XIV Annual Meeting of the SRNT Europe

“Mission Possible – Towards a Tobacco-Free Society”

30 August – 2 September, 2012
University of Helsinki
Main building
Helsinki
FINLAND
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Dear SRNT-E Helsinki conference delegates,

Welcome to the 14th Conference of the Society for Research on Nicotine and Tobacco-Europe Chapter. The scientific preparations started a year ago, when the current board of the European Chapter of SRNT was elected, a process in which two former board members rotate off and two new ones are elected based on nominations and voting by the SRNT-E members. The new board elected from its midst the chair and co-chair of the programme committee, which has the responsibility for creating the scientific program for the next conference. Programme committee members represent the broad spectrum of interests and scientific fields represented in the Society. The Programme committee requested ideas and suggestions for program content (symposia, workshops) from the membership at the end of the year. These were used to provide a provisional framework for the programme, but individual symposia and workshops were confirmed only once the abstracts had been submitted at the end of April and reviewed in May by the programme committee and external reviewers. A similar procedure was used for abstracts of individual oral and poster presentations.

A novel and experimental form of presentation in use for the first time at SRNT-E conferences is the poster-oral presentation format. The highest quality posters were selected for a brief oral presentation as well. These sessions are held immediately after the actual poster sessions and are intended to provide a forum for further discussion of exciting new results in a larger group than would be possible if it took place by the poster itself. We look forward to your feedback about this experiment!

The scientific programme starts with two topical workshops, being followed by a well-established structure of the conference. The keynote and theme lectures alternate with symposia and oral sessions to provide an overview of recent developments and entirely new results in the area of nicotine and tobacco research. Despite much progress in tobacco control and enhancement of smoking cessation, there is still much to learn about the basic mechanisms of nicotine action, the neurobiological, psychological and social aspects of tobacco dependence and the societal implications of tobacco control policies. We hope that our conference will contribute to enhancing this understanding.

We would like to thank the programme committee, the SRNT-E members, the local organizing committee and all other stakeholders for their hard work and input in creating an outstanding programme.

Jaakko Kaprio, MD, PhD                Henri-Jean Aubin, MD, PhD
SRNT-E President            Programme Committee chair
ABSTRACT REVIEWERS

Amanda Amos  Karl Fagerström  Hayden McRobbie
Deborah Arnott  Karine Gallopel  Yves Martinet
Henri-Jean Aubin  Tony George  Ann McNeill
Paul Aveyard  Ania Gigmore  Marcus Munafó
David Balfour  Christine Godfrey  Rachael Murray
Linda Bauld  Cecilia Gotti  Sakire Pogun
Anil Batra  Peter Hajek  Ovide Pomerleau
Emmanuelle Beguinot  Gerard Hastings  Sylviane Ratte
Ivan Berlin  Jose Ignacio de Granda Orive  Martin Raw
John Britton  Luk Joossens  Jed Rose
Tony Caggiula  Jaakko Kaprio  Outi Salminen
Christian Chiamulera  Paul Kenny  Mohammed Shaib
Tim Coleman  Taru H. Kinnunen  Ian Stoleman
Jacques Cornuz  Tellervo Korhonen  Rachel Tyndale
Alan Collins  Daniel Kotz  Robert West
Bill Corrigall  Ersin Koylu  Marc Willemsen
Paul Clarke  Eva Kralikova  Susan Wonnacott
Mariella DeBiasi  Jacques Le Houeze  Michele Zoli
Jean-François Etter  Caryn Lerman

LOCAL ORGANISING COMMITTEE

Professor Jaakko Kaprio Chair
Dr. Ari Haukkala  University Lecturer, Department of Social Research, Faculty of Social Sciences, University of Helsinki
Dr. Antero Heloma  Principal Medical Adviser, National Institute for Health and Welfare
Professor Heikki Murtomaa  Head and Chair Department of Oral Public Health Institute of Dentistry, University of Helsinki
Dr. Meri Paavola  Ministerial Adviser, Department for Promotion of Welfare and Health, Ministry of Social Affairs and Health
Dr. Kristina Patja  Director, Association for Medical Continuous Professional Development in Finland (Promedico)
Professor Kari Reijula  Professor, Finnish Institute of Occupational Health
Dr. Outi Salminen  University Lecturer, Division of Pharmacology and Toxicology, Faculty of Pharmacy, University of Helsinki
Dr. Tellervo Korhonen Secretary
**PROGRAMME**

### 30 August, Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>09:15–15:15</td>
<td>Pre-Conference Workshops</td>
<td>Main Building (street address: Fabianinkatu 33)</td>
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<td></td>
<td><strong>Hall 1</strong> (2nd floor)</td>
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<td></td>
<td><strong>W1</strong> - E-cigarettes: Current status and future challenges</td>
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<td><strong>Moderators:</strong> Natalie Walker, Maciej Goniewicz</td>
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<tr>
<td>15:00–17:00</td>
<td><strong>Main Building Lobby</strong> (1st Floor) Registration &amp; Info</td>
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<td>15:30–16:30</td>
<td><strong>AUD VII</strong> (street address: Unioninkatu 34) SRNT-E Board Meeting (By invitation only)</td>
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<td>17:00–17:45</td>
<td><strong>Great Hall</strong> (street address: Unioninkatu 34, 1st floor) Opening and Welcome</td>
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<td>17:45–18:30</td>
<td><strong>Great Hall</strong> Keynote Lecture: Antti Maunu, European Commission</td>
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<td>&quot;Scientific knowledge and the EU legislation against tobacco&quot;</td>
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<td>18:30–19:00</td>
<td>Break to move to the City Hall (5-10 minutes walk)</td>
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<tr>
<td>19:00–20:30</td>
<td>Helsinki City Hall (street address: Pohjoisesplanadi 11-13) Helsinki City Reception</td>
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### 31 August, Friday

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>08:00 – 17:00</td>
<td><strong>Main Building Lobby</strong> (1st Floor) Registration &amp; Info</td>
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<tr>
<td>08:30–09:15</td>
<td><strong>Hall 1</strong> Pre-Clinical Theme Lecture: Michael J. Marks</td>
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<td></td>
<td>Introduced by: Outi Salminen</td>
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<td></td>
<td>&quot;Nicotinic receptor up-regulation (?): Thirty years on&quot;</td>
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<td>09:15–10:15</td>
<td><strong>Symposia</strong></td>
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<td><strong>Hall 1</strong></td>
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<td></td>
<td><strong>S1</strong> - A tribute to contributions made by Professor David Balfour in the field of nicotine and tobacco research</td>
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<td></td>
<td>This symposium has been organized by the SRNT-E Board</td>
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<td><strong>Moderator:</strong> Mohammed Shoaiib</td>
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<td><strong>Speakers:</strong></td>
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<td></td>
<td>Neil Paterson (video)</td>
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<td>Edward Levin</td>
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<td>Michael J. Marks</td>
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<td>Susan Wonnacott (video)</td>
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<td>Ian Stolerman</td>
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<td>Ivan Berlin</td>
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<td></td>
<td>David Balfour</td>
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<td><strong>Small Hall</strong></td>
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<td><strong>S2</strong> - Snus use, smoking, and dual use: associations to behaviour, lifestyle, and cessation in Nordic countries</td>
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<td><strong>Moderators:</strong> Ari Haukkala</td>
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<td><strong>Presentations:</strong></td>
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<td>&quot;Dual use of cigarettes and snus among adolescents and young people in a country where sale of snus is forbidden&quot;</td>
<td>Ari Rimpela</td>
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<td>&quot;Psycho-social and behavioral correlates of snus use among young people and adults in Sweden&quot;</td>
<td>Maria Rosana Galanti</td>
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<td>&quot;Patterns of dual use of snus and cigarettes in a mature snus market&quot;</td>
<td>Karl Erik Lund, Ann McNeill</td>
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<td>Use of snus, nicotine addiction, and smoking cessation among young male smokers in Finland: A longitudinal study</td>
<td>Ari Haukkala, Ulla Broms, Tellervo Korhonen, Hanna Ollila, Kauko Heikkilä, Jaakko Kaprio</td>
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<td>Time</td>
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<td>10:15–10:45</td>
<td>Coffee Break&lt;br&gt;Lobby of the 2nd floor / Lobby of the 4th floor</td>
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<td>10:45–12:00</td>
<td>Translational Symposium&lt;br&gt;Hall 1&lt;br&gt;S3 - Nicotine as gateway to illicit drugs: New evidence from animal and human studies&lt;br&gt;Moderators: Tellervo Korhonen, Amir Levine&lt;br&gt;Presentation:&lt;br&gt;“A mouse model of the Gateway Hypothesis: Nicotine and cocaine”&lt;br&gt;Amir Levine, YanYou Huang, Bettina Drisaldi, Edmund A. Griffin Jr., Daniela D. Pollak, Shiqin Xu, Deqi Yin, Christine Schaffran, Denise B. Kandel, Eric R. Kandel&lt;br&gt;“Nicotine-opioid interactions: In Vivo and In Vitro studies”&lt;br&gt;Raimo K. Tuominen, Reeta Taika, Tanja Vihavainen, Jukka S. Pakkanen, Mikko Airavaara, T. Petteri Piepponen, Liisa Ahtee, Paul Whiteaker, Ronald J. Lukas, Outi Salminen&lt;br&gt;“Early cigarette smoking as predictor of illicit drug use in adolescence: Evidence from the FinnTwin12 cohort”&lt;br&gt;Tellervo Korhonen, Aniti Latvala, Danielle M Dick, Lea Pulkkinen, Anja C. Huzink, Richard J. Rose, Jaakko Kaprio&lt;br&gt;Discussant: Allan C Collins&lt;br&gt;12:00–13:00</td>
<td>Lunch Break&lt;br&gt;(Delegates have received Lunch Vouchers which they can use in numerous restaurants and cafes at down town in immediate neighborhood of the university campus)</td>
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<td>13:00–13:45</td>
<td>Poster Viewing&lt;br&gt;Lobby of the 2nd floor&lt;br&gt;Poster Session 1: P1 – P73 + PO11-1 - PO12-5</td>
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<tr>
<td>Time</td>
<td>Location</td>
<td>Session Details</td>
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| 15:00–16:00| **Symposia**      | **Hall 1**  
S4 - Modern ways of smoking cessation  
Moderators: Outi Salminen, Kirs Pietilä  
Presentations:  
“Utilization of internet-based smoking cessation discussion forums for peer support and data collecting purposes”  
Tarhi Kurko  
“Smoking cessation support delivered via mobile phone text messaging (TXT2STOP)”  
Caroline Free  
“ forget smoking cues: Specific mechanisms for the disruption of nicotine and tobacco memory”  
Alessia Aub, Christian Chiamulea  

**Hall 2**  
S5 - New plain packaging research in Europe  
Moderator: Crawford Moodie  
Presentations:  
“Perceptions of plain and branded cigarette packaging among Norwegian adults and youth: A focus group study”  
Janne Scheffels, Gunnar Saeboe  
“Visual attention to health warnings on plain tobacco packaging in adolescent smokers and non-smokers”  
Olivia M. Maynard, Marcus R. Munafò, Ute Leonards  
“The influence of tobacco packaging on attitudes and purchase intentions among young women”  
Cristina Romero, Juan Miguel Rey, Ana Polo, Blanca Lacave  
“Young adult women smokers’ perceptions of using plain packaging in real world settings”  
Crawford Moodie, Anna Marie Mackintosh, Diane Dixon  
“Perceptions of plain packaging for other tobacco products”  
Karine-Gallopal-Morvan

| 16:00–16:45| **Oral Presentations** | **Hall 1**  
Session Co-chairs: Henri-Jean Aubin, Rachael Murray  
O1 - “Exercise to enhance smoking cessation: Results from the FIT2QUIT trial”  
Ralph Maddison, Vaughan Roberts, Chris Bullen, Yanan Jiang, Hayden McRobbie, Harry Prapavessis, Marewa Glover, Paul Brown, Sue Taylor  
O2 - “Smoking cessation interventions for smokers with current or past depression: A systematic review and meta-analysis”  
Regina M. van der Meers, Marc C. Willemsen, Filip Smit, Pim Cuypers  
O3 - “Predictive validity of the motivation to stop scale (MTSS): A simple measure of motivation to stop smoking”  
Daniel Kotz, Jamie Brown, Robert West  

**Hall 2**  
Session Co-chairs: Robert West, Meri Paavola  
O4 - “Did expanding the licence for NRT in England to permit use for smoking reduction affect its use for this purpose, attempts to stop smoking and motivation to stop?”  
Emma Beard, Jamie Brown, Robert West  
O5 - “GP advice on smoking cessation in England: A national survey”  
Jamie Brown, Robert West, Jennifer A.Fidler, Alison Bish, Andy McEwen  
O6 - “Short-term effects os statutory total smoking ban in Finnish schools”  
Hanna Ollila, Anni Lommi, Paulina Luopa, Jukka Jokela, Riikka Puusniekka

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<td>Small Hall</td>
<td>Pharmaceutical Industry Sponsored Symposium</td>
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<td>19:15–19:30</td>
<td>Small Hall</td>
<td>Transfer to the Reception</td>
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| 19:30–21:30| Foyer of the Great Hall (street address: Unioninkatu 34, 1st floor)  
University of Helsinki Reception  
Greeting by the Vice Rector Kimmo Kontula  
Buffet |
1 September, Saturday

08:00–17:00  Main Building Lobby (1st Floor)
  Registration & Info

08:30–09:15  Hall 1
  Clinical Theme Lecture: A. Eden Evins
  Introduced by: Henri-Jean Aubin
  “Treating smokers with mental illness: Toward best practices”

09:15–10:30  Symposia

Hall 1

S6 - Nicotine vaccination:
A multidisciplinary investigation of an eagerly awaited smoking cessation tool
Moderator: Daniel Kotz
Presentations:
- “Nicotine vaccination: How it works, why we need it, and what we expect from it”
  Onno van Schayck
- “Electroencephalography (EEG) as a tool to measure nicotine’s effects in the brain”
  Eric Vuurman
- “Breaking the habit: A neurobiological investigation into the influence of vaccination on the effects of nicotine in the brain”
  Anne Havermans
- “Efficacy of a novel therapy to quit smoking: Nicotine vaccination”
  Philippe Hoogsteder
- “Quitting smoking with nicotine vaccination: The experiences of trial participants and their families”
  Anna Wolters

Small Hall

S7 - Genetics of smoking behavior
Moderators: Jacqueline Vink, Jaakko Kaprio
Presentations:
- “A twin study of nicotine metabolism among young adult smokers”
  Jaakko Kaprio, Maria Novalen, Jenni Hällfors, Tellervo Korhonen, Antti Latvala, Aru Loukola, Richard J. Rose, Rachel F. Tyndale
- “Genome-wide association analyses of cotinine levels in two Dutch cohort samples”
  Jacqueline M. Vink, Gonneke Wilmens, Gerard Grootheest, Brenda Penninx, Dorret I. Boomsma
- “Hydroxybupropion levels, formed by genetically variable CYP2B6, is a major determinant of bupropion’s efficacy for smoking cessation”
- “Utility of genetic variants associated with tobacco use for causal analyses”
  Marcus R. Munafò
- “Genome-wide association study of smoking behavior in a twin sample discloses evidence for shared predisposition for nicotine dependence and schizophrenia”
  Aru Loukola, Juho Wedenjoa, Janne Pitkäniemi, Kaisu Kesikitalo-Vuokko, Ulla Broms, Tellervo Korhonen, L. He, Samuli Ripatti, Antti-Pekka Sarin, Anja Häppölä, Kauko Heikkinä, Michele L. Piergadia, Y-L Chou, Pamela A.F. Mad- den, Aarno Palotie, Jaakko Kaprio

10:30–11:00  Coffee Break
  Lobby of the 2nd floor / Lobby of the 4th floor

11:00–11:45  Hall 1
  Public Health / Epidemiology Theme Lecture: Linda Bauld
  Introduced by: Rachael Murray
  “The NHS smoking cessation services: ‘An individual level’ intervention with ‘population’ reach”

11:45–12:45  Poster Viewing and Refreshments
  Lobby of the 2nd floor

Poster Session 2: P74 – RRP22 + PO21-1 - PO22-7
**Poster-Oral Presentations**

**PO21 - Hall 1**

**Session Co-chairs:**
Jacques Le Houezec, Antero Heloma

**Presentations:**

- **PO21-1:** "Dutch tobacco control out of control? Results from the first Dutch FCTC shadow report"  
  Marc Willemsen, Els Rennen

- **PO21-2:** "Smoke in bars and restaurants pre and post implementation of smoking ban in Poland"  
  Maciej L. Goniewicz, Leon Kosmider, Jakub Knyaz

- **PO21-3:** "Adolescents’ perceptions on the effectiveness of tobacco control policies"  
  Melinda Péntez, Péter Báázs, Kristie L. Foley

- **PO21-4:** "Tobacco taxes, consumption, and smuggling in Hungary: A review of the past decade"  
  József Bodrogi, Kristie L. Foley

- **PO21-5:** "Community adult smoking prevalence moderates the associations between perceived peer smoking norms and behavior and youth cigarette smoking – A multilevel analysis"  
  Johannes Thurl, Sharon Lipperman-Kreda, Joel W. Grube

- **PO21-6:** "Opinions about the positive effects of comprehensive smoke-free legislation in Hungary"  
  Edit Pauik, László Nagymajtényi, Kristie L. Foley, Todd Rogers, Doug Easterling

- **PO21-7:** "Measuring the impact of tobacco control policies on health outcomes using the ToPIQ (Tobacco Policy Impact on Quitting) model"  
  Graeme Roberts, Kevin Bowrin, Antoine E. Kunst, Enrico de Nigris

**PO22 - Small Hall**

**Session Co-chairs:** Marcus Munafo, Ari Haukkala

**Presentations:**

- **PO22-1:** "Responses to environmental smoking in never-smoking children: Can symptoms of nicotine addiction develop in response to second-hand smoke exposure?"  
  Kathrin Schuck, Marloes Kleinjan, Roy Otten, Rutger C. M. E. Engels, Joseph R. DiFranza

- **PO22-2:** "Genetic polymorphisms of CYP2A6 and smoking addiction"  
  Emmi Tiili, M. Antikainen, S. Hyttinen, Ari Hirvonen

- **PO22-3:** "The effect of nicotine availability on performance during a vigilance task with affective and smoking cue distracters"  
  Jason D. Robinson, Jeffery M. Engelman, Yong Cui, Francesco Versace, Andrew J. Waters, David G. Gilbert, Ellen R. Gritz, Paul M. Cinciripini

- **PO22-4:** "Prescribing of nicotine replacement therapy in and around pregnancy in the UK – A population based study using primary care data"  
  Nafeesa N. Dhalwani, Laila J. Tata, Tim Coleman, Lisa Szatkowski

- **PO22-5:** "Pregnancy and smoking cessation in Wales"  
  Katie Tulloch, Vasiliki Kiparoglou, Hugo Van Woerden

- **PO22-6:** "Prevalence of long-term NRT use among ex-smokers and associated exposure to nicotine"  
  Lion Shahab, Emma Beard, Jamie Brown, Robert West

- **PO22-7:** "Joint non-linear associations of CPD and cotinine levels with nine candidate gene regions among heavy smoking Finns"  
  Janne Pitkäniemi, Ulla Broms, Samuli Ripatti, Veikko Salomaa, Jaakko Kaprio

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**Schedule**

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<th>Time</th>
<th>Event</th>
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<tr>
<td>12:45–13:45</td>
<td><strong>PO21 - Hall 1</strong>&lt;br&gt;Presentation Talk 1 &amp; 2: N. Dhalwani &amp; Liat-density&lt;br&gt;PO21-1, 2, 3, 4, 5, 6, 7</td>
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<tr>
<td>13:45–14:30</td>
<td>Lunch Break&lt;br&gt;(Pre-symposium lunch in the Foyer of the Small Hall)</td>
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<tr>
<td>14:30–16:00</td>
<td>Small Hall&lt;br&gt;Pharmaceutical Industry Sponsored Symposium</td>
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<tr>
<td>16:00–18:00</td>
<td>Main Lobby &amp; Lobby of the 2nd floor&lt;br&gt;Exhibitions&lt;br&gt;AUD VII (street address: Unioninkatu 34)&lt;br&gt;SNTE-E Board Meeting (By invitation only)</td>
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<tr>
<td>18:00–18:30</td>
<td>Break</td>
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<td>18:30–19:00</td>
<td>Transfer to the Conference Dinner&lt;br&gt;Charter Boat M.S. Natalia leaves at 18:30 sharp at the Market Place&lt;br&gt;(See: Map)</td>
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<td>19:00–23:00</td>
<td>Tenali von Fersen&lt;br&gt;Suomenlinna Sea Fortress&lt;br&gt;Conference Dinner (by dinner card only)&lt;br&gt;Boat arrives to city at 23:00</td>
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### 2 September, Sunday

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<th>Time</th>
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<tr>
<td>08:00–14:00</td>
<td>Main Building Lobby (1st Floor)</td>
<td>Registration &amp; Info</td>
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| 08:30–09:45   | **Symposia**        | **Hall 1**  
S8 - The Tobacco Control Research Turanga: A platform for informing the route to a Smokefree New Zealand by 2025  
**Moderator:** Marewa Glover  
**Presentations:**  
“Research to inform progress towards the endgame: New Zealand’s unique tobacco tobacco control research Turanga”  
*Marewa Glover, Chris Bullen*  
“Developing strategic tobacco control research priorities: The NZ Turanga model”  
*Jonathan Williman, Chris Bullen, Marewa Glover, Natalie Walker*  
“En route to a Smokefree New Zealand by 2025: Research progress, issues and challenges”  
*Marewa Glover, Chris Bullen, Natalie Walker, Jane Kelsey, Caroline Saunders, Peter Tait*  
**Discussant:** Robert West  
|               | Small Hall          | **S9 - Attention Deficit-Hyperactivity Disorder (ADHD) and tobacco smoking: Recent findings**  
**Moderators:** Ivan Berlin, Lirio S. Covey  
**Presentations:**  
“Nicotine-induced enhancement of attention and Attention Deficit–Hyperactivity Disorder”  
*Stephen J. Heishman*  
“Brain substrates of nicotine dependence-ADHD comorbidity”  
*F. Joseph McClernon*  
“Smoking cessation and mors-methylphenidate: Findings from a clinical trial of smokers with Attention Deficit–Hyperactivity Disorder”  
*Lirio S. Covey, Mei-Chen Hu, Edward Nunes*  
“Do symptoms of Attention Deficit–Hyperactivity Disorder overlap with tobacco withdrawal symptoms?”  
*Ivan Berlin, Mei-Chen Hu, Lirio S. Covey* |
| 09:45–10:30   | Hall 1              | **Policy Theme Lecture:** Armando Peruga  
**Introduced by:** Jaakko Kaprio  
“Stop tobacco industry interference in tobacco control”  
|               | Small Hall          | **Coffee Break**  
**Lobby of the 2nd floor**  
| 10:30–11:00   |                    | **Round Table**  
**Moderators:** David Balfour, Ivan Berlin  
“Publishing in the Nicotine & Tobacco Research Journal”  
|               | Small Hall          | **Oral Presentations**  
**Session Co-chairs:** Sakire Pogun, Outi Salminen  
*O7-*“Nicotinic 42 desensitizing agents and nicotine self-administration in rats”  
*Edward D. Levin, Vanessa Cousins, Joshua Johnson, Susan Slade, Corrine Wells, Amir Rezvani, Yingxian Xiao, Milton L. Brown, Mikell A. Paige, Kenneth J. Kellar*  
*O8-*“Exercise attenuates withdrawal symptoms from nicotine in mice”  
*Helen Kweworth, Andria Tziakouri, Mark Copley, Ying Chen, Ian Kitchen, Alexis Bailey*  
*O9-*“A novel anti-nicotine vaccine: Antigen design affects antibody function in mice”  
*Michael J. McCluskie, Ningli Zhang, Michelle Benoit, Karen Robertson, Heather L. Davis, David C. Pryde, David Blakemore, Alan D. Brown, Lyn H. Jones, David R. Stead, David P. Gervais, Phil White, James R. Merson*  
*O10-*“NIC7-DT, a novel anti-nicotine vaccine, induces better functional antibody responses in mice compared to a NIC- Q mimetic”  
*Heather L. Davis, Michael J. McCluskie, Ningli Zhang, Michelle Benoit, Karen Robertson, David C. Pryde, David R. Stead, David P. Gervais, Phil White, James R. Merson* |
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<td>“Total smoking ban reduced exposure to tobacco smoke among restaurant workers in Finland”</td>
<td>Jere Reijula, Tom Johnsson, Simo Kaleva, Tapani Tuomi, Kari Reijula</td>
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<td>David Dok, Arja Rimpelä</td>
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<td>“Influence of delivery strategy on message processing mechanisms and E-loyalty of a Dutch computer tailored smoking cessation intervention”</td>
<td>Nicola E. Stanczyk, R. Cruizet, C. Bolman, JWM Murns, Hein de Vries</td>
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<td>O14</td>
<td>“Smoking cessation for health care providers: A four country case study”</td>
<td>Frances A. Stillman, Jennifer M. Kreslake, Michelle R. Kaufman, Sule Akcay, Magdalena Cobanu, Javaid Khan, Zhao Na, Jiangbo Wang</td>
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<td>Daniel Kotz, Marc C. Willemsen, Robert West</td>
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<td>O17</td>
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<td>Vasiliki Kiparoglou, Katie Tulloch, Hugo Van Woerdan</td>
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<td>“Hospital nurses’ adherence to the 5 A protocol after tobacco guideline implementation”</td>
<td>Patricia M. Smith, Scott M. Sellick</td>
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<td>O19</td>
<td>“Comparison of smokers from extreme ends of the cigarette dependence continuum”</td>
<td>Oliver West, Peter Hajek</td>
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<td>O20</td>
<td>“Factors associated with smoking cessation in early and late pregnancy in a trial of standard dose nicotine replacement therapy”</td>
<td>Luis Vaz, Tim Coleman, Jo Leonard-Bee, Paul Aveyard, Sue Cooper, Sarah Lewis, Matthew Grainge, Jim Thornton, Kim Watts, John Britton</td>
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13:15–13:45 | Closing Ceremony | Small Hall | Session Co-chairs: Daniel Kotz, Kristiina Patja | O16 | “Are light smokers less likely to receive advice to quit from their GP than moderate-to-heavy smokers? A comparison of population data from the Netherlands and England” | Daniel Kotz, Marc C. Willemsen, Robert West | O17 | “Smoking cessation and gender differences in Wales” | Vasiliki Kiparoglou, Katie Tulloch, Hugo Van Woerdan | O18 | “Hospital nurses’ adherence to the 5 A protocol after tobacco guideline implementation” | Patricia M. Smith, Scott M. Sellick | O19 | “Comparison of smokers from extreme ends of the cigarette dependence continuum” | Oliver West, Peter Hajek | O20 | “Factors associated with smoking cessation in early and late pregnancy in a trial of standard dose nicotine replacement therapy” | Luis Vaz, Tim Coleman, Jo Leonard-Bee, Paul Aveyard, Sue Cooper, Sarah Lewis, Matthew Grainge, Jim Thornton, Kim Watts, John Britton |
PRE-CONFERENCE WORKSHOPS
W1
E-CIGARETTES: CURRENT Status AND FUTURE CHALLENGES

Moderators: Natalie WALKER, Maciej GONIEWICZ
Speakers: Natalie WALKER1, Maciej GONIEWICZ2, Peter HAJEK3, Hayden McROBBIE4, Martin DOCKRELL5

1 The National Institute for Health Innovation (Formerly known as the Clinical Trials Research Unit), University of Auckland, Auckland, New Zealand
2 Tobacco Dependence Research Unit, Queen Mary University of London, London, England
3 Action on Smoking and Health, London, UK
4 Department of Tobacco Dependence, University of Bath, UK
5 Action on Smoking and Health, London, UK

Electronic cigarettes or e-cigarettes (EC) are battery-powered devices that deliver a vaporized liquid nicotine solution, usually in propylene glycol or glycerine. In addition to nicotine delivery, the vapour also provides a flavour and physical sensation similar to that of inhaled tobacco smoke, while no tobacco, smoke, or combustion is actually involved in its operation. There is currently a growing interest in EC. EC may have a potential to impact public health. The best solution for smokers to avoid health risk associated with cigarettes is to stop smoking. However, many are unable to do so. For such smokers, harm reduction strategies are increasingly seen as an important alternative which could deliver substantial reductions in the mortality and morbidity currently caused by tobacco. The substitution of tobacco smoking with a safer alternative is one such option. EC may also have a potential in stop-smoking treatment where it may be more effective and more attractive to users than existing nicotine replacement products. The increasing popularity of EC however also poses some potential problems and risks, such as initiation of nicotine use among young non-smokers serving as a potential gateway to smoking conventional cigarettes, issues of safety and regulation, etc. The symposium aims to present the latest findings from several areas of interest including population use (Dockrell), efficacy in smoking cessation (Dr. Walker) and use among young smokers and non-smokers (Dr. Goniewicz), and to provide an overview of what is known about the safety, efficacy and use of EC (Prof. Hajejk). The audience will be able to participate in discussing some of the controversies which currently surround this topic.

W1-1
E-CIGARETTES: THE VIEWS OF SMOKING CESSION STAFF IN THE UNITED KINGDOM

Linda Bauld, Ph.D.*, University of Stirling, UK, Rosemary Hiscock, Ph.D., University of Bath, UK, Maciej L. Goniewicz, M, Ph.D., Queen Mary University of London, UK, Andy McEwen, Ph.D., University College London, UK, and UK Center for Tobacco Control Studies, Deborah Arnott and Martin Dockrell *, Action on Smoking and Health, UK

Background: An increasing number of smokers in the UK report that they have tried e-cigarette (EC). However, limited information about these products is available to health professionals who are treating smokers. This study set out to determine to what extent staff working in NHS stop smoking services were receiving requests for information regarding ECs and what smokers were reporting about their use of these products. Methods: A survey was sent in July 2011 to all (n=904) stop smoking service managers, commissioners and advisers in the UK who were named on a national register held by the NHS Centre for Smoking Cessation and Training (NCSCT). 592 staff completed the survey, a response rate of 65% and all of those (n=587) who had heard of ECs were included in the analysis. Results: Most smoking cessation staff (86%) had been asked by clients about EC in the past 6 months, but two thirds said that less than a quarter of their clients regularly used ECs. Of those staff who had seen clients who used ECs, nearly two thirds said that their clients were using them to try to quit, 3% said their clients were using ECs to cut down and 10% said their clients were using ECs when they could not smoke. Among respondents whose clients were using ECs to quit, almost half thought that clients had found them helpful to quit and nearly 60% of respondents whose clients used ECs for cutting down thought ECs had been useful. Staff reported that over two fifths of questions from clients were about getting access to ECs, one fifth of questions were about safety and a tenth of questions were about effectiveness. Many respondents felt they did not have enough information and guidance to answer clients’ questions. Conclusions: Health professionals supporting smokers to quit are being asked about EC by their clients. Many smokers are using these products but smoking cessation staff have limited information to address any queries they have and express concern about issues of safety and effectiveness. Better information and possibly regulation of these products is required to assist both smokers and health professionals to make informed choices about EC use.

Funding: UK Centre for Tobacco Control Studies and Cancer Research UK.

W1-2
ELECTRONIC CIGARETTES FOR SMOKING CES- SATION: A RANDOMISED CONTROLLED TRIAL

Chris Bullen, FAFPHM, MBChB, Ph.D., Jonathan Williman, Ph.D., Colin Howe, Ph.D., Varsha Parag, M.Sc., and Natalie Walker, Ph.D.*, University of Auckland, New Zealand, Hayden McRobbie, MBChB, Ph.D., Queen Mary University of London, UK, and Murray Laugesen, FAFPHM, MBChB, Health New Zealand Limited, New Zealand

Design and Methods: Parallel group 3-arm randomised controlled trial. Participants (n=653) will be randomised in a 4:4:1 ratio to 16 mg cartridges (n=290), 21 mg nicotine patch (n=290) or 0 mg EC cartridges (n=73) to use for 12 weeks, providing 80% power at p=0.05 to detect an absolute difference of 10% in abstinence between the nicotine EC and patch groups, and 15% between the nicotine and placebo EC groups. All participants are encouraged to use standard Quitline behavioural support. Participants: Smokers of ≥10 cigarettes/day for ≥1 year, who are aged ≥18 years and want to quit smoking. Participants are recruited from the community using media
advertising. Primary outcome: Continuous abstinence (Russell Standard) at 6 months after the quit day, verified by exhaled carbon monoxide (CO<10ppm). Secondary outcomes: Self-reported continuous abstinence and 7-day point prevalence abstinence at 1.3 and 6 months after quit day; self-reported acceptability, utilisation of tobacco or other cessation products over the treatment period (quit day to 12 weeks post-quit day); urges to smoke, tobacco withdrawal symptoms, adverse events and cost per quitter. Summary: This is the only EC efficacy trial to be embarked upon to date. More than 50% of participants have now been randomised. Key challenges include frequent battery failure and participant withdrawal from the trial.

Funding: This trial was supported by funding from the Health Research Council of New Zealand. ECs used in the trial are provided by PGM International Ltd.

W1-3
USE OF ELECTRONIC CIGARETTES AMONG POLISH ADOLESCENTS AND YOUNG ADULTS
Maciej L. Goniewicz, Ph.D.*, Queen Mary University of London, UK; Wioleta Zielinska-Danch, Ph.D. and Andrzej Sobczak, Ph.D., Medical University of Silesia, Poland; Peter Hajek, Ph.D., Queen Mary University of London, UK

Background: The electronic nicotine delivery systems are cigarette-like plastic devices that generate vapor by heating nicotine solution in a mixture of propylene glycol and water. They are commonly called electronic cigarettes or e-cigarettes (EC) and are advertised as a safer alternative for conventional cigarettes. The online popularity of EC has surpassed that of smokeless tobacco products and nicotine replacement therapies. Little is known about EC popularity among adolescents. The aim of this study was to evaluate prevalence, patterns of use, and attitudes towards EC among Polish adolescents and young adults.

Methods: This study was a part of the Polish national survey of tobacco and nicotine use among adolescents and young adults, conducted in 2010 and 2011. The total of 20,240 secondary and high school students took part (age range 16-24). The survey included questions about use of EC and attitudes and beliefs about health and social consequences of these products. Results: The total of 20.9% (95%CI 20.1-21.6) of students had ever tried an EC and 6.9% (95%CI 6.4-7.4) had used one in the 30 days prior to completing the survey. EC use was associated with being male, younger age, living in an urban area, smoking cigarettes, and having a smoking parent or partner. Students who tried conventional cigarettes were more likely to try ECs than those who had never smoked (29.5% (95%CI 28.5-30.4) vs. 3.2% (95%CI 2.6-3.7), respectively). 54.8% (95%CI 53.9-55.6) believed that ECs were safer than regular cigarettes. Conclusions: More than one fifth of Polish students tried EC. ECs may have the potential to compete with the conventional cigarettes. We recommend that the Polish tobacco control programs and anti-smoking campaigns for adolescents start paying attention to new nicotine delivery products. Regulation on minors access to ECs should be implemented.

Funding: Supported by the Ministry of Science and Higher Education of Poland (grant numbers N N404 025738 and N N404 025638). This study was conducted while the first author was at the Medical University of Silesia, Poland.

W2
ROLE FOR NICOTINE AND nAChR-TARGETED THERAPIES FOR PARKINSON’S DISEASE
Moderators: Outi SALMINEN, Allan C COLLINS
Speakers: Cecilia GOTTI1, Paul WHITEAKER2, Sharon GRADY3, Maryka QUIK4, Alexandra POTTER5, Ullamari PESONEN6
Discussant: Allan C. COLLINS3

1University of Milan, Italy
2Barrow Neurological Institute, USA
3University of Colorado, Boulder, USA
4Stanford Research Institute, USA
5University of Vermont, USA
6Orion Pharma, Finland

W2-1
SUBUNIT COMPOSITION, PHYSIOLOGICAL ROLE AND REGULATION OF NATIVE nAChR SUBTYPES IN THE MESOSTRIATAL DOPAMINERGIC PATHWAY
Cecilia GOTTI1, Michele ZOLI2
1CNR, Institute of Neuroscience, Milano, Italy
2University of Modena and Reggio Emilia, Modena, Italy

Background: Neuronal nicotinic acetylcholine receptors (nAChRs) encompass a family of ligand-gated ion channels consisting of a variety of subtypes made up of different combinations of nine alpha (alpha2- alpha10) and three beta (beta2-beta4) subunits. Recent studies of the anatomical distribution, composition and physiological role of native nAChRs have shown that their assembly is a highly regulated process, with certain subunit combinations being favored on the basis of their subunit expression patterns, subunit interactions, post-translational modifications and other cellular processes.

Methods: We used a battery of subunit specific antibodies to immunoprecipitate and immunopurify radiolabeled nAChRs in the mesostriatal pathway of control and 6-hydroxydopamine (a toxin that selectively destroys dopaminergic neurons)-treated rats, and wildtype and nicotinic subunit KO mice. Moreover, we investigated the effect of chronic nicotine treatment on the nAChR subtypes expressed in this pathway.

The contribution of native nAChRs to the neurochemical and behavioural effects of systemic nicotine was then studied by perfusing selective antagonists into the mesostriatal pathway. Results: By dissecting the different components of the mesostriatal system, in particular distinguishing the nigrostriatal from the mesolimbic dopamine pathway and by comparing nAChR subtypes present in the nerve terminals from those present in the cell body/dendrite compartments we have identified the native subtypes expressed in vivo. In particular, immunohistochemical analysis showed a partial regional heterogeneity of nAChR...
subtypes in mesostriatal dopamine neurons. These subtypes are differently affected by chronic nicotine treatment. In vivo pharmacological studies showed that the alpha6* nAChRs expressed in the ventral tegmental area (VTA) are necessary for the effects of systemic nicotine on dopamine release in the nucleus accumbens, a main neurochemical target of addictive drugs, and dopamine-dependent behaviors, such as nicotine-elicited habituated locomotion and nicotine self-administration. **Conclusions:** The results of these experiments show that the alpha6* nAChRs expressed in the dopamine neurons of the VTA are necessary for the effects of systemic nicotine on these neurons and mediate, at least in part, nicotine reinforcing properties.

**Funding:** These studies are supported by European Union grant agreement N° HEALTH-F2-2006-202088 “NeuroCypres” and the Italian PRIN 2009R7WCZS

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**W2-1 NOVEL APPROACHES TO STUDYING ALPHA6BETA2* NICOTINIC RECEPTORS**

Paul WHITEAKER, J. Brek EATON, Linda M. LUCERO
Division of Neurobiology, Barrow Neurological Institute, Phoenix, USA

**Background:** Nigrostriatal dopamine neurons are lost in Parkinson’s disease, and express a highly-unusual alpha6beta2(alpha4beta2) nicotinic acetylcholine receptor (nAChR) population. These nAChRs may provide a novel antiparkinsonian drug target. Alternatively, since alpha6beta2* nAChR loss is an early marker of nigrostriatal dopamine neuron degeneration, selective labels for these nAChRs may provide a valuable approach for tracking disease progress and treatment success. Heterologous expression of alpha6beta2* nAChRs has proven challenging, which has slowed efforts to study this rare subtype. We have worked to produce a suite of pharmacologically accurate, practically useful, alpha6beta2* nAChR models. **Methods:** A cell line expressing alpha6/2beta2beta3 nAChRs was produced, and a membrane potential dye approach was employed to develop a high-throughput screening (HTS)-ready functional assay using this cell line. Fully-concatemeric nAChR pentamer cDNA constructs were used to model the family of complex alpha6beta2(alpha4beta2) nAChR subtypes when expressed in Xenopus oocytes. **Results:** The alpha6/2beta2beta3 SH-EP1 cell line has high levels of nAChR expression as measured by radioligand binding and functional measures (86Rb+ efflux and voltage-clamp electrophysiology). Careful optimization of cell growth and assay conditions allowed the development of an HTS-ready assay using a membrane potential readout, with together with lower-throughput but even more-faithful concatemeric models provides a powerful set of tools for studying alpha6beta2* nAChRs.

**Funding:** Supported by NIH grants DA012242, DA026627, DA032483, and Targacept Inc. contract # 09-030-0388

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**W2-3 THE NIGRO-STRIATAL PATHWAY NICOTINIC RECEPTOR SYSTEM: ADAPTATION, ACTIVATION AND DESENSITIZATION**

Sharon R. GRADY, Charles R. WAGEMAN, Outi SALMINEN, Allan C. COLLINS, Michael J. MARKS
Institute for Behavioral Genetics, University of Colorado, Boulder, CO, USA

**Background:** Nigro-striatal dopamine neurons express a variety of subtypes of nicotinic acetylcholine receptors (nAChRs), including the widespread CNS subtype, alpha4beta2-nAChR, as well as the less universal, alpha4alpha5beta2. The alpha6alpha3beta2a and alpha6alpha4beta3beta2 subtypes, which have very limited distribution, are also expressed in dopamine neurons. Relative function of the various nAChR subtypes as well as the balance between activation and desensitization, are important considerations for drug therapies. Adaptations to null mutations and to chronically applied nicotine were investigated. **Methods:** Dopamine release mediated by nAChRs was measured using crude synaptosomal preparations from various genotypes of mice. Results: In mice with subunit null mutations, deletion of the alpha5 subunit results in an increase in the function of the alpha6beta2-nAChR subtypes and a decrease in the alpha4(non-alpha6)beta2- nAChR function. Conversely, deletion of the beta3 subunit results in the opposite change. Functional adaptations are also seen with gain-of-function mutations. Mice with the hypersensitive alpha4L9A knock-in mutation (Fonck et al, 2005), show a decrease in alpha4(non-alpha6)beta2- nAChR function and an increase in alpha6beta2-nAChR function. However, the hypersensitive alpha6L9S transgenic mice (Drenen et al, 2008) also show decreased alpha4(non-alpha6)beta2-nAChR activity and increased alpha6beta2-nAChR function indicating some differences in regulation of these receptor subtypes. Recent data indicate that there are also differences in how the various nAChR subtypes respond to extended exposure to agonists like nicotine. As compared to alpha4beta2-, the alpha6beta3beta2- and alpha4alpha5beta2-nAChR subtypes appear to desensitize less with exposure to 300 nM nicotine. **Conclusions:** Investigations with a variety of genetically modified mice show that there is functional adaptation that occurs among the various nAChR subtypes on dopaminergic neurons. This property of continued activation at the less widespread nAChR subtypes has important implications for targeted therapeutic drugs.

**Funding:** Supported by NIH grants DA032483, DA019375, DA012242, DA015663
BACKGROUND: Converging research suggests that nicotine and nicotinic acetylcholine receptor (nAChR) drugs may be beneficial in the management of Parkinson’s disease. This movement disorder is characterized by a generalized dysfunction of the nervous system, with the most pronounced deficits in the nigrostriatal dopaminergic pathway. The idea that nAChR drugs may be useful first stemmed from epidemiological studies, which showed that smoking is linked to a decreased incidence of Parkinson’s disease. Work with parkinsonian animal models then demonstrated that nicotine protects against neuronal damage, including nigrostriatal dopaminergic degeneration. More recent studies also indicate that nicotine can reduce motor complications that arise with chronic L-dopa treatment, the gold standard for Parkinson’s disease therapy. An important question is what nAChRs may be involved as this would allow for a targeted therapeutic approach with minimal side effects. METHODS: Nicotine is a nonselective agonist that acts at multiple nAChRs in both the peripheral and central nervous system. A variety of different approaches in experimental animal models have been used to identify the specific subtypes that are most relevant for Parkinson’s disease therapeutics. RESULTS: Experiments with nAChR mutant mice and nAChR subtype selective drugs suggest that alpha4beta2* and alpha6beta2* nAChRs may be linked to the beneficial impact of nicotine on L-dopa-induced dyskinesias in parkinsonian rodents. These two receptor populations also appear to be important for nicotine-mediated protection against nigrostriatal damage, with possibly an involvement of alpha7 nAChRs. In addition to these effects of nicotine on neuronal pathways linked to Parkinson’s disease motor problems, nicotine has anti-depressant properties and improves attention/cognition through an action at alpha4beta2* and alpha7 nAChRs. Thus nAChR drugs also may be of benefit for non-motor symptoms that arise with Parkinson’s disease. CONCLUSION: These combined findings suggest that CNS selective nAChR drugs may represent promising therapeutic agents for the management of Parkinson’s disease. FUNDING: These studies are supported by NIH NS59910 and NS65851

W2-5 Nicotinic Modulation of Cognitive Function: Therapeutic Implications for Parkinson’s Disease
Alexandra POTTER, James BOYD, Paul NEWHOUSE
University of Vermont, College of Medicine, Burlington, VT, USA

BACKGROUND: Cognitive and behavioral features of Parkinson’s disease have been increasingly recognized in recent years, and are currently considered part of the clinical features of this disease. Cognitive deficits are associated with all stages of PD, and contribute to the disability, caregiver strain, and diminished quality of life for patients. Deficits in executive function, decision making, impulsivity, attentional control, set shifting, and reward processing have all been found to be affected in PD. Nicotinic receptor function affects cognitive function in many relevant cognitive domains, a finding which has been demonstrated in several clinical populations. Further support for the relationship between cognitive dysfunction in PD and nicotine comes from literature documenting decreased numbers of nAChR receptors in PD and a decreased incidence of Parkinson’s disease in cigarette smokers. METHODS: Data from human studies examining the effects of pharmacological manipulations of nicotinic acetylcholine receptor function on cognitive functions will be presented. Relevant data from diverse clinical populations including PD, mild cognitive impairment, and attention deficit hyperactivity disorder will be presented to illustrate a potential role of nAChR receptors in cognitive deficits and difficulty with behavioral control in PD. RESULTS: Nicotine and novel nicotinic agonists are associated with improvements in cognitive domains that are affected in Parkinson’s disease, including executive function, task switching, response inhibition, and memory. Cognitive benefits are seen with both acute and chronic drug administration suggesting the viability of targeting nAChR receptors therapeutically. Studies of nicotinic receptor antagonists further support nicotinic regulation of core cognitive processes in Parkinson’s disease. CONCLUSION: These findings support the further study of therapeutic agents targeting nicotinic cholinergic receptors for treatment of cognitive and behavioral dysfunction in PD. FUNDING: Support for this research was provided by Japan Tobacco (PN), the Parkinson’s disease Study Group (JB), the National Institute on Aging (PN), and the National Institute of Mental Health (AP).
lective chemical entities. At the moment most of the research concentrates on the role of alpha4beta2*, alpha6 and alpha7 subunit containing subtypes in the several CNS indications, like addiction, cognition and attention, and pain as well as movement disorders. A pipeline search with nicotinic receptor agonist as a search term (nicotine excluded; Citeline® search 08/12) reveals that cognitive disorders are the most popular indication. This term covers half of the pipeline, including AD, SCZ associated cognitive impairment, and other cognitive disorders and dementia. Other major indications are pain, addiction and ADHD. There are only 6 projects listed for PD and motor diseases (4% of all projects). The most active companies in the area of nAChR development are Abbott/NeuroSearch and AstraZeneca/Targacept covering over half of the projects listed in the database. Although, the exact active project sponsorships are currently difficult to determine, since there has been many reversals of the licensing agreements and rearrangements of the R&D portfolios in the big pharma. Also the exact number of active projects in the clinical phases is difficult to determine. Most of the projects targeting nAChRs are in the PhaseII at the moment, since many chemical entities are tested for several indications. Only 5 projects are listed to have reached the Phall according to this pipeline database. These are all clinical studies with isopronicline (AZD-3480; TC-1734), orally active, brain-selective alpha4beta2/alpha2beta2 partial agonist. For the drug development some of the fundamental questions are still enigmatic: since nAChR are known to rapidly desensitise, is it an agonistic action with functional blockade we need or direct receptor antagonism. Another issue is that if we go for agonists, do we need full or partial agonists, or positive allosteric modulators (PAM).

*Professor Ullamari Pesonen is an employee of Orion Pharma, Finland
LECTURES
Tobacco use in general and cigarette smoking in particular is a major cause of premature mortality throughout the world. The primary initial sites of action for nicotine, the major pharmacologically active component in tobacco, are the nicotinic acetylcholine receptors. It has been nearly thirty years since the observation that chronic nicotine exposure increases the numbers of high affinity nicotinic receptor (nAChR) binding sites (Marks et al., 1983; Schwartz and Kellar, 1983). Indeed, chronic nicotine exposure of cells, animals and humans results in an increase in the numbers of receptors with high affinity for nicotine, a response that has been termed upregulation. Despite significant progress in evaluation of the adaptations occurring following chronic nicotine treatment, questions remain about the nature of the up-regulation and the development of tolerance to nicotine. The extent and pattern the development of tolerance following chronic nicotine treatment differs markedly among inbred strains of mice indicating that genetic background is an important factor in this response. We are investigating some of these questions using mice that differ in receptor expression, including nicotinic receptor gene knockout mice. This importance of genetics is reinforced by distinctly different responses of beta2 and beta4 knockout mice to chronic nicotine treatment. Immunochemical experiments indicate that this upregulation is most pronounced for the 42*-nAChR and that the increase represents an increase in subunit protein. However, other nAChR subtypes may respond differently to chronic nicotine treatment. Understanding which nAChR subtypes are altered by smoking could help establish appropriate targets for smoking cessation agents.

Clinical Theme Lecture:

TREATING SMOKERS WITH MENTAL ILLNESS: TOWARD BEST PRACTICES
A. Eden EVINS
Associate Professor of Psychiatry, Harvard Medical School, Boston, MA, USA
Director, Center for Addiction Medicine, Massachusetts General Hospital, Boston, MA, USA

Prevalence of nicotine dependence and the burden of smoking-related morbidity and premature mortality is high among those with psychiatric illness worldwide, underscoring the importance of focusing smoking cessation efforts on these vulnerable subgroups. Because smokers with psychiatric illnesses have traditionally been excluded from smoking cessation intervention trials, clinicians have had little guidance on what cessation aids are safe and effective for smokers with psychiatric illness. Further, it has been unclear the extent to which loss of the psychoactive effects of nicotine with smoking cessation may worsen psychiatric illness such as cognitive performance in schizophrenia or recurrence of depressive illness. It has also been unclear whether cessation aids or adjunctive treatments may ameliorate any adverse effect of cessation on psychiatric illness. The first evidence-based guidelines for smoking cessation treatment in schizophrenia recommend bupropion with or without nicotine replacement therapy for smokers with schizophrenia, citing no evidence for worsening in psychiatric symptoms. In two controlled trials, varenicline has been well tolerated and effective in smokers with schizophrenia. While standard smoking cessation interventions are effective for smokers with affective disorders, further research is needed to determine the optimal duration of treatment and whether co-treatment with an antidepressant medication is advantageous.

