Handbook

Nicotine Replacement Therapy (NRT) & Follow-up Assessment

Edited by

Professor Chitta Ranjan CHOWDHURY

Contributors

Dr Arnab Gupta
Professor Edward Lynch
Professor Stewart Harding
Dr. Gay Sutherland
Professor Tadaaki Kirta
Dr. Andrew Lyons

Published by

Saroj Gupta Cancer Centre & Research Institute
Kolkata (SGCC & RI), India

In association with

- Nitte University, Mangalore, India
- The University of Warwick, Coventry, UK
- BPP University City of London Dental School, UK
- Nara Medical University, Japan
HANDBOOK

NICOTINE REPLACEMENT THERAPY (NRT)

A Guidance For

EXAMINATION & ASSESSMENT

MONITORING & FOLLOW-UP

[NRT Clinical & Research Service]

Editor

Professor Chitta Ranjan Chowdhury
PhD (Japan), MPH (UK), FFDRCS (Ire), BDS (DU), DND (DU)

Lead, Unit of Oral Cancer Screening, NRT Services & Addiction Research
Head, Department of Oral Biology & Genomic Studies, Nitte University, Mangalore 574, India
Faculty, Department of Education & Development, Warwick Dentistry
School of Medicine, The University of Warwick, Coventry, England, UK
Professor Oral Surgical Science, BPP University City of London Dental School, London, UK
Consultant, Global Child Dental Health Trust Fund, Kings College London, UK
Director, International Programme for Tropical Oral Health
Visiting Professor, Osaka Dental University, Japan

Contact
C.R. Chowdhury@warwick.ac.uk

©Chitta Chowdhury, Nitte University | SGCC& RI, Kolkata, 9th Feb., 2014, London, UK
Foreword

Primary prevention of a cancer is largely possible when a person maintains a healthier lifestyle in terms of not starting personal habit(s), such as smoking and chewing of tobacco and drinking of excessive alcohol, and these are strongly associated with the onset of a cancer. In India, we have another distinctive problem—the habit of chewing tobacco (i.e., commercially produced Gutka or similar brands, Pāan, either home-made or vendor-made), and those are identified cause of oral cancer. In some part of India, the incidence rate is so high that it exceeds 20-30% of all cancers in those places. Therefore, it has a major concern of stopping chewing tobacco which is globally categorized as Smokeless Tobacco (ST). In this concern, nicotine replacement therapy (NRT) is one of the standard methods is successful to stop smoking in many developed countries, but we do not know whether any NRT product helps stop the habit of chewing tobacco, i.e., ST. Therefore, it is essential to find out an effective NRT product that helps stop chewing tobacco, such as Gutka/Pāan etc. In India, we have very limited number of NRT products; therefore, we need to come-up with different forms of NRT products especially to stop smoking as well as chewing.

In this regard, Professor Chowdhury and his team have come-up with a guidebook for NRT which helps the methodical assessment and management of nicotine addicted people, especially the smokers and it seems equally helpful for chewers. But we need a good research to find a product that equally effective for the nicotine addicts of smoking as well as chewing (Gutka and Pāan).

This book is carefully written on methodical aspects of assessment and follow-up of the tobacco users by incorporating various indices, especially using of internationally accepted scoring system for tobacco dependency i.e., Fagerström Test for Nicotine Dependence (FTND) – all of them are appropriate and useful. His NRT unit is well equipped with CO-monitor, Lung function testing facilities, including ophthalmic, psychometric and nutritional assessment.

Apart from FTND, Dr. Chowdhury included another important parameter in this guidebook, and that helps assess pre and post NRT conditions for appropriate follow-up. The uniqueness of this publication is that detection of age-adjusted macular degeneration (AMD) among smokers which has not been done in many countries including India is included in this book. And the oral health assessment as per WHO criteria is equally useful to estimate the detrimental effect of tobacco inside the mouth cavity of both chewers and smokers.

At the end of this book, it has been given an operational method of NRT services which is developed by Professor Chitta Ranjan Chowdhury – could be considered as a model for comprehensive assessment and follow-up of services. At the same time, the instructions to patients receiving NRT is clear and useful.

Professor Chitta Chowdhury deserves appreciation for his efforts to combat tobacco related cancer, especially oral and head-neck cancer in India and beyond. I am sure that this guide will be useful both for trainers and trainees.

(V.M. Katoch)
Since we published a book on Oral Cancer Screening and Education [1], and an educational booklet for patients who suffers from Oral Cancer (the doctors find this book in educating their patients is useful), started working on a road-map for primary prevention of tobacco related oral cancer. A good number of our patients came to our unit of oral cancer screening and education who are really helpless to stop tobacco, because of their dependency on nicotine from tobacco. Many of them simply asked me “Do you have any medicine to stop my tobacco habit”. Of course we do.

Fortunately I was very much involved whilst I was working as a faculty and clinician at Poole Hospital NHS Department of Maxillofacial Surgery and Bournemouth University. Poole-Bournemouth Primary Care Trust, Department of Health, UK (pb-PCT, DoH, UK) has got unique programme of stop-smoking, and it provided me a comprehensive understanding about NHS supported stop-smoking programme across the country, which is one of the best services in the world. In there, I was actively engaged in running some of the sessions, and I myself contributed to help develop questionnaire and action-programmes on tobacco habit and oral health.

However, probably many of you know that the South –East Asian population is badly affected not only with smoking, also chewing tobacco (of it’s different forms) - is a big concern today. This is an established fact that, chewing tobacco is strongly associated with oral cancer (nearly 30% of all cancers in some part of India) is a huge threatening to many lives of SE-Asian population.

Therefore, considering a fierce scenario, we felt to establish a nicotine replacement therapy (NRT) unit (clinical, training and addiction research) – aiming to stop tobacco among the people addicted with nicotine from tobacco and improvement of the services. And we find NRT is as one of the best measures for primary prevention of oral cancer. But, we observed a problem that—although NRT works excellent for smokers, but we do not know how it works for quid chewers (both commercial sachet and home-made Paan). Anyway we started NRT services within a University Hospital based clinical service and related addiction research at Nitte University of Mangalore linking with my experts at home and abroad and, of course a good number of stakeholders are also associated with our programme.

In many developing countries NRT is non-existent and some of the countries started simply in the form of unregulated trade. For example, India (one of the highly populated countries in the world) is heavily burdened with tobacco related pre-mature deaths and diseases. But the reality is that, in India and many developing countries NRT products of different forms are not easily available, importantly one of the effective NRT products ie., Varenicline (Champix), although limited products are marketed through third-party agreement. But the product is quite expensive –even for rich people in India and regional countries. In this context – we took NRT chewing gum produced by Indian manufacturing company Cipla. But, as I said we don’t know how this NRT chewing-gum (Nicogum of Cipla) can help stop Gutkha (and a similar commercially marketed quid sachets) at all. Although Cipla claims that NRT gum can be used to stop Gutkha and Paan chewing, but there is no evidence available until date – would have been generated through clinical trial—needs to be addressed urgently. In this context Cipla and other manufacturers are communicated.

However, considering all these facts and fallacies we decided to start an NRT clinic, and since last couple of years we established this unit of NRT clinical service and number of researches on tobacco addictions are on progress. And we are in a position to extend the services (clinical and training for NRT care) including multi-centric addiction research) elsewhere— linking with the UK Universities of Warwick, BPP London, Kings College London and Nara Medical University of Japan. I add that, this handbook is developed based on our own research and operational actions, also number of published researches, guidelines are consulted and included to provide supportive information for its users.

Importantly, in this operational project we included assessment of nutritional status in terms of Skin-Fold Thickness (SFT) and Body Mass Index (BMI), considering the fact that, significant proportion of tobacco addicts start eating more food when they stop tobacco, because, they develop increased appetite after stopping the habit(s), and that creates another problem of obesity—so we carefully monitor pre-post NRT.
Second, macular degeneration (especially Age-adjusted Macular Degeneration - AMD— may develop total blindness eventually) is another serious concern among smokers— and we have included this to detect any AMD among smokers and chewers, but we don't know any relation of AMD and quid chewing. However, we have a comprehensive unit to assess the cases clinically, and at the same time we are collecting data information in order to regulate NRT management and follow-up assessment — is a focused objective of this service.

Another issue we take seriously, -- oral health assessment, and this issue is not taken up by NRT assessors elsewhere including UK NHS, so I talked to my UK colleagues-- particularly Gay Sutherland a consultant at Kings College London, who is one of the leaders of stop-smoking and involved in addiction research within the department of Psychiatry and also other stakeholders of National Institute of Health and Clinical Excellence (NICE, DoH) to incorporate oral health assessment among NRT clients/cases. It needless to mention that published researches revealed and also the clinicians find that many smokers and quid-chewers develop poor oral health, such as- periodontal destruction, dental caries and oral mucosal diseases, along with ugly appearance of mouth cavity. Frequent spitting of quid-stained saliva by the chewers in public places-- is really a disgusting practice and a public health concern among SE Asian population living any part of the world. Therefore, it is essential to include the determinants for assessment of oral health status as well.

The Knowledge, Attitude and Practice (KAP) indices are included to measure the level of risk, along-with Fagerstrom Test for Nicotine Dependence i.e. FTND indices are used for proper assessment and follow-up. Moreover, In this book, we have included selected published paper to provide an idea that the dental, medical and nursing professionals understand their role in stopping tobacco habit(s) and relevant research.

I believe, this handbook aimed to include necessary information to run clinical services as well as research operations. I always welcome critical analysis and helpful advises on this work. This publication will be updated regularly.

Thanks for your support.

9th Feb 2014, London

Chitta Chowdhury, Prof
Editor
Acknowledgement

I have my profound admiration to Dr Arnab Gupta, Director of Saroj Gupta Cancer Centre & Research Institute (SGCC & RI) for his outstanding support throughout, especially in bringing this book for users. He rightly holds the helm of such an extraordinary cancer hospital in India. I duly acknowledge Dr. Suman Shetty, who was lecturer of the Department of Oral Biology and Genomic Studies at Nitte University for her contribution in preparation of this book and running day-to-work in NRT clinical and training services during 2013. I also thankful to Dr. Anup John Pereira, who was partially involved as one of the volunteer team-members of NRT programme. Many thanks to my colleagues on the board as experts and contributors in this book—their advisory support is helpful. Specially, I would like to mention about Professor Satheesh Rao, Head of Psychiatry of KS Hegde Medical Academy, Professor Fatima D ’Silva, Principal of Nursing College and Professor C S Shastry, Principal of Pharmacy College of Nitte University for their active participation in working group meeting and frontier research— they have established active collaboration with my centre for research and training.

My special thanks to Professor Rajendra Prasad, Dean, AB Shetty Dental Institute for all the supports he has been provided so amicably. Thanks to Professor Sridhar Shetty , the founding Dean of AB Shetty Dental College for his all time encouragement and good suggestions. I must remember gratefully Professor Jnan Sil and especially Professor Bela Bose of Kolkata (Calcutta)-with the support of Professor Bose, Kolkata NRT course enjoys good success always. I gratefully appreciate the cooperation of Professor Aparajijja Saha of Kolkata for facilitating outreach NRT courses at SGCC & RI of Kolkata.

My best wishes to Professor Edward Lynch of Warwick University, Professor Stewart Harding of BPP University Dental School, London and Professor T Kirita of Nara Medical University—they are really supportive to replicate the services elsewhere.

Especially I would like to express my sincere thanks to Mr N. Vinay Hegde, Chancellor of Nitte University—he is always supportive and inspirational to me, without his encouragement such initiative would not have been incepted in India.

I am so much impressed with Professor SK Banerjee, Director of Medical Education, Ministry of Health, Government of West Bengal — he is really a quite outstanding personality and extraordinary visionary to embrace all the events and I hope with his administrative and strategic support we will be able to help save million lives from pre-mature death from tobacco menace.

I am of course ever grateful to Professor VM Katoch, Director General of Indian Council of Medical Research who is also Secretary of Health Research of Government of India. He is the person I ever seen— having such high profile role in the Country. He manages to reply my discussions so meaningfully and cordially. He is our great support to take our initiative forward. I have my profound respect to Dr. Katoch, and my best wishes to him.

Thanks to my friends and colleagues for giving their messages which is not only be considered as a good will gesture, also a piece of review for the publication—users may find them useful.

Disclaimer

The views and contents published in this book are not necessarily those of Saroj Gupta Cancer Centre & Research Institute, Calcutta, India who commissioned this intervention- based handbook, as well as other organizations and experts who provided the advisory and strategic support.

Preparation of this handbook of NRT Services and Follow-up Assessment and addiction research is led by professor Chitta Chowdhury upon consultation with his stakeholders, contributors and relevant published reports.
Dedicated to

- People Intent To Stop Tobacco To Avoid Pre-mature Death and Disabilities

- Late Dr. Saroj Gupta, a great man, founder of Saroj Gupta Cancer Centre & Research Institute (SGCC & RI) — a comprehensive cancer centre in the country. His dreams are transformed into a reality today.

- My Son Avidyuti and Wife Ashoka for Their Continuous Support and Sacrifice in all of my work - as always.
Addiction Research and NRT Clinical Service

Advisors and Contributors [Expert Group]

National

1. Prof. Sateesh Rao, Head of psychiatry, KSHegde Medical Academy (KSHEMA) : Psychometric analytical support, and main collaborator
2. Prof. Nazir Attar, Internal Medicine, KSHEMA : Managing treatment complications with NRT
3. Dr. Giridhar, Pulmonary Medicine, KSHEMA : Assessment of Respiratory Function
4. Prof. Viji Pai, Department of Ophthalmology, KSHEMA : Age related Macular Degeneration (AMD) among Smokers
5. Prof. Satyanarayan Rao, HoD Pharmacology, KSHEMA : Development of cost-effective NRT product
6. Dr. Rajeev, Urology, KSHEMA : Assessment of Renal Function & NRT
7. Prof. Biju Thomas, Head, Periodontology, ABSMIDS : Assessment of Periodontal health among tobacco users
8. Prof. Udaya Kiran, KSHEMA : Community Involvement for Health Development for addicts
9. Prof. Fatima D'Silva, Principal Nursing College, Nitte University : Supportive team for counselor and NRT
10. Prof. C S Shastry, Principal, Pharmacy College, Nitte University : Research and formulation of cost-effective NRT products
11. Dr. Prakash C Gupta, Director of Healis – Sekhsaria Institute of Public Health, Navi Mumbai : Policy and Strategic Research
12. Professor Jnan Sil, Saroj Gupta Cancer Centre & Research Institute : Education & Policy Research
13. Professor Bela Bose, Ex- Principal Bihari Lal College of Home Sc, Kolkata University : Education, Networking & Policy Research
14. Dr. Arnab Gupta, Director, SGCC & RI, Kolkata : Improving QoL of Cancer Survivors, Surgical Oncology

Foreign Advisors & Contributors

* Professor Edward Lynch, Head of Warwick dentistry, The University of Warwick, Coventry UK
* Dr. Gay Sutherland, Consultant, Inst of Psychiatry, Kings College London, Tobacco Research Unit, 1-4 Windsor Walk, London, SE5 8AF, Specialist Smokers Clinic, SL&M NHS Foundation Trust, London, UK
* Professor Tadaaki Kiriti, Nara Medical University, Japan
* Professor Stewart Harding, Dean, The City of London Dental School, BPP University, London, UK
* Mr Tony Markus, Formerly Consultant Maxillofacial Surgeon Poole Hospital NHS, UK
* Mr. Andrew Lyons, Consultant Maxillofacial Surgeon and Head, Department of Head-Neck Cancer Services, Guys Hospital, London, UK
NRT KOLKATA : A DIVISION IN WEST BENGAL

Chairman

Dr. Arnab Gupta, Director, SGCC&RI

Chief Advisor

Professor SK Banerjee, Director of Medical Education. Ministry of Health & Family Welfare Government of West Bengal, Kolkata.

Convener of the Programme and Course Director

Professor Chitta Ranjan Chowdhury, Head, Department of Oral Biology & Genomic Studies, Lead, NRT Services of Nitte University, Mangalore, India & The University of Warwick, UK

C.R.Chowdhury@warwick.ac.uk

Advisors

Dr. Partha Haldar, Medical Superintendent, SGCC&RI, Dr. Soma Bhattacharya, Medical Administrator, SGCC&RI, Professor Bela Bose, President, Calcutta Ekatma, Kolkata-700026, Professor Aparajita Saha, Sambhunath Pandit Hospital, Kolkata-0700020, Ms. Gouri Roy, Nursing Superintendent, SGCC&RI, Ms. Ashoka Gosh, Dy. Nursing Superintendent, SGCC&RI, Major Jharna Das, MNS, Matron, SGCC&RI

Local Course Coordinator

Prof. (Dr.) Jnan Sil, Dy. MS, SGCC&RI, (m) 9433244945, Email: drjsil@gmail.com

Interest Group

Dr. Saradindu Ghosh, Dr. Arun Ganguly, Dr. Dhrubajyoti Mukherjee, Dr. Dev Roy, Dr. Amitava Guha, Dr.Indranil Chatterji, Dr. Nipun Saha

Admin

Ms. Krishnakali Das (Extn. 2102) and Ms. Piyali Chatterjee (Extn. 2106)

Secretariat

SAROJ GUPTA CANCER CENTRE & RESEARCH INSTITUTE (SGCC&RI)

Mahatma Gandhi Road, Thakurpukur

Kolkata-700063, West Bengal, India

Tel: 91-33-2453 2781/ 82/ 83; 91-33-2467 8001/8003; Fax: 91-33-24678002, 91-33-2453 6711 Email: cancercentre6@gmail.com/cancarwelfare@yahoo.co.in Website: www.cancercentrecalcutta.org
# Table of Contents

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory page</td>
<td>i</td>
</tr>
<tr>
<td>Foreword</td>
<td>ii</td>
</tr>
<tr>
<td>Editors Note</td>
<td>iii-iv</td>
</tr>
<tr>
<td>Acknowledgement, Disclaimer</td>
<td>v</td>
</tr>
<tr>
<td>Dedicated to</td>
<td>vi</td>
</tr>
<tr>
<td>Advisors and Contributors</td>
<td>vii</td>
</tr>
<tr>
<td>NRT Kolkata: Division of West Bengal</td>
<td>viii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>ix-x</td>
</tr>
<tr>
<td>1. Assessment of Personal Habit(s) For Counseling, NRT Services and Addiction Research</td>
<td>01</td>
</tr>
<tr>
<td>2. Study for Indices on Knowledge, Attitude &amp; Practice (KAP)</td>
<td>12</td>
</tr>
<tr>
<td>3. Understanding on Nicotine Replacement Therapy (NRT)</td>
<td>22</td>
</tr>
<tr>
<td>4. Measurement of Blood Pressure</td>
<td>28</td>
</tr>
<tr>
<td>5. Measuring Body Mass Index (BMI)</td>
<td>39</td>
</tr>
<tr>
<td>6. Measuring Percentage of body fat</td>
<td>42</td>
</tr>
<tr>
<td>7. Measuring Pulmonary Function Test (PFT)</td>
<td>49</td>
</tr>
<tr>
<td>7.1. PFT John Hopkins Hospital Protocol</td>
<td>52</td>
</tr>
<tr>
<td>8. Carbon Monoxide Detection (CO-measuring)</td>
<td>58</td>
</tr>
<tr>
<td>9. Macular Degeneration and Smoking</td>
<td>61</td>
</tr>
<tr>
<td>9.1. Correlation between macular degeneration and smoking</td>
<td>62</td>
</tr>
<tr>
<td>9.2. Macular Degeneration – causes, symptoms and treatment</td>
<td>68</td>
</tr>
<tr>
<td>10. Role of nurses in reducing use of tobacco</td>
<td>71</td>
</tr>
<tr>
<td>10.1. Role and behavioral perspective of physician in reducing the use of tobacco</td>
<td>78</td>
</tr>
<tr>
<td>10.2. Role of Dentists/dental hygienists/ Dentistry in reducing the use of tobacco</td>
<td>93,119</td>
</tr>
<tr>
<td>11. Quitting of tobacco (one-to-one approach)</td>
<td>127</td>
</tr>
</tbody>
</table>
ASSESSMENT OF PERSONAL HABIT(S) FOR COUNSELING, NRT SERVICES & ADDICTION RESEARCH

GENERAL INFORMATION

Interviewing

A detailed case-history has to be recorded, diagnosed and studied for the sole purpose of maintaining data-information. Particulars such as name, age, gender and address are mandatory. Added on information such as number of cigarettes/ Beedi / other tobacco product (eg smokeless tobacco-ST) consumed, should be taken into account. This helps the interviewer to maintain a good rapport with the tobacco users, and that helps achieve the goal of stopping tobacco at earlier.

Assessment and Monitoring

Survey conducts to understand about smoking habits and develop a client-friendly stop tobacco program. A survey format, with criteria for assessment will be used.

Entry of the file (computer coded Microsoft Excel format): All the information collected has to be tabulated, designed and computed in a computer-coded system. Maintainance of a record helps the investigator for easy progression of the case treated with NRT and re-call. The purpose of this system is referral and follow-up of the cases.

NOTE:
- This is an interview generated survey
- Greet the patient/subject appropriately (introduce yourself and ask the patients/subjects by name)
- Take informed consent (sample format below). Circle the answer, and mention where applicable.

Patient’s/ Subjects ID ______________ Informed consent: Taken
Name of examiner ______________ Date ______________ Location______________

DEMOGRAPHIC INFORMATION

NB. Circle the answer/data-information

1. Name (Optional): ______________________________

2. Age-group:
   - 77-80, 80 and above

3. Gender: Male / Female

4. Literacy status: Illiterate / Primary / higher primary/ secondary/ Higher secondary/ University
5. Occupation, mention ____________________

6. Socio-economic status: (at Indian standard)*: Poor / Average / Rich

7. Religious beliefs: Hinduism / Islam / Christian / Buddhism / Jainism / Parsi / No belief

8. Ethnicity: Any tribal origin, mention ______________________

9. What is your habit? Bidi smoking / Cigarette with filter / without filter / Hookah/ Chillum / Cigar/ Gutka / Pan-parag / Beeda with tobacco / Beeda without tobacco / Alcohol drinking

10. KAP Score: (Detail is enclosed)

11. How many cigarettes / ST (Smokeless Tobacco) do you consume in a day? Less than 5, 5-10, 11-15, 16-20, 21-30, 31 or more

Mention the name of the brand (if any) you consume ________________________________

12. When do you think smoking / ST helps you most? [please circle your answers]
   - When I am stressed
   - When I am angry
   - When I am nervous and tensed
   - When I have difficulty in clearing my bowel
   - When I am not able to sleep
   - When I am tired
   - When I am bored
   - I don’t know

13. What would make it difficult for you to stop smoking / ST?

<table>
<thead>
<tr>
<th>Answer(s)</th>
<th>Agree to an extent</th>
<th>Mostly agree</th>
<th>Fully agree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have less will power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I may put on weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be too stressed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I’m too much addicted to Cigarette / ST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because, my spouse smokes/ chews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will miss smoking/ST with my Friends and relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can’t help craving for a Smoke/ST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would miss smoking /ST breaks at work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be bored</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would not bother to stop Smoking/ chewing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy smoking / ST very much</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. Do you smoke/ chew your first cigarette / ST within 30 minutes of waking up? : Yes / No

15. Are you intending to stop smoking / ST in the next 6 months? : Yes / No / No answer

16. If YES, are you intending to stop within the next month? : Yes / No / I don’t know

17. If NO, would you like to stop if there is a help available to you? : Yes / No / Not sure

18. If you try to stop smoking / ST, how confident would you be about succeeding? : Fairly confident / No confident / Very confident

19. Your FTND indices  [Very Important Parameter. Give a score below]

PS. Items and scoring for Fagerstrom Test for Nicotine Dependence (FTND).
If this scale is used for any purpose other than research, then kindly obtain permission from K.O. Fagerstron

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How soon after you wake up do you smoke your first cigarette / ST?</td>
<td>within 5 mins</td>
<td>.....3</td>
</tr>
<tr>
<td></td>
<td>6-30 mins</td>
<td>.....2</td>
</tr>
<tr>
<td></td>
<td>31-60 mins</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>After 60 mins</td>
<td>.....0</td>
</tr>
<tr>
<td>2. Do you find it difficult to refrain from smoking / ST in places where it is forbidden e.g in temple, church, at the library, in cinema, etc.?</td>
<td>Yes</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>.....0</td>
</tr>
<tr>
<td>3. Which cigarette / ST would you hate most to give up?</td>
<td>The first one in</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>the morning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All others</td>
<td>.....0</td>
</tr>
<tr>
<td>4. How many cigarettes and / ST per day do you smoke or chew?</td>
<td>10 or less</td>
<td>.....0</td>
</tr>
<tr>
<td></td>
<td>11-20</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>21-30</td>
<td>.....2</td>
</tr>
<tr>
<td></td>
<td>31 or more</td>
<td>.....3</td>
</tr>
<tr>
<td>5. Do you smoke/chew more frequently during the First hours after waking than during the rest of the day?</td>
<td>Yes</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>.....0</td>
</tr>
<tr>
<td>6. Do you smoke/chew if you are so ill that you are In bed most of the day?</td>
<td>Yes</td>
<td>.....1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>.....0</td>
</tr>
</tbody>
</table>

Total Score =

Scoring: 1-3 = Low Dependence, 4-6= Moderate Dependency, 7 and More= High Dependency
EXAMINATION AND ASSESSMENT

20. Measurement of Blood Pressure:

Blood pressure (BP), sometimes referred to as arterial blood pressure, is the pressure exerted by circulating blood upon the walls of blood vessels, and is one of the principal vital signs. During each heartbeat, blood pressure varies between a maximum (systolic) and a minimum (diastolic) pressure.

