

French Conference of Experts 2005

Perioperative smoking control

PROMOTERS

- Association Française de Chirurgie - AFC
- Société Française d'Anesthésie et de Réanimation - SFAR
- Office Français de prévention du Tabagisme - OFT

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ORGANISING COMMITTEE

- Dr Robert COHENDY (*Anesthésiste-Réanimateur, SFAR*), Nîmes robert.cohendy@chu-nimes.fr
- Pr Bertrand DAUTZENBERG (*Pneumologue- Tabacologue, OFT*), Paris bertrand.dautzenberg@psl.aphp.fr
- Pr François DESGRANDCHAMPS (*Urologue, AFU*), Paris francois.desgrandchamps@sls.ap-hop-paris.fr
- Pr Bertrand DUREUIL (*Anesthésiste-Réanimateur, SFAR*), Rouen bertrand.dureuil@chu-rouen.fr
- Pr François GAYRAL (*Chirurgien viscéral, AFC*), Paris francois.gayral@bct.aphp.fr
- Dr Claire LEPOUSE (*Anesthésiste-Réanimateur*), Reims clepouse@chu-reims.fr
- Pr Alain Charles MASQUELET (*Chirurgien orthopédique, SOFCOT*), Avicenne alain-charles.masquelet@avc.aphp.fr
- Dr Laura MUNOZ (*Médecin généraliste-Tabacologue, OFT*), Paris l.munoz@oft-asso.fr
- Pr François PERROTIN (*Gynécologue-Obstétricien, CNGOF*), Tours franck.perrotin@med.univ-tours.fr
- Pr Marc RIQUET (*Chirurgien thoracique*), Paris marc.riquet@hgp.aphp.fr
- Dr Valéry TROSINI-DESERT (*Pneumologue-Tabacologue, OFT*) valery.trosini-desert@psl.ap-hop-paris.fr

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Ministère de la Santé DGS,
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EXPERTS

- Dr Kamel Abdenni, Paris, Tabacologue/cardiologue fondacv@club-internet.fr
- Dr Marion Adler, Clamart, Tabacologue/Médecin généraliste marionadler@9online.fr
- Dr Alex Bedes, Saint Flour, Anesthésiste-Réanimateur bedesams@club-internet.fr
- Dr Remy Bocquet, La roche sur Yon, Anesthésiste-Réanimateur rbocquet.csc@sa3h.fr
- Dr Anne Borgne, Bobigny, Tabacologue/MG anne.borgne@jvr.aphp.fr
- Dr Jean Louis Bourgain, Villejuif, Anesthésiste-Réanimateur bourgain@igr.fr
- Dr Anne Marie Clauzel, Montpellier, Tabacologue/pneumologue am.clauzel@wanadoo.fr
- Dr Robert Cohendy, Nîmes, Anesthésiste-Réanimateur robert.cohendy@chu-nimes.fr
- Dr Anne Marie Cros, Bordeaux, Anesthésiste-Réanimateur anne-marie.cros@chu-bordeaux.fr
- Pr Bertrand Dautzenberg, Paris, Pneumologue/tabacologue bertrand.dautzenberg@psl.aphp.fr
- Pr Michel Delcroix, Lille, Gynécologue-Obstétricien mhdelcroix@wanadoo.fr
- Dr Daniel Garelik, Paris, Tabacologue/Médecin généraliste dangarelik@aol.com
- Dr Jean Pierre Hubsch, Paris, Anesthésiste-Réanimateur jphubsch@wanadoo.com
- Dr Laurent Lalourcey, Montpellier, Anesthésiste-Réanimateur l.lalourcey@valdorel.fnclcc.fr
- Dr Claire Lepousé, Reims, Anesthésiste-Réanimateur clepouse@chu-reims.fr
- Pr Alain-Charles Masquelet, Paris, Chirurgien alain-charles.masquelet@avc.aphp.fr
- Dr Laura Munoz, Paris, Tabacologue/Médecin généraliste l.munoz@oft-asso.fr
- Dr Jean Perriot, Clermont Ferrand, Tabacologue/pneumologue jean.perriot@cg63.fr
- Pr Marc Riquet, Paris, Chirurgien marc.riquet@hgp.aphp.fr
- Pr Jean Marie Servant, Paris, saint louis Chirurgien jean-marie.servant@sls.aphp.fr
- Pr Karem Slim, Clermont-Ferrand, Chirurgien kslim@chu-clermontferrand.fr
- Dr Valéry Trosini-Désert, Paris, Tabacologue/pneumologue valery.trosini-desert@psl.ap-hop-paris.fr