Public Health / Epidemiology Theme Lecture:

THE NHS SMOKING CESSATION SERVICES: AN ‘INDIVIDUAL LEVEL’ INTERVENTION WITH ‘POPULATION’ REACH
Linda BAULD
Professor at School of Management
UK Centre for Tobacco Control Studies and University of Stirling, Scotland

Considerable evidence now exists about effective ways to support smokers to quit, with the best outcomes achieved from a combination of behavioural support and pharmacotherapy. In the mid 1990s in the UK, this evidence, summarised in a special issue of the journal Thorax, was used to make the case with policy makers for the creation of a national treatment service for smokers. This service was developed from 1998 and embedded in the UK’s National Health Service (NHS). Known as NHS stop smoking services, this network of free at the point of use clinics has now treated more than 5 million smokers. This presentation will outline existing evidence for the reach and effectiveness of these services, with point prevalence CO validated abstinence averaging 45% at 4 weeks post quit date and 15% at one year. It will also describe how the services have evolved to offer a range of forms of behavioural support (such as drop in rolling groups) and what outcomes are observed from these types of interventions. Challenges around conducting research with these services and in treating particular groups of smokers will be highlighted. Finally, future developments including the likely introduction of tobacco harm reduction options into service protocols will be outlined.

Policy Theme Lecture:

STOP TOBACCO INDUSTRY INTERFERENCE IN TOBACCO CONTROL
Armando PERUGA
Program Manager, Tobacco Free Initiative, WORLD HEALTH ORGANIZATION, Geneva, SWITZERLAND
SYMPOSIA
S1

A TRIBUTE TO CONTRIBUTIONS MADE BY PROFESSOR DAVID BALFOUR IN THE FIELD OF NICOTINE AND TOBACCO RESEARCH

Moderator: Mohammed Shoai
Speakers: Neil PATERSON1, Edward LEVIN2, Michael J. MARKS3, Susan WONNACOTT4, Ian STOLERMAN5, Ivan BERLIN6, David BALFOUR7
1 Psychogenics Inc., Tarrytown, NJ, USA
2 Institute for Brain Sciences, Duke University, USA
3 Institute of Genetics, Colorado University, Boulder, USA
4 Department of Biochemistry, Bath University, Bath, UK
5 Addiction Sciences, Institute of Psychiatry, London, UK
6 Faculté de Médecine Université P. & M. Curie, Paris, France
7 Pharmacology Department, Dundee University, UK

This symposium organized by the SRNT-E Board will commemorate the valuable contributions made by Professor David Balfour in the field of nicotine psychopharmacology. A series of distinguished colleagues will highlight his contributions on preclinical aspects of nicotine action, his mentorship and his successful role as chief editor of the Nicotine and Tobacco Research Journal.

S2

SNUS USE, SMOKING, AND DUAL USE: ASSOCIATIONS TO BEHAVIOUR, LIFESTYLE, AND CESSSION IN NORDIC COUNTRIES

Moderator: Ari HAUKKALA
Speakers: Arja RIMPELÄ1, Maria Rosaria GALANTI2, Karl Erik LUND3, Ari HAUKKALA4
1 University of Tampere, Finland
2 Norwegian Institute for Alcohol and Drug Research, Norway
3 University of Helsinki, Finland

Nordic countries have been interesting context to examine associations of snus use and smoking. Snus is moist tobacco that has spread from Sweden to other Nordic countries. Currently there is a different regulation related to snus use in Nordic countries. Sweden got exemption from EU ban while in Finland selling snus have been forbidden since 1992. In Norway as non EU member allows selling snus but prevalence has been lower than in Sweden. This symposium presents four papers concentrating to snus use, smoking and combined use of these products and associations to nicotine addiction, smoking cessation, other substance use and lifestyle among adolescence and adults. Arja Rimpelä review current status and trends of dual use of cigarettes and snus and their correlates among adolescents and young people in Finland while Maria Rosaria Galanti will examine psycho-social and behavioral correlates of snus use and dual use in Sweden. Karl Erik Lund will show magnitude of dual use, the order of uptake of the two products, and compared dual users with other groups in relation to cessation related factors in Norway. Ari Haukkala will examine if cessation rates and nicotine addiction differ between dual users and other groups in longitudinal setting among young adults in Finland.

S2.1

DUAL USE OF CIGARETTES AND SNUS AMONG ADOLESCENTS AND YOUNG PEOPLE IN A COUNTRY WHERE SALE OF SNUS IS FORBIDDEN

Arja RIMPELÄ
School of Health Sciences, University of Tampere, Finland

The sale of snus has been forbidden since 1992 when Finland joined EU. Before that use of snus was rare among young people and adults. The Adolescent Health and Lifestyle Survey has measured snus use since 1981 and smoking from 1977. At that time daily smoking has decreased among 14-year-olds from 16% to 4% and among the 16-year-olds from 32% to 22%. Daily snus use has stayed low among the 14-year-olds and increased particularly during the last two years (among the 16-year-olds from 1.3% in 1981 to 4.2% in 2011). Over half of all snus users report using only snus and no cigarettes. The surveys have revealed that most of the snus is imported from Sweden (or Estonia) by frequent ferry trips cheap enough for everybody. There have been hardly any limitations for amounts and it seems that there has been organized mediation and delivery of products. Organized sports have been one of the channels through which young people get acquainted with snus. Over the period 1999-2010, prevalence of cigarette smoking among Finnish conscripts decreased from 42% to 34%, while snus use increased from 5% to 12%, and dual use from 7% to 13%. Regular competitive sports training is associated with increased use of snus and decreased cigarette smoking. Of different sport types, ice hockey is most strongly associated with snus use and dual use as well as are other team sports.

Funding: The Ministry of Social Affairs and Health, Finland

S2.2

PSYCHO-SOCIAL AND BEHAVIORAL CORRELATES OF SNUS USE AMONG YOUNG PEOPLE AND ADULTS IN SWEDEN

Maria Rosaria GALANTI
Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden

The use of snus in Sweden has attracted attention because of its possible role in the reduction of smoking prevalence at the population level. However, very little is known about the psycho-social and lifestyle characteristics of snus users, likely to be important modifiers of the health consequences of tobacco use itself. The analysis of data from three Swedish surveys, partly unpublished, will be used to highlight the cross-sectional association between use of snus (in particular dual use), use of other substances, risk behaviors, associated lifestyle, as well as indicators of mental well-being. Both young (15 and 17 years old students) and adult populations (18-84 years old) are included. Measures of association will be presented as Odd Ratios and corresponding 95% Confidence Intervals derived through logistic regression models. A survey conducted in 2011 among students 15 years of age confirmed earlier findings of an association between
use of snus and use of other tobacco (cigarettes, water-pipe), alcohol and illicit drugs in male adolescents. Other problem behaviors were also more prevalent among snus users than among non-users of tobacco. However, there was a notable difference between exclusive users of snus and dual users. This latter group constituted at least 50% of all young male users and showed prevalence of risky behaviors similar to or even higher than that of smokers, while the prevalence was lower among exclusive users of snus than among smokers. In a survey among adults conducted in 2010, the same gradient was noted concerning lifestyle and psycho-social correlates of snus use. Psycho-social characteristics and health-related behaviors of snus users differ from those of non-users of tobacco, but also remarkably between exclusive and dual users. This knowledge should inform risk assessment connected to the use of snus.

**Funding:** The Stockholm County Council and/or by the Swedish National Institute of Public Health

### S2.3 PATTERNS OF DUAL USE OF SNUS AND CIGARETTES IN A MATURE SNUS MARKET

Karl Erik LUND1, Ann MCNEILL2
1 Norwegian Institute for Alcohol and Drug Research, Norway
2 Division of Epidemiology & Public Health, University of Nottingham, UK Centre for Tobacco Control Studies, UK

In Norway, use of snus has a long tradition. In 2011 snus held a 30% market share of the nicotine market. Among males, the snus epidemic is in a relatively progressed stage, and Norway might represent an interesting case in which to study the magnitude of combined use of snus and cigarettes. We selected 3524 males from a data pool (2005-2010) of annual cross-sectional surveys of tobacco behaviour, comprising a representative sample of the adult Norwegian population (16 + years). We studied the magnitude of dual use, the order of uptake of the two products, the reasons for the additional snus use, and compared dual users and exclusive cigarette smokers with regard to smoking intensity, plans for quitting smoking and future smoking identity. 6.8% of men had some kind of current concomitant use of snus and cigarettes, but only 1% reported a daily consumption of both products. The most typical pattern of dual use was a combination where daily use of one product was paired with occasional use of the other. Dual users consumed significantly fewer cigarettes per week (56.6, N=226, SD 53.82) than smokers who had either quit snus (79.6, N=108, SD 61.47) or single smokers with no history of snus use (80.2, N=621, SD 55.86). Only 24% with a history of dual use reported snus to be their first tobacco product. However, the proportion who had initiated tobacco use with snus, increased significantly with younger age. Among dual users with daily intake of snus, a majority of 53.6% reported that the purpose of their snus use was to quit smoking. No significant difference was observed between dual users (49.8%, 95% CI 43.5-56.1, N=238) and exclusive smokers (43.2%, 95% CI 39.5-46.9, N=679) with respect to the proportion that planned to quit smoking within the next six months. However, a higher proportion of dual users (74.4%, 95% CI 68.8-80.0, N=235) than exclusive smokers (61.3%, 95% CI 57.6-65.0, N=658) reported that they most definitely or probably would be totally smoke-free five years into the future. Our study indicates that the prevalence of smoking is quite low among men who use snus every day, but generally quite high among men who use snus on a less-than-daily basis.

**Funding:** The Norwegian Directorate of Health and the Norwegian Research Council

### S2.4 USE OF SNUS, NICOTINE ADDICTION, AND SMOKING CESSATION AMONG YOUNG MALE SMOKERS IN FINLAND – A LONGITUDINAL STUDY

Ani HAUKKALA1, Ulla BROMS2, Tellervo KORHONEN3, Hanna OLLILÄ4, Kauko HEIKKILÄ5, Jaakko KAPRIO6
1 Department of Social Research, University of Helsinki, Finland
2 Department of Public Health, University of Helsinki and National Institute for Health and Welfare, Helsinki, Finland
3 Hjelt Institute, University of Helsinki, Finland
4 National Institute for Health and Welfare, Helsinki, Finland
5 Department of Public Health, University of Helsinki, Finland
6 Department of Public Health, University of Helsinki, Institute for Molecular Medicine and National Institute for Health and Welfare, Helsinki, Finland

Smoking cessation among snus users is a controversial question as some studies have shown that snus use could help in smoking cessation while other studies have shown that dual use of snus and cigarettes leads to higher nicotine addiction. We examined if cessation rates differ between dual users of snus plus cigarettes and daily cigarette smokers. Second, if dual use of cigarettes and snus is related to higher nicotine addiction. Questionnaires with items on tobacco use were administered in wave 4 (mean age 24.4, SD 0.9 yrs) in 2000-2002 and ten years later in wave 5 (mean age 33.9, SD 1.1) of the FinnTwin16 longitudinal cohort study of twins born 1974-1979. At wave 4 respondents were asked 1) how many times one had ever used snus (0, 1, 2-49, >50) or if one was a regular use, and 2) whether they had ever smoked, had quit, smoked less than daily or if they smoked daily the amount smoked. Over 4000 twins were examined in these two waves. Daily smoking and snus experiment and use was assessed at both baseline and follow-up. Fagerström Test for Nicotine Dependence (FTND) at follow-up was used as an indicator of nicotine addiction. At wave 4, 31.5% of males while 22.7% of women were daily smokers. One third of males had tried snus more than once while only 3.3% of women. Among male daily smokers 28.1% had not tried snus while among regular smokers 20% had never smoked. From baseline male smokers (n=668) 20% had quit at wave 5. Use of snus at the baseline or at the follow-up did not predict smoking cessation after adjusting for baseline number of cigarettes smoked per day (CPD). Among daily male smokers snus...
The Gateway Hypothesis refers to epidemiological findings that describe the progression from licit psychoactive substances, such as nicotine and alcohol to use of illicit drugs, such as cannabis and cocaine in human populations. For years, evidence supporting this hypothesis was based mostly on epidemiological studies. Also, several alternative mechanisms have been suggested to challenge this hypothesis. Recently, studies using animal models have been conducted to test this debated hypothesis. In this symposium we will present new evidence on nicotine as a gateway to initiation of illicit drug use. The Gateway Hypothesis was based mostly on epidemiological studies. Also, several alternative mechanisms have been suggested to challenge this hypothesis. Recently, studies using animal models have been conducted to test this debated hypothesis. In this symposium we will present new evidence on nicotine as a gateway to initiation of illicit drug use.

**S3 NICOTINE AS GATEWAY TO ILLICIT DRUGS: NEW EVIDENCE FROM ANIMAL AND HUMAN STUDIES**

**Moderators:** Tellervo KORHONEN, Amir LEVINE

**Speakers:** Amir LEVINE1, Raimo K. TUOMINEN2, Tellervo KORHONEN3

**Discussant:** Allan C. COLLINS

1 Department of Neuroscience, College of Physicians and Surgeons, Columbia University, New York, USA
2 Division of Pharmacology and Toxicology, Faculty of Pharmacy, University of Helsinki, Finland
3 New York State Psychiatric Institute, New York, USA

The Gateway Hypothesis refers to epidemiological findings that describe the progression from licit psychoactive substances, such as nicotine and alcohol to use of illicit drugs, such as cannabis and cocaine in human populations. For years, evidence supporting this hypothesis was based mostly on epidemiological studies. Also, several alternative mechanisms have been suggested to challenge this hypothesis. Recently, studies using animal models have been conducted to test this debated hypothesis. In this symposium we will present new evidence on nicotine as a gateway to initiation of illicit drug use. The Gateway Hypothesis was based mostly on epidemiological studies. Also, several alternative mechanisms have been suggested to challenge this hypothesis. Recently, studies using animal models have been conducted to test this debated hypothesis. In this symposium we will present new evidence on nicotine as a gateway to initiation of illicit drug use.

**A MOUSE MODEL OF THE GATEWAY HYPOTHESIS: NICOTINE AND COCAINE**

Amir LEVINE1, YanYou HUANG1, Bettina DRISALDI1, Edmund A. GRIFFIN Jr.2, Daniela D. POLLAK3, Shiqin XU1, Deqi YIN1, Christine SCHAFFRAN4, Denise B. KANDEL2, Eric R. KANDEL5

1 Columbia University, New York, USA
2 New York State Psychiatric Institute and Columbia University, New York, USA;
3 New York State Psychiatric Institute, New York, USA and Medical University of Vienna, Vienna, Austria
4 New York State Psychiatric Institute, New York, USA
5 Columbia University and New York State Psychiatric Institute, New York, USA

We present the results of mouse models of the Gateway Hypothesis, an epidemiological finding that describes the progression from nicotine or alcohol to marijuana to the use of cocaine and other illicit drugs in human populations. We designed alternate sequential treatment paradigms involving nicotine and cocaine and examined the behavioral, electrophysiological and molecular effects of alternate sequential pretreatments. Pretreatment with nicotine alters the response to cocaine of both addiction-related behavior and synaptic plasticity in the striatum, a region critical for addiction related reward. The ordering effect from nicotine to cocaine is unidirectional; there is no effect of cocaine on nicotine. Nicotine alters addiction related behavior and cellular physiology of long-term potentiation in the striatum in response to cocaine. Nicotine produces these effects by initiating global histone acetylation in the striatum, which leads to greater transcriptional activation of the fosB gene, a molecular marker for addiction. Pretreatment with the histone deacetylase inhibitor SAHA produces an enhancement of the effect of cocaine very similar to that produced by pretreatment with nicotine. Conversely, decreasing histone acetylation leads to a decrease in the effects of cocaine electrophysiologically and in fosB expression. Histone acetylation is reduced genetically by using a mouse which lacks one functional allele of CREB binding protein (a histone acetyl transferase), or pharmacologically, by infusing low-dose theophylline (an HDAC stimulator) to the nucleus accumbens. Nicotine enhances the effects of cocaine only when it is administered for several days prior to cocaine treatment and is given concurrently with cocaine. These findings stimulated a new analysis of epidemiological data which indicates that the majority of cocaine users initiate cocaine use after onset of smoking and while still smoking actively, and that initiation of cocaine after smoking increases the risk of becoming dependent on cocaine compared with initiation prior to smoking. The histone deacetylase inhibitory properties of nicotine provide a molecular mechanism for the Gateway Hypothesis.

**Funding:** NIH grants 5 R01 DA024001 (E.R.K., D.B.K., A.L., and multiple principal investigators)
S3.2 NICOTINE-OPIOID INTERACTIONS: IN VIVO AND IN VITRO STUDIES

Raimo K. TUOMINEN1, Reeta TALKA1, Tanja VIHAVAINEN1, Jukka S. PAKKANEN2, Mikko AIRAVAARA3, T. Petteri PIEPPONEN1, Liisa AHTEE1, Paul WHITEAKER4, Ronald J. LUKAS4, Outi SALMINEN1

1 Faculty of Pharmacy, University of Helsinki, Finland
2 Faculty of Pharmacy and Institute of Biotechnology, University of Helsinki and Finnish Medicines Agency, Helsinki, Finland
3 Faculty of Pharmacy and Institute of Biotechnology, University of Helsinki, Finland
4 Barrow Neurological Institute, Phoenix, Arizona, USA

Methadone is used in maintenance therapy of opioid addicts and nearly all of these patients are smokers. We have studied nicotine-opioid interactions in mice after chronic administration of nicotine in drinking water. In these mice the number of binding sites corresponding to high affinity alpha(4)beta(2)-nAChRs and low affinity alpha(7)-nAChRs were increased in various brain regions. Their dopaminergic system was sensitized to the effects of acute nicotine challenge. Nicotine treated NMRI mice were cross-sensitized to the reinforcing effect of morphine in conditioned place preference paradigm. Thus, the effect of morphine was acquired with a lower dose as compared to mice with no chronic nicotine. Effects of acute morphine on locomotor activity and brain dopamine metabolism were enhanced for at least one week after cessation of nicotine. In nicotine treated mice the effect of morphine on extracellular GABA in ventral tegmental area/substantia nigra (VTA/SN) was reversed as measured by in vivo microdialysis of conscious mice. In control mice morphine decreased GABA while in nicotine treated mice it increased GABA in microdialysis fluid. No changes were found in the number or affinity or functional activity of mu-opioid receptors in any of the brain areas studied. Thus, the cross-sensitization does not seem to be mediated by changes in mu-opioid receptors. To study hypothesis that the interaction takes place at nAChR level, we used SH-SY5Y cells with native expression of various nAChRs subunits, and genetically modified SH-EP1-h alpha(4)beta(2) and SH-EP1-h-alpha(7) cell lines. Morphine was able to displace [3H]epibatidine in all cell-lines studied. Methadone inhibited [3H]methyllycaconitine binding and [3H]epibatidine binding in SH-SY5Y and SH-EP1-h alpha(7) cells. However, methadone and buprenorphine had no effect on [3H]epibatidine binding in SH-EP1-alpha(4)beta(2) cells. In these cells morphine behaved as a partial agonist and methadone as non-competitive antagonist in 86Rb+ efflux assay. Our data suggest that morphine is a partial agonist and methadone is a functional noncompetitive antagonist for alpha(4)beta(2) nAChRs.

Funding: Academy of Finland, Sigrid Juselius Foundation, Finnish Cultural Foundation

S3.3 EARLY CIGARETTE SMOKING AS PREDICTOR OF ILLICIT DRUG USE IN ADOLESCENCE: EVIDENCE FROM THE FINNTWIN12 COHORT

Tellervo KORHONEN1, Antti LATVALA1, Danielle DICK2, Lea PULKKINEN3, Anja C. HUJINIK4, Richard J. ROSE4, Jaakko KAPRIO1

1 University of Helsinki and National Institute for Health and Welfare, Helsinki, Finland
2 Virginia Commonwealth University, Richmond, VA, USA
3 University of Jyväskylä, Finland
4 VUUniversity Amsterdam and Behavioral Science Institute, Nijmegen, The Netherlands
5 Indiana University, Bloomington, IN, USA

The Gateway Hypothesis suggests that cigarette smoking leads to use of illicit drugs. Here we review evidence based on genetically informative twin studies. Data were collected within the population-based longitudinal FinnTwin12 cohort at the ages of 12, 14 and 17. Predictors for use of illicit drugs were female sex, early smoking onset, own and parental binge drinking, peers using drugs, and aggressive behavior. Smoking onset by age 12 was the most powerful predictor, which motivated exploring causal nature of association. We compared model describing direct impact of liability to tobacco use on illicit drug use with model including shared liability for both substances. Model including direct impact of tobacco on drugs had the best data fit. In the next study we explored if externalizing behaviors (age 12) predict illicit drug use independently or if their associations with drugs are mediated via tobacco use (age 14). The association of hyperactivity–impulsivity with drugs was mediated via tobacco. For aggressiveness and inattention, girls showed no mediation, but in boys mediation was seen. Consistently, the direct association of early cigarette smoking on drugs was significant. Finally, we studied genetic and environmental influences common to externalizing behavior, smoking and drug use initiation. Multivariate Cholesky models were fit to data from 737 monozygotic and 722 dizygotic twin pairs. Heritability of externalizing behavior was 56% that of smoking initiation/amount 20/32% and 27% for drug use. In the best-fitting model common environmental influences explained most of the covariance between externalizing behavior and smoking initiation (69%) and amount (77%). Covariance between smoking initiation/amount and drug use was due to additive genetic (42/22%) and common environmental (58/78%) influences. Half of the covariance between externalizing behavior and drug use was due to shared genetic and half due to environments shared by co-twins. The results indicate that especially early exposure to cigarette smoking is a very strong predictor of illicit drug use initiation. However, shared genetic and environmental influences partly explain this association.

Funding: The Academy of Finland Research Program on Substance Use and Addictions (118555); the Academy of Finland (100499; 205585; 141054); the Academy of Finland Center of Excellence in Complex Disease Genetics (213506, 129680); the National Institutes of Alcohol Abuse & Alcoholism (NIAAA), USA (AA-12502; AA-09203; AA-00145; AA-15416); and the NWO – Vidi scheme, Netherlands (452-06-004).
S4 MODERN WAYS OF SMOKING CESSATION

Moderators: Outi SALMINEN, Kirsi PIETILÄ
Speakers: Terhi KURKO1, Caroline FREE2, Alessia AUBER3
1 Division of Social Pharmacy, Faculty of Pharmacy, University of Helsinki, Finland
2 Department of Epidemiology and Population Health, London School of Hygiene & Tropical Medicine, UK
3 NeuroPsi Lab, Department of Public Health & Community Medicine, University of Verona, Italy

Smoking contributes to many health problems including cancers and heart and lung diseases. People trying to quit smoking can be helped with medication and/or through behavioural support such as specialist counseling or group therapy. Support, information and counseling can be offered either face-to-face or by other more technical means. Innovative effective smoking cessation interventions are required to appeal to those who are not willing to access traditional cessation services. Mobile phones are widely used and are now well integrated into the daily lives of many, particularly young adults. Mobile phones are a potential medium for the delivery of health interventions such as smoking cessation via automated text messaging programme. Also, internet-based support for smoking cessation has been developed in recent years. Of those, internet-based discussion forums provide an easy-to-use possibility to share sensitive issues, to receive support and to discuss informative matters. These interventions are low cost and likely to highly cost-effective. Moreover, retrieval of smoking-related memories is a potent trigger of relapse after otherwise successful smoking cessation. Stimuli repeatedly paired with cigarette smoking may become components of these smoking related memories. The exploration of the bio-behavioural mechanisms underlying smoking memories may lead to the discovery of innovative pharmacological and non-pharmacological therapies to be integrated into existing relapse prevention programs. In this symposium, modern web-based and mobile phone-based methods of smoking cessation are presented and discussed. Also, the role of innovative pharmacological and non-pharmacological therapies to prevent relapse after smoking cessation is further explored.

S4.1 UTILIZATION OF INTERNET-BASED SMOKING CESSATION DISCUSSION FORUMS FOR PEER SUPPORT AND DATA COLLECTING PURPOSES

Terhi KURKO
Division of Social Pharmacy, Faculty of Pharmacy, University of Helsinki, Finland

Public health potential of various forms of internet-based support for smoking cessation has been acknowledged. According to systematic reviews, internet-based support may benefit smoking cessation (Shabab & McEwen 2009; Myung, McDonell, Kazinets, Seo & Moskowitz 2009; Civljak, Sheikh, Stead & Car 2010). Of the great variety of internet-based smoking cessation services, especially Internet discussion forums (also called online support groups) provide quitters with an easily accessed way to gain and express peer support and share experiences. Internet-based discussion forums provide a comfortable and easy to use possibility to share sensitive health issues, express emotional support and bring up several informative matters. Smoking cessation discussion forums are widely used, as nearly every Western country offers online smoking cessation support. There is some evidence that the social support received from the Internet community can support the management and empowerment of chronic conditions. This may result in better health outcomes. On the other hand, the quality of the information provided in the discussion forums has been questioned and the importance of critical evaluation of their content has been highlighted. For research purposes the discussion forums can provide information of true personal experiences of illness and conditions. These discussions can highlight viewpoints, truly important for quitters without researchers’ interference. However, ethical issues, quality and rigor assessment as well as different possibilities to use internet discussion forums for data collection should be taken into account in planning such studies. The pros and cons of the utilization of internet-based discussion forums as a form of support for smoking cessation, and on the other hand, for research purposes are discussed in this presentation. Further, examples of studies exploring smokers’ and quitters’ naturalistic perceptions emerged in these discussions are given.

Funding: The Finnish Cultural Foundation

S4.2 SMOKING CESSATION SUPPORT DELIVERED VIA MOBILE PHONE TEXT MESSAGING (TXT2STOP)

Caroline FREE
Nutrition and Public Health Intervention Research Unit, Department of Epidemiology and Population Health, London School of Hygiene & Tropical Medicine, UK

The txt2stop trial was the first trial to report that automated mobile phone text messaging smoking cessation programme (txt2stop) doubles continuous abstinence which was bio-chemically verified at 6 months. In the trial 5,800 smokers who were willing to make a quit attempt were randomly allocated, to a mobile phone text messaging smoking cessation programme (txt2stop), comprising motivational messages and behavioural change support, or to a control group that received text messages unrelated to quitting. All analyses were by intention to treat. Primary outcome data were available for 5,524 (95%) participants. Bio-chemically verified continuous abstinence at six months was significantly increased in the txt2stop group, (10.7% txt2stop versus 4.9% control, relative risk 2.20, 95% CI 1.80 to 2.68, p<0.0001). Similar results were obtained when participants that were lost to follow up were treated as smokers, (268/2911 [9.2%] txt2stop versus 124/2881 [4.3%] control, relative risk 2.14, 95% CI 1.74 to 2.63, p<0.0001), and when they were excluded (268/2735 [9.8%] txt2stop versus 124/2789 [4.4%] control, relative risk 2.20, 95% CI 1.79 to 2.71, p<0.0001). There was no significant heterogeneity in any of the pre-specified subgroups. A number of pieces of
research were conducted leading up to or alongside the trial. In the symposium I will present key aspects of the work completed to develop the txt2stop intervention, describe the behaviour change techniques in the intervention and the key findings from our process evaluation (qualitative interviews with participants, a questionnaire survey among 600 participants and open comments from all participants). I will discuss the implications for potential mechanisms of action of the texting program and the development of future texting interventions. 

**Funding:** UK Medical Research Council

**S4.3 FORGETTING SMOKING CUES: SPECIFIC MECHANISMS FOR THE DISRUPTION OF NICOTINE AND TOBACCO MEMORY**

Alessia AUBER1, Christian CHIAMULERA1

1 NeuroPsi Lab, Dept. Public Health & Community Medicine, University of Verona, Italy

**Background:** Stimuli repeatedly paired with cigarette smoking may become components of smoking related memories. Retrieval of such as memories is a potent trigger of relapse. During retrieval, memory undergoes to a process of update, that may put the memory in a labile state during which the underlying molecular mechanisms may be inhibited (i.e., memory disruption) or reactivated (i.e., memory reconsolidation). Selective disruption of traumatic- or drugs- related memory has been proposed of therapeutic benefit for post-traumatic stress and drug addiction disorders. The identification of the molecular mechanisms underlying reconsolidation may become potential targets for pharmacological treatment for such as disorders. Beside the pharmacological intervention, it has been also proposed that the exposure to a behavioural procedure, i.e. extinction after retrieval, may prevent fear memories reconsolidation suggesting a similar effect against drug addiction memories. Moreover a recent paper by Xue et al. (2012) showed that postretrieval drug cue extinction is able to disrupt reconsolidation and to inhibit cue reactivity responses to heroin and cocaine.

**Method:** Our research aims to extend these findings to nicotine and tobacco dependence. Using the paradigm of nicotine self-administration in rat, we have tested the effect of post-retrieval extinction of nicotine related cues on renewal of nicotine seeking behaviour. **Results:** We observed that the post-retrieval extinction of Pavlovian nicotine cues reduced the renewal of responding for cues in rats. We are also assessing the occurrence of reconsolidation of instrumental memory for nicotine self-administration. These behavioural studies are associated with ex-vivo assessment of specific molecular event in key brain areas as correlates of reconsolidation. **Conclusion:** The exploration of the bio-behavioural mechanisms underlying smoking memories may lead to the discovery of innovative pharmacological and non-pharmacological therapies to be integrated into existing relapse prevention programs.

**Funding:** Grant from the University of Verona on "Reconsolidation of drug memory" and the SRNT Travel Grant for Helsinki 2012 meeting.

**S5 NEW PLAIN PACKAGING RESEARCH IN EUROPE**

**Moderator:** Crawford MOODIE

**Speakers:** Janne SCHEFFELS1, Olivia M. MAYNARD2, Juan Miguel REY3, Crawford MOODIE4, Karine-GALLOPEL-MORVAN5

1 Norwegian Institute for Alcohol and Drug Research, Oslo, Norway
2 School of Experimental Psychology and UK Centre for Tobacco Control Studies, University of Bristol, England
3 El Departamento de Comercialización e Investigación de Mercados, University of Granada, Spain
4 Centre for Tobacco Control Research, University of Stirling, Scotland
5 French School of Public Health, Comité National Contre le Tabagisme, Paris, France

Plain tobacco packaging was first suggested as a means to reduce the allure of tobacco packaging in the mid-1980s. Plain packaging has yet to be introduced in any jurisdiction, although this will change in Australia from December 2012 when plain packaging will be mandatory for all tobacco products. Prior to this the European Commission is expected to announce the scope of the revised Tobacco Products Directive in September, which may include plain packaging, and the UK Government launched a consultation on plain packaging in April. A recent systematic review of the plain packaging literature, with 37 included studies, suggests that plain packaging may have a number of potential public health benefits, including: 1) reducing the appeal of the pack, product and user, 2) increasing the salience of the health warnings, although this was influenced by the type (pictorial or text), size and strength of the warnings used, and 3) increasing perceptions of harm, although this was largely dependent upon plain pack colour, with darker coloured plain packs perceived as more harmful, and lighter coloured plain packs less harmful, than branded cigarette packs. The symposium involves four recent plain packaging studies, using four different methodologies, from across Europe. None of the studies were included in the systematic review. In Scotland, naturalistic research, which involved the use of plain packs in real life settings, was conducted with young adult female smokers (aged 18-35) to assess their perceptions of packaging, feelings about smoking, response to health warnings and avoidant and cessation related behaviours. In Norway focus groups were used to gauge younger and older adult smokers and ex-smokers (aged 16-65) perceptions of branding and packaging, including plain packaging. In England, eye tracking research was employed with young (aged 14-19) regular smokers, weekly smokers, experimenters and non-smokers to measure number of eye movements towards warnings on branded and plain packs. And in Spain, an experimental design with young women (aged 16-25) was used to measure attitudes, beliefs and purchase intentions towards either a branded or a plain pack.
A qualitative exploration of how current and former younger and older adult smokers perceive cigarette packages when important design elements, like colours, symbols, logos and branded fonts are removed, i.e. plain packaging. The study explores how smokers, in a country where advertising has been banned for almost 40 years, talk about the meaning of cigarette brands and the role of package design in respect to perceptions of brand image, and also whether and how plain packaging could interfere with the processes by which branding and packaging promote smoking. Focus groups interviews with Norwegian daily, occasional and former smokers (N=69), aged 16-50. Branded packs and two plain packs were used as the stimulus for discussion. Plain pack 1 was a grey pack with all symbols removed but where the original branded font was maintained (i.e. original font size, style and position). Plain pack 2 was a grey pack with all symbols removed and with the brand name in a standard font positioned under ‘20 cigarettes’in a larger font in a prominent position on the pack. The analysis indicates that branded cigarette packs communicate particular messages that make consumers identify with brands. Characteristics of the packages such as colour, illustrations and the font of the letters used for the brand name stands out as important building blocks in this. The two plain cigarette packs were perceived more unfavourably than branded packs, and particularly so for the completely plain pack in comparison to the plain pack with the original branded font. Plain packages were also regarded as detracting from the images that branded packs communicate, and making the health warnings more visible. Although few respondents thought that plain packaging would affect their own smoking behavior, the majority believed that plain packaging could have an impact as a way of making smoking less interesting to susceptible young people. The findings suggest plain packaging may be a potentially effective strategy for removing the visual identity and appeal of tobacco packaging as an advertisement for the product.

Funding: No funding

**S5.2 VISUAL ATTENTION TO HEALTH WARNINGS ON PLAIN TOBACCO PACKAGING IN ADOLESCENT SMOKERS AND NON-SMOKERS**

Olivia M. MAYNARD1, Marcus R. MUNAFÒ1, Ute LEONARDS1

1 School of Experimental Psychology, University of Bristol and UK Centre for Tobacco Control Studies

**Background:** Previous research with adults indicates that plain packaging increases visual attention to health warnings in adult non-smokers and weekly smokers, but not daily smokers. The present research extends this study with adolescents aged 14 to 19 years. Methods: A mixed-model experimental design was employed, with smoking status as a between subjects factor and package type (branded or plain package) and eye gaze location (health warning or branding) as within subjects factors, with a convenience sample of adolescent never smokers (n = 24), experimenters (n = 34), weekly smokers (n = 13) and daily smokers (n = 14). Results: Analysis of variance revealed more eye movements to health warnings than branding on plain packages, but an equal number of eye movements to both regions on branded packages [P = 0.002]. This was observed among experimenters [P < 0.001] and weekly smokers [P = 0.047] but not among never smokers or daily smokers. Conclusions: These results partially replicate the findings with adults, indicating that among light and non-established adolescent smokers, plain packaging increases visual attention to health warnings and away from branding. Perhaps indicative of their decision not to smoke, adolescent never smokers attend the health warnings preferentially on both types of packs. By contrast, daily smokers, even relatively early in their smoking careers, seem to be resistant to the health warnings on the plain packages.

Funding: UK Centre for Tobacco Control Studies

**S5.3 THE INFLUENCE OF TOBACCO PACKAGING ON ATTITUDES AND PURCHASE INTENTIONS AMONG YOUNG WOMEN**

Cristina ROMERO1, Juan Miguel REY2, Ana POLO1, Blanca LACAVE2

1 Marketing Management and Research Department, University of Granada, Spain
2 Marketing Management and Research Department, University of Cadiz, Spain

**Background:** The ban on the use of traditional marketing channels to promote tobacco products has accentuated the importance of the package as a promotional tool. Plain packaging is proposed to be a means of negating the appeal of packaging and increasing the salience of the on-pack health warnings. Methods: An experimental survey design was employed with a total of 186 young women between the ages of 16 and 25 years, recruited from within high schools and universities in Granada. The scales used to gauge attitudes and beliefs towards packaging, and purchase intent, were adapted from previous models (Bloch, 1994; Crilly et al. 2004; Eagly and Chaiken, 1993; Ajzen, 1991). The sample was randomly assigned to one of two conditions (branded vs plain pack). The branded pack was a Fortuna pack, with Fortuna a leading brand among young people in Spain, with the (grey) plain pack used in prior qualitative research in Spain. Results: The findings highlight the importance of packaging design in how it is assessed. The results suggest that packaging design (plain or branded) significantly influences beliefs about the product and attitudes towards smoking. The branded pack was viewed as more aesthetically appealing and, in comparison to the plain pack, created more favourable beliefs about the product, a more positive attitude towards smoking and higher purchase intent.
Conclusions: The aesthetics of tobacco packaging influences attitudes towards the brand and also the product. When packs are made less aesthetically appealing, as was the perception of plain packaging, then attitudes towards the brand and the product are weakened. These findings are consistent with existing literature and highlight the importance of package aesthetics in respect to positive attitudes toward smoking.

Funding: No funding

S5.4 YOUNG ADULT WOMEN SMOKERS’ PERCEPTIONS OF USING PLAIN PACKAGING IN REAL WORLD SETTINGS
Crawford MOODIE1, Anne Marie MACKINTOSH1, Diane DIXON1 Centre for Tobacco Control Research, University of Stirling, Scotland

Background: To explore the impact, if any, that using plain cigarette packs in real-life settings have upon young adult female smokers, a key target group for both tobacco companies and public health. Methods: Naturalistic type research was employed, where participants from the six largest cities and towns in Scotland, used brown ‘plain’ cigarette packs for one week and their regular packs for one week. A total of 301 young women smokers, aged 18-35 years, were recruited. Over the two-week study period participants completed a questionnaire twice a week assessing pack perceptions and feelings, feelings about smoking, salience of health warnings and avoidant and cessation behaviours. Results: Trends in the data show that in comparison to branded packaging, plain packaging was associated with more negative perceptions and feelings about the pack and about smoking. No difference in salience, seriousness or believability of health warnings were found between the pack types, although participants reported looking more closely and covering the pack, and certain smoking cessation behaviours, such as smoking less around others and thinking about quitting, when using the plain packs. Conclusions: No research design can capture the true impact of plain packaging on these other tobacco products. Our qualitative study revealed that the plain packaging has the potential to decrease the attractiveness of these products.
Although being very similar to acetylcholine, does not exert bodily functions such as muscle movement, breathing, and memory. The effects of nicotine on neurotransmission in the brain have been studied using electroencephalography (EEG) in both populations of habitual smokers and non-smoking individuals. Consistent patterns of changes in EEG frequency shift, power, and distribution have been observed after single and chronic administration of nicotine. Consequently, these findings also allow the use of EEG as an indicator or marker of nicotine presence in the brain.

Nicotine vaccination would represent a unique addition to the available strategies for treating nicotine dependence. Indeed, smoking prevalence and incidence in the 21st century are much higher than was aimed for. A multidisciplinary research team covers all the relevant issues of this innovative treatment: safety and efficacy, brain mechanisms, and socio-ethical implications.

Funding: Netherlands Organisation for Scientific Research NWO/Research School CAPHRI, Maastricht University/ Nabi Biopharmaceuticals

Nicotine vaccination is a promising alternative method of blocking nicotine effects. In order to evaluate the effectiveness of such treatment, better understanding is needed of the neuropsychological mechanisms underlying nicotine addiction. The current study intends to expose the diverse functional networks influenced by nicotine by means of fMRI measurement during performance of a small battery of tasks. Neural networks of different cognitive functions that are typically affected by nicotine usage will be mapped in the same subjects, in order to distinguish a concrete measure to assess the effects of a specific nicotine vaccine (NicVAX®). The primary aim is to demonstrate that treatment with this nicotine vaccine attenuates the effects of nicotine on brain activation patterns and cognitive performance relative to placebo. The secondary aim is to evaluate how these neural changes alter subjective measures and the addictive properties of nicotine. Forty-eight currently smoking male volunteers, age 18-45, were recruited and randomized in two parallel groups, receiving either active vaccine or placebo over a period of 20 weeks. Subjects were asked to refrain from smoking 12 hours before testing. Regional blood oxygenated level dependent (BOLD) response was measured during task performance in two sessions; once after administration of two doses of nicotine.
tine 2 mg gum, and once after administration of placebo gum. Tasks included a smoking cue reactivity paradigm, which is especially suited to identify changes in brain activity related to craving. Second, an N-back task is used to reveal differences in neural activity related to working memory load. Third, a task was used to evaluate the differential effects of nicotine on selective and divided attention. Finally, in order to investigate the influence of nicotine and a nicotine vaccine on executive control, a modified version of the flanker task was used. In addition, several questionnaires were used throughout the study as subjective measurements to assess changes in mood and tobacco use, and withdrawal symptoms, including compensatory smoking.

Funding: Netherlands Organisation for Scientific Research NWO / Research School CAPHRI Maastricht University

S6.4 EFFICACY OF A NOVEL THERAPY TO QUIT SMOKING: NICOTINE VACCINATION
Philippe HOOGSTEDER
Research School CAPHRI, Maastricht University, NL

Currently available therapies to quit smoking (e.g. NRTs, bupropion and varenicline) in combination with counseling only have modest abstinence rates that rarely exceed 25% at 1-year follow-up. More effective treatment options are needed. An intriguing novel therapy that is still under development is active immunisation; “vaccination” against the nicotine molecule. To date, a total of five phase I/II clinical trials on nicotine vaccination have been published. Previous studies have proven both the safety and immunogenicity of the nicotine vaccine as an aid in smoking cessation. First efficacy results have been disappointing in that there was only an increase in quit rates in a subgroup of smokers with high antibody titers. An important advantage of active immunization is this therapy will probably not interfere with the central nervous system (CNS) and is therefore likely to produce fewer side effects than for instance bupropion and varenicline - smoking cessation aids that act on the neurotransmitters in the CNS. Besides these advantages, a nicotine vaccine is likely to have a better compliance. Research School CAPHRI is the first to conduct a phase IIb, multi-center, randomized, double-blind, parallel-arm study to evaluate the efficacy and safety of the nicotine vaccine NicVAX® co-administered with varenicline in smokers who want to quit. A total of 558 subjects were included in this trial to receive a total of 6 injections with the nicotine vaccine over a 26-week period, together with 12 weeks of varenicline treatment and a series of individual counseling sessions. Our primary objective was to evaluate the efficacy of the nicotine conjugate vaccine NicVAX® in combination with varenicline over a 1-year period on relapse prevention. Vaccinated ex-smokers who lapse are expected to have no or diminished reward from nicotine inhalation resulting in a considerable reduction of the relapse rate. Ideally, nicotine vaccination could one day become part of a multifaceted approach to treat tobacco addiction including counseling and pharmacotherapy.

Funding: Netherlands Organisation for Scientific Research NWO/Research School CAPHRI Maastricht University

S6.5 QUITTING SMOKING WITH NICOTINE VACCINATION: THE EXPERIENCES OF TRIAL PARTICIPANTS AND THEIR FAMILIES
Anna WOLTERS
Research School CAPHRI, Department of Health, Ethics & Society, Maastricht University, NL

In trials with smokers who wish to quit, the nicotine vaccine is not only tested in the bodies of research participants, but also enters the personal lives of these quitters and their family members. Thus, the impact of the vaccine will not only be assessed by scientific standards in a controlled research setting, but also by the norms and values that are prevalent in broader society. The meaning that is attributed to the new technology, both in research settings and in broader society, has consequences for the discussion on its desirability and, eventually, for the new roles and responsibilities that will be connected to the use of the vaccine. This qualitative study of the vaccine trial is the first investigation of the meaning of the nicotine vaccine in actual daily practice of subjects and their families. It will make clear how research participants and family members embed vaccination in their views on smoking and quitting. Eliciting the users’ perspective in the developmental phase of the nicotine vaccine allows to articulate what they expect from the vaccine, from themselves, and from other parties involved. The study offers insights in what this quit attempt represents and does in real life settings. It also furthers the ethical reflection on the uses of nicotine vaccination that has been kicked-off in the tobacco control literature. To perform this investigation, a number of trial participants and a family member were interviewed in-depth at the start of the quit attempts and a year later; 40 semi-structured interviews in total. Based on the analysis of the material, it will be shown how participants and family members perceive the physical and mental effects of the vaccine, how they consider the importance of the vaccine as compared to other features of the trial, and how they feel about their responsibilities in the quitting process. From this analysis it will become clear that participants strongly contextualize the meaning of nicotine vaccination, regardless of the success or failure of the quit attempt.

Funding: Netherlands Organisation for Scientific Research NWO/Research School CAPHRI Maastricht University

S7 GENETICS OF SMOKING BEHAVIOR
Moderators: Jacqueline VINK, Jaakko KAPRIO
Speakers: Jaakko KAPRIO1, Jacqueline M. VINK2, Rachel F. TYNDALE3, Marcus R. MUNAFÒ4, Anu LOUKOLA5
1University of Helsinki, Hjelt Institute , Dept of Public Health, Helsinki, Finland; National Institute for Health and Welfare, Dept of Mental Health and Substance Abuse Services, Helsinki, Finland; University of Helsinki, Institute for Molecular Medicine (FIMM), Helsinki, Finland
2Department of Biological Psychology, VU University, Amsterdam, The Netherlands

S7
This symposium will present recent findings on the genetics of smoking behavior. Recently, genome-wide association studies (GWAS) have identified genetic variants in nicotinic receptors and genes involved in nicotine metabolism. The next step is to further unravel the underlying biological mechanism explaining individual differences in smoking behavior and nicotine dependence. Jaakko Kaprio will present results of a twin study on the heritability of cotinine and 3-hydroxycotinine (enzymes involved in nicotine metabolism) suggesting that genetic factors play a role. Next, Jacqueline Vink will present the results of a genome-wide association study to cotinine levels exploring which genes are involved in nicotine metabolism. Associations with the CYP2A6 gene and nicotinic receptor genes are expected. Rachel Tyndale will present results of a double-blind, placebo controlled, randomized smoking cessation trial to Bupropion (BUP) and metabolite levels in light smokers. One of the conclusions was that genetic variation in CYP2B6, the enzyme that metabolizes BUP to OH-BUP, was identified as major source of variability in OH-BUP formation. Marcus Munafò used two SNPs located in nicotinic receptor genes to investigate the relationship between smoking behavior and body mass index, depressive symptoms and executive function. He suggests the discovery of genetic variants robustly associated with smoking behavior offers the potential to explore the causal basis of the relationship between tobacco use and a number of physical and psychiatric health outcomes. Anu Loukola will present results of GWAs for different dimensions of smoking behavior. Results show novel evidence for the involvement of ERBB4 in nicotine dependence, providing a link between the co-morbidity of schizophrenia and nicotine dependence. Genetic variation in CLEC19A may partly underlie the co-occurrence of smoking and ADHD. The discussants of this panel will stimulate discussion among the speakers and the audience about the presented findings and the future direction of genetic research on smoking behaviour.

S7.1
A TWIN STUDY OF NICOTINE METABOLISM AMONG YOUNG ADULT SMOKERS
Jaakko KAPRIO1,2,3, Maria NOVALEN4, Jenni HALLFORS1,2, Tellervo KORHONEN1,2, Antti LATVALA1,2, Anu LOUKOLA1,2, Richard J. ROSE5, Rachel F. TYNDALE4
1 University of Helsinki, Hjelt Institute, Department of Public Health, Helsinki, Finland
2 National Institute for Health and Welfare, Department of Mental Health and Substance Abuse Services, Helsinki, Finland
3 University of Helsinki, Institute for Molecular Medicine (FIMM), Helsinki, Finland
4 School of Experimental Psychology, University of Bristol, UK
5 Department of Public Health, Hjelt Institute, University of Helsinki, Finland

Background: Twin, family and adoption studies indicate clear genetic influences on smoking behavior. Self-reported smoking behavior is error-prone, and biomarkers of smoking provide more accurate measures of nicotine intake. The few laboratory studies of such biomarkers in twins indicate substantial genetic influences on the rate of metabolism of nicotine metabolites, but estimates from free-living populations are rare. Methods: Serum samples from smoking and non-smoking twins participating in two studies of the Finnish Twin Cohort were collected. In the FinnTwin12 study, 780 serum samples from twins attending an in-person assessment were taken. Information on smoking behavior and nicotine dependence were obtained from questionnaires and interviews of these young adults (mean age 22, range 21-24). In the FinnTwin16 study, twin pairs concordant and discordant for alcohol problems were studied with a mean age of 26.2 years, range 23-30). Serum samples from 520 subjects were available. For regular smokers, nicotine metabolites, cotinine and 3-hydroxycotinine, were assayed by liquid chromatography with tandem mass spectrometry. Cotinine provides an estimate of tobacco consumption, while 3-hydroxycotinine/cotinine provides the nicotine metabolite ratio (NMR) an estimate of the rate of nicotine clearance. In pairs where both twins were smokers (i.e., cotinine >=10 ng/ml), pairwise correlations for cotinine and NMR in monozygotic (MZ, n=54 pairs), same-sex dizygotic (SSDZ, n=49) and opposite-sex pairs (OSDZ, n=32) pairs were computed. The zygosity of twin pairs was determined using a panel of highly polymorphic genetic markers. Results: The MZ correlations are 0.64 for cotinine, and 0.8 for NMR. The DZ correlations (0.28 for cotinine and 0.40 for NMR) are about half that magnitude in SSDZ pairs, suggesting a straightforward additive model, with heritabilities of 64 and 80% respectively. The opposite-sex pairs are fairly close to SSDZ pairs for cotinine (0.23), but not for NMR (0.11). Conclusions: Among young adult twin pairs in the population, the heritability of cotinine levels and NMR is high.

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S7.2
GENOME-WIDE ASSOCIATION ANALYSES OF COTININE LEVELS IN TWO DUTCH COHORT SAMPLES
Jacqueline M. VINK1,2, Gonneke WILEMSEN1, Gerard GROOTHEEST3, Brenda PENNIX1, Dorret I. BOOMSMA1
1 Department of Biological Psychology, VU University, Amsterdam, The Netherlands
2 Neuroscience Campus Amsterdam, Amsterdam, The Netherlands
3 Department of Psychiatry, VU University Medical Center/GGZ inGeest

Background: Smoking exposure is usually assessed through questionnaires. Circulating levels of cotinine, one of the metabolites of nicotine, has been widely used as biomarker for assessment of exposure to cigarette smoking. Cotinine has a half-life of approximately 17 hours, and therefore provides an accurate measure of recent tobacco exposure. Using cotinine measurements together with self-reported information might increase reliability of smoking exposure data and allow for a more complete picture of recent smoking behavior. Genome wide association (GWA) analyses for self-reported smoking measures like risk profile analyses or GCTA (genomic control test for association) will be carried out to confirm genetic influence on cotinine levels. Additional analyses (like risk profile analyses or GCTA (genomic control test for association)) will be carried out to confirm genetic influence on cotinine levels. The aim of the present study is to explore which genetic variants are associated with cotinine levels in a genome-wide association study. Method: Both genotype data and cotinine measurements are available in 796 smokers registered with the Netherlands Twin Register (NTR) and 777 smokers from the Netherlands Study to Depression and Anxiety (NESDA). GWA analyses will be carried out in Plink including covariates gender and age. Results: We will present the results of the genome wide association analyses for cotinine in two Dutch cohorts of smokers. We will explore which DNA variants are associated with cotinine levels in a genome-wide association study. Conclusions: Unraveling the genetic factors involved in cotinine levels will add to unraveling the biological measures involved in smoking behavior. Funding: ERC starting grant 284167 (Jacqueline Vink), Neuroscience Campus Amsterdam AB 1 BB.