NOTE: Please read the 10 points for accuracy of BP reading (enclosed)

Normal value for adults: 120/80 mm/Hg.

21. Calculating and Interpreting BMI (Body Mass Index):

21.1. Weight in kilograms is recorded using weighing scale: __________

21.2. Height in centimeters is recorded using Height measuring scale: __________

To calculate BMI, the weight in kilograms is divided by square of height in meters (1m = 100 cms)

\[
\text{BMI} = \frac{\text{Mass (Kg)}}{(\text{Height (m)})^2}
\]

BMI = __________ kg/m²

Interpreting BMI

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>Healthy weight</td>
</tr>
<tr>
<td>25-29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30 or above</td>
<td>Obese</td>
</tr>
</tbody>
</table>

22. Measurement of skin fold thickness and Body Fat percentage

Skin fold thickness is measured using skin fold calipers. The key locations measured are biceps, triceps, subscapular and suprailliac area in millimeters. The sum of four skin folds is calculated. The body fat % is determined from the chart given at the bottom of the page (Images are enclosed how you will measure them).

CHART TO CALCULATE BODY FAT % : MEN’S CHART:

<table>
<thead>
<tr>
<th>Sum in mm</th>
<th>Age 16-29</th>
<th>Age 30-49</th>
<th>Age 50+</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>8.1</td>
<td>12.1</td>
<td>12.5</td>
</tr>
<tr>
<td>22</td>
<td>9.2</td>
<td>13.2</td>
<td>13.9</td>
</tr>
<tr>
<td>24</td>
<td>10.2</td>
<td>14.2</td>
<td>15.1</td>
</tr>
<tr>
<td>26</td>
<td>11.2</td>
<td>15.2</td>
<td>16.3</td>
</tr>
<tr>
<td>28</td>
<td>12.1</td>
<td>16.1</td>
<td>17.4</td>
</tr>
<tr>
<td>30</td>
<td>12.9</td>
<td>16.9</td>
<td>18.5</td>
</tr>
<tr>
<td>35</td>
<td>14.7</td>
<td>18.7</td>
<td>20.8</td>
</tr>
<tr>
<td>40</td>
<td>16.3</td>
<td>20.3</td>
<td>22.8</td>
</tr>
<tr>
<td>45</td>
<td>17.7</td>
<td>21.8</td>
<td>24.7</td>
</tr>
<tr>
<td>50</td>
<td>19.0</td>
<td>23.0</td>
<td>26.3</td>
</tr>
<tr>
<td>55</td>
<td>20.2</td>
<td>24.2</td>
<td>27.8</td>
</tr>
<tr>
<td>60</td>
<td>21.2</td>
<td>25.3</td>
<td>29.1</td>
</tr>
<tr>
<td>65</td>
<td>22.2</td>
<td>26.3</td>
<td>30.4</td>
</tr>
<tr>
<td>70</td>
<td>23.2</td>
<td>27.2</td>
<td>31.5</td>
</tr>
<tr>
<td>75</td>
<td>24.0</td>
<td>28.0</td>
<td>32.6</td>
</tr>
<tr>
<td>80</td>
<td>24.8</td>
<td>28.8</td>
<td>33.7</td>
</tr>
<tr>
<td>85</td>
<td>25.6</td>
<td>29.6</td>
<td>34.6</td>
</tr>
<tr>
<td>90</td>
<td>26.3</td>
<td>30.3</td>
<td>35.5</td>
</tr>
<tr>
<td>95</td>
<td>27.0</td>
<td>31.0</td>
<td>36.5</td>
</tr>
<tr>
<td>100</td>
<td>27.6</td>
<td>31.7</td>
<td>37.3</td>
</tr>
<tr>
<td>Sum in mm</td>
<td>Age 16-29</td>
<td>Age 30-49</td>
<td>Age 50+</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>14</td>
<td>9.4</td>
<td>14.1</td>
<td>17.0</td>
</tr>
<tr>
<td>16</td>
<td>11.2</td>
<td>15.7</td>
<td>18.6</td>
</tr>
<tr>
<td>18</td>
<td>12.7</td>
<td>17.1</td>
<td>20.1</td>
</tr>
<tr>
<td>20</td>
<td>14.1</td>
<td>18.4</td>
<td>21.4</td>
</tr>
<tr>
<td>22</td>
<td>15.4</td>
<td>19.5</td>
<td>22.6</td>
</tr>
<tr>
<td>24</td>
<td>16.5</td>
<td>20.6</td>
<td>23.7</td>
</tr>
<tr>
<td>26</td>
<td>17.6</td>
<td>21.5</td>
<td>24.8</td>
</tr>
<tr>
<td>28</td>
<td>18.6</td>
<td>22.4</td>
<td>25.7</td>
</tr>
<tr>
<td>30</td>
<td>19.5</td>
<td>23.3</td>
<td>26.6</td>
</tr>
<tr>
<td>35</td>
<td>21.6</td>
<td>25.2</td>
<td>28.6</td>
</tr>
<tr>
<td>40</td>
<td>23.4</td>
<td>26.8</td>
<td>30.3</td>
</tr>
<tr>
<td>45</td>
<td>25.0</td>
<td>28.3</td>
<td>31.9</td>
</tr>
<tr>
<td>50</td>
<td>26.5</td>
<td>29.6</td>
<td>33.2</td>
</tr>
<tr>
<td>55</td>
<td>27.8</td>
<td>30.8</td>
<td>34.6</td>
</tr>
<tr>
<td>60</td>
<td>29.1</td>
<td>31.9</td>
<td>35.7</td>
</tr>
<tr>
<td>65</td>
<td>30.2</td>
<td>32.9</td>
<td>36.7</td>
</tr>
</tbody>
</table>
Normal or Ideal % Body fat

For men:

For men up to about the age of 30, 9-15% is good, from age 30 to 50, 11-17% ia a good range, and from age 50 and up, 12 to 19%.

For women:

For women, the range up to age 30 is 14-21%, from 30-50 it is 15-23%, and from 50 up it is 16-25%.

23. Respiratory function test:

Spirometry is the most common of the pulmonary function tests, measuring lung function, specifically the amount (volume) and / or speed (flow) of air that can be inhaled and exhaled.

Note: FAQ is Enclosed , you may visit a authentic site: http://www.barnescare.com/?id=4448&sid=18

Also visit http://www.lung.ca/diseases-maladies/help-aide/spirometry-spirometrie/index_e.php
24. CO detection and completion of smokerlyzer chart:

Micro Smokerlyzer device is used to measure the amount of carbon monoxide in the breath. The patient/subject is asked to inhale deeply and hold his / her breath for 15 seconds and then slowly exhale into the mouthpiece. The device will measure the amount of CO in the breath and the percentage of carboxyhaemoglobin in blood.

Note: Expired air carbon monoxide (ECO) measurement is an objective measure, but has a short half-life and only provides an indication of recent smoking exposure. So ask if s/he smoked the day visited.

Detail: See the Manual of the manufacturer (Enclosed)

25. Oral Health Status of Tobacco Users (Smoker/Chewers)

[Assessed for Dental Caries, Periodontal (gum) disease and their destruction including disease in mucous membrane of mouth cavity. WHO format will be used]

25.1. Scores of tooth disease/status: DMFT (Decayed, Missing, and Filled teeth with Treatment need )

Score for DMFT __________

25.2. Periodontal disease status: Community Periodontal Index (CPI) or Index of Basic Periodontal Examination (BPE): Score: __________

25.3. LOA (Loss of Periodontal Attatchment) ___________________ mm

25.3. Mucosal Lesion (mention as per WHO Criteria) __________________________________________

25.4. Oral Hygiene Status (Simplified): Plaque Index (PI) + Calculus Index (CI), Formula-

\[
\text{Number of surfaces with plaque/calculus} \times 100
\]

\[
\text{Total number of teeth} \times 4 \text{ (quadrants)}
\]

:OHS(S)=_______

PS. Read WHO Basic Oral Health Survey Method 4th ed* of Oral Health Assessment & WHO Method for Oral Mucosal Diseases and Conditions** – is self explanatory. You may also need to take assistance of a dental professional/researcher experienced in oral health assessment using WHO format and criteria for detections-diagnosis including calculation for indices.

World Health Organization
Oral Health Assessment Form
for Adults (by tooth surface), 2013

<table>
<thead>
<tr>
<th>Leave blank</th>
<th>Year</th>
<th>Month</th>
<th>Day</th>
<th>identification No.</th>
<th>Orig/Dupl</th>
<th>Examiner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**General information:**

Sex: 1=M, 2=F

Date of birth

Age in years

(Name)

Ethnic group

Other group

Years in school

Occupation

Community (geographical location)

Location: Urban (1), Periurban (2), Rural (3)

Other data

Other data

Extra-oral examination

**Dentition status by tooth surface**

| Tooth Surface | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
|---------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Occlusal       | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Mesial         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Buccal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Distal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Occlusal       | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Mesial         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Buccal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Distal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Occlusal       | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Mesial         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Buccal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Distal         | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |

**Permanent teeth**

Status

0 = Healthy
1 = Caries
2 = Filled w/caries
3 = Filled no/caries
4 = Missing due to caries
5 = Missing for another reason
6 = Fissure sealant
7 = Fixed partial denture/crown, abutment, veneer, implant
8 = Unerupted
9 = Not recorded

**Gingival bleeding**

Score

0 = Absence of condition
1 = Presence of condition
9 = Tooth excluded
X = Tooth not present

**Pocket Score**

0 = Absence of condition
1 = Pocket 4-5 mm
2 = Pocket 6 mm or more
9 = Tooth excluded
X = Tooth not present
COMMUNITY PERIODONTAL INDEX (CPI)  
0 = healthy  
1 = Bleeding  
2 = Calculus  
3 = Pocket 4-5 mm (black band probe) Partially visible  
4 = Pocket 6 mm or more (black band On probe not visible)  
X = Excluded sexion  
9 = Not recorded  
Not recorded under 15 years of age  

LOSS OF ATTACHMENT  
0 = 0-3 mm  
1 = 4-5 mm (cementoenamel junction (CEJ))  
2 = 6-8 mm (CEJ) with (black band probe and 8.5 mm ring)  
3 = 9-11 mm (CEJ between 8.5 mm and 11 mm ring)  
4 = 12 mm or more (CEJ beyond 11.5 mm ring)  
X = Excluded sexion  
9 = Not recorded  
Not recorded under 15 years of age  

Tobacco related OHS (Oral Hygiene Status)  
Level of Extrinsic Stains on tooth : Mild / Moderate / Severe (Follow the criteria included)  
Level of Extrinsic Stains (or redness) on tongue : Mild / Moderate / Severe (Follow the criteria included)  
Level of Extrinsic Stains / redness in mucosa : Mild / Moderate / Severe (Follow the criteria included)  
Level of Periodontal Destruction (Clinical) : Mild / Moderate / Severe (Follow the criteria included)  
Level of Periodontal Destruction (Radiological) : Mild / Moderate / Severe (Follow the criteria included)  

27. Oral Mucosal Diseases and Conditions (Use WHO format for OMD&C to depict)  
If any positive result is present, then mention it:  

Oral Mucosal Diseases and Conditions (WHO format)  

ORAL LIUCOSA  

LOCATION  
0 = Vermillion border  
1 = Commissures  
2 = Lips  
3 = Suid  
4 = Buccal mucosa  
5 = Floor of mouth  
6 = Tongue  
7 = Hard end/or soft palate  
8 = Alveolar ridges/gingiva  
9 = Not recorded  

1 NOTE: Use the WHO Topography  

Read WHO Oral Mucosal Diseases and Conditions*.  


28. Checking for Age-related Macular Degeneration (AMD) among smokers/ST users (criteria vide appendix)  
Positive / Negative / Not Detected  
AMD status: Mild / Moderate / Severe
29. Associated Systemic Diseases

Mention ____________

30. Metabolic Syndrome?*** Y/N

31. Psychometric / Psychological assessment (if needed)

PS. Consult with the Department of Psychiatry (refer to Professor Sateesh Rao, Head Psychiatry, KHEMA  email. dr_satheeshrao@yahoo.com or your nearest Psychiatrist can help assess of its kind. You may contact to editor of this hadbook Professor Chowdhuery crc.ob.cod@gmail.com for further assistance)

32. Biomedical Parameters (optional— mainly need for addiction research)

   i) Salivary PH: (Paper test) Acidic / Alkaline / Neutral 
   Value (by using Ph meter) ________________

   ii) Candidal Load: 
       KOH mouth wash : Load of Candidal hyphi : Low / moderate / high 
       Gram staining : Load of Candidal hyphi: Low / moderate / high

   iii) Level of Cotinine (a nicotine metabolite) ______________
       Salivary Cotinine ______________
       Serum Cotinine ______________ 
       Urinary Cotinine ______________
       Urinary Protein ______________
       Urinary Creatinine ____________

   iv) Glomerular filtration rate (eGFR)****

   v) 24-h urinary protein (Uprot) excretion

Foot note (Metabolic Syndrome)*** and eGFR****

Criteria set by National Heart Lung and Blood Institute of National Health Institute of USA below.

The five conditions described below are metabolic risk factors. You can have any one of these risk factors by itself, but they tend to occur together. You must have at least three metabolic risk factors to be diagnosed with metabolic syndrome.

- A large waistline. This also is called abdominal obesity or "having an apple shape." Excess fat in the stomach area is a greater risk factor for heart disease than excess fat in other parts of the body, such as on the hips.
- A high triglyceride level (or you’re on medicine to treat high triglycerides). Triglycerides are a type of fat found in the blood.
- A low HDL cholesterol level (or you’re on medicine to treat low HDL cholesterol). HDL sometimes is called "good" cholesterol.
- This is because it helps remove cholesterol from your arteries. A low HDL cholesterol level raises your risk for heart disease.
- High blood pressure (or you’re on medicine to treat high blood pressure). Blood pressure is the force of blood pushing against the walls of your arteries as your heart pumps blood. If this pressure rises and stays high over time, it can damage your heart and lead to plaque buildup.
- High fasting blood sugar (or you’re on medicine to treat high blood sugar). Mildly high blood sugar may be an early sign of diabetes.
- **** eGFR is expensive, therefore you may consult Urologist for assessment of Urinary protein among tobacco users
Study for Indices

KNOWLEDGE, ATTITUDE & PRACTICE (KAP)
ON TOBACCO HABIT(s)

Section I: DEMOGRAPHIC INFORMATION

Subject’s code No: ______________ Date of Interview: ____________________________

1. Name (Optional): ______________ 2. Age (yrs)_________ 3. Gender: Male / Female

4. Date of Birth __________________

5. Religion / Religious faith ___________________ / No religious faith

6. Marital status: Married / Single / Divorced / Partner / Other ________________

7. Socio-economic status: (at Indian Standard) Poor / Average / Rich

8. Literacy status: Illiterate / Elementary / Junior High / High / High Secondary / University

9. Occupation: __________

Section II: KNOWLEDGE (K)

Statements: The following two statements (related to knowledge) will be asked first.

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q10. Have you ever heard about oral cancer?</td>
<td>□□</td>
</tr>
<tr>
<td>A. Yes / No</td>
<td>□</td>
</tr>
<tr>
<td>Q11. Do you know what causes oral cancer?</td>
<td>□□</td>
</tr>
<tr>
<td>A. Yes / No</td>
<td>□</td>
</tr>
</tbody>
</table>
Q12. I believe, you never hear about oral cancer

Yes / No

Q13. I believe, you do not know the cause of oral cancer

A. Yes, I know / No, I do not know

Question items 14-23 are related to the knowledge of oral cancer related facts

Note: Positive = 1; wrong and negative = 0 (See appendix 4 for detail)

Q14. Did you ever hear about oral cancer?

A. Yes / No

Q15. Where or from whom did you hear about oral cancer?

A. Parents / Friends / Doctor / Dentist / Radio / TV / Newspaper / I can’t remember

Q16. Do you know the cause of oral cancer?

A. Yes / No / I don’t know:

Q17. If yes, please mention __________________________

Q18. Does oral cancer kill many people in India?

A. Yes / No / I do not know:
Q19. Do you think, Paan (Quid) chewing with tobacco may cause oral cancer?  
A. Yes / No / I don’t know

Q20. Do you think Paan chewing with tobacco is better than smoking?  
A. Yes / No / I don’t know

Q21. Do you know any other bad effects of the tobacco habit?  
Yes / No:

Q22. If yes, please mention (i)____ (ii)__________ (iii)__________  
Heart disease / Lung cancer / High BP

A. 20. [If s/he can mention any correct ** answer, score will be 1]:

Q23. Family history of cancer  
A. Yes / No:

Section III: ATTITUDE (A)

The following question items 24-32 are related to attitude of the respondents.
<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q24. Do you want to quit the habit of chewing quid (chewew)?</td>
<td></td>
</tr>
<tr>
<td>A. Yes / No / No answer ?</td>
<td></td>
</tr>
<tr>
<td>Q25. Which habit do you prefer to give up? (in case of both habits)</td>
<td></td>
</tr>
<tr>
<td>A. Chewing / Smoking / both / None / difficult to do so:</td>
<td></td>
</tr>
<tr>
<td>Q26. Do you want our help to give up any your habit?</td>
<td></td>
</tr>
<tr>
<td>A. Yes / No / No answer:</td>
<td></td>
</tr>
<tr>
<td>Q27. How do you feel when a person is smoking near you?</td>
<td></td>
</tr>
<tr>
<td>A. Feel nothing / bad smell:</td>
<td></td>
</tr>
<tr>
<td>Q28. Do you want to quit the habit of smoking (smoker)?</td>
<td></td>
</tr>
<tr>
<td>A. Yes / No / No answer:</td>
<td></td>
</tr>
<tr>
<td>Q29. Do you think a quid chewer looks good?</td>
<td></td>
</tr>
<tr>
<td>A. Yes / No / No answer:</td>
<td></td>
</tr>
</tbody>
</table>
Questions items 33-34 (multiple choice) regarding believes and psychological aspects of quid chewing habit

BELIEVES & PSYCHOLOGICAL ASPECTS OF QUID CHEWING HABIT

Q33. Why do you chew a quid?

[Please give your answer(s)]

A. Any answer from these options will be scored ‘0’, otherwise ‘1’

Yes
It gives pleasure

It’s a long traditional practice and entertainment, I like it.
It relieves tension
It reduces tiredness
Chewing quid stains the inside of the mouth red which is aesthetically pleasing.
It improves appetite
It helps digestion
It produces sweet smell
It kill dental pain
It prevents dental decay
It produces sweet breath
It produces red saliva which I like
It prevents gum bleeding
Other
I have no answer

Q34. How a quid – chewer looks?  
A. Looks good / Not good looking / I have no answer

Section IV: PRACTICE (P)

Questions items 35-41 are related to practice on habit (s)

Q35. Do you have any present history of personal habit(s) of the following?  
A. YES / NO (if yes, please mention)
Cigarette / Bidi / Hooka / Quid chewing (QC)/ Both S & QC/
Home-made snuff (tobacco + lime)/ Commercial Gutkha / alcohol drinking (AD)/ AD + S + QC
Q36. Do you have any past history of personal habit(s) of the following?  

A.YES/NO If yes, please mention)  
Cigarette / Bidi / Hooka / Quid hewing (QC) /  
Both S & QC/ Home-made snuff (tobacco + lime)/Commercial Gutkha / alcohol drinking (AD) / AD + S + QC

Q37. Duration of personal habit (s):  

A.(P.S. Interviewer should enter available information in the boxes)

<table>
<thead>
<tr>
<th>Type of habit</th>
<th>Frequency / 24 hours</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q38. What is your choice of tobacco habit(s)?  

A.(Interviewer will tick the answers, one may have more than one habit)  
Cigarette  
Bidi  
Hooka (indigenous water pipe)  
Quid chewing  
Home-made snuff (tobacco + lime)  
Commercial sachet Gutkha or alike  
Alcohol drinking
Q39. What type of food do you prefer more?

A. Vegetarian food / Non – vegetarian food / No preference

Q40. Do you eat raw green and coloured vegetables?

A. Yes / No

Q41. (OPTIONAL) Can you remember how many meals you eat with raw green and coloured vegetables (such as salads with green leaves (spinach), carrots, tomatoes, beet-root) during last 3 days?

A. 1/2/3/4/5 or more meals / None / do not raw vegetables/ (based on 3 days re-call survey)?

Other-wise mention

( Interviewers should note, this information must be collected based on the principle of 3 days’ recall dietary survey)

B. Like/ Do not A. Like/ No answer

Foot Notes

1. About the questionnaire: The questionnaire is developed based on the principle of knowledge, Attitude and Practice (KAP) study. The questionnaire will have four sections. Section I contains demographic information, item 1-9 will be asked to record the demographic information of the respondents. Sections II is for the question items on knowledge (K); III is for Attitude (A) and the section IV is for Practice (P of the respondents).
2. **Scoring:**

   * Good = Class I or equivalent job/ earning
   
   Average = Class II, III or equivalent job/ earning
   
   Poor = Class IV or No job

   ** Any of the answer for a score, 1

   Yes/ equivalent = 1

   No / equivalent = 0

   I don't know/ equivalent = 0

**Explanations on question item 12 & 13:** These two questionnaires will aim to detect the person’s knowledge based on belief on two different statements (as open end questions) on whether s/he had ever heard about oral cancer. In question 12, if the responder says ‘No’, that will indicate, s/he has no knowledge on ill effect of chewing quid. The question number 13 is based on negative agreement. The answer “No” and “I” do not know will be scored"0"

3. Question items 14-23 are related to the knowledge of oral cancer related facts Note: Positive= 1; wrong negative = 0

4. Question item 41 could be done in one of the ways, and that will be decided during pretesting
Understanding

NICOTINE REPLACEMENT THERAPY (NRT)

[based on FAQ]
Nicotine Replacement Therapy

Reference: Patient.co.in (for further detail: http://www.patient.co.uk/pdf/4543.pdf)

Nicotine replacement therapy (NRT) increases your chance of quitting smoking.

What is nicotine addiction?

Nicotine is a drug that is inhaled from the tobacco in cigarettes. It gets into the bloodstream and stimulates the brain. Most regular smokers are addicted to nicotine.

If you are a regular smoker, when the blood level of nicotine falls, you usually develop withdrawal symptoms such as restlessness, increased appetite, inability to concentrate, irritability, dizziness, constipation, nicotine craving, or just feeling awful. These symptoms begin within a few hours after having the last cigarette. If they are not relieved by the next cigarette, withdrawal symptoms get worse. If you do not smoke any more, the withdrawal symptoms peak after about 24 hours, and then gradually ease over about 2-4 weeks.

So, most smokers smoke regularly to feel 'normal', and to prevent withdrawal symptoms. About 2 in 3 smokers want to stop smoking but, without help, many fail to succeed. The main reason why so few smokers succeed, even though they want to stop smoking, is because nicotine addiction is strong and difficult to break. This is where nicotine replacement therapy (NRT) can help.

What is nicotine replacement therapy?

NRT is a way of getting nicotine into the bloodstream without smoking. There are nicotine gums, patches, inhalers, tablets, lozenges, and sprays. You can buy most of these from pharmacies and other retail outlets. Most are also available on prescription.

How does nicotine replacement therapy work?

NRT stops, or reduces, the symptoms of nicotine withdrawal. This helps you to stop smoking, but without having unpleasant withdrawal symptoms. NRT does not 'make' you stop smoking. You still need determination to succeed in breaking the smoking habit.

How do I use nicotine replacement therapy?