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Smoking consumption is the cause of a significant increase risk of surgical adverse events, too often neglected. A good assumption of the responsibility of the tobacco smoke must lead to a quick benefit, reducing general and local surgical complication rate, which would constitute a significant profit in term of health and savings.

This conference of experts has been organized by surgeons; tobacco specialists and anesthetists with the intention to change the current practices to better practices taking into account the smoking consumption during surgical period.

This conference has allowed identifying the professional practices that should be used in order to control smoking and to reduce morbidity and surgical mortality.

A complete literature review has been conducted by 22 experts, divided into 6 subgroups so as to answer to the 6 questions that were presented by the Steering Committee of the expert's conference. The recommendations were score from A (at least 2 studies of level I: randomized of good power) to E (studies of level IV or V: case studies, opinion of experts). The recommendations have reached a consensus following successive meetings of the experts. The final validation has occurred from a public debate during the French society of anesthesiologists meeting (SFAR) on the September 23rd, 2005.

A "follow up" committee has been established in order to assist in the implementation of the expert conference recommendations and to modify the medical practices.

The recommendation's text is available on the conference's promoters and co promoter's websites.

Conclusions of experts

QS1: What are the tobacco related risks in surgical period?

1.1 What is the epidemiology of the smoking habits of surgical patients in France?

- The rate of daily smokers in the French population varies according to age and sex. The rate of smokers in 2004 was 33% among men and 27% among women.
- Approximately 8 million patients undergo anesthesia in France each year, 7 million of which are over 15 years of age, mainly for surgery, less often for childbirth or endoscopies. In addition many minor surgical procedures are undertaken without anesthesia other than local.
- There is no argument to state that the smoking rate of the patients who undergo anesthesia is dramatically different from the smoking rate of the general population. One can estimate that the smoking rate during the surgical period is 40% for patients aged from 15 to 45 years old, 20% for patients from 46 to 65 years old and 10% for patients more than 75 years old.
- According to these figures, the estimate surgical procedures conducted each year in smokers in France are close to 2 millions [E].
- New studies on the smoking habits of surgical patients need to be conducted in order to obtain more precise epidemiologic data [E].

1.2 What is the increase risk of mortality in the peri-operative period related to the smoking habit?

- The only study available in general surgery shows an increased risk of mortality among smokers (RR of 2.56) [D].

1.3 Which are the risks of general complications (cardiovascular, respiratory, and infectious,...)?

- The increase in the relative risk (RR) according to studies concerns:
 - The risk of being transferred to an intensive care units (RR from 2.02 to 2.86) [D],
 - Infectious complications (RR from 2 to 3.5) [D],
 - Coronary complications (RR of 3) [D],
 - Immediate respiratory complications (RR of 1.71) [D].

1.4 What are the risks of surgical complications among smokers (scars, releasing of joining and by-passes, delay of bone consolidation...)?

- The increased risk of surgical complications due to peri-operative smoking is mainly related to the harmful effects on the microcirculation [E].
- This increased risk is confirmed by many various studies and relates to all tissues crossed by surgery, from the skin to the bone:

- Complications of scarring after knee surgery (RR of 2.4) [D],
- Infectious complications of the scar (best estimate 12% vs 2% $p < 0,05$) [B],
- Poor closing of wound at the scraps/site receiver interface in plastic surgery (27% vs 12%) [D],
- Risk of disembowel after laparotomy (RR of 3.93) [D],
- Sternum and mediastinal Infection after thoracic surgery (RR of 3) [D],
- Releasing of digestive joining (RR of 3.18) and vascular (RR of 3) [D],
- Increase risk of thrombosis of vascular by pass (RR of 3.09) [A],
- Increase delay of bone consolidation (RR 2.7 increasing to a RR of 8.1 for the pseudarthrosis risk) [D].