S7.3
HYDROXYBUPROPION LEVELS, FORMED BY GENETICALLY VARIABLE CYP2B6, IS A MAJOR DETERMINANT OF BUPROPION’S EFFICACY FOR SMOKING
Rachel F. TYNDALE1, Andy Z.X. ZHU1, Lisa SANDERSON COX1, Nikki NOLLEN2, Babalola FASERU2, Kola OKUYEMI3, Jasjit S. AHLUWALIA4, Neal L. BENOWITZ5
1 Center for Addiction and Mental Health and Department of Psychiatry and Pharmacology and Toxicology, University of Toronto, Ontario, Canada
2 Department of Preventive Medicine and Public Health, University of Kansas School of Medicine, Kansas City, KS, USA; Department of Family Medicine, University of Kansas Medical Center, Kansas City, KS, USA
3 Department of Family Medicine and Community Health and Program in Health Disparities Research, University of Minnesota, MN, USA
4 Department of Medicine and Center for Health Equity, University of Minnesota Medical School, Minneapolis, MN, USA
5 Division of Clinical Pharmacology and Experimental Therapeutics, Department of Medicine and Bioengineering & Therapeutic Sciences, University of California, San Francisco, CA, USA

Bupropion (BUP) is indicated to promote smoking cessation. Animal studies suggest that BUP’s major metabolite hydroxybupropion (OH-BUP) mediates some aspects of BUP’s pharmacology activity; it also has a longer half-life than BUP which may enhance its contribution to the BUP effect. We measured plasma BUP and metabolite levels (Week 3 at steady state) in a double-blind, placebo controlled, randomized smoking cessation trial in African American light smokers (≤10 cigarettes per day, n=540). Our pharmacokinetic results revealed the following key observations: (1) Many subjects were classified “non-adherent” as they either did had no detectable BUP in their plasma (n=60), did not provide blood (n=5) or were lost to follow-up at Week 3 (n=51). Those subjects (n=116) had quit rates comparable to placebo (n=270) treatment (Week 26: 8% in the non-adherent group vs. 10.0% in the placebo group, OR=0.76, 95%CI:0.35-1.63, P=0.49). (2) In those with detectable levels of BUP (n=156), BUP significantly improved quit rates compared to placebo (Week 26: 17.5% in the BUP adherent group vs. 10.0% in the placebo group, OR=1.91, 95%CI:1.08-3.38,P=0.025). (3) There was a positive relationship between OH-BUP concentrations and smoking abstinence in the BUP adherent individuals (Week 3: OR=2.82, 95%CI: 1.34-5.95, P=0.007; Week 7, end of treatment: OR=2.96, 95%CI:1.38-6.34, P=0.005; Week 26: OR=2.37, 95%CI:1.04-5.41, P=0.04); which was not observed for BUP drug levels (Week 3: OR=1.00, P=0.90; Week7, end of treatment: OR=1.01, P=0.78; Week 26: OR=1.03, P=0.59). (4) Genetic variation in CYP2B6, the enzyme that metabolizes BUP to OH-BUP, was identified as the major source of variability in OH-BUP formation (=0.24, P=0.003). Our data indicate that OH-BUP mediates the pharmacologic effects of BUP that promote
smoking cessation, and that variability in response to BUP treatment is related, at least in part, to variability in CYP2B6-mediated OH-BUP formation. Our findings suggest that adjusting plasma steady state OH-BUP levels to a minimum therapeutic concentration of 700 ng/ml and/or increasing BUP dose for CYP2B6 slow metabolizers, should improve cessation outcomes of BUP treatment.

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**S7.4 UTILITY OF GENETIC VARIANTS ASSOCIATED WITH TOBACCO USE FOR CAUSAL ANALYSES**

Marcus M. Munafò
School of Experimental Psychology, University of Bristol, UK

**Background:** A number of genetic variants associated with tobacco use are now beginning to be identified through GWAS consortia. The chromosome 15 region, in particular, appears to be very strongly associated with heaviness of smoking and, possibly, less strongly with smoking cessation. This offers the potential to use these variants as instrumental variables in causal analyses of the effects of tobacco use.

**Methods:** Data were drawn from the Avon Longitudinal Study of Parents and Children, a large birth cohort study located in the south-west of the United Kingdom. Where available, data from additional cohorts were used to increase sample size. Using the rs1051730 / rs16966968 variant as an instrumental variable, we investigated the relationship between smoking behaviour and three outcomes: body mass index, depressive symptomatology, and executive function.

**Results:** The data support a causal relationship between tobacco use and some, but not all, of the phenotypes investigated. Given the ethical and practical difficulties of experimental studies to investigate the causal effects of tobacco use, genetic information can provide a feasible alternative, without the problems of confounding typically associated with observational data. Although large samples are required, these are increasingly available through existing GWAS consortia.

**Conclusions:** The discovery of genetic variants robustly associated with heaviness of smoking and, possibly, smoking cessation offers the potential to explore the causal basis of the relationship between tobacco use and a number of physical and psychiatric health outcomes. The potential wider application of this method to a range of outcomes associated with smoking will be discussed.

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smoking and ADHD.

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**S8**

**THE TOBACCO CONTROL RESEARCH TURANGA: A PLATFORM FOR INFORMING THE ROUTE TO A SMOKEFREE NEW ZEALAND BY 2025**

**Moderator:** Marewa GLOVER

**Speakers:** Marewa GLOVER, Natalie WALKER

**Discussant:** Robert WEST

1 Centre for Tobacco Control Research, School of Population Health University of Auckland, New Zealand

2 NIHI, University of Auckland, New Zealand

In 2010 the New Zealand government set an ambitious goal to reduce tobacco smoking prevalence to less than 5% by 2025. In order to rapidly reduce smoking prevalence and close ethnic and socioeconomic smoking inequalities within such a short timeframe, innovative interventions will be needed at policy, service delivery and community levels. Research to inform policy and programme planning to ensure an optimal ‘mix’ of effective interventions is implemented is vital. In mid-2011 the Ministry of Health and Health Research Council funded the establishment of the Tobacco Control Research Turanga research programme. The Turanga (Maori for ‘Platform’) trials a new funding model as well as being charged with conducting innovative shorter-termed projects. To ensure responsiveness to the sector and fast changing political environment and to support knowledge transfer the Turanga seeks to engage and involve leading researchers from varied disciplines across multiple institutions. Mechanisms for involving key tobacco control stakeholders in research priority setting and dissemination are a critical element. This symposium gives an overview of New Zealand’s Tobacco Control Research Turanga: the rationale and structure, the research priorities for achieving the goal and an outline of the projects completed and underway.

**S8.1**

**RESEARCH TO INFORM PROGRESS TOWARDS THE ENDGAME: NEW ZEALAND’S UNIQUE TOBACCO CONTROL RESEARCH TURANGA**

Marewa GLOVER, Chris BULLEN

New Zealand Tobacco Control Research Turanga, School of Population Health, New Zealand

**Background:** This paper outlines the rationale and establishment of a programme of strategic tobacco control research in New Zealand, the Tobacco Control Research Turanga. Methods: Narrative account.

**Results:** In 2010 the New Zealand government declared its intention to reduce tobacco smoking prevalence from 20% to less than 5% by 2025. To rapidly reduce smoking prevalence and close ethnic and socioeconomic smoking inequalities within such a short timeframe it was recognised that a mix of innovative interventions would be needed. The vision was accompanied by contestable funding from the Ministry of Health and Health Research Council (HRC) for a research programme, called the Tobacco Control Research Turanga (meaning ‘platform’). Researchers were charged with conducting innovative short-term research projects to inform halving smoking prevalence in a decade, and linked to research end-users. A flexible funding model was established to ensure responsiveness by researchers to a dynamic tobacco control environment. NZ$5 million over 4 years was awarded to a consortium of New Zealand’s leading researchers (led by CB and MG) from within and outside the tobacco control research community, from a range of disciplines including law and economics, and across multiple institutions, including universities, NGOs, healthcare providers and consultancies. To support knowledge transfer and exchange, and to ensure stakeholder’s voices are heard in research priority setting and dissemination, the Turanga uses a wide range of mechanisms. Research priorities identified through a systematic analysis of the tobacco ‘end game’ literature are framed around tobacco and nicotine supply and demand, as well as on population groups among whom smoking prevalence is still high. **Conclusions:** The goal of halving prevalence in a decade from 20% to 10% is ambitious and will require innovative approaches in policy and practice that impact on the majority of smokers. However, these strategies may not reach some priority groups. Therefore, researchers face the dual challenge of testing new ideas for achieving mass population-wide cessation while at the same time reducing smoking inequalities.

**Funding:** Health Research Council of New Zealand and Ministry of Health of New Zealand

**S8.2**

**DEVELOPING STRATEGIC TOBACCO CONTROL RESEARCH PRIORITIES: THE NZ TURANGA MODEL**

Jonathan WILLIMAN, Chris BULLEN, Marewa GLOVER, Natalie WALKER

1 National Institute for Health Innovation, University of Auckland, New Zealand

2 NIHI, University of Auckland, New Zealand

3 Centre for Tobacco Control Research, School of Population Health, University of Auckland, New Zealand

4 National Institute for Health Innovation, University of Auckland, New Zealand

**Background:** In 2010 the New Zealand (NZ) government set the goal of reducing smoking prevalence to less than 5% by 2025. The Tobacco Control Research Turanga (‘platform’) was established through government funding to support leading researchers to develop and undertake a suite of innovative research projects to inform the steps to achieving this goal. This paper presents work undertaken to identify innovative strategies and to develop a framework that could be used to identify research priorities. **Methods:** We searched literature for publica-
tions focusing on the ‘end game’ goal of a society free from tobacco use or tobacco-related harm, and/or described a strategy or combination of strategies applicable at a population level to achieve this. Publications were identified by searching Medline, EMBASE, PsycInfo, and Google, reference and citation lists of eligible studies and websites of tobacco control organisations. Publications were coded using NVivo software. The general inductive approach was used to identify common themes and an overall framework. Results: We identified two broad groups of strategies for reducing tobacco use prevalence applicable at the level of the tobacco consumer, tobacco manufacturer or retailer, government or regulatory body, or tobacco control community: single intervention strategies for reducing tobacco supply through appropriation or greater regulation of the tobacco industry; and strategies to end tobacco use through demand reduction requiring multiple interventions in combination. Authors highlighted the need and potential benefits of a rational approach to all nicotine products rather than just considering smoked tobacco. The final framework identifying areas for tobacco control research correlated closely with the Tobacco-Use Management System as proposed by Borland et al.

Conclusion: Research priorities identified include investigating the feasibility and acceptability to politicians and public of nicotine supply reduction and tobacco product content regulation, and exploring new ways to markedly increase levels of sustained mass quitting.

Funding: Health Research Council of New Zealand and New Zealand Ministry of Health

**S8.3 EN ROUTE TO A SMOKEFREE NEW ZEALAND BY 2025: RESEARCH PROGRESS, ISSUES AND CHALLENGES**

Marewa GLOVER1, Chris BULLEN1, Natalie WALKER2, Jane KELSEY3, Caroline SAUNDERS4, Peter TAIT4

1 NZ Tobacco Control Research Turanga, University of Auckland, New Zealand
2 National Institute for Health Innovation, University of Auckland, New Zealand
3 Faculty of Law, University of Auckland, New Zealand
4 AERU, Lincoln University, New Zealand

The NZ Tobacco Control Research Turanga has commissioned four studies thus far to inform policy and planning towards a 2025 smokefree nation goal: 1) University of Auckland Law Professor Jane Kelsey considered the range of proposed Endgame strategies against existing international trade and investment treaties. At the time of the study, NZ was negotiating to join a new Trans-Pacific Partnership Agreement. The results elucidated critical potential barriers for the kinds of tobacco control strategies needed to advance to smokefree. 2) NZ’s leading economist Lincoln University Professor Caroline Saunders and her team considered the potential for a quota management system for tobacco. They developed a model based upon the need to reduce smoking prevalence to 5% or below by 2025. Their research poses challenges for the application of a quota management system when a market is pre-existing. Further research is indicated given the legislative programme and costs involved of introducing and maintaining a quota management system to effect a ‘sinking lid’ on tobacco. 3) We established and tested a group stop smoking contest for its potential to trigger mass quitting, among Maori (the Indigenous people) and NZ resident Pacific peoples. Maori smoking prevalence (at 45%) is double that of the NZ-European population. Pacific rates, which vary greatly by Island nation and gender, are overall at one-third. More effective interventions for Maori and Pacific people that can initiate a cultural movement are needed. 4) Reducing nicotine in tobacco to non-addictive levels is a new strategy receiving increasing attention. Dr Natalie Walker is leading a team exploring the effect on smoking behaviour when smokers with no intent to quit are given access to denicotinised cigarettes: (a) in addition to their usual cigarettes, (b) instead of their usual cigarettes, and (c) along with nicotine replacement products. The results will help inform the potential contribution of removal of nicotine from tobacco as a strategy towards a smokefree NZ.

Funding: Health Research Council of New Zealand and New Zealand Ministry of Health

**S9 ATTENTION DEFICIT–HYPERACTIVITY DISORDER (ADHD) AND TOBACCO SMOKING: RECENT FINDINGS**

Moderators: Ivan BERLIN, Lirio S. COVEY

Speakers: Stephen J. HEISHMAN1, F. Joseph McCLERNON2, Lirio S. COVEY3, Ivan BERLIN4

1 Nicotine Psychopharmacology Section, Intramural Research Program, National Institute on Drug Abuse, Baltimore, Maryland, USA
2 Duke University Medical Center; Durham, NC, USA
3 Department of Psychiatry, New York State Psychiatric Institute, NYC, USA
4 Hôpital Pitié-Salpêtrière-Faculté de Médecine, Université P. & M. Curie – INSERM, Paris, France

ADHD is a neuropsychiatric condition of childhood onset. Individuals with ADHD start smoking earlier, smoke more heavily, are more likely to become regular smokers and experience greater difficulty to stop smoking than smokers without ADHD. This symposium will provide an overview of recent findings about different aspects of the ADHD-smoking relationship. S. Heishman will report on the enhancement of attentional and cognitive functioning by nicotine. Evidence will be presented supporting the self-medication hypothesis of the increased prevalence of smoking among persons with ADHD (and also with schizoaffective disorder). Smoking may improve symptoms of confused thinking, inattention, and inhibition of responses. F.J. McClernon will report on new data about the neural mechanism underlying the tobacco dependence-ADHD comorbidity. Analysis of structural MRIs suggest that smokers with elevated inattention symptoms exhibit decreased gray matter in brain substrates of attention. Preliminary data from a functional MRI study assessing the differential effects of smoking withdrawal on inhibitory control and reward sensitivity in smokers with and without ADHD.
will also be presented. Covey et al. will review the findings generated from a randomized double blind smoking cessation study comparing osmotic-release oral system methylphenidate with placebo for smoking cessation in smokers with ADHD. They will report on the main study but also on other findings such as ethnic differences in abstinence rate; the role of ADHD subtype and craving in predicting abstinence. Berlin et al. studied the potential overlap between tobacco withdrawal symptoms (TWDS) and ADHD symptoms. Some TWDS e.g. difficulty concentrating, impatience, restlessness may be confounded with ADHD symptoms among smokers with ADHD. They found that TWDS but not craving for cigarettes may confound with ADHD symptoms in particular during abstinence. A careful distinction of craving, tobacco withdrawal symptoms and ADHD symptoms is needed during the follow up of smokers with ADHD who quit.

S9.1 NICOTINE-INDUCED ENHANCEMENT OF ATTENTION AND ATTENTION DEFICIT-HYPERACTIVITY DISORDER
Stephen J. HEISHMAN
Nicotine Psychopharmacology Section, Intramural Research Program, National Institute on Drug Abuse, Baltimore, Maryland, USA

Tobacco smoking or nicotine administration can enhance attentional and cognitive functioning in persons without psychiatric disorders. Enhancement has been reliably documented in the domains of fine motor skills, alerting and orienting attention, short-term episodic memory, and working memory. Enhanced performance was observed in nonsmokers and in smokers who were not tobacco deprived, thus results were not confounded by withdrawal relief. Nicotine can also temporarily attenuate the attentional and cognitive deficits in persons diagnosed with schizophrenia and attention-deficit/hyperactivity disorder (ADHD). In both patient populations, the prevalence of cigarette smoking is much higher than in the general population. On average, patients begin smoking at an earlier age, smoke more cigarettes per day, and are less successful in quitting smoking than persons without psychiatric disorders. One hypothesis for the increased smoking prevalence among patients is that they are self-medicating symptoms of confused thinking, inattention, and inhibition of responses. Evidence will be presented supporting this self-medication hypothesis. These data suggest that attentional and cognitive deficits might represent important targets for treatment strategies that result in more effective smoking cessation rates in persons with schizophrenia and ADHD.

Funding: This research was supported by the Intramural Research Program of the NIH, National Institute on Drug Abuse.

S9.2 BRAIN SUBSTRATES OF NICOTINE DEPENDENCE-ADHD COMORBIDITY
F. Joseph McCLENNON
Duke University Medical Center; Durham, NC, USA

Individuals with clinically diagnosed attention deficit-hyperactivity disorder (ADHD) or with elevated ADHD symptoms start smoking at a younger age, are more likely to smoke and have greater difficulty quitting smoking. Both nicotine dependence (ND) and ADHD are associated with deficiencies in executive functions including attention and inhibitory control; and with aberrant reward sensitivity. Moreover, evidence suggests that each condition individually is associated with altered functioning in similar neurotransmitter systems and underlying genetic factors. Despite knowledge of the overlapping endopheno- and geno-typic factors underlying ND and ADHD, little is known regarding the neural mechanisms underpinning their comorbidity. New data from our laboratory on the brain substrates of ND-ADHD comorbidity will be presented. Analysis of structural MRIs, suggest that smokers with elevated inattention symptoms exhibit decreased gray matter in brain substrates of attention. Preliminary data from a functional MRI study assessing the differential effects of smoking withdrawal on inhibitory control and reward sensitivity in smokers with and without ADHD will also be presented. In general, data from these studies suggest that the comorbidity between ND and ADHD is associated with specific neural substrates and thus, successful prevention and/or intervention may require specifically targeting these brain-based liabilities.

Funding: This research was supported by a grant from the National Institute on Drug Abuse to FJM (R01DA024838).

S9.3 SMOKING CESSION AND OROS-METHYLPHENIDATE: FINDINGS FROM A CLINICAL TRIAL OF SMOKERS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER
Lirio S. COVEY, Mei-Chen HU, Edward NUNES
Department of Psychiatry, New York State Psychiatric Institute, NYC, USA

ADHD is a neuropsychiatric condition of childhood onset with potential to continue to adulthood. A significant association between tobacco use and ADHD has been recognized. The clinical trial tested whether a common ADHD treatment known to reduce ADHD symptoms can promote smoking abstinence in with ADHD. Main hypothesis: Reduction of ADHD symptoms with OROS-MPH will promote smoking cessation. Study design: two-arm placebo controlled clinical trial. 252 smokers with ADHD were randomized to receive OROS-MPH+Nicotine Patch or Placebo +Nicotine Patch. Participants were adults diagnosed with ADHD, aged 18+, healthy, no current Axis I, no Antisocial Personality Disorder. Treatment period: 11 weeks of OMPH/Placebo, individual counseling at each of 11 clinic visits, target quit day at week 4 with daily nicotine patch from weeks 5 to 11. Results: Main Study:
Winhusen et al, 2010: ADHD symptoms were reduced, more strongly with OROS-MPH treatment. Prolonged abstinence rate (no smoking during last four weeks) did not differ by OROS-MPH treatment vs. placebo. Secondary studies: Abstinence in white vs. nonwhite participants (Covey et al, 2010) OROS-MPH efficacious in nonwhites, not whites. Craving significantly reduced with OROS-MPH in nonwhites, not whites. Enriched model – effect of race/ethnicity no longer apparent but effect of reduction in craving remained significant.2. Abstinence by ADHD subtype (Covey et al, 2011) OROS-MPH was efficacious for Attention Deficit but not for Hyperactivity subtype, but only with high FTND.3. Correlation of ADHD symptoms, withdrawal symptoms, and craving (Berlin et al, 2012): Reduction in craving, not ADHD nor tobacco withdrawal symptoms, correlated with efficacy of OROS-MPH. Discussion: Important to do subgroup analyses, examine interactions of treatment with moderators (race/ethnicity, baseline ADHD symptoms, sub-type), and mediators (within treatment symptom changes). Hypothesis that improvement in ADHD symptoms or tobacco withdrawal symptoms reduces need to smoke is questionable. Decline in craving predicted abstinence. Treatments that reduce craving could be the treatment of choice for smokers with ADHD.

Funding: US NIH–National Institute on Drug Abuse – Clinical Trials Network

S9.4
DO SYMPTOMS OF ATTENTION DEFICIT-HYPERACTIVITY DISORDER OVERLAP WITH TOBACCO WITHDRAWAL SYMPTOMS?
Ivan BERLIN1, Mei-Chen HU2, Lirio S. COVEY2
1 Hôpital Pitié-Salpêtrière-Faculté de médecine, Université P. & M. Curie – INSERM, Paris, France
2 Department of Psychiatry, New York State Psychiatric Institute, NYC, USA

Some tobacco withdrawal symptoms (e.g. difficulty concentration, impatience, restlessness, anxiety/anger) may be confounded with attention-deficit/hyperactivity disorder (ADHD) symptoms among smokers with ADHD. It may therefore be difficult to disentangle ADHD symptoms from tobacco withdrawal symptoms in a clinical setting. Objectives: To assess 1) overlap between ADHD symptoms and tobacco/nicotine withdrawal symptoms and craving; 2) whether the treatment of ADHD by osmotic-release oral system methylphenidate (OROS-MPH) attenuate not only ADHD symptoms but also tobacco withdrawal symptoms; 3) the association of ADHD symptoms, craving, and tobacco withdrawal symptoms with abstinence. Methods: Secondary analysis of a randomized, placebo controlled smoking cessation trial assessing the efficacy of OROS-MPH taken in addition to nicotine patch among individuals with ADHD (Winhusen et al, 2010). ADHD symptoms, withdrawal symptoms, and craving were assessed at baseline and 2, 4 and 6 weeks after a target quit day. Results: Withdrawal symptoms and craving showed limited and modest overlap with ADHD symptoms prior to abstinence but a stronger correlation after quit day. Compared to placebo, OROS-MPH reduced ADHD symptoms; this effect was attenuated by controlling for tobacco withdrawal symptoms but not by craving. Craving, but not ADHD symptoms or tobacco withdrawal symptoms was associated with abstinence during the trial. Conclusion: Tobacco withdrawal symptoms but not craving for cigarettes may confound with ADHD symptoms in particular during abstinence. When treating smokers with ADHD, craving rather than tobacco withdrawal symptoms or ADHD symptoms may be the more effective therapeutic smoking cessation targets. Careful distinction of craving, tobacco withdrawal symptoms and ADHD symptoms is needed during the follow up of smokers with ADHD who quit.

ROUND TABLES

R1
PUBLISHING IN THE NICOTINE & TOBACCO RESEARCH JOURNAL
Moderators: David BALFOUR, Ivan BERLIN
Speakers: David JK Balfour1, Ivan Berlin2, Jaakko Kaprio3, Robert West4
1 Editor in Chief
2 Deputy editor
3 Associate editor, Nicotine and Tobacco Research
4 Past President of SRNT

This Round Table session will provide detailed information about the Journal, its scopes and editorial aims, numbers of manuscripts submitted and accepted and the criteria used to evaluate manuscripts and decide upon their disposition. Some suggestions will be given on what makes a good or a bad paper and how to increase the likelihood of acceptance of a manuscript. A particular objective of the Round Table is help young researchers, PhD students and post-docs to prepare straightforward manuscripts for submission to Nicotine and Tobacco Research. Sufficient time will be allowed to discuss questions from the audience.
ORAL PRESENTATIONS
O1 EXERCISE TO ENHANCE SMOKING CESSTION: RESULTS FROM THE FIT2QUIT TRIAL
Ralph MADDISON1, Vaughan ROBERTS1, Chris BULLEN1, Yannan JIANG1, Hayden McROBBIE2, Harry PRAPAVESSIS3, Marewa GLOVER1, Paul BROWN4, Sue TAYLOR5
1 Ralph Maddison, University of Auckland
2 Hayden McRobbie, University of London
3 Harry Prapavessis, University of Western Ontario
4 Paul Brown, University of Southern California
5 Sue Taylor, T&T consulting

Background: Most smokers want to stop smoking and many try to quit. Aided quit attempts through a combination of behavioural support and pharmacotherapy can improve success rates, but these remain low. Exercise has been proposed to aid smoking cessation, however most trials are underpowered to show significant treatment effects due to small sample sizes. The Fit2Quit study aimed to determine the effects of a home and community-based exercise intervention on smoking abstinence at six months when used as an adjunct to usual care (telephone smoking-cessation counselling and nicotine replacement therapy, NRT). Methods: A pragmatic parallel two-arm randomized controlled trial (RCT) was conducted in Auckland, New Zealand. Participants (n = 906) were randomised to a structured home and community-based exercise programme (i.e., individualized exercise prescription, referral to existing community programmes, face-to-face telephone support, and strategies to facilitate exercise adherence) plus usual care (Quitline-based behavioural counselling and NRT, n=455) or to usual-care alone (n=451). Outcomes included seven-day point prevalence of smoking abstinence at 6 months (primary outcome); 6 months continuous abstinence; physical activity levels. Analysis: Intention to treat principles were followed. Simple chi-squared analyses were used to evaluate the main treatment effect on the proportions quit at the end of the intervention period, with estimation of relative risks, 95% confidence intervals and two-sided p-values. Results: No statistically significant differences between groups in smoking cessation rates (7-day point prevalence or continuous abstinence) were found at 6 months. The 7-day point prevalence were 9% (42 out of 455) and 11% (48 out of 451) in the two groups, respectively, relative risk (RR) 1.02 (95% CI 0.97-1.06; p= 0.5). There were no statistically significant differences between the groups in physical activity outcomes. Conclusion: A community-based exercise programme as an adjunct to Quitline care did not improve abstinence rates in adult smokers trying to quit compared to usual Quitline care alone.
Funding: Health Research Council of New Zealand Heart Foundation

O2 SMOKING CESSTION INTERVENTIONS FOR SMOKERS WITH CURRENT OR PAST DEPRESSION: A SYSTEMATIC REVIEW AND META-ANALYSIS
Regina M. Van Der MEER1, Marc C. WILLEMSEN1,2, Filip SMIT1, Pim CUIJPERS4
1 STIVORO, Expertise Centre on Tobacco Control, The Hague, The Netherlands
2 University of Maastricht, School for Public Health and Primary Care (CAPHRI), Maastricht, The Netherlands
3 Netherlands Institute of Mental Health and Addiction, Utrecht, The Netherlands
4 Department of Clinical Psychology, Vrije Universiteit, Amsterdam, The Netherlands

Background: The aim of this review was to assess the effect of smoking cessation interventions to aid long-term smoking cessation for smokers with current or past depression. We compared psychosocial mood management versus control and antidepressants for smoking cessation versus placebo separately for current or past depression. Methods: Criteria for considering studies for this review were that the studies had to be RCTs comparing smoking cessation interventions for adult smokers with current or past depression. Depression was defined as major depression, depressive symptoms or depression according to a single item. We also included studies with pre stated and post hoc subgroups of depression. The outcome was abstinence from smoking for 6 months or greater. We preferred sustained abstinence and biochemically validated abstinence. We searched the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PsyclnFO, other reviews, and asked experts, in July 2011. When possible, we estimated pooled risk ratios with the Mantel-Haenszel method. We also performed subgroup analyses, like for example length of follow up, depression measurement, published or unpublished data, with or without additional NRT. Results: 49 RCTs were included. Meta-analysis showed a positive effect of adding mood management for current (10 trials RR 1.45, 95% CI 1.11-1.89) and past depression (14 trials RR 1.44, 95% CI 1.16-1.78). Meta-analysis also demonstrated a positive effect of adding antidepressants for past depression (9 trials RR 1.53, 95% CI 1.12-2.08), especially for bupropion. Conclusions: Evidence suggests that adding a mood management component to a smoking cessation intervention increases cessation rates for smokers with depression, and adding antidepressants (especially bupropion) increases cessation rates for smokers with past depression.
Funding: No Funding

O3 PREDICTIVE VALIDITY OF THE MOTIVATION TO STOP SCALE (MTSS): A SIMPLE MEASURE OF MOTIVATION TO STOP SMOKING
Daniel KOTZ1,2, Jamie BROWN1, Robert WEST3
1 Department of General Practice, CAPHRI School for Public Health and Primary Care, Maastricht University Medical Centre, Maastricht, the Netherlands
2 University of Maastricht, School for Public Health and Primary Care (CAPHRI), Maastricht, the Netherlands
3 Netherlands Institute of Mental Health and Addiction, Utrecht, The Netherlands

Background: The aim of this review was to assess the effect of smoking cessation interventions to aid long-term smoking cessation for smokers with current or past depression. We compared psychosocial mood management versus control and antidepressants for smoking cessation versus placebo separately for current or past depression. Depression was defined as major depression, depressive symptoms or depression according to a single item. We also included studies with pre stated and post hoc subgroups of depression. The outcome was abstinence from smoking for 6 months or greater. We preferred sustained abstinence and biochemically validated abstinence. We searched the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PsychINFO, other reviews, and asked experts, in July 2011. When possible, we estimated pooled risk ratios with the Mantel-Haenszel method. We also performed subgroup analyses, like for example length of follow up, depression measurement, published or unpublished data, with or without additional NRT. Results: 49 RCTs were included. Meta-analysis showed a positive effect of adding mood management for current (10 trials RR 1.45, 95% CI 1.11-1.89) and past depression (14 trials RR 1.44, 95% CI 1.16-1.78). Meta-analysis also demonstrated a positive effect of adding antidepressants for past depression (9 trials RR 1.53, 95% CI 1.12-2.08), especially for bupropion. Conclusions: Evidence suggests that adding a mood management component to a smoking cessation intervention increases cessation rates for smokers with depression, and adding antidepressants (especially bupropion) increases cessation rates for smokers with past depression.
Funding: No Funding
Background: Many different measures of motivation to stop smoking exist but it would be desirable to have one that is standard for use in population surveys and for evaluations of interventions to promote cessation. The aim of this study was to assess the predictive validity of the single-item Motivation To Stop Scale (MTSS). Methods: We used data from the “Smoking Toolkit Study”. A representative sample of 2,483 English smokers used the MTSS and were followed up 6 months later to provide information on quit attempts since baseline. The MTSS has 7 response categories ranging from 1 (reflecting the absence of any belief, desire or intention to stop smoking) to 7 (having a strong desire and short-term intention to stop). Results: A total of 692 smokers (27.9% (95% CI = 26.1-29.6)) made an attempt to quit smoking between baseline and 6-month follow-up. Of the 447 smokers who scored the two highest levels of motivation at baseline, 219 made an attempt to quit (positive predictive value = 49%). The odds of quit attempts increased linearly with increasing level of motivation at baseline (p<0.001) and were 6.8 times (95% CI = 4.7-9.9) higher for the highest level of motivation compared with the lowest. The accuracy of the MTSS for discriminating between smokers who did and did not attempt to quit was ROC AUC = 0.67 (95% CI = 0.65-0.70). Conclusions: The MTSS provides strong quantitative prediction of quit attempts and is a candidate for a standard measure of motivation to stop smoking. Further research should first of all assess the external validity of this measure in different smoking populations.

Funding: The “Smoking Toolkit Study” is funded by the English Department of Health, Cancer Research UK, Pfizer, Glaxo-SmithKline, and Johnson and Johnson, who had no involvement in the design of the study, collection, analysis or interpretation of the data, the writing of the report, or the decision to submit the paper for publication.

O4 DID EXPANDING THE LICENCE FOR NRT IN ENGLAND TO PERMIT USE FOR SMOKING REDUCTION AFFECT ITS USE FOR THIS PURPOSE, ATTEMPTS TO STOP SMOKING AND MOTIVATION TO STOP?
Emma BEARD, Jamie BROWN, Robert WEST
Cancer Research UK Health Behaviour Research Centre, University College London, London, UK

Background: At the end of 2009/early 2010, the UK MHRA expanded the licence for a number of Nicotine Replacement Products (NRT) to include harm reduction i.e. smoking reduction without a requirement for an intention to stop completely. A potential concern with this expanded indication was that it might undermine motivation to stop smoking altogether. This study assessed the impact of the expanded indication of NRT for smoking reduction on smoking cessation, motivation to quit and on the use of NRT for harm reduction. Methods: Data were used from Smoking Toolkit Study, a series of monthly representative household surveys of adults aged 16+ in England, to assess differences in the following measures 1 year before and 2 years following the change in license of NRT for harm reduction: use of NRT for harm reduction; motivation to quit using a validated scale; and quit attempts. Results: Data were available between November 2006 and January 2012 on 114,188 adults; of whom, 25,137 were current cigarette smokers. Expansion of the licence was not associated with an increase in use of NRT for harm reduction, which was already substantial prior to the change (18.5% of smokers using NRT for smoking reduction prior to the expansion and 16.6% afterwards). The expansion was not associated with any change in smoking cessation or motivation to quit. Conclusions: Expanding the indication for use of NRT to include smoking reduction in England has not increased its use for this purpose and there has been no detectable effect on attempts to quit smoking or motivation to quit.

Funding: This study was funded by the English Department of Health, Cancer Research UK, Pfizer, Glaxo-SmithKline, and Johnson and Johnson, who had no involvement in the design of the study, the analysis or interpretation of the data, the writing of the report, or the decision to submit the paper for publication.

O5 GP ADVICE ON SMOKING CESSION IN ENGLAND: A NATIONAL SURVEY
Jamie BROWN, Robert WEST, Jennifer A. FIDLER, Alison BISH, Andy MCEWEN
University College London, UK

Background: Limited evidence from RCTs suggests that the offer of help with quitting by GPs may be more effective in promoting smoking cessation than simple advice to stop. This study provided the first population level estimate in any country of the prevalence of different forms of advice on quitting and whether smokers who had received the offer of help were more likely to quit than those who were just advised to stop. Methods: Design: A series of cross-sectional national household surveys. Setting: Monthly household surveys conducted in England between February 2010 and November 2011. Participants: 6,229 adults who reported having smoked in the past 12 months and consulted their GP. Measurements: Recall of having received different types of advice on smoking from their GP, having made a serious attempt to quit smoking and smoking cessation in the past 12 months. Results: Of current and recent (<12 months) ex-smokers who visited their GP in the past year, 42.8% (95% CI = 41.5%-44.0%) recalled having been offered support, while 17.8% (95% CI = 16.9% - 18.8%) received advice but no offer of support and 39.4% (95% CI = 38.2% - 40.7%) did not recall having received any advice. After adjustment for socio-demographic characteristics, those who reported having been offered support were more likely than those receiving advice only or those receiving no advice to have made a quit attempt in the past year (OR = 2.36, 95% CI = 2.04-2.74; OR = 3.12, 95% CI = 2.78-3.51
In a sensitivity analysis of data from only current smokers, those offered support were still the most likely to have tried to stop after adjusting for motivation to quit (vs. advice-only, OR = 1.86, 95% CI = 1.58-2.20; vs. no advice, OR = 2.66, 95% CI = 2.32-3.04). Conclusions: In line with predictions from RCT evidence, a GP offer of support with quitting appears to be associated with a higher probability of a quit attempt and becoming an ex-smoker than GP advice to quit without offer of support.

**Funding:** Cancer Research UK and the Department of Health.

**O6 SHORT-TERM EFFECTS OF STATUTORY TOTAL SMOKING BAN IN FINNISH SCHOOLS**

Jukka JOKELA, Riikka PUUSNIEKKA
National Institute for Health and Welfare, Helsinki, Finland

**Background:** Tobacco control in schools is an important part of smoking prevention. In Finland, underage (<18 yrs) smoking in schools has been banned by law since 1977. In October 2010, total smoking ban in schools came into effect: all smoking in school buildings and outdoor premises is now prohibited by law, regardless of smokers’ age or position in school. This study focuses on ban enforcement and short-term effects of the 2010 ban.

**Methods:** Data is from National School Health Promotion (SHP) Study of 14-16-year-old secondary school (SS) pupils, 16-18-year-old upper secondary school (USS) and 16-20-year-old vocational school (VS) students. SHP runs even-numbered years in Southern and Eastern Finland and Lapland, odd-numbered years in Western and Northern Finland and Åland. For countrywide trend analyses even- and odd-numbered years are paired. Current analyses run from 2008/2009 (N=199 757) to 2010/2011 (N=192 414).

**Results:** In 2010/2011 daily smoking was most common in VS (40 %) followed by SS (15 %) and USS (11 %). The prevalence did not change significantly since 2008/2009. However, viewing smoking allowed in school decreased in VS (from 86 % to 62 %), USS (from 75 % to 65 %) and SS (from 9 % to 8 %). Thinking that school smoking restrictions are rarely supervised decreased in USS (from 52 % to 48 %), VS (from 51 % to 45 %) and SS (from 22 % to 18 %). Among weekly smokers, smoking daily in school premises decreased in VS (from 74 % to 61 %), USS (from 39 % to 37 %) and SS (from 38 % to 37 %), but smoking daily next to school area increased in USS (from 44 % to 47 %) and VS (from 63 % to 70 %). Reports of personnel smoking daily in school area decreased in VS (from 46 % to 33 %), USS (from 11 % to 10 %) and SS (from 15 % to 13 %).

**Conclusions:** Finnish schools differ in smoking prevalence and enforcement of tobacco bans. Total ban had positive short-term effects on student and personnel smoking in school area and student perceptions of smoking bans and their supervision. Supportive elements, most importantly health education and smoking cessation support, are needed in order to decrease smoking prevalence and to prevent increase in smoking next to school area.

**Funding:** The study was funded by the Finnish National Institute for Health and Welfare.

**O7 NICOTINIC α4β2 DESSENSITIZING AGENTS AND NICOTINE SELF-ADMINISTRATION IN RATS**

Edward D. LEVIN1, Vanessa COUSINS1, Joshua JOHNSON1, Susan SLADE1, Corrine WELLS1, Amir REZVANI1, Yingxian XIAO2, Milton L. BROWN2, Mikell A. PAIGE2, Kenneth J. KELLAR2

1 Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, USA
2 Department of Pharmacology and Physiology, Georgetown University School of Medicine, USA

Sazetidine-A, a nicotinic α4β2 desensitizing agent, has been shown in our earlier studies to significantly reduce IV nicotine self-administration (0.03 mg/kg/infusion) in adult female Sprague-Dawley rats using the classic lever press operant response paradigm with an effective systemic dose of 3 mg/kg. Sazetidine-A at the same dose also caused a significant decrease in IV nicotine invoked by a licking operand rather than a lever response. The licking operand for IV nicotine self-administration was used to better model the oral aspects of nicotine self-administration in people, while preserving the rapid uptake achieved by IV administration. We have tested three additional similar compounds with α4β2 desensitizing effects. VMY-2-95 (effective dose 3 mg/kg) caused significant reductions in IV self-administration with the classic lever press and the licking response operands. With the licking operand neither YL-1-127 (0.03-9 mg/kg) nor triazetidine-O (2-18 mg/kg) two other analogs of sazetidine-A was effective in reducing IV nicotine self-administration. With the lever press operand YL-1-127 significantly reduced IV nicotine self-administration at 0.3 mg/kg, but not at either lower or higher doses. These studies have identified two nicotinic α4β2 desensitizing agents that reliably reduce IV nicotine self-administration. We have also found sazetidine-A to also significantly reduce alcohol, cocaine and methamphetamine self-administration as well as to improve attentional performance in rats. The differences in neuropharmacological properties of YL-1-127 and triazetidine-O vs sazetidine-A and VMY-2-95 which underlie their differences in efficacy for reducing nicotine self-administration will help determine the critical receptor mechanisms that can potentially be targeted for new effective treatments for smoking cessation.

**Funding:** This project was supported by Grant DA027990 from NIH.
sive and relatively ineffective. Previous research has demonstrated that just 10 minutes of moderate intensity exercise could decrease nicotine withdrawal symptoms and cravings in humans. In animals, exercise has been shown to attenuate self-administration of cocaine, morphine and alcohol, and decreases alcohol and morphine withdrawal symptoms. This study aims to explore the mechanisms underpinning the effect of exercise on nicotine withdrawal severity. Methods: C57Bl/6 male mice (n=7-8) were surgically implanted with a subcutaneous minipump infusing nicotine (24 mg/kg/day) or saline for 14 days, and underwent one of three exercise regimes: 24 hrs/day, 2 hrs/day and 0 hrs/day running wheel access for 14 days in their home cage. On day 14, withdrawal was precipitated by injection of mecamylamine, a nicotinic receptor antagonist, and withdrawal symptoms were assessed for 30 minutes. Results: Withdrawal data were normalised and a composite total withdrawal factor calculated. Non-parametric Kruskal-Wallis test found a significant effect of exercise on withdrawal (p<0.05). Nicotine treated mice in the sedentary group displayed significantly higher severity of withdrawal symptoms than mice in the 2 or 24 hrs/day wheel access groups (p<0.01 and p<0.05, respectively). There was no difference in severity of withdrawal between 2 and 24 hrs/day wheel access groups. Conclusions: The data indicates that even a low level of exercise aids in reducing withdrawal symptoms, but a higher level of exercise does not necessarily provide greater benefit. These results mirror human studies where just 10 mins exercise has been shown to reduce withdrawal symptoms.

Funding: Supported by a MRC/ESRC interdisciplinary doctoral training grant to H. Keyworth.

**O9**

**A NOVEL ANTI-NICOTINE VACCINE: ANTIGEN DESIGN AFFECTS ANTIBODY FUNCTION IN MICE**

Michael J. McCCLUSKIE, Ningli ZHANG, Michelle BENOIT, Karen ROBERTSON, Heather L. DAVIS, David C. PRYDE, David BLAKEMORE, Alan D. BROWN, Lyn H. JONES, David R. STEAD, David P. GERVAIS, Phil WHITE, James R. MERSON

1 Pfizer Vaccine Research, Ottawa, Canada
2 Pfizer Worldwide Medicinal Chemistry, Cambridge, UK
3 Pfizer Worldwide Medical Chemistry, BioTherapeutics Chemistry, Cambridge, MA, USA
4 Pfizer Vaccine Research, La Jolla, CA, USA
5 Health Protection Agency, Technology Development Group, Porton Down, Salisbury, UK

**Background:** Anti-nicotine antibodies (Ab) may aid smoking cessation by reducing nicotine entering the brain, and hence the associated reward. Ab function depends on both the quantity (titer) and the quality (avidity) of the Ab. Anti-nicotine vaccines tested previously in clinical studies had poor efficacy despite high Ab titer, and this may be due to inadequate function if Ab of low avidity were induced. A carrier is essential to render a hapten such as nicotine immunogenic and we explored the effect of conjugate antigen design on functional Ab responses using different haptons and linkers with diphtheria toxoid (DT) as carrier. Methods: Eleven nicotine-like haptons were designed, synthesized and conjugated to DT using sulfon-N-hydroxysuccinimide (s-NHS)/1-ethyl-3-(3-dimethylamino propyl) carbodiimide hydrochloride (EDC) reagents; hapten loading was ~2 - ~20 haptons per DT. Conjugates were adjuvanted with aluminium hydroxide and CpG adjuvants and tested in BALB/c mice for anti-nicotine Ab titers (ELISA), avidity (ammonium thiocyanate assay), specificity (competition ELISA) and function (reduced 3H-nicotine in brain after IV challenge). Different linkers varying in length, rigidity and polarity were used with a single hapten to generate additional DT-conjugates, which were also tested in mice. Results: Conjugates made with different haptons resulted in various titers of anti-nicotine Ab that did not directly correlate with hapten loading, except conjugates with <5 hapten per DT were poorly immunogenic. Several haptons gave similarly high Ab titers, but among these, Ab avidity and hence function varied considerably. Of note, the hapten used in NicVax did not reduce nicotine to the brains of vaccinated mice as much as some other haptons. Linker also influenced Ab titer, avidity and function. Conclusions: Immune responses induced in mice by nicotine-conjugate antigens are influenced by both the hapten and linker. While both antibody titer and avidity contributed to function, avidity was more sensitive to antigen differences. Screening efforts for effective anti-nicotine vaccines should include testing Ab avidity and/or function as well as titer.

**Funding:** All studies were funded by Pfizer Inc.

**O10**

**NIC7-DT, A NOVEL ANTI-NICOTINE VACCINE, INDUCES BETTER FUNCTIONAL ANTIBODY RESPONSES IN MICE COMPARED TO A NIC-Q8 MIMETIC**

Heather L. DAVIS, Michael J. McCluskie, Ningli ZHANG, Michelle BENOIT, Karen ROBERTSON, David C. PRYDE, David R. STEAD, David P. GERVAIS, Phil WHITE, James R. MERSON

1 Pfizer Vaccine Research, Ottawa, Canada
2 Pfizer Worldwide Medicinal Chemistry, Cambridge, UK
3 Pfizer Vaccine Research, La Jolla, CA, USA
4 Health Protection Agency, Technology Development Group, Porton Down, Salisbury, UK

**Background:** Anti-nicotine vaccines aim to induce antibodies (Ab) that reduce nicotine entering the brain. Ph2 testing of NicQb, an anti-nicotine vaccine developed by Cytos, showed the upper 1/3 of Ab responders had better 1-yr quit rates than placebo. Since Ab function depends on both quantity (titer) and quality (avidity), the lack of efficacy of NicQb in the intent-to-treat population, despite induction of high antibody titers, may be due to low avidity Ab. We compared a novel vaccine for which both antigen and adjuvant were optimized using functional readouts, to a NicQb mimetic, which was adjuvanted with aluminium hydroxide. Methods: NIC7-DT comprises a nicotine related hapten conjugated to diphtheria toxoid (DT) with a hapten density of ~10 haptons per DT molecule. Mice were immunized at 0, 4 & 6 wks with NIC7-DT (10 μg)
adjuvanted with aluminum hydroxide (40 µg Al3+) and CpG (50 µg) or a mimetic of NicQb (10 µg antigen [~600 nicotine molecules conjugated to each E. coli QB phage virus-like particle] with 40 µg Al3+). Plasma was tested at various times for Ab titre (ELISA) and avidity (ammonium thiocyanate elution ELISA or competitive ELISA to determine IC50). At 8 wks mice received 3H-nicotine (IV) and nicotine concentrations in brain and plasma were determined. The effect of antigen dose and dosing frequency (q1, q2 or q4 wks) were also explored. Results: Anti-nicotine Ab titers were at least 5-fold higher and Ab avidity was statistically greater with NIC7-DT than the NicQb mimetic after 2 or 3 doses (p< 0.01). This translated to statistically better function with less nicotine entering the brain with NIC7-DT than the NicQb mimetic (p<0.001) (41% and 15% less than non-vaccinated controls respectively). Higher doses of the Nic-Qb mimetic did not compensate for the 40 µg dose of the NicQb mimetic, and the nicotine concentration happened between 2004 and 2008. The average nicotine concentration decreased from 130 µg/m³ to 4.8 µg/m³. The same numbers for minimum concentrations were 0.08 and 0.025 µ/m³, respectively. The greatest reduction in the measured nicotine concentration happened between the years 2006 and 2008. The average nicotine concentration decreased from 13 µg/m³ to 0.35 µg/m³ during the period. Conclusion: In conclusion, total prohibition of smoking in restaurants was effective in reducing work-related exposure to tobacco smoke. Both questionnaire surveys and nicotine measurements can be used in assessing the exposure.

Funding: This study was funded by the Ministry of Social Affairs and Health.

O12 DOES THE MODEL OF THE CIGARETTE EPIDEMIC EXPLAIN SOCIOECONOMIC DIFFERENCES IN ADOLESCENT SMOKING? A STUDY OF FINNISH AND GHANAIAN ADOLESCENTS

David DOKU1, Arja RIMPELÄ2

1 Department of Population and Health, University of Cape Coast, Ghana
2 School of Health Sciences, University of Tampere, Finland

Background: In developed countries, the development of socioeconomic differences in smoking behavior in a population and the smoking epidemic in general are consistent with the theory of diffusion of innovation. In developing countries, however, the pattern of the smoking epidemic has not been exploited in this perspective. Aim: This study investigates whether the model of the cigarette epidemic in developed countries explains socioeconomic differences in adolescent smoking. Method: Nationwide biennial surveys conducted since 1977 (response rate, 59%-88%; N = 96,747) among Finnish adolescents and a cross-sectional survey conducted in 2008 on health behaviours and lifestyles among school going Ghanaian adolescents (N=1195, response rate=89.7%) were used. Familial and individual social position indicators were used to assess adolescents’ socioeconomic status. Results: Socioeconomic and differences exist in smoking to the disadvantage of those in lower SES groups in both countries whether SES was measured by familial indicators or adolescents own social position. Smoking was male dominant among Ghanaian adolescents. On the contrary, among Finnish adolescents, gender differences were observed at the beginning of the survey (1977) but in 2009 the prevalence was similar for both genders, even 18-year-old girls had slightly higher prevalence than boys of the same age. Conclusions: Largely, the development of smoking behavior in the Finnish adolescent population over a 30-year period appears similar to the development of smoking among adults described in the cigarette epidemic model and it seems to be in the later stages epidemic. It is possible that Ghanaian adolescents are at the initial stages of the cigarette epidemic or are immune to it.

Funding: No Funding
O13
INFLUENCE OF DELIVERY STRATEGY ON MESSAGE PROCESSING MECHANISMS AND E-LOYALTY OF A DUTCH COMPUTER TAILORED SMOKING CESSATION INTERVENTION
Nicola E. STANČZYK, R CRUTZEN, C BOLMAN, JWM MURIS, Hein de VRÈES
Maastricht University, Department of Health Promotion, Maastricht, the Netherlands

Background: Although Internet computer tailored (CT) smoking cessation interventions have the potential to reach a large number of smokers, they often face high attrition rates, especially among lower educated smokers. A possible reason for the high attrition rates in the latter group is that the CT smoking cessation interventions may not be attractive enough as they are mainly text-based. Video-based messages might be more effective in attracting attention and stimulating comprehension in people with a lower educational level and therewith reducing attrition rates. It was investigated whether differences in message processing mechanisms and e-loyalty according to delivery strategy and educational level toward a Dutch CT smoking cessation program.

Methods: Smokers, motivated to quit within 6 months and aged over 16 were included in the program. The study was a randomized control trial with two conditions (video/text CT). The sample was stratified into 2 categories, low and high educated participants. 139 participants completed the first session of the web-based CT intervention and were asked to fill out a questionnaire assessing message processing mechanisms and e-loyalty. ANOVAs and regression analyses were conducted to investigate differences in message processing mechanisms and e-loyalty.

Results: No interactions were found between delivery strategy and educational level on message processing mechanisms and e-loyalty. Delivery strategy had no effect on e-loyalty and processing mechanisms. However, results indicated that lower educated participants showed higher attention and processing levels. Results revealed that lower educated participants were more inclined to visit the CT intervention website again.

Conclusions: CT programs have the potential to positively influence lower educated groups as they might be more involved in the CT intervention than higher educated smokers. Longitudinal studies with a larger sample are needed to investigate whether the intention to visit the intervention website again results in the ultimate goal of behavior change.

Funding: The study was funded by ZonMw, the Netherlands Organisation for Health Research and Development (grant number: 20011007).