- Take advice from a GP, practice nurse, pharmacist or Stop Smoking Clinic.
- Decide on which type of NRT will suit you best (see below).
- Set a date to start. Some people prefer to stop smoking at the end of one day, and start NRT when they wake the following day. Others prefer to use NRT while they are still smoking, as a way of cutting down gradually.
- You should use NRT regularly at first, and not 'now and then'.
- Use an adequate dose of NRT. The higher doses are used if you smoked more than 18-20 per day.
- Use NRT for at least 8-12 weeks for the best chance of stopping smoking in the long term.
- The dose of NRT is typically reduced in the later part of the course, and then stopped.
- You should not combine NRT with other medicines that help you stop smoking, such as bupropion or varenicline.

You are more likely to stop smoking if you receive counselling or support whilst taking NRT. A doctor, nurse, pharmacist, or Stop Smoking Clinic may give this support. Also, the manufacturers of NRT often offer support such as telephone counselling, tapes, internet sites, personalised written programmes, etc. The details come on the packets of the various NRT products. It is strongly advised that you take up any offer of support whilst going through the difficult time of giving up smoking.

**How effective is nicotine replacement therapy?**

NRT does increase the chance of quitting smoking. Various studies have looked at this issue. The studies compared NRT to a similar dummy (placebo) product in people who were keen to stop smoking. The results from the studies showed that, on average, about 17 in 100 people who took NRT stopped smoking successfully. This compared with about 10 in 100 who took the dummy (placebo) product rather than NRT. In other words, it increased the rate of success by about 70%. A combination of NRT with support or counselling may give the best chance of success.

**Which form of nicotine replacement therapy is best?**

There is not much difference in how well the different types of NRT work. Personal preference usually determines which one to use. Below are listed some points about each form of NRT. Please note, this is just a brief overview. Read the manufacturer’s instructions on the packet for detailed advice on each type of NRT, or seek advice from a pharmacist, doctor or nurse.

**Nicotine gum**

Two strengths are available - 2 mg and 4 mg. You should use the 4 mg strength if you smoke 18 or more cigarettes a day. You can chew up to 15 pieces a day to start with. To release the nicotine, chew the gum slowly until the taste is strong. Then rest it between the cheek and the gum to allow absorption of nicotine into the bloodstream. Chew the gum again when the taste fades, and rest it again when the taste is strong, etc. Use a fresh piece of gum after about an hour. 

Two strengths are available - 2 mg and 4 mg. You should use the 4 mg strength if you smoke 18 or more cigarettes a day. You can chew up to 15 pieces a day to start with. To release the nicotine, chew the gum slowly until the taste is strong. Then rest it between the cheek and the gum to allow absorption of nicotine into the bloodstream. Chew the gum again when the taste fades, and rest it again when the taste is strong, etc. Use a fresh piece of gum after about an hour.

After 2-3 months you should use the gum less and less. For example, reduce the chewing time, cut the gum into smaller pieces, or alternate the nicotine gum with sugar-free gum. Gradually stop the gum completely.
The disadvantage of gum is that some people do not like the taste, or always having something in their mouth. Gum is not suitable if you wear dentures.

**Nicotine patches**

A patch that is stuck on to the skin releases nicotine into the bloodstream. Some patches, which you wear only when you are awake, last 16 hours. Other types last 24 hours, and you wear these the whole time. The 24-hour patch may disturb sleep, but is thought to help with early morning craving for nicotine. Patches are discreet, and easy to apply.

The patches come in different strengths. The manufacturers normally recommend that you gradually reduce the strength of the patch over time before stopping completely. However, some research studies suggest that stopping abruptly is probably just as good without the need to gradually reduce the dose.

The disadvantage of patches is that a steady amount of nicotine is delivered. This does not mimic the alternate high and low levels of nicotine when you smoke, or with chewing nicotine gum. Skin irritation beneath the patch occurs in some users.

**Nicotine inhaler**

This resembles a cigarette. Nicotine cartridges are inserted into it, and inhaled in an action similar to smoking. You should use about 6-12 cartridges a day for eight weeks, and then gradually reduce over four further weeks. It is particularly suitable if you miss the hand-to-mouth movements of smoking.

**Nicotine tablets/lozenges**

You dissolve these under the tongue (they are not swallowed). Nicotine is absorbed through the mouth into the bloodstream. They are easy to use.

**Nicotine nasal spray**

The nicotine in the spray is rapidly absorbed into the bloodstream from the nose. This form of NRT closely mimics the rapid increase in nicotine level that you get from smoking cigarettes. This may help to relieve sudden surges of craving. Side-effects such as nose and throat irritation, coughing, and watering eyes occur in about 1 in 3 users. As the nasal spray may cause sneezing and watering eyes for a short time after use, do not use it whilst driving.

**Nicotine mouth spray**

This acts in a similar way to the nose spray, providing a very rapid increase in nicotine level. You can use 1 or 2 sprays whenever you get the urge to smoke. You should use no more than two sprays at a time, four sprays in an hour, or more than 64 sprays over the whole day. You might notice irritation of the throat or nose.

**Can different methods of nicotine replacement therapy be combined?**

This is an option, especially if you have particularly bad withdrawal symptoms. The common combination is to use an NRT patch (which gives a regular background level of nicotine) with
gum or spray (taken now and then to top up the level of nicotine to ease sudden cravings). Evidence from research studies suggests that this kind of combination provides a small but significant increase in success rates compared with a single product. It is also thought that it is safe to combine NRT in this way.

**Nicotine replacement therapy and other diseases and situations**

As a rule, getting nicotine from NRT is much safer than from cigarettes. (NRT does not contain the harmful chemicals that cigarettes have.) But the following points may be relevant to some people.

**Pregnancy.** NRT is likely to be safer than continued smoking and so its use can be justified in pregnant women who are finding it difficult to stop smoking. NRT products that are taken intermittently (such as gum, lozenge, spray, inhalator) are preferred to patches. This is to minimise the exposure of nicotine to the unborn baby. Avoid liquorice-flavoured NRT products.

**Breast-feeding.** The amount of nicotine that gets into breast milk is probably similar whether the mother smokes or uses NRT. Breast-feeding within one hour of smoking or taking an NRT product can significantly increase the levels of nicotine in breast milk. Therefore, NRT products that are taken intermittently are probably best if NRT is used during breast-feeding. Avoid using the NRT for at least one hour before breast-feeding.

**If you are taking a aminophylline medicine.** Aminophylline, a medicine used for lung conditions, is broken down by the body into the active ingredient theophylline. If you stop smoking, this breakdown speeds up and the level of theophylline in the blood rises. If this happens, your doctor may advise you to reduce the dose of aminophylline you usually take.

**Some other points about nicotine replacement therapy**

Apart from causing addiction, nicotine is not thought to cause disease when taken for a few months. The health problems from cigarettes, such as lung and heart diseases, are due to the tar and other chemicals in cigarettes. So, taking NRT instead of smoking is one step towards a healthier life.

The dose of nicotine in NRT is not as high as in cigarettes. Also, the nicotine from smoking is absorbed quickly, and has a quicker effect than NRT. So, NRT is not a perfect replacement. Withdrawal symptoms are reduced with NRT, but may not go completely.

Always read the product label before starting NRT for full instructions and cautions.

Cost - a week's supply of NRT can vary, depending on the one you choose. NRT is also available on prescription. However, your doctor will follow guidelines when prescribing NRT. For example, a first prescription should only be issued if you are committed to giving up smoking, and further prescriptions should only be issued if you have stayed off cigarettes.

The risk of becoming addicted (dependent) on NRT is small. About 1 in 20 people who stop smoking with the help of NRT continue to use NRT in the longer term. The safety of NRT when used for a very long time is not yet known and the risks and benefits of doing this should be discussed with your doctor.
Further help and information

Quit- a charity that helps people to stop smoking
Web: www.quit.org.uk

Smokefree- Information from the NHS
Web: www.smokefree.nhs.uk

For help and advice on stopping smoking and for details of your local NHS stop smoking service. Reference | provide feedback
Assessment

----------------------------------------

BASIC HEALTH STATUS OF RELEVANCE

Blood Pressure
Body Mass Index (BMI)
Body Fat Percentage
MEASUREMENT OF BLOOD PRESSURE

Step 1- Chose the right equipment:

What you will need:

1. A quality stethoscope
2. An appropriately sized blood pressure cuff
3. A blood pressure measurement instrument such as an aneroid or mercury column sphygmomanometer or an automated device with manual inflate mode.

Step 2- Prepare the patient: Make sure the patient is relaxed by allowing 5 minutes to relax before the first reading. The patient should sit upright with their upper arm positioned so it is level with their heart and feet on the floor. Remove excess clothing that might interfere with the BP cuff or constrict blood flow in the arm. Be sure you and the patient refrain from talking during the reading.

Step 3 - Chose the proper BP cuff size: Most measurement errors occur by not taking the time to chose the proper cuff size. Warp the cuff around the patient’s arm and use the INDEX line to determine if the patient’s arm circumference falls within the RANGE area. Otherwise, chose the appropriate smaller or large cuff.

Step 4- Please the BP cuff on the patient’s arm: Palpate/ locate the brachial artery and position the BP cuff so that the ARTERY marker points to the brachial artery. Warp the BP cuff snugly around the arm.

Step 5- Position the stethoscope: On the same arm that you placed the BP cuff, palpate the arm at the antecubical fossa (crease of the arm) to locate the strongest pulse sound and place the bell of the stethoscope over the brachial artery at this location.

Step 6- Inflate the BP cuff: Begin pumping the cuff bulb as you listen to the pulse sounds. When the BP cuff has inflated enough to stop blood flow you should hear no sound through the stethoscope. The gauge should read 30 to 40 mmHg above the person’s normal BP reading. If this value is unknown you can inflate the cuff to 160-180 mmHg. (If pulse sounds are heard right away, inflate to a higher pressure.)

Step 7- Slowly Deflate the BP cuff: Begin deflation. The AHA recommends that the pressure should fall at 2-3 mmHg per second, anything faster may likely result in an inaccurate measurement.*

Step 8 – Listen for the Systolic Reading: The first occurrence of rhythmic sounds heard as blood begins to flow through the artery is the patient’s systolic pressure. This may resemble a tapping noise at first.

Step 9- Listen for the Diastolic Reading: Continue to listen as the BP cuff pressure drops and the sounds fade. Note the gauge reading when the rhythmic sounds stop. This will be the diastolic reading.

Step 10 – Double Check for Accuracy: The AHA recommends taking a reading with both arms and averaging the readings. To check the pressure again for accuracy wait about five minutes between readings. Typically, blood pressure is higher in the morning and lower in the evenings. If the blood pressure reading is a concern or masked or while coat hypertension is suspected, a 24 hour blood pressure study may be required to assess the patient’s overall blood pressure profile.
ABC of Hypertension

Blood Pressure measurement

Source: BMJ 2001; 322 doi: http://dx.doi.org/10.1136/bmj.322.7292.981 (Published 21 April 2001)

Part I- Sphygmomanometry: factors common to all techniques

Methods of blood pressure measurement

Most devices for measuring blood pressure are dependent on one common feature, namely, occluding the artery of an extremity (arm, wrist, finger, or leg) with an inflatable cuff to measure blood pressure either oscillometrically, or by detection of Korotkoff sounds. Other techniques, which are not dependent on limb occlusion, such as pulse-waveform analysis, can also be used, but these have little application in clinical practice. The array of techniques available today owe their origins to the conventional technique of auscultatory blood pressure measurement, and these new techniques must indeed be shown to be as accurate as the traditional mercury sphygmomanometer. Since the introduction of sphygmo- manometry, mercury and aneroid sphygmomanometers have been the most popular devices for measuring blood pressures.

This article has been adapted from the newly published 4th edition of ABC of Hypertension.

Factors affecting blood pressure measurement

No matter which device is used to measure blood pressure, it must be recognised that blood pressure is a variable haemodynamic phenomenon, which is influenced by many factors, not least being the circumstances of measurement itself. These influences on blood pressure can be significant, often accounting for rises in systolic blood pressure greater than 20 mm Hg, and if they are ignored, or unrecognised, hypertension will be diagnosed erroneously and inappropriate management instituted. These factors have to be carefully considered in all circumstances of blood pressure measurement—self measurement by patients, conventional measurement, measurement with automated devices whether in a doctor’s surgery, an ambulance, a pharmacy, or in hospital using sophisticated technology.
Variability of blood pressure

The observer must be aware of the considerable variability that may occur in blood pressure from moment to moment with respiration, emotion, exercise, meals, tobacco, alcohol, temperature, bladder distension, and pain, and that blood pressure is also influenced by age, race, and circadian variation. It is usually at its lowest during sleep. It is not always possible to modify these many factors but we can minimise their effect by taking them into account in reaching a decision as to the relevance or otherwise of a particular blood pressure measurement.

Important factors affecting measurement

· The inherent variability of blood pressure
· The defence reaction
· The limitations of the device being used
· The accuracy of the device
· Blood pressure is not as easily measured in some groups, such as elderly people

Example of ambulatory blood pressure pattern plotted by the DABL (R) Program showing a marked variability of blood pressure

Insofar as is practical the patient should be relaxed in a quiet room at a comfortable temperature and a short period of rest should precede the measurement. When it is not possible to achieve optimum conditions, this should be noted with the blood pressure reading—for example, “BP 154/92, R arm, V phase (patient very nervous).”
“White coat” hypertension

Anxiety raises blood pressure, often by as much as 30 mm Hg. This may be regarded as a physiological reaction, often referred to as the “fight and flight” phenomenon, or “defence” or “alarm” reaction. It is commonly seen in the accident and emergency departments of hospitals when patients are frightened and extremely anxious, but it may also occur in family doctors’ surgeries and in the outpatients department. It may occur in normotensive and hypertensive subjects. The degree of this reaction varies greatly from patient to patient, being absent in many, and it is usually reduced or abolished altogether with reassurance and familiarisation with the technique and circumstances of blood pressure measurement. Its importance in practice is that decisions to lower blood pressure, and especially to administer drugs, should never be made on the basis of measurements taken in circumstances where the defence reaction is likely to be present.

White coat hypertension is a condition in which a normotensive subject becomes hypertensive during blood pressure measurement, but pressures then settle to normal outside the medical environment. It is best demonstrated by ambulatory blood pressure measurement (ABPM). No one group seems to be exempt from the white coat phenomenon; it may affect the young, the elderly, normotensive and hypertensive subjects, and pregnant women. In young subjects with borderline elevation of conventional blood pressure, identification of white coat hypertension can be of considerable importance in avoiding undue penalties for insurance and employment. Moreover, there are no characteristics that allow for the identification of the phenomenon, other than by obtaining blood pressures away from the medical environment, either by self measurement in the home or with ABPM, which is the technique of choice. Patients diagnosed as “hypertensive” with conventional measurement in whom white coat hypertension is considered a possibility should have ABPM performed before they are labelled “hypertensive,” and certainly before treatment is instigated.
Posture of subject

Posture affects blood pressure, with a general tendency for it to increase from the lying to the sitting or standing position. However, in most people posture is unlikely to lead to significant error in blood pressure measurement provided the arm is supported at heart level. None the less, it is advisable to standardise posture for individual patients and in practice blood pressure is usually measured in the sitting position. Patients should be comfortable whatever their position. No information is available on the optimal time that a subject should remain in a particular position before a measurement, but three minutes is suggested for the lying and sitting positions and one minute standing. Some antihypertensive drugs cause postural hypotension, and when this is expected blood pressure should be measured both lying and standing.

Arm Support

If the arm in which measurement is being made is unsupported, as tends to happen if the subject is sitting or standing, isometric exercise is performed raising blood pressure and heart rate. Diastolic blood pressure may be raised by as much as 10% by having the arm extended and unsupported during blood pressure measurement. The effect of isometric exercise is greater in hypertensive patients and in those taking a blockers. It is essential, therefore that the arm is supported during blood pressure measurement and this is best achieved in practice by having the observer hold the subject's arm at the elbow, although in research the use of an arm support on a stand has much to commend it.

Arm position

The arm must also be horizontal at the level of the heart as denoted by the midsternal level. Dependency of the arm below heart level leads to an overestimation of systolic and diastolic pressures and raising the arm above heart level leads to underestimation. The magnitude of this error can be as great as 10 mm Hg for systolic and diastolic pressures. This source of error becomes especially important in the sitting and standing positions, when the arm is likely to be dependent by the subject's side. However, it has been demonstrated that even in the supine position an error of 5 mm Hg for diastolic pressure may occur if the arm is not supported at heart level. Arm position has become an important issue for self measurement of blood pressure with the manufacture of devices for measuring blood pressure at the wrist, which are proving very popular because of the ease of measurement. Many of these devices are inherently inaccurate, but measurement is extremely inaccurate if the wrist is not held at heart level during measurement.
The Cuff and bladder

The cuff is an inelastic cloth that encircles the arm and encloses the inflatable rubber bladder. It is secured around the arm most commonly by means of Velcro on the adjoining surfaces of the cuff, occasionally by wrapping a tapering end into the encircling cuff, and rarely by hooks. Velcro surfaces must be effective, and when they lose their grip the cuff should be discarded. It should be possible to remove the bladder from the cuff so that the latter can be washed from time to time. 1

Mismatching of bladder and arm

- Bladder too small Overestimation of BP Undercuffing
- Bladder too large Underestimation of BP Overcuffing
- Undercuffing more common than Overcuffing

“Cuff hypertension”

However sophisticated a blood pressure measuring device may be, if it is dependent on cuff occlusion of the arm (as are the majority of devices), it will then be prone to the inaccuracy induced by miscuffing, whereby a cuff containing a bladder that is either too long or too short relative to arm circumference is used.


A review of the literature on the century-old controversy relating to the error that may be introduced to blood pressure measurement by using a cuff with a bladder of inappropriate dimensions for the arm for which it is intended has shown that miscuffing is a serious source of error, which must inevitably lead to incorrect diagnosis in practice and erroneous conclusions in hypertension research. There is unequivocal evidence that either too narrow or too short a bladder (undercuffing) will cause overestimation of blood pressure, so called “cuff hypertension,” and there is growing evidence that too wide or too long a bladder (overcuffing) may cause underestimation of blood pressure. Undercuffing has the effect in clinical practice of overdiagnosing hypertension and overcuffing leads to hypertensive subjects being diagnosed as normotensive. Either eventuality has serious implications for the epidemiology of hypertension and clinical practice.

A proposal for the future—the “Adjustable Cuff”

On the basis of a thorough examination of the literature and aware of the advances in cuff design, the design features for an “Adjustable Cuff,” which would be applicable to all adult arms, have been proposed, and one such cuff is presently undergoing testing (AC Cosor and Sons Ltd (Surgical), London, UK).

A review of the literature shows that a number of approaches have been used over the years to cope with the difficulty of mismatching and none has been ideal. These have included application of correction factors, a range of cuffs, cuffs containing a variety of bladders, and a cuff for the majority of arms.
Blood pressure measurement in special subjects

Certain groups of people merit special consideration for blood pressure measurement, either because of age, body habitus, or disturbances of blood pressure related to haemodynamic alterations in other parts of the cardiovascular system. Although there is evidence that many subgroups of the hypertensive population may have peculiarities affecting the accuracy of measurement, such as patients with renal disease, patients with diabetes mellitus, women with pre-eclampsia, and youths with “spurious” hypertension, discussion will be confined to children, the elderly, obese subjects, and pregnant women.

Mean systolic (top) and diastolic (bottom) blood pressures of boys and girls from birth to 18 years. Diastolic blood pressure reflects the use of phase IV Korotkov sounds. Reproduced with permission from de Swiet M, Dillion MJ, Littler W, O’Brien E, Padfield PL, Petrie JC. Measurement of blood pressure in children. Recommendations of a working party of the British Hypertension Society. BMJ 1989;299;469-70

Children

Blood pressure measurement in children presents a number of difficulties and variability of blood pressure is greater than in adults, and thus any one reading is less likely to represent the true blood pressure. Also increased variability confers a greater tendency for regression towards the mean. Conventional sphygmomanometry is recommended for general use, but systolic pressure is preferred to diastolic pressure because of greater accuracy and reproducibility. Cuff dimensions are most important and three cuffs with bladders measuring 4×13cm, 10×18cm, and the adult dimensions 12×26cm are required for the range of arm sizes likely to be encountered in the age range 0-14 years. The widest cuff practicable should be used. Korotkoff sounds are not reliably audible in all children under one year and in many under five years of age. In such cases conventional sphygmomanometry is impossible and more sensitive methods of detection such as Doppler, ultrasound, or oscillometry must be used.

Elderly people

In epidemiological and interventional studies blood pressure predicts morbidity and mortality in elderly people as effectively as in the young. The extent to which blood pressure predicts outcome may be influenced by various factors that affect the accuracy of blood pressure measurement and the extent to which casual blood pressure represents the blood pressure load on the heart and circulation.

The elderly are subject to considerable blood pressure variability, which can lead to a number of circadian blood pressure patterns that are best identified using ambulatory blood pressure measurement. The practical clinical consequence of these variable patterns in the elderly is that blood pressure measuring techniques can be inaccurate and/or misleading.

**Pseudohypertension**

It has been postulated that as a consequence of the decrease in arterial compliance and arterial stiffening with ageing, indirect sphygmanometry becomes inaccurate. This has led to the concept of “pseudohypertension” to describe patients with a large discrepancy between cuff and direct blood pressure measurement.7 The significance of this phenomenon has been disputed,8 but in elderly patients in whom blood pressure measured with the conventional technique seems to be out of proportion to the clinical findings, referral to a specialist cardiovascular centre for further investigation may be appropriate.
Overweight people

The association between obesity and hypertension has been known since 1923. The link has been confirmed in many epidemiological studies, and has at least two components. Firstly, there appears to be a pathophysiological connection and it may well be that in some cases the two conditions are causally linked, and secondly, if not taken into account, it may result in inaccurate blood pressure values being obtained by indirect measurement techniques.

Obesity may affect the accuracy of blood pressure measurement in children, young people, the elderly, and pregnant women.

The relationship of arm circumference and bladder dimensions has been discussed above. If the bladder is too short, blood pressure will be overestimated—"cuff hypertension"—and, if too long, blood pressure may be underestimated.

Arrhythmias

The difficulty in measuring blood pressure in patients with arrhythmias is that when cardiac rhythm is irregular there is a large variation in blood pressure from beat to beat. Thus in arrhythmias, such as atrial fibrillation, stroke volume and as a consequence blood pressure vary, depending on the preceding pulse interval. Secondly, in such circumstances, there is no generally accepted method of determining auscultatory endpoints. Furthermore blood pressure measuring devices vary greatly in their ability to accurately record blood pressure in patients with atrial fibrillation, indicating that devices should be validated independently in patients with arrhythmias.

In bradyarrhythmias there may be two sources of error. Firstly, if the rhythm is irregular the same problems as with atrial fibrillation will apply. Secondly, when the heart rate is extremely slow, for example 40 beats per minute, it is important that the deflation rate used is less than for normal heart rates as too rapid deflation will lead to underestimation of systolic and overestimation of diastolic pressure.
Pregnancy

Clinically relevant hypertension occurs in more than 10% of pregnant women in most populations, and in a significant number of these raised blood pressure is a key factor in medical decision making in the pregnancy. Particular attention must be paid to blood pressure measurement in pregnancy because of the important implications for patient management, as well as the fact that it presents some special problems.

There has been much controversy as to whether the muffling or disappearance of sounds should be taken for diastolic blood pressure. The general consensus from obstetricians based on careful analysis of the evidence is that disappearance of sounds (fifth phase) is the most accurate measurement of diastolic pressure, with the proviso that in those rare instances in which sounds persist to zero the fourth phase of muffling of sounds should be used.