The total complications of the surgical site is reported in 3 studies 31% vs 5%, 48% vs 15% and 39% vs 25% among smokers compared to non smokers [D].

1.5 What is the influence of the parental smoking on the child's health during surgical period?

- Children exposed to passive smoking have higher nicotine levels in urine, particularly in children less than 3 years old [C].
- In addition, children who are exposed to passive smoking are more likely to experience upper airways infections than non exposed children [A].
- A correlation exists between the intensity of exposure and rate of occurrence of respiratory complications. This is particularly proven for upper airways surgery [D].
- The risk of laryngospasme increases dramatically with smoking exposure in 2 studies (RR: 5.6-10) [D].

1.6 What are the consequences of tobacco related complications on the duration of hospital stay and on the overall surgical costs?

The increase of the total duration of smoker's hospitalization for a major surgery act is estimated to 2 - 3 days [D].

The longer the hospital stay, the greater the risk of being transferred to an intensive care unit and the increase occurrence of surgical complications raises the surgery cost. However, this cost has not been properly quantified in France, an economic study is needed [E].

QS2 What are the proven benefits from of quitting smoking during the surgical period?

2.1 What are the benefits of quitting smoking according to the period before the surgical procedure (> 48 hours)?

- The surgical risk of former smokers for a long period is lower than the risk of current smokers and not different from those of non smokers [C].
- Smoking cessation of 6-8 weeks before surgery diminishes the surgical risk observed in current smokers [A].
- Smoking cessation closer to surgery, 3-4 weeks before, is beneficial for decreasing all the surgical risks [C].
- Smoking cessation of less than 3 weeks before surgery is beneficial, as it reduces the local surgical site's complications that counterbalance the potential increase risk of respiratory complications [E].

2.2 What are the benefits of smoking reduction with or without nicotine replacement therapy before surgical procedure, according to the period (> 48 hours)?

- Smoking reduction without nicotine replacement therapy is not to be recommended. [E].
- One may anticipate a potential benefit of an observed decrease in the circulating CO, observed when smoking reduction is associated with nicotine replacement therapy [E].
- There is a lack of evaluation of the smoking reduction under nicotinic replacement therapy during the surgical period [E].

2.3 What are the benefits of late smoking cessation, with or without nicotine replacement therapy, in the 48 hours preceding a surgical procedure?

- From the physiological point of view, complete smoking cessation even of less than 48 hours before surgical procedure should be beneficial [E].
- Temporary increase in cough and bronchial secretions are the only related adverse events that can be harmful just after smoking cessation [E].

2.4 What are the benefits of parental smoking cessation in child surgery?

- The effect on children exposure to parental environmental tobacco smoke is fully documented. However, the benefits of parental quit smoking during surgical period have not been properly assessed in a specific study; so, no conclusion could be made as yet [E].

2.5 Does smoking cessation during the surgical period contribute to long term smoking cessation?

- In the general population, the relapse rate after quitting is approximately 50% one year after cessation [A].
- In the case of cardiac surgery, 50% of post coronary artery surgical patients who quit smoking had relapsed one year later [C].
- Quitting smoking for a surgical procedure is a positive prognostic factor for long term smoking abstinence. However, the high relapse rate highlights the need to reinforce the prevention of relapses [E].

2.6 What are the benefits of continuous abstinence after surgery on bone consolidation and thrombosis risk?

- When smoking abstinence is continued in the postoperative period, the benefit on bone consolidation is demonstrated [D] and the benefit on skin and soft cicatrisation is probably beneficial [E].
- When smoking cessation is maintained in the post operative period, benefits are seen in osseous consolidation [D], and probably in skin and soft cicatrisation [E].
- The permeability of vascular bypass is improved, when smoking cessation is prolonged during the post operative period [A].
- In smokers, thromboses of vascular bypass are 57% tobacco related [B].