O14
SMOKING CESSATION FOR HEALTH CARE PROVIDERS: A FOUR-COUNTRY CASE STUDY
Frances A. STILLMAN1, Jennifer M. KRESLAKE1, Michelle R. KAUFMAN1, Sule AKCAY2, Magdalena CIÖBANU3, Javaid KHAN4, Zhao NA5, Jiangbo WANG5
1 Johns Hopkins Bloomberg School of Public Health, Baltimore, USA
2 Turkish Thoracic Society, Turkey
3 Ministry of Health, Romania
4 FRCP (Edin), The Aga Khan University
5 Chinese Association for Tobacco Control, China

Background: Article 14 of the Framework Convention on Tobacco Control (FCTC) states that signatory countries shall develop measures to promote cessation and treatment of tobacco use: (a) develop evidence-based guidelines; (b) involve health and human service sectors in counseling and treatment; (c) ensure treatment is accessible and affordable. Case studies of smoking cessation education programs for healthcare professionals (HCPs) were conducted in 4 countries (Turkey, Romania, Pakistan, China) to understand challenges and successes to implement of Article 14.

Methods: Qualitative analysis assessed the relationship of the programs to objectives of Article 14. Data for the study included review of project proposals, interim and final reports, structured interviews, correspondence, and all communication with grantees.

Results: Successes included establishment of smoking cessation clinics, training of HCPs and changes in knowledge and counseling behaviors, reported quit intentions, and tobacco control policy changes. Lessons learned: (a) Cessation curricula needs to be comprehensive, tailored according to national priorities and cultural contexts and behavioral approaches are viewed as novel; (b) HCPs' receptivity is higher in smaller cities and countries since opportunities for additional medical training are limited. HCPs do not perceive their role as providing preventive medicine. Public education campaigns seem to increase public awareness and patient requests for cessation increased HCPs interest in training. Including social context of tobacco control in curricula generated a high degree of enthusiasm and interest from HCPs; (c) Pharmacotherapy provision, not part of this initiative, helped HCPs in countries where pharmacotherapy was subsidized provide treatment consistent with behavioral models. Patient receptivity and compliance was a challenge when pharmacotherapy was an out-of-pocket expense.

Conclusions: The challenges and successes of these case studies provide valuable recommendations for future program efforts in FCTC signatory countries. Project success and sustainability was enhanced when conducted in tandem with national tobacco initiatives.

Funding: Support was provided from the Pfizer Foundation for their Global Health Partnerships Program

O15
THE EFFECTS OF TEXT MESSAGE SUPPORT AMONG THOSE WITH HIGH, MEDIUM AND LOW CHANCES OF SUCCESSFUL QUITTING
Caroline FREE, Pablo PEREL
LSHTM, London, UK

Background: The txt2stop trial demonstrated that mobile phone based text messaging support for smoking cessation doubled biochemically verified quitting at six months (10.7% txt2stop versus 4.9% control, relative risk 2.20, 95% CI 1.80 to 2.68 p<0.0001). Smoker’s chances of successful quitting vary according to smoker’s characteristics. The effects of text messaging support might
also vary according to smoker's chances of quitting. We aimed to conduct an analysis of the characteristics of smokers influencing quitting in the txt2stop trial and the effect of the txt2stop intervention according to smokers’ chances of quitting. **Methods:** We used the txt2stop trial data set with 5800 smokers. The primary outcome was self-reported continuous abstinence bio-chemically verified at six months. We used univariate and multivariate analysis to identify the characteristics of smokers that predicted quitting. Smokers were then divided, according to those characteristics, into those with a low (0-3%), medium (3.1-7%) or higher (>7%) chance of quitting. We examined the effect of the txt2stop intervention in each of these subgroups. Heterogeneity in treatment effect across subgroups was assessed with $X^2$ tests. All analyses were by intention to treat. **Results:** In the multivariate analysis: age(16-18, 19-34 >34), type of work (manual/ non manual), previous quit attempt with support (yes/no), smoking when sick(yes/no), number of cigarettes smoked per day (1-10, 11-20, 21-30,>30) and having difficulty refraining from smoking in places where smoking is forbidden (yes/ no) were statistically significant predictors of quitting. The effect of the txt2stop intervention in those with a low (0-3%), medium (3.1-7%) or higher (>7%) chance of successfully quitting was relative risk (RR) 3.7(95% confidence intervals (CI) 2.1-6.5), RR 1.9 (95% CI 1.5-2.5) and RR 2.14 (95% CI 1.4-3.3) respectively, Chi squared test 4.2, p 0.124 for heterogeneity. **Conclusion:** There is no evidence that the effect of the txt2stop intervention differs according to smokers chances of successfully quitting. Text message support should be considered for smokers wanting to quit. **Funding:** UK Medical Research Council

### O15

**ARE LIGHT SMOKERS LESS LIKELY TO RECEIVE ADVICE TO QUIT FROM THEIR GP THAN MODERATE-TO-HEAVY SMOKERS? A COMPARISON OF POPULATION DATA FROM THE NETHERLANDS AND ENGLAND**

**Daniel KOTZ**$^{1,2}$, **Marc C. WILLEMSEN**$^{3,4}$, **Robert WEST**$^2$

$^1$Department of General Practice, CAPHRI School for Public Health and Primary Care, Maastricht University Medical Centre, Maastricht, the Netherlands

$^2$Cancer Research UK Health Behaviour Research Centre, Department of Epidemiology and Public Health, University College London, London, UK

$^3$Dutch Expertise Centre on Tobacco Control, STIVORO, The Hague, the Netherlands

$^4$Department of Health Promotion, CAPHRI, Maastricht, The Netherlands

**Background:** About one third of current smokers in the Netherlands and in England smoke less than 10 cigarettes per day (cpd). The aim of the current study was to assess whether light smokers (<10cpd) are less likely to receive advice to stop smoking during a consultation with their GP than moderate-to-heavy smokers (>=10cpd), and whether the level of GP advice differs between countries. **Methods:** Comparison of data from two series of monthly national surveys: the Dutch “Continuous Survey of Smoking Habits” and the English “Smoking Toolkit Study”. We used data from respondents to both surveys in the period from February 2010 through to December 2011 who were 16+ years of age and consulted their GP in the previous 12 months. Results: A total of 7,734 smokers responded to the surveys in the Netherlands and 10,383 in England. The percentage Dutch smokers receiving advice to quit from their GP was 22.6% (95%CI=21.5-23.7) compared to 58.9% (95%CI=57.6-60.2) of English smokers. Light smokers were less likely to receive advice to quit from their GP than moderate-to-heavy smokers, and this difference was larger in the Netherlands (OR=0.57, 95%CI=0.50-0.65) than in England (OR=0.64, 95%CI=0.57-0.72). The percentage light smokers who received a recommendation/prescription for smoking cessation medication from their GP was similar in the Netherlands and in England: 20.9% (95%CI=16.4-25.3) and 23.6% (95%CI=22.2-24.9), respectively. However, the percentage light smokers who were referred to counselling was only one tenth in the Netherlands compared to England: 3.7% (95%CI=1.7-5.8) and 42.7% (95%CI=41.1-44.3), respectively. **Conclusions:** Light smokers are less likely to receive advice to stop smoking from their GP than moderate-to-heavy smokers. Compared to England, smokers in the Netherlands are much less likely to receive advice to stop from their GP and a referral for smoking cessation counselling. These discrepancies may be explained by differences between countries in incentivisation of GPs for registration of smoking and offer of advice, available treatment infrastructure for referral to counselling, reimbursement of smoking cessation treatment, and culture. **Funding:** The “Dutch Continuous Survey of Smoking Habits” is supported by grants from the Dutch Ministry of Health, Welfare and Sport. The “Smoking Toolkit Study” is funded by the English Department of Health, Cancer Research UK, Pfizer, GlaxoSmithKline, and Johnson and Johnson. Pfizer, Johnson and Johnson, and GlaxoSmithKline are manufacturers of smoking cessation products who had no involvement in the design of the study, collection, analysis or interpretation of the data, the writing of the report, or the decision to submit the paper for publication.

### O16

**SMOKING CESSATION AND GENDER DIFFERENCES IN WALES**

**Vasiliki KIPAROGLOU**$^1$, **Katie TULLOCH**$^1$, **Hugo Van WOERDEN**$^{2,3}$

$^1$Public Health Wales, Cardiff, UK

$^2$Institute of Primary Care and Public Health, School of Medicine, Cardiff University, Cardiff, UK

$^3$Public Health Wales, Temple of Peace and Health, Cardiff, UK

**Background:** Smoking remains the single most preventable cause of premature death and is estimated to lead to 6,000 deaths every year in Wales (Wales Centre for Health, 2007). Stop Smoking Wales (SSW) is a national service provided by Public Health Wales. SSW delivers evidence-based 6-week behavioural support programmes to smokers who wish to quit smoking. Evidence-based cessation...
services have been proved to be a cost-effective way of helping smokers to give up. Methods: Data from 26,018 contacts in SSW in 2010-11 were used to assess the association between gender differences and successful quit rates. Clients who participated in at least one behavioural support session were included in the further analysis (n=17519). Treatment characteristics examined were attendance rates, type of support, treatment intervention and quit rates. The main outcome was abstinence from smoking 4 weeks post-quit date. Results: A significant difference was found between males and females who contacted SSW with more females contacting the service than males (p<0.001). There was no significant difference in attendance at the assessment sessions and conversion to treated smokers between genders. There was a significant difference in the type of support received between males and females with more males attending the group venue type (p<0.001). There was not a difference between the type of pharmacotherapy used and gender. Furthermore, there was a significant difference in quit rates between males and females with a higher proportion of males quitting when compared to females across Wales (p<0.001). Conclusions: Although females are more likely to contact the service than males, the proportion of males quitting smoking is higher than the one in females. Results support findings of an observational study of NHS treatment services that reported women were more likely to access treatment services but less likely to quit at 4-weeks (Baud et al, 2005). These results can further enhance the future delivery of smoking cessation services and identify smokers motivated to quit and also to establish the attendance and quit rates between genders.

Funding: Public Health Wales

O18
HOSPITAL NURSES’ ADHERENCE TO THE 5A PROTOCOL AFTER TOBACCO GUIDELINE IMPLEMENTATION
Patricia M. SMITH1, Scott M. SELLICK2
Northern Ontario School of Medicine, Thunder Bay, Canada
Thunder Bay Regional Health Sciences Centre, Thunder Bay, Canada

Background: This presentation reports on nurses’ adherence to the 5A smoking cessation protocol after tobacco guidelines were implemented into standard nursing practice in acute care hospitals. Methods: Eleven of the 12 NW Ontario community hospitals participated. Nurses were trained to provide a brief 5A tobacco cessation intervention (ask, advise, assess, assist, arrange) and asked to provide the intervention to all inpatients. Intervention was cued by a one-page intervention form in patients’ charts, which was included as part of quality chart audits in most hospitals (none of the hospitals used electronic charting). Patient materials including cessation booklets and Smoker’s Helpline pamphlets and fax referral program information were offered. Results: Over a 3 year period, 18,256 intervention forms were collected on which 96% (17,569) documented tobacco use (ask). Tobacco use prevalence was 32% (5,637/17,569), consistent with the average smoking rate for the rural communities. Seventy-three percent of smokers (4,099) were advised to quit by their attending nurse, 85% (4,767) were assessed for interest in quitting, 40% (2,259) were assisted to quit by receiving a booklet, 55% (3,091) were offered NRT, and only 9% (497) were offered follow-up, either information about the Smokers’ Helpline or a fax referral to the Helpline or referral to another counsellor. Discussion: Adherence to completing the forms and providing the brief intervention, up to the 4th step (assist) was quite remarkable, especially given this was the first research study these hospitals had been involved with and the first time the nurses were asked to provide tobacco cessation interventions. The low ‘arrange’ rates indicate a need to understand why this step is not being provided even though materials and a fax referral system has been established, and also signals a potential need for additional training. Given high rates of smoking in these communities and the success with translating a tobacco cessation intervention into standard nursing practice, this brief inpatient intervention has the potential to make an important contribution to lowering tobacco use rates in NW Ontario and enhancing health outcomes.

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O19
COMPARISON OF SMOKERS FROM EXTREME ENDS OF THE CIGARETTE DEPENDENCE CONTINUUM
Oliver WEST, Peter HAJEK
UK Centre for Tobacco Control Studies, Barts and The London School of Medicine, Queen Mary, University of London

Background: Individual differences in cigarette dependence are poorly understood. Comparing smokers unable to quit despite strong motivation to do so with smokers who show little sign of dependence (quit easily or smoke only occasionally) is a novel approach to identify relevant factors. Methods: 25 unable-to-quit smokers (UQ; never managed more than three consecutive days of abstinence despite specialist treatment and medication) were compared to 50 low-dependent smokers (LD) comprising 25 non-daily smokers (ND) and 25 ex-smokers who quit easily without treatment on a series of questionnaires and laboratory tasks. Results: UQ had as expected higher FTND scores than LD (mean=7 v 2; p<.001) and were more likely to smoke at night (p<.0001). They also started to smoke earlier (14 v 17 years old; p<.001). The groups did not differ in enjoyment of their first ever cigarette. After overnight abstinence and cue-exposure, effects of smoking on ratings of enjoyment, increased concentration, and decreased irritability were higher for UQ than ND (p <.05-.0001), but there were no differences in craving relief (only ND group was used for this comparison). Total puff volume of the first cigarette of the day was similar for UQ and ND (677 v 576mg; p=.13), despite greater carbon monoxide (CO) boost in UQ (5.5 v 3.4ppm; p<.001). Pa-
rental smoking was not different between UQ and LD. UQ reported greater perceived stress than LD (p<.01). (There were no differences in self-reported active coping skills). Past-month depression and anxiety scores were higher in UQ than LD (p<.05), but they were not more likely to have ever been treated for depression. UQ were more likely to have ever been treated for non-depression mental health disorders, alcohol misuse, and substance misuse (p's <.001), and scored more highly on a social isolation scale (p <.01). Conclusions: Smokers unable to quit differ from low-dependent smokers in mental health, stress levels and social connectedness. They enjoy smoking more, and post-deprivation cigarettes have stronger effects on their wellbeing, although they inhale the same volume of smoke.

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O20 FACTORS ASSOCIATED WITH SMOKING CESSATION IN EARLY AND LATE PREGNANCY IN A TRIAL OF STANDARD DOSE NICOTINE REPLACEMENT THERAPY

Luis VAZ1, Tim COLEMAN1, Jo LEONARDI-BEE1, Paul AVEYARD2, Sue COOPER1, Sarah LEWIS1, Matthew GRAINGE1, Jim THORNTON1, Kim WATTS1, John BRITTON1
1 University of Nottingham, UK
2 University of Birmingham, UK

Outside of pregnancy, nicotine replacement therapy (NRT) has been established as an effective intervention for smoking cessation both with and without behavioural counselling. Currently though, there is a lack of evidence for the efficacy of NRT in pregnancy, despite its cautious use being recommended in many clinical guidelines. A large placebo RCT of standard dose NRT in pregnancy found statistically higher quit rates with NRT in early pregnancy but not at delivery. In an exploratory analysis, data from this trial were analysed to determine factors associated with cessation in early and late pregnancy. Data were collected at baseline, one month and delivery from 1050 women enrolled in the UK Smoking, Nicotine and Pregnancy (SNAP) trial. Two multivariable models for validated cessation at one month and delivery were created using logistic regression. Independent variables found to have significant associations in the univariable analyses (p≤0.05) were included the multivariable analyses, based on a stepwise backwards elimination method. Afterwards, non-significant variables were entered individually and included in the final model if their inclusion caused statistically significant changes. All findings are for multivariable analyses. At one month, odds of cessation were greater amongst those who completed full time education >16 years of age (p=0.004), but were lower in women aged <20 years (p=0.020), with increased baseline cotinine levels (p<0.001) and who smoked more cigarettes prior to pregnancy (p=0.013). Women allocated to NRT also had greater odds of cessation (p=0.002) as did those who adhered more strongly with their allocated treatment (p<0.001). At delivery, greater adherence with patches of either type was also strongly associated with cessation (p<0.001), but treatment allocation was not (p=0.921). Adherence with patches was the only factor to be found associated with both validated cessation in early and late pregnancy. Treatment adherence is, therefore, a potentially important determinant of outcome after use of either nicotine or placebo transdermal patches for smoking cessation in pregnancy and should be investigated further.

Funding: The SNAP trial was funded by the NIHR Health Technology Assessment Programme and Luis Vaz is funded by a UK Centre for Tobacco Control Studies research studentship.
POSTER-ORAL PRESENTATIONS
Background: Children's exposure to secondhand smoke (SHS) remains a significant public health concern with up to two-thirds of European children regularly exposed to SHS at home. Health care professionals (HCP) working with smoking families are in a unique position to offer help to caregivers who wish to make their homes smoke-free, should they not want to quit. However, there has been limited exploration of HCP attitudes to raising the issue. The aim of this study was to explore HCP attitudes and experiences of raising the issue of SHS and smoke-free homes with disadvantaged smoking families. **Methods:** Semi-structured interviews were conducted with 29 HCP working with disadvantaged smoking caregivers in Nottingham, UK (10 midwives, 12 health visitors, 6 stop smoking advisors and 1 Children's Centre family worker). Data were analysed using the Framework method. **Results:** HCP highlighted that raising the issue of smoking and SHS exposure is often low on their priority list and that it competes with a number of other issues which are perceived as being more important and which also need to be raised in the short amount of time available to engage with families. HCP articulated that their roles involve striking a balance between doing the best for the children living in the household, raising sensitive issues, limited time and, perhaps most importantly, maintaining a good relationship with the family. For those HCP who were raising the issue of SHS, they reported that they often used a tool such as an information sheet on SHS related health issues in order to initiate the conversation rather than raising the issue directly. The use of an initiation tool may be indicative of a lack of knowledge confidence and to directly address SHS exposure in the home. **Conclusion:** More needs to be done to protect children from the harms of exposure to SHS at home. One way to do this is to develop guidance for HCP on the messages to give to caregivers who cannot or are not ready to quit, including how to directly raise the issue of SHS exposure and how to offer practical help and support to caregivers to make their homes smoke-free. **Funding:** This study presents independent research commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0608-10020). The views expressed in this abstract are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

**PO11-2**
**LONG TERM COST-EFFECTIVENESS OF TWO TOBACCO USE PREVENTION PROGRAMS FOR LOWER VOCATIONAL SCHOOL STUDENTS**

Elco OVER1, Boukje van GELDER1, Rudolf HOOGVENNE1, Talitha FEENSTRA2
1 National Institute for Public Health and the Environment, Bilthoven, the Netherlands
2 University Medical Centre Groningen, Groningen, the Netherlands

**Background:** Especially among lower educated adolescents, smoking prevalence rates are high. These youths increase their risk for health problems and mortality at later ages. Smoking prevention programs in vocational schools might be a tool to reduce their smoking rates. The present study evaluated the long-term effects in terms of benefits and costs of two (evidence-based) smoking prevention programs in Dutch vocational schools.

**Methods:** Policy scenarios describe the implementation of two smoking prevention programs, computer tailoring program (CT) and Healthy Schools and Drugs program (HSD) tailored for use in lower educational levels. Effectiveness was taken from literature, school participation rates were based on empirical data and costs were estimated bottom up. The RIVM Chronic Disease Model was used to estimate the long-term effects of the policy scenarios from a healthcare perspective. **Results:** For a lifetime horizon, the CT program had a cost-effectiveness of €4,000 per QALY gained compared to care as usual. Adding the HSD program would cost an extra €22,300 per QALY. Compared to care as usual, the combination of CT and HSD cost €5,300 to €8,000 per QALY. HSD alone compared to care as usual cost €21,600 per QALY. Remarkably, most health gains from the CT program were obtained by adults in high SES categories, while the HSD program resulted in a slight reduction of health disparities. **Conclusions:** The CT program is cost-effective with a ratio of €4,000 per QALY but does not reduce health disparities. Adding HSD, or solely implementing HSD, had costs per QALY around €22,000. The HSD program marginally reduced health disparities. Choosing between CT and HSD thus seems a choice between better cost-effectiveness and reducing health disparities. However, a combined program is both feasible and cost-effective and will obtain the most total health gain. **Funding:** No funding
Background: Exercise has been shown to attenuate tobacco withdrawal symptoms (TWS) during temporary smoking abstinence; however, the most effective intensity of exercise to reduce TWS, and the mechanisms of action are not clearly understood. This study sought to determine the most appropriate intensity of exercise to relieve TWS. Methods: A randomised cross-over trial (n=40) was conducted. Following overnight abstinence, each participant attended three separate sessions and performed light, moderate, or vigorous intensity exercise for 15-minutes on a cycle ergometer. Ratings of cigarette cravings, TWS, affect, and food cravings were collected pre and post exercise. Eight participants provided blood samples for plasma cortisol. All outcomes were analysed using repeated measures two-way (condition x time) analysis of variance (ANOVA). Results: A total of 40 participants (25 males, mean age = 38 ±12 years) completed all sessions. ANOVAs revealed statistically significant main effects for time for desire to smoke (F(3,113) = 12.6, p<.001), strength of desire to smoke (F(3,132) = 16.6, p<.001), restlessness (F(4,153) = 4.0, p=.005), and hunger (F(4,155) = 5.3, p = .001), main effects for condition for desire to smoke (F(2,78) = 7.1, p=.001), strength of desire to smoke (F(2,78) = 4.3, p=.018), composite TWS score (F(2,84) = 4.2, p=0.019), stress (F (2,84) = 3.3, p=.043), and food cravings (F(2,84) = 3.9, p=.027), and time x condition interaction effects for desire to smoke (F(7,266) = 2.5, p=0.19), strength of desire to smoke (F(7,256) = 2.3,
Periphere Research Funding. Mr Roberts is three days adding new CSC. After 28 days, cells showed ml CSC for 7, 14, or 28 days, with media changes every For chronic studies, the cells were exposed to 1 or 10 µg/ were noted at 0.1 or 1 µg/ml of CSC in NL-20 lung cells. F1A at both the 10 and 100 µg/ml doses. No changes noted. This correlated to increased expression of RASS- in the control samples. However, when treated with 10 or the promoter. RASSF1A promoter profile was methylated in time points. This correlated to an unmethylated profile of moter methylation profile of critical genes involved in vari- sion increased only with the dose of 100 µg/ml CSC at all doses using MSP analysis. MGMT expres- sion correlated to hypermethylation of the ECAD pro- moter at both doses using MSP analysis. MGMT expres- sion was not significantly affected, nor was its methylation status. However, ECAD showed a significant decrease in expression after 72 hrs with both 10 and 100 µg/ml CSC. This decrease in ex- pression correlated to hypermethylation of the ECAD pro- moter at both doses using MSP analysis. MGMT expres- sion increased only with the dose of 100 µg/ml CSC at all time points. This correlated to an unmethylated profile of the promoter. RASSF1A promoter profile was methylated in the control samples. However, when treated with 10 or 100 µg/ml CSC, an unmethylated promoter profile was noted. This correlated to increased expression of RASS- F1A at both the 10 and 100 µg/ml doses. No changes were noted at 0.1 or 1 µg/ml of CSC in NL-20 lung cells. For chronic studies, the cells were exposed to 1 or 10 µg/ ml CSC for 7, 14, or 28 days, with media changes every three days adding new CSC. After 28 days, cells showed morphological changes associated with transformation. Foci were noted. These cells were further analyzed for invasion capacities and global methylation status. This study provides critical data showing epigenetic regulation of critical genes involved in DNA repair, invasion and tumor suppressor with CSC treatment of lung cells.

Funding: No Funding

PO12-2
EFFICACY OF NRT FOR SMOKING CESSATION AMONG ADOLESCENTS: A RANDOMIZED CONTROLLED TRIAL
Charlotte S. SCHERPFOH1, Regina J.J.M. van den EIJNDEN1, Rutger C.M.E. ENGELS2, Wilma A.M. VOLLEBERGH1
1Utrecht University, the Netherlands
2Radboud University Nijmegen, the Netherlands

Background: The majority of adolescent smokers is willing to quit smoking, but successful quit rates are low. Nicotine replacement therapy (NRT) is designed to reduce or prevent withdrawal symptoms, thereby making it easier to quit smoking. A recent meta-analysis, however, found that NRT for smoking cessation among adolescents did not have a significant effect on abstinence rates. Compliance rates in these studies were low, however compliance was not included in the efficacy analyses. This study tests the efficacy of NRT and the potential mod- erating role of compliance in a relatively large sample of adolescents. Methods: For this randomized, double-blind placebo-controlled clinical trial, adolescents were randomized to either a nicotine patch or a placebo patch condition. Participants attended an information meeting (including a short smoking cessation training) preceding the treatment. The duration of treatment with patches was 6 or 9 weeks, depending on the number of ciga- rettes participants smoked. Abstinence after two weeks, end-of-treatment abstinence, compliance, and possible side-effects were measured using online questionnaires.

Results: A total of 257 participants (age: 16.7 +/- 1.13 years) were eligible for analyses. Using nicotine patches compared to placebo patches increases the odds of quitting smoking two weeks after treatment, whereas end-of-treatment abstinence was not predicted by NRT. However in the end-of-treatment model a significant in- teraction effect was found, indicating that the nicotine patch was predictive of end-of-treatment abstinence in high compliant participants only. Intent-to-treat analyses showed end of treatment abstinence rates of 2.7% in low compliant participants in the placebo group, 3.5% in high compliant participants in the placebo group, 1.9% in low compliant participants in the nicotine group, and 5.8% in high compliant participants in the nicotine group. Overall the nicotine patches were well tolerated and appeared safe.

Conclusions: The findings provide evidence for the importance of supporting adolescents to be compliant during NRT treatment in order to increase the chance of successful smoking cessation.

Funding: This study was financed by ZonMw (The Nether- lands Organisation for Health Research and Develop- ment)
Background: Urges to smoke during the first weeks of smoking abstinence are well documented and aids to smoking cessation focus on reducing these urges. Urges experienced later on in the quitting process are less well understood and it is not clear whether treatments need to be extended to target these urges. Previous studies of ‘prolonged urges’ (i.e., those reported six months or more after quitting) have been limited by having retrospective designs, by not validating smoking abstinence at multiple time points or by focusing on the presence of ‘any urges’ rather than on reports of severe urges. Also it is not clear whether those experiencing prolonged urges can be identified from information gathered early in the quitting process. We conducted a longitudinal study to chart the time course, over 52 weeks of smoking abstinence, of severity and frequency of urges to smoke. We also assessed the extent to which urges to smoke reported early in a quit attempt predict urges later on. Method: We assessed strength of urges to smoke, and time spent with urges, among 452 smokers attempting to stop smoking with the help of behavioural support, but without the use of stop smoking medications. Ratings of urge to smoke were obtained from abstinent smokers at 1, 2, 3, 4, 26 and 52 weeks after the quit date (n=197, 156, 139, 131, 66 and 38, respectively). Lapse free abstinence was validated, at all time points, by expired carbon monoxide. Ratings of urges to smoke in the first weeks of quitting were correlated with urges after 6 and 12 months. Results: Ratings of urges to smoke followed a logarithmic (i.e., negatively accelerated) function over 52 weeks following the quit date. A substantial minority (13%) of ex-smokers reported strong urges 6 months after stopping and these urges were predicted from strength of urges after 2 weeks. Conclusions: There is a rationale for extending treatments to combat urges to smoke at least up to 6 months after quit, possibly targeting smokers who report strong urges in the first weeks of abstinence. Funding: This study was funded by the Wellcome Trust and Cancer Research UK. Michael Ussher, Robert West and Peter Hajek are members of the UK Centre for Tobacco Control Studies.

Influence of multiple genetic variants on antidepressant therapy for smoking cessation

Epidemiologic studies rely on retrospective accounts of smoking behavior, including nicotine withdrawal (NW), to assess lifetime prevalence. While there have been studies of test-retest reliability of NW across laboratory sessions, there have been no studies examining the validity of retrospective accounts of NW symptoms experienced after a verified nicotine abstinence period, nor evaluating the effects of gender, ethnicity and history of depression effects on such reports. We tested for within-subject change in DSM-IV NW symptoms (depressed mood, insomnia, irritability, anxiety, trouble concentrating, restlessness, decreased heart rate, increased appetite) from a smoking session to a 24-hour verified nicotine abstinence session (controlling for cigarettes smoked per day and years smoked). We also evaluated 1-week and 1-month retrospective recall of symptoms experienced during the 24-hour abstinence condition in 60 heavy smoking adults, and whether reports varied by gender, ethnicity and history of major depression (hxMD) [55% female, 50% African American(AA) and 55% with hxMD]. Abstinence resulted in a significant increase in symptoms (p=.003). AA smokers’ symptoms increased less with abstinence (p=.038), and hxMD was associated with higher symptoms in both smoking and abstinence states (p=.033); there was no effect of gender; Retrospective reports correlated with the contemporaneous reports at r=.70 and r=.67, at 1-week and 1-month, respectively; test-retest reliability between 1-week and 1-month was r=.82 and r=.77. Recall was unaffected by gender or hxMD, but was affected by ethnicity (p<.05). AA smokers recalled a greater level of symptoms than reported during the original abstinence session, while by 1-month European American smokers recalled a lower level than the original abstinence session. Findings suggest that assessments of NW using retrospective recall are reasonably valid and reliable, but subject to bias by ethnicity. Our finding of ethnic differences in NW symptoms could be due to variation in smoking behavior, including nicotine withdrawal, to assess lifetime prevalence. While there have been studies of test-retest reliability of NW across laboratory sessions, there have been no studies examining the validity of retrospective accounts of NW symptoms experienced after a verified nicotine abstinence period, nor evaluating the effects of gender, ethnicity and history of depression effects on such reports. We tested for within-subject change in DSM-IV NW symptoms (depressed mood, insomnia, irritability, anxiety, trouble concentrating, restlessness, decreased heart rate, increased appetite) from a smoking session to a 24-hour verified nicotine abstinence session (controlling for cigarettes smoked per day and years smoked). We also evaluated 1-week and 1-month retrospective recall of symptoms experienced during the 24-hour abstinence condition in 60 heavy smoking adults, and whether reports varied by gender, ethnicity and history of major depression (hxMD) [55% female, 50% African American(AA) and 55% with hxMD]. Abstinence resulted in a significant increase in symptoms (p=.003). AA smokers’ symptoms increased less with abstinence (p=.038), and hxMD was associated with higher symptoms in both smoking and abstinence states (p=.033); there was no effect of gender; Retrospective reports correlated with the contemporaneous reports at r=.70 and r=.67, at 1-week and 1-month, respectively; test-retest reliability between 1-week and 1-month was r=.82 and r=.77. Recall was unaffected by gender or hxMD, but was affected by ethnicity (p<.05). AA smokers recalled a greater level of symptoms than reported during the original abstinence session, while by 1-month European American smokers recalled a lower level than the original abstinence session. Findings suggest that assessments of NW using retrospective recall are reasonably valid and reliable, but subject to bias by ethnicity. Our finding of ethnic differences in NW symptoms could be due to variation in smoking behavior, including nicotine withdrawal.
PO21-1
DUTCH TOBACCO CONTROL OUT OF CONTROL?
RESULTS FROM THE FIRST DUTCH FCTC SHADOW REPORT
Marc WILLEMSEN1,2, Els RENNEN1
1STIVORO, Dutch expert centre on Tobacco Control, the Netherlands
2CAPHRI School for Public Health and Primary Care, Maastricht University, the Netherlands

Background: European countries vary with respect to implementation of the Framework Convention of Tobacco Control (FCTC). Although FCTC is legally binding, there are no sanctions for countries which do not comply. As a counterpart to official country progress reports, shadow reporting is recommended by the Framework Convention Alliance (FCA) to critically monitor country progress. The Netherlands is one of the first EU countries that produced a shadow report. We report on the methods, results and societal impact of the Dutch shadow report. Methods: Between April and September 2011, fieldwork was conducted, consisting of interviews with experts and stakeholders, observations and desk research. In a final stage, the report was endorsed by 32 Dutch health organizations. The report was modeled after the Canadian shadow report, but we added a system of summarizing the results using a color coding scheme. Results: Of the 14 FCTC obligations reviewed, 8 measures were not yet implemented or reversed, 5 were complied with, but could improve further, and only 1 exceeded minimum standards. The latter was about surveillance of tobacco use. The 8 negative markings were for not having a comprehensive national tobacco control policy, no central coordination, no protection against tobacco industry influence, reversal of smoking bans, inadequate labeling of cigarette packs, a stop on finance of awareness campaigns, a reversal of reimbursement of tobacco dependence treatment, and a reduction of financial resources. The results were presented to the Government and to Parliament, attracted media attention and resulted in one MP requesting the government to fully implement FCTC. Conclusions: The Dutch Shadow Report is unique, in that it covers the full range of the FCTC and is one of the first in the EU. The results informed advocates and policy makers about the lack of progress in the Netherlands with respect to implementing FCTC. In particular, the Netherlands is lagging behind on 8 of 14 important FCTC obligations. We recommend that other countries produce similar reports so that comparisons across countries can be made. Funding: The study was financially supported by the Dutch Cancer Society, the Dutch Heart Foundation and the Asthma Foundation.

PO21-2
EXPOSURE TO SECONDHAND SMOKE IN BARS AND RESTAURANTS PRE AND POST IMPLEMENTATION OF SMOKING BAN IN POLAND
Maciej L. GONIEWICZ1, Leon KOSMIDER2, Jakub KNYSIAK3
1Queen Mary University of London, UK
2Medical University of Silesia, Poland

Background: The aim of the study was to assess the indoor air quality in popular hospitality venues in Poland and to evaluate the effectiveness of the nationwide public smoking ban. Baseline study taken up prior to implementation of the ban on 15th November 2010, and the follow-up study after it came into effect. The new law allows bar owners to exempt some space in their bars from smoking-ban. Such exemptions might affect effectiveness in reducing second-hand exposure to tobacco smoke in public places in Poland. Methods: Forty venues including thirty pubs and ten restaurants were selected using...
a mix of random, convenience and purposeful sampling. Particulate matter PM2.5 measurements at these venues were made during one hour using TSI DustTrak Aerosol Monitor. CO levels were measured with TSI Q-Trak Indoor Air Quality Monitor. Concentration of tobacco-specific lung carcinogen 4-(methyl nitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) was measured in urine of sixteen pub patrons with highly sensitive UPLCMS/MS method. **Results:** The average PM2.5 and CO levels in venues where smoking was permitted prior to implementation of ban were found to be 599 µg/m3 and 3.3ppm, respectively, in the baseline study. Post ban, the average PM2.5 level in same test venues was reduced to 463 µg/m3 and CO level increased to 4.4ppm, respectively (p>0.05). Before ban, the average urine NNAL level increased among patrons who stayed for four hours in each pub from 3.88 to 6.51 pg/ml. After ban was introduced, the effect of same visit in same pubs was lower; NNAL increased from 3.28 to 3.99 pg/ml (p=0.09 pre vs. post ban). **Conclusions:** The baseline study showed that the hospitality venues had hazardous levels of PM2.5 particles arising from second-hand smoke prior to smoking ban. These decreased by only of 23% after the law took effect. There was some reduction in exposure to tobacco-specific lung carcinogen among pub patrons. A partial improvement in air quality at these venues and small changes in tobacco-specific biomarkers among patrons post implementation of the smoking ban indicate that the law is not fully effective.

**Funding:** No funding. This study was conducted while the first author was at the Medical University of Silesia, Poland.

**PO21-3**

**ADOLESCENTS’ PERCEPTIONS ON THE EFFECTIVENESS OF TOBACCO CONTROL POLICIES**

Melinda PÉNZES¹, Péter BALAZS¹, Kristie L. FOLEY²

¹Institute of Public Health, Semmelweis University, Budapest, Hungary
²Medical Humanities Program, Davidson College, NC, USA

**Background:** Tobacco smoking has a most important negative impact on health status of the Hungarian population. The latest anti-tobacco legislation (effective since January 1, 2012) based on the Framework Convention on Tobacco Control (FCTC) prohibited smoking in all confined public places. This study performed before 2012 evaluates the adolescents’ perceptions about the possible effectiveness of tobacco control policies to reduce general smoking prevalence. **Methods:** Data were collected in six metropolitan cities in Hungary by a questionnaire-based cross-sectional survey of randomly selected 7th and 10th grade adolescents (n=2081; 54.8% girls, mean age 15.02 years, standard deviation=1.62, range=12-19 years). Possible effectiveness of nine tobacco control policies as suggested by the WHO FCTC were rated by participants. Using chi-square tests and multivariate logistic regression models, we examined the associations between the self-rated effectiveness of tobacco control policies and predictor variables (socio-demographic factors, school achievement, smoking status, parental smoking). **Results:** Current smoking was prevalent in 28.5% of respondents, but was significantly higher among 10th graders (40.0%) versus 7th graders (7.8%), students with poor school achievement (43.8%), higher weekly allowance from parents (USD≥4.3) (37.7%) and those with smoking parents (36.8%). According to the adolescents, price increases and stricter regulation of tobacco products’ sales as well as non-smoking role models (e.g., parents) will have the greatest positive impact on smoking prevalence. Smoking students and those with poor school achievement, higher weekly incomes and smoking parents did not perceive that the most tobacco control policies would be effective at reducing tobacco use. However they suggested that school-based tobacco prevention programs, pictorial health warnings on tobacco products and promoting smoking cessation could successfully reduce the number of smokers in Hungary. **Conclusions:** Perceptions on the effectiveness of tobacco control policies varies across adolescent subgroups and therefore must be considered when implementing targeted anti-tobacco programs.

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**PO21-4**

**TOBACCO TAXES, CONSUMPTION, AND SMUGGLING IN HUNGARY: A REVIEW OF THE PAST DECADE**

Jozsef BODROGI¹, Kristie L. FOLEY²

¹Corvinus University, Budapest, Hungary
²Medical Humanities Program, Davidson College, NC, USA

**Background:** More than 30% of adults in Hungary smoke, and one-fifth of all deaths are attributable to tobacco. Taxation is one of the most effective methods to reduce tobacco use, especially among price-sensitive populations. We estimate tobacco tax increases and the effect of increasing taxes on consumption and smuggling over the prior decade in Hungary. **Methods:** We collected data from the Hungarian Tax and Customs Office and the Ministry of Finance on tax increases and recovered smuggled tobacco. **Results:** The Hungarian excise tax (direct taxation) has two forms: added value tax and sales tax. Direct tobacco taxes have risen rapidly in the past 10 years, but the positive impact of reduced consumption was observed only during the first half of the decade; from 2000 to 2004, consumption declined markedly from 20B to 14.9B pieces/year. During 2007 to 2011, sales tax was raised 9 times from 7240 HUF/1000 pieces to 9750 HUF and added value tax increased five times, from 27.50% to 28.40%. Correspondingly, VAT (indirect taxation) also rose from 20% to 27% during this period and is currently among the highest rates in the world. Despite the heavy and increasing tax burden imposed on the Hungarian population, tobacco consumption remained relatively stable at 15B pieces/year from 2005 to 2009 with a modest
PO21-5
COMMUNITY ADULT SMOKING PREVALENCE MODERATES THE ASSOCIATIONS BETWEEN PERCEIVED PEER SMOKING NORMS AND BEHAVIOR AND YOUTH CIGARETTE SMOKING – A MULTILEVEL ANALYSIS
Johannes THRUL1, Sharon LIPPERMAN-KREDA2, Joel W. GRUBE3
1 IFT Institut für Therapieforschung, München, Germany
2 Prevention Research Center Berkeley, CA, USA

Background: Smoking behavior of adolescents is increasingly seen as influenced by ecological factors and by individual beliefs. Characteristics of the personal social context, especially peer smoking, have been found to be among the strongest predictors of adolescent smoking. Additionally, community social norms have been shown to be associated with adolescent smoking. However, the relationships among these predictors are less well understood. This study investigates the moderating effect of community adult smoking on the association between perceived peer smoking norms and behavior and adolescent smoking. Methods: Self-report data from 1190 youths (49.3% male, M age = 15.6 years, SD = 1.07) in 50 midsized Californian cities were obtained through annual telephone interviews. Community characteristics were obtained from 2010 GeoLytics data. Adult smoking prevalence was ascertained from telephone interviews with 8,918 adults conducted in the same 50 cities. Adolescent past 12-month smoking behavior was regressed on perceived peer smoking norms and behavior, as well as community adult smoking, using multi-level analyses controlling for confounding variables. Results: Significant cross-level interactions were observed. The association between peer smoking norms and behavior and adolescent smoking was significantly moderated by the percentage of adult smokers in the community such that the association was stronger in communities with more adult smokers. Controlling for wave 1 smoking and therefore analyzing change in adolescent smoking behavior from wave 1 to wave 2, the moderating effect was still significant for peer smoking behavior. Conclusions: Smoking in the community may moderate the association between perceived adolescent peer smoking norms and behavior and adolescent individual smoking. These results support the idea that predictors of adolescents’ smoking both at the personal and the broader social context influence adolescent smoking and may interact with one another. Successful prevention and tobacco control efforts should therefore target both adolescents themselves and community smoking norms and behaviors.

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PO21-6
OPINIONS ABOUT THE POSITIVE EFFECTS OF COMPREHENSIVE SMOKE-FREE LEGISLATION IN HUNGARY
Edit PAULIK1, László NAGYMAJTENYI1, Christie L. FOLEY2, Todd ROGERS3, Doug EASTERLING4
1 University of Szeged, Szeged, Hungary
2 Medical Humanities, Davidson College, Davidson, NC, USA
3 RTI International, San Francisco, CA, USA
4 Wake Forest School of Medicine, Winston-Salem, NC, USA

Background: Comprehensive tobacco control program can be highly effective in various ways. Complete prohibition of smoking in indoor environments protects people from the harm of second-hand smoke, motivates smokers to quit, prevents the initiation of tobacco use among young people, and contributes to changing the social norm to make smoking less acceptable. The Hungarian Anti-Smoking Law implemented in 2012 strictly regulates smoking in public places (e.g. it bans smoking completely in workplace). The objective of this study was to assess Hungarians’ knowledge about the expected positive effects of this law and to identify factors that explain variation in expected benefit. Methods: In 2009, 2,250 Hungarians aged 16-70 years completed a self-administered questionnaire on tobacco-related attitudes, opinions, and behaviors. Of the 1,479 people from the first wave who agreed to be re-contacted, 1,042 people completed a follow-up survey in 2011. The 2011 survey collected information on demographics, smoking behavior, attitudes towards tobacco control and knowledge about expected positive effects of smoke-free environments. Logistic regression analyses were applied to study the association among knowledge and demographics and smoking. Data analyses were performed using SPSS 17.0 for Windows. Results: 87.2% of the respondents knew that smoke-free environment decreases the exposure to second-hand...
tobacco, 77.2% thought that it helps the prevention of smoking among youth, 78.8% believed that tobacco control policies support the development of smoke-free society, while only 46.8% thought that it supports smokers in cessation. The main predictor of Hungarians’ awareness about the expected benefits of tobacco control policies was smoking behavior: the odds ratios were significantly higher in non-smokers (ORs: 2.46-3.69) and ex-smokers (ORs: 1.38-3.38) than in active smokers. Conclusions: Our results suggest that during the implementation of tobacco control interventions more attention have to be paid on educational campaigns to inform the population, especially smokers about the expected positive results of these policies.

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PO22-1

RESPONSES TO ENVIRONMENTAL SMOKING IN NEVER-SMOKING CHILDREN: CAN SYMPTOMS OF NICOTINE ADDICTION DEVELOP IN RESPONSE TO SECOND-HAND SMOKE EXPOSURE?

Kathrin SCHLÜCK, Marloes KLEINJAN, Roy OTTEN, Rutger C. M. E. ENGELS, Joseph R. DiFRANZA

Radboud University Nijmegen, the Netherlands

University of Massachusetts Medical School, USA

Background: Recently, a new line of studies has brought attention to the question whether repeated exposure to secondhand smoke (SHS) is capable of producing psycho-physiological effects in non-smokers and whether symptoms of nicotine dependence can develop in the absence of active smoking. Children seem to be particularly vulnerable to the effects of SHS. Methods: The present study examined the occurrence of self-reported symptoms, designed to assess nicotine addiction and nicotine withdrawal in smokers, in a sample of 778 never-smoking children aged 9-12 years using cross-sectional survey data collected in 15 Dutch primary schools. Results: In the present study, 6% of never-smoking children reported symptoms of craving, 8% reported cue-triggered wanting to smoke, and 20% reported subjective symptoms in response to SHS exposure. In never-smoking children, a higher number of smokers in the child’s social environment was associated with reporting more symptoms of cue-triggered wanting to smoke and more subjective symptoms in response to SHS. Never-smoking children and children who had initiated smoking were equally likely to report subjective symptoms in response to SHS exposure, however, children who had initiated smoking were significantly more likely to report symptoms of craving and cue-triggered wanting to smoke. Conclusions: Never-smoking children seem to experience craving or cue-triggered wanting to smoke, but the implications of such reports may be different for smokers and never-smokers. Environmental smoking is associated with self-reported symptoms in never-smoking children. Future research needs to investigate whether repeated symptoms in children exposed to SHS are physiologically-based or whether they reflect other characteristics which predispose youth for smoking initiation in the future.

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PO22-2
GENETIC POLYMORPHISMS OF CYP2A6 AND SMOKING ADDICTION
Emmi TILLI, M. ANTIKAINEN, S. HYTTINEN, Ari HIRVONEN
Finnish Institute of Occupational Health, Helsinki, Finland

Background: CYP2A6 is one of the most important metabolizers of nicotine. Due to the extensive variability of CYP2A6 gene, individuals differ considerably in the CYP2A6-related nicotine metabolism capacity. This variation may have a notable effect on smoking behaviour. In agreement with this, previous studies have indicated that individual susceptibility is an important modifier of both the probability of smoking initiation and the ability of smoking cessation. Most of the results from the previous studies have been based solely on comparisons between current smokers and non-smokers. We studied this issue further in a study population consisting of both current smokers and former smokers, in addition to non-smokers. This gives a much better basis to identify the potential genetic factors in tobacco dependence compared to most of the previous studies on this topic. Methods: The smoking history together with blood samples was collected from 1153 Caucasians of Russian origin. The samples will be genotyped for selected CYP2A6 alleles: *2 (rs1801272), *4 (gene deletion), *9 (rs28399433), *12 (hybrid), and 1x2 (gene duplication). Besides genotype information, a well characterized phenotype of the metabolism capacity of nicotine will be revealed based on the previous knowledge about genotype-phenotype correlation. Genotyping is performed by real-time Taqman PCR using commercially available Drug Metabolism Genotyping and Copy Number Variation Assays. Use of several CNV-assays from different part of the CYP2A6 gene allows the identification of deletion, duplication, and a hybrid-allele. The associations between genetic polymorphisms of CYP2A6 gene, nicotine metabolism, and smoking habits will be analysed statistically using SPSS-software. Results: The genotyping analyses are currently underway and no preliminary data is yet available. However, the first results will be presented at the meeting. Conclusions: Enligthening of genetic factors affecting smoking behaviour is needed to find more efficient ways to reduce smoking. Identification of the particularly prone individuals would undoubtedly help in this, e.g., by enabling more focused smoking prevention actions.

Funding: This study is supported by the Juho Vainio foundation.

PO22-3
THE EFFECT OF NICOTINE AVAILABILITY ON PERFORMANCE DURING A VIGILANCE TASK WITH AFFECTIVE AND SMOKING CUE DISTRACTERS
Jason D. ROBINSON, Jeffery M. ENGELMANN, Yong CUI, Francesco VERSACE, Andrew J. WATERS, David G. GILBERT, Ellen R. GRITZ, Paul M. CINCIIRIPINI
MD Anderson Cancer Center, Department of Behavioral Science, Houston, TX, USA

Background: Smoking availability has been found to influence craving to smoke, possibly by increasing attentional bias to smoking cues. This study investigated the effects of nicotine availability on attentional bias to smoking, affective, and neutral cues during a vigilance task. Methods: At the beginning of each of four laboratory sessions, 12-hr nicotine-deprived smokers (n=51) were instructed that they would be smoking either a nicotineized (Told-NIC) or denicotinized (Told-DENIC) experimental cigarette after completing a 15-min vigilance task. Reaction time (RT) was recorded during the vigilance task, which consisted of a rapid visual information processing task with central emotional distractors (RVIP-CED). The RVIP-CED task presented single digits at a rapid pace (800 ms), with participants instructed to simultaneously push two buttons if either three consecutive even or three consecutive odd digits were shown. Participants were distracted by the presence of smoking, pleasant, unpleasant, or neutral pictures preceding some target and non-target digits. Attentional bias was determined by examining latency and signal-detection components (i.e., sensitivity, response bias) of RT to target digits that preceded the distractors. Results: Overall, during Told-NIC conditions, participants had significantly slower RT latency than during Told-DENIC conditions. Furthermore, the Told-NIC conditions, compared to the Told-DENIC conditions, resulted in significantly lower RT sensitivity to targets following cigarette distracters and significantly slower RT latency and more positive RT response bias to targets following pleasant distracters. Conclusions: These results suggest that nicotine-deprived smokers expecting to imminently smoke a nicotineized cigarette experience greater attentional bias toward appetitive stimuli in general, compared to when expecting to smoke a denicotinized cigarette.

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PO22-4
PRESCIBING OF NICOTINE REPLACEMENT THERAPY IN AND AROUND PREGNANCY IN THE UK – A POPULATION BASED STUDY USING PRIMARY CARE DATA
Nafeesa N. DHALWANI1, Laila J. TATA2, Tim COLEMAN3, Lisa SZATKOWSKI4
1 Division of Epidemiology and Public Health, Division of Primary Care, University of Nottingham, UK
2 Division of Epidemiology and Public Health, University of Nottingham, UK
3Division of Primary Care, University of Nottingham, UK
4Division of Primary Care, University of Nottingham, UK

Background: Smoking in pregnancy increases the risk of foetal and maternal problems, therefore reducing smoking in pregnancy is a public health priority. In 2005, licensing arrangements for nicotine replacement therapy (NRT) in the United Kingdom were broadened such that NRT could be prescribed to pregnant smokers. However, little is known about trends and uptake of NRT by pregnant women. We aimed to quantify annual trends of NRT uptake in and around pregnancy and variation in prescribing by maternal characteristics. Methods: In The Health Improvement Network primary care database we identified all pregnancies from 2000 to 2010 in women aged 15-
49 years and used READ codes to determine women's smoking status. NRT prescriptions were identified in all women during three time periods: up to 9 months before conception, during pregnancy, and up to 9 months after delivery. Annual proportions of pregnancies where NRT was prescribed were calculated and variations by age and socio-economic deprivation were assessed using logistic regression. **Results:** Women were classified as smokers in 19% of 298,083 pregnancies identified in 178,051 women. NRT was prescribed in 5,281 of all pregnancies which represented a prescribing prevalence of 9% of pregnancies in smokers and 2% of pregnancies overall. The rate of NRT prescribing was approximately 50% lower 9 months before and after pregnancy, compared to during pregnancy. There was a gradual increase in the annual rate of prescribing until 2005, after which the rate became stable. The rate of prescribing during pregnancy in smokers was higher in older age groups such that the rate in 35-40 year old group was 13% higher (95%CI:1.02-1.26) and the rate in 15-20 year age group was 6% lower (95%CI:0.85-1.04) than the rate of prescribing in the 25-30 year old group. The rate of prescribing during pregnancy in smokers also increased with deprivation such that it was 30% (95% CI 1.16-1.45) higher in the most deprived group than in the least deprived group. **Conclusions:** Uptake of NRT is higher during pregnancy compared to time periods outside pregnancy and is higher in smokers from older and more socio-economically deprived groups.