Reference:
Recommendations for Blood measurement in Human and Experimental Animals (Hypertension. 2005;45;142) (c) 2005 American Heart Association, Inc

Sourced by Department of Oral Biology & Genomic Studies, NRT Clinical Service / 5 August 2013
Body Mass Index (BMI)

The **body mass index (BMI)**, or **Quetelet index**, is a measure for human body shaped by individuals mass and height. It was devised between 1830 and 1850 by the Belgian polymath Adolphe Quetelet during the course of developing "social physics", Body mass index is defined as the individual's body mass divided by the square of their height. The formulae universally used in medicine produce a unit of measure of kg/m\(^2\). BMI can also be determined using a BMI chart, which displays BMI as a function of mass (horizontal axis) and height (vertical axis) using contour lines for different values of BMI or colors for different BMI categories.

\[
\text{BMI} = \frac{\text{Mass (Kg)}}{\text{Height (m)}^2}
\]

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI range – kg/m(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very severely underweight</td>
<td>less than 15</td>
</tr>
<tr>
<td>Severely underweight</td>
<td>from 15.0 to 16.0</td>
</tr>
<tr>
<td>Underweight</td>
<td>from 16.0 to 18.5</td>
</tr>
<tr>
<td>Normal (healthy weight)</td>
<td>from 18.5 to 25</td>
</tr>
<tr>
<td>Overweight</td>
<td>from 25 to 30</td>
</tr>
<tr>
<td>Obese Class I (Moderately obese)</td>
<td>from 30 to 35</td>
</tr>
<tr>
<td>Obese Class II (Severely obese)</td>
<td>from 35 to 40</td>
</tr>
<tr>
<td>Obese Class III (Very severely obese)</td>
<td>over 40</td>
</tr>
</tbody>
</table>

While the formula previously called the Quetelet Index for BMI dates to the 19th century, the new term "body mass index" for the ratio and its popularity date to a paper published in the July edition of 1972 in the Journal of Chronic Diseases by Ancel Keys, which found the BMI to be the best proxy for body fat percentage among ratios of weight and height; the interest in measuring body fat being due to obesity becoming a discernible issue in prosperous Western societies. BMI was explicitly cited by Keys as being appropriate for population studies, and inappropriate for individual diagnosis. Nevertheless, due to its simplicity, it came to be widely used for individual diagnosis. Nevertheless, due to its simplicity, it came to be widely used for individual diagnosis, despite its inappropriateness.
'BMI' provides a simple numeric measure of a person's thickness or thinness, allowing health professionals to discuss overweight and underweight problems more objectively with their patients. However, BMI has become controversial because many people, including physicians, have come to rely on its apparent numerical authority for medical diagnosis, but that was never the BMI's purpose; it is meant to be used as a simple means of classifying sedentary (physically inactive) individuals, or rather, populations, with an average body composition. For these individuals, the current value settings are as follows: a BMI of 18.5 to 25 may indicate optimal weight, a BMI lower than 18.5 suggests the person is Underweight, a number above 25 may indicate the person is Overweight, a number above 30 suggests the person is Obese (over 40, morbidly obese).

For a given height, BMI is proportional to mass. However, for a given mass, BMI is inversely proportional to the square of the height. So, if all body dimensions double, and mass scales naturally with the cube of the height, then BMI doubles instead of remaining the same. This results in taller people having a reported BMI that is uncharacteristically high compared to their actual body fat levels. In comparison, the Ponderal Index is based on this natural scaling of mass with the third power of the height. However, many taller people are not just "scaled up" short people, but tend to have narrower frames in proportion to their height. Nick Korevaar (a mathematics lecturer from the University of Utah) suggests that instead of squaring the body height (an exponent of 2, as the BMI does) or cubing the body height (an exponent of 3, as the Ponderal index does), it would be more appropriate to use an exponent of between 2.3 and 2.7 (as originally noted by Quetelet). (For a theoretical basis for such values see MacKay)

BMI Prime

BMI Prime, a simple modification of the BMI system, is the ratio of actual BMI to upper limit BMI (currently defined at BMI 25). As defined, BMI Prime is also the ratio of body weight to upper body weight limit, calculated at BMI 25. Since it is the ratio of two separate BMI values, BMI Prime is a dimensionless number, without associated units. Individuals with BMI Prime less than 0.74 are underweight; those between 0.74 and 1.00 have optimal weight; and those at 1.00 or greater are overweight. BMI Prime is useful clinically because individuals can tell, at a glance, by what percentage they deviate from their upper weight limits. For instance, a person with BMI 34 has a BMI Prime of 34/25 = 1.36, and is 36% over his or her upper mass limit. In South East Asian and South Chinese populations (see international variation section below) BMI Prime should be calculated using an upper limit BMI of 23 in the denominator instead of 25. Nonetheless, BMI Prime allows easy comparison between populations whose upper limit BMI values differ.

Categories

A frequent use of the BMI is to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height. The weight excess or deficiency may, in part, be accounted for by body fat (adipose tissue) although other factors such as musculature also affect BMI significantly (see discussion below and overweight). The WHO regards a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese. These ranges of BMI values are valid only as statistical categories.
Health consequences of overweight and obesity in adults

The BMI ranges are based on the relationship between body weight and disease and death. Overweight and obese individuals are at increased risk for many diseases and health conditions, including the following:

- Hypertension
- Dyslipidemia (for example, high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides)
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (endometrial, breast, and colon).

Applications

Statistical device

The BMI is generally used as a means of correlation between groups related by general mass and can serve as a vague means of estimating adiposity. The duality of the BMI is that, whilst easy-to-use as a general calculation, it is limited in how accurate and pertinent the data obtained from it can be. Generally, the index is suitable for recognizing trends within sedentary or overweight individuals because there is a smaller margin for errors. This general correlation is particularly useful for consensus data regarding obesity or various other conditions because it can be used to build a semi-accurate representation from which a solution can be stipulated, or the RDA for a group can be calculated. Similarly, this is becoming more and more pertinent to the growth of children, due to the majority of their exercise habits. The growth of children is usually documented against a BMI-measured growth chart. Obesity trends can be calculated from the difference between the child's BMI and the BMI on the chart.

Clinical practice

BMI has been used by the WHO as the standard for recording obesity statistics since the early 1980s. In the United States, BMI is also used as a measure of underweight, owing to advocacy on behalf of those suffering with eating disorders, such as anorexia nervosa and bulimia nervosa.

BMI can be calculated quickly and without expensive equipment. However, BMI categories do not take into account many factors such as frame size and muscularity. The categories also fail to account for varying proportions of fat, bone, cartilage, water weight, and more.
Despite this, BMI categories are regularly regarded as a satisfactory tool for measuring whether sedentary individuals are underweight, overweight or obese with various exemptions, such as: athletes, children, the elderly, and the infirm.

One basic problem, especially in athletes, is that muscle weight contributes to BMI. Some professional athletes would be overweight or obese according to their BMI, despite carrying little fat, unless the number at which they are considered overweight or obese is adjusted upward in some modified version of the calculation. In children and the elderly, differences in bone density and, thus, in the proportion of bone to total weight can mean the number at which these people are considered underweight should be adjusted downward.

How to Measure Your Body fat % Using Calipers

This in-depth guides teaches you how to calculate your body fat percentage and measure your progress using skin fold calipers. This is the most accurate method to measure your body fat.

Bodyfat Testing With Skinfold Calipers

The Skinfold caliper is a device which measures the thickness of a fold of your skin with its underlying layer of fat. By doing this at the key locations can be a quite accurate representative of the total amount of fat that is on your body, it is also possible to estimate the total percent of bodyfat on your body.

The diagrams show the locations of the areas for the measurements to be taken. Because of the location of the tests you will need someone who can do the measurements for you. It is important that the measurements are taken as close to the area's shown in the diagrams for each measurement.

How To Correctly Take Measurements

If you're right handed, pull out the fold of skin with the underlying layer of fat with your left hand and hold it with the fingers of the left hand. Then with the calipers in your right hand, place the jaws of the calipers as shown in the diagrams below. The jaws of the calipers should be about 1/4" (7.5mm) from the fingers of your left hand which continues to hold the fold of skin. Release the trigger of the calipers so the entire force of the jaws is on the Skinfold. Do not release the fingers of the left hand while taking the readings.

It is important to keep holding firmly the fold of skin with the fingers so that the calipers are measuring just the thickness of the fold of skin. You will notice that when you place the calipers on the Skinfold that the calipers will "creep" a little, after a few seconds the “creep“ will slow down and this is the time that the measurement should be taken. You must note the reading on the scale before releasing any pressure off the calipers.

Taking Measurements & Calculating Your Percentage

Measure all four locations shown in the diagrams below and write down the readings on the calipers scale. It doesn’t matter what order you do the readings in. Add up the four readings. The % bodyfat can then be determined from the chart at the bottom of this page. You will notice one set of figures for males and one for females, make sure you use the right one!
You may also note that the charts do not have a line for every millimetre or column for every age group on the chart, to do this would make the chart very large. To get accurate figures it is necessary to interpolate. For example, a female in the 16-29 age groups could have a sum of 29mm for the four measurements. This is halfway between the 28 and 30 on the chart. The % bodyfat for 28mm is 18.6% and that for 30 is 19.5%. Interpolating halfway between would give approximately 19.0%. Another example would be a 40 year old male with a sum of 42mm for the four measurements. Referring to the chart for males we find % bodyfat listings for 40 and 45mm. 42mm is 2/5ths of the way between 40 and 45. The bodyfat for 48mm is 20.3%, and for 45mm it is 21.8%. Two fifths of the way from 20.3 to 21.8 is approximately 20.9%.

Where To Take The Measurements

**Back of the arm (triceps):**

![Image of a person measuring the back of their arm for body fat percentage.]

The back of the upper arm, (Triceps). This is located halfway between the shoulder and elbow joints. The fold is taken in a vertical direction directly on the centre of the back of the arm.

**Front of the arm (Biceps):**

![Image of a person measuring the front of their arm for body fat percentage.]

The front of the upper arm, (Biceps). This is taken exactly the same as the Triceps, Figure 1, except it is taken on the centre of the front of the upper arm.
Shoulder blade:

Back, below the shoulder blade (subscapular). This is located just below the shoulder blade. Note that the skinfold is taken at 45 degrees angle as shown on the diagram.

Waist:

Waist (Suprailiac). This is located just above the iliac crest, the protrusion of the hip bone, a little towards the front from the side of the waist. The fold is taken approximately horizontally as shown on the diagram.
Charts To Calculate Your Bodyfat Percentage

Men's Chart:

<table>
<thead>
<tr>
<th>Sumin mm</th>
<th>Age 16-29</th>
<th>Age 30-49</th>
<th>Age 50+</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>8.1</td>
<td>12.1</td>
<td>12.5</td>
</tr>
<tr>
<td>22</td>
<td>9.2</td>
<td>13.2</td>
<td>13.9</td>
</tr>
<tr>
<td>24</td>
<td>10.2</td>
<td>14.2</td>
<td>15.1</td>
</tr>
<tr>
<td>26</td>
<td>11.2</td>
<td>15.2</td>
<td>16.3</td>
</tr>
<tr>
<td>28</td>
<td>12.1</td>
<td>16.1</td>
<td>17.4</td>
</tr>
<tr>
<td>30</td>
<td>12.9</td>
<td>16.9</td>
<td>18.5</td>
</tr>
<tr>
<td>35</td>
<td>14.7</td>
<td>18.7</td>
<td>20.8</td>
</tr>
<tr>
<td>40</td>
<td>16.3</td>
<td>20.3</td>
<td>22.8</td>
</tr>
<tr>
<td>45</td>
<td>17.7</td>
<td>21.8</td>
<td>24.7</td>
</tr>
<tr>
<td>50</td>
<td>19.0</td>
<td>23.0</td>
<td>26.3</td>
</tr>
<tr>
<td>55</td>
<td>20.2</td>
<td>24.2</td>
<td>27.8</td>
</tr>
<tr>
<td>60</td>
<td>21.2</td>
<td>25.3</td>
<td>29.1</td>
</tr>
<tr>
<td>65</td>
<td>22.2</td>
<td>26.3</td>
<td>30.4</td>
</tr>
<tr>
<td>70</td>
<td>23.2</td>
<td>27.2</td>
<td>31.5</td>
</tr>
<tr>
<td>75</td>
<td>24.0</td>
<td>28.0</td>
<td>32.6</td>
</tr>
<tr>
<td>80</td>
<td>24.8</td>
<td>28.8</td>
<td>33.7</td>
</tr>
<tr>
<td>85</td>
<td>25.6</td>
<td>29.6</td>
<td>34.6</td>
</tr>
<tr>
<td>Sum in mm</td>
<td>Age 16-29</td>
<td>Age 30-49</td>
<td>Age 50+</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>14</td>
<td>9.4</td>
<td>14.1</td>
<td>17.0</td>
</tr>
<tr>
<td>16</td>
<td>11.2</td>
<td>15.7</td>
<td>18.6</td>
</tr>
<tr>
<td>18</td>
<td>12.7</td>
<td>17.1</td>
<td>20.1</td>
</tr>
<tr>
<td>20</td>
<td>14.1</td>
<td>18.4</td>
<td>21.4</td>
</tr>
<tr>
<td>22</td>
<td>15.4</td>
<td>19.5</td>
<td>22.6</td>
</tr>
<tr>
<td>24</td>
<td>16.5</td>
<td>20.6</td>
<td>23.7</td>
</tr>
<tr>
<td>26</td>
<td>17.6</td>
<td>21.5</td>
<td>24.8</td>
</tr>
<tr>
<td>Speed (km/h)</td>
<td>28.6</td>
<td>22.4</td>
<td>25.7</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>30</td>
<td>19.5</td>
<td>23.3</td>
<td>26.6</td>
</tr>
<tr>
<td>35</td>
<td>21.6</td>
<td>25.2</td>
<td>28.6</td>
</tr>
<tr>
<td>40</td>
<td>23.4</td>
<td>26.8</td>
<td>30.3</td>
</tr>
<tr>
<td>45</td>
<td>25.0</td>
<td>28.3</td>
<td>31.9</td>
</tr>
<tr>
<td>50</td>
<td>26.5</td>
<td>29.6</td>
<td>33.2</td>
</tr>
<tr>
<td>55</td>
<td>27.8</td>
<td>30.8</td>
<td>34.6</td>
</tr>
<tr>
<td>60</td>
<td>29.1</td>
<td>31.9</td>
<td>35.7</td>
</tr>
<tr>
<td>65</td>
<td>30.2</td>
<td>32.9</td>
<td>36.7</td>
</tr>
<tr>
<td>70</td>
<td>31.2</td>
<td>33.9</td>
<td>37.7</td>
</tr>
<tr>
<td>75</td>
<td>32.2</td>
<td>34.7</td>
<td>38.6</td>
</tr>
<tr>
<td>80</td>
<td>33.1</td>
<td>35.6</td>
<td>39.5</td>
</tr>
<tr>
<td>85</td>
<td>34.0</td>
<td>36.3</td>
<td>40.4</td>
</tr>
<tr>
<td>90</td>
<td>34.8</td>
<td>37.1</td>
<td>41.1</td>
</tr>
<tr>
<td>95</td>
<td>35.6</td>
<td>37.8</td>
<td>41.9</td>
</tr>
<tr>
<td>100</td>
<td>36.3</td>
<td>38.5</td>
<td>42.6</td>
</tr>
<tr>
<td>110</td>
<td>37.7</td>
<td>39.7</td>
<td>43.9</td>
</tr>
<tr>
<td>120</td>
<td>39.0</td>
<td>40.8</td>
<td>45.1</td>
</tr>
<tr>
<td>130</td>
<td>40.2</td>
<td>41.9</td>
<td>46.2</td>
</tr>
<tr>
<td>140</td>
<td>41.3</td>
<td>42.9</td>
<td>47.3</td>
</tr>
<tr>
<td>150</td>
<td>42.3</td>
<td>43.8</td>
<td>48.2</td>
</tr>
<tr>
<td>160</td>
<td>43.2</td>
<td>44.7</td>
<td>49.1</td>
</tr>
<tr>
<td>170</td>
<td>44.6</td>
<td>45.5</td>
<td>50.0</td>
</tr>
</tbody>
</table>
Normal Or Ideal % Bodyfat?

What is the correct or ideal % bodyfat? This is perhaps the most difficult question to answer. Not all people have the same ideal % bodyfat. It varies with age, sex, and genetics. One person might be better at a higher or lower bodyfat than another person of the same age and sex. And the desirable bodyfat of athletes can vary depending on the sport. For example, swimmers seem to perform better at a higher % bodyfat than runners. But, some general guidelines can be given that are applicable to most people.

For men:

For men up to about the age of 30, 9-15% is good, from age 30 to 50, 11-17% is a good range, and from age 50 and up, 12 to 19%. A person should try to stay at or below the upper limits given, and a person near the lower limit would be described as lean.

For women:

For women, the range up to age 30 is 14-21%, from 30-50 it is 15-23%, and from 50 up it is 16-25%. Again it is desirable to be at or below the upper limit, and a woman near the lower limit would be lean.

It should be noted that the ranges given above are not averages for the US and UK populations, but are the desirable ranges. The actual averages for the populations as a whole are much higher because of the large number of people with % bodyfat well above the upper limits of the desirable ranges.

Sourced by Department of Oral Biology & Genomic Studies, NRT Clinical Service / 5 August 2013
PULMONARY FUNCTION TEST

______________________________

SPIROMETRY
Pulmonary Function Test (Spirometry) FAQS

Q. What is spirometry?

A. Spirometry is the most basic and frequently performed test to measure lung function—the ability to move air into and out of the lungs. The test is performed using a spirometer, which is standardize according to specification developed by the American Thoracic Society and the American College of Occupationl and Environmental Medicine. An individual breathes in and out as quickly as possible through a measurement device on the spirometer. Specific measurements from the person’s test are compared to standard values obtained from a healthy population of similar race, age, gender, height and weight, thus comparing the individual’s lung function against a norm.

Q. What exactly does spirometry measure?

A. When an individual blows into the spirometer, the machine monitors the amount of air that flow over a special sensor with time. When one exhales, the force and speed of the air exhaled is very fast at first and then decreases as the exhalation continues. The same is basically true with inhalation. The total amount of air the lungs can hold and the person exhales is called the forced vital capacity. The amount of air that is exhaled after one second is called the forced expired volume at one second. Both of these values are important in the determination of underlying lung problems. There are many other values that are determined by the spirometer and printed in tabular and graphical format which are then compared to predicted values. In other words, a spirometer measures airflow and volume over time in a very accurate manner.

Q. What are the indication for spirometry in occupational medicine?

A. Spirometry can play an important role in the pre-placement and fit-for-duty examination, especially when respirator equipment may need to be used by the employee (primary prevention). Repeated spirometric testing often is used for surveillance of workers at risk of developing occupational lung disease (secondary prevention). Finally, spirometry can be used to actually measure and track patients with lung disease, whether related to the workplace or non-occupational diseases (tertiary prevention).

Q. Is spirometry mandated by OSHA?

A. Yes, for employees exposed to asbestos, cadmium, coke ovens, cotton dust; and for respirator-wearers exposed to benzene, formaldehyde or methylene chloride. OSHA recommends spirometry for employees at risk exposure for silicosis.
Q. Is special training or equipment required to perform spirometry?

A. Spirometers vary widely and can perform a variety of testing. A spirometer to be used in an occupational medicine setting should always meet the criteria developed by the American Thoracic Society. Spirometers also require calibration, at least on a daily basis prior to use, and perhaps more frequently if there are changes in the environment in which the testing is to be performed (for example, changes in environmental temperature). The American College of Occupational and Environmental Medicine (ACOEM) recommends that technicians be trained at a NIOSH-approved course in spirometry if they are to be performing pulmonary function testing in an occupational medicine facility. The ACOEM also recommends that technicians take refresher training every three years.

Q. How are spirometric tests interpreted?

A. While some spirometers are programmed to review results and suggest interpretations, the results should always be reviewed by a physician provider or person of similar expertise. The reports need to be reviewed for accuracy of testing, consistency and reproducibility of measured functions in addition to making diagnostic determinations.

Q. What is a spirographic pre-to post- bronchodilator challenge test?

A. One of the diagnostic possibilities with spirometric evaluation is obstructive lung disease (inability to exhale air in a normal fashion). How much of the abstractive changes present is nonreversible and how much is reversible often can be determined using a bronchodilator challenge test. A bronchodilator is a medication, usually given by inhaler, that treats most reversible components of obstruction. The patient first undergoes regular spirometry and values are determined (pre-challenge test). A dosage of the bronchodilator is administered, and the test is an indication of the reversibility of the underlying abstractive problems.
Pulmonary Function Tests

John Hopkins Hospital Protocol

(PFTs, Pulmonary Function Studies, Lung Function Studies/Tests, Airflow Assessment)

Procedure overview

What are pulmonary function tests?

Pulmonary function tests (PFTs) are noninvasive diagnostic tests that provide measurable feedback about the function of the lungs. By assessing lung volumes, capacities, rates of flow, and gas exchange, PFTs provide information that, when evaluated by your doctor, can help diagnosis certain lung disorders.

A normally-functioning pulmonary system operates on many different levels to ensure adequate balance. One of the primary functions of the pulmonary system is ventilation, the movement of air into and out of the lungs. Some medical conditions may interfere with ventilation. These conditions may lead to chronic lung disease. Conditions that interfere with normal ventilation are categorized as restrictive or obstructive. An obstructive condition occurs when air has difficulty flowing out of the lungs due to resistance, causing a decreased flow of air. A restrictive condition occurs when the chest muscles are unable to expand adequately, creating a disruption in air flow.

Pulmonary function tests may be indicated to determine the presence, location, cause, and characteristics of the problem, and to guide treatment.

Pulmonary function tests is an inclusive term that refers to several different procedures that measure lung function in different ways. Some of the more common values that may be measured during pulmonary function testing include:

- **Tidal volume (VT).** This is the amount of air inhaled or exhaled during normal breathing.
- **Minute volume (MV).** This is the total amount of air exhaled per minute.
- **Vital capacity (VC).** This is the total volume of air that can be exhaled after maximum inspiration.
- **Functional residual capacity (FRC).** This is the amount of air remaining in lungs after normal expiration.
- **Total lung capacity.** This is the total volume of lungs when maximally inflated.
- **Forced vital capacity (FVC).** This is the amount of air exhaled forcefully and quickly after maximum inspiration.
- **Forced expiratory volume (FEV).** This is the volume of air expired during the first, second, and third seconds of the FVC test.
- **Forced expiratory flow (FEF).** This is the average rate of flow during the middle half of the FVC test.
- **Peak expiratory flow rate (PEFR).** This is the maximum volume during forced expiration.
Some PFTs involve the use of a spirometer.

The spirometer is an instrument that measures the amount of air breathed in and/or out and how quickly the air is inhaled and expelled from the lungs while breathing through a mouthpiece. The measurements are recorded on a device called a spirograph.

Other test results are derived from calculations based on the results of certain spirometry procedures. In addition to measuring the amount and rate of air inhaled and exhaled, these tests can also indicate how well oxygen and carbon dioxide are being exchanged in the alveoli.

Some PFTs, such as thoracic gas volume or other lung volume measurements, may be determined by plethysmography. During plethysmography, a person sits or stands inside an air-tight box that resembles a short, square telephone booth to perform the tests.

The normal values for PFTs vary from person to person. The amount of air inhaled and exhaled in your test results are compared to the expected average in someone of the same age, height, sex, and race. In addition, results are compared to your previous test results, if previous testing has been done. If you have abnormal PFT measurements or if your results are different from previous tests, you may be referred for other diagnostic tests to establish a medical diagnosis.
Anatomy of the respiratory system

The respiratory system is made up of the organs involved in the exchange of gases, and consists of the:

- Nose
- Pharynx
- Larynx
- Trachea
- Bronchi
- Lungs

The upper respiratory tract includes the:

- Nose
- Nasal cavity
- Ethmoidal air cells
- Frontal sinuses
- Maxillary sinus
- Larynx
- Trachea

The lower respiratory tract includes the lungs, bronchi, and alveoli.

What are the functions of the lungs?

The lungs take in oxygen, which cells need to live and carry out their normal functions. The lungs also get rid of carbon dioxide, a waste product of the body's cells.

The lungs are a pair of cone-shaped organs made up of spongy, pinkish-gray tissue. They take up most of the space in the chest, or the thorax (the part of the body between the base of the neck and diaphragm).

The lungs are enveloped in a membrane called the pleura.

The lungs are separated from each other by the mediastinum, an area that contains the following:

- The heart and its large vessels
- Trachea (windpipe)
- Esophagus
- Thymus
- Lymph nodes

The right lung has three sections called lobes. The left lung has two lobes. When you breathe, the air enters the body through the nose or the mouth. It then travels down the throat through the larynx (voice box) and trachea (windpipe) and goes into the lungs through tubes called mainstem bronchi.

One mainstem bronchus leads to the right lung and one to the left lung. In the lungs, the mainstem bronchi divide into smaller bronchi and then into even smaller tubes called bronchioles. Bronchioles end in tiny air sacs called alveoli.
Reasons for the procedure

There are many different reasons why PFTs may be ordered. They are sometimes ordered in healthy individuals as part of a routine physical. In others, the tests may be ordered when a specific illness is suspected. Some of the disorders that may be detected with PFTs include, but are not limited to, the following:

- **Allergies.** An acquired, abnormal immune response to one or more substances that can cause a broad range of inflammatory reactions.
- **Chronic lung conditions.** Conditions, such as asthma, bronchiectasis, emphysema, and chronic bronchitis, that can be treated but not cured.
- **Asbestosis.** A lung disease caused by the inhalation of asbestos fibers.
- **Chest trauma.** Trauma to the chest, such as fractured ribs or a recent surgical procedure, can restrict an individual’s ability to breathe adequately.
- **Restrictive airway conditions.** Impaired lung expansion as a result of conditions, such as scoliosis, pulmonary tumors, or inflammation or scarring of the chest wall.
- **Respiratory infections**
- **Sarcoidosis.** A condition that causes small, fleshy swellings in the tissue around the organs, usually in the liver, lungs, and spleen.
- **Scleroderma.** A disease of the body’s connective tissue that causes thickening and hardening of the skin.