QS3 How a smoker should be looked after before elective surgery?

3.1 Which tools are necessary for smokers before elective surgery? (Minimum Counseling, Standardized Information, Evaluation of the dependence and of the craving, Self-evaluation tools, CO Measurements)

- During this period, diagnostic and smoking cessation evaluation tools are the standard tools that are used in this context [E].
- Among the self-questionnaires, the Fagerström test measuring the nicotine dependence is the mostly used [B].
- Measurement of the expiratory carbon monoxide (CO) is a motivating test to quit smoking [B].
- Minimum counseling must be provided by health staff worker to all smoking patients [E].
- The information which is provided to smokers must be suitable to the type of surgery that they are scheduled for [E].

3.2 How to help the smoker to quit smoking before surgery?

- When the need for surgery is announced to the patient, health staff must use all the available tools in order to provide assistance to patient's in smoking cessation process [E].
- All health care workers have a responsibility to provide support to smokers by using techniques that are suitable to each case or by addressing the most difficult cases to a tobacco specialist, or according to their availability to a general practitioner, to an anesthesiologist, a chest physician or a trained midwife [E].
- Treatment tools are used in accordance with the French Medication Agency recommendations [E]:
- In standard population, nicotine oral or transcutaneous replacement therapy, improves the quitting rates (RR: 1.74) [A].
- Bupropion is used under the standard conditions for smoking cessation, which is lignified more than 6-8 weeks before the intervention [E]. If before the surgical period, a treatment with Bupropion has been initiated, this treatment should be continued without any change [E].
- The psychological and behavioral support is particularly necessary in the surgical period [E].
- Quit Lines for smoking cessation assistance (In France Tabac Info Service 0825 309 310) [E].

3.3 In which circumstances should smoking reduction be offered?

- For a smoker, who does not or cannot quit, smoking reduction with nicotine replacement therapy could be a first step towards smoking cessation [E].

- Smoking reduction using nicotine replacement therapy decreases the inhaled CO [D].
- There are no studies in the surgical period with regard to the proven benefits of smoking reduction under nicotine replacement therapy. However, such reduction in surgical period is recommended under the usual conditions [E].

3.4 How to help parents who smoke prevent their child being exposed to passive smoke before a scheduled surgery?

- Initially, quitting smoking has to be recommended to all parents. If a complete smoking cessation is not possible, a reduction of smoking with nicotine replacement therapy may help to protect their child from a passive smoking environment (>2 hours before) [E].
- The simple oral information or leaflets handing-over to the parents of hospitalized children is not sufficient. It is recommended to address the parents in smoking clinic, if needed [D].

3.5 What organization should be set up for an ambulatory follow up?

- All surgery out patients documents addressed to health staff and patients must refer to tobacco smoke effects, which constitute a major risk factor of surgical complications [E].
- The easiest smoker's cases, particularly the non daily smokers, those who do not smoke in the first hour of waking, those who do not have anxio-depressive factors, will profit from minimal counseling and if necessary, can be assisted with nicotine replacement therapy. A follow up with tobacco counseling at each surgical visit is recommended [E].
- The fairly or strongly dependent smokers (Fagerström score > 4) may benefit from a follow-up by the health professional, who will be taking care of them during the surgical period (general practitioner, surgeon, anesthesiologist specialized doctor, midwives) and who will initiate the treatment and ensure a weekly follow-up, usually up to the surgery date [E].
- Strongly addicted smokers and those, who cannot be taken in care by the usual surgical team, will need to be addressed by a tobacco specialist (smoking clinic, if existing) [E].
- A coordinated approach for taking care of smokers by tobacco specialists in the surgical period must be established so as to facilitate a quick smoking cessation in surgical context [E].