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**PO22-5**

**PRENATRNY AND SMOKING CESSATION IN WALES**

Katie TULLOCH1, Vasiliki KIPAROGLOU1, Hugo Van WOERDEN2,3

1 Public Health Wales, Cardiff, UK
2 Institute of Primary Care and Public Health, School of Medicine, Cardiff University, Cardiff, UK
3 Public Health Wales, Temple of Peace and Health, Cardiff, UK

**Background:** Stop Smoking Wales provides an evidence-based NHS smoking cessation service for the population of Wales. The intervention includes attendance at an initial assessment session which then allows access to the intensive behavioural support programme that consists of six, weekly, treatment sessions. In Wales 16% of pregnant females smoke throughout pregnancy, furthermore a third will smoke at some point in the year before pregnancy or during pregnancy (Infant Feeding Survey, 2010). Stop Smoking Wales prioritises supporting pregnant females, and their families, who wish to stop smoking. **Methods:** Data from 26,018 contacts to SSW in 2010-11 were used to assess differences in engagement with Stop Smoking Wales and quit rates between pregnant and non-pregnant female clients. Differences assessed included attendance at the assessment session, conversion to treated smoker (attending at least one treatment session), pattern of attendance at treatment sessions, 4-week quit status, use of pharmacotherapy and Fagerstrom test for nicotine dependence score. **Results:** A significant difference was detected between pregnant and non-pregnant females attending the assessment session with a higher proportion of non-pregnant females attending (p<0.001). Furthermore, there was a significant difference in conversion to treated smoker and the pattern of attendance with a higher proportion of non-pregnant females attending treatment sessions (p<0.001). At 4-weeks post quit date a significantly higher proportion of non-pregnant females self-reported abstinence (p<0.001). When excluding prescription only medicines, there was not a significant difference in the use of pharmacotherapy. Finally there was a significant difference in Fagerstrom score with the highest proportion of non-pregnant women reporting a high score and the highest proportion of pregnant women reporting a medium score (p<0.001). **Conclusions:** Pregnant females are less likely to attend an assessment session, be converted to treated smokers or self-report abstinence at 4-weeks post quit date with Stop Smoking Wales. This requires further investigation to assess how the needs of pregnant females who require support to stop smoking can best be met.

**Funding:** Public Health Wales NHS Trust

**PO22-6**

**PREVALENCE OF LONG-TERM NRT USE AMONG EX-SMOKERS AND ASSOCIATED EXPOSURE TO NICOTINE**

Lion SHAHAB, Emma BEARD, Jamie BROWN, Robert WEST

University College London, UK

**Background:** Over recent years there has been increasing interest in the use of Nicotine Replacement Therapy (NRT) for harm reduction. Research to date has mostly focused on the partial substitution of cigarettes with NRT (i.e. smoking reduction or temporary abstinence). Much less is known about the complete substitution of cigarettes with medicinal nicotine (i.e. long-term use of NRT following cessation). The study therefore aimed to assess prevalence of long-term (> 2 months) NRT use and exposure among ex-smokers in the general population. **Methods:** Data come from follow-up waves of the Smoking Toolkit Study, a monthly representative household survey of adults aged 16 and over in England conducted between 2006 and 2011. Current and recent ex-smokers at baseline agreeing to be followed up were re-contacted at 6 months and standard socio-demographic and smoking characteristics assessed (N=5243, response rate 47.7%). A random sub-sample (N=1544; 26.7%) also provided saliva, analysed for cotinine. **Results:** At follow-up, 8.2% (95%CI 7.5-9.0; N=431) were current ex-smokers, abstinent for more than 2 months. Of these, 10.0% (95%CI 7.2-12.8; N=43) were still using NRT. Ex-smokers of more
than 2 months who continue to use NRT had significantly higher cotinine levels (94.7 ng/ml, 95%CI 28.3-161.1; N=11) than ex-smokers who did not (4.5 ng/ml, 95%CI 0.6-8.3; N=105) but compared with current smokers not using NRT (313.1 ng/ml, 95%CI 303.0-323.2; N=1198), cotinine levels were significantly lower for both groups of ex-smokers (F(2, 1311)=164.2, p<0.001). **Conclusions:** Although this sample size was relatively small, this study provides a first insight into the prevalence and effects of long-term NRT following cessation. About one in ten ex-smokers continue to use NRT long-term in the general population. Long-term NRT use is associated with higher levels of exposure among ex-smokers but results in a significant reduction of cotinine levels to about a third of that of continuing smokers. This is likely to yield appreciable health benefits.

**Funding:** This study was funded by Cancer Research UK, Department of Health UK, Pfizer, GlaxoSmithKline and Johnson & Johnson.

PO22-7 
**JOINT NON-LINEAR ASSOCIATIONS OF CPD AND COTININE LEVELS WITH NINE CANDIDATE GENE REGIONS AMONG HEAVY SMOKING FINNS**

Janne PITKÄNIEMI1, Ulla BROMS1, Samuli RIPATTI1, Veikko SALOMAA2, Jaakko KAPRIO1
1 University of Helsinki, Finland
2 Institute for Molecular Medicine Finland, Finland
3 National Institute for Health and Welfare, Helsinki, Finland

**Background:** The aim of this study was to explore whether the SNPs in the nine gene regions show joint association with both nicotine intake among heavy smokers using both the level of a metabolite of nicotine and the self-reported amount of the cigarettes smoked per day (CPD). CPD as continuous phenotype from face-to-face interview and immune-reactive serum cotinine levels were determined from 438 regular smokers in eight gene regions (age 30-75 years, 252 males) and 1,500 subjects on chromosome 15 region from the population-based Health 2000 study. Association of 91 SNPs from the following candidate regions were explored: CHR-NA5-CHRNA3-CHRNB4 (chr 15), CHR-NA2 (chr 8), CHRNA4 (chr 20), CHRNA6-CHRNB3 cluster (chr8), CHRNA7 (chr 15), CHRNA9 (chr 4), CHRNA10 (chr 11), CHRNB2 (chr 1), and CHRNA4-CHRNB1 cluster (chr 2) passed the quality control and were included in the analyses. **Methods:** As a novel measure of association we used the recently proposed Maximum Information Criteria (MIC). This statistic has the benefit of being able to detect also non-linear relationships and simultaneously account for variability in the association between CPD and cotinine levels. We compared the MIC SNP minor allele carriers to the MIC among the major allele homozygotes and obtained p-values using bootstrapping with 1,000 replicate samples. **Results:** We did not detect any statistically significant associations with SNPs located at the various candidate regions. The scatter plot of CPD vs. cotinine according to rs4603829 in the CHRNA4 region on chromosome 20 showed the possibility of non-linear association and high-lights differences at high values of CPD with respect to the rs4603829. The highest MIC values between CPD and cotinine were found with CHR15 SNPs and two of these SNPs were among top10 ranked SNPs when looking at difference in the genotypic MIC values. **Conclusion:** Despite the earlier promising findings in the studied regions we were not able to detect significant associations in our samples when applying state-of-art statistical methods. Larger sample sizes are needed. **Funding:** The study is funded by Center of Excellence (CoE) in Disease Genetics, Academy of Finland, the National Institutes of Health grant DA12854 and CoE in Complex Disease Genetics. The genome-wide association genotyping was funded by the Welcome Trust Sanger Institute, VS was supported by the Academy of Finland (129494), the Finnish Foundation for Cardiovascular Research, and the Sigrid Juselius Foundation. UB was supported by the Yrjö Jahnsson Foundation and the Juho Vainio Foundation for postdoctoral research.
POSTER PRESENTATIONS
Nicotine has been shown to non-contingently enhance the positive value of other stimuli. In relation to affective stimuli, nicotine is suggested to modulate attentional bias to emotional stimuli. Here we investigated the effects of smoking abstinence on attentional bias to positive and negative stimuli. We hypothesised that non-abstinence would increase attention towards positive stimuli while reducing attention to negative stimuli. Weekly smokers (n = 39) were randomised to either abstain for smoking for 12 hours or asked to smoke just before coming to the lab. Participants completed a visual probe task, including positively (happy) and negatively (sad) valenced facial expressions, paired with neutral facial expressions. Participants identified characteristics of a probe that replaced the emotional stimulus on 50% of trials (valid condition) and neutral stimulus on 50% of trials (invalid condition). Data were analysed within a 2 x 2 x 2 design, with abstinence state (abstinent, non-abstinent) as a between-subjects factor, and stimulus type (positive, negative), and validity (valid, invalid) as within-subject factors. A significant interaction between validity x abstinence state (F [1, 37] = 4.12, p = 0.050, η2 = 0.10) was observed. Participants in the non-abstinent condition were faster to respond to probes replacing (valid) emotional stimuli (M = 627, SD = 126) compared to those replacing (invalid) neutral stimuli (M = 641, SD = 133). Whereas participants in the abstinent condition were faster to respond to probes replacing neutral stimuli (M = 636, SD = 80) compared to those replacing emotional stimuli (M = 644, SD = 93). Our data did not support our hypothesis that non-abstinence would increase attention towards positive affective stimuli while reducing attention to negative affective stimuli. However, our results indicated an attentional bias for emotional cues in non-abstinent smokers that was not observed in abstinent smokers. These data suggest that smoking abstinence may disrupt attention towards emotional stimuli. Reduced value of affective cues during nicotine abstinence may therefore be a potential mechanism for novel smoking cessation interventions.

Funding: AFA, ASA and MRM are members of the UK Centre for Tobacco Control Studies, a UKCRC Public Health Research: Centre of Excellence. Funding from British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged. SP was supported by a scholarship from the Leverhulme Trust.

POSTER SESSION 1: FRIDAY 31 AUGUST

P1
EFFECTS OF SMOKING ABSTINENCE ON ATTENTIONAL BIAS FOR EMOTIONAL CUES
Alia F. ATAYA, Sally ADAMS, Sophie PARKER, Angela S. ATTWOOD, Marcus R. MUNAFO
University of Bristol, UK

P2
POST-RETRIEVAL EXTINCTION OF NICOTINE MEMORY: STUDY OF NICOTINE SELF-ADMINISTRATION IN RATS
Alessia AUBER, Vincenzo TESESCO, Nazeema SHEERIN, Christian CHIAMULEA
Neuropsychopharmacology Laboratory, Department of Public Health and Community Medicine, University of Verona, Verona, Italy

Background: Retrieval of previously consolidated memories, including drug-associated memories, induces a labile phase during which these memories could be disrupted or reconsolidated. It has been shown that post-retrieval extinction was able to disrupt fear or food memory reconsolidation (Monfils et al, 2009; Flavell et al. 2011). Aim of our study was to investigate if it was possible to disrupt nicotine-memory reconsolidation by applying post-retrieval extinction of conditioned stimuli (CS) previously paired to nicotine self-administration (S/A) in rats. We assessed whether post-retrieval CS-extinction, applied in a context (CxB) different from that where nicotine S/A and CS association took place (CxA), may reduce renewal of nicotine-seeking behaviour when rats were placed back in CxA. Methods: Sixty male Sprague-Dawley rats were trained to self-administer nicotine (IV 0.03 mg/kg/infusion). Each nicotine infusion was paired with 5 seconds (s) illumination of a cue lamp (CS). Rats were then divided in two groups exposed to Retrieval (exposure to 3 CS) or No-Retrieval (no CS) in CxB. One hour later both groups were divided into two sub-groups: CSExtinction and NoCSExtinction. The former group underwent a CS-extinction session (responding for delivery of 5 s CS, session duration up to extinction of responding on nicotine-paired lever), whereas the latter group was left in the home cage. After 24 hours, rats were placed in CxA for the renewal test session (responding for delivery of 5 s CS). Results: A temporal analysis of responding during renewal revealed that that post-retrieval CS-extinction significantly reduced renewal of nicotine-seeking behaviour compared to no-CS-extinction condition. Moreover, no effect of CS-extinction was observed in those subjects that did not receive nicotine CS retrieval. Conclusion: These preliminary findings provide the evidence for the inhibition of nicotine Pavlovian memory reconsolidation by applying post-retrieval CS-extinction.

P3
EXTENT OF, AND INFLUENCES ON, CLEAR OVERESTIMATION OF PEER PREVALENCE BY AGE AND SMOKING STATUS
Louise M. HOPPER, Michael J. GORMLEY
Trinity College Dublin, School of Psychology, Dublin, Ireland

Background: Overestimating peer smoking prevalence is widely associated with smoking behaviour especially in adolescents. Various factors have been shown to predict overestimation yet there is little consensus as to the most influential, and few studies examine age-related differences. This study investigated proximal peer smoking perceptions across three age groups to determine where
overestimation occurred, the factors most likely to influence clear overestimation, and age, gender and smoking status differences. Methods: A survey of smoking behaviours and related social norms was completed by 322 smokers (15-18yrs:180, 19-25:102, 26-45:40), 601 non-smokers (386, 143, 72) and 109 exsmokers (34, 22, 53). Banded peer prevalence estimates (e.g. 0-10%, 11-20%) were compared with actual Irish prevalence rates. Clear overestimation was defined as exceeding actual prevalence rate by more than one band, minimising the impact of marginal overestimation. Results: Estimates differed significantly by smoking status for all ages. Despite clear overestimation by adolescent nonsmokers (82%), they were significantly less likely to overestimate than either smokers or exsmokers (p<.001). Similar results were seen for young adults (p<.01) but both adult non and exsmokers overestimated less than current smokers (p<.01). A linear decline in overestimation was seen with age. Gender difference was only seen in adolescent smokers: 98% of girls overestimated compared with 89% of boys. Multiple logistic regression analyses found that clear overestimation by all groups is best predicted by the percentage of close friends who smoke. In addition, smoking status, age and how often individuals are around smoking influence adolescent overestimation. Conclusions: A peer prevalence false consensus effect was found at all ages. Contrary to previous research, only proximal peer group behaviour was most closely associated with overestimation in each group, but both adult and adolescent models suggest overestimation is based on sampling bias. This raises the issue for intervention programmes of how to build realistic perceptions of peer prevalence despite immediate social and environmental factors.

Funding: No Funding

P4
TASTE AND NICOTINE PREFERENCE IN MALE AND FEMALE RATS
Lutfiye KANIT, Tanseli NESIL, Sakire POGUN
Ege University, Center for Brain Research, Izmir, Turkey

Background: An interaction between taste and nicotine preference is well documented. Methods: A survey of smoking behaviours and related social norms was completed by 322 smokers (15-18yrs:180, 19-25:102, 26-45:40), 601 non-smokers (386, 143, 72) and 109 exsmokers (34, 22, 53). Banded peer prevalence estimates (e.g. 0-10%, 11-20%) were compared with actual Irish prevalence rates. Clear overestimation was defined as exceeding actual prevalence rate by more than one band, minimising the impact of marginal overestimation. Results: Estimates differed significantly by smoking status for all ages. Despite clear overestimation by adolescent nonsmokers (82%), they were significantly less likely to overestimate than either smokers or exsmokers (p<.001). Similar results were seen for young adults (p<.01) but both adult non and exsmokers overestimated less than current smokers (p<.01). A linear decline in overestimation was seen with age. Gender difference was only seen in adolescent smokers: 98% of girls overestimated compared with 89% of boys. Multiple logistic regression analyses found that clear overestimation by all groups is best predicted by the percentage of close friends who smoke. In addition, smoking status, age and how often individuals are around smoking influence adolescent overestimation. Conclusions: A peer prevalence false consensus effect was found at all ages. Contrary to previous research, only proximal peer group behaviour was most closely associated with overestimation in each group, but both adult and adolescent models suggest overestimation is based on sampling bias. This raises the issue for intervention programmes of how to build realistic perceptions of peer prevalence despite immediate social and environmental factors.

Funding: No Funding

P5
ARE COGNITIVE AND MOTOR DEVELOPMENTAL DIFFERENCES IN CHILDHOOD RELATED TO SMOKING IN ADOLESCENCE:
A CO-TWIN CONTROL STUDY
Antti LATVALA1,2, Richard J. ROSEA, Tellervo KORHONEN1,2, Lea PULKKINEN4,
Daniele M. DICK5, Jaakko KAPRIO1,2
1 Department of Public Health, University of Helsinki, Finland
2 Department of Mental Health and Substance Abuse Services, National Institute for Health and Welfare, Finland
3 Department of Psychological and Brain Sciences, Indiana University, USA
4 Department of Psychology, University of Jyväskylä, Finland
5 Virginia Institute for Psychiatric and Behavioral Genetics, Virginia Commonwealth University, USA

Background: There is great variation between children in cognitive and motor development but very little is known of the role of this variation relative to smoking behaviors in adolescence. Methods: In two population-based longitudinal birth cohort studies of Finnish twins, FinnTwin12 and FinnTwin16, parents reported retrospectively on differences between co-twins in cognitive and motor development in childhood. Cognitive indicators were age of speaking words, age of reading, intellectual development before school age, verbal expression in childhood, and grades in elementary school. Motor indicators were age of walking, manual dexterity and general motor development before school age, and agility and physical strength in school age. Smoking behaviors were reported by the twins at ages 12, 14, 17, and 21-24 in FT12, and ages 16, 17, 18.5 and 23-30 in FT16. Conditional logistic regression analysis in same-sex twin pairs discordant for their development (N pairs between 221 and 1,128 for different indicators) was used to map the associations be-
between development and smoking. Within-pairs sums of differences across all cognitive and motor indicators were also created and correlated with within-pair differences in smoking. Results: Higher grades in elementary school were related to a reduced likelihood of smoking by age 12 (OR=0.5, p<.05) and being a daily smoker at ages 16, 17, 18.5 and in young adulthood (ORs 0.5-0.6, p<.01). Physical strength was related to an increased likelihood of being a daily smoker at ages 14 (OR=2.6, p<.05) and 18.5 (OR=1.5, p<.05). Better cognitive development, as indexed by the sum of within-pair cognitive differences, was inversely related to daily smoking at ages 16, 17, and 18.5 (polyserial rho: -0.1, p<0.05). Motor development, as indexed by the sum of within-pair motor differences, had a positive association with daily smoking at ages 16 and 17 (polyserial rho: 0.1, p<0.05). Conclusions: Controlling for familial influences, better cognitive development in childhood is related to a lower likelihood of becoming a smoker in adolescence, whereas better motor development may indicate increased risk.

Funding: National Institute of Alcohol Abuse and Alcoholism (grants AA-12502, AA-00145, and AA-09203 to RJR), Academy of Finland (grants 100499, 205585, 118555, and 141054 to JK), Finnish Foundation for Alcohol Studies (grant to AL)

P6 COMPARISON OF ORAL HEALTHCARE PROFESSIONALS IN THEIR FAMILIARITY OF THEIR ROLES, KNOWLEDGE AND ATTITUDE TOWARDS SMOKING CESSATION IN THEIR CLINICAL PRACTICE TO FORM POLICY AND GUIDELINES

Hyun Jin LEE
Singapore Dental Health Foundation, GlaxoSmithKline, National University Singapore

Background: Public health guidelines in many countries encourage all oral health care professionals to provide smoking cessation advice. However, this is often not possible due to a number of reasons. In order to improve further on the quality of practice in Singapore and increase standard of care, health promotion principles should be implemented into their daily clinical practice. Method: A Cross-sectional survey will be mailed to all dental health professionals,(Hygienists, Dentists and Periodontists) and will assess their demographic characteristics, knowledge, attitude and activities in their clinical practice. Their familiarity in their roles in how each play a role in the health professional spectrum will be assessed and formulated for future references and practice guidelines.

Practice Implications: Tobacco plays a major role in contributing as a major risk factor for periodontal(gum disease)disease and oral cancer for the population as a whole (worldwide).Its implications in clinical treatment and practice ,effect on individuals health should be emphasised for the health professionals to improve the patient’s oral health care. Method of Motivational Interviewing and Counselling is a standard example. Other measures to follow include following the 5 As. Ask, Assess, Advise, Assist, Arrange for follow-up. The role of the 3 Oral health professionals in each of these steps should be familiarised and formulated for further practice guidelines. ABC: Offer support, assess the willingness to quit, Strengths of these methods are in being evidence-based, used as first line intervention, Limitations include: Triggers a quit attempt from the patients rather than increasing their chance of continuation if not followed up adequately. The Results will be tabulated in comparison for all three professionals and each of their roles will be devised and planned for future references and practice guidelines.

Funding: GlaxoSmithKline, Singapore Dental Health Foundation

P7 AMITIFADINE (EB-1010), A TRIPLE DOPAMINE, NOREPINEPHERINE AND SEROTONIN REUPTAKE INHIBITOR, REDUCES NICOTINE SELF-ADMINISTRATION IN FEMALE RATS

Edward D LEVIN1, Corrine WELLS1, Joshua E JOHNSON1, Amir H. REXVANI1, Frank P. BYMASTER2, Jed E. ROSE1
1 Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, USA
2 Euthymics Bioscience Inc., USA

A greater diversity of drug therapies is needed to help tailor the most effective treatment for the different types of tobacco smokers trying to quit smoking. The current study was conducted to determine whether amitifadine (EB-1010), which inhibits reuptake of three monoaminergic transmitters, dopamine, norepinephrine and serotonin, would decrease nicotine self-administration at SC doses that do not cause adverse side effects. Adult female Sprague-Dawley rats were trained to self-administer nicotine IV (0.03 mg/kg/infusion, FR1) and were given acute doses of amitifadine in a repeated measures counterbalanced design. Effects of amitifadine on locomotor activity and food-motivated responding were also evaluated. The 30-mg/kg amitifadine dose significantly reduced nicotine self-administration during all parts of the session. The 5 and 10 mg/kg doses reduced nicotine self-administration during the first third of the session when the greatest amount of nicotine was self-administered. The 30-mg/kg amitifadine dose, but not the lower doses caused a significant reduction in locomotor activity averaged over the 1-hour session and reduced food motivated responding. The 10-mg/kg dose caused hypoactivity at the beginning of the session, however 5-mg/kg did not show any sign of hypoactivity. We tested the specific binding of amitifadine for nicotinic receptors and did not observe an effect. In summary, the triple monoaminergic reuptake inhibitor amitifadine significantly reduced nicotine self-administration at a dose that did not cause sedation or decrease food self-administration. Based on these results further research is called for to determine if amitifadine might be effective in helping people to more successfully quit tobacco use.

Funding: This research was supported by P50 grant DA DA027840 from NIDA.
**P8**

**EFFECTIVENESS OF A SMOKING CESSATION PROGRAM FOR ADOLESCENTS IN KOREA**

Yu-Jin PAEK

Hallym University Sacred Heart Hospital, Republic of Korea

**Background:** Korea School Health Association (KSHA) developed smoking cessation program for smoking adolescents. The purpose of this study was to test the effectiveness of a comprehensive smoking cessation program for Korean adolescents. **Method:** The quasi-experimental and longitudinal designs were used with a sample of 124 smokers from a Korean adolescents aged 13-17. Data were collected through face-to-face interviews conducted in 1 September 2010-30 December 2011 at pre-intervention and at one year later. The smoking cessation program consisted of 5 sessions with content on enhancement of self-efficacy, stress management, correction of distorted thoughts, consciousness raising, and assertiveness training. The study variables were urine cotinine levels, self-efficacy, stress, perceived ‘cons’ of smoking, and stages of changed behavior. **Results:** Long-term abstinence rate verified by urine cotinine was 16.1% (20 among 124) at one year follow-up. Those adolescent who succeeded in smoking cessation have improved scores related to the perceived ‘cons’ of smoking ($P < 0.05$). The students’ self-efficacy mean scores increased significantly ($P < 0.01$) and stages of change before and after the program were also significant ($P < 0.01$). **Conclusions:** The interventions by KSHA in the smoking cessation program were effective, resulting in a positive change in attitude and behavior that would support the students’ smoking cessation and the process of cessation.

**Funding:** This study was conducted while the first author was at the University of Hallym. Supported by Korea Health Promotion Foundation.

**P9**

**MULTIPLE GENETIC VARIANTS INFLUENCE NICOTINE DEPENDENCE**

Marijke QUAAK, CP van SCHAYCK, DS POSTMA, PHJ HOOGSTEDER, EJ WAGENA, D KOTZ, FJ van SCHOOTEN

1 Department of General Practice, Care and Public Health Research Institute (CAPHRI), Maastricht University, the Netherlands / Department of Toxicology, Nutrition and Toxicology Research Institute Maastricht (NUTRIM), Maastricht University, the Netherlands;
2 Department of General Practice, CAPHRI, Maastricht University, the Netherlands;
3 Department of Pulmonology, University Medical Centre Groningen, the Netherlands;
4 Department of General Practice, CAPHRI, Maastricht University; Kiadis Pharma, Amsterdam, the Netherlands;
5 Department of Toxicology, NUTRIM, Maastricht University, the Netherlands

Both genetic and environmental determinants are believed to contribute to nicotine dependence (ND). However, so far most (candidate) gene studies investigated only single genes. Therefore, this study aims to investi-
Both genetic and environmental determinants are believed to contribute to smoking. However, so far most (candidate) gene studies investigated only single genes and only nicotine addiction in general. Therefore, this study aims to investigate the influence of multiple genetic variants in candidate genes in smoking-related pathways on the different aspects of ND. Smokers were recruited via four smoking and smoking cessation trials (N=1502), and 783 (52%) provided a DNA sample. Participants were genotyped for 35 genetic variants in 19 candidate genes in smoking-related pathways. The primary outcome measure was the separate items of the Fagerström Test of Nicotine Dependence (FTND). The different items of the FTND questionnaire were found to be associated with several, often different, variants in smoking-related genes. Overall, item 3 (hate-most-to-give-up) was mainly associated with genes that may influence the response to nicotine, while items 2 (forbidden-places), 4 (number-of-cigarettes/day), and 6 (smoke-if-ill) were mainly associated with genes that influence neurotransmitter pathways. The different aspects of ND seem to be influenced by genetic variants in different pathways.

**Funding:** School for Public Health and Primary Care (CA-FPHRI), Maastricht University, the Netherlands. Netherlands Organization for Health and Development (ZonMW), The Hague (50-50101-96-404)

**P11**

**INTERACTIONS OF NICOTINE AND OPIOIDS IN NACHR–CONTAINING CELL LINES**

Reeta TALKA, Mari HAVIA, Juri MEIJER, Outi SALMINEN, Raimo K. TUOMINEN
Division of Pharmacology and Toxicology, Faculty of Pharmacy, University of Helsinki, Finland

**Background:** Nicotinic acetylcholine receptors (nAChRs) are ion channels, which consist of either muscle-type or neuronal-type subunits. Opioid receptors are G-protein coupled and they are subdivided into three types: mu, delta, and kappa-receptors. Previously we have found that methadone and morphine exhibit receptor-level interactions at nAChRs. Therefore, we wanted to study other opioid ligands (oxycodone, codeine and tramadol) and the possible receptor mechanisms mediating the nicotine and opioid interactions. **Methods:** SH-EP1-halpha4beta2 cells have native expression of mu- and delta-opioid receptors and they have been transfected with alpha4beta2 nAChR subunit gene to express human alpha4beta2 nAChRs. SH-SY5Y cell line is a human neuroblastoma cell line naturally expressing alpha3, alpha5, alpha7, beta2, and beta4 nAChR subunits as well as mu- and delta-opioid receptors. 86Rb+ efflux assay was used specifically to demonstrate the function of nAChRs. Binding studies were done with tritiated epibatidine, an agonist that binds in at least seven nAChR subtypes. **Results:** In both cell lines codeine and oxycodone, but not tramadol, inhibited [3H]epibatidine binding with low affinity. In 86Rb+ efflux assay agonist dose-response profiles showed no effect for the opioid ligands. In antagonist dose-response assays all opioid ligands showed dose-dependent inhibition of nAChR function stimulated by nicotine. All opioid ligands decreased the nicotine-stimulated response in 86Rb+ efflux assay. **Conclusions:** Our data suggest that oxycodone and codeine act as inhibitors of multiple nAChRs and that they have low affinity to the epibatidine binding site. Tramadol seems to block nAChR function without binding to the epibatidine binding site. **Funding:** This study was supported by a three-year research grant from University of Helsinki (OS).

**P12**

**IMPROVEMENT OF MELANIN INDEX AFTER SMOKING CESSATION**

Eun Jung CHOI, Sangyeoup LEE, Jeong Gyu LEE, Dong Wook JEONG, Yun Jin KIM, Yu Hyun YI, Young Hye CHO
Pusan Yangsan National University Hospital, Department of Family Medicine, Yangsan, South Korea

This study was performed to assess changes in skin color over 1 month after smoking cessation. The study population consisted of 49 men who participated in a smoking cessation program from March 2010 to June 2010 at a public health centre in Yangsan, South Korea. 34 men who stop smoking completely were included in our study. Instrumental evaluations of skin color were performed using Mexameter at the beginning of the study and at 1-week and 4-week follow-up visits. Skin color was evaluated by measurement of 2 main color bases—melanin and haemoglobin—with the results expressed as melanin index (MI) and erythema index (EI). Both MI and EI were significantly reduced at the 4-week follow-up visit on all 7 sites measured. We anticipate that desirable effects on skin color after smoking cessation will play a positive role in maintaining smoking abstinence in routine clinical practice. **Funding:** No Funding

**P13**

**SEE HOW SOPHISTICATED LC-MS/MS ASSAYS ARE HELPING SMOKING RESEARCH AND CESSATION PROGRAMMES**

Mira V. DOIG1, Colin FEYERABEND1, Tim COLEMAN2, Sue COOPER2
1 ABS Laboratories Ltd. BioPark, UK
2 Division of Primary Care and UK Centre for Tobacco Control Studies, University of Nottingham, UK

Cotinine is a metabolite of nicotine and its presence in biological fluids indicates nicotine intake. Research has shown that cotinine levels in saliva directly correlate with those in plasma, so measuring cotinine in a saliva sample from a smoker can then be related to the actual amount of nicotine inhaled. In addition, research now indicates that successful smoking cessation, in a quit attempt may be affected by the rate with which nicotine is metabolised, and this rate can also be ascertained from the same saliva sample by assaying both cotinine and another metabolite of nicotine, 3-hydroxy cotinine. This means that from one sample you could find out the daily level of nicotine your smoker usually inhales (or in the case of smokeless tobacco, absorbs) and how quickly it is metabolised. The optimal method and matrix for assaying 3-hydroxy...
cotinine and cotinine levels for such analyses needs determining. However, we have also analysed blood samples for these analytes and have found that, unlike urine, when investigating metabolic status in blood analyses, it is unnecessary to hydrolyse the glucuronides of these metabolites to look at the metabolic status as the same. This simpler analytical method for the quantification of these nicotine metabolites can then help with researching into the selection of the most appropriate smoking cessation programme for an individual. We have also set up an LC-MS/MS assay to measure cotinine and anabasine in saliva to help researchers worried about compliance to an NRT regime. Data on the analytical methodology used and results of these tests will also be presented.

Funding: NIHR Health Technology Assessment Programme

P14

EFFECT OF DENICOTINIZED CIGARETTES ON BRAIN ACTIVATION OF WORKING MEMORY

Stephen J. HEISHMAN1, Carol S. MYERS1, Thomas J. ROSS1, Richard C. TAYLOR1, Betty Jo SALMERON1, Elliot A. STEIN1, Ivan BERLIN2

1 NIDA Intramural Research Program, National Institute on Drug Abuse, NIH, Baltimore, USA
2 Masaryk University, Brno, Czech Republic

Background: Denicotinized (Denic) cigarettes can suppress some symptoms of nicotine withdrawal, but their effect on cognitive function, which is typically impaired during withdrawal, has not been determined. We studied effects of Denic cigarettes on brain activation of working memory.

Methods: Male, right-handed, daily smokers performed baseline measures and were then randomized into 3 groups (n=15 each): nicotine-containing (Nic) cigarettes, Denic cigarettes, or tobacco abstinent. Subjects performed the n-back task (1-, 2-, and 3-back) during fMRI scans on Days 2, 3, and 7. On Day 8, they resumed smoking and had a final fMRI session on Day 10. The n-back task consisted of six 4'12" runs in a randomized block design.

Results: The abstinent group reported increased withdrawal and tobacco craving during the 8 days, but symptoms were suppressed in the Denic group. N-back accuracy declined with task difficulty in all groups. The abstinent group had significantly slower response time in the 3-back condition compared to the Nic and Denic groups, which did not differ. fMRI data were analyzed by 3-way ANOVA (Group x Session x Back). Across sessions, increased activation with task difficulty was noted in regions typically associated with working memory (e.g., middle frontal gyrus, anterior cingulate, inferior parietal lobule). We examined Group x Session effects within these regions. In left precuneus, left inferior parietal lobule, and right middle temporal gyrus, Denic and abstinent groups showed deactivation (compared to Nic) throughout the experimental phase. This was particularly evident on Day 3 (48 hr) in the 2- and 3-back conditions. In contrast, the Denic group showed increased activation in the right precuneus compared to abstinent and Nic groups in the 2- and 3-back conditions.

Conclusions: Results showed that Denic cigarettes suppressed cognitive impairment and subjective symptoms typically seen during nicotine withdrawal. The brain deactivation pattern in the Denic group might reflect this behavioral withdrawal suppression. Denic cigarettes might enhance long-term quit success by suppressing withdrawal during the first week when relapse rates are high.

Funding: This research was supported by the Intramural Research Program of the NIH, National Institute on Drug Abuse.

P15

FACTORS ASSOCIATED WITH WEIGHT CHANGES IN THE SAMPLE OF 607 QUITTERS

Alexandra KMETOVA1, Eva KRALIKOVA1, Lenka STEPANKOVA1, Kamila ZVOLSKA1, Vladislava FELBROVA1, Stanislava KILOVANA1, Milan BLAHA2, Michal STICHA2

1 Charles University, Prague, Czech Republic
2 Masaryk University, Brno, Czech Republic

Background: Smoking cessation is associated with weight gain from several reasons based on central, metabolic and gastrointestinal effects. Still there is insufficient knowledge about all factors influencing weight changes during quitting smoking.

Methods: From the sample of 1,775 our patients with one year follow-up we analysed 607 successful abstainers (CO-validated abstinence, Russell standard criteria), containing 52.1 % men (N=316) and 47.9 % women (N=291) with the mean age of 48 years (18-85). We assessed several factors that may influence the weight gain.

Results: The mean weight gain after one year post-quit was 6.8 % or 5.1 kg (-2.3;+13.5). Weight gain differed significantly (alpha = 0.05) according to the baseline BMI (body mass index), especially between overweight (BMI 25-29.9) and obese (BMI over 30) patients: +5.5 kg (-2.1;+14.7) in overweight patients vs. +3.8 kg (-7.0;+15.4) in obese patients. Those more dependent (defined by Fagerström test of nicotine dependence, FTND≥ 5 points) gained more, +5.6 kg (-3.2;+15.4) compared to those with FTND 2-4 (+4.3 kg, -4.6;+19.1). But, there was no significant difference according to the age of the first cigarette, age of onset of regular smoking, Beck Depression Scale (assessed 3 times during the one year follow-up), level of withdrawal symptoms or surprisingly those with and without any pharmacotherapy or according to the length of the pharmacotherapy use.

Conclusion: More research should be done to identify reasons for this important quitting complication.

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P16
CZECH MEDICAL COMMUNITY: EDUCATION AND TREATMENT OF TOBACCO DEPENDENCE 2012
Eva KRALIKOVA1, Alexandra KMETOVA1, Lenka STEPANKOVA1, Kamila ZVOLSKA1, Vladislava FELBROVA1, Stanislava KULOVANA1, Katerina MALA2, Milan BLAHA3, Michal STICHA3
1 Charles University, Prague, Czech Republic
2 Central Military Hospital, Prague, Czech Republic
3 Masaryk University, Brno, Czech Republic

Background: In the CR with about 10,000,000 inhabitants, we have about 40,000 physicians, 80,000 nurses and 2,100,000 smokers. Methods: We describe education of physicians and nurses in treatment of tobacco dependence, availability of intensive treatment to smokers and outcomes of our patients between 2005-2011 (one-year follow up, CO-validated abstinence, Russel criteria). The schedule of visits in our centre is as follows: screening visit (about 1 hour), psychobehavioural intervention (2 hours), follow up visits (30 minutes). At each visit CO, weight, blood pressure and withdrawal symptoms (Minnesota Withdrawal Scale) are observed. Results: Since 1990s, regular education of physicians and since 2007, regular post-graduate education of nurses in treatment of tobacco dependence started. Based on collaboration with Nicotine Dependence Centre at Mayo Clinic, Rochester, Minnesota, USA, the first Centre for Tobacco-Dependent was founded in 2005 - still the only one working full-time for smokers only. Currently, overall 38 centres across the country are available. They are equipped by a CO-monitor and at least one educated physician and one educated nurse work there. Twice a year the Society for Treatment of Tobacco Dependence invites their staff to a one-day meeting with updates. Evidence-based treatment methods are used. A web-based application for evaluation of the treatment outcomes is available to all of them. Currently, there are over 6,000 patients included in the system from different centres. From 3,073 our patients have been collected. Symptomatic patients, with diagnosis security by genetic tests, of the Department of Neurology of the Friedrich-Baur-Institute in Munich, Germany were asked by standardized questionnaire about smoking status, their motivation to quit in case of smoking, the age of beginning smoking, their quit attempts, Fagerström test of Nicotine Dependence (FTDN) and personal data like gender, age etc. In all cases a carbon monoxide measurement in exhalation air and a cotinin measurement in saliva have been performed, to verify the anamnestic data and to identify those, who do not tell the truth. To all patients with positive smoking status a counselling for smoking cessation was offered, corresponding the guidelines. Results and Conclusion: In progress.

Funding: No funding

P17
SMOKING IN PATIENTS WITH LEBER HEREDITARY OPTIC NEUROPATHY (LHON)
Andrea LINHARDT, Tobias RUTHER, Boriana BUCHNER, Thomas KLOPSTOCK, Constanze GALLENMULLER
Ludwig Maximilians University Munich, Germany

Background: LHON has no treatment, so disease prevention is extremely important. Smoking is the most important trigger for outbreak and worsening of disease. Quitting smoking could aware patients of visual loss. From our point of view, as addiction specialists and physicians, there are many questions. One of the interesting and most important question could be: How is the motivation for smoking cessation, in patients who know, that in case of continuing smoking the visual loss will be most likely? Methods: In context of annual physicals in patients with symptomatic LHON (n=28) different information have been collected. Symptomatic patients, with diagnosis security by genetic tests, of the Department of Neurology of the Friedrich-Baur-Institute in Munich, Germany were asked by standardized questionnaire about smoking status, their motivation to quit in case of smoking, the age of beginning smoking, their quit attempts, Fagerström test of Nicotine Dependence (FTDN) and personal data like gender, age etc. In all cases a carbon monoxide measurement in exhalation air and a cotinin measurement in saliva have been performed, to verify the anamnestic data and to identify those, who do not tell the truth. To all patients with positive smoking status a counselling for smoking cessation was offered, corresponding the guidelines. Results and Conclusion: In progress.

Funding: No funding

P18
SMOKING, HOMOZYGOSITY IN THE LOC387715/ARMS2-GENE AND THEIR PROGNOSTIC IMPACT ON VISUAL FUNCTIONAL STATUS IN AGE-RELATED MACULAR DEGENERATION (AMD)
Bruno NEUNER1,2, J WELLMANN1, M DIETZEL1, A FUHS1, HW HENSE1
1 Institute of Epidemiology and Social Medicine, University of Muenster, Muenster, Germany
2 Charité-Universitätsmedizin Berlin, Department for Anesthesiology, Operating-Room Management and Intensive Care Medicine, Berlin, Germany

Background: Age-related macular degeneration (AMD) is a chronic progressive disease of the retina and a common cause for blindness in developed countries. Apart from age and genetic disposition, smoking is an important risk factor for AMD. Gene-environment interactions with smoking and the A69S single-nucleotide polymorphism in the LOC387715/ARMS2 gene have been identified in AMD incidence. Objective: To prospectively evaluate the impact of homozygosity in the LOC387715/ARMS2 gene and its interaction with smoking on visual functional status (VFS) in 60-80 year old participants of the Muenster Aging and Retina cohort. Methods: Baseline (n = 812) and 2.5 (n = 656) respectively 6.5 year (n = 390) follow-up investigations using standardized medical examina-
tion methods (including fundus grading), genotyping, and questionnaires (to evaluate the smoking status). Outcome was VFS at baseline and both follow-up examinations. VFS was assessed with the National Eye Institute Visual Functioning Questionnaire-25 ranging from 0 (maximal impaired) to 100 (unimpaired) points in general-, near-, and far vision. Analysis was by generalized linear mixed models with stepwise adjustments. Results: In initial models (adjusted for age, gender, AMD status and eye status at baseline) ever smoking at baseline as well as homozgyosity in the LOC387715/ARMS2 gene were associated with declines in near respectively far vision over 6.5 years (ever smoking: -5.4 respectively -6.4 points, each p < 0.05; homozgyosity in the LOC387715/ARMS2 gene: -4.2 respectively -6.0 points, each p < 0.05). In models including a gene-environment interaction between homozgyosity in the LOC387715/ARMS2 gene and smoking intensity, a dose-dependent negative interaction was found in all three dimensions of the VFS (each p < 0.05). Homozgyosity in the LOC387715/ARMS2 gene showed no effect on VFS in never-smokers. Time since smoking cessation in former smokers protected against declines in near and far vision. Conclusions: Smoking intensity modifies the effect of the LOC387715/ARMS2 gene, a well known risk factor for AMD, on the VFS decline over 6.5 years. Quitting smoking seems to have a protective effect on declines in near and far vision even in older patients.

Funding: No Funding

P19 PREDICTORS OF QUITTING AMONG MIDDLE-AGED & OLDER MEN IN A LARGE HEALTH MAINTENANCE ORGANIZATION: IS THE GLASS STILL HALF EMPTY?
Virginia P. QUINN1, Jeff M. SLEZAK1, Steven J. JACOBSEN2, Stephen K. Van Den EEDEN2, Chun CHAO1
1 Department of Research & Evaluation, Kaiser Permanente Southern California, USA
2 Division of Research, Kaiser Permanente Northern California, USA

Background: Since 1996 the US clinical guideline for tobacco control has called on clinicians and health care organizations to identify, advise, and treat smokers. By 2000, Kaiser Permanente Southern California (KPSC), a large prepaid health care organization, included smoking status as a vital sign at all clinical encounters and provided comprehensive coverage for tobacco treatment. Methods: We identified 2,508 middle-aged and older men who reported smoking in a survey in 2000-2002 and who completed a follow-up survey in 2006-2007. Subjects were KPSC members participating in the California Men’s Health Study. We compared men who reported quitting at follow-up with those who continued to smoke. We used multivariate logistic regression and included sociodemographic, smoking history, health behaviors, and medical diagnoses to identify significant predictors of smoking cessation. Results: Mean age at baseline was 62.8 (sd=6.6), almost half the men were from minority racial/ethnic groups, 30% had completed high school or less, and 31% had an annual household income <$40,000. Histories of cardiovascular disease (CVD) and related risks included 6% myocardial infarction, 25% other CVD, 12% stroke, 49% hypertension, and 18% diabetes. 16% had asthma and 19% other respiratory disease. 9% had a cancer diagnosis. Three-quarters of the men were overweight/obese, had a diet high in fat and low in fruits and vegetables, and were physically inactive. At follow up, almost half (48.3%) of the smokers reported quitting. Multivariable analysis found quitters more likely to be Hispanic or Asian v. white, born outside the US, and were lighter smokers with fewer pack years. Men with hypertension (AOR=1.34, 95% CI=1.10-1.63) or a cancer diagnosis (AOR=1.48, 95% CI=1.06-2.06) also were more likely to quit. No effect was found for most CVD risk factors, asthma, and other respiratory disease. Conclusions: Despite belonging to a health plan known for its strong commitment to tobacco control, half the men continued to smoke. Physicians and health systems must engage more smokers in quitting. Focus on patients with smoking-related disease would be a critical next step.

Funding: This work was funded by the California Cancer Research Program, Grant 99-86883 and the Kaiser Permanente Southern and Northern California Community Benefit Programs.

P20 PASSIVE SMOKING AND PERIODONTAL HEALTH IN CHILDREN
Samaneh RAZEGHI, Mohammad R. KHAM1
Tehran University of Medical Sciences, Iran

Background: There is strong epidemiological evidence of a positive association between smoking and periodontal disease. In other hand, environmental tobacco smoke (ETS) or passive smoking (PS) exposure has been associated with a number of negative health outcomes in children which one of them might be change in periodontal health. The aim of the present study was to review the association between passive smoking and periodontal conditions in children. Methods: A literature search of PubMed, Google Scholar and EMBASE was performed. Databases were searched from 1980 to December 30, 2011, using various combinations of the following key words: passive smoking, tobacco, periodontal disease, periodontal health, and children. The inclusion criteria included all levels of available evidence. Articles published only in the English language were evaluated, and unpublished data were not sought. Results: Three studies were found. A case-control study showed that excessive pigmentation in the gingiva of children is associated with passive smoking. A historical cohort study found that the mean salivary cotinine concentration was significantly higher in children whose father or mother was a smoker as compared, respectively, to children whose fathers and mothers were non-smokers. The mean clinical attachment level (CAL) was also significantly less in children with smoker parents compared to children with none-smoker parents. Another study showed that the prevalence of gingival pigmentation in passive smokers was statistically significant. Increased levels of urinary
cotinine were observed in non-smoking participants with ≥1 smoker parent. **Conclusions:** Few studies exist on the association of PS with periodontal health. It seems that PS might have some adverse effect on periodontal health in children. More studies should be done to confirm these findings. **Funding:** No Funding

**P21**
**GENDER SPECIFIC IMPACT OF TOBACCO USE ON THE APICAL INFLAMMATORY CONDITIONS OF TEETH – AN ANALYSIS IN A SWISS POPULATION (KREBS PROJECT)**

Fabiola R. RODRIGUEZ, B. TANER, R. WEIGER, C. WALTER
University of Basel, Department of Periodontology, Endodontology and Cariology, Basel, Switzerland

**Background:** An inflammatory condition on the tip of a root of a tooth is called apical periodontitis. To evaluate the association between cigarette smoking and the effect of smoking cessation on the prevalence of apical periodontitis in females and males in a cohort study in Switzerland. **Methods:** This cohort study included full-mouth periapical radiographs of 163 subjects, including 68 current smokers, 26 former smokers and 69 individuals who had never smoked. The number of pack years was calculated. Gender, socioeconomic and periodontal/dental variables were assessed. Radiographically, the periapical region (“root tip”) of all teeth (n= 4055) was evaluated by two examiners using the Periapical Index Score, with PAI >2 defined as apical periodontitis. **Results:** Apical periodontitis showed (i) a more frequent occurrence in the maxillary teeth compared to mandibular teeth and (ii) increased from the front to the molar region. Current male cigarette smokers with <10 or ≥10 pack years showed a prevalence of apical periodontitis of 12% or 5.5% compared to 3.8% in never smokers. The corresponding data for female smokers were 5.9%, 7.2% versus 5.2%. A current smoking habit of <10 pack years significantly predicted apical periodontitis in males (p=0.001), after adjustment for several potential confounders. The effect of smoking cessation was different among men and women. While the prevalence of apical periodontitis decreased by about 50% in former female smokers (3.3%), almost no changes in prevalence were detected in former male smokers (7.3%). **Conclusions:** The results from the present study demonstrate different prevalence of apical periodontitis in current female and male cigarette smokers. Current smoking with a tobacco use history of <10 pack years was a predictor for apical periodontitis in males in this sample. **Funding:** The KREBS Project is partly supported by two unrestricted grants from MS-Dental Forum (Busswil, Switzerland) and the Swiss National Program to promote Tobacco Use Prevention and Cessation (Bern, Switzerland).

**P22**
**EVALUATION OF A BEHAVIOURAL THERAPY MANUAL FOR TOBACCO CESSATION AS A PERMANENT PART OF TREATMENT ON AN ACUTE PSYCHIATRIC WARD FOR SUBSTANCE USE DISORDERS**

Tobias RUTHER, Amelie BERTHOLD, Christoph KROGER, Sabine FELTEN, Veronika SCHULER, Verena LANG, Oliver POGARELL
University of Munich, Psychiatric Department, Outpatient Clinic for Tobacco Dependence, Munich, Germany

**Background:** The treatment of tobacco dependence during the acute or withdrawal treatment of addiction patients remains a controversial topic, despite the positive data on its effectiveness. A manualised therapy concept for tobacco withdrawal, including a group programme and associated individual therapies, was developed over a two-year period of testing and improvement. Treatment objectives are not only tobacco abstinence but also a reduction in smoking in the sense of ‘harm reduction’. **Methods:** During a six-month data collection period, all tobacco-dependent patients on an acute addiction ward were included in the treatment approach, regardless of their motivation status. A sample of n = 102 participants was studied (control group: n = 102). The open programme lasted for two weeks and consisted of two group sessions and an optional individual consultation. Patients were assessed at four points in time: a pre-test assessment before the patient started the programme, a post-test assessment at discharge and a 3- and 6-month follow-up. A questionnaire was used to inquire about the acceptance and practicability of the programme and the patients’ motivation and changes in smoking behaviour. In addition, patients were offered drug treatment (NRT) as specified in treatment guidelines. **Results:** Although participation was mandatory, acceptance was good to very good among the acute addiction patients. A total of 11.9% of the participants participated in the voluntary, manualised individual therapy sessions in addition to the group programme and recorded their cigarette consumption for at least three days. Compared to the control group (brief information about tobacco dependence and nicotine replacement therapy), all participants showed a change in smoking behaviour and motivation to quit. During the acute treatment, 24.3% of the patients reduced their smoking and 4.3% even quit smoking. Data will be presented from the 3- and 6-month follow-ups. **Conclusion:** The results indicate good acceptance, very good practicability and positive effects on smoking behaviour of early counselling and tobacco withdrawal in patients with comorbid addiction disorder. **Funding:** No Funding

**P23**
**NICOTINE AS AN INDICATOR OF TOBACCO EXPOSURE AND ITS EFFECT ON ORAL HEALTH**

Sabin SIDDIQUE, GS PANCHMAL
Yenepoya University, Mangalore, Karnataka, India

**Background:** Tobacco use is termed as modern global epidemic. Nicotine is considered the most pharma-
Patients included COPD (FEV1/FVC <70%), and determine which pharmacologic treatment obtain better abstinent results. Method: We have designed a descriptive, longitudinal and prospective study. We have performed in all the patients a tobacco clinic history, cooximetry and we asked them for co-morbidities. We have scheduled 7 visits to our clinic (basal, 2ª y 4ª weeks; 2ª, 3ª y 6ª month, and finally at the 52ª weeks). Abstinent was monitored in all patients at each of the scheduled sessions by patient self – report and measurement of CO in expired air (< 10 ppm). Results: 96 patients have participated, 68 (71%) were males; 28 (29%) females. The median age was 53.1 years. Median consumption of cigarettes per day was 29.77cigarettes/day. Median age for beginning the consumption was 16 years. Median of the Fagerström test was 7.51; for Richmond test was 7.35; and for cooximetry was 27.8 ppm, and carboxhemoglobin of 4.33%. Comorbidities: Dyslipemia 23, High arterial pressure 18, Obesity 14, Depression 9, Miocardic infarction 7, COPD 7, Ischemic cardiopathy 5. Time to first cigarette after wake up: 45.8% between 5-3´; under 5´19.8% and >30´34.4% 81 patients intended to quit smoking before, 86 of this intended to quit were without medication, 6 with nicotine patches, 3 with Varenicline and 1 with bupropion. Conclusions: Patients included in this study have a higher consumption of cigarettes. They have a severe dependence: more than 65% of them smoke the first cigarette 30 min after wake up. Motivation is priority for diabetic patients and we have to include this treatment for smoking cessation in the total treatment of these patients.