PFTs may be used to assess the lung function of patients prior to surgery or other invasive procedures in patients who have current lung and/or heart problems, who are smokers, or who have other conditions that might be affected by surgery or other procedures.

Another use of PFTs is the evaluation of treatment for conditions such as asthma, emphysema, and other chronic lung problems.

There may be other reasons for your doctor to recommend pulmonary function tests.

Risks of the procedure

Because pulmonary function testing is a noninvasive procedure, it is safe for most individuals. It is quick and the individual needs to be able to follow clear, simple directions. Complications of PFTs may include:

- Faintness or light-headedness due to hyperventilation
- Asthmatic episode precipitated by deep inhalation exercises

Situations in which PFTs may be contraindicated include, but are not limited to, the following:

- Recent eye surgery, because of increased pressure inside the eyes during the procedure
- Recent abdominal or chest surgery, because of potential interference with the ability to take deep breaths and stress on the surgical site
- Chest pain, recent heart attack, or unstable cardiovascular status
- Thoracic, abdominal, or cerebral aneurysm
- Active tuberculosis or acute respiratory infection, such as a cold or the flu
There may be other risks depending on your specific medical condition. Be sure to discuss any concerns with your doctor prior to the procedure.

Certain factors or conditions may interfere with the accuracy of PFTs. These factors may include, but are not limited to, the following:

- Medications such as bronchodilators (open the airways) or pain medications (may affect the ability to perform the tests)
- Pregnancy or gastric distention (may affect the ability to take in deep breaths)
- Fatigue or other conditions that affect the ability to perform the tests

**Before the procedure**

- Your doctor will explain the procedure to you and offer you the opportunity to ask any questions that you might have about the procedure.
- Generally, no prior preparation, such as fasting, fluid restriction, or sedation is required. However, you may be asked to avoid eating a heavy meal before the test.
- If you are pregnant or suspect that you may be pregnant, you should notify your doctor.
- Notify your doctor of all medications (prescription and over-the-counter) and herbal supplements that you are taking.
- If you are a smoker, you will usually be asked to refrain from smoking for a period of time before the test.
- Your height and weight will be recorded so that your results can be accurately calculated.
- Based on your medical condition, your doctor may request other specific preparation.

**During the procedure**

Pulmonary function tests may be done on an outpatient basis or as part of your stay in the hospital. Procedures may vary depending on your condition and your and your doctor’s practices.

Generally, PFTs follow this process:

1. You will be asked to loosen tight clothing, jewelry, or other objects that may interfere with the procedure
2. If you wear dentures, you will be asked to wear them during the procedure.
3. You will be asked to empty your bladder before the procedure to optimize comfort.
4. You will sit in a chair or stand for the procedure.
5. You will be given a soft nose clip to wear during the procedure so that all of your breaths will go through your mouth, rather than your nose.
6. You will be given a sterile mouthpiece that will be attached to the spirometer.
7. With your mouth forming a tight seal around the mouthpiece, you will be instructed to perform various breathing maneuvers. The maneuvers will be done by inhaling and exhaling. Depending on what measurements are ordered, you may be asked to repeat the maneuvers several times before the test is completed.
8. You may be given a bronchodilator after certain tests have been performed. These tests will be repeated several minutes later after the bronchodilator has taken effect.
9. You will be monitored carefully during the procedure for faintness, dizziness, difficulty breathing, or any other problems.
After the procedure

Generally, there is no special type of care following PFTs. You may resume your usual diet, medications, and activities unless your doctor advises you otherwise.

If you have a history of respiratory problems, you may be tired after the procedure. You will be given the opportunity to rest afterwards.

Your doctor may give you additional or alternate instructions after the procedure depending upon your particular situation.

Online resources

The content provided here is for informational purposes only, and was not designed to diagnose or treat a health problem or disease, or replace the professional medical advice you receive from your doctor. Please consult your health care provider with any questions or concerns you may have regarding your condition.

This page contains links to other websites with information about this procedure and related health conditions. We hope you find these sites helpful, but please remember we do not control or endorse the information presented on these websites, nor do these sites endorse the information contained here.

Further link:

American Lung Association
National Heart, Lung, and Blood Institute (NHLBI)
National Institute of Health (NIH)
National Library of Medicine

Sourced by Department of Oral Biology & Genomic Studies, NRT Clinical Service / 5 August 2013
CARBON MONOXIDE DETECTION

__________________________

USING SMOKERLYZER
Carbon monoxide detection

A carbon monoxide detector or Co detector is a device that detects the presence of the carbon monoxide (CO) gas. CO is a colorless, tasteless and odorless compound produced by incomplete combustion of carbon containing materials.

It is often referred to as the “silent killer” because it is virtually undetectable without using detection technology and most do not realize they are being poisoned. Elevated levels of CO can be dangerous to humans depending on the amount present and length of exposure. Smaller concentrations can be harmful over longer periods of time while increasing concentrations require diminishing exposure times to be harmful.

CO detectors are designed to measure CO levels over time and sound an alarm before dangerous levels of CO accumulate.

It can be used to measure the percentage of Fetal Haemoglobin (Hb) saturated with CO of a pregnant mother affected by passive smoking.

Helping People To Stop Smoking with a Smokerlyzer® CO Monitor

Smoking Cessation/ Stop smoking monitor for adults, adolescents and pregnant women measuring breath carbon monoxide (CO).

A while range of CO monitors are available in the market which help smokers in measuring the breath carbon monoxide level.

Young people’s smoking habits and motivations tend to differ from adults and their breath CO reading are typically lower. Using breath CO monitors as part of a smoking cessation program is useful and efficient way of monitoring CO levels in both adults as well as young people.

Breath Carbon Monoxide (CO) Monitoring

The Micro+ Smokerlyzer® CO monitor is the new-and-improved version of the revolutionary Micro™ Smokerlyzer® is a longstanding benchmark device used clinical trials and research.
The piCO+™ CO monitor

Low cost and visually motivational, the piCO+™ CO monitor is a leader in a new generation of breath CO monitors. The CO monitor has user profiles for adult smokers, young smokers and pregnant women, as well the ability to easily create custom profiles when used alongside the COdata+ PC software, making it a favorite with group smoking cessation clinics.

The piCO+™ CO monitor is lightweight and battery powered and combines the features of the original piCO and piCO-lo models, used throughout the world by health professional working in smoking cessation programs.

Breath CO levels are easily measured when patients blow into the monitor through single-use disposable mouthpieces. These cardboard mouthpieces are connected to the piCO+™ CO monitor via a unique breath control filter to address potential cross-contamination concerns.

CO or carbon monoxide chart aims to help smokers to interpret and understand the reading they get after taking a breath CO monitor test. It explains what CO does to the body and how the CO monitor or Smokerlyzer can convert the CO reading into a COHb reading. This demonstrates how much CO is in the bloodstream at the time of the test. It also give the readings for foetal blood COHb for a mother who smokes and her baby. The chart gives the readings for different breath CO monitors with a short explanation for different breath CO monitors. Invaluable for anyone testing smokers with a CO monitor or Smokerlyzer.

Sourced by Department of Oral Biology & Genomic Studies, NRT Clinical Service / 5 August 2013
MACULAR DEGENERATION

_____________________

SMOKING
Is smoking dangerous for people suffering from a macular degeneration?

This key question for people suffering of macular degeneration or generally for endangered older people we wanted to get to the bottom to. But before we have a closer look at the relation between macular degeneration and smoking here first a few facts researched in literature and on the internet upon which medicals and experts agree:

**Germany**
- Every year about 145 billion cigarettes are smoked
- Approx. 25 percent of all adults smoke regularly
- Between 110,000 and 140,000 people each year become victims of their tobacco

**Worldwide:**
- About 1 billion people smoke worldwide
- About every 10-15 seconds a person dies from the effects of smoking.
- About 500 million people who now live probably will die from smoking. They are about 8% of the world’s population.
- Smoking kills more people a year than road accidents, fires, alcohol, cocaine, heroin, AIDS, murder and suicide combined!
- Smoking is killing more people than any other disease.

**Can smoking damage the eyes?**

Despite numerous hints of all cigarette packets there are 20 million people alone in Germany who smoke. How many suffer from those of a macular degeneration is unknown. The list of the in the meantime proved diseases is long - but what about the eyes?

- Nicotine is bad for the eyes, and indeed very dangerous," says Professor Dr. Bernd Bertram, vice chairman of the Professional Association of Ophthalmologists (BVA).
- Professor Horst Helbig, director of the university eye clinic Regensburg says: "Smoking furthers damaging the eyes and starts the aging process quicker than if you are a non-smoker."

In the middle of 2010 Focus Online reported about the connection of smoking and macular degeneration. They say smokers are especially endangered because of the fact that this risk group generally has an unfavourable vitamin and nutrient household and the consumption of cigarettes moreover free more free oxygen radicals which could attack the tissue in the long run. It also says oculists would encourage their patients at the first signs of illness to an immediate "smoking stop". Study results show, so they say further, that vitamin A, C, E, copper and zinc could reduce the risk to develop a late state of the illness by 25 percent.
Why does smoking damage the eyes?

We researched the relations for you:

Professor Carl Erb, head of the department for eye diseases of the Schlossparkklinik Charlottenburg, Berlin, explains that smoking causes circulatory disorder of the vessels which leads to a shortage of oxygen supply for the eyes which also leads to dying cells in the retina. The in the smoke contained poisons thicken the vessels' walls and the blood flow towards the retina is hindered. This often has a catastrophic result for the vision because this could cause a macular degeneration or also a cataract.

Also, metabolic products could not be dissipated in a normal extent so that the junk in the eye gather up in the so called geodes. This process, too, could further the development of a macular degeneration. Additionally this leads to almost 3,400 people dying worldwide every day on the consequences of their consuming tobacco.

Can I become blind through smoking?

Blind through cigarettes? This may sound terrifying but it is indeed possible. We found one doctor who warns especially clearly. The head of the eye clinic at Charlottenburg, Professor Carl Erb explains, that there was the opinion that the by smoking changed vessel process is responsible for man eye diseases. Even a sudden blindness due to a sudden closing up of retina vessels could happen as often as bleedings at the vision nerve head due to a heightened intraocular pressure. Especially strong smokers have to take into account massive vision loss or even blindness through a poisoning of the visionary nerve.

If smoking is thus dangerous how about macular degeneration?

Our research results clearly show that smoking is an earnest danger for the human eye. What do researches say in relation to macular degeneration?

- Prof. Dr. Johann Roider of the University Eye Hospital Kiel says, "Age-related macular degeneration is fate. The only way to avoid it is not to smoke."
- The representative of the German Ophthalmological Society (DOG), Prof. Frank Wood goes a step further and says: "Smoking is the only proven controllable risk factor for age-related macular degeneration or AMD, an eye disease which the World Health Organisation as the leading cause of recognition of blindness in developed countries have."
- The Asklepios Clinic North in Heidelberg said on your website: "The most important risk factor for macular degeneration (AMD) is the smoking. With more than 25 cigarettes per day increases the risk of developing the wet form of macular degeneration (AMD) by a factor of two, 5"
- The University of Cambridge has commissioned a study with 435 affected by macular degeneration carried out, reports the British Journal of Ophthalmology. Those who have over 40 years of time consumed at least one packet daily, the study shows that, compared to abstainers an almost threefold risk of developing the degenerative disease of the retina.
What do studies say on the relation between smoking and macular degeneration?

United Kingdom*

The British Medical Journal published a study by the University of Manchester on the relationship between macular degeneration and smoking. Accordingly, in Britain one in five is caused by macular degeneration tobacco consumption. This means that smoking is currently responsible for about 54,000 in the UK macular degeneration sufferers over 69 years. Of these, the "British Medical Journal are" nearly 18,000 blind.

It said there was evidence that the progression of the disease slows down when the macular degeneration-affected population would stop smoking.

*Citation and source: "British Medical Journal", Vol. 328, S. 537

Australia*:

In Australia in 2500 participants of a study of 10 years by a team from the University of Sydney were accompanied. The subjects were all at least 49 years old and had to answer among other questions about dietary habits and cigarette consumption. After five and ten years on the condition of the retinal images were taken of participants to the condition of the macula can be documented and as indications of potential macular degeneration explore.

The result: Smoking carried a fourfold higher risk of macular degeneration as a Non smoking. At least three times as high was the risk for former smokers.

*Citation and source: University of Sydney/"Blue Mountains Eye"-Studie / "Jama" Bd.125, S.1089

But I have not smoked myself. Is passive smoking also a problem for macular degeneration?

The German Cancer Research Center indicates in a study that would die each year more than 3300 Non smoking by passive co-smoking. But what is with macular degeneration? The study by Cambridge University also shows who had been living at least five years with a smoking show, in the current study a nearly twofold risk of age-related macular degeneration. The risk of developing macular degeneration, it says there is already a short time exposure to tobacco smoke is greatly increased.

Is it safe to say that smoking affects my macular degeneration?

The AMD Alliance report says: "The single most preventable risk factor that can be clearly seen as scientifically proven, is smoking. A 1996 published study showed a clear link between smoking and
AMD.” In addition, the report further said: “In addition, an overview of the studies shows on the relationship between smoking and age-related macular degeneration, that the scientific evidence clearly justifies the statement that smoking causes age-related macular degeneration.”

What happens if I stopped smoking immediately?

Stopping smoking is certainly a good decision. But the earlier you decide for the better for your eyes and your related macular degeneration. This is confirmed by the AMD Alliance UK, which has come to the conclusion: Even if you immediately stop smoking, the risk could be susceptible to macular degeneration reduced only very slowly. Ten years had to do without cigarettes, before falling to the risk to begin. But after 20 years "Non smoking,” the risk of macular degeneration has reached to suffer the “normal level”.

So what should I do?

• The pharmaceutical company Novartis recommends clearly with existing macular degeneration, one should stop smoking.

• CE Uhlig, MD from the University Hospital Münster is still an important note: "Because smokers who took beta-carotene as a food itself, increasingly suffering from lung cancer, smokers are discouraged from taking beta-carotene” (caution: The vitamin Á- carotene is often high in vitamin supplements contain doses that are recommended in macular degeneration!)

• The AMD Alliance Report states that: "In short, there is now no longer any doubt that smoking is the most important preventable risk factor for AMD."

Our result - Recommendation

Since the first October 2003, all EU Member States and Switzerland has undertaken to include prominent warnings be printed on every cigarette pack. For a long time there has been the warning requirement "Smoking causes blindness" on cigarette packs. Nevertheless, every year die worldwide about 5 million people from the consequences of smoking according to the WHO, about 5 million Experts and studies see clear evidence of a link between smoking and passive smoking on the development and progression of macular degeneration.

In conclusion we can give with regards to our research, only one recommendation: If you are a smoker, they hear it as soon as possible to avoid them, or passive smoking immediately. Thus you give yourself the best chance that your body can regenerate something and the consequences of smoking their macular degeneration does not aggravate further and further not only can contribute to macular degeneration

Macular degeneration and smoking correlates in many ways to affect eye health

Smoking impedes the circulation of blood to the and retina and damages the delicates blood vessels inside your eye.
Several large epidemiologic studies have shown that smoking more than doubles the risk for age related macular degeneration (AMD).

There are many reasons that smoking increases your risk of macular degeneration for dry (atrophic) and wet (neo vascular) macular degeneration.

**Why Quit Smoking to save your eye**

Every cigarette you smoke is causing damage to your vision. Macular degeneration and smoking have many health implication for the eyes.

Smoking cause vasoconstriction (narrowing of blood vessels which affects the blood supply to the eye and increases your blood pressure which is also a risk factor for macular degeneration.

---

Smoking enhances the generation of free radicals which causes cellular damage. Smoking decreases the levels of antioxidants (which protect against free radical damage) in the blood circulation, the aqueous humor (the clear liquid between the cornea and the lens) and the tissue surrounding the eye and retina.

Smoking causes a reduction in macular pigment density in the fovea (centre of the macula). Macular pigment protects protects the macula from UV and blue light damage.

Smoking reduces the amount of oxygen in the blood so that there is less oxygen being fed to the macula. The tar in cigarettes triggers the formation of deposits and thickening in the retina that cause age-related macular degeneration, according to Duke University Medical Centre Researchers.

“Our group also previously demonstrated that nicotine makes active wet macular designation worse. This is important because this implies that patients with active wet AMD should not smoke or use nicotine replacement therapies,” states Ivan Sufier, MD.
The study done by Dr. Sufier also concluded that heavy exposure to secondhand smoke can also cause these changes.

- Smoking impedes the circulation of blood to the eye and retina and damages the delicate blood vessels inside your eye.

- Studies in mice showed that smoking has a role in cell injury to the retinal pigment epithelium.

The most important thing you can do to protect yourself against AMD is not to smoke, and if you do smoke, to stop.

_Sourced by Department of Oral Biology & Genomic Studies, NRT Clinical Service / 5 August 2013_
With age-related macular degenerative disease (ARMD) as the leading cause of vision loss in people 65 and older, you most likely know someone who is struggling with limited vision and their quality of life.

The Facts on Macular Degeneration

The **macula** is a tiny circle in the middle of the **retina**, a light-sensitive membrane that lines the inside of the back of the eye. In older people, it sometimes begins to deteriorate or degenerate for unknown reasons. Women are believed to be more at risk than men. Macular degeneration is the leading cause of legal blindness in Canada, accounting for 34% of cases. However, macular degeneration rarely leaves you totally unable to see.

There are two types of this disease:

- **Dry macular degeneration** accounts for about 90% of cases. The tissue of the retina shrinks and pigments accumulate inside of it. Dry macular degeneration can progress to the wet form.
- In **wet macular degeneration**, new blood vessels grow around and behind the macula. There’s sometimes bleeding in or behind the macula. Material seeps into the retina and settles in the macula. This is called an **exudate**. Eventually the exudate disappears, but a scar takes its place. All people who have wet macular degeneration had dry macular degeneration first.
Causes of Macular Degeneration

The causes of macular degeneration are unknown, but the risk grows with age. Because it's extremely rare in people under age 50, the condition is usually referred to as age-related macular degeneration (AMD).

There are some known risk factors for macular degeneration. Smoking may increase your chances of developing the condition and seems to speed up its progress. High cholesterol levels, high blood pressure, obesity, and a diet lacking in dark green leafy vegetables and omega-3 fatty acids may also be associated with macular degeneration. Women seem to be at a higher risk than men.

Macular degeneration runs in some families but not in all. Recent studies of twins suggest that both genes and environment contribute to the onset of macular problems. Wet macular degeneration, at least, seems to be more common in people with poor cardiovascular health. Although it only accounts for about 10% of the cases, wet macular degeneration is responsible for 90% of the blindness caused by this disease.

Symptoms and Complications of Macular Degeneration

Both types of macular degeneration are completely painless. In dry macular degeneration, the centre of the field of vision in an eye slowly blurs or grows dim. You can still see colours, but the details aren't clear. This tends to happen over a period of years. Often, people don't notice the early stages, especially if the other eye is working fine.

Unfortunately, macular degeneration rarely affects just one eye. It may take time, but the other eye may eventually start to develop the same problems.

The vision loss in wet macular degeneration is much more rapid. While the central part of the field of vision fades and blurs, it usually vanishes completely, leaving a large blind spot. An early sign of wet macular degeneration is when you notice that lines in the centre of the field of view become wavy. This is due to the new blood vessels leaking fluid under the macula, which lifts it from its bed and deforms its shape. Wet macular degeneration usually occurs in one eye at a time.

Diagnosing Macular Degeneration

An ophthalmologist or eye specialist will likely know you have macular degeneration from your description of the symptoms of whiteout, blackout, or blurring of the centre of vision, but an eye exam is needed to confirm the diagnosis.

Any eye test involves examining the retina visually. The ophthalmologist will look into your eyes after putting in some eye drops to dilate the pupils. Tiny yellow flecks called drusen are a possible sign of macular degeneration. Some people have drusen without macular degeneration, but increasing amounts of this material may foretell problems to come.
Macular degeneration can be detected with a test called an *Amsler* grid. This is a poster showing a grid of vertical and horizontal lines with a dot in the centre. A person with macular degeneration may see wavy lines or missing areas of the grid while focusing on the dot in the centre. When wet macular degeneration is suspected after an eye exam, a fluorescein angiography is done to see the blood vessels in the eye more clearly. For this test, fluorescein (a non-toxic dye) is injected in to a vein and a special light is used to see the macula.

**Treating and Preventing Macular Degeneration**

While there's little that can be done for **dry macular degeneration**, the disease progresses very slowly, and will probably never completely black out the central vision. Many people with this condition live full lives without serious disability.

Some studies have suggested a link between poor nutrition and faster degeneration of the macula. According to this evidence, fruit and dark green vegetables like spinach can slow the disease and contribute to better outcomes. For some people, a doctor will recommend a daily supplement that contains zinc, copper, vitamin E, vitamin D, and beta-carotene or vitamin A.

**There is no cure for wet macular degeneration, but treatment may help to slow it down.** Laser surgery destroys tiny, newly grown blood vessels that may be bleeding into the macula. Photodynamic therapy may also be used. This involves injecting a medication called verteporfin* into a vein. Then, a light is used to activate the medication to close abnormal blood vessels. Medications injected into the eye, such as ranibizumab or pegaptanib, may be used to slow down the growth of blood vessels. Daily supplements may also be recommended.

**It's been shown that bright sunlight may speed up the progress of macular degeneration.**

Those with the condition should consider wearing UV-protective sunglasses when they are outdoors during daytime hours. People who have lost their vision may need magnifiers, strong reading glasses, and other devices to help them manage.

To help reduce your chances of getting macular degeneration:

- don't smoke
- exercise
- eat a healthy diet rich in leafy greens
- maintain a healthy weight
- wear sunglasses with UV protection during the day
ROLE OF NURSES

IN REDUCING THE USE OF TOBACCO

[Information is based on published research]
The role of nurses in reducing the use of tobacco

weeks after the agreed target stop date, and subsequent prescriptions should be issued only if the person can demonstrate that they are still trying to stop. NRT is also available over the counter in pharmacies.

Cessation targets

The support made available to tobacco users has shown impressive results to date. In 2001-2001, the target in England of 50000 successful quitters at four-week follow-up (from self-reports) was exceeded comfortably, with 79,646 succeeding in the period April to December 2002 alone (DoH, 2002). The services have been set even more ambitious targets for this and the following three years. They are expected to achieve 100,000 quitters for 2002-2003, and a three-year target of 800,000 for the years 2003 to 2006 (DoH, 2003). More specifically, the aim is to reduce the smoking rate among manual socioeconomic groups from 32 per cent to 26 per cent by 2010, and to achieve a one per cent reduction in the number of pregnant smokers each year. Extra funding has been made available to expand local smoking cessation support, as well as the NHS’s national services.

The nurse’s role Identification

One of the most important groups to target in smoking cessation programmes is ‘well’ smokers and other tobacco users whose health has not yet been noticeably affected by their habit. Intervention by health professionals can be highly effective in persuading people to stop smoking (Raw et al, 1998), and many of these people will have contact with the health services for reasons unrelated to smoking. However, their smoking status may go unrecognised by most health professionals involved in their care and treatment.

Encouragement

The limited time available in consultations is often barely enough to discuss the issue with which the patient is presenting, let alone raise other subjects. Nurses often spend significant amounts of time with patients and may be in a position to raise the issue of smoking. Many primary care nurses and health visitors, whose work involves preventive health care and public health improvement, are aware of their potential role in reducing smoking rates. However, hospital-based nurses, who have the opportunity to develop relationships with patients over days or weeks, can also be effective in encouraging patients to quit smoking (Fiore et al, 1996).

Support

Smoking cessation support can be a time-consuming process and requires specialist knowledge and skills, and nurses are not generally expected to provide such intensive input. While many nurses undergo training to enable them to develop local smoking cessation services, the most appropriate way for most nurses to contribute is through ‘brief interventions’. These can be undertaken as part of the admission procedure, during nursing assessment or while providing general nursing care. Nurses with prescribing qualifications can offer extra support by prescribing NRT or bupropion as well as referring people to specialist smoking cessation services.
Cessation services

Many smokers are unaware of the services set up to help them to stop smoking, so an effective intervention can be as simple as explaining how they can obtain support, giving them the contact details and encouraging them to take the first step. The message can be reinforced by explaining some of the lesser-known effects of smoking on health, while the dangers of second-hand smoke, such as increasing the risk of cot death, can be explained to those with children or grandchildren (Poswillo, 1998; Strachan and Cook, 1997). These interventions may give smokers new reasons to give up.