3.6 Which organization should be set up for in-patients smokers?

- The smoker, who quits because of surgery, must use the advantage of his hospitalization in order to continue his smoking cessation treatment, previously initiated [E].
- Smokers, who have reduced smoking before hospitalization, must be advised to completely quit smoking during their hospitalization, by eventually increasing nicotine replacement therapy by transcutaneous or oral way or associated. In case of refusal or specific difficulties, smoking reduction can be continued during hospitalization with nicotine replacement therapy.
- However, the fasting rules will have to be respected [E].

3.7 What kind of cooperation can be developed with smoking clinics for tobacco cessation?

- Cooperation with smoking clinical units for tobacco cessation, when they exist, may be developed at all stages of the organization, in health staff training and take care of smokers [E].
- These units will take care of the most difficult cases and if necessary, will provide assistance to the surgical units in organizing the care of the less heavy cases [E].

QS4-What is the role of the general practitioner in the surgical period?

4.1 What is the role of the general practitioner in tobacco cessation during surgical period?

- In view of a surgical procedure, every doctor must:
 - Systematically interview the patient about his smoking status, if possible more than 8 weeks before surgery [E],
 - Point out to the smoker the need to quit [E],
 - Propose to the patient their assistance in tobacco cessation or direct the smoker to a smoking clinic, or a quit lines (Tabac Info Service, in France) [E],
 - Inform surgeon and anesthesiologist of smoking habits and of treatment [E].
 - Point out that total cessation is always preferred and recommended in a delay of more than 6-8 weeks before surgical procedure [A].
 - In the case that total smoking cessation is not possible; recommend smoking reduction with nicotine replacement therapy [C].
 - Reinforce patient's motivation in case of poor motivation [E].
 - Ensure the follow-up and the prevention of smoking relapse (followed at 6-12 months) [E].

4.2 What is the surgeon's role in identifying smoking patients, providing assistance in tobacco cessation, or suitably lead them throughout the surgical period?

- Any surgeon must ask the patient his smoking status before surgery [E].
- He must explain the link between the result of the surgical act and the need for smoking cessation. This information must be mentioned in the set of information provided to the patient before surgery [E].
- He must advise firmly smoking cessation [C].
- In certain cases, he can put forward the date of the surgical action in order to facilitate smoking cessation, when the associated pathology allows it. [E].
- Smoking cessation assistance may include: minimum counseling, nicotine substitution, orientation to another health professional (general practitioner, tobacco specialist), who will take into consideration the daily consumption and the nicotine dependence [E].
- At hospital discharge, the surgeon must take care of the patient's follow up (mail to general practitioner) [E].

4.3 What is the role of the anesthesiologist for identification of smoking patients, providing assistance in tobacco cessation, taking care of smokers during the surgical period?

- Anesthesiologist has an essential role to play in the aid for tobacco cessation. During the preoperative consultation, he identifies the smokers, ideally by measuring the expired carbon monoxide (CO), evaluates the smoking status and the general consequences of smoking, advises and assists in smoking cessation [E].
- During hospitalization in surgical department, the anesthesiologist :
 - supports smoking cessation process and compensates the craving syndrome, when that is necessary [E],
 - can be supported by the smoking clinic unit, if existing [E],

- takes into consideration patient's smoking status for anesthesia [E].

4.4 What is the role of paramedical and nursing staff in taking care of smokers during surgical period?

- All the paramedical staff participates, in accordance with their role, in identifying smoking patients and in providing assistance in tobacco cessation during the surgical period [E].
- Surgical units are recommended to establish a standard procedure for the smoker's identification and treatment [E].
- The paramedical staff must make sure that these procedures are applied [E].

4.5 What is the role of the management of health service organization's, of the related services and pharmacy in taking care of smokers during the surgical period?

- Smoking is prohibited in all premises (participation in the French Network Smoke Free Hospital and application of its Charter). This posted norm is validated by the medical and administrative hospital staff [E].
- An organization of coordination in taking care of smokers is recommended within the health organization [E].
- The hospital pharmacy organises nicotine replacement therapy provision. A procedure allowing to facing the emergencies and dosage changes [E].