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P25
SMOKING CESSATION AMONG COPD PATIENTS
Segismundo SOLANA REINA1, 2, Jose Ignacio de GRANDA ORIVE2, 1, Raquel SOLANO GARCIA-TENORIO1, 2, Juan Carlos MARUEZ NIETO1, 2, Lidia PERERA LOPEZ1, 2, Ana CICERO GUERRERO1, 2, Marisa MAYAYO ULIBARRI1, 2, Maria Isabel CRISTOBAL GUERRERO1, 2, Carlos JIMENEZ RUIZ1, 2, 1 H.General Universitario Gregorio Marañón, Spain 2 S. Neumología, Hospital Infanta Elena, Spain

Background: The aims of this study were: evaluate the efficacy of a combination treatment (pharmacologic and psicologic) for smoking cessation among patients with COPD (FEV1/FVC <70%), and determine which pharmacologic treatment obtain better abstinent results. Method: The design of the study was descriptive and retrospective. We have included 378 smokers with COPD (January 1th 2007 to November 30th 2010). We have performed in all the patients a tobacco clinic history, and cooximetry. We have scheduled 7 visits to our clinic (basal, 2ª y 4ª weeks; 2ª, 3ª y 6ª month, and finally at the 52ª weeks). Abstinent was monitored in all patients at each of the scheduled sessions by patient self – report and measure-
ment of CO in expired air (< 10 ppm). Between sessions we did phone calls. All patients have received the combination of pharmacologic (varenicline VNC, bupropion BP and nicotine replacement therapy NRT) and psicologic treatment and we have given specific self-help materials

**Results:** We have included 378 smokers with COPD, median age of 56, 7 (±9, 3) years; 67, 6% were males. Median consumption of cigarettes per day was 27.9 (±12.5).Median age for beginning the consumption was 15, 5 (±4, 7) years. Median of the Fagerström test was 7.2 (±2.8). Time to the first cigarette after wake up: 52% between 5-30`; 38% under 5 and more 30`10% Previous quit attempts: 47%, 1 to 3 attempts 67% of the total of patients had ≥ 8 points in Richmond test. More frequent adverse effects: VRN (Nauseas, headache), BP (Insomnia, Mouth dryness), TSN (Erythema, Pruritus) Abstinence rates: VRN 36%, BP 29% y TSN 27% at 52th weeks. The total abstinent rate was 31%. Conclusions: 1. Patients included in this study have a higher consumption of cigarettes and a higher dependence. 90% of them smoke the first cigarette 30 min after wake up. 2. Higher motivation to quit, 67% had ≥ 8 points in Richmond Test and 71% of them have made previous quit attempts. 3. The first line pharmacologic treatment was effective, safety and good tolerated. 4. Higher abstinent rates with varenicline compared with bupropion and nicotine patches.

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**P26**

**QUITTING WITH AND WITHOUT DEPRESSION: ABSTINENCE RATES AND SELECTED FACTORS**

Lenka STEPANKOVA1,Eva KRALIKOVA1, Alexandra KMETOVA1, Kamila ZVOLSKA1, Milan BLAHA2, Michal STICHA2, Vladislava FELBROVA1, Stanislava KULOVANA1

1 Charles University, Prague, Czech Republic
2 Central Military Hospital, Prague, Czech Republic
3 Masaryk University, Brno, Czech Republic

**Background:** The relationship of tobacco dependence and psychiatric comorbidity is well documented. By contrast, cessation outcomes are controversial and factors influencing the success are unclear. **Methods:** In the sample of our patients (one year follow-up , N=1,730) we compared smoking cessation success rates (one year CO-validated abstinence, Russell standard criteria) according to depression and possible factors that may influence the outcomes. The treatment includes evidence based methods - psychobehavioural intervention as well as pharmacotherapy (nicotine, bupropion, varenicline or combinations). **Results:** Current of former depression treatment was present in 16.7 % (289/1,730) of our patients. According to the Fagerström Test of Nicotine Dependence (FTND), the group with depression was more nicotine dependent: 6.8 points versus 5.6. One year abstinence in this depressive subgroup was 32.5 %, and significantly higher in patients without depression history: 38.7 %, OR 1.31 (1.00 – 1.71) for non-depressive group. Statistical significance (95% CI) of the relationship with abstinence was displayed in depressive subgroup in following factors: FTND ≤ 5 vs.≥ 6; OR 1.97 (1.09 – 3.56), number of daily smoked cigarettes 1-10: OR 4.45 (1.37 – 14.47) and for 11-20 OR 3.16 (1.50 – 6.65) - both versus ≥ 31 cigarettes/day smoked, number of visits ≥6 OR 10.78 (5.75 – 20.20) and the type of pharmacotherapy. Odds Ratios were for bupropion 12.20 (1.93 – 76.96), for varenicline 14.35 (5.18 – 39.80), and for nicotine replacement therapy 5.03 (1.82 – 13.96), all vs. no pharmacotherapy. The difference in the outcome according to gender in the depressive subgroup was not statistically significant in contrast to the non-depressive subgroup. Other monitored factors (age of the first cigarette, CO level at first visit, number of previous quit attempts and alcohol abuse) did not significantly differ. **Conclusions:** High smoking cessation rates (despite the statistically significant difference in both subgroups) supports the benefit of tobacco dependence treatment in patients with either current of former depression. Further analysis of all factors influencing the process is needed. **Funding:** Supported partly by grants: AMVIS-KONTAKT ME09014 and IGA MZ CR NT12170-5/2011

**P27**

**EFFECTIVENESS OF A NEWLY DEVELOPED SMOKING CESSATION PROGRAM FOR ADOLESCENT SMOKERS WITH LOW EDUCATIONAL BACKGROUND – RESULTS OF A NON-RANDOMIZED CONTROLLED TRIAL**

Johannes THRUL1, Anneke BÜHLER1, Michaela GOECKE2, Daniel KLEIN2

1 IFT Institut für Therapieforschung München, Germany
2 German Federal Center for Health Education (BZgA), Germany

**Background:** Adolescents with low educational background are particularly at risk for smoking and have a low probability of smoking cessation. This study is the first to analyze the effectiveness of a smoking cessation program in German low educational track schools. **Methods:** In a multi-center, non-randomized, controlled intervention study, 56 professionals (health care providers, social workers) were trained in a youth specific smoking cessation manual. After recruitment, 275 currently smoking program participants (11-19 years) from 40 intervention schools and 270 current smokers from 10 control schools were included in the study. At follow-up six months after the intervention, 66% of the sample was successfully contacted. **Results:** The mean recruitment rate of the target population at intervention schools was 25.9%. Participants had higher levels of nicotine dependence and smoked more heavily than non-participants. During the program, 28.9% of participants successfully stopped smoking (ITT analysis). At the end of the after-care interval, four weeks post program, 23.6% reported they were still smoke-free. At the end of the follow-up interval of six months, 14.3% of participants reported smoking abstinence (30-day prevalence). Controlling for baseline smoking intensity and dependence, participation in the program was a significant predictor of smoking abstinence at follow-up (adj. OR = 1.78, 95% CI 1.01 – 3.13, p<.05). Additionally, participants who continued smoking or had relapsed to follow-up reported smoking
significantly less frequent and less cigarettes than the control group. **Conclusions:** Adolescent smokers participating in the smoking cessation program "losgelöst" have a higher likelihood of smoking cessation than smokers in the control group. The achieved quit rate is comparable to other internationally reported smoking cessation interventions for adolescent smokers. Due to "losgelöst", now there is a youth specific and effective smoking cessation program for German adolescents with low educational background, who belong to a particularly vulnerable population.

**Funding:** This study was conducted on behalf of the German Federal Center for Health Education (BZgA).

**P28**

**STATISTICAL ANALYSES IN SMOKING CESSATION CLINICAL TRIALS: A SIMPLIFIED MODEL ENCOMPASSING MORE COMPLEXITY**

Charles S. WILCOX, Nader OSKOOLAR, My-Linh TONG, Judy L. MORRISSEY, Melissa M. HENRY, Daniel E. GROSZ, Don F. De FRANCISCO

Pharmacology Research Institute [PRI], Newport Beach, CA, USA

**Background:** When analyzing clinical trials to evaluate the safety and efficacy of therapeutic interventions, conventional wisdom is to focus only on sustained cessation over a pre-determined period of time. For regulatory review and approval, this seems reasonable and appropriate; however, given the high number of factors influencing smoking behaviors, we believe it is prudent to examine the efficacy of new cessation treatments associated with smoking (e.g., harm) reduction in a more contextual/multi-factorial manner. **Methods:** We analyzed data from 84 smokers who recently completed a one-year smoking cessation clinical trial. We identified 13 factors, including baseline number of cigarettes, baseline carbon monoxide (CO), smoking start age, education, body mass index (BMI), Fagerström Test for Nicotine Dependence (FTND), Minnesota Withdrawal Scale (MNWS), modified Cigarette Evaluation Questionnaire (mCEQ) and motivation to quit. Bivariate and multiple linear regression analyses were performed using all 13 variables as potential predictors. **Results:** The active treatment evaluated did not produce statistically significant evidence of efficacy. The baseline MNWS (p<.05) and the FTND (p=.02) correlated well with reduction/cessation and baseline number of cigarettes smoked was highly correlated (p<.0001). When analyzed in a more contextual ‘real world’ manner, the predictive power of several factors was markedly enhanced, including the MNWS (p<.001), the number of years smoking (p<.003) and the mCEQ (p<.001). Moreover, the resultant model predicts that a subject with an MNWS score of 0 will smoke 60 fewer cigarettes at endpoint and for each additional year one has smoked he/she will smoke 1.3 more cigarettes at endpoint, etc., etc. The model may proactively assist researchers/cessation counselors in identifying and focusing on key variables. **Conclusions:** Key variables associated with successful cessation efforts have greater predictive value when analyzed within a multiple linear regression statistical model. A predictive model may enhance retention, compliance and completion rates vis-à-vis more individualized smoking cessation efforts and warrants further study.

**Funding:** The funding for the data compilation and statistical analyses was provided (internally) by Pharmacology Research Institute.

**P29**

**THE UTILITY OF COTININE AS A BIOMARKER OF TOBACCO EXPOSURE IS ALTERED BY GENDER AND CYP2A6 GENOTYPE: A PHARMACOKINETIC AND PHARMACOGENETIC INVESTIGATION**

Andy ZHU

Centre for Addiction & Mental Health, Departments of Psychiatry, Pharmacology and Toxicology, University of Toronto, Toronto, Ontario Division of Clinical Pharmacology, Departments of Medicine, Bioengineering & Therapeutic Sciences, University of California San Francisco, CA, USA

**Background:** Cotinine (COT) is the primary metabolite of nicotine and is routinely used as a biomarker of the level of tobacco exposure due to its long half-life. COT is formed and removed by CYP2A6; steady state COT levels are determined by both the level of tobacco exposure and by the relative rates of CYP2A6-mediated COT formation and removal. We hypothesized that variation in CYP2A6 activity affects COT formation less than its removal, which may lead to non-tobacco exposure related variations in COT levels. Differences in COT levels, which are not related to tobacco exposure, have been reported between genders and CYP2A6 genotypes. Females have significantly lower COT levels compared to males after adjusting for tobacco exposure and socioeconomic factors. We speculate this is due to the higher CYP2A6 activity in females compared to males. Likewise, African American light smokers without any reduced function CYP2A6 variants (CYP2A6 normal metabolizers, NM) have significantly lower COT levels than those with reduced function CYP2A6 variants (CYP2A6 reduced metabolizers, RM) when consuming similar amounts of nicotine. **Methods:** Participants (n=185) received an infusion of deuterium-labeled nicotine and COT. Blood samples were collected for CYP2A6 genotyping and the pharmacokinetic analyses. **Results:** CYP2A6 genotype and gender altered COT removal (i.e. COT clearance) to a greater extent than COT formation (i.e. the fraction of nicotine converted to COT). Females and CYP2A6 NM, both having faster CYP2A6 activity, had lower ratios of COT formation to removal compared to males and CYP2A6 RM respectively. Thus, females or CYP2A6 NM have lower COT levels than males or CYP2A6 RM at similar levels of tobacco exposure. **Conclusions:** Our data indicate the relationship between COT and tobacco exposure is different between groups with different CYP2A6 activities. Thus, COT levels are most accurate when used to compare tobacco exposure in populations with similar CYP2A6 activities; the different CYP2A6 activities across CYP2A6 genotype groups, genders, and ethnicities can weaken COT’s ability to estimate the true tobacco exposure.

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P30
EDUCATION AND FEES IN ENHANCING TOBACCO COUNSELLING AMONG ORAL HEALTH PROFESSIONALS: A CLUSTER-RANDOMISED COMMUNITY TRIAL
Masamitsu AMEMORI1, Jorma VIRTANEN1, Teilefro KORHONEN2, Tatu H KINNUNEN3, Haikki MUFTOMAA1
1 Department of Oral Public Health, Institute of Dentistry, University of Helsinki, Helsinki, Finland
2 Department of Public Health, Hjelt Institute, University of Helsinki, Helsinki, Finland
3 Department of Oral Health Policy and Epidemiology, Harvard School of Dental Medicine, Harvard University, Boston, USA

Background: Tobacco use adversely affects oral health. Clinical guidelines recommend that oral health professionals promote tobacco abstinence and provide patients who use tobacco with brief tobacco use cessation counselling. Research shows that these guidelines are seldom implemented, however. This study aimed to evaluate two interventions to enhance tobacco use prevention and cessation (TUPAC) counselling among oral health professionals in Finland. Methods: We used a cluster-randomised community trial to test (1) educational and (2) educational and fee-for-service interventions in enhancing TUPAC counselling among a sample of dentists (n = 73) and dental hygienists (n = 22) in Finland. Educational intervention consisted of one day of training, including lectures, interactive sessions, multi-media demonstrations, and a role play session with standard patient cases. Fee-for-service intervention consisted of monetary compensation for providing tobacco use prevention or cessation counselling. During the six-month follow-up period, TUPAC counselling procedures provided were reported and measured using an electronic dental records system. Of 95 providers, 73 participated (76.8%). Results: In preventive counselling, there was no statistically significant time effect or group-by-time interaction. In cessation counselling, statistically significant group-by-time interaction was found after a six-month follow-up (F = 2.31; p = 0.007), indicating that counselling activity increased significantly in intervention groups. On average, dental hygienists showed greater activity in tobacco prevention (F = 12.13; p = 0.001) and cessation counselling (F = 30.19; p < 0.001) than did dentists. In addition, cessation counselling showed a statistically significant provider-by-group-by-time interaction (F = 5.95; p < 0.001), indicating that interventions to enhance cessation counselling were more effective among dental hygienists. Conclusions: Educational interventions yield positive short-term effects on cessation counselling, but not on preventive counselling. Adding a fee-for-service to education failed to significantly improve TUPAC counselling performance. Funding: This work has been supported by the Academy of Finland (grant no. 1130966), the Juho Vainio Foundation, the Yrjö Jahnsson Foundation, the Helsinki Biomedical Graduate School, the Finnish Dental Society Apollonia and the Finnish Dental Association.

P31
A NEW REASON FOR TOTAL BAN OF MENTHOL IN CIGARETTES
Pierre BARTSCH
University of Liege, Department of Pneumology, Belgium

Hard controversy about menthol ban in cigarettes is still ongoing around FDA, accused of guilty inertia and poor ability to protect people’s health. It is widely recognized that menthol increases initiation rate in youngsters. The sensory perception also induces the belief of a safer cigarette. The impact on marketing is evident among young Afro-Americans and also among young boys and girls particularly in Japan. It has been shown that the severity of dependence is clearly related to the early age of initiation. Until now, few attention has been given to a new type of mentholated cigarette, using a breakable capsule inserted in the filter. This gives the choice to the smoker to activate a menthol boost whenever he likes, before, during or after the inhalation of the cigarette smoke. The Belgian Health Council experts were asked by the Minister of Health, if the components of the capsule, whatever the content of the device is, could be added to cigarettes sold in the country. Any product added to any part of a cigarette being considered by the legislation as an additive, a negative advice about the capsule was given. Unfortunately, to our knowledge, this is the unique example of a national interdiction of the capsule technology in cigarettes. The marketing reports of the different brands of menthol capsule cigarettes show that in all continents, this new type of tobacco product is increasing its market share, seducing more and more new and young consumers, in part because of the “gadget” aspect and mainly because of the flexibility of the menthol use, to the smoker’s desire. This new device increases strongly the threat, among public health advocates, about menthol, the oldest additive, present not only in “menthol” cigarette, but also in a large proportion of “regular” cigarettes containing subliminal doses of this additive. Tobacco industry needing new and strongly addicted smokers is pushing this last trick.

Funding: No funding.

P32
SMOKING PREVALENCE AMONG MIGRANTS IN THE US COMPARED TO US-BORN AND THE COUNTRIES OF ORIGIN
Jizzo BOSDRIESZ, Nienke LICHTHART, Wim BUSSCHERS, Anton KUNST
University of Amsterdam, the Netherlands

Background: Smoking prevalence among migrants is known to differ from that of the host population, but migrants’ smoking is rarely ever compared to the prevalence of smoking in their country of origin. The goal of this study is to compare the smoking prevalence among migrants in the US to host country prevalence and country of origin prevalence. Further analyses assess the influence of sex, education level and age at time of entry to the US. Methods: Data of 202,295 US-born and migrants from 14 countries were obtained from the Tobacco Use Supplement to the Current Population Survey (TUS-CPS)
from 2006-2007. Data on 108,653 respondents from the corresponding countries of origin were taken from the World Health Survey (WHS) from 2002-2005. Results: The prevalence of smoking among migrants (13.8% of men, 4.0% of women) is lower than among both US-born (20.8% of men, 17.6% of women) and countries of origin (39.4% of men, 11.0% of women). The ratio of female to male smokers among migrants is the same as in the countries of origin. Smoking prevalence is especially low among migrants with low education, compared to US-born with low education. Age at time of entry to the US does not systematically influence smoking prevalence for migrants. Similar patterns are observed among almost all migrant groups except those from Ethiopia and Laos.

Conclusions: The smoking prevalence among migrants is not in-between country of origin levels and US levels, but is systematically lower than both. This might have various causes, including the ‘healthy migrant effect’ or selective assimilation and migration at an earlier stage of the smoking epidemic. Differences in tobacco control policies between the US and countries of origin are also likely to play a role in this; especially those policies that reach the whole population, like tax increases and smoking bans.

Funding: No Funding

P33 SMOKING STATUS VERIFIED BY COTININE LEVELS IN A POPULATION SAMPLE OF FINNISH ADULTS
Ulla BREMS1,2, Kristiina PATJA3, Hanna OLLILA2, Tellervo KORHONEN1,2, Marjaana PENNANEN1,2, Aino KANKAANPAA2, Ari HAUKKALA1, Tiina LAATIKAINEN2, Jaakko KAPRIO1,2,5
1 Department of Public Health, University of Helsinki, Finland
2 National Institute for Health and Welfare (THL), Helsinki, Finland
3 Pro Medico, Helsinki, Finland
4 Department of Social Research, University of Helsinki, Finland
5 Institute for Molecular Medicine Finland FiM, Helsinki, Finland

Background: We used Finnish population data to confirm the smoking status of Finnish ever smokers by cotinine blood levels. While earlier studies from the 1990s have suggested that smokers report their smoking status accurately, comprehensive smoking restrictions and changes in the social acceptance of smoking may lead to underestimation of personal smoking in health surveys.

Methods: Participants aged from 25 to 74 years were sampled from the representative national FINRISK 2007 study, and a clinical health examination; a sample of ever smokers received a more detailed tobacco questionnaire (N=1746, 56% men). Cotinine levels were analyzed from all current daily smokers (smoked last time today or yesterday, n=885), all occasional smokers (smoked last time two days to one month ago, n=23) and self-reported recent quitters (quit one month to half a year ago, n=65) and a random sample of every fourth former smoker (quit > 6 months ago, n=197) to confirm smoking status. Cotinine was determined from plasma samples using gas chromatography-mass spectrometry (GC-MS) methodology. Persons with levels ≥10 µg/l were considered active smokers.

Results: Of those 197 persons who reported being former smokers, 28.4% (men 30.8% and women 25.8%) had elevated blood cotinine levels (≥10 µg/l) ranging from 10.5 µg/l to 389 µg/l (mean 114 µg/l). There were 4 persons (2%) who used nicotine replacement therapy (NRT) products indicating that among former smokers 26.4% had elevated cotinine levels without any explanation. Of the 23 occasional smokers, 6 individuals (26%) reported using NRT, leaving 26.0% of occasional smokers with elevated cotinine levels without any explanation. Other tobacco products (27 cigar, 10 pipe and 16 smokeless tobacco users) were used only among current daily smokers.

Conclusions: We conclude that quarter of former smokers had elevated cotinine levels indicating that they have smoked recently.

Funding: Study is supported by the Juho Vainio Foundation (UB, MP, TK) and the Yrjö Jahnsson Foundation (UB). Study is supported by Academy of Finland Center of Excellence in Complex Disease Genetics.

P34 USING APPS FOR BEHAVIOUR CHANGE; DO PEOPLE USE THEM, AND DO THEY HAVE POTENTIAL FOR EFFICACY?
Emma CROGHAN
North 51, Nottingham, UK

There are hundreds of smart phone apps on the market with a wide population reach - there were 1 billion smartphones in use (of a total 4 billion mobile phones being used) worldwide in 2011 (Microsoft 2011). Many of these apps claim to help and support behaviour change across many different behaviours, including tobacco dependence. This presentation will discuss the content of existing tobacco dependence apps and will compare this content to identified tobacco dependence behaviour change techniques. It will also describe an assessment of the current use and usability of existing apps and will conclude with a discussion of the potential for apps as an adjunct or as a stand alone tobacco dependence behaviour change mechanism.

Funding: No funding

P35 PERSONAL NO-SMOKING POLICIES AND CHALLENGES OF ASKING OTHERS NOT TO SMOKE AMONG MEMBERS OF THE HALIWA-SAPONI INDIAN TRIBE
Kristie L. FOLEY1, Pamela RICHARDSON2, Donna KRONNER3, Julia PHIPPS1, Douglas EASTERLING3, Donald HELME4
1 Davidson College, Davidson, NC, USA
2 Haliwa-Saponi Indian Tribe
3 Wake Forest School of Medicine, USA
4 University of Kentucky, USA

Study is supported by Academy of Finland Center of Excellence in Complex Disease Genetics.
Background: NC has a state law prohibiting smoking in public places, but these laws may be insufficient to reduce secondhand smoke exposure in rural communities with few public places. Instead, SHS reduction efforts must address exposure in private venues. 73% of North Carolinians have a home ‘no smoking’ rule, ranking 37th out of 50 U.S. states. Little is known about American Indians’ personal ‘no smoking’ policies in homes and cars compared to 16% who responded that it would difficult to tell a family member not to smoke. Difficulty telling an acquaintance (35%), family member not in the home (31%), or friend (24%) not to smoke varied considerably. Nonsmokers were more likely to have smoking bans in their homes (OR = 10.50, 95% CI 2.63-41.87), cars (OR= 18.02, 95% CI 3.61-89.98), and around children (OR= 5.95, 95% CI 1.53-24.07). Age, education, marital status, and support for indoor smoking bans were correlated with difficulty asking others not to smoke in private venues in logistic regression analyses. Conclusions: Reducing SHS in private venues raises logistical and ethical concerns regarding practice and policy options. These issues will be discussed with consideration for rural and American Indian communities.

Funding: Funding was provided by a Wake Forest University Comprehensive Cancer Center Support Grant, CA12197-31S1.

P36 INNOVATION IN DELIVERY USING MOBILE GO ANYWHERE CLINICS 7 DAYS PER WEEK
John GUYATT, Leena SANKLA
Solutions 4 Health, Department of Tobacco Control, Reading, UK

Background: This poster presentation will outline an innovative approach to delivering stop smoking services, by using a ‘mobile stop smoking clinic’, to be able to provide a mobile, community-based, go anywhere service! This service has been rolled out across the West Midlands, Croydon, Lambeth, Portsmouth and Buckinghamshire and has been successful in targeting areas of highest smoking prevalence, disadvantaged areas, council estates and industrial areas with routine and manual workers by actually taking the service to their ‘door step’.

Based on the success of this initial service we are now also using a fleet of small smart cars as a nimble way of getting access to users and delivering a service to them.

Methods: In order to deliver a service in the heart of the community, particularly for hard to reach groups such as Routine & manual workers, socially deprived areas, ethnic communities and young people, a large mobile vehicle was commissioned with two consultation areas, disability ramp etc. This vehicle was then driven into key areas and a full service was provided to individuals physically inside the vehicle itself, 7 days per week including early morning (5am) and evenings.

Results: Over a 24 month period, over 3,000 people successfully quit smoking. These people may not have accessed traditional services.

Conclusions: By taking the service to service users actually works. This innovative way of delivering a service encouraged people from hard to reach groups to join and successfully quit.

Funding: No Funding

P37 INNOVATIVE APPROACHES TO REDUCING HEALTH INEQUALITIES THROUGH ONLINE FACE-TO-FACE, TELEHEALTH STOP SMOKING SERVICES
John GUYATT, Leena SANKLA
Solutions 4 Health, Department of Tobacco Control, Reading, UK

In order to reach out to smokers who want to quit smoking, it is important that as many barriers are removed as possible and that multiple channels exist where smokers can get help to quit. In partnership with various NHS PCT’s we have recently introduced another way of accessing smokers in our quest to get prevalence lower in the UK. SmokeFreeLife (www.smokefreelife.co.uk) is the first global web based online video chat behaviour support application. This is ideal for those that find it difficult to get to traditional clinics, are house bound, unable to travel, may not have English as their first language, or may require support in sign language. This innovative service gives them the opportunity to access a stop smoking service by booking an appointment with an advisor, in their specific language at a time convenient to them from the comfort of their home or workplace. This service emulates a normal face to face clinic and follows the latest NCSC guidelines. During the consultation, the advisor provides stop smoking counselling and behavioural support as well as taking their CO readings, prescribing NRT as appropriate, recording patient results as well as recording other vital signs as a part of their lifestyle change. Service user can also choose to use mobile text messaging and/or instant messaging. To embrace innovation further, the service user can engage with an advisor on multiple devices including PCs, smart phones, & tablet computers.

Funding: No Funding
SMOKING IN PREGNANCY – AN INTEGRATED MODEL, INCORPORATING SELF MANAGEMENT AND SELF ESTEEME
John GUYATT, Leena SANKLA, Kathy HAWLEY
Solutions 4 Health, Department of Tobacco Control, Reading, UK

Smoking in pregnancy increases infant mortality by about 40% and is much higher in routine and manual groups. Many women ‘spontaneously quit’ on discovering their pregnancy, or in the period of ‘trying’ before a pregnancy – although the relapse rate post-partum is still relatively high. Women who do not spontaneously quit are likely to be apparently less motivated (although this could be a low sense of self-efficacy in disguise) and/or more addicted to nicotine and smoking related ritual and behaviours. These factors combine to make intervention with pregnant smokers more difficult and the need for behaviour change models more essential. Their fears around the consequences of smoking and being perceived as a ‘bad mother’ mean that – even more than any other – this group of women need sensitive handling. In order to increase the overall success rates and wellbeing, a new integrated model has been developed. This is currently being piloted in Wirral and in essence combines the basis of stop smoking and self-management techniques, with an assessment of self-esteem before and after the programme.

Funding: No Funding

AWARENESS OF HEALTH HAZARDS OF SMOKING AMONG NEPALESE SCHOOL CHILDREN
Sakari KAINULAINEN1, Sami KIVELÄ1, Heikki HIILAMO2
1 Diaconia University of Applied Sciences, Helsinki, Finland
2 Social Insurance Institute of Finland, Helsinki, Finland

The Health Education & Tobacco Intervention Program (HETIP) has been carried out in Nepal during 2001-2012 when more than 500 schools and almost half a million students were visited by the HETIP team. The aim of the program was to raise awareness of health hazards of smoking in Nepalese schools by educating both students and teachers. This paper evaluates if the intervention was successful. We collected data on smoking attitudes, awareness of health hazards and smoking prevalence from the same schools visited by the HETIP team. The results were compared with the data obtained through a similar questionnaire filled out when the program visited the schools. Additionally we collected data from a sample of control schools where the HETIP team had not visited. Overall the intervention had a positive effect on the awareness of health hazards. However, the results show diverging trends in smoking attitudes, awareness and smoking prevalence by gender, age and region. Implications for future interventions are discussed.

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BEHAVIORAL AND EMOTIONAL PROBLEMS IN CHILDHOOD AND RISK OF TOBACCO SMOKING INITIATION BY ADOLESCENTS: BIRTH COHORT STUDY
Olena IAKUNCHYKOVA1, Tatiana ANDREEVA1, Daniel HRYHORCZUK2, Zoreslava SHKIRYAK-NIZHNYK3, Alexander ZVINCHUK2, Natalia CHISLOVSKA3, Yuri ANTIPKIN3
1 National University of “Kyiv-Mohyla Academy
2 University of Illinois at Chicago
3 Institute of Pediatrics, Obstetrics, and Gynecology

Background: Behavioral and emotional problems in childhood have been shown to be associated with increased propensity to substance abuse. The present study seeks to confirm the association between externalizing behavior problems and tobacco smoking initiation by adolescents in the prospective study design. Methods: This study is based on the data of the Family and Children of Ukraine Study (FCOU), which is a part of the cohort study in Europe for pregnancy and childhood “ELSPAC”. Main exposures were externalizing traits, in particular conduct and hyperactivity problems measured by Stress and Difficulties Questionnaire at the 7-years-old age. Smoking status of the adolescent and age of smoking initiation, reported at the 16-years-old follow-up, were outcome measures. Data were analyzed using multivariate binary regression model controlling for sociodemographic characteristics. Results: The initial sample consisted of 2148 women, their babies and partners (if present), but at 16-years-old follow-up only data about 1020 participants were available. Conduct problems score was available for 780 participants, and hyperactivity problems score was available for 761 participants. In multivariate analysis current smoking by adolescents and age of smoking initiation was not associated with hyperactivity problems in childhood. However, participants who scored 5-10 points for conduct traits dimension in childhood were twice more likely (OR = 2.09, 95% CI = 1.19-3.65) to report current smoking in adolescence compared two children who scored 0-3 points. Similarly, children who scored 5-10 points on conduct problems scale had 1.7 times higher odds of initiating tobacco smoking at 13 years old or younger (OR=1.79, 95% CI = 1.07-3.00) compared two children who scored 0-3 points. Conclusions: Conduct problems in children may have effect on vulnerability to substance abuse, in particular tobacco smoking by adolescents. Hence, children with signs of conduct problems should be specifically targeted with prevention programs at adolescence as a high risk group.

Funding: No Funding
**P41 PASSIVE SMOKING, SOMETHING MORE IMPORTANT THAN A HEALTH HAZARD**

Hooman KESHAVARZ¹, Ahmad JAFARI², Mohammad Reza KHAMI³, Jorma I. VIRTANEN

¹ Tehran University of Medical Sciences and University of Helsinki,
² Tehran University of Medical Sciences
³ University of Oulu and University of Helsinki

**Background:** Environmental tobacco smoke (ETS) has adverse effects on health and passive smoking is among the most important threats to public health. Involvement of health professionals in tobacco control requires positive attitudes which may be affected by their exposure to ETS. The aim of our study was to investigate the association between passive smoking and attitudes towards tobacco control among Iranian dental students. **Methods:** All fourth-year students (n=385) of eight randomly selected Iranian dental schools were invited to participate in a survey in December 2010. Using Global Health Professions Student Survey (GHPSS) questionnaire, data were collected in ordinary classroom settings. Tobacco use experience was considered as using a tobacco product at least once during someone’s lifetime. Each student who had used a tobacco product at least once during the previous month was considered a current tobacco user. Exposure to ETS on at least once a day during the previous week was considered as passive smoking. Students’ attitudes towards tobacco control were assessed calculating a sum score for 5 questions. Chi-square and linear regression served for statistical analyses. **Results:** Of the students, 84% (326 students, 66% female) participated in the survey. About 54% had the experience of tobacco use and 21% were current tobacco users. A clear majority (74%) of the participants (68% of women, 87% of men, P<0.001) reported being passive smokers. Most of the students (>72%) completely or partially agreed on quitting smoking. Students’ attitudes towards tobacco control were assessed calculating a sum score for 5 questions. **Conclusions:** The prevalence of passive smoking among Iranian dental students is high. Passive smoking at home may adversely affect dental students’ attitudes towards tobacco control programs. This factor should be taken into account when preparing dental students for their future responsibilities in controlling tobacco use.

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**P42 QUITLINE STUMPPI AND WEBSITE STUMPPI.FI IN FINLAND**

Maija KOLSTELA
The Organisation for Respiratory Health in Finland

**Background:** The Organisation for Respiratory Health in Finland maintains a tobacco cessation phone line (since 2002) and an Internet portal called Stumppi (www.stumppi.fi since 2004). The website is being constantly updated and renewed and contains a lot of current information on tobacco consumption and cessation. There’s also a special section for healthcare and other professionals who might benefit from sharing knowledge and good practices in cessation. In November – December 2011 a customer satisfaction survey targeted at Stumppi.fi website visitors was carried out by Taloustutkimus. Taloustutkimus is an independent market research company operating in Finland, Russia and all Baltic countries. The objective of the survey was to gather user information and experience from present Stumppi.fi website visitors in order to improve the website. **Methods:** The data collection was done via pop-up method on Stumppi.fi website with a link to an on-line questionnaire, which could be answered either anonymously or by providing personal details. A total of 275 participated in the survey; 65 per cent women and 35 per cent men. **Results:** The main reason for visiting Stumppi.fi website was to get support, advice and tips on stopping smoking and stopping techniques. Most of the visitors found what they were searching for and only 15 per cent experienced difficulty in acquiring the appropriate information. Stumppi.fi website was considered useful and relevant. Especially important was the support from other people in the Stumppi forum by reading about their experience and efforts in quitting smoking. Visitors to Stumppi.fi website referred to the service actively; 20 per cent visited it at least once a week. **Conclusions:** The role of Stumppi.fi website as a source of support, information and advice is of importance to people wishing to stop smoking regardless of their age, place of residence or working status. It is desirable that more healthcare and other professionals would take an interest in the website as a source of helpful information and a way of sharing experience and good practice.

**Funding:** Finland’s Slot Machine Association (RAY)

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**P43 THE ROLE OF INDIVIDUAL SOCIOECONOMIC STATUS IN THE ASSOCIATION BETWEEN NEIGHBOURHOOD DEPRIVATION AND THREE SMOKING OUTCOMES**

Mirté KUIPERS¹, Mariel DROOMERS¹, Marleen WINGEN², Karien STRONKS³, Anton KUNST¹

¹ Department of Public Health, Academic Medical Center/University of Amsterdam, Amsterdam, the Netherlands
² Directorate for Socio-Economic and Spatial Statistics, Statistics on Labor, Income and Living Conditions, Statistics Netherlands, Heerlen, the Netherlands

**Background:** Previous studies showed that the prevalence of smoking is higher in deprived than in affluent
neighbourhoods. The aim of this study was to assess to role of socioeconomic status (SES) in the association between neighbourhood deprivation and smoking prevalence, and its two components smoking initiation and continuation. Methods: Cross-sectional data of 20,603 Dutch adults, living in 963 urban areas in the Netherlands, were obtained from the national health survey (POLS) 2003-2009. Three interrelated smoking outcomes were used: smoking initiation (i.e. ever smoking, determined in the past), smoking continuation (i.e. not quitting, up to present time), and smoking prevalence (i.e. current smoking, determined by both initiating smoking and continuing smoking). We distinguished deprived urban areas (as defined by the Dutch government) vs. other urban areas. Multilevel logistic regression models were used, adjusted for age, gender, ethnicity, household composition, educational level, and household income. Results: Results for smoking initiation, continuation and prevalence were very similar. Without correction for SES, the prevalence of smoking outcomes was higher in deprived neighbourhoods than other urban areas (initiation: OR=1.10 [0.99–1.24], continuation: OR=1.12 [0.97–1.30], prevalence: OR=1.15 [1.01–1.30]). Adjustment for education and income strongly reduced the differences between deprived and other neighbourhoods (initiation: OR=1.05 [0.93–1.18], continuation: OR=1.03 [0.88–1.19], prevalence: OR=1.04 [0.92–1.18]). A statistically significant association between deprivation and smoking initiation was found for younger generations and for higher educated respondents. No interaction was found for other smoking outcomes. Conclusion: The higher prevalence of smoking in deprived areas is largely explained by the socioeconomic characteristics of individual residents. The results give no support to the hypothesis that neighbourhood of residence per se affects risk of smoking. Funding: This study is funded by two grants: - a grant of the Netherlands Organisation for Health Research and Development for the URBN40 project on neighbourhood effects on health; - and a Seventh Framework Programme grant of the European Commission for the SILNE project on smoking inequalities.

P44 LONG TERM NON-DAILY SMOKING AND EDUCATION IN A NORWEGIAN SAMPLE OF YOUNG ADULTS
Elisabeth KVAAVIK
Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

Background: The main aim of the study was to explore the stability of non-daily smoking in a sample of Norwegian men and women between age 15 and 27 years (yrs). Next, we investigated the predictive value of parental and own education and school achievements in adolescence for adult non-daily smoking. Methods: The cohort study “Young in Norway” were used in the present study (T1:1992, age 12-15 yrs, T2:1994, 13-17 yrs, used as baseline, replaced by T1 if missing, T3: 1999, 19-23 yrs, T4: 2003, 24-28 yrs. Questionnaires were used for self reports of smoking habits, educational level and school achievements (mean grades in three main subjects at T2), while parental education were assessed by register data from Statistics Norway. Participants in 7. and 8. grades at T1 and participating at all subsequent waves were included in the study (N=942). Results: Non-daily smoking did not change notably from T2 to T4: 12 % at T2, 13 % at T3 and 10 % at T4. Non-daily smokers remaining as such by the next follow-up were few, with between 18 and 27 % of non-daily smokers continuing to be so at next follow-up. Forty-seven per cent of non-daily smokers at T2 became daily smokers at T3 while 26 % had quit. Corresponding numbers for T2 to T4 were 34 and 48 %, respectively. Only five out of initially (T2) 114 (4.4 %) non-daily smokers were non-daily smokers at T3 and T4 as well. School achievements in adolescence were predictive of male non-daily smoking at T4; OR was 0.44 (95% Confidence Interval (CI): 0.24-0.82), for women the association did not reach significance; OR was 0.82 (95% CI: 0.45-1.51). Adjustment for parental and own adult education did not change the association and parental and own adult education was not predictive of non-daily smoking for neither men nor women. Conclusion: The prevalence of non-daily smoking remained low during adolescence and young adulthood. The degree of stability of non-daily smoking seems to be very low, with few subjects being long term non-daily smokers. While own school achievements were negatively associated with non-daily smoking rates for men; neither parental nor own education had any impact on non-daily smoking for men or women. Funding: The present study was supported by Norwegian Social Research (NOVA) and the Research Program on Public Health (FOLKEHELSE), Research Council of Norway, project no.190443 "Tobacco and the social inequality gap"

P45 ELECTRONIC CIGARETTE USE AMONG KOREAN ADOLESCENTS
Juyoung LEE1, Jung-Ah LEE1, Hong-Jun CHO1, Hyun-Suk KIM2
1 Asan Medical Center, University of Ulsan College Medicine, Seoul, South Korea
2 Shinheung College, Seoul, South Korea

Background: Despite the fact that electronic cigarette (e-cigarette) is an emerging phenomenon that is becoming increasingly popular worldwide, a few study has been done for e-cigarette use among adolescents. We studied e-cigarette use and factors associated with it among adolescents in South Korea. Methods: We used the data from the 2011 survey for 1872 students (1036 males and 836 females) of middle and high schools in Uijeongbu, a city near Seoul, capital city of South Korea. Using logistic regression we examined whether gender, level of school, cigarette smoking experience, father’s education, mother’s education, religion, satisfaction in school life, grades and depressive mood were associated with e-cigarette use. We also investigated the routes to purchase e-cigarettes. Results: 117(6.3%) students reported as having used e-cigarettes. Through chi-square analyses, statistically significantly higher rates of e-cigarette use were found for
females (9.3%), for those having cigarette smoking experience (31.8%), for those with fathers with lower education level (12.8%), for those with absent mothers (16.7%), for those with dissatisfaction in school life (8.6%), for those with low grades (10.9%), for those presenting with depressive mood (7.5%). The multivariate models revealed that gender (OR in female, 0.37; 95% CI, 0.21-0.65) and cigarette smoking experience (OR, 3.05; 95% CI, 1.87-5.38) were significantly associated with e-cigarette use. The purchase routes to e-cigarettes were friends (29.9%), e-cigarette stores (21.4%), internet shopping malls (9.4%) and others (23.1%). Conclusions: The prevalence of e-cigarette use among adolescents in South Korea was rapidly increased in this study compared to the previous report in 2008. Continuous attention and prevention interventions are needed to protect adolescents from exposure to e-cigarettes with considering the factors associated with e-cigarette use.

Funding: No Funding

P46 THE ASSOCIATION BETWEEN EDUCATIONAL LEVEL AND HARDCORE SMOKING
Marianne LUND
Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

Background: The purpose of the study is to identify whether smoking history/habits are possible mediators between educational level and hardcore smoking. Methods: Nationally representative data for the adult population collected by Statistics Norway was used in this study. The study sample consist of daily smokers 30-65 years old, N=700, based on a pooled cross sectional data for the years 2007-2010. Hardcore smoking was the outcome, defined by daily smokers with no intention to quit, no recent quit attempt and future belief in continued smoking. All other daily smokers were defined as non-hardcore smokers. Mediators were age at smoking onset, nicotine dependence (Fagerstrom test for nicotine dependence, FTND), cigarette consumption per day (CPD) and second hand smoke exposure (time spent in room at home where somebody smoke). Single and multiple mediation analysis using a regression or path-analytical framework were conducted to calculate the indirect effect. Bootstrap bias-corrected confidence intervals at 95% level were used to test the effects. Gender, age and number of members in the household were included as covariates. The macro PROCESS developed for SPSS was used for the analysis.

Results: The results showed significant indirect effects ab (SE) for both age at smoking onset = 0.015 (0.008), CPD = -0.011 (0.008), FTND = -0.02(0.01) and secondhand smoking exposure in the home = -0.028 (0.01) between educational level and hardcore smoking in single mediation models. In a multiple model where all the mediators (except CPD) were operating in parallel, only secondhand smoke exposure had a significant indirect effect. The total indirect effect via the mediators was also significant, with the ab (CI) = -0.042 (-0.077, -0.017). Conclusion: Secondhand smoke exposure in the home seems to be an important factor in the relationship between education and hardcore smoking. Other studies support the association between socio-economic position and smoking in the home. A smoking practice that includes smoking in the home indicates that smoking is strongly rooted in their everyday life, which in the next instance reduces their motivation for smoking cessation.

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P47 EVALUATION OF CARDIOVASCULAR RISK AMONG SMOKERS: RESULTS OF THE CARDIOVASCULAR RISK ASSESSMENT AMONG SMOKERS IN PRIMARY CARE IN EUROPE (CV ASPIRE) STUDY
Pablo MALLAINA1, Christos LIONIS2, Hugo ROL3, Renzo IMPERIALI4, Andrew BURGESS5, Mark NIXON6, Eric GEMMEN7
1 Pfizer
2 University of Crete, Greece
3 Bennebroek Primary Care Center, the Netherlands
4 Primary Care Varese ASL, distretto di Tradate, Italy
5 Quintiles

Background: Smoking is a major risk factor for cardiovascular disease (CVD) and several multi-factorial risk models have been developed to assess the risk for development of CVD. We performed this multicenter, cross-sectional survey to evaluate the CV risk among smokers at primary care centres using standard risk assessment tools and to estimate the CV risk attributable to smoking. Methods: 1439 consecutive smokers (814 male, 631 female) were recruited from Greece (n=571), Italy (n=443) and the Netherlands (n=425), from 104 GP practices in 2011. Smokers were ≥40 years old, smoked > 10 cigarettes/day and had recent measurements on blood pressure and lipids. CV risk was calculated using the SCORE system, Framingham risk equations, and Progetto CUORE model. The CV risk attributable to smoking was evaluated using a simulated control (hypothetical non-smoker) with identical characteristics as the enrolled smoker. Risks assessed were CV mortality, coronary heart disease (CHD), CVD, hard CHD (i.e., myocardial infarction or coronary death), coronary or CV event, intermittent claudication, and recurring CHD. Results: Smokers were 57.4 ± 10.6 years old and had smoked for 35.2 ± 12.5 years. Hypothetical non-smokers vs Smokers experienced lower mean 10-year risk for CV mortality (by 50%), CHD (by 34%), CVD (by 24%), hard CHD (by 39%), and coronary or CV event (by 41%). Non-smokers showed lower mean risk for 4-year intermittent claudication (by 48%). Non-smokers also experienced lower risk for 2-year recurring CHD compared with hypothetical non-smokers. Results were similar across countries. Conclusions: The prediction models consistently demonstrated a high CV risk attributable to smoking, cessation of which may reduce risk of CV disease by up to 50%. The findings reinforce the strength of smoking as risk factor for the events and diseases analyzed. One of the best gains in health could be obtained by tackling the most important modifiable risk factors smoking being one of them.

Funding: Pfizer
**P48**
**DESCRIBING CHARACTERISTICS OF SMOKERS IN PRIMARY CARE IN EUROPE: RESULTS OF THE CARDIOVASCULAR RISK ASSESSMENT AMONG SMOKERS IN PRIMARY CARE IN EUROPE (CV ASPIRE) STUDY**

Pablo MALLAINA¹, Renzo IMPERIALI², Christos LIONIS³, Hugo ROL⁴, Mark NIXON⁵, Andrew BURGESS⁵, Shital KAMBLE³

¹Pfizer
²Primary Care Varese ASL, distretto di Tradate, Italy
³University of Crete, Greece
⁴Bennebroek Primary Care Center, the Netherlands
⁵Quintiles

**Background:** Smoking is associated with risk for serious clinical conditions including reducing expected lifetime in good health. We performed multicenter, cross-sectional survey to describe the characteristics of smokers visiting general practitioners (GP). Methods: 1439 smokers were recruited consecutively from 104 GPs in Greece (n=571), Italy (n=443) and the Netherlands (n=425) in 2011. Smokers were ≥40 years old, smoked >10 cigarettes/day and had recent measurements on blood pressure and lipids. Descriptive statistics were performed on demographics, comorbidities (cardiovascular disease [CVD], diabetes, hypercholesterolaemia, hypertension, and chronic obstructive pulmonary disease [COPD]), other disorders (persistent chronic cough, production of excess mucous and phlegm, shortness of breath, and wheezing), and primary reasons for consultation (general medical examination, cardiovascular related, psychiatric issue related, gastrointestinal issue related, metabolic issue related, pulmonary issue related and other). Results: Smokers were 57.4±10.6 years old, had mean BMI 27.1±4.9, and 56.3% were male. A majority of smokers had hypertension (54.4%) and hypercholesterolaemia (50.5%), with 46.5% and 34.1% smokers receiving medications for these diseases respectively. Persistent chronic cough (33.1%) and shortness of breath (29.9%) were the most common disorders. Smokers in Netherlands had a higher rate of reported CVD (32.2% vs 15.6% vs 17.0%), diabetes (30.6% vs 16.7% vs 17.5%), and COPD (26.8% vs 19.9% vs 14.2%) compared with smokers in Italy and Greece. Overall, smokers frequently had consultations for general medical examination (45.3%) and cardiovascular disease (16.2%). A majority of smokers in Greece (57.2%) and Italy (57.1%) had consultation for general medical examination. In Netherlands, a higher proportion of smokers had consultation for cardiovascular disease (31.7%). Conclusions: This epidemiological study highlighted that a high proportion of smokers who visit their primary care physician have additional risk factors for cardiovascular disease. Primary care physicians may play an important role treating the modifiable risk factors in their smokers population.

**Funding:** Pfizer

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**P49**
**CHARACTERISING PATIENT BEHAVIOURS AND PHYSICIAN PRACTICE PATTERNS IN SMOKING CESSATION: RESULTS OF THE CARDIOVASCULAR RISK ASSESSMENT AMONG SMOKERS IN PRIMARY CARE IN EUROPE (CV ASPIRE) STUDY**

Pablo MALLAINA¹, Hugo ROL², Renzo IMPERIALI¹, Christos LIONIS³, Mark NIXON⁵, Andrew BURGESS⁵, Joseph KIM⁶

¹Pfizer
²Bennebroek Primary Care Center, the Netherlands
³Primary Care Varese ASL, distretto di Tradate, Italy
⁴University of Crete, Greece
⁵Quintiles
⁶University of Quintiles

**Background:** As general practitioners (GPs) play an important role in smoking cessation, we performed this cross-sectional survey to better understand patient behaviours related to smoking and characterise physician practice patterns. Methods: Consecutive subjects were recruited from 104 GP practices in Greece (n=571), Italy (n=443) and the Netherlands (n=425) in 2011. Subjects were ≥40 years old, smoked > 10 cigarettes/day and had recent measurements on blood pressure and lipids. Patient behaviour was assessed by asking the patient participants about previous attempts to quit smoking and their interest in smoking cessation. Dependence on nicotine was evaluated using the FTND score: low (<4), moderate (4-6), and high (>7) dependence on nicotine. GP practice patterns were assessed through a questionnaire about their smoking advice pattern. Results: We enrolled 1439 subjects (814 male, 631 female). Subjects were 57.4 ± 10.6 years old and had smoked for 35.2 ± 12.5 years. 73% were interested in quitting smoking. 70% had previously attempted to quit. The median time without smoking was 361 days. Regarding the methods in which subjects are interested for quitting: prescription medicine (35%), behavioural therapy (21%), nicotine replacement therapy (15%) or alternative medicine (6%). Despite a high interest in quitting, majority of subjects (77%) had not tried a formal smoking cessation programme. Among those who have tried, the methods they have used were nicotine replacement therapy (64%), prescription medicine (22%), alternative medicine (22%), and behavioural therapy alone (13%). The mean FTND score was 5.0±2.4 suggestive of moderate dependence. FTND suggested that 28% were highly dependent on nicotine; 45% moderate and 27% low dependence. Participant physicians report offering smoking cessation advice (79%), behavioural support (51%), and pharmacotheapy (24%). Conclusions: GP clinics provide an opportune target for implementing smoking cessation programmes, as smokers seen by GPs are moderately dependent and have an interest in quitting through pharmacological or behavioural means.