Brief interventions

The brief intervention generally involves assessing and recording the patient’s current smoking status. The way

Box 1. Effects of smoking on health Department of Health, 1998

Smoking causes:
- 84 per cent of deaths from lung cancer;
- 83 per cent of deaths from chronic obstructive pulmonary disease;
- 30 per cent of cancer deaths - In addition to lung cancer, smoking can cause death by cancer of the mouth, larynx, oesophagus, bladder, kidney, stomach and pancreas;
- 14 per cent of deaths from heart disease.

Smoking is also linked to many other serious conditions including:
- Asthma;
- Osteoporosis.


Smoking is a major cause of morbidity and mortality in the UK, and the government has funded a range of local and national smoking cessation initiatives. Supporting people as they attempt to give up smoking requires specialist skills and knowledge, often provided by nurses who have received appropriate training. However, non-specialist nurses can also play a role in cutting smoking rates by encouraging patients to consider giving up and directing them towards specialist services. This article focuses on the role that hospital-based nurses can play in encouraging patients to give up smoking.

The fact that smoking is harmful to health is well known by both health professionals and the general public:
- Over 120,000 people die from smoking-related conditions every year in the UK;
- Half of those who smoke for most of their lives die from the habit;
- An average of 16 years is lost from every smoker’s life expectancy (Department of Health, 1998).
Most people understand that smoking is the prime cause of cancer and heart disease, but it is less widely known that it can lead to or exacerbate a range of other fatal conditions and chronic illnesses (Box 1).

It is less that chewing tobacco also causes cancer. Some ethnic groups in the UK favour oral tobacco. For example, many people of South Asian origin chew tobacco, usually added to paan—a package of betel leaf thinly sliced areca palm nut and lime paste. Many South Asian women believe it aids digestion and can relieve tooth or gum pain, and more than half of Bangladeshi women aged 55 and over regularly chew paan with tobacco (Department of Health, 2001).

**Smoking cessation services**

In order to combat the effects of tobacco use on the health of the population the government has funded a range of local and national smoking cessation services (Box 2). These services aim to encourage smokers to quit and to support them once they have decided to do so. The NHS Smoking Helpline offers callers non-judgemental advice and support from trained advisers, and also serves as a gateway to other sources of support. Callers can be referred to local cessation services, where they may be offered one-to-one or group support from trained smoking cessation advisers. Callers can also opt to receive e-mail support or choose from a range of literature giving advice and information.

The NHS ‘Giving up Smoking’ website contains information on the benefits of giving up, and other motivational aids such as a tool that enables smokers to calculate their lifetime expenditure on tobacco to date. It gives practical advice on giving up, as well as contact.

**Source:**

Tobacco Information Campaign  
PO Box 102, Hayes, Middlesex UB3 1VD, UK  
**DoH tobacco policy:** www.doh.gov/tobacco
Websites

Action on smoking and health: www.ash.org.uk

Coping with quitting: www.community.netdoktor.com/ccs/uk/smoking/coping/index.jsp

Giving up smoking: www.givingupsmoking.co.uk

details for local smoking cessation services. While most smoking cessation efforts target the general population, two groups are specifically targeted:

● The NHS Pregnancy Smoking Helpline was set up to encourage pregnant smokers and their patient - to quit. Smoking and breathing in second-hand smoke during pregnancy can be harmful to mother and foetus (Gilliland et al., 2000; Blair et al., 1996; Poswillo and Alberman, 1992);

● The NHS Asian Tobacco Information Campaign aims to address tobacco use among Asian people and raise awareness of the associated health issues. The campaign funds a number of local support services and provides helplines in five Asian languages. In addition to the support offered by helplines and other smoking cessation interventions, people who want to give up smoking can be offered nicotine replacement therapy (NRT) and/or bupropion on prescription. Following an appraisal of their effectiveness, the National Institute for Clinical Excellence (NICE, 2002) has recommended that they be prescribed to smokers unless they are contraindicated as part of abstinence contingent treatment, in which the smoker sets a target stop date. There is little evidence that these interventions are effective for non-smoking tobacco users. Initial prescriptions should last only until two

References


**Dangers to children of secondhand smoke (Strachan and cook, 1997)**

- Cot death is twice as likely for babies whose mothers smoke
- Children whose parents smoke are 72 per cent more likely to contract serious chest infections
- Children whose parents smoke are twice as likely to require hospital admission during infancy due to a serious lung infection
- Smoking near children causes asthma attacks and increases the risk of other breathing problems

To proceed then depends on which of six ‘stages’ the patient is in – the aim being to encourage smokers to move on to the next stage towards giving up:

- Non-smokers can simply be congratulated and encouraged to resist any pressure to start (particularly in the case of young people);
- Smokers who are not interested in quitting can be told about the less well-known risks associated with smoking and the benefits of quitting, and offered appropriate literature in case they decide to quit in the future;
- Smokers who are thinking about giving up in the future can be encouraged to set a date and offered support and literature;
- Those who are ready to quit can be referred to their local NHS stop smoking service or encouraged to call the NHS Stop Smoking Helpline;
- Ex-smokers can be congratulated on their achievement and encouraged to maintain it;
- Smokers who have quit but have since relapsed can be encouraged to try again. They should be reassured that most people relapse a number of times before they quit for good, and that this is a normal part of the process. Such brief interventions are more likely to be effective if the patient can be given literature and contact details for smoking cessation services. A wide range of resources can be obtained free from the Tobacco Information Campaign (see Box 2).
Conclusion

Tobacco use is a major cause of morbidity and mortality. Smoking cessation programmes are government priorities to reduce both the human cost and the cost to the health service of smoking-related ill health. As health care professionals who often have the greatest amount of contact with patients, hospital-based nurses are ideally placed to identify smokers before their habit causes lasting damage. They can encourage these smokers to consider quitting. In addition, they can direct them on to specialist smoking cessation services.

-
ROLE OF PHYSICIAN

__________________________________________

IN REDUCING THE USE OF TOBACCO

[Based on a summary report- published]
Physician Behavior and Practice Patterns Related to Smoking Cessation

Summary Report: A Report Prepared for the American Legacy Foundation

By

Association of American Medical Colleges, 2450 N Street, N.W., Washington, D.C. 20037-1127

In cooperation with

Center for Health Workforce Studies, University at Albany, 7 University Place, Rensselaer, NY 12144-3458

Association of American Medical Colleges
Preface

While significant strides have been made in reducing tobacco use in the United States, smoking remains the number one cause of preventable death and illness in this country. Nearly 70% of smokers want to quit, but many lack access to treatments that support ongoing abstinence. Physician involvement greatly increases the likelihood that patients who try to quit smoking would achieve long-term success. However, physicians are not being used as effectively as they could be to help patients quit. Greater understanding of physician experiences in treating individuals who smoke is important in developing strategies to increase physicians’ sustained participation in cessation activities.

Through the generous support of the American Legacy Foundation (Legacy), the Center for Workforce Studies, Association of American Medical Colleges (AAMC) was able to conduct a national physician study examining physician knowledge, perspectives, and practice patterns in assisting patients to stop smoking. AAMC collaborated on this project with the Center for HealthWorkforce Studies (CHWS), School of Public Health, University at Albany. Both research centers are dedicated to helping providers, educators, policy makers, and the public better understand issues related to the health workforce.

AAMC appreciates the interest and valuable support provided to this research effort by Cheryl Healton, Dr.P.H., Jennifer Duke, Ph.D., and Kristen McCausland,M.P.H.,M.S.W. at Legacy.

Edward Salsberg,M.P.A.; Director of the AAMC Center was the Principle Investigator for the Study. Bonnie Primus Cohen,M.S., Associate Director of CHWS/Albany was the project director. Sandra McGinnis, Ph.D., Research Associate at CHWS/Albany assisted in the research and preparation of this report. Other contributors include Guy Forte, Tracey Continelli,M.S., Debra Krohl, and Lyrysa Smith of the CHWS/Albany; Atul Grover M.D., Ph.D. and Hisachi Yamagata, Ph.D. of CWS/AAMC and Jane Lindsey,M.D.

Further, we would like to thank members of the two advisory boards whose expertise and insights contributed to the development of our survey instruments and informed our analyses. National Advisory Committee members included Michael Eriksen, Sc.D.; Michael Fiore,M.D.,M.P.H.; Howard Koh,M.D.; Steven Schroeder,M.D.; Susan Swartz,M.D.,M.P.H.; and Christine Williams,M.Ed. Medical Specialty Committee members include Jacquelyn Admire-Borgelt,M.S.P.H.; Steven Bernstein, M.D.;Wayne Bylsma, Ph.D.; Janet Chapin, R.N.,M.P.H.; Donna Grande,M.G.A.; Jeanne Mahoney; MichaelWeitzman,M.D.; JoshWilk, Ph.D.; and Richard Yoast, Ph.D.

Ideas expressed in this report are those of the authors and do not represent the views of Legacy, AAMC, or the University at Albany.

The full report, detailed data and appendices can be viewed on the AAMC Legacy Foundation websites at www.AAMC.org/workforce/ and www.legacy.org.
Introduction

Physicians can be major contributors to efforts to reduce smoking and tobacco use and remain one of the most important sources of information on health issues and health risks for patients and their families. More than 70% of smokers will visit a physician each year (AHCPR, 1997), and physician advice and encouragement have been shown to increase the number of patients who will attempt and succeed in quitting smoking. Recent studies suggest that physician interventions have the potential to increase long-term abstinence rates to 30% from only 7% among adult smokers attempting to quit on their own (Orleans & Alper, 2003).

Physicians do not yet play the role they might in helping patients to reduce their dependence on tobacco. Of the approximately 45 million Americans who smoke, an estimated 70% reported wanting to quit (Centers for Disease Control and Prevention, 2004). However, the number of patients reporting that they had received advice to quit smoking from their physicians fell short of national goals established to address smoking cessation (National Women's Law Center, 2003; Fiore, Bailey & Cohen, 2000; Schnoll & Engstrom, 2004; Katz et al., 2004; Soloe et al., 2003). In addition, physicians are not routinely prescribing medications or providing services such as counseling and other supports consistent with current practice guidelines (Thorndike et al., 1998; Borum, 1999). Greater understanding of the factors that facilitate or impede physician participation in activities to control use of tobacco is needed to inform the design of programs and policies aimed at further reducing smoking, the most preventable cause of death and illness in our country.

The American Legacy Foundation (Legacy) funded the Association of American Medical Colleges (AAMC) to undertake a study that would increase understanding of physician practices and help explain why some doctors are more active in addressing smoking cessation with smokers than others. This information will be useful to a range of stakeholders including professional medical associations, public health agencies, policy makers, advocates and medical educators. AAMC, in collaboration with the Center for Health Workforce Studies (CHWS) at the School of Public Health, University at Albany, completed this comprehensive, national study of physicians and smoking interventions in 2006.

Project Goals

The overarching goal of the study was to promote the health of Americans by informing the development of programs and policies that improve medical treatment and prevention activities related to tobacco dependence. To reach this goal, the project was designed to:

- identify physician perspectives, knowledge, and practice patterns related to helping patients quit smoking;
- identify strategies to make more effective use of physicians in reducing smoking; and
- inform future investment in tobacco control initiatives.

Background

The study targeted physicians in four medical specialties: Family Medicine, General Internal Medicine, Obstetrics/Gynecology and Psychiatry. The specialties selected have extensive
contact with patients and are likely to treat patients who are smokers. Physicians in the primary care specialties and Obstetrics/Gynecology are likely to be the first point of contact for patients experiencing medical problems, and these physicians typically have long-term relationships with patients and their families. Psychiatrists were included because individuals with mental health diagnoses are more likely to be smokers than others (Williams & Aiedonis, 2004) and these physicians are also likely to have regular and long-term relationships with patients.

**Project Activities**

Several activities were undertaken to increase understanding of physician practices and experiences in addressing smoking with patients. These included:

**Expert Advisory Committees**

A National Advisory Committee and a Medical Specialty Advisory Committee were established to serve as resources to investigators. The committees assisted with the design of the survey instrument, interpretation of findings, and identification of strategies to support physician involvement in helping control smoking with patients. The National Advisory Committee included educators, researchers, providers, and policy makers who were experts in addressing tobacco use. Medical Specialty Advisory Committee members included representatives of specialties targeted in the study as well as representatives from Emergency Medicine, Pediatrics, and the American Medical Association (AMA). A listing of committee members can be found in Appendix A of the full report on the AAMC and LegacyWeb sites.

**Survey of Physician Perspectives on Smoking Interventions**

A comprehensive survey instrument was developed and distributed to a sample of 17,941 physicians in the targeted specialties randomly selected from the AMA Masterfile of Physicians. The response rate to the survey was 17.1%, with more than 3,000 physicians returning completed questionnaires. This was significantly lower than had been anticipated; therefore, a validation survey was developed. The intent of the validation survey was to assess the potential bias from the low response rate to the original survey. The second survey trimmed down survey was sent to 650 non-respondents—along with $20—which yielded a response rate of 56%. Based on a comparison of responses to both surveys, it was determined that little bias existed in responses to the original survey. This determination enabled the investigators to proceed with the analysis of the original survey responses and to generalize findings to all physicians in the four specialties with greater confidence. Findings presented in the report were drawn from a weighted database of survey responses from the original survey mirroring the profile of the targeted specialties. Both questionnaires are provided in Appendix B of the full report. A more detailed discussion of the data collection and analysis methodologies can be found in Appendix E of the full report.

AAMC/CHWS also used information on levels of state tobacco control investment and information on quitlines (Tauras, 2005; North American Quitlines Consortium, 2006) to further examine physician practice patterns.

**Literature Review**

A review of the literature examining physician participation in activities addressing tobacco use was also completed. The review included an examination of factors that influence physician behavior as well as the practices of physicians in the targeted specialties related to helping control tobacco use. The summary of the literature review is provided in Appendix D.
Findings of the Study

- All physicians surveyed believe it is their role to help patients quit smoking.
- While most physicians consistently ask patients who smoke about their smoking status and advise them to stop (86%), they do not regularly provide extensive assistance to help patients try to quit. For example, only 13% say they usually refer smokers to others for appropriate treatment and only 17% say they usually arrange for follow-up visits to address smoking.
- Physicians regard current smoking cessation tools as inadequate, citing:
  1. Insufficient services, resources, and organizational supports;
  2. Interventions that have only limited effectiveness; and
  3. Limited education and training for physicians on addressing tobacco use and cessation interventions.
- The five factors cited most often by physicians as significant barriers to successful interventions are: (1) lack of patient motivation (63%); (2) limited coverage for interventions (54%); (3) limited reimbursement for a physician’s time (52%); time with patients is limited (41%); and too few available cessation programs (39%).
- Physicians believe patients bear a significant responsibility for both smoking and quitting. However, these beliefs were not found to be associated with levels of participation in cessation activities.
- Physicians identified “More effective interventions” (78%) and “Increased availability of interventions” (60%) as the factors that would most motivate them to more frequently assist patients quit smoking. Increased insurance coverage for both cessation interventions (61%) and physician services (43%) to support their helping patients to quit smoking would also motivate physicians.
- Physicians who viewed incremental reductions in levels of tobacco use as successful outcomes were more likely to participate in cessation activities than those regarding success as complete abstinence only.
- Physicians reported they are not confident in their ability to motivate smokers to quit (44%), make referrals (34%), or monitor patient progress (33%).
- Physicians required by their medical practices to perform cessation activities were more likely to participate in a greater depth and breadth of activities to address tobacco use.
- Conversely, physicians who participated in a greater breadth and depth of cessation activities reported they had more resources available and/or were more positive in assessments of intervention effectiveness.
- The cessation practices and attitudes of Psychiatrists were significantly different from the other physician specialties targeted.
- Greater per capita investment in state tobacco control programs was associated with increased rates of physician referrals to cessation services as well as increased awareness of some resources.
• Quitline referrals were higher in states with established quitline programs and with a greater investment in tobacco control.

Physician Behaviors and Experience

Physicians believe they have a significant role to play in helping patients control tobacco use. More than 90% believed their role included helping both motivated and unmotivated patients to quit, discussing smoking behavior and relapse with patients, referring smokers to others for appropriate treatment, and monitoring patients’ progress in their attempts to quit. Perceptions varied little by medical specialty, organizational setting of practice, or demographic background.

Physicians were much less likely to report that they regularly participated in the range of activities they recognized as part of their responsibilities. While a significant majority routinely asked patients about smoking status (84%) and advised smokers to stop (86%), fewer participated in activities such as counseling patients, enlisting support for quitting, monitoring progress, or prescribing medication (Table 1). Physicians were least likely to arrange follow-up visits to address smoking with patients or refer them to others for appropriate treatment. This broad variation in performance of tasks was generally consistent with findings of other physician studies.

Table 1. Percent of Physicians who “Usually” Engage in Specific Cessation Activities with Patients who Smoke

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advise patients to stop smoking</td>
<td>86%</td>
</tr>
<tr>
<td>Ask about smoking status</td>
<td>84%</td>
</tr>
<tr>
<td>Discuss pharmacotherapies</td>
<td>68%</td>
</tr>
<tr>
<td>Assess patient willingness to quit</td>
<td>63%</td>
</tr>
<tr>
<td>Discuss counseling options</td>
<td>37%</td>
</tr>
<tr>
<td>Recommend nicotine replacement therapy</td>
<td>31%</td>
</tr>
<tr>
<td>Discuss enlisting support for quitting</td>
<td>29%</td>
</tr>
<tr>
<td>Monitor patient progress in attempting to quit</td>
<td>27%</td>
</tr>
<tr>
<td>Prescribe other medication</td>
<td>25%</td>
</tr>
<tr>
<td>Provide brochures/self help materials</td>
<td>24%</td>
</tr>
<tr>
<td>Arrange follow-up visits with patient to address smoking</td>
<td>17%</td>
</tr>
<tr>
<td>Refer patients who smoke to others for appropriate cessation treatment</td>
<td>13%</td>
</tr>
<tr>
<td>Refer patients to a quitline</td>
<td>7%</td>
</tr>
</tbody>
</table>
Practice patterns differed among the targeted medical specialties, with Psychiatrists being the least likely to participate in most cessation activities. Obstetricians/Gynecologists were less likely than other specialties to prescribe medication and nicotine replacement therapy (NRT), or to discuss pharmacotherapies. While this likely reflects the fact that medications are often contraindicated when treating women who are pregnant, it also suggests particular challenges in addressing smoking with patients within this specialty as increasing numbers of women use Obstetricians/Gynecologists as their primary source of care. Practice patterns among physicians did not vary by demographic background or by organizational setting.

More than half of physicians reported spending on average between two and 10 minutes discussing quitting with patients. One in 10 reported spending more than 10 minutes, which is remarkable given the length of the average patient encounter.

**Shortage of Cessation Tools**

A majority of physicians across specialties and settings reported significant limitations in the interventions they have available to help smokers stop smoking. These included having too few cessation resources and organizational supports, as well as lacking interventions that are effective in helping patients quit.

In fact, physicians identified “More effective interventions” (78%) and “Increased availability of interventions” (60%) as the factors that would most motivate them to more frequently assist patients quit smoking. The more resources and organizational supports that physicians reported were available, the more they reported participating in a greater breadth and depth of cessation activities. Physicians most active in smoking cessation were also more likely to have more positive perceptions of the effectiveness of interventions.

**Insufficient Services, Resources and Organizational Supports**

Only half of physicians reported having at least one resource available to help patients quit smoking. As seen in Table 2, physicians were most likely to report that brochures, pamphlets, and posters were available in their waiting rooms, and that group programs by referral and individual counseling by referral were available. Many physicians without access to adequate resources indicated they would use them if they were available: Nine in ten physicians reported that they would use individual counseling and group programs, and seven in ten would use Internet-based smoking programs and multilingual resources.

**Table 2. Percent of Physicians Reporting the Following Resources/Organizational Supports Were Available to Help Patients Quit Smoking**

<table>
<thead>
<tr>
<th>Resource Available to Help Patients Quit Smoking</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informational poster / pamphlets in waiting room</td>
<td>50%</td>
</tr>
<tr>
<td>Group programs available by referral</td>
<td>46%</td>
</tr>
<tr>
<td>Individual counseling available by referral</td>
<td>41%</td>
</tr>
<tr>
<td>Tobacco user identification system</td>
<td>33%</td>
</tr>
<tr>
<td>Individual counseling available on-site</td>
<td>27%</td>
</tr>
<tr>
<td>Web-based smoking cessation programs available</td>
<td>26%</td>
</tr>
<tr>
<td>Multilingual resources available</td>
<td>18%</td>
</tr>
<tr>
<td>Staff dedicated to providing tobacco dependence treatment</td>
<td>13%</td>
</tr>
<tr>
<td>Group programs available on-site</td>
<td>10%</td>
</tr>
<tr>
<td>None of the above</td>
<td>13%</td>
</tr>
</tbody>
</table>
Physicians practicing in states with a higher per capita investment in tobacco control programs were more likely to report that resources were available and to refer patients to others for appropriate treatment. This pattern was consistent with physicians’ reports that they would use resources if they were available.

Physicians who were more likely to know the status of patient coverage for medication/pharmacotherapy, counseling, and quitlines were also more likely to engage in smoking cessation activities.

While there was some variation among medical specialties in reporting the availability of resources and organizational supports, no single specialty had the most access to cessation tools. Psychiatrists were generally least likely to report that resources were available, with the exception of individual counseling. Internists, who were typically among the most active in participating in cessation activities, were more likely to report limited availability of resources than physicians in the other primary care specialties.

Lack of Effective Smoking Cessation Interventions

A majority of physicians reported that most cessation interventions have “some” effectiveness; however, less than one-third rated any single intervention as “highly” effective. The interventions physicians were most likely to perceive as being highly effective included bupropion and nicotine replacement therapy (NRT) (29%), NRT and counseling (21%), or family support (19%). Evidence-based studies suggested that such interventions are associated with abstinence rates of up to 38%.

Assessments of interventions did not vary by specialty, organizational setting, or gender. Younger physicians and those who reported being well prepared by their formal medical education and training on tobacco use were more likely to accurately identify intervention effectiveness.

As noted above, physicians who were more active in cessation activities differed from other physicians in their perceptions of intervention effectiveness. They were more likely to hold positive perceptions of interventions overall and less likely to hold negative perceptions. However, more active physicians were only slightly more likely than others to accurately assess intervention effectiveness consistent with evidence-based findings. This reinforces the need to improve physicians’ knowledge about interventions generally.

Limited Learning Opportunities

Few physicians reported being “very well prepared” by medical education and training to help patients stop smoking. However, more recent medical school graduates were more likely to report that they were well prepared by education and training. Most physicians reported that their specialty training (graduate medical education or GME) programs prepared them to assist patients with smoking cessation; 42% of physicians graduating prior to 1975 reporting they were “somewhat” or “very well prepared” as compared to 80% of graduates since 1995. However, seven in ten physicians graduating since 1995 did not feel well prepared by their undergraduate medical education alone (Figure 1).
Addressing the Need for Behavioral Changes

Most physicians felt they were not “very effective” in addressing behavioral changes of any type with patients (Table 3). However, physicians who were more confident in their abilities in this area were more likely to participate in a greater breadth and depth of activities to reduce use of tobacco with patients.

Table 3: Physicians Perceived Effectiveness When Discussing Certain Behavioral Changes

<table>
<thead>
<tr>
<th></th>
<th>Not very effective</th>
<th>Somewhat effective</th>
<th>Very effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>14%</td>
<td>76%</td>
<td>10%</td>
</tr>
<tr>
<td>Alcohol</td>
<td>21%</td>
<td>71%</td>
<td>8%</td>
</tr>
<tr>
<td>Obesity</td>
<td>32%</td>
<td>61%</td>
<td>7%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>10%</td>
<td>58%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Most physicians feel unable to affect behavioral changes in their patients particularly when it comes to the use of tobacco, alcohol and behavior related to obesity. However, physicians clearly feel more comfortable dealing with health conditions that are medically or pharmacologically “treatable” such as hypercholesterolemia. Providing opportunities for skill development around behavioral change issues at all levels of education would help improve physicians’ effectiveness in addressing chronic relapsing disorders, such as smoking, with patients.

In addition, most physicians regard patient outcomes short of total abstinence as successful results in controlling use of tobacco. Broader views of what constitutes successful outcomes were associated with greater physician participation in cessation activities. This suggests that physicians should be educated about more inclusive definitions of what constitutes “successful” smoking cessation outcomes.