4.6 How to transform the surgical period tobacco abstinence into long term abstinence?

- At hospital discharge, general practitioner must be sent a mail, informing him of patient's smoking cessation treatment during hospitalization and giving him the possibility to organize the follow-up [E].
- The smoking clinic, if it exists, will act in the best way so as to ensure links are made to provide support to definitive tobacco abstinence [E].
- In all cases, at hospital discharge, patient must be reminded of the definitive smoking cessation benefits [E].

Qs5- What are the specificities of an anesthesia for a smoker?

5.1 What are the interactions between the anesthetics agents and the smoking habits or the smoking cessation medications?

- Smoking habits increase the risk of the occurrence of respiratory and cardiovascular events during anesthesia [D].
- The anesthetic protocol has to take into account the possible heart rhythm increase because of nicotine exposure during tracheal tubing [C].
- Incidence of nausea and of post-operative vomiting is lower among smokers than among non-smokers [D].
- Smoking habits increase the risk of respiratory and cardiac reactions to the desflurane related to the coughing because of airway irritation and neuro-vegetative reaction [D].

5.2 What is the influence of smoking habits, smoking cessation, nicotine replacement therapy and Bupropion on gastric motility?

- There is no observation of difference on volume and gastric pH between a smoker who quits smoking the day before the surgical procedure and those of a non-smoker [D].
- There is no difference in gastric volume between a smoker who stop to smoke the day before the intervention and a smoker's who quit only half hour before the surgical procedure [D].
- The studies results on smoking cessation duration effects and the use of nicotine replacement therapy on motility gastric are incoherent [E].
- There are no valid data available on Bupropion's effect on gastric motility [E].

5.3 Rules of the fast and smoking habits in surgical period

- Smoking fast leads to better oxygenation because of the rapid CO clearance [D].
- Smoking fast must be recommended according to the same rules' as the food fast: «do not eat, nor drink neither smoke before surgery " [E].
- If a patient breaks smoking fast before surgery by consuming one or two cigarettes, the effect on oxygenation remains moderate, while the effect on motility gastric and the risk of inhalation during induction of the anesthesia is not demonstrated. Rupture smoking fast does not represent a formal counter-indication of anesthesia [E].
- Breaks of smoking fast could be prevented by good pre-operative advertising and the use of nicotinic replacement therapy, if necessary [D].
- Oral nicotinic replacement therapy has an oral absorption [A] Such intake does not constitute a non respect of the fast [E].

5.4 What is the influence of tobacco consumption, of smoking cessation, of nicotinic replacement therapy and Bupropion on analgesia?

- Nicotinic agonists induce in experimental conditions analgesia [B].
- A recent smoking cessation without nicotine replacement therapy is associated with an increased need for analgesic drugs [D].
- There are not sufficient data regarding the nicotine replacement therapy | beneficial effects on pain control [E].
- Bupropion has been proposed for the neuropathy type pain's [E].

5.5 What is the influence of the smoking cessation on the bronchial mucus according to the cessation delay?

- The increase of tracheal-bronchial mucus volume is maximal during the first 2 weeks after smoking cessation (RR: 2.7) then decreases slowly to disappear 8 weeks after smoking cessation [D].
- Respiratory symptoms (cough, rhinitis, catarrh) are raised during the first 2 weeks after smoking cessation [D].
- Cough rate is significantly higher during the first 7 days of smoking cessation and decreases in approximately 4 weeks [D].
- Quit smoking is recommended at least 8 weeks before surgical procedure, in order to decrease post-operative pulmonary complications risk [D].

5.6 What is the influence of the smoking cessation on the bronchial hyper reactivity according to the delay of cessation?

- When metacholin is used to perform the tests of bronchial provocation, there is a bronchial hyper reactivity significantly higher in the group of smokers compared to those of ex smokers and non smokers [D].
- Smoking cessation improves the bronchial hyper reactivity but in case those patients are COPD, its benefits are less important, [D].