**Funding:** Pfizer
P50
DOES KNOWLEDGE ABOUT THE RISKS OF ENVIRONMENTAL TOBACCO SMOKE AFFECT THE IMPLEMENTATION OF HOME-SMOKING BANS IN HUNGARY?
László Nagyajtenyi1, Doug Easterling2, Todd Rogers3, Edit Paulik1
1 University of Szeged, Szeged, Hungary
2 Wake Forest School of Medicine, Winston-Salem, NC, USA
3 RTI International, San Francisco, CA, USA

Background: Exposure to environmental tobacco smoke (ETS) is responsible for the development of a wide range of diseases. ETS increases the risk of premature birth and sudden infant death syndrome in newborns, the risk of acute respiratory infections, middle ear disease, exacerbated asthma, respiratory symptoms, and decreased lung function in children, and of heart disease and lung cancer in non-smoking adults. The objective of this study was to assess Hungarians’ knowledge about the risks of ETS, and the role that knowledge plays in leading people to implement smoking bans in their homes. Methods: This study reports findings from survey data collected in 2009 from a cross-section of Hungarians aged 16-70 (n=2,250). A self-administered questionnaire was used to collect information on demographics, smoking behaviour, knowledge of health risks of smoking and ETS, and attitudes toward tobacco control policies, including the rules about smoking in private homes. Multivariate logistic regression analyses were applied to study the association between smoke-free homes and knowledge about the risks of ETS, demographic characteristics and smoking. Data analyses were performed using SPSS 17.0 for Windows.

Results: 58.9%-92.2% of the population was familiar with the various health consequences of exposure to ETS, and 59.3% reported have a smoke-free home. The results of multivariate logistic regression models showed that non-smoker (OR: 4.76) or former smoker (OR: 3.28) status, female gender (OR: 1.23), high level of education (OR: 1.97) and better knowledge about the risk of exposure (OR: 1.12) were associated with the higher prevalence of smoke-free homes.

Conclusions: The study demonstrates the association between knowledge of ETS-related health risks, education level, smoking status and preventive efforts at home to reduce ETS exposure. These findings reinforce the importance of population-level educational approaches (e.g. via a media campaign) focusing on the harm caused by ETS, especially if those efforts can be tailored and targeted to reach smokers and those with less education.

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P51
AGE OF INITIATION OF TOBACCO, CANNABIS AND ALCOHOL: IMPACT ON USE DURING PREGNANCY
Megan Passey1, Janelle Stirling1, Cate D’Este2, Rob Sanson-Fisher2
1 University of Sydney, Australia
2 University of Newcastle, UK

Background: Early initiation of tobacco smoking is recognised as a risk for dependency and ongoing use. Little is known about the age of initiation of cannabis and alcohol and the relationship with use of tobacco, cannabis or alcohol during pregnancy. Indigenous women in many countries, including Australia, have a high prevalence of tobacco smoking during pregnancy. Understanding the context of use is important in developing appropriate services to support cessation.

Methods: Cross-sectional surveys with 257 pregnant Aboriginal and Torres Strait Islander women in two states collected self-report data on use of tobacco, cannabis and alcohol, quitting during pregnancy and age of initiation of each substance. The association between age of initiation of each substance and a) current use of each substance; b) quitting during pregnancy, was tested using Students t-test. Results: Younger age of initiation of tobacco was significantly associated with current alcohol (p<0.005) and cannabis (p<0.001) use. Younger age of initiation of alcohol was significantly associated with current tobacco (p=0.005), alcohol (p=0.021) and cannabis use (p<0.001). Age of initiation of cannabis was not associated with current use of any substance. For quitting, early initiation of alcohol was significantly associated with quitting alcohol (p=0.032) and cannabis (p=0.0072) and early initiation of tobacco smoking was associated with quitting alcohol (p=0.043).

Conclusions: Younger age of initiating tobacco and alcohol is associated with persistent use of tobacco, alcohol and cannabis during pregnancy in this population. Addressing the drivers of early initiation of substance use is critical to reducing the intergenerational burden from substance use during pregnancy.

Funding: This study was supported by a grant from the Australian Government, Department of Health and Ageing, and the Northern Territory, Department of Health and Family.

P52
SHOULD ANTE-NATAL CARERS ADDRESS TOBACCO, ALCOHOL AND CANNABIS COLLECTIVELY, WITH ABORIGINAL AND TORRES STRAIT ISLANDER WOMEN?
Megan Passey1, Janelle Stirling1, Cate D’Este2, Rob Sanson-Fisher2
1 University of Sydney, Australia
2 University of Newcastle, UK

Background: Addressing the high prevalence of smoking among Indigenous Australians is a priority, and pregnancy is an opportune time. Quitting smoking while pregnant confers numerous benefits on both the mother and baby.
Little is known about the role other substances play in antenatal tobacco smoking. Methods: Cross-sectional surveys with 257 pregnant Aboriginal and Torres Strait Islander women in two states collected self-report data on use of tobacco, cannabis and alcohol, and quitting during pregnancy. Results: 120 (47%) women reported using no substances at the survey time; 119 (46%) reported tobacco, 53 (21%) alcohol and 38 (15%) cannabis. Current tobacco smokers had higher odds of current cannabis use (OR: 10.21; 95%CI: 3.73, 34.52) and alcohol consumption within the last month (OR: 4.32; 95%CI: 2.12, 9.13) than women who didn’t smoke tobacco. Women who reported alcohol consumption also had higher odds of cannabis use than those who did not currently consume alcohol (OR: 2.69; 95%CI: 1.17, 5.97). Quitting tobacco since becoming pregnant was associated with quitting cannabis (p=0.015) and alcohol (p=0.003), and quitting alcohol was associated with quitting cannabis (p=0.034). Conclusions: Use of tobacco, alcohol and cannabis are strongly inter-related, with cessation of one substance associated with cessation of others. Antenatal care providers supporting women to quit tobacco, should enquire about use of other substances, and provide supports to address these interactions.

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P53 KILLING THE HABIT - QUITTING SMOKING IN THE 1950’S
Kristiina PATJA¹, Jouni WILSKA²
¹ Pro Medico, Helsinki, Finland
² University of Helsinki, Finland

Background: In the 1950’s, the first studies were published in English confirming health risks of smoking, and diffusion of this information took a long time. In Finland, male smoking prevalence was at its peak at about 70 % and female smoking was uncommon. Prof. Alvar Wilksa was one the best-known researchers in Finland since 1930’s. He is known of his work with electro-microscope, but he was also disseminating health research to both professionals and the general populace at that time. He opposed tobacco, and in order to support his views, being a practical man, he published questions to quitters in all major national newspapers in the spring of 1957 to collect data on cessation. His family found this material from summer cottage in 2007 and gave it to the National Public Health Institute. Material was scanned into electronic format. Methods: Questions included items on smoking initiation, smoking habits, cessation, motivation for quitting, benefits of cessation and health harms. This material includes 578 typed and handwritten letters from quitters of which first 250 were analysed at this phase. Nearly all respondents gave some background information, at least age and sex, and the majority also revealed their occupation and place of residency. All letters were read and then data was classified for first analyses. Results: Quitters reported similar health hazards, like cough and palpitation, from smoking as current research has shown, but with lay-person terminology. Quitting aids included substitute activities, sour drops, and fruits. Motivations to quit were somatic symptoms or economical reasons. Smoking was also described as sinful and morally objectionable. Conclusions: Motivations for smoking cessation were similar in the 1950’s compared to today, as smokers experienced the same health hazards and improved health with quitting smoking. This study gives interesting insight into a world before population awareness of the health hazards of tobacco use.

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P54 THE EFFICACY AND SAFETY OF AN ELECTRONIC CIGARETTE (ECLAT) STUDY: A PROSPECTIVE 12-MONTH RANDOMIZED CONTROL DESIGN STUDY
Pasquale CAPONNETTO¹,², Davide CAMPAGNA¹,², Fabio CIBELLA³, Jaymin B. MORJARIA¹, Cristina RUSSO¹,², Riccardo POLOSA¹,²
¹ Centro per la Prevenzione e Cura del Tabagismo (CPCT), Università di Catania, Catania, Italy
² Institute of Internal Medicine,Università di Catania, Catania, Italy
³ Instituto di Biomedicina e Immunologia Molecolare del Consiglio Nazionale delle Ricerche, Palermo, Italy.
⁴ School of Medicine, University of Southampton, Southampton General Hospital, UK

Background: Recent evidence suggests that E-cigarettes may be an effective and safe aid to smoking cessation, and large randomized controlled trials are now required to confirm and expand these preliminary observations. We designed a double-blind, placebo-controlled, randomized clinical study to evaluate smoking reduction, smoking abstinence and adverse events in smokers not intending to quit experimenting two different nicotine strengths of a very popular E-cigarette brand (‘Categoría’; Italy). Methods: A double-blind, sham-controlled, randomized, clinical trial of 300 smokers (unwilling to quit) was designed to assess the efficacy and safety of ‘Categoría’ E-cigarette (Arbi Group, Italy) loaded with 7.2 mg nicotine (study group A) and 4.8 mg nicotine (study group B) cartridges in comparison to no-nicotine containing cartridges (study group C). Study participants were invited to attend a total of nine study visits in 1-yr during which product use, number of cigarettes smoked, and exhaled carbon monoxide (eCO) levels were recorded. Smoking reduction and abstinence rates were calculated. Adverse events and product preferences were also reviewed. Analyses were computed as per intention-to-treat. Results: A significant reduction in mean cig/day use and eCO levels from baseline was recorded at all study visits in all three study groups. A mean of 2.0 cartridges/day was used in each study group up to the 3-month time point, but falling thereafter. 50% reduction in the number of cig/day was shown in 21% and 9% participants in group A, in 16% and 8% in group B and in 19% and 10% in group
C, at month-3 and -12 respectively. Smoking abstinence was observed in 11% and 13% participants in group A, in 17% and 9% in group B and in 4% and 4% in group C, at month-3 and -12 respectively. Only minor and transient adverse events were reported, including mouth and throat irritation, and dry cough. By and large, participants’ perception and acceptance of the product was positive.

**Conclusion:** In smokers not intending to quit, the use of e-Cigarette decreased cigarette consumption and elicited enduring tobacco abstinence at 1-yr without causing significant side effects.

**Funding:** None of the authors have any competing interests to declare, with the exception of RP. RICCARDO POLOSA has received lecture fees from Pfizer and GSK, a research grant from Pfizer, and he served as a consultant for Pfizer, Global Health Alliance for treatment of tobacco dependence, and Arbi Group Sri.

**P55**

**SMOKING CESSATION COUNSELLING IN LUNG CLINIC OF TARTU UNIVERSITY HOSPITAL 2006 – 2010: A PILOT STUDY**

Tiina MÄNDLA1, Ülle ANI2, Inge RINGMENTS1, Kersti PÄRNA1

1 Department of Public Health, University of Tartu, Estonia
2 Tartu University Hospital, Lung Clinic, Estonia

**Background:** The present study describes smoking cessation (SC) counselling in Lung Clinic of Tartu University Hospital in 2006–2010. The objectives were to describe maintenance in SC process and to calculate abstinence rate, and to analyse relationship between maintenance in SC process and factors associated with smoking relapse.

**Methods:** The target group were 566 persons visiting SC counselling service in Lung Clinic of Tartu University Hospital between 01.01.2006–31.12.2010. Among factors associated with smoking relapse gender, age, motivation, pack-years, depression, anxiety disorders, nicotine addiction, and treatment of tobacco addiction were examined. Kaplan-Meier method was used to estimate the probability of maintaining in SC process at different time points the first smoke-free day. Cox proportional hazard model was used to evaluate relationship between maintenance in SC process and factors associated with smoking relapse. Hazard ratios and the corresponding 95% confidence intervals were computed. **Results:** Of all adults visiting SC counselling service, 54.6% started with SC process. Among those who visited SC counselling clinic, 6- and 12-month abstinence rate was 14.0% and 9.7%, respectively. Probability to be smoke free 6- and 12-month after cessation was 29.9% and 22.2%, respectively. Compared to at least 25-year old quitters, less than 25-year olds were 1.79 (95% CI 1.08–2.96) times less likely to stop smoking. Quitters with depression were 1.36 (95% CI 1.01–1.85) and those whom was prescribed nicotine replacement therapy were 1.48 (95% CI 1.11–1.97) times less likely to be abstinent at the end of 12 months after the first smoke-free day. **Conclusion:** Abstinence rate of smokers visiting SC counselling service in Lung Clinic of Tartu University Hospital in 2006–2010 was efficient. In order to increase effectiveness of SC process, it is necessary to focus on the factors associated with smoking relapse at the individual level.

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**P56**

**TOBACCO USE AMONG PREGNANT WOMEN IN HUNGARY: INDIVIDUAL AND PARTNER CORRELATES OF SMOKING AFTER CONCEPTION**

Ildiko RAKOCZI, Andrea FOGARASI-GRENCZER, Péter BALAZS, Kristie L. FOLEY

University of Debrecen, Nyiregyhaza, Hungary

**Background:** Smoking during pregnancy is a risk factor for low birth weight (LBW) and preterm birth (PTB) outcomes. High percentages of LBW (8.6%) and PTB (8.7%) in Hungary suggest a significant contribution of smoking to these outcomes. Understanding the correlates of smoking during pregnancy will identify points of intervention. **Methods:** In a 2009-10 retrospective cohort study about smoking and cessation among 8,350 women, 42% smoked prior to pregnancy. Logistic regression was used to estimate the factors correlated to continued smoking (p<0.05) during the pregnancy. **Results:** 63.8% of pregnant women continued smoking after learning they were pregnant. Only 12.9% of Roma women quit compared to 53.2% of non-Roma. If the pregnancy was unexpected, only 1 in 5 quit smoking. Most women (55%), who had previously tried to quit, stopped smoking during pregnancy. Factors correlated with continued smoking in multivariable analysis include: Roma ethnicity (OR=1.68, 95%CI=1.15-2.46); lowest education versus university/college (OR=14.13, 95%CI 5.40-37.0); exposure to secondhand smoke (OR=1.72, 95%CI 1.23-2.40), and a smoking partner (OR=2.17, 95%CI=1.56-3.03). Cessation was supported by marriage versus cohabitation (OR=0.60, 95%CI=0.45-0.80); expected pregnancy (OR=0.57, 95%CI=0.43-0.76); and earlier cessation attempts (OR=0.23, 95%CI=0.20-0.41). **Conclusion:** Interventions specifically targeting partner support for quitting, lower educated women and those who are ethnically diverse is important. Also, knowing whether or not the pregnancy was planned may impact how cessation strategies are delivered.

**Funding:** Fogarty International Center

**P57**

**SMOKING AND ALCOHOL USE AS INDEPENDENT RISK FACTORS FOR BRUXISM AMONG ADULTS**

Kati RINTAKOSKI1, Jaakko KAPRIO2

1 Institute of Dentistry, University of Helsinki, Finland & Department of Public Health, University of Helsinki, Finland
2 Department of Public Health, University of Helsinki, Finland & National Institute for Health and Welfare, Helsinki, Finland

**Background:** Different factors affecting the central nervous system are considered as risk factors for bruxism. Among others, smoking and alcohol consumption are suggested to increase the risk. Smoking and alcohol drinking correlate strongly which may disturb their inde-
endent effects on bruxism. The aim of the present study was to investigate the possible independent effect of smoking and alcohol consumption on bruxism. **Methods:** The material derives from the Finnish Twin Cohort study consisting of 12,502 twin individuals (45.6% men, 54.4% women, mean age 44 years) born in 1930–1957. Twins responded to a questionnaire in 1990 (response rate of 77%) consisting of 103 multiple choice questions, seven dealing with tobacco use, four with alcohol use, and two with self-reported bruxism. **Results:** Expectedly, current smoking was less common among abstainers than among moderate or heavy drinkers (10% vs. 31% and 49%, respectively). Current smoking was an independent risk factor for bruxism in all models, with odds ratios (OR) varying between 2.3-2.7. Alcohol use raised the risk for weekly bruxism even when adjusted for smoking status (heavy drinking OR 1.9; 95% CI 1.23-2.84, binge drinking OR 1.6; 95% CI 1.26-2.12, and passing out due to alcohol at least 2 times during the last year OR 1.5; 95% CI 1.09-2.18). Both alcohol consumption and passing out due to alcohol intake lost their statistical significance in all-current smoker (current and occasional smokers combined) but the OR’s increased among non-smokers (never and former smokers combined) compared to estimates from analyses on all subjects. Binge drinking stayed statistically significant in both groups, although the OR for non-smokers was higher than for all-current smokers (2.1 vs. 1.5, respectively). Interaction analyses for “smoking by alcohol consumption, by binge drinking, or by passouts,” revealed no statistically significant interactions. **Conclusions:** Given the observed associations with smoking, alcohol drinking, binge drinking and passing out due to alcohol, the present results support our hypothesis of an independent association of both smoking, and alcohol use with bruxism. **Funding:** Dr. Rintakoski reports no funding. Dr. Kaprio was supported by the Academy of Finland Centre of Excellence on Complex Disease Genetics.

**P58**
**THE FIT2QUIT TRIAL: EFFECTS OF AN EXERCISE INTERVENTION FOR SMOKING CESATION ON PHYSICAL ACTIVITY, FITNESS, SELF-EFFICACY, AND MOTIVATION**
Vaughan ROBERTS1, Ralph MADISON1, Chris BULLEN1, Yannan JIANG1, Soren BRAGE2, Hayden McROBBIE3, Harry PRAPAVESSIS4, Marewa GLOVER5, Sue TAYLOR6, Paul BROWN7

1 National Institute for Health Innovation (NIHI), University of Auckland, New Zealand
2 MRC Epidemiology Unit, Institute of Metabolic Science, Addenbrooke’s Hospital, Cambridge, UK
3 UK Centre for Tobacco Control Studies, Wolfson Institute of Preventive Medicine, Barts & The London School of Medicine and Dentistry, Queen Mary, University of London, London, UK
4 School of Kinesiology, University of Western Ontario, London, Ontario, Canada
5 Centre for Tobacco Control Research, Social and Community Health, School of Population Health, University of Auckland, New Zealand

**Background:** Exercise has been proposed to mitigate the effects of tobacco withdrawal symptoms and weight gain following quitting, on relapse to smoking. The Fit2Quit trial sought to determine the effects of a home and community-based exercise intervention on smoking abstinence at six months when used as an adjunct to usual quitline support. We explored the effect of the Fit2Quit intervention on physical activity, fitness, body mass index (BMI), self-efficacy, and motivation. **Methods:** A prospective parallel two-arm randomized controlled trial. Participants (n=906) were randomized to a structured home and community-based exercise program plus usual care or to usual care alone. A sub-sample of 219 participants completed additional measures of body mass index (BMI), physical fitness, leisure exercise (Leisure Score Index [LSI]), self-efficacy and motivation. BMI and physical fitness were evaluated using analysis of covariance (ANCOVA). Self-efficacy, motivation, and the LSI were analysed using a repeated measures mixed model. **Results:** The main trial found no statistically significant differences between groups in smoking cessation rates (7-day point prevalence or continuous abstinence) at six months. Subgroup analyses revealed a significant mean difference in weekly leisure time exercise score of 9.18 (SE = 4.09, 95% CI: 1.12 – 17.23, p = .026) between intervention and control groups. There were no statistically significant intervention effects on physical fitness, BMI, self-efficacy, or motivation. **Conclusions:** A community based exercise intervention for smoking cessation in combination with usual care smoking cessation support delivered by the quitline can increase mean self-reported leisure time exercise at 6 months, compared with usual care alone, but has no effect on smoking cessation rates, self-efficacy, motivation, fitness, or BMI. **Funding:** This trial was funded by the Health Research Council of New Zealand, and the Heart Foundation of New Zealand. Mr Roberts is supported by a University of Auckland Doctoral Scholarship.

**P59**
**SHISHA SMOKING – COOL AND FUN? – THE NEXT WAVE!**
Leena SANKLA
Solutions 4 Health, Department of Tobacco Control, Reading, UK

Throughout England, smoking the water pipe shisha has become a trendy pursuit for the young. It is usually shared between friends and is seen to be an enjoyable and relaxing experience. However, very few understand the shocking truth, our team of researchers carried out a field study and spoke to a number of users on their perceived risks and undertook carbon monoxide readings at various time over a typically 60 minute session, this showed readings spinning to at least four times more than the amount produced by one cigarette! The poster presentation will share the results of this study, undertaken with a cohort of 87 participants, some dual users (cigarettes & Shisha)
and the readings taken at 15 minute intervals. The CO readings of our research team were also taken showing the impact of ‘passive’ smoking. Another key issue within the South Asian community is tobacco chewing, and how it is a culturally acceptable and a norm. Following a series of test purchases, these products were readily available and were sold in attractive packages, in some cases near the sweet counter from as little as 20p per single packet.

Funding: No Funding

P60
ENVIROMENTAL TOBACCO SMOKE AS A RISK FACTOR TO INCREASING RESPIRATORY CHILDHOOD INFECTION AND PNEUMONIA IN SOUTH-WEST REGION
Omiyela SEYE1, Osoba REMILEKUN2
1 Youth Action on Tobacco Control and Health (YATCH) 2 University College Hospital Ibadan

Background: There is consistent evidence that children exposed to environmental tobacco smoke (ETS) have higher incidence of asthma, ear- and throat disease, worsening of asthma symptoms and lung symptoms as cough, wheezing and pneumonia. A child exposed to ETS has about 30% higher risk of absence from school due to illness. Evidence clearly implicates (ETS) as a cause of lung cancer, excess respiratory disease, and cardiovascular disease mortality in non-smokers. Few studies have looked at the interaction of tobacco use or ETS exposure with occupational and ambient air pollution (both indoor and outdoor) in contributing to chronic obstructive pulmonary disorders in developing countries, or the importance of ETS as a risk factor for the already high burden of childhood respiratory infections. Method: A descriptive cross-sectional study was carried out in 5 states (Ogun, Lagos, Akure, Oyo and Ekiti). A multistage cluster random sampling was employed to select 450 families in each state. Data was collected using structured questionnaires by trained interviewers. Result: About 2113 records were available for analysis. There were 1298(60.7%) males and 815(38.1%) females aged 10 and below. A Majority, 807(38.0%) live with both parents, 213(10.0%) live with mother alone while 265(12.5%) live with relatives. The prevalence of children exposed to ETS in the southwest region Nigeria was 73.2%, the study further revealed that 28.5% of children in this region with respiratory childhood infection are exposed to environmental tobacco smoke and 18.4% pneumonia cases are attributed to ETS. However, (122, 14.7%) parents or relatives don’t see a problem with using tobacco products. It is also clearly stated that about 46.9% cases of respiratory childhood infection and pneumonia combined are caused by ETS in the south west region Nigeria. Conclusion: Since Environmental Tobacco Smoke has this much negative effects on children in the south west region Nigeria. Efforts should be tailored towards protecting children from ETS to reduce the rate of children exposed to ETS, thereby curbing or reducing respiratory childhood infection and pneumonia in Nigeria.

Funding: No Funding

P61
MENTHOLATED CIGARETTES AND SMOKING-RELATED CANCERS REVISITED: AN ECOLOGIC EXAMINATION
GC KABAT1, Nitin SHIVAPPA2, James HEBERT3
1 Department of Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, NY, USA 2 Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, USA 3 Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, USA

The U.S. Food and Drug Administration is assessing whether menthol should be banned as an additive to cigarettes. An important part of this determination concerns the health effects of mentholated relative to non-mentholated cigarettes. We examined the ecologic association between sales of mentholated cigarettes for the period 1950-2007, menthol preference by race and sex, and incidence rates of four tobacco-related cancers during 1973-2007. Total sales of menthol cigarettes (market share) increased from about 3% in 1950 to slightly less than 30% in 1980 and remained fairly stable thereafter. Additional data show consistently that, compared to White smokers, Black smokers favor mentholated cigarettes by roughly a 3-fold margin. Changes in the incidence of lung cancer, squamous cell cancer of the esophagus, oropharyngeal cancer, and laryngeal cancer by race and sex and trends over a 35-year period, during which menthol sales were relatively stable and during which Black smokers were much more likely to smoke menthol cigarettes compared to Whites, are not consistent with a large contribution of menthol, over and above the effect of smoking per se.

Funding: Work conducted at the University of South Carolina was supported by a grant from the National Cancer Institute, Center to Reduce Cancer Health Disparities (Community Networks Program Centers) to the South Carolina Cancer Disparities Community Network (SC-CDCN) [U54 CA153461 Hebert, JR (PI)]. Dr. Hébert also was supported by an Established Investigator Award in Cancer Prevention and Control from the Cancer Training Branch of the National Cancer Institute (K05 CA136975).

P62
CONCENTRATION OF CLASSIC AND NON-CLASSIC RISK FACTORS OF ISCHAEMIC HEART DISEASE IN BLOOD PLASMA OF PEOPLE EXPOSED AND UNEXPOSED TO TOBACCO SMOKE
Wojeich GNYP1, Izabela SZOLTYSZ-BOLDSY2, Wioleta ZIELINSKA-DANCH2, Bartosz KOSZOWSKI3, Maciej L. GONIEWICZ2, Andrzej SOBCZAK2,3
1 Department of Cardiology, Hospital 1, Sława, Poland 2 Department of General Chemistry, Medical University of Silesia, Sosnowiec, Poland 3 Institute of Occupational Medicine and Environmental Health, Sosnowiec, Poland
The aim of the paper was to define the influence of environmental tobacco smoke (ETS) and active cigarette smoking on the concentration of classic and non-classic risk factors in blood plasma, and to evaluate the legitimacy of widened examinations in primary prevention in people exposed to tobacco smoke. 211 volunteers (aged 30-67) were divided into: a group of people unexposed to tobacco smoke (reference group, 74 men), a group of passive smokers (57 men), and a group of active smokers (80 men). Examined has been the lipid profile, and from among the non-classic risk factors: C-reactive protein (CRP), fibrinogen, homocysteine, cysteine, asymmetric and symmetric dimethylarginine (ADMA and SDMA). The concentration of total cholesterol, the LDL fraction and triglycerides increased in the group of active smokers by 10,0%; 13,6%; 36,6%, respectively. The HDL concentration decreased significantly in active smokers by 13,8%. In passive smokers, the only significant decrease was noted for the concentration of the LDL fraction – by 9,3%. For the non-classic risk factors, in all examined groups, the changes in concentration of CRP, cysteine, ADMA and SDMA were statistically irrelevant. However, significant increase in plasma concentration of fibrinogen and homocysteine was observed both in passive and in active smokers (for fibrinogen by 7,3% and 11,0% respectively, and for homocysteine by 8,8% and 31,2%). Relevant were also the correlation between the concentration of fibrinogen and homocysteine and the concentration of cotinine in the entire examined population (r = 0,1800; p=0,0088 and r = 0,548; p<0,001, respectively). The BETA rates obtained by way of multiple factor regression indicate that cotinine has the strongest predictive properties as regards plasma concentration of fibrinogen and homocysteine. Among tobacco smokers, early diagnostics for cardiovascular diseases does not have to involve measurement of the concentration of CRP, cysteine, ADMA and SDMA - no interrelation between these compounds and exposure to tobacco smoke. However, biochemical examination of fibrinogen and homocysteine plasma concentration should be a routine element in this group of patients.

Funding: The study was partly supported by Research Grant N404 125 32/3706 of the Ministry of Science and Higher Education. The study protocol was approved by Medical University of Silesia Committee on Bioethics.

P63
DETERMINANTS OF DUTCH PRACTICE NURSES’ INTENTION TO IMPLEMENT A NEW SMOKING CESSATION INTERVENTION
ES SMIT, C HOVING, NE STANCZYK, H de VRIES
Maastricht University, the Netherlands

Background: Implementation of effective smoking cessation programs is often suboptimal. Therefore, a study was conducted to identify the determinants of Dutch practice nurses’ intention to implement a new smoking cessation intervention combining multiple computer tailoring messages and a counseling session. Moreover, this study aimed to identify the independent value of attitude and Roger’s innovation characteristics in determining the intention to implementation of this intervention. Methods: In 2010, 56 practice nurses filled out an Internet-based questionnaire about demographics, patient population characteristics, attitude, innovation characteristics, self-efficacy, perceived social influence and intention to implement the intervention. T-tests and Chi-square tests were executed to explore differences between practice nurses intending and not intending to implement. Correlation coefficients were calculated to identify associations between the potential determinants of the intention to implement the intervention. Regression analysis was used to detect significant determinants of the intention to implement. Results: The results indicated that both attitude and innovation characteristics were independently important in explaining practice nurses intention to implement the new smoking cessation intervention. Additionally, recruitment success and perceived social support from patients were shown to be significant determinants of the intention to implement. Conclusion: The main results of the study imply that to increase implementation rates it is essential to generate a positive attitude towards the intervention among practice nurses and to convince them of its beneficial characteristics. Furthermore, aiding practice nurses in successfully recruiting smoking patients and creating more perceived patient support might be strategies to increase practice nurses’ intention to implement.

Funding: The study was funded by the Dutch Cancer Society (UM 2007-3834)

P64
EXPECTATION ABOUT SMOKING IN ADOLESCENTS AND ADULTS: A LONGITUDINAL STUDY
Jorien L TREUR, Dorret I BOOMSMA, Jacqueline M VINK
Department of Biological Psychology, VU University, Amsterdam, the Netherlands

Background: Intention to quit smoking is essential to understand quitting behavior. This longitudinal study explored ‘expectations about smoking’, regardless of smoking status, i.e. it quizzed participants on their intentions about future smoking regardless of their current smoking status. The study had three aims; 1. Determining if and how expectation about smoking is associated with other smoking variables and demographical characteristics through cross-sectional analyses. 2. Determining the predictive value of expectation about smoking on future smoking status through longitudinal analyses. 3. Testing the additive value of expectation about smoking as a predictor for smoking status when other significant variables are taken into account. Methods: Subjects are registered with the Netherlands Twin Registry. Expectation about smoking was measured in multiple surveys between 1993 and 2011 in 8997 adolescents (aged 14-18, 3485 subjects with two consecutive surveys), and between 1993 and 2004 in 16787 adults (aged 18+, 11250 subjects with two consecutive surveys). Participants were asked ‘Do you think you’ll smoke in a year’s time?’. Answer categories ranged from ‘Certainly not’ to ‘Absolutely’. Regression analyses that tested the three aims were...
performed in STATA. Results: In adolescents, expectation about smoking is significantly associated with smoking frequency, number of cigarettes a day, age of first cigarette, self-perceived health and social economic status (SES) in smokers and with SES in ex-smokers. For adults, there is a significant association with the Fagerström Test for Nicotine Dependence (FTND), number of cigarettes a day, number of previous quit attempts, number of years smoked and SES in smokers and FTND, SES, sex and age in ex-smokers. There is a significant, positive association with future smoking status which remains significant after adding the other associated variables. Conclusions: Expectation about smoking is associated with several important smoking characteristics, and is a good measure for predicting future smoking status. In never smokers it predicts initiation of smoking, where in (ex) smokers it predicts continued smoking or relapse. Funding: ERC starting grant 284167 obtained by Dr. Jacqueline M Vink

P65
SMOKING IS ASSOCIATED WITH GENERAL PSYCHIATRIC SYMPTOM SEVERITY AND NOT WITH SPECIFIC SYMPTOM FACTORS IN A LARGE COMMUNITY SAMPLE
Róbert URBAN¹, Bernadette KUN¹, Borbála PAKSI², Zsolt DEMETROVICS¹
¹ Institute of Psychology, Eötvös Loránd University, Budapest, Hungary
² Center of Behavioral Sciences, Corvinus University of Budapest, Budapest, Hungary

Smoking is associated with psychiatric problems; however the pattern of the association is less frequently investigated. Two alternative hypotheses were formed: (1) smoking is associated with specific psychiatric symptoms; (2) smoking is associated with the global severity of psychiatric symptoms. Data were collected in the frame of the National Survey on Addiction Problems in Hungary in 2007. The national representative sample included 2,710 adults. Psychiatric symptoms were assessed by the Symptom Checklist (SCL-90-R). Smoking behaviour and dependence was assessed by the Fagerstrom Test of Nicotine Dependence (FTND) and five self-report questions. Comparison of daily smokers and nonsmokers revealed that smokers have higher scores on all psychiatric symptoms (somatization Cohen d=0.17; obsession-compulsion d=0.13; interpersonal sensitivity d=0.11; depression d=0.17; anxiety d=0.19; hostility d=0.22; phobia d=0.12; paranoia d=0.19; psychoticism d=0.12; global severity d=0.18). Nicotine dependence (FTND) however did not correlate significantly with any psychiatric symptoms among smokers. We performed SEM analyses in which a bifactor model (global severity factor (GSF) and specific factors) of SCL-90-R regressed on current smoking status (daily smokers vs. non-smokers). Only GSF predicted positively the smoking status (Probit B=0.13 p<.0001). However, two separate analyses in men and women revealed that GSF significantly predicts smoking status only in women (Probit B=0.24 p<.0001). The associations between smoking and psychiatric symptoms can be explained with the global severity of symptoms and not with the specific factors such as depression, anxiety in a nonclinical sample. The association between smoking and psychiatric symptoms differs in men and women. Funding: The project was supported by the European Union and the European Social Fund under Grant Agreement No. TAMOP 4.2.1./B-09/1/KMR-2010-0003. This publication was also supported by Grant Number 1 R01 TW007927-01 from the Fogarty International Center, the National Cancer Institute, and the National Institutes on Drug Abuse, within the National Institutes of Health (NIH).

P66
QUIT AND WIN 2009 IN FINLAND: ONE-YEAR FOLLOW-UP RESULTS
Eeva R. VARTIAINEN
North Karelia Center for Public Health, Joensuu, Finland

Background: North Karelia Center for Public Health organizes a Quit and Win (Q&W) contest in Finland every year. The idea of the contest is to abstain from tobacco for the contest period. Adult (> 18 years old) daily smokers can register for the contest. At the end of contest, there is a draw for prizes among the contest participants (abstinence is verified by a witness and by a biochemical test). In 2009 there were two Quit and Win contest periods: 1) a 4-week contest in May and 2) a 6-month contest from May until end of October. There were 2228 participants: 16 % took part in the 4-week contest and 84 % in the 6-month contest. About half were women and half men. 96 % smoked cigarettes and 4 % other tobacco products (snus, cigars, pipe). More than half had tried to quit smoking more than 3 times. A one-year follow up survey of the contest participants was organized every other year. The objective of the Q&W 2009 survey was to detect the smoking status of the participants after one year from the start of the contest. Questions regarding withdrawal symptoms, used medications and support etc. were also asked. Methods: A random sample of 500 contestants in the QW 2009 was surveyed by mail during May and June 2010. One reminder was sent to non-respondents in June 2009. Abstinence rates in the follow-up surveys were calculated as the proportion of abstainers among the purified follow-up sample, in which all non-respondents were considered smokers. Results: The continuous abstinence rate was 22 % and the point abstinence rate 28 %. The participants in the 6-month contest period seem to succeed better than those taking part in the 4 week contest. The use of NRT with the successful quitters has reduced. The main results of the one-year follow up survey will be presented. Conclusions: The majority of the participants entered the Quit and Win competition with the firm intention to quit using tobacco for good. Even though the support from the health care has increased from the previous surveys, less than 10 % got support from health care sector. Also employers should support their employees more - non-smoking workers mean less sick leave days. Funding: Funded by Finland's Slot Machine Association (RAY)
Background: The tobacco epidemic model states that the first group to take up smoking were men with higher social status followed by women with lower status and women. Women with low education should be the last group to stop smoking. To better understand changes in smoking over time, this paper examines net age, period and cohort effects on smoking according to gender and education in Norway in the period 1976-2009. Method: Data came from cross-sectional surveys of smoking behavior conducted yearly from 1976 to 2009. Using a pseudo-cohort approach, net age, period and cohort effects on smoking were calculated from aggregated survey data. Outcome variable was mean smoking prevalence. Independent variables were age (25-74), age-squared, birth cohort (1910-1980) and cohort-squared. Education and gender were entered as dummy variables. A transformed year variable (orthogonal to a time trend) was entered as dummy-variables. Interactions between education/gender and age/cohort were included to model the tobacco epidemic. Results: For both genders, probability (p) of smoking decreased with age. For men with tertiary education p(smoking) remained around 0.30 from age 20-40 before dropping sharply. Among men with primary/secondary education, p(smoking) fell with around 7‰ in both education groups but was 0.20 points lower for cohorts with tertiary education. Among women with primary/secondary education, p(smoking) increased from 0.29-0.37 in early cohorts (born 1910-1945) before decreasing to 0.29. Among women with tertiary education, p(smoking) decreased with each successive cohort and ranged from 0.24 (1910) to 0.05 (1980). Conclusion: Age effects on smoking were similar in all groups. Differences in cohort effects indicate that smoking among Norwegian adults fits the pattern predicted by the tobacco epidemic model. Women with primary/tertiary education were the last group in which smoking rose before decreasing and the probability of smoking is still high in late birth cohorts.

Funding: Research Council of Norway (project no. 190443, “Tobacco and the social inequality gap”) and the Norwegian Institute for Alcohol and Drug Research.
P69
EMERGENCY DEPARTMENT-INITIATED TOBACCO CONTROL: SYSTEMATIC REVIEW AND META-ANALYSIS
B. NEUNER1,2, E. WEISS-GERLACH1, J. WELLMANN2, H.W. HENSE2, G.L. RABE2, C. SPIES1
1 Chanté-Universitätsmedizin Berlin, Department for Anesthesiology, Operating-Room Management and Intensive Care Medicine, Berlin, Germany
2 Institute of Epidemiology and Social Medicine, Clinical Epidemiology Section, University of Muenster, Muenster, Germany

Introduction: A 2006 joint statement of US American Emergency Physicians called on emergency care providers to routinely screen emergency department (ED) patients for their smoking status and to support smokers to quit. The effectiveness of emergency department-initiated tobacco control (ETC) is unclear. Systematic review and meta-analysis of randomized controlled trials (RCTs) examining the efficacy of ETC. Methods: Following the PRISMA statement, in October 2010, 6 electronic databases were searched using predefined search terms. Outcome was the number of abstinent smokers at each follow-up. Relative risks of ETC on point prevalence abstinence were calculated separately for each study and follow-up time and, pooled at different follow-up times, by Mantel-Haenszel relative risks. The effects of ETC on combined point prevalence abstinence across all follow-up times were calculated using generalized linear mixed models. Results: The literature search identified 7 relevant studies (3 of moderate and 4 of weak quality according to the Quality Assessment Tool for Quantitative Studies with a total of 1986 participants) out of 4371 records. Follow-up time varied between 3 and 12 month and the rate of abstinent smokers varied between 0% and 16%. The strongest effect of ETC on point prevalence abstinence was found at one month: Relative risk (RR) = 1.47 (95% confidence interval (CI): 1.06 to 2.06), 3 studies, while the effect at 3, 6, and 12 months was RR = 1.24 (95% CI: 0.93 to 1.65), 6 studies; 1.13 (95% CI: 0.86 to 1.49), 5 studies; and 1.25 (95% CI: 0.91 to 1.72), 1 study; respectively. The benefit on combined point prevalence abstinence was RR = 1.33 (95% CI: 0.96 to 1.83), p = 0.075, 7 studies; with RR = 1.33 (95% CI: 0.92 to 1.92), p = 0.100, for the 5 studies featuring motivational interviewing combined with booster phone calls. Conclusions: The main finding of this systematic review and meta-analysis of RCTs evaluating ETC was a trend towards increased combined point prevalence abstinence. Sensitivity analyses indicated that this trend was based on ETC in the form of motivational interviewing in combination with booster phone calls. More methodologically rigorous trials are needed.

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P70
THE ROLE OF SCHOOL ACHIEVEMENT, PARENTAL SMOKING AND PEER SMOKING IN THE SMOKING CESSATION AND TOBACCO DEPENDENCE
Marijana PENNANEN1,2, Ari HAUKKALA3, Ulla BROMS1,2, Erkki VARTIAINEN2
1 Department of Public Health, University of Helsinki, Finland
2 National Institute for Health and Welfare (THL), Helsinki, Finland
3 Department of Social Research, University of Helsinki, Finland

Background: This study examines whether Finnish adolescents’ school achievement, parental smoking and best friend’s smoking at the beginning of the eighth grade were related to the ninth grade smoking cessation and tobacco dependence measured by the one item of Fagerström Test for Nicotine Dependence: time to first cigarette. Methods: The study is part of the European Smoking prevention Framework Approach (ESFA). The sample consists of 916 Finnish students from 27 upper comprehensive schools in the Helsinki area. Participated students had at least tried smoking by the eighth grade. The longitudinal data were collected using self-reported questionnaires at two separate occasions between the years 1999 and 2001: at the beginning of the eighth grade and end of the ninth grade. Results: At the beginning of the eighth grade lower levels of school achievement (OR=0.70 CI 95% 0.58 to 0.85), parental smoking (OR=0.73 CI 95% 0.53 to 0.99) and smoking of best friend (OR=0.63 CI 95% 0.44 to 0.90) decreased likelihood of smoking cessation among ninth graders. Doing poorly at school (OR=1.12 CI 95% 0.88 to 1.35), having smoking parents (OR=1.13 CI 95% 0.70 to 1.55) and best friends who were smokers (OR=1.69 CI 95% 1.23 to 2.16) were associated with an increased likelihood of tobacco dependence. Conclusion: To reduce health inequalities a strong input on continuing research to improve smoking cessation methods especially for students with low school grades and for students whose parents or close friends smoke, is needed.

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P71
CROSS-SPECIES EFFECTS OF NICOTINE ABSTINENCE ON REWARD RESPONSIVENESS: MOVING TOWARDS CONSILIENCE
Michele L. PERGADIA1, Andre DER-AVAKIAN2, Manoranjan S. D’SOUZA2, Pamela A.F. MADDEN1, Andrew C. HEATH1, Saul SHIFFMAN3, Athina MARKOU2, Diego A. PIZZAGALLI 4
1 Department of Psychiatry, Washington University School of Medicine, St. Louis, MO, USA
2 Department of Psychiatry, University of California at San Diego, USA
3 Department of Psychology, University of Pittsburgh, USA
4 Department of Psychiatry, Harvard Medical School, Boston, USA

These authors contributed equally to the work reported
Nicotine withdrawal-related negative affect is an important predictor of relapse to smoking in humans, and validation of an objective measure of reward responsiveness may shed light on this process. Animal models can be effectively used to identify neurobiological mechanisms underlying decreased reward responsiveness during nicotine withdrawal. Importantly though, for animal research on nicotine to be relevant to human smoking and treatment, it is important to conduct parallel research on the effects of abstinence on humans and experimental animals. Using a reward responsiveness task optimized across species with a conceptually identical paradigm rooted in signal detection theory, we examined whether reward responsiveness varied from: 1) a baseline nicotine-saturated condition to a 24-hour acute nicotine abstinence condition in human smokers (N=31); and 2) in Wistar rats that had been administered nicotine (N=10) or saline (N=12) through osmotic pumps for 29-days followed by discontinuation for 24 hours before testing reward responsiveness. Analysis of variance found a significant decrease in reward responsiveness in human smokers during 24-hours nicotine abstinence (p<.05), and a trend towards decreased reward responsiveness in the nicotine treated vs. saline treated rats (p =.078). While these findings will require replication and future additional cohorts to increase power, these data converge in suggesting that humans and rats react similarly to nicotine abstinence with decreased reward responsiveness. In conclusion, by establishing behavioral homology across humans and rodents based on a measure of reward responsiveness we lay the foundation for identifying neurobiological substrates mediating decreased reward responsiveness during nicotine withdrawal and translational treatment development for smoking cessation.


P72 OCCASIONAL SMOKERS’ ACCOUNTS OF SMOKING AND IDENTITY: A QUALITATIVE INTERVIEW STUDY
Rikke TOKLE, Janne SCHEFFELS
The Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

Background: Most smokers smoke daily. Studies find daily smokers to be overrepresented among people with bad health and with low socioeconomic status. Occasional smokers (OS) are in ways different. They are a diverse group when it comes to age, amount and history of smoking. Studies find that OS attend higher education and have higher income than regular smokers. 10% in Norway are occasional smokers, nearly 15% in the age group 16–34 years. Aims: To examine how OS talk about their use of cigarettes and explore the accounts in relation to issues of legitimacy, meaning and identity. Methods: Qualitative in-depth interviews with OS (N= 18) aged 24–32 were conducted, aiming to grasp interviewees’ narratives and understanding of smoking and identity. The interviews were semi structured, lasted 1-2 hours and raised questions on history of smoking, identity, cigarettes as a symbol, presentation of self and rituals, among others. Results: Preliminary analysis shows that the informants often explain their own smoking, by explaining how they don’t smoke. For example; they do not smoke alone, not when they are at work, and not because they are addicted to nicotine. They smoke for pleasure. Occasional smoking is guided by a number of unwritten rules and connected to particular situations. From the young OS’ accounts, an underlying story of control evolves. The story of control is however characterized by contradictions and paradoxes: for example when smoking in a stressful situation, as comfort or binge smoking in combination with alcohol. Conclusion: The young OS’accounts indicates that they understand themselves in contrast to daily smokers: as in control and not addicted, as smoking because of lust, not of need. By distinguishing themselves from regular smokers they neutralize their own smoking, constructing an identity as OS and even “non smokers that sometimes smoke”. Understandings of how occasional smokers see their own smoking is a key to include this group of smokers in future tobacco preventive work.

Funding: Norwegian Institute for Alcohol and Drug Research

P73 TESTING A MULTIDIMENSIONAL APPROACH TO NICOTINE DEPENDENCE IN ADOLESCENTS
Róbert URBAN1, Mark WOLFSON2, Erin L. SUFTIN2, Zsolt DEMETROVICS1
1 Institute of Psychology, Eötvös Loránd University, Budapest, Hungary
2 Department of Social Sciences and Health Policy, Wake Forest University School of Medicine, Winston-Salem, NC, USA

Previous research has identified a three-dimensional model of nicotine dependence in adolescents referring to behaviors, craving and nervousness when the individual cannot smoke. Our aim is to test the multidimensional approach of nicotine addiction in a longitudinal study and identify the pattern of change during adolescence. Data were collected in a representative cohort study of Hungarian adolescents. The present analysis includes only adolescents who smoked at least 1 cigarette during the past 30 days (N=1954) at any wave. Nicotine dependence was measured using the items on a modified Fagerström Tolerance Questionnaire and the Hooked on Nicotine Checklist in all waves. Applying confirmatory factor analysis, the three-factor model yielded superior fit compared to the one-factor model in all waves. Latent growth analyses revealed a significant positive linear slope in craving and nervousness and a small negative linear slope in behavioral aspects. Three separate latent class growth analyses with behaviors, craving and nervousness were performed. Two classes were identified in all three analyses. One class (33.2%) demonstrated increasing craving and one class (29.7%) demonstrated increasing nervousness. The other classes demonstrated the stability of craving or nervousness. Only one small class (1%) displayed
an increasing level of behavioral dependence, and one major class revealed stability of behavioral dependence. The three aspects of nicotine addiction change differently during adolescence. Although environmental control over smoking behaviors might hinder the development of behavioral aspects of dependence, increasing levels of craving and nervousness when one cannot smoke identified approximately one-third of adolescents at risk of future dependence.

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POSTER SESSION 2: SATURDAY 1 SEPTEMBER

P74 PRETESTING OF PICTORIAL HEALTH WARNING PICTURES AND MESSAGES IN NEPAL
Suresh TIWARI1, Syaron BASNET2
1 Health Financing, Nepal Health Sector Support Programme (NHSSP), Ministry of Health and Population (MoHP), Nepal
2 University of Eastern Finland, Kuopio, University of Turku, National Institute for Health and Welfare (THL), Helsinki, Finland

Nepal has made a significant progress in tobacco control through the endorsement of a progressive national ‘Anti-Tobacco Act -2011’. To control tobacco use in the country, a bill with provision of 75% pictorial health warnings in a pack of cigarette and tobacco products in the total areas of the outer side of the pack has been passed. The pre-testing of pictorial health warning pictures and warning message was executed with an objective to understand the perception of youth about testing pictorial health warnings pictures and messages in cigarette packs. Issue centered discussion was implemented among the 54 participants in 6 groups and self administered questionnaires were executed among 221 school children. The pre-testing aimed to contribute in motivating smokers to quit smoking, in convincing youth not to start smoking and chew tobacco, in helping ex-smokers to stay quitting tobacco use and in informing public on health hazards danger of tobacco use. Comparatively picture 9 was able to grab the highest percentage of attention. Majority of the respondents believed that pictures 2, 7 and 9 can motivate tobacco users to quit the tobacco use and motivate youth not to start smoking and chew tobacco. Majority of the respondents believed that pictures 3, 7 and 9 can be effective in informing public on harmful impacts of smoke and re-convincing ex-smokers to stay on not smoking. 32.5% of the respondents believed that picture 7 will be the most effective picture in motivating smokers and chewing tobacco users to quit 22.9% believed it would convince youth not to start smoking and use of chewing tobacco, 30.2% said it would be effective informing the public about the harms of smoking and chewing tobacco and 26.5% believed that the picture will be useful in re-convincing the ex-smoker to stay on quit smoking or chewing tobacco. People participating to the group discussion organized, mostly believed that picture 7 will be very effective among the newly married couples and will sensitize them about the harmful effects of smoking and it will emotionally sensitize people and help reduce smoke intake in the community.

Funding: The survey was funded by National Health Education, Information and Communication Centre (NHEICC) Teku, Kathmandu, Nepal under the Department of health services (DoHS)
P75
IDENTIFYING ACTION AND NEED FOR HEALTH CARE PROFESSIONAL BRIEF AND VERY BRIEF TRAINING NEEDS ACROSS EUROPE - METHODS AND RESULTS OF A SCOPING EXERCISE
Emma CROGHAN1, Andy McEWEEN2
1 North 51, Nottingham UK and NCSCT, UK
2 NCSCT, UK

Global Bridges is a worldwide science-based initiative to help health care providers unite to treat tobacco dependence while advocating for effective tobacco control policies. Supporting smokers to stop is an important element of public health and tobacco control policy and action. To be able to maximise the potential for improved public health and reduce smoking prevalence, countries need effective infrastructure that includes all health systems and service providers identifying risks to health and offering patients solutions to those risks. Levels of health care professional knowledge, attitudes and behaviours about tobacco dependence treatment vary widely despite the fact that brief interventions by trained health care professionals double the rate of quit attempts. Many countries provide tobacco dependence services to help people stop smoking, but these may be underutilised if health care professionals are not supported to identify and offer action to smokers when they present. This Global Bridges European Scoping exercise was carried out to identify and determine which European countries might be willing and able to receive evidence-based support and assistance with training of health care professionals. The scoping exercise included three phases of activity: Phase 1 (web search), Phase 2 (direct country contact) and Phase 3 (face to face exploratory meeting with selected countries). The scoping included ALL European countries, with the widest possible inclusion criteria, therefore the total number of countries scoped was 52. This presentation will discuss the methods used, and outcomes of each phase of work, and will conclude by presenting the total process and conclusions/recommendations.