Other Barriers to Effective Smoking Cessation Behavior

Lack of patient motivation and poor financing of cessation activities were both reported as significant barriers to helping patients stop smoking.

Patient Responsibility

Physicians believe that patients bear considerable responsibility for choosing to smoke and for quitting; “Patients are not motivated to quit” was most frequently identified as a significant barrier (63%). Two-thirds also believe that “Smokers choose to continue smoking,” and almost two-fifths believe that “Most smokers quit on their own.” These attitudes and perspectives suggest the frustrations and challenges many physicians experience in trying to assist smokers to reduce tobacco use.
It is important to note that physicians’ attitudes about patients were not associated with the breadth or depth of their participation in smoking cessation activities. Physicians who held these attitudes were no more or less likely to be active in assisting smokers. However, more than half of physicians reported that they would be motivated to assist patients more frequently if more patients asked for help. Since most smokers report wanting to quit, identifying strategies to encourage both smokers and physicians to initiate discussions about stopping smoking would be useful.

As their self-reported general knowledge about tobacco use increased, physicians were less likely to hold negative perceptions and attitudes about patients’ use of tobacco.

**Reimbursement**

More than half of physicians identified financing issues as barriers to assisting patients to stop smoking, including limited coverage for cessation interventions (54%) and limited reimbursement for a physician’s time (52%).

As seen in Table 4, medical specialties differed in their perceptions of these barriers. Physicians in most specialties were similarly likely to report coverage for cessation interventions as “limited”. Those in Family Medicine were more likely than others to view reimbursement for a physician’s time as limited. Psychiatrists were less likely than others to report these barriers as “significant”.

**Table 4. Physicians Reporting Significant Barriers to Helping Patients Stop Smoking by Specialty**

<table>
<thead>
<tr>
<th>Percent reporting barrier as significant</th>
<th>Family Medicine</th>
<th>Internal Medicine</th>
<th>Obstetrics/Gynecology</th>
<th>Psychiatry</th>
<th>All Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients are not motivated to quit</td>
<td>59%</td>
<td>67%</td>
<td>67%</td>
<td>58%</td>
<td>63%</td>
</tr>
<tr>
<td>Coverage for cessation interventions is limited</td>
<td>56%</td>
<td>55%</td>
<td>54%</td>
<td>45%</td>
<td>54%</td>
</tr>
<tr>
<td>Reimbursement for physician time is limited</td>
<td>58%</td>
<td>51%</td>
<td>48%</td>
<td>46%</td>
<td>52%</td>
</tr>
<tr>
<td>Time with patients is limited</td>
<td>45%</td>
<td>43%</td>
<td>41%</td>
<td>30%</td>
<td>41%</td>
</tr>
<tr>
<td>Too few cessation programs are available</td>
<td>32%</td>
<td>44%</td>
<td>34%</td>
<td>47%</td>
<td>39%</td>
</tr>
<tr>
<td>My understanding of CPT codes for smoking treatment is limited</td>
<td>32%</td>
<td>36%</td>
<td>42%</td>
<td>40%</td>
<td>36%</td>
</tr>
<tr>
<td>Patients have more immediate problems to address</td>
<td>31%</td>
<td>34%</td>
<td>34%</td>
<td>47%</td>
<td>35%</td>
</tr>
<tr>
<td>Patients usually fail to quit</td>
<td>30%</td>
<td>38%</td>
<td>37%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Other practice priorities reduce my ability to address smoking w/patients</td>
<td>27%</td>
<td>25%</td>
<td>37%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Staff are unfamiliar with interventions to help smokers quit</td>
<td>15%</td>
<td>19%</td>
<td>26%</td>
<td>28%</td>
<td>20%</td>
</tr>
<tr>
<td>Colleagues do not believe in the efficacy of cessation interventions</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Cessation heightens patients’ other symptoms</td>
<td>6%</td>
<td>10%</td>
<td>6%</td>
<td>22%</td>
<td>9%</td>
</tr>
<tr>
<td>My experience in intervening with smokers is limited</td>
<td>3%</td>
<td>5%</td>
<td>14%</td>
<td>19%</td>
<td>8%</td>
</tr>
</tbody>
</table>
The survey asked physicians whether most of patients had coverage for specific cessation services. Nearly two-thirds reported that patients had some coverage for medication as compared with only one-third reporting coverage for counseling, and less than one-tenth reporting coverage for quitlines. Physicians were also more likely to “know” whether a majority of patients had coverage for medication and pharmacotherapies as compared to counseling services and quitlines. Physicians who knew the status of coverage, despite availability, were more likely to participate in a greater depth and breadth of cessation activities.

Specialties differed in their understanding of how to effectively code for smoking treatment. Physicians with lower understanding of codes were less active in cessation activities. Increasing physician awareness both of the status of patient insurance coverage and of CPT codes related to cessation interventions would seem to be advisable.

Factors Associated with Increased Cessation Activities

Practice Requirements

Approximately half (53%) of physicians report that they are required by practice guidelines to ask patients about tobacco use and to document patient smoking status; one-third are required to document discussion of treatment strategies. Physicians participating in the greatest breadth and depth of cessation activities were more likely to report any one of such required protocols in their practices. The greatest correlation between physician activity and practice protocols was with the requirement to document treatment strategies.

Psychiatrists were less likely than other physicians to have requirements to ask about tobacco use or to document smoking status or treatment strategies despite organizational setting.

Physicians who reported any practice requirements were also more likely to report having resources available to help smokers stop smoking. Since resources and organizational supports do not currently meet existing needs, understanding the relationship between access to resources and clinical practice requirements will be a useful focus for future study. Such research will help clarify how requirements influence physicians’ skills in identifying potential resources and shape characteristics of practices that may facilitate access to services. This information will help optimize use of existing and new resources that may become available.

State Investment in Tobacco Controls

Investment in tobacco control varies with states allocating funds from several potential sources to reduce tobacco use. These include Master Settlement Agreement funds negotiated by the tobacco industry and states, state taxes on tobacco, other federal or state allocations, and foundation support. Investments have been made in a range of initiatives: cessation programs, public information campaigns to increase awareness of the hazards of tobacco use, development of educational material, establishment of information and referral resources, school smoking prevention programs, and public policy initiatives to reduce smoking.
Investigators found that the level of state per capita investment in tobacco control was positively associated with physician behavior in some key areas. Physicians are more likely to refer patients who smoke to others for treatment as state investment in tobacco control increases. Those practicing in states with higher per capita investment were also more likely to report greater availability of some types of cessation resources, including group programs and informational materials (pamphlets, brochures, and posters).

A positive relationship between state investment and the use of quitlines was also found. Quitlines typically provide a range of direct and referral services to smokers. Physicians in states with greatest per capita investment in tobacco control were more than twice as likely to make referrals to quitline programs as those in states with lowest investment. Physicians’ awareness of quitlines also increased with investment in tobacco control programs (Figure 2).

**Figure 2. Referral to Quitlines by Level of State Investment in Tobacco Control**

Physicians were more likely to know about refer to quitlines as state investment in tobacco control increased.

![Graph showing referral to quitlines vs state investment level](image)

Quitlines have been available in some states for several years but have only recently been established in many others. There is now an established national quitline, 1-800-QUITNOW, that directs patients to their state-run quitline. These programs promote system change by connecting partners working to reduce smoking, e.g., employers, insurers, and services, in addition to offering direct services to smokers.

Only about one-fifth of physicians surveyed had ever referred patients to quitlines. Referrals were higher in states where quitlines had operated 36 or more months and were also highest in states that had established programs. Physicians under the age of 40 were more likely to have ever referred patients to a quitline. Referrals to, and familiarity with, quitlines decreased as physicians aged, with those older than 60 being less likely to use or know about this type of resource.

Other referrals by physicians increased with the level of state investment as well (Figure 3).
More physicians had “ever” made referrals to others in states with higher per capita investment in tobacco control initiatives.

The association between physician behavior and level of state investment differed by specialty. Those in Family Medicine were more likely to refer and to report awareness and availability of resources than physicians in other specialties as state expenditures increased. Physicians in hospitals were much more likely to be familiar with and to have referred to quitlines (50% vs 33% for group practice and 24% for solo practice) as state investment in tobacco control programs increased. Women and non-Hispanic White physicians were also more likely to participate in cessation activities in high investment states.

This finding seems consistent with physicians’ views that more resources would be used if they were available.

Conclusions

Decreasing the rate of tobacco use in the US will require greater activity on the part of the nation’s physicians in cessation activities. This will require increased familiarity with available resources as well as sustained efforts to improve the quantity and quality of these resources. Specifically, several areas for improvement exist, including:

Increase the availability and use of tobacco control tools

· Increase the number and range of smoking cessation services

· Promote physician familiarity with tobacco control resources through the timely sharing of information on new and existing programs as well as how patients can access these services
· Provide physicians with additional information on quitlines and web based resources Increase physician assistance to patients who smoke to reduce their use of tobacco

· Encourage medical practices to require documentation of activities undertaken to help patients quit smoking, e.g., documentation of treatment strategies discussed with patients

· Include questions in electronic medical records that monitor smokers’ use of tobacco

· Use feedback systems in practice settings to update physicians on patient activities related to trying to quit

· Develop incentives, such as “pay for performance” initiatives, to encourage regular physician participation in cessation activities

· Improve physician-patient communication around tobacco use Increase physician knowledge of tobacco control interventions

· Improve effectiveness of medical school and residency curricula on tobacco control as part of assisting patients with behavioral changes

· Increase the availability of CME related to smoking cessation and behavioral change Improve coverage for tobacco control treatment, services, and physician time

· Expand insurance coverage to include additional cessation treatment and support services

· Broaden the services reimbursable for physicians when assisting patients with smoking cessation

· Improve physician understanding of insurance coverage for cessation activities Support investment in tobacco control

· Increase tobacco education funding to states with lower spending

· Improve linkages between physician associations and other tobacco control stakeholders to promote collaboration in efforts to promote the health of citizens in communities.
DENTISTS’ ROLE

In Stopping Tobacco

[Based on published Paper]
Tobacco Use Cessation Services and the Role of the Dental Hygienist—ACDHA position paper

- by the Canadian Dental Hygienists Association

POSITION STATEMENT ON TOBACCO USE CESSATION SERVICES AND THE ROLE OF THE DENTAL HYGIENIST

Whereas,
1. tobacco use has a devastating effect on general health and a significant negative impact on oral health;
2. tobacco use cessation services provided by dental hygienists have a significant positive impact on quit rates;
3. all forms of tobacco including cigarettes, pipe, cigar and spit tobacco cause addiction and detrimental health effects;
4. the public generally expects oral health professionals to provide tobacco use cessation services;

The Canadian Dental Hygienists Association declares that,
1. dental hygienists have a key role to play as a member of an inter-disciplinary health professional team, where each member delivers a consistent tobacco use cessation message;
2. dental hygienists have a professional responsibility to provide tobacco use cessation services, as a routine component of dental hygiene practice;
3. it is imperative that tobacco use cessation services are an integral part of oral health services;
4. spit tobacco, cigars and pipes are not safe alternatives to cigarettes.

RECOMMENDATIONS ON TOBACCO USE CESSATION SERVICES AND THE ROLE OF THE DENTAL HYGIENIST

Dental hygienists can
· play an important role in preventing and eliminating tobacco use by identifying tobacco users, documenting tobacco use history, offering brief advice and written materials, as a routine part of clinical practice;
· change clinical culture and clinical practice patterns so that every client who uses tobacco is identified and offered at least brief counselling;
· obtain increased knowledge about tobacco use cessation by discussing the topic with colleagues, reading articles, or participating in continuing education opportunities;
· display self-help tobacco use cessation materials and provide additional resources for clients;
· establish tobacco use cessation clinics;
· act as change agents by advocating for policy changes and community-based initiatives that would help reduce tobacco use such as enacting smoke-free ordinances, supporting effective health promotion campaigns, increasing tobacco taxation, restricting tobacco advertising, and reducing tobacco use placement in movies.
Dental hygiene professional associations can

- develop and provide tobacco use cessation continuing education programs;
- take a role in promoting the reimbursement of tobacco use cessation services through dental insurance plans;
- encourage provincial governments to recognize dental hygiene tobacco cessation services as effective and essential public health promotion services that will aid in reducing the long-term negative effects of tobacco use;
- act as change agents by advocating for policy changes and community-based initiatives that would help reduce tobacco use, such as enacting smoke-free ordinances, supporting effective health promotion campaigns, increasing tobacco taxation, restricting tobacco advertising, and reducing tobacco use placement in movies.

Dental hygiene educational institutions can

- integrate didactic and clinical education in tobacco use cessation services from the inception of the student’s dental hygiene education;
- encourage students to integrate tobacco use screening, prevention, and cessation services as a routine part of dental hygiene services provided to clients; • provide increased continuing education on tobacco use cessation services.

Dental insurance plans can

- consider tobacco use cessation services and pharmacotherapeutic treatments, as a reimbursed benefit, just as they would reimburse other chronic conditions;
- consider covering expenses for nicotine replacement therapy and bupropion for tobacco cessation.

Public health departments can

- utilize the dental hygienist’s expertise in the provision of tobacco use cessation and prevention programs;
- consider covering expenses for nicotine replacement therapy and bupropion for tobacco cessation within medication insurance plans.

Federal and provincial governments can

- increase funding for tobacco use cessation services for all tobacco users, particularly those in the highest need groups such as Aboriginal peoples and youth; take a more pro-active approach to tobacco cessation and develop a “call to action” to promote tobacco use cessation;
- cover expenses for nicotine replacement therapy and bupropion for tobacco cessation within medication insurance plans.

Researchers can

- determine availability of, usage of, and barriers to obtaining tobacco use cessation continuing education;
- determine the extent of involvement of Canadian student clinics in providing tobacco use cessation services;
- develop new tobacco cessation continuing education programs for dental hygienists;
- assess and make recommendations for improvements to undergraduate curricula on tobacco use cessation;
• conduct further studies to determine the efficacy of dental hygiene delivered tobacco use cessation services, particularly for special populations, such as women, youth and Aboriginal peoples; investigate dental hygienists’ ethical obligations in the provision of tobacco cessation services.

METHODOLOGY

This paper is based on a systematic review of literature, focusing primarily on the role of the dental hygienist in tobacco use cessation. A detailed search of relevant international English language research from 1981 to 2004 was carried out using MedLine and Cinahl databases and the Cochrane controlled trials register. The main focus, however, was on current literature from 1999 to 2004.

The search was expanded by reviewing “grey” literature, information not reported in scientific periodicals, as well as websites known to contain publications on this topic. In addition, the researcher manually searched references cited in the database search articles. Journals that were not indexed on these databases but that were relevant to the topic were identified from the CDHA collection. Finally, recognized experts in the topic area were contacted for identification of other relevant articles that may not have been identified. Animal studies were excluded; human studies
Table 1. Smoking rates in Canada, 2003

<table>
<thead>
<tr>
<th>Area</th>
<th>Current smokers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>20</td>
</tr>
<tr>
<td>Newfoundland and</td>
<td>23</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>23</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>22</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>24</td>
</tr>
<tr>
<td>Quebec</td>
<td>23</td>
</tr>
<tr>
<td>Ontario</td>
<td>19</td>
</tr>
<tr>
<td>Manitoba</td>
<td>21</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>21</td>
</tr>
<tr>
<td>Alberta</td>
<td>21</td>
</tr>
<tr>
<td>British Columbia</td>
<td>16</td>
</tr>
</tbody>
</table>

Approximately 15% of youth aged 15 to 19 years of age were smoking, with girls smoking more than boys (19% vs. 16%).

were included. The following MeSH (medical subject headings) terms were used in the searches: dental hygienists, smoking cessation, tobacco use cessation, drug therapy, behaviour therapy, exercise therapy, acupuncture therapy, self-help groups, literature review, meta-analysis, systematic review (publication type) and practice guidelines.

Input from CDHA members was obtained in two ways; first, an e-mail broadcast and a notice in the Probe journal invited members to provide input, and second, a draft paper was posted on the CDHA web site and member input was obtained through an internet survey. In addition, a peer review process allowed the author to incorporate input from topic experts.

WHO USES TOBACCO?

According to the Canadian Tobacco Use Monitoring Survey¹, the prevalence of smoking varies by age, gender, geographical location, and ethnicity. There were over 5 million people aged 15 years and older smoking in Canada in 2003, representing approximately 21% of the population. Approximately 23% of men and 18% of women were smoking. The highest prevalence of smoking occurs among Canada’s young adults, aged 20 to 24, where 30% indicated that they smoked. Approximately 15% of youth aged 15 to 19 years of age were smoking, with girls smoking more than boys (19% vs. 16%). There are regional differences in smoking, with British Columbia showing the lowest prevalence and New Brunswick the highest (see table 1). First Nations peoples, Inuit, and immigrants all have a higher prevalence of smoking than the average Canadian, with the first two groups showing a prevalence over twice as high as the general population.²,³ The last group has a prevalence of 23.8%.⁴ About 1% of Canadians use spit tobacco, with the highest provincial rate of 1.4% in Alberta⁵.
Spit tobacco

There are two types of smokeless or spit tobacco. Both are addictive and cause a significant negative impact on health. The first type is snuff that is a finely ground or shredded tobacco and that comes in either wet or dry. The dry form can be inhaled, but wet snuff is the more common form. Users of wet snuff place a “dip” or sachet of snuff between the lip or cheek and gum where it stays until swallowed or spit out. The second type of spit tobacco is chewing tobacco, a coarsely cut tobacco. Users put a “wad” of tobacco in their cheek and chew on it.

This paper uses the term “spit tobacco” instead of “smokeless tobacco” to avoid a possible association between “smokeless tobacco” and a product that is less harmful than smoking. It should be noted that both smoking and smokeless tobacco are harmful. Spit tobacco use produces higher nicotine levels in the body than cigarette smoking. An average dose of 7.9 g of chewing tobacco in the mouth for 30 minutes produces an average of 4.5 mg of nicotine; 2.5 g of moist snuff kept in the mouth for 30 minutes produces an average of 3.6 mg nicotine; one cigarette produces an average of 1.0 mg of nicotine. The higher level of nicotine produced by spit tobacco may result in a dependence more easily formed than with cigarette smoking.

There is a low prevalence of spit tobacco use in the general Canadian population, with 1% of the male population using this product. The highest prevalence of spit tobacco use is found in Saskatchewan and Alberta, with 2% and 1.4% of the population respectively using it. Spit tobacco use is higher in the Aboriginal population than the general population. It is also higher in athletes than the general population, with high rates reported for players in hockey (47%), football (36%), and soccer (22%). Other athletes, including those playing baseball, golf, lacrosse, water polo, and wrestling may also use spit tobacco. Some athletes believe that spit tobacco improves performance but studies do not support this. A 1992 study in Calgary found that the age of initiation for spit tobacco use was just over nine years. Given the high risk for cancer, early initiation creates a serious health risk for these individuals.

THE COMPLEXITIES OF ADDICTION

Tobacco addiction is composed of three components; (1) pharmacologic—the nicotine addiction causing the physical addiction; (2) behavioural—the habit formation; and (3) psychological and social—related to the time of day and situations that prompt you to smoke. Nicotine dependence may be measured by the amount of time that elapses after waking in the morning before the first cigarette is lit. In 1999, 25% of smokers were highly dependent, that is, they smoked their first cigarette within 5 minutes of awakening, while 32% showed moderately high dependence, by smoking within 6 to 30 minutes of awakening.

To explore the association between mental health and smoking, the mental health of 4,000 nicotine and nonnicotine dependent smokers were compared. Nicotine dependent smokers smoked 20 cigarettes per day on average; the non-nicotine dependent smokers smoked on average 14 cigarettes per day. More than half of the nicotine dependent subjects reported at least one of the following types of mental disorders including anxiety disorders, depressive disorders, somatoform disorders, and substance abuse other than nicotine dependence. In comparison, only one-quarter of the non-smokers and non-nicotine dependent subjects reported at least one of these mental disorders. Although this study does not show that heavy smoking leads to poor mental health, it does show that the two are associated.
GENERAL HEALTH RISKS

Tobacco use has profound health risks that include chronic diseases, early morbidity, and mortality. It harms nearly every major organ of the body. People using tobacco not only place their health at risk, but also their lives. One-half of regular smokers will die from smoking-related illness and one-half of those deaths occur prematurely in middle age from ages 35 to 65. The following statistics will give you a vivid picture of what these statistics mean in terms of the number of lives lost. Tobacco kills four times as many people as traffic accidents, suicide, AIDS, and murder combined.18 Approximately 40,000 people in Canada die each year from tobacco-related illnesses. World-wide, tobacco kills three million people every year, or one every second, and that number is expected to rise to 10 million by the year 2025.18

Smoking harms the whole body and causes the following illnesses:

- Cancers of the mouth, throat, larynx, lung, esophagus, pancreas, kidney, bladder, stomach, cervix, and acute myeloid leukaemia

Table 2. Impact of smoking on mothers, fetuses, and infants

<table>
<thead>
<tr>
<th>Condition</th>
<th>Causal relationship</th>
<th>Evidence suggests a possible association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden infant death syndrome smoking (during and after pregnancy)</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Maternal smoking during pregnancy and decreased</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Reduced fertility in women</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Premature rupture of the membranes, placenta previa, and placental abruption</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Risk for preeclampsia</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Preterm delivery and shortened gestation</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Fetal growth restriction and low birth weight</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Infant oral clefts</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Ectopic pregnancy</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Spontaneous abortion</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Smoking and oral health risks

<table>
<thead>
<tr>
<th>Condition</th>
<th>Causal relationship</th>
<th>Association with increased risk</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodontal disease</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer of the oral cavity and pharynx</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coronal dental caries</td>
<td>19</td>
<td></td>
<td>Inadequate evidence to infer relationship</td>
</tr>
<tr>
<td>Root surface caries</td>
<td>19</td>
<td></td>
<td>Sufficient to infer a causal relationship</td>
</tr>
<tr>
<td>Oral mucosal lesions, such as leukoplakia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delayed tissue healing with periodontal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>therapy, including surgical, non-surgical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and antimicrobial therapy and extractions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental implant failure</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Alveolar bone loss</td>
<td></td>
<td>√</td>
<td>OR* 3- light smoking OR 7.28- heavy smoking</td>
</tr>
</tbody>
</table>

*OR: Odds ratio

*Cigars and pipes are also not safe alternatives to smoking cigarettes.*

However, both general and oral health risks are associated with spit tobacco. There is some evidence that spit tobacco can lead to heart and blood vessel disease. As early as 1986, the Surgeon General concluded that spit tobacco “is not a safe substitute for smoking cigarettes,” and to date, there is no evidence that disputes this.

Cigars and pipes are also not safe alternatives to smoking cigarettes. Cigar and pipe smokers are exposed to the negative health effects of nicotine, regardless of whether or not they inhale. The mildly alkaline cigar smoke is absorbed more easily in the mouth than cigarette smoke. Smoking one cigar may produce the same negative health effects as smoking one package of cigarettes and the second-hand smoke is more harmful than of three cigarettes. Specific health risks associated with pipe and cigar smoking are as follows: a rate of laryngeal, oral, and esophageal cancer that is similar to that of cigarette smokers; a risk of developing lung cancer that is 2 to 3 times that of non-smokers; up to 3.6 times the risk of dying from chronic obstructive lung disease (emphysema) than nonsmokers.
Non-smokers are also at risk for some of these health effects as a result of exposure to cigarette smoke. Environmental tobacco smoke (ETS) or second-hand smoke is a human lung carcinogen. Exposing children increases their risk of lower respiratory tract infections such as bronchitis and pneumonia, fluid in the middle ear, reduced lung function, worsened asthmatic condition, and new cases of asthma. In addition, babies who were exposed to ETS in the womb are at risk of sudden infant death syndrome. There is no known safe level of exposure to ETS. The United States Environmental Protection Agency has declared it a Class A cancer-causing substance, which means that it is the most dangerous of cancer agents.

**ORAL HEALTH RISKS**
The detrimental effects of tobacco on oral health are well documented; some of these involve a high degree of risk. Table 3 outlines several types of relationships. A number of studies examine the strength of the relationship between tobacco use and oral health risks. In Canada 3,000 cases of oral cancer are diagnosed each year and 75% of these cases are attributable to tobacco use. When variables such as oral hygiene, age, gender, systemic diseases, medication, and frequency of oral health visits are controlled, cigarette smoking is the most significant risk factor for periodontal disease. One study further defines this risk by indicating that smoking is associated with approximately one-half of the cases of periodontitis. Three additional studies indicate that smokers have a two- to six-fold increased risk of developing periodontal disease compared with non-smokers and the risk of developing severe periodontal disease is three times greater for smokers.