- There is no data on the delay of smoking abstinence necessary to decrease the bronchial hyper reactivity [E].
- There is no data on the benefit of a late quit of smoking (less than 4 weeks) before a surgical procedure with regard to the bronchial hyper reactivity [E].
- After smoking cessation, the hyper reactivity of the upper airway starts to improve after 48 H and the threshold is regulated near the 10th day [D].

QS 6: How to deal with dependent smoker hospitalised for a not anticipate surgical procedure?

6.1 What are the symptoms and the suffering of abrupt nicotinic privation without substitution?

- Withdrawal symptoms (anxiety, agitation, irritability, aggressiveness, craving to smoke) start in dependant smokers between 2 to 6 hours after the beginning of abstinence [D].
- Nicotine abstinence causes a deficit in psychometric performances [D].
- Nicotine abstinence produces significant changes of the electroencephalogram (in the 5 hours following the abstinence), which can last 7 days and be regressive under nicotine substitution [D].

6.2 What is the benefit of temporary nicotine replacement therapy in emergency surgical procedure?

- There is not study in literature with relation to temporary nicotine substitution for smoker who needs urgent surgery [E].
- In general population, nicotine replacement therapy provides a greater number of temporary abstinence among surgery hospitalized patients, (versus absence of procedure) (RR of abstinence with the nicotine replacement therapy = 1.38) [A].
- Temporary nicotinic replacement therapy may reduce the withdrawal and the amount of inhaled smoke [C].
- Temporary nicotinic replacement therapy as in non surgical conditions may reduce aggressiveness, observed during an 8 hours smoking privation [D].

6.3 What procedures to set up in surgical units in order to detect and treat the withdrawal?

Withdrawal detection procedure

- It is necessary to sensitize, train and imply all health professional in the assumption of responsibility of the smokers before a surgical procedure (general practitioner, emergency specialist, anesthesiologist, surgeon, nurse, nurse's assistant, and doctor specialist) [E].
- Co-operation with smoking clinic unit team is suitable [E].
- Need for practices evaluation: role of the referent [E].
- Procedure available in each surgical unit with recommendations for the recognition of withdrawal signs and action to be taken [E].

Withdrawal treatment procedures:

- Literature review on the benefit of withdrawal symptoms prevention by temporary nicotinic substitution is contradicted by a well led recent study in surgical period and need confirmation [E].
- Nicotine replacement therapy is not sufficiently used for in-patients and should profit with more smokers [E].

6.4 How to treat HbCO increase before a surgical procedure in urgency?

- Smoking abstinence of more than 12 hours allows a significant decrease of the CO accumulated by smoker [D].
- On a theoretical level an oxygen treatment with FiO₂ =1 eliminates the CO accumulated within 4 hours. The benefit of such a practice is not assessed in case of tobacco smoke intoxication and it cannot be recommended [E].

Conclusions

Systematic analysis of surgical procedure practices in order to implement present recommendations should lead to improvements in staff training, procedures and medical practices, and thus, reduce surgical and general complications occurring in surgical period. This implementation will thus reduce surgery and human costs, fight against one of the avoidable major causes of surgical complications, too often neglected: smoking. Tools development for practices evaluation, staff training and information to the public must be quickly set up. In addition the health and economic benefits are still awaited. It must be directly measurable with the new tracing of activity of the hospitals in France.



Office Français de Prévention du Tabagisme (OFT)
Boulevard Saint Michel 75006 PARIS France
Phone. + 33 1 43 25 19 65 **Fax** + 331 43 25 18 27
<http://www.oft-asso.fr>



Association Française de Chirurgie 121, rue de Rennes
75006 Paris, France. Phone: +33 1 45 44 96 77 fax: +33 1
45 44 96 79 <http://afc.caducee.net> afc10@wanadoo.fr

Société Française
d'Anesthésie
et de Réanimation



Société Française d'Anesthésie et de Réanimation 74 Rue
Raynaud, 75016 Paris. France. Phone.:+331 45 25 82 25
fax: + 331 40 50 35 22 <http://www.sfar.org> sfar@invivo.edu