Funding: Funded by Global Bridges

P76
TOBACCO LOBBYING IN FRANCE DURING 5 YEARS OF CHIRAC PRESIDENCY AND 5 YEARS OF SARKOZY PRESIDENCY FROM THE BEST TO THE WORST
Bertrand DAUTENBERG, Joseph OSMAN
Office Français de prévention du Tabagisme (OFT), France

Over the last decade, both French presidents, Jacques Chirac and Nicolas Sarkozy are from the same political party. The only difference between them, in terms of tobacco control, is that one president has closed the door to tobacco lobbyists, while the second left the same door open. From 2002 to 2007, during the five year Jacques Chirac term, France has experienced one of the best improvements of tobacco control ever seen. These results led to a significant drop from 82 to 54 billion of cigarettes sold within 18 months, a 76% decrease in daily smoking rate in Paris 12-15 year old schoolchildren, a 23% reduction in smoking among 17 year old teenagers according the Escapad national survey, a decline by 4% of daily smokers in adults according to Inpes, an estimate of 20 000 lives saved and fresh air for all after the total smoking ban in public places and at work decided in November 2006. During this period the tobacco lobbyists have tried to act, but president Jacques Chirac (who had officially declared war to tobacco in March 2003) has increased taxes by 39% increasing at the same time the price of the most popular packs by 1.4€ and closed them the door. In total opposition during the Nicolas Sarkozy's 2007-2011 term, France has not known any significant benefit in tobacco control. The cigarette sales remain 54 billion per year. Among 12-15 years old, smoking rate has increased by 35%. The National Survey Escapad on 17 years old shows a catastrophic policy in terms of tobacco control led to disastrous results with 10 000 lives of smokers not saved. At the same time, the tobacco industry has collected a cumulative additional 1.055 billion euros and the tobacco industry got 562 million euros. The increase of the price of most popular cigarettes brands has been then of 1.2 € and was planned to increase up to 1.6 € by small 6% steps organized by the tobacco industry. This gives a distressing caricature of the submission of France to the desiderata of tobacco lobbyists.

Funding: No funding
monthly sales of each smoking cessation therapy were analysed. The time series of smoking cessation therapies sales (units and value) from November 2009 to September 2010 were compared with the period from November 2010 to September 2011. **Results:** One year before the smoking ban mean monthly sales of smoking cessation therapies were as following (units; mean±SD): for nicotine patches 36,109±13,155, for nicotine gums 66,701±10,909, for Champix 20,883±3,706, and Zyban 684±222. One year after the ban the mean values were as follows: for nicotine patches 28,382±8,314, for nicotine gums 53,042±10,999, for Champix 19,128±2,203 and Zyban 599±110. We did not observed any significant changes in smoking cessation therapies sales during one year after the introduction of the 2010 Polish smoke-free legislation (p<0.05). **Conclusions:** These data suggest no changes in smoking cessation behaviour with pharmacological support in the period of one year after the introduction of the 2010 Polish smoke-free legislation. Real-time monitoring of existing non-traditional surveillance data, such as pharmacy sales of smoking cessation products, can help assess the effects of public policies on smoking quit attempts. **Funding:** No Funding
RAPID RESPONSE POSTER PRESENTATIONS
POSTER SESSION 2: SATURDAY 1 SEPTEMBER

RRP1
ALLOPREGNANOLONE BY MENSTRUAL PHASE DURING SHORT-TERM SMOKING CESSION
Alicia ALLEN, Sharon ALLEN, Harry LANDO, Mustafa al'ABSI, Bernie HARLOW
University of Minnesota, USA

Background: Allopregnanolone (ALLO) is a neuroactive steroid metabolized from progesterone and, therefore, varies by menstrual phase. Recent preclinical research indicates that ALLO may protect against drug abuse behaviors. Given that risk for relapse varies by menstrual phase, this study characterizes ALLO by menstrual phase and smoking status in a sample of premenopausal female smokers. Methods: Utilizing a 2x2 cross-over trial design, participants (n=84) were randomized to completed two testing weeks in the follicular (F) menstrual phase followed by the luteal (L) phases or vice versa (L-F). The testing week consisted of two days of ad libitum smoking followed by four days of biochemically verified smoking abstinence. Blood samples were collected during ad libitum smoking and on the fourth day of smoking abstinence. Descriptive statistics were computed to describe the study sample and ALLO levels. Paired t-tests were used to compare ALLO levels by menstrual phase and smoking status. Results: Participants were, on average, 30.1±6.7 years old and smoked 12.6±5.7 cigarettes/day. Most (73%) were White and had at least a High School education (64%). The average ALLO level during F phase decreased significantly from 0.88±0.29 ng/mL during ad libitum smoking to 0.79±0.32 ng/mL on the fourth day of smoking abstinence (t-value=2.03, p-value=0.047). Conversely, during the L phase, ALLO levels increased significantly from 2.93±1.65 ng/mL during ad libitum smoking to 3.83±1.67 ng/mL on the fourth day of smoking abstinence (t-value=4.71, p-value<0.001). Conclusion: ALLO levels varied by menstrual phase and smoking status in premenopausal women. Given that previous research has indicated L phase is associated with improved smoking cessation outcomes, an increase in ALLO during short-term abstinence is important to study. Women ≥ 40 years old, who wanted to quit smoking were recruited to participate in a smoking cessation study and randomized to an exercise or relaxation intervention. Prior to study enrollment participants had to attend two clinic visits - orientation (an informational session) and screening (formal assessment of eligibility criteria). Dependent variables included attendance to orientation and screening visits. Independent variables, collected via self-report on the initial phone screen, included: demographics (age, race, education), recruitment source (print, television, radio, internet, referral), motivation (for smoking cessation, exercise and relaxation), cigarettes/day, travel time from home to clinic, and number of major medical problems. Descriptive statistics were computed to describe the study sample. Chi-square and t-tests were used to identify predictors of study visit attendance. Results: Participants (n=396) were, on average, 54.5±5.9 years of age and smoked 18.5±7.7 cigarettes/day. Of 396 scheduled orientation visits, 254 (66%) were attended. Predictors of orientation attendance included age (t=−3.7, p<0.001), education (chi-square=11.1, p=0.050), race (chi-square=20.0, p=0.001), travel time (t=−2.43, p-value=0.016) and recruitment source (chi-square=25.8, p<0.001). Of 224 scheduled screening visits, 151 (67%) were attended. Predictors of screening attendance included education (chi-square=20.0, p<0.005) and number of medical problems (t=−2.24, p=0.027). Motivation and cigarettes/day were not predictive of attendance to either clinic visit. Conclusions: Predictors of enrollment into this smoking cessation trial included demographic variables and recruitment source, but not variables specific to smoking behavior. Additional research is needed to explore how these predictors may influence study outcomes and how results may vary in other populations. Funding: NIDA R01DA024872

RRP2
PREDICTORS OF ENROLLMENT OF OLDER WOMEN IN A SMOKING CESSATION STUDY
Katherine HARRISON1, Lindsay FARNSWORTH1, Alicia ALLEN1, Sharon ALLEN1, Cheryl ONCKEN2
1University of Minnesota
2University of Connecticut

Background: Research on effective recruitment strategies in clinical research is limited. This project aims to identify predictors of enrollment, including type of recruitment strategy, into a smoking cessation study. Methods: Women ≥ 40 years old, who wanted to quit smoking were recruited to participate in a smoking cessation study and randomized to an exercise or relaxation intervention. Prior to study enrollment participants had to attend two clinic visits - orientation (an informational session) and screening (formal assessment of eligibility criteria). Dependent variables included attendance to orientation and screening visits. Independent variables, collected via self-report on the initial phone screen, included: demographics (age, race, education), recruitment source (print, television, radio, internet, referral), motivation (for smoking cessation, exercise and relaxation), cigarettes/day, travel time from home to clinic, and number of major medical problems. Descriptive statistics were computed to describe the study sample. Chi-square and t-tests were used to identify predictors of study visit attendance. Results: Participants (n=396) were, on average, 54.5±5.9 years of age and smoked 18.5±7.7 cigarettes/day. Of 396 scheduled orientation visits, 254 (66%) were attended. Predictors of orientation attendance included age (t=−3.7, p<0.001), education (chi-square=11.1, p=0.050), race (chi-square=20.0, p=0.001), travel time (t=−2.43, p-value=0.016) and recruitment source (chi-square=25.8, p<0.001). Of 224 scheduled screening visits, 151 (67%) were attended. Predictors of screening attendance included education (chi-square=20.0, p<0.005) and number of medical problems (t=−2.24, p=0.027). Motivation and cigarettes/day were not predictive of attendance to either clinic visit. Conclusions: Predictors of enrollment into this smoking cessation trial included demographic variables and recruitment source, but not variables specific to smoking behavior. Additional research is needed to explore how these predictors may influence study outcomes and how results may vary in other populations. Funding: NIDA R01DA024872

RRP3
NICOTINE WITHDRAWAL DURING SHORT-TERM ABSTINENCE: DO SOCIAL AND ENVIRONMENTAL FACTORS PLAY A ROLE?
Nicole TOSUN, Alicia ALLEN, Sharon ALLEN
University of Minnesota

Background: Smoking is the leading cause of preventable death in the United States and while more men than women currently smoke, the gender gap is narrowing. Emerging evidence suggests that women have a more difficult time quitting than men and have greater withdrawal symptoms putting them at an even greater risk of the dangers of smoking. While the reasons for this phenomenon are not fully understood, one hypothesis is that social and environmental factors may play a role. The present study explores whether social factors, as well as house rules on smoking, are associated with withdrawal symptoms in women smokers during short-term abstinence. Methods: This is a secondary data analysis from a larger study on menstrual phase and depressive symptoms during short-term smoking abstinence. Data was collected on social factors, house rules on smoking, smoking behavior, and demographics. In addition, data from the Minnesota Withdrawal Scale (MNWS) was collected on
the second day of smoking abstinence. A one-way analysis of variance investigated differences in craving (an item on the MNWS), as well as total withdrawal symptoms during short-term smoking abstinence by social factors and house rules. Results: Participants (N=152) were 28.7 (±6.8 SD) years of age and smoked 12.1 (±5.8 SD) cigarettes per day. Craving scores were higher in those participants who were allowed to smoke anywhere in the home (3.34±0.87), followed by some places (3.27±0.92) and nowhere (3.01±1.98; t=1.86; p=0.07). After controlling for race and age, craving scores were lower in participants who had only a few or no friends and family that smoked (2.88±0.91) followed by less than half or half and more than half or all (3.28±0.92, 3.23±0.98, respectively; t=2.67; p=0.07). No significant differences were found in craving or total withdrawal by social factors or house rules. Conclusion: These data suggest that some social and environmental factors such as restricting smoking in the home and the number of friends and family who smoke may play a role in withdrawal during smoking abstinence in women. Further studies are needed to examine how these findings may play a role in smoking cessation. Funding: This study was funded by a Pfizer GRAND Award

RRP4
EFFECTS OF VARENICLINE ON ASPECTS OF INHIBITORY CONTROL IN SMOKERS
A.J. AUSTIN1, T. DUKA2, J. RUSTED2, A. JACKSON1
1 School of Pharmacy and Biomolecular Sciences, University of Brighton, Brighton, UK
2 School of Psychology, University of Sussex, Brighton, UK

Background: Varenicline, a partial agonist at alpha4beta2 nicotinic receptors (nAChRs) aids smoking cessation by reducing craving (Patterson et al, 2009 Biol Psychiatry 65:144–149). Successful quitting may be associated with greater inhibitory control (Bickel et al, 1999 Psychopharmacology 146:447–454) but the effectiveness of varenicline in this regard is unknown. Methods: Eighty participants took part in a randomized, double-blind, placebo-controlled study investigating the cognitive and subjective effects of varenicline 1mg (or matched placebo) in satiated and abstinent smokers. Tests included Rapid Visual Information Processing (RVIP) stop signal (SS) and prospective memory (PM) administered at baseline and three hours after varenicline/placebo. Results: Smoking enhanced RVIP accuracy and latency to respond (p’s<0.05). Varenicline did not alter RVIP performance, nor the effect of smoking on RVIP, suggesting that this effect might be unrelated to alpha4beta2 nAChRs. In contrast, for the SS task, smoking increased the number of errors on stop trials and increased the stop latency (p’s<0.05) indicating that smoking decreased inhibitory control. On its own, varenicline increased errors slightly, but it reduced the smoking-induced increase in errors (p<0.05) showing a partial agonist profile and indicating a role for alpha4beta2 nAChRs. Varenicline had no effect on stop latencies. There was no effect of smoking or varenicline on PM accuracy per se. However, smoking and varenicline differentially protected against the cost to performance of the ongoing task that would normally be observed when the prospective intention was introduced; whilst smoking reduced the decrement in hits regardless of drug treatment, varenicline improved reaction times in both satiated and abstinent smokers (p’s<0.05). Conclusions: These data suggest that varenicline can improve some aspects of inhibitory control related to prospective memory and that it can also block smoking-induced decreases in response inhibition. Funding: No funding

RRP5
DIFFERENT URINARY COTININE CUTOFF TO DISTINGUISH SMOKERS FROM NON-SMOCKERS IN SOUTH KOREA
Hong-Jun CHO1, Kyunghee JUNG-CHOI2, Young-Ho KHANG3
1 Asan Medical Center, University of Ulsan College of Medicine, South Korea
2 Ewha Womans University School of Medicine
3 University of Ulsan College of Medicine

Objective: We tried to identify an optimal cotinine cutoff concentration distinguishing between smokers and non-smokers in South Korea. Methods: Data from 4,529 men and 5,424 women in the 2008–2009 Korean National Health and Nutrition Examination Survey were analyzed. Receiver operation characteristic curve analysis was used to identify an optimal cutoff of urinary cotinine. Results: The cutoff for the urinary cotinine concentration with a maximal probability of correct classification was 104.7 ng/mL in men and 268. ng/mL in women. The sensitivity was much higher in men (96.6% vs. 85.3%) whereas the specificity was higher in women (97.2% vs. 93.3%). Missclassification of self-reported smoking status was more accurately detected at a cutoff of 100 ng/mL than at 50 ng/mL, reducing the false negative rate from 11.1% to 8.4% and from 57.5% to 43.5%, while increasing the false positive rate from 1.6% to 2.7% and from 0.2% to 0.3% in men and women, respectively. Considering the bimodal distribution of urinary cotinine concentration at or near 100 ng/mL and the under-reporting of smoking by women, this cutoff well differentiated smokers from non-smokers among both genders. Conclusion: The optimal urinary cotinine cutoff in South Korea should be 100 ng/mL, for both men and women. Funding: No funding

RRP6
PREDICTORS OF SMOKING CESSATION IN HOMELESS PERSONS ENROLLED IN A SMOKING CESSATION RANDOMIZED CONTROLLED TRIAL
Kate GOLDADE1, Hongfei GUO2, Janet L. THOMAS3, Jasjit S. AHLUWALIA4, Kola S. OKUYEMI2
1 University of Minnesota, Department of Family Medicine and Community Health, Program in Health Disparities Research, Minneapolis, MN, USA
2 University of Minnesota, Division of Biostatistics, School of Public Health, Minneapolis, MN, USA
Background: Smoking prevalence is a strikingly high 70% in the United States’ homeless population. Homeless smokers face significant barriers to smoking cessation yet targeted interventions have not been developed. To design effective cessation interventions for homeless populations, predictors of quitting need to be elucidated.

Methods: A community-based smoking cessation randomized clinical trial (RCT) was conducted in the Twin Cities of Minneapolis and Saint Paul, Minnesota. A sample of homeless smokers (n=430) was randomized to control or intervention arms. All 430 participants received 21 mg NRT patch for 8 weeks. Control group included one session of brief cessation advice, and intervention group included six sessions of Motivational Interviewing counseling. Predictors of cessation were determined using bivariate and multiple logistic regression (MLR). Predictors included baseline socio-demographics, smoking behaviors, treatment arm assignment, study visit attendance, type of homeless shelter, and duration of homelessness. The outcome was cotinine-verified 7-day abstinence at 26 weeks follow-up. Results: The main findings of the trial were that 7-day abstinence (≤20 ng/ml) for the MI intervention (9.3%) was not significantly higher than for the control (5.6%) (p=0.15). Bivariate analysis showed statistically significant (p < 0.05) predictors of cessation were: baseline cotinine, baseline Carbon Monoxide, income, number of MI sessions attended, and number of people known who had quit. Marginal predictors (< 0.10) were: encouragement to quit smoking, study treatment arm, attending 5 or more MI sessions, and duration of homelessness. In the final logistic regression model there were statistically significant (p < 0.05) predictors of cessation were: baseline cotinine, baseline Carbon Monoxide, income, number of MI sessions attended, and number of people known who had quit. Marginal predictors (< 0.10) were: encouragement to quit smoking, study treatment arm, attending 5 or more MI sessions, and duration of homelessness. In the final logistic regression model there were two statistically significant (p < 0.05) predictors. Attending ≥ 5 study assessment visits during the eight week intervention period (AOR=3.23, 95% CI=1.062, 9.850) and lower clinically significant levels of baseline cotinine (AOR = 0.66, 95% CI =0.46, 0.95). Conclusions: Results support the benefit of attending study counseling sessions to efficacy in smoking cessation treatment for smokers experiencing homelessness.

Funding: This work was supported by a grant from the National Heart Lung and Blood Institute [R01HL081522, PI: Okuyemi].

RRP7
GAINS IN LIFE EXPECTANCY WITH SMOKING CES SATION IN ITALY
Giulia CARRERAS, Andrea MARTINI, Giuseppe GORINI, Laura CARROZZI, Francesco PISTELLI, Carlo ZERBINO, Franco FALCONE, Giovanni VIEGL
Cancer Prevention and Research Institute (ISPO), Florence, Italy

Background: Smoking is one of the leading preventable causes of death and disease in Italy. The communication of the health benefits associated with smoking cessation is an important and challenging task for health professionals. Life extension associated with smoking cessation may be a simple and effective message. The aim of this study is to quantify the benefit of quitting smoking in terms of life expectancy using Italian specific data. Methods: We computed life tables specific for current and former smokers using Italian data on mortality and on smoking habits. The number of life years gained with quitting smoking at various ages was then computed comparing the survival curves of former and current smokers, by gender and number of cigarettes smoked per day. Results: Cessation at age 30, 40, 50, or 60 years gained, respectively, about 7, 7, 6, or 5 , and 5, 5, 4, or 3 years of life respectively for men and women that smoked an average of 10-19 cigarettes per day. The gain in life years was higher for heavy smokers (9 years for > 20 cigarettes) and lower for light smokers (2 years for 1-9 cigarettes) and related to age of quitting. Conclusions: Cessation at any age provides meaningful life gain, especially for heavy smokers. The novelty of this study is to provide estimates of life years gain for Italian smokers who quit according to the number of cigarettes smoked per day.

Funding: The Italian Association of Hospital Pneumologists (AIPO)

RRP8
CC4, A DIMER OF CYTISINE, IS A SELECTIVE PARTIAL AGONIST OF ALPHA4BETA2/ALPHA6BETA2 nAChRs THAT REDUCES NICOTINE ADDICTION ASSOCIATED BEHAVIOURS
Mariaelvina SALA1,2, Daniela BRAIDA2, Luca PUCCI1,2, Francesca FASOLI2, Michael J. MARKS3, Charles R. WAGEMAN3, Sharon R. GRADY3, Sergio FUCILE4,5, Michele ZOLI4, Cecilia GOTTI1,2
1 Consiglio Nazionale delle Ricerche (CNR), Istituto di Neuroscienze, Milan, Italy
2 Dipartimento di Farmacologia, Chemioterapia e Tossicologia Medica, Università degli Studi di Milano, Milano, Italy
3 Institute for Behavioral Genetics, University of Colorado, Boulder, Colorado, USA
4 IRCCS NEUROMED, Pozzilli, Italy
5 Dipartimento di Fisiologia e Farmacologia, Università di Roma La Sapienza, Rome, Italy
6 Dipartimento di Scienze Biomediche, Sezione di Fisiologia, Università di Modena e Reggio Emilia, Modena, Italy

Nicotine is responsible for the addiction-induced by smoking by acting on the neuronal nicotinic acetylcholine receptors (nAChRs) expressed in the mesocorticolimbic pathway. A number of drugs acting at different levels in this pathway have been tested for their capacity to induce smoking cessation, the most successful of which are cytisine-derived partial agonists, although they are burdened by side effects. We have recently developed various cytisine derivatives and begun to study their properties. We have electrophysiologically tested CC4, a dimer of cytisine using heterologously expressed human subtypes and found that it was less effective than cytisine in activating alpha4beta2, alpha3beta4, alpha7 and muscle-type receptors. CC4 is also a partial agonist of nAChR mediated striatal dopamine release by acting through alpha4beta2and alpha6beta2 nAChR. When co-
incubated with nicotine, CC4 prevents nicotine’s maximal effect. In addition, CC4 has low affinity for, and is less efficacious than nicotine and cytisine on the alpha3beta4 and alpha7 nAChR subtypes. CC4, like cytisine and nicotine, induces conditioned place preference (CPP) and is self-administered with an inverted-U dose-response curve. Pre-treatment with non-reinforcing doses of CC4 significantly antagonised the rewarding effects induced by nicotine without affecting motor functions. These findings indicate that CC4 has a selective effect in reducing nicotine addiction-associated behaviours. The in vitro and in vivo findings, are consistent with the observed partial agonist selectivity of CC4 for beta2*-nAChR, and support the possible development of CC4 or its derivatives as a new medication specific for tobacco smoking cessation with fewer of side effects due to its lack of action on alpha4beta2 and alpha6beta2−nAChR subtypes.

**Funding:** European Union grant agreement N° HEALTH-F2-2008-202088 “NeuroCypres”, the Italian PRIN European Union grant agreement N° HEALTH-pha4beta2 and alpha6beta2−nAChR subtypes.

**RRP9**

GENETIC INFLUENCE ON LUNG CANCER BASED ON THE NORDIC TWIN STUDY OF CANCER (NorTwinCan) COHORTS

Jacob HJELMBORG1, Tellervo KORHONEN2, Maria HUKKINEN1, Lorelei MUCCI3, T. SCHEIKE4, A. SKYTTHE1, Jaakko KAPRIO5

1 Biostatistics and Epidemiology, Institute of Public Health, University of Southern Denmark, Odense, Denmark
2 Department of Public Health, Hjelt Institute, University of Helsinki, Finland
3 Cancer Epidemiology, Harvard School of Public Health, Boston, USA
4 Department of Biostatistics, University of Copenhagen, Denmark
5 Department of Public Health, Hjelt Institute, University of Helsinki, Finland and National Institute for Health and Welfare, Helsinki, Finland and Institute for Molecular Medicine (FIMM), Helsinki, Finland

We study the genetic and environmental influences on lung cancer using the Nordic twin cohorts. The combined Nordic cohorts of twins consists of more than 154,000 twin pairs of which 133 are concordant for lung cancer and 2690 are discordant at follow-up of twins born since 1870. The cumulative incidence in the twins agrees well with that of the background population when taking censoring and the competing risk of death into account. The lifetime risk of lung cancer in a twin is 3.6 (SE=0.6) times higher if the co-twin has lung cancer and the pair is monozygotic. For dizygotic pairs this relative risk is estimated at 2.4 (0.3). This is indicating familial and further genetic influences to lung cancer. We consider how the concordance varies over time depending on zygocity and smoking status giving insight to the action of genetic and environmental causes.

**Funding:** NorTwinCan Study + NCU

**RRP10**

SEX DIFFERENCES IN THE SMOKING EFFECTS ON DEVELOPMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A LONG-TERM FOLLOW-UP STUDY AMONG FINNISH MEN AND WOMEN

Maria HUKKINEN1, Tellervo KORHONEN1, Kauko HEIKKILÄ2, Jaakko KAPRIO3

1 Department of Public Health, Hjelt Institute, University of Helsinki and National Institute for Health and Welfare, Helsinki, Finland
2 Department of Public Health, Hjelt Institute, University of Helsinki, Finland
3 Department of Public Health, Hjelt Institute, University of Helsinki, Finland and National Institute for Health and Welfare, Helsinki, Finland and Institute for Molecular Medicine (FIMM), Helsinki, Finland

**Background:** The prevalence of chronic obstructive pulmonary disease (COPD) among women has increased during recent decades. This phenomenon is partly explained by women’s increasing smoking, but it has also been suggested that female lungs are more susceptible to cigarette smoke when compared to men.

**Methods:** We studied sex differences in COPD development by taking into account changes in smoking patterns between 1975 and 1981, and then tracking the disease development rates during 1981-2008. We used data from the Finnish Twin Cohort 1975 and 1981 surveys, including 21,609 persons participating in both years. According to the amount smoked, we collapsed participants into categories describing change in smoking. National registry data on anticholinergic drug usage and diagnoses entitling to special reimbursements for medication purchases between 1981 and 2008 were received from the Finland’s Social Insurance Institution. Regular use of inhaled anticholinergics or a COPD diagnosis entitling to a special reimbursement was regarded as COPD. The disease risk among smoking categories was studied with multivariate-adjusted survival models.

**Results:** Self-reported ever smoking prevalence was 69 % among men and 37 % among women in 1981. The cumulative incidence of COPD during follow-up was 3.3 % among men and 1.7 % among women. The risk for regular anticholinergic medication was greater among women when compared to men among former (HR 1.99 vs. 1.86), moderate (HR 5.29 vs. 5.12), constant heavy smokers (HR 16.60 vs. 7.33), smoking increasers (HR 12.27 vs. 4.34), and smoking reducers (HR 6.51 vs. 3.77) (all p-values ≤0.05). The risk for special reimbursement eligibility was higher among female moderate smokers (HR 15.99 vs. 11.73), whereas lower among heavy smokers (HR 4.41 vs. 3.77), when compared to males.

**Conclusions:** This study shows that all daily smoking patterns are associated with an increased risk for COPD. The results suggest that women may be more susceptible for COPD, as similar smoking patterns were associated with higher risk estimates among women than men.

**Funding:** Yrjö Jansson Foundation (TK and MH), Academy of Finland Centre of Excellence in Complex Disease Genetics (JK)
Background: Increases in tobacco taxes provide smokers with a stimulus to quit and may prevent smoking initiation in the young. The availability of illicit tobacco undermines the effect of this price mechanism by providing an unregulated source of cheap tobacco. A detailed and up-to-date understanding of the use of illicit tobacco and the characteristics of those who purchase illicit tobacco is needed in order to respond effectively. Methods: Questionnaire data from 1520 smokers in 2007-8 and 2541 smokers in 2010-11 from the Smoking Toolkit Study were used. We assessed the proportion of respondents who reported purchase of illicit tobacco. Results: Nearly one-fifth (19.1%; n=290, 95% CI 17.7–21.6) of smokers in 2007-08 reported illicit tobacco purchase; this decreased to 4% (n=98, 95% CI 3.5–5.0) in 2010-11. In 2007-08 smokers reporting illicit tobacco purchase were of a younger age (OR = 0.73, CI 0.49 – 1.09; p ≤0.001), had high tobacco dependence (OR=1.03, CI 1.02-1.04; p ≤ 0.001), were almost twice more likely to be male (OR = 1.71, CI 1.20 – 2.11; p ≤ 0.001) and were from low socio-economic groups (OR=1.83, CI 1.35-2.48; p<0.001). This was the same in 2010-11, with only a non-significant difference in age, this increased to 55-64 (OR=0.89, CI 0.49-1.62; p=0.692). Conclusions: Although there was a marked decline in reported use of illicit tobacco in England between 2007-08 and 2010-11, our findings suggest that the characteristics of those who purchase illicit tobacco did not change over this period. This suggests illicit tobacco purchasing behaviour is embedded in certain groups. Therefore, in order to build on current efforts to decrease illicit tobacco use, more targeted measures are needed to achieve a continued decline in illicit tobacco use in England. Funding: Cancer Research UK

Background: There is substantial international evidence that tobacco control media campaigns increase quitting attempts and reduce smoking prevalence. In England, until 2010, mass media campaigns were run regularly, often advertising stop smoking services, the national quitline, free quit support packs and the national smoking cessation website. In April of that year, however, the government ceased spending on public health mass media campaigns. We investigated the impact of this freeze on quitting behaviour. Methods: We used quarterly population-level data on attendance and 4-week quitters at National Health Service (NHS) stop smoking services from 2001 to 2011, and monthly data on calls to the NHS quitline, text requests for quit support packs, and web hits on the smoking cessation website from 2005 to 2012. We
carried out interrupted time series analysis to estimate the effect of the freeze on tobacco control mass media campaigns on these measures, using General Additive Mixed Models to model any seasonality and autocorrelation in the data. **Results:** Prior to the freeze there was a mean of over 20,000 calls to the quitline per month. Following the freeze there was an immediate decrease in the number of monthly calls of over 13,000. Text requests for support packs ceased almost completely. Web hits fell by 134,000 per month from a pre-freeze monthly average of 270,000. There was an increasing trend in attendance and successful quitters at stop smoking services throughout the study period which did not change following the spending freeze. **Conclusions:** Our findings suggest that mass media campaigns have a substantial effect on quitting behaviour in England. Attendance at stop smoking services did not decline during the freeze, but there were large and immediate reductions in calls to the quitline, requests for quit support packs, and hits on the smoking cessation website. A tobacco control campaign has recently been re-introduced in England, but at a much lower rate of funding than prior to the cut. This reduced funding means that opportunities to help people stop smoking are probably being missed, as people may be less likely to seek information to support their quit attempts.

**Funding:** National Prevention Research Initiative

**RRP14**

**SMOKING CHARACTERISTICS AND CO-MORBIDITIES IN THE POWER TO QUIT RANDOMIZED CLINICAL TRIAL FOR HOMELESS SMOKERS**

Kolawole S. OKUYEMI1, Kate GOLDADE1, Guy-Lucien WHEMBOLUA1, Janet L. THOMAS1, Sara EISCHEN1, Hongfei GUO1, John E. CONNETT1, Jon GRANT1, Jasjit S. AHLUWALIA1, Ken RESNICOW2, Greg OWEN3, Lillian GELBERG4, Don Des JARLAIS5

1 University of Minnesota, Minneapolis, USA
2 University of Michigan, Ann Arbor, USA
3 Wilder Foundation, St. Paul, USA
4 University of California Los Angeles, USA
5 Albert Einstein College of Medicine, New York, USA

**Background:** Smoking prevalence in homeless populations is strikingly high (~ 70%), yet little is known about effective smoking cessation interventions for this population. We conducted a community-based clinical trial, Power To Quit (PTQ), to assess the effects of motivational interviewing (MI) and nicotine patch (NRT) on smoking cessation among homeless smokers. This paper describes the smoking characteristics and co-morbidities of smokers in the study. **Methods:** 430 homeless adult smokers were randomized to either the intervention arm (NRT+MI) or to the control arm (NRT+Brief Advice). Baseline assessment included demographic information, shelter status, smoking history, motivation to quit smoking, alcohol/other substance abuse, and psychiatric co-morbidities. **Results:** Of the 849 individuals who completed the eligibility survey, 578 (68.1%) were eligible and 430 (74.4% of eligibles) were enrolled. Participants were predominantly African American, male, had mean age of 44.4 (S.D=9.9), and the majority were unemployed (90.5%). Most participants reported sleeping in emergency shelters; nearly half had been homeless for more than a year. Nearly all of the participants were daily smokers who smoked an average of 20 cigarettes per day. Nearly 40% had PHQ-9 depression scores in the moderate or worse range and more than 80% screened positive for lifetime history of drug abuse or dependence. **Conclusions:** This study demonstrates the feasibility of enrolling a diverse sample of homeless smokers into a smoking cessation clinical trial. The uniqueness of the study sample enables investigators to examine the influence of nicotine dependence as well as psychiatric and substance abuse co-morbidities on smoking cessation outcomes.

**Funding:** National Institutes of Health/National Heart, Lung, and Blood Institute

**RRP15**

**NICOTINE PREFERING AND NON-PREFERRING RATS LINES: ORAL INTAKE, WITHDRAWAL AND REINSTATEMENT**

Sakire POGUN, Tanseli NESIL, Muzeyyen UGUR, Lutfiye KANIT

Ege University, Center for Brain Research, Bornova, Izmir, Turkey

**Background:** We aim to develop nicotine (NIC) preferring (NP) and non-prefering (NNP) rat lines using selective breeding based on oral NIC intake. We report here results from the F8 generation, where we also evaluated somatic signs of withdrawal and reinstatement. **Methods:** Male and female Sprague Dawley rats (F0, n=77) were subjected to free-choice oral NIC for 6 weeks starting at 10-12 weeks of age. NP and NNP rats were selected (Ward method); in F1-F8 the highest NIC consuming of the NP and the lowest of the NNP were selected and outbred. Weekly NIC consumption and weight were monitored. In F8 (n=98), after oral NIC self-administration, NIC was replaced with water. Somatic signs of withdrawal, locomotor activity, and weight were measured at 16 and 40 hrs. Following one week of withdrawal, NIC was provided again to study reinstatement. **Results:** Average NIC intake of NP and NNP rats was 4.03 and 2.20 in F0 and 7.53 and 4.61 mg/NIC/kg in F8, respectively. Escape attempts decreased during withdrawal (p<0.0001), but only in NP rats (p<0.0001); females made more escape attempts than males (p<0.005). The other somatic signs of withdrawal were higher during withdrawal compared to baseline (p<0.0001); among NP rats, females showed more signs than males, but in NNP rats there was no sex difference. Basal locomotor activity was higher in NP than NNP rats (p<0.0001) and decreased during withdrawal; this fall was more in NP than NNP rats (p<0.0001). NIC intake before withdrawal and during reinstatement was higher in NP than NNP rats (p<0.05 for both). NP rats gained more weight than NNP rats at 40 hrs of withdrawal (p<0.05). There were correlations between escape attempts and weight, locomotor activity, somatic signs and NIC intake during reinstatement; between somatic signs, weight change, and NIC intake before withdrawal. **Conclusions:** Although NIC intake of NP rats increased through genera-
Background: Tobacco control policies have focused on a combination of a variety of initiatives such as monitoring, smoke-free public sites, cessation programmes, health warnings, advertising bans and taxation. Using the Tobacco Policy Impact on Quitting (ToPiQ) model we present the impact of current policies in 4 countries on smoking prevalence, smoking attributable deaths and morbidity (lung cancer, stroke, coronary heart disease and chronic obstructive pulmonary disease).

Methods: ToPiQ has been developed as an open or closed cohort semi-Markov model, where current and former smokers may quit or relapse in their smoking status over time. The impact of a tobacco policy on the quit rate is modelled using the tobacco control scale (TCS) which has been shown to correlate with quit ratios, age, sex and educational attainment in regression analyses. Country specific smoking prevalence and initiation rates in adults over 18 years old, demographic inputs and mortality rates are derived from published literature.

Results: If policies achieving maximum TCS score were implemented smoking prevalence could decrease in Denmark from its current level of 18.6% to 13.0% after 20 years, in Finland 16.9% to 12.4%, Norway 27.7% to 19.0% and in Sweden from 14% to 11.1%. This would result in fewer smoking attributable deaths and morbidity over the same time period, a reduction in each country of at least 2.5%. However our analyses show that currently implemented policies have a more limited impact with only modest reductions in smoking prevalence, morbidity and mortality. Conclusions: Comprehensive smoking cessation policy is instrumental in reducing smoking prevalence, mortality and morbidity. To gain further reductions in smoking prevalence, morbidity and mortality in the general population further initiatives such as healthcare smoking cessation interventions should be considered together with tobacco control policies.

Funding: Institutional Funds. Ethics Committee Approval: 2011-160

RRP16
MEASURING THE IMPACT OF TOBACCO CONTROL POLICIES ON HEALTH OUTCOMES IN DENMARK, FINLAND, NORWAY AND SWEDEN
Graeme ROBERTS1, Peter Bo POULSEN2, Karl LINDBERG1, Kevin BOWRIN3
Double Helix Consulting London, UK
Pfizer Denmark
Pfizer Finland
Pfizer UK

Background: Tobacco control policies have focused on a combination of a variety of initiatives such as monitoring, smoke-free public sites, cessation programmes, health warnings, advertising bans and taxation. Using the Tobacco Policy Impact on Quitting (ToPiQ) model we present the impact of current policies in 4 countries on smoking prevalence, smoking attributable deaths and morbidity (lung cancer, stroke, coronary heart disease and chronic obstructive pulmonary disease).

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Funding: Funding Provided by Pfizer Ltd.

RRP17
CYTOTOXICITY OF ELECTRONIC CIGARETTE VAPOR EXTRACT ON CULTURED MAMMALIAN FIBROBLASTS (CLEARSTREAM-LIFE PROJECT): COMPARISON WITH TOBACCO SMOKE EXTRACT
Giorgio ROMAGNA1, Elena ALLIFRANCHINI1, Elena BOCCHIETO1, Stefano TODESHI1, Mara ESPOSITO1, Konstantinos FARSALINOS2
1 Abich biological and chemical toxicology research laboratory, Verbania, Italy
2 Onassis Cardiac Surgery Center, Athens, Greece

Background: Electronic cigarettes (e-CIG) have been introduced to the market in recent years as a smoking alternative. We have designed a set of research protocols to evaluate the safety of e-CIG on human health (ClearStream). The cytotoxic effects of e-CIG vapor have not been studied. The purpose of this study was to evaluate the in vitro cytotoxic effects of e-CIG vapor extract on cultured cells and to compare them with the cytotoxicity of regular cigarette smoke extract (ClearStream-LIFE).

Methods: We performed MTT-assays on cultured murine fibroblasts (3T3) according to UNI EN ISO 10993-5 standard. We tested 10 different commercially available e-CIG liquids (FlavourArt, Italy) with nicotine concentration of 9mg/ml and a commercially available cigarette (containing 1mg nicotine, 10mg tar and 10mg carbon monoxide). Standardized smoking machine conditions (35-ml puff volume, 60-s puff interval and 2-s puff duration) were used. The extracts were transferred in a 96-well microtiter plate in 1:1 to 1:32 dilutions. After 24 hours incubation, viability was measured spectrophotometrically. Both percent viability and inhibitory concentration 50 (IC50) were measured, with reduction of cell viability of more than 30% considered as cytotoxic effect.

Results: Regular cigarette smoke extract showed significant cytotoxic effects at dilutions less than 1:8 (viability: 72.8 ± 9.7% at 1:8, 5.9 ± 1.9% at 1:4, 9.4 ± 5.3% at 1:2 and 5.7 ± 0.7% at undiluted extract). The IC50 of cigarette smoke extract was 0.16ml/ml. For e-CIG liquids extract, viability rate was: 98.8 ± 6.9% at 1:32 (P = 0.043), 98.6 ± 7.6% at 1:16 (P = 0.001), 98 ± 7.1% at 1:8 (P < 0.001), 96.2 ± 5.4% at 1:4 (P < 0.001), 94.2 ± 5.7% at 1:2 (P < 0.001) and 89.9 ± 8.9% at 1:1 (P < 0.001). The IC50 of e-CIG vapor extract could not be measured since survival was higher than 50% at all dilutions. Conclusion: Although smoke extract exhibited significant cytotoxic effects, no cytotoxicity was observed from e-CIG vapor extract on cultured mammalian fibroblasts. Electronic cigarette may be a safer alternative to regular cigarette smoking.

Funding: The research was funded by FlavourArt, Italy.
CHARACTERIZATION OF CHEMICALS RELEASED TO THE ENVIRONMENT BY ELECTRONIC CIGARETTES USE (CLEARSTREAM-AIR PROJECT): IS PASSIVE VAPING A REALITY?

Giorgio ROMAGNA¹, Luigi ZABARINI¹, Lidia BARBIERO¹, Stefano TODESHI¹, Emanuele CARAVATI¹, Davide FOSTER⁵, Konstantinos FARSALINOS²
¹ Abich biological and chemical toxicology research laboratory, Verbania, Italy
² Onassis Cardiac Surgery Center, Athens, Greece

Background: Electronic cigarettes (eCIG) have been marketed as a safer alternative habit to tobacco smoking. We have developed a group of research protocols to evaluate the effects of eCIG on human health, called ClearStream. No studies have adequately evaluated the effects of eCIG use on the release of chemicals to the environment. The purpose of this study was to identify and quantify the chemicals released to a closed environment from the use of eCIG (ClearStream-AIR).

Methods: A 60m³ closed-room was used for the experiment. Two sessions were organized, the first using 5 smokers and the second using 5 users of eCIG. Both sessions lasted 5 hours. Between sessions, the room was cleaned and ventilated for 65 hours. Smokers used cigarettes containing 0.6mg of nicotine while eCIG users used commercially available liquid (FlavourArt) with nicotine concentration of 11mg/ml. We measured total organic carbon (TOC), toluene, xylene, carbon monoxide (CO), nitrogen oxides (NOx), nicotine, acrolein, polycyclic aromatic hydrocarbons (PAHs) glycerin and propylene glycol levels in the air of the room. Results: During the smoking session, 19 cigarettes were smoked, administering 11.4mg of nicotine (according to cigarette pack information). During the eCIG session, 1.6ml of liquid was consumed, administering 17.6mg of nicotine. During the smoking session we found: TOC=7.66mg/m³, toluene=1.7µg/m³, xylene=0.2µg/m³, CO=11mg/m³, nicotine=34µg/m³, acrolein=20µg/m³ and PAH=9.4µg/m³. No glycerin, propylene glycol and NOx were detected after the smoking session. During the eCIG session we found: TOC=1.73mg/m³ and glycerin=72µg/m³. No toluene, xylene, CO, NOx, nicotine, acrolein or PAHs were detected in room air during the eCIG session. Conclusion: Passive vaping is expected from the use of eCIG. However, the quality and quantity of chemicals released to the environment are by far less harmful for the human health compared to regular tobacco cigarettes. Evaporation instead of combustion, absence of several harmful chemicals from the liquids and absence of sidestream smoking from the use of the eCIG are probable reasons for the difference in results.

Funding: The research was funded by FlavourArt, Italy.

DESIGN OF THE MULTICENTRIC, PROSPECTIVE, RANDOMIZED AND CONTROLLED ‘BRIEF INTERVENTION STUDY FOR QUITTING SMOKING (BISQUITS)’

Alexander RUPP, T. RÜTHER, S. MÜHLIG, C. GRAH, M. KREUTER
Zentrum für Tabakentwöhnung (ZfT), Stuttgart, Germany

Background: The current gold standard for smoking cessation is a combination of Cognitive Behavioural Therapy (CBT) interventions and pharmacotherapy, in Germany frequently offered in group courses over several weeks. Although the majority of smokers are willing to quit, only a very small part (< 1 %) of them are attending intensive smoking cessation programmes. Thus, in Germany for the vast majority of smokers evidence based smoking cessation services are lacking. Recent data support that less intensive interventions are effective and might attract more smokers. However, only limited data are available on that topic in Germany. Aims and objectives To investigate the effectiveness of an intervention of two sessions (120 min at a time) in a group setting on the basis of Motivational Interviewing (MI) and important elements of CBT. According to national and international guidelines patients are advised to quit and pharmacoologically supported with one of the established first line smoking cessation treatments. Methods: The study design is multicentric, prospective, randomized and controlled. The study is taking place in cooperation with smoking clinics of 5 centres in Germany (Heidelberg, Stuttgart, Munich, Chemnitz, Berlin). A total number of 800 smokers is calculated to participate in the study. After enrolment participants are randomized in one of the three intervention groups: (A) “Advice only”, (B) “Brief intervention”, (C) “Intensive therapy”. The follow up includes a telephone interview 3 months after the last intervention, and two visits at the smoking clinics after 6 and 12 months with biochemical validation of the smoking status by measurement of the exhaled carbon monoxide and the concentration of cotinine in an urine sample respectively. The primary endpoint is the continuous abstinence rate after 12 months. Several secondary endpoints are determined amongst others the continuous abstinence rate after 6 months, point prevalence cessation rates after 6 and 12 months, life quality, weight gain, predictors of a successful cessation attempt. Funding: The study is sponsored by an independent investigator grant from Pfizer Pharma GmbH.

ADOLESCENTS’ INTERPRETATIONS OF VARIOUS MOVIE SMOKING SCENES: A FOCUS GROUP STUDY

Gunnar SÆBO, Rikke TOKLE, Janne SCHEFFELS
Norwegian Institute for Alcohol and Drug Research (SIRUS), Oslo, Norway

Background: Exposure to smoking scenes in movies is considered a causal factor for smoking initiation among young people, and the more smoking scenes adolescents see, the more likely they are to experiment with tobacco products, and eventually start smoking. Yet, little is
known about how adolescents interpret various smoking scenes. **Method:** A qualitative study was conducted to explore how adolescents decode smoking scenes from different movie genres, and scenes with positive and negative moods and characters. Data were collected by way of eight focus group interviews with adolescents (n=54) between 13 and 17 years old. Participants were recruited from schools of various geographical and socio-economic profiles in Oslo, Norway. Interviews were conducted at school. **Results:** Adolescents consider movie smoking as a narrative ingredient designated to illustrate and amplify character traits. Smoking characters are usually interpreted in terms of stereotypes (stress relief among strained characters, habit among the poor, romantic seduction, social and celebrative interaction between equals, empowering of mafia bosses). Adolescents identify more strongly with elegant, positive and powerful characters who smoke than anxious, negative and ambiguous characters who smoke. **Conclusion:** In general, adolescents interpret smoking scenes in accordance with preferred meanings, which mean that they tend to decode the scenes in line with genre expectations and the meanings favored by the movie makers. As positive and glamorous representations are more likely to stimulate smoking experimentation and initiation among youth than negative representations, future research should distinguish more clearly between positive and negative representations of smoking when exposure is concerned.

**Funding:** This work was funded by the Norwegian Institute for Alcohol and Drug Research.

**RRP21**

**ASSOCIATION OF WEIGHT CONCERNS WITH SELF-EFFICACY TO QUIT SMOKING: POPULATION-BASED STUDY AMONG FINNISH SMOKERS**

Eeva TUOVINEN1,2, Suoma SAARNI3, Ari HAUKKALA2, Maria HUKKINEN2, Ulla BROMS2,3, Kristina PATJA4, Jaakko KAPRIO2,3, Tellervo KORHONEN2,3

1 University of Eastern Finland, Kuopio, Finland
2 University of Helsinki, Finland
3 National Institute of Health and Welfare, Helsinki, Finland

**Background:** Concerns over weight gain after smoking cessation may negatively affect self-efficacy when planning to quit. The aim of this study was to examine the associations of weight concerns with self-efficacy in relation to smoking cessation among Finnish current smokers.

**Methods:** Data were collected in conjunction with the National FINRISK 2007 Study with a randomized, population-based sample of 25-74 year old Finns. These analyses were based on a subsample of 749 current smokers (400 men, 349 women) taking part in a more detailed clinical investigation (DILGOM study) and with valid data on the main variables. Weight concerns were analyzed as a six item sum score based on the Borrelli scale (range 0-24). Self-efficacy concerning success in quitting for good was assessed with a self-reported scale ranging from ‘no self-efficacy at all’ to ‘very much self-efficacy’ (0-10). Regression analyses were used to study the association of weight concerns with self-efficacy, while adjusting for several potential confounders.

**Results:** When adjusting for age, BMI, education, marital status, physical activity, daily intake of fiber and fat, as well as for weekly alcohol consumption, higher level of weight concerns was significantly associated with lower self-efficacy in both genders (β=-0.07, p=0.007 for men; β=-0.08, p=0.001 for women). In women, the association remained significant also when further adjusting for nicotine dependence measured by the Fagerström Test for Nicotine Dependence (β=-0.06, p=0.012). In men, the association did not remain significant when nicotine dependence was added to the model (β=-0.04, p=0.085).

**Conclusion:** Smokers with high weight concerns have lower self-efficacy when concerning success in cessation. Future population-based longitudinal research is needed to determine whether high weight concerns actually predict low self-efficacy and whether these impact smoking cessation prospectively.

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**RRP22**

**EFFECTS OF VARENICLINE ON ALCOHOL USE**

Oliver WEST, Sarah SNUGGS, Peter HAJEK

UK Centre for Tobacco Control Studies, Barts and The London School of Medicine, Queen Mary, University of London, UK

**Background:** Laboratory data suggest the alpha-4 beta-2 nicotinic receptor is involved in alcohol reinforcement, smokers taking varenicline on occasion say that their enjoyment of alcohol decreases, and a randomized trial found that varenicline reduced alcohol consumption in smokers. We compared the effects of varenicline versus nicotine replacement treatment (NRT) on alcohol use and enjoyment during a stop smoking attempt.

**Methods:** Between January 2009 and January 2011, UK NHS stop smoking patients reported weekly alcohol consumption pre-quit date (QD), and consumption of alcohol and its enjoyment relative to before treatment one and four weeks post QD (QD+1, QD+4).

**Results:** At QD+1, varenicline users (n=352) reported enjoying alcohol less than NRT users (n=124) (p<.05) (60% and 54% smoke-free in the two groups, respectively). There was no difference at QD+4 (N=343 and 120 in the two groups; 50% and 44% smoke-free, respectively). In heavy drinkers (those who exceeded the UK recommended weekly amount (men=21 units; women=14)), there was no difference in enjoyment at either time-point (N’s; QD+1: varenicline=58, NRT=19; QD+4; varenicline=53, NRT=13). In patients who provided consumption data at all three time-points, there was no overall medication effect, but there was a significant interaction (p<.05) due to varenicline users’ (N=128) consumption not changing (mean of 10 units at
baseline, 9.1 at QD+1 and 10.1 at QD+4), while NRT users (N=28) drank more (8.4, 8.7, 13.4, respectively). In heavy drinkers, varenicline users (N=40) reduced their self-reported consumption more than NRT users (N=11)–from 29.9 units at baseline to 23.7 at QD+4, and 32 to 30.1, respectively–but this was not statistically significant (p=.15). Conclusions: During the first two weeks of use, varenicline reduced enjoyment of alcohol but not alcohol consumption in light but not in heavy drinkers. After five weeks, NRT and varenicline users reported the same enjoyment of alcohol, with light drinking varenicline users not changing their alcohol consumption, while NRT users increased theirs. Varenicline may reduce alcohol enjoyment, but the effect may be too weak to have clinical implications.

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RRP23
SMOKING CESSATION IN HOSPITALIZED PATIENTS – THE MODEL OF THE COMPREHENSIVE CANCER CENTER FREIBURG, GERMANY (CCCF)
Andreas JAEHNE, James BALMFORD, Cornelia SCHULZ, Mirjam ELZE, Jens LEIFERT
University Clinic Freiburg, Germany

Background: Smoking cessation influences the progress of several diseases in a positive way and hospitalized patients are especially receptive to cessation advice. Structured counselling of smoking in-patients is rarely available in German hospitals. We provide data on the implementation of a smoking cessation service at the University Hospital Freiburg, characteristics of referred patients, and preliminary efficacy data at 6-month follow-up. Methods: The service offers (a) bedside counselling based on Motivational Interviewing; (b) information about and encouragement to use evidence-based forms of cessation assistance (including, where appropriate, referral to a regional network of providers), and; (c) post-discharge phone support for up to 12 weeks. Outcome data was obtained at 6 months among those who agreed to receive post-discharge support. Results: Since April 2009, 1,690 eligible patients have been referred to the service and 82% agreed to receive bedside counselling, of whom 53% agreed to receive post-discharge support. These patients (59% male, mean age 49 years, mean FTND of 5.4) had a range of admitting diagnoses; 22% cancer, 21% cardiovascular, 12% pulmonal, 5% traumatological, 9% internal medical, 6% gynaecological and 24% other. Most agreed to use either medication or behavioural assistance, with higher uptake of medication (61% vs 29%). Among patients recruited prior to August 2011, over half (54%) received 4+ post-discharge calls. A point-prevalence abstinence rate of 29% (intention-to-treat) was found at 6 months, with a clear dose-response effect of number of post-discharge calls. Abstinence rates among those hospitalized for cancer (34%) or cardiovascular disease (39%) were higher than for traumatological patients (12%). Conclusions: The findings support providing smoking cessation support to hospitalized patients in Germany, particularly those with a smoking-related disease. Most patients will consent to receive counsel-

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