Maternal tobacco use during pregnancy also has a negative impact on the fetus' oral health. It is associated with intrauterine growth retardation that is harmful to the fetus' and child's oral and dental development. Oral developmental anomalies include cleft palate, dental asymmetry, and morphologic variants such as reduced tooth crown size.

Spit tobacco is not associated with generalized periodontal disease but does have a number of detrimental effects on oral health. It increases the risk of localized gingival recession and attachment loss as well as alveolar bone loss from constant irritation at the site where the tobacco is placed in the mouth. It also increases the risk of tooth abrasion from the grit and sand in the products plus increased tooth decay, possibly due to the sugar that is added to the product.

Spit tobacco also increases the risk of cancers of the pharynx (throat), larynx (voice box), and esophagus as well as the risk of developing leukoplakia (mouth sores that can become cancerous), usually at the site where the dip is placed in the mouth. One study shows that spit tobacco users have a four-fold greater risk of developing oral cancer than non-users. Stronger evidence is found in a meta-analysis of case-control studies showing an association between cancer of the oral cavity and other respiratory sites and smokeless tobacco and dry snuff. This metaanalysis indicates that dry snuff imposes the highest relative risk, ranging from 4 to 13 with smokeless tobacco (unspecified as to type) creating an intermediate risk of 1.5 to 2.8.
There is also some indication of an interaction between tobacco use and systemic disease, which creates further negative impact on oral health. For example, persons with diabetes are twice as likely to have periodontal attachment loss compared with non-diabetics. However, diabetics who smoke are 30 times more likely to have periodontal attachment loss than persons without these risk factors. This suggests that smoking interacts with systemic conditions to produce greater oral disease than either factor alone. The biological mechanism whereby smoking impacts on periodontal disease requires further study and clarification. There is, however, some indication that it may include changes in the vasculature, the immune and inflammatory systems, tissue oxygenation, and the healing process. Dental hygiene research has an important role to play in advancing the knowledge in this area.

**THE ECONOMIC CONSEQUENCES OF TOBACCO USE**

Tobacco use is a serious public health problem with heavy human, social, and economic costs. The following describes four studies that show the direct and indirect costs associated with smoking. Direct costs measure the value of resources or medical costs used as a consequence of smoking; indirect costs measure the value of productivity lost due to smoking-related illness, injury, or premature death. A 1992 study in Ontario found that the total direct and indirect costs associated with smoking were US$2.91 billion. Similar results were found in a 1999 study in Louisiana: the total direct and indirect costs associated with smoking were 2.81 billion dollars or $645 per capita. Direct costs totalled $1,151 million with indirect costs were estimated at $1,663 million. Total annual U.S. direct and indirect costs have also been estimated at more than $150 billion. These expenses are considerable and many

*A 1992 study in Ontario found that the total direct and indirect costs associated with smoking were US$2.91 billion.*

could be prevented with increased tobacco cessation services.

The substantial costs associated with tobacco use can be reduced with tobacco cessation services. The costs in 1993 in the United States associated with physician-delivered brief advice and counselling about tobacco cessation are $705 to $988 per life-year gained for men and $1,204 to $2,058 for women. A 1996 Canadian study found that it would cost $67 per client to implement a school-based smoking cessation program. The benefit-cost ratio was determined to be 15.4 with annual net savings of $619 million. These studies demonstrate the cost effectiveness of tobacco cessation services. It is possible that if physician-delivered services obtain this high rate of return, services delivered by a dental hygienist would produce a similar or higher rate of return, due lower service costs. Given that dental hygienists currently deliver oral disease prevention programs and services in various settings, including schools, expanding these activities to include tobacco cessation has the potential for significant cost savings.

**WHY DENTAL HYGIENISTS SHOULD PROVIDE TOBACCO USE CESSATION SERVICES**

Dental hygiene practices have a combination of factors that create favourable conditions for the delivery of tobacco use cessation services (TCS). Not only do the majority of oral health clients expect dental hygienists to provide tobacco use cessation services, but dental hygienists are also well suited to providing TCS. They have important skills in health promotion, disease
prevention, health education, and behavioural motivation that would allow them to provide effective tobacco use cessation services. Moreover, dental hygienists serve some client populations that do not see other health professionals on a regular basis and that may therefore miss opportunities to receive tobacco use cessation advice. For example, men and teenagers generally make regular visits to oral health professionals; they are, however, less likely to see a physician.

In addition, contact with a client over an extended period of time, which may be common in dental hygiene practices, allows repeated reinforcement—essential for tobacco users who have a high tendency to relapse. In fact, quitting a tobacco addiction is difficult and may take at least two or three attempts. Strong evidence also shows that treatment delivered by a variety of health professionals positively influences quit rates. Therefore dental hygienists can confidently join other health professionals in providing encouragement and sending a consistent message that tobacco use is detrimental to health. Dental hygienists can also contribute to the “denormalization” of smoking as an acceptable behaviour. The three

Dental hygienists have important skills in health promotion, disease prevention, health education, and behavioural motivation that would allow them to provide effective tobacco use cessation services.

main aspects of denormalization are the following:

(1) dental hygienists can teach clients that due to the hazardous, addictive nature of tobacco, it is undesirable to use tobacco products; (2) they can promote tobacco use as socially unacceptable; (3) they can provide educational information about the tobacco industry’s marketing techniques that link tobacco with popularity, attractiveness, and rebellion against conformity.

Although clients may be aware of the many health risks of tobacco use, they may be less familiar with the impact on oral health. The dental hygiene visit provides a unique venue where dental hygienists can discuss oral health effects of tobacco, relate oral changes to tobacco use, and deliver a tobacco use cessation message. Relating oral changes to tobacco use and providing visible evidence of the harm may provide clients with a powerful motivator for quitting tobacco use.

Since oral cancer screening is within the scope of practice of dental hygienists, it naturally follows that tobacco use cessation counselling should go hand in hand with this screening. The oral effects of smoking appear earlier than the systemic effects. The dental hygienists can therefore be the first line of defence in detecting this negative impact on oral health. In the long term, helping clients to succeed in tobacco use cessation, preventing tobacco use, and conducting routine oral cancer screening has the potential to reduce health care costs, reduce premature morbidity and mortality rates associated with tobacco related diseases, minimize disfigurements and loss of function, and prevent systemic diseases from arising.

CURRENT INVOLVEMENT OF DENTAL HYGIENISTS IN TOBACCO USE CESSATION SERVICES (TCS)

There are numerous ways in which dental hygienists have incorporated tobacco use cessation into their practices. At the micro level, dental hygienists in public health are involved in tobacco use cessation services on a one-to-one basis, through group counselling, and by providing educational
talks in schools and at health fairs.56-57 Dental hygienists who deliver private oral health services are also involved with tobacco use cessation services. There is increasing recognition that dental hygienists have an opportunity and a professional responsibility to deliver TCS. In a recent survey by the Canadian Dental Hygienists Association (CDHA), 80% of dental hygienists disagreed strongly and disagreed somewhat with the statement, “It is not the role of a dental hygienist to counsel patients on smoking cessation.”58 Two other studies indicate similar attitudes of dental hygienists. Fried and Rubinstein in 1990 surveyed 397 dental hygienists and 71% agreed that it is a dental hygienists responsibility to counsel smokers and smokeless tobacco users.59 Gussy and others in 1996 surveyed dental hygienists and 60% felt it was appropriate for the dental hygienist to address smoking cessation with clients.60 This research on attitudes shows that dental hygienists generally recognize that they have a professional responsibility to provide tobacco cessation services (TCS).

In keeping with this prevalent attitude, a number of dental hygiene professional associations support the provision of tobacco use cessation services by dental hygienists and are actively promoting these services. For example, CDHA and the Alberta Dental Hygienists Association61 provide TCS continuing education programs and support for oral health professionals to use TCS. At a macro level, dental hygienists and their professional associations across Canada also advocate for reduction in tobacco advertising, an increase in oral health professional education, and government tobacco reduction policies, such as smoke-free environmental policies. In addition, CDHA has been politically active in advocating for increased funding for dental hygiene smoking cessation services through the First Nations and Inuit Health Branch of Health Canada.64 The goal is to address the staggering rates of tobacco use among Aboriginal peoples.

There are two ways in which dental hygiene professional associations provide support for the administrative aspects of providing TCS. First, the CDHA National List of Dental Hygiene Services and System of Service Coding includes a code for smoking cessation counselling. Second, suggested fees for TCS are listed in the provincial fee guides for British Columbia, Ontario, and Saskatchewan.

Although there may be a growing awareness about tobacco use cessation issues among dental hygienists, there is considerable evidence that oral health services do not commonly include tobacco use cessation services. Results from six studies of the nature and extent of TCS provided by dental hygienists in the United States, Canada, and the United Kingdom are shown in Table 4. It shows weaknesses in a number of service provision areas, including asking clients if they use tobacco, counselling in tobacco cessation, distributing relevant literature, referring to other tobacco cessation programs, and following up with clients. This gap in services is an opportunity lost, since dental hygienists could be contributing to improved oral and general health by collaborating with other health professionals in sending a consistent message about tobacco use.

Table 4 also shows a strong involvement of student clinics in the United States in tobacco cessation activities. The majority of these clinics advise clients to quit, distribute pamphlets, and discuss quit strategies. However, following graduation, dental hygienists become less involved in these activities. The weakest area is follow-up with clients who are interested in quitting smoking. Improvements in these activities may be obtained with effective TCS continuing education for dental hygienists. These studies highlight the need for further research to
Table 4. Tobacco cessation services provided by dental hygienists in the United States, Canada, and the United Kingdom

<table>
<thead>
<tr>
<th>Researcher (location of study)</th>
<th>Question</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fried et al. 199059 (U.S.)</td>
<td>Almost always or often counselled smokers and smokeless tobacco users</td>
<td>397 dental hygienists</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td>Distributed relevant literature</td>
<td>“”</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Almost always or often referred to “”</td>
<td>“”</td>
<td>14%</td>
</tr>
<tr>
<td>Hastreiter et al. 199765 (U.S.)</td>
<td>Advised smokers to quit</td>
<td>2,073 dental hygienists</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td>Advised smokeless tobacco users to quit</td>
<td>“”</td>
<td>74%</td>
</tr>
<tr>
<td></td>
<td>Discussed specific strategies to stop tobacco use</td>
<td>“”</td>
<td>24-25%</td>
</tr>
<tr>
<td></td>
<td>Follow-up with clients</td>
<td>“”</td>
<td>1%</td>
</tr>
<tr>
<td>Dolan et al. 199766 (U.S.)</td>
<td>Provide tobacco use cessation services</td>
<td>723 dental hygienists</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Asked if the client smoked</td>
<td>“”</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Asked if the client used spit tobacco</td>
<td>“”</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Advised smokers to quit</td>
<td>“”</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Advised spit tobacco users to quit</td>
<td>“”</td>
<td>84%</td>
</tr>
<tr>
<td>Gussy et al. 199660 (U.K.)</td>
<td>Routinely asked clients about smoking</td>
<td>N/A</td>
<td>30%</td>
</tr>
<tr>
<td>Brothwell et al. 200467 (Canada)</td>
<td>Mostly and routinely ask clients about tobacco-use status</td>
<td>31 dental hygienists</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Mostly and routinely advise smokers of the health risk and need to quit</td>
<td>“”</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>Mostly and routinely assist clients to quit</td>
<td>“”</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Follow-up with clients</td>
<td>“”</td>
<td>0%</td>
</tr>
<tr>
<td>Barker et al. 199968 (U.S.)</td>
<td>Inquire about tobacco use</td>
<td>200 dental hygiene programs</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Advise clients to quit</td>
<td>“”</td>
<td>98.2%</td>
</tr>
<tr>
<td></td>
<td>Give clients motivational pamphlets</td>
<td>“”</td>
<td>84.5%</td>
</tr>
<tr>
<td></td>
<td>Discuss cessation strategies with clients</td>
<td>“”</td>
<td>76.5%</td>
</tr>
<tr>
<td></td>
<td>Follow-up on tobacco cessation at subsequent appointments</td>
<td>“”</td>
<td>53.2%</td>
</tr>
</tbody>
</table>

determine the extent of involvement of Canadian student clinics in providing tobacco cessation services.

**DENTAL HYGIENISTS’ INVOLVEMENT WITH ORAL CANCER SCREENINGS**

Oral cancer screenings are an important aspect of tobacco cessation services, since smoking causes cancer of the oral cavity and spit tobacco use is associated with oral cancer. A routine oral examination by a dental hygienist provides an opportunity to see abnormal tissue changes and to detect oral cancer at an early curable stage.
Despite the benefits of such screening, there is some indication that dental hygienists perform this screening infrequently. A 1998 Canadian study shows that only 42.4% of dental hygienists provided oral cancer screenings at initial appointments for clients most at risk (>40 years of age). A slightly higher rate is reported in a U.S. study of 464 dental hygienists: while 100% of respondents indicated the oral cancer examinations for adults 40 years of age or older should be provided annually, only 66% reported doing so on their initial appointment.

In addition, two surveys of the general population confirm that U.S. citizens frequently do not receive oral cancer screenings. The first study shows that only 8.7% of adults reported an oral cancer screening by a dentist or a dental hygienist, the second that fewer than 15% of the population receives an oral cancer screening by health professionals. This is an opportunity lost, since dental hygienists could be using the oral screening as a teachable moment to inform their clients about the risk factors and signs of oral cancer and to advise tobacco use cessation. These studies draw attention to a possible need for tobacco cessation continuing education programs with information on oral cancer risk factors and conducting oral cancer screenings.

**DENTAL HYGIENE PRACTICES AS EFFECTIVE VENUES FOR THE PROVISION OF TOBACCO USE CESSATION SERVICES**

There is sound evidence (see Table 5) that dental hygienists are effective in the provision of smoking and spit tobacco use cessation services. Three randomized controlled trials (RCTs) show positive results when dental hygienists provide smoking cessation services. In the United States, Secker-Walker et al. in 198873 reported a 14.6% quit rate in a pilot study with dental hygienists providing smoking cessation services. In England, a randomized controlled trial with dental hygienists providing smoking cessation services showed a quit rate ranging from 13% to 16.9%, compared with the control group with a 5% to 7.7% quit rate. These services also resulted in an 80% smoking reduction rate compared with 24% in the control group. These level 1 studies confirm that dental hygienists are achieving quit rates for smoking cessation that range from a low of 2.5% to a high of 14.6%.

Only one study reported a non-significant quit rate with intervention. Although the researcher suggests a number of reasons for this, the most convincing rationale was that the type of intervention may be more effective for smokeless tobacco users who might have more visible signs of the effects of tobacco use on their oral health.

The five randomized controlled trials in Table 5 show positive results when dental hygienists implement spit tobacco use cessation services. In summary, the quit rates for the clients who received dental hygiene tobacco use cessation services ranged from 10.2% to 35% compared with the control group’s quit rates of 3.3% to 21%. Similar positive results were found in a spit tobacco study with no control; dental hygienists obtained a 19% quit rate.

**Dental hygienists are effective in the provision of smoking and spit tobacco use cessation services.**

Although these are important, primarily level I studies showing dental hygienists are successful in changing clients’ tobacco use behaviour, some aspects of the studies’ methodologies limit the significance of the results. Most of the studies may be limited by their method of measuring the outcome. Macgregor (1996), Stevens et al. (1995), Secker-Walker (1988), Severson et al. (1998),
Greene et al. (1994), and Little et al. (1992) used self-reporting of quit status to measure the outcome. This method is limited by the lack of biochemical validation of reported smoking cessation. Walsh et al. (1999) used self-reporting with a pipeline procedure—they informed subjects that biochemical assessments would be used to assess tobacco use status while actually most would be collected but not evaluated. Walsh et al. (2003) determined tobacco use status with a biochemical assays of saliva and self-reporting. The saliva test is limited due to the 20-hour half-life of cotinine. (Cotinine is a metabolite of nicotine and the most widely used biochemical marker of tobacco use.) This method does not allow validation of quitting for more than 20 hours.

There is also some difficulty in comparing the RCTs due to the way in which subjects were assigned to the control and intervention groups. Although the control subjects in the smoking studies were randomly assigned to both control and intervention groups, there was one difference in the way in which the intervention subjects were assigned. In Macgregor (1996), intervention subjects specifically expressed a wish to reduce or cease smoking. Secker-Walker et al. (1988) did not screen subjects in this way. The screening-in of committed subjects may increase the quit rate and this information should therefore be taken into account when comparing the two studies. Also, the Secker-Walker study is limited by the lack of a control group.

FACTORS AFFECTING DENTAL HYGIENISTS’ PROVISION OF TOBACCO USE CESSION SERVICES

A number of factors influence a dental hygienist’s decision to provide tobacco use cessation services (TCS). International studies show that a lack of training may be one factor that prevents some dental hygienists from providing TCS. A recent CDHA survey confirmed this, showing that 44% of dental hygienists believed they were not knowledgeable enough about smoking cessation to counsel clients on this topic. A study in England also indicated that dental hygienists do not provide TCS since they do not have sufficient training or enough materials to advise clients. Similar results were found in two U.S. studies. The first indicates that 23% of dental hygienists had completed formal TCS training but that only 17% felt they were well prepared to assist clients with TCS. The second indicates that 30% of dental hygienists believed themselves adequately prepared to counsel smokers and smokeless tobacco users. Dental hygienists’ perceived lack of knowledge about tobacco cessation may be the leading factor in this service provision gap.

Some solutions to address this service gap may include increased availability of effective tobacco cessation continuing education (CE) programs, and integrated didactic and clinical education in tobacco use cessation services at dental hygiene schools. Narrowing the gap in services through increased education may be relatively simple, for two reasons. First, 89% of dental hygienists are interested in learning more about smoking cessation; they therefore may readily enrol in CE programs. Second, a review of RCTs that examine the training of health care professionals in smoking cessation interventions shows that training had a measurable effect on delivery of interventions.

Other factors influence the dental hygienist’s decision to provide TCS. Dental hygienists may be deterred by an inability to obtain cost reimbursement from dental insurance. However, a significant portion of oral health services is paid for out-of-pocket; therefore the client may be charged directly for tobacco cessation services. The extent to which clients would be prepared to pay for these services has yet to be determined. The dental hygienist–client
Table 5. Efficacy of tobacco cessation services provided by dental hygienists

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Type of service/ –Number of subjects</th>
<th>Quit Rate Tobacco use cessation services</th>
<th>Tobacco use cessation services Control</th>
<th>Reduction Rate Tobacco use cessation services Control</th>
<th>Randomized controlled trial (RCT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macgregor 1996(^74)</td>
<td>Brief 4-6 minutes of advice 98 intervention/38 control dental hospital clients</td>
<td>13.3%</td>
<td>5.3%</td>
<td>80%</td>
<td>29%</td>
</tr>
<tr>
<td>Secker-Walker et al. 1988 (^73)</td>
<td>Brief counselling; printed and reminder postcards 51 private dental clinic</td>
<td>14.6%</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Severson et al. 1998</td>
<td>Extended intervention: brief couns, video &amp; follow-up cal 1,374 private dental clinic clients</td>
<td>2.5%</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Severson et al. 1998 (^7)</td>
<td>Extended intervention: brief counselling, video and follow-up call 633 private dental clinic clients</td>
<td>10.2%</td>
<td>3.3%</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Stevens et al. 1995 (^7)</td>
<td>Brief advice, sel-help booklet and et &amp; kit, video, follow-up call 245 intervention/ 273 control/ 58 pre-intervention* clinic clients</td>
<td>18.4%</td>
<td>12.4%</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Walsh et al. 1999(^77)</td>
<td>Brief intervention by dentist; selfhelp guide; 15 to 20 minutes of counselling; a follow-up call 171 intervention/ 189 control baseball and football team members</td>
<td>35%</td>
<td>16%</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Walsh et al. 2003 (^78)</td>
<td>Oral cancer screening exam; peerled component (video and slides); brief counselling by dhc; self-help guide; 15-minute small group session; follow-up call 516 intervention /566 control baseball athletes</td>
<td>27%</td>
<td>14%</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Smoking cessation services

Spit tobacco cessation services
<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>Follow-Up Call</th>
<th>Quit Rate</th>
<th>Study Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little et al. 1992(^7)</td>
<td>Brief intervention; videotape; self-help manual; quit kit; and follow-up call</td>
<td></td>
<td>32%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>518 male dental HMO clients</td>
</tr>
<tr>
<td>Greene et al. 1994(^8)</td>
<td>Advice to quit and extended intervention; behavioural counselling</td>
<td></td>
<td>19%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>128 major league baseball players</td>
</tr>
</tbody>
</table>

* Pre-intervention subjects received usual care for the first 6 months and then tobacco cessation intervention for the remainder of the project.
**44% of dental hygienists believed they were not knowledgeable enough about smoking cessation to counsel clients on this topic.**

relationship may also be a consideration. Some dental hygienists may be concerned that raising this issue may alienate or offend their clients and some of their younger clients may feel embarrassed discussing this topic. However, this concern may be unwarranted, since as stated earlier in the paper, many clients expect dental hygienists to provide this service.

The service delivery time factor may also be a concern, since there may be a need to work efficiently to achieve a high ratio between billable and non-billable hours. There are two ways in which to minimize the amount of time for delivery of TCS. First, as discussed in the next section, brief tobacco use cessation services do not have to take more than three minutes. Second, TCSs can be incorporated directly into the routine of client services. Tobacco use can be one item on a list of causal factors for poor oral health and can be discussed along with other issues such as high sugar intake and uncontrolled diabetes.

**BRIEF AND INTENSIVE TOBACCO CESSTION INTERVENTIONS**

The United States Public Health Service developed a tobacco use and dependence clinical practice guideline that suggests that counselling and behaviour therapy, including brief and intensive counselling, should be employed with all clients who are using tobacco.

Brief clinical interventions are three-minute interventions, incorporating the “Five A’s” (described below). This intervention has five major steps: ask, advise, assess, assist, and arrange. The dental hygiene clinical setting may be well suited to the brief intervention rather than more intensive counselling, since TCSs are only one of a number of other oral health services delivered by a dental hygienist in a limited amount of time.

The Five A approach is also recommended by a number of other health organizations including the United States National Cancer Institute and the U.S. Agency for Health Care Policy and Research (AHCPR). The approach is recommended in Ontario under the Clinical Tobacco Intervention Program, under the Ontario Medical Association, the Ontario Pharmacists’ Association, and the Ontario Dental Association. For additional information on the “Five A’s,” visit the following website: [www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.View..ShowSection&rid=hs tat2.section.7741](http://www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.View..ShowSection&rid=hs%20tat2.section.7741).

**The Five A’s**

1. **Ask:** Determine tobacco use status and flag the chart of those who are actively using tobacco, to prompt future discussions. Systematic identification and tracking of tobacco using clients is an essential first step.

2. **Advise:** Advice should be clear, strong, and personalized.

   Minimal – The following is an example of one way in which to give advice: “As an oral health professional, I must advise you that tobacco use is detrimental to your oral and overall health and I urge you to stop using tobacco products. I can help you to quit.”
The following is another example of how to provide advice: “As your dental hygienist, I must tell you that the best thing you can do to protect the health of your teeth and gums is to quite smoking. Of course, this will also have a positive impact on your general health.”

Advice the client of their current oral condition, which may be related to tobacco use and teach them how to detect possible future signs or symptoms that they should be looking for. Augmented – educate the client regarding the health benefits of tobacco use cessation.

3. **Assess:**
   - Minimal – ask if client is interested in quitting.
   - Augmented – assess smoking history and patterns.

4. **Assist** client to stop:
   - Minimal – provide self-help materials.
   - Augmented – provide client-centred counselling; offer support and recommend first- or second-line pharmacotherapies

5. **Arrange** a referral.
   - Minimal – to prevent relapse, arrange for a follow up visit or contact by phone, or provide a referral to a tobacco use cessation program/counsellor/phone line. Follow up and referral can be arranged according to the different stages of change discussed below.
   - Augmented – to prevent relapse, arrange quit date and follow up appointments.

Two other integral aspects of the Five A approach include determining the client’s level of addiction and willingness to quit. Level of addiction can be assessed using a simple or more complex method. A simple method may include a tally of the number of cigarettes per day: mild addiction is 1-5 cigarettes per day; moderate addiction, up to 10 cigarettes per day; severe addiction, up to 20 or more cigarettes per day. This may not be as accurate as a more complex method of assessment. A complex method, such as the Fagerström test, consists of questions about the timing of the first cigarette of the day, previous history of withdrawal, and ability to resist the urge when smoking is prohibited.

A willingness to quit can be assessed with a variety of techniques. Prochaska’s transtheoretical model of change is a comprehensive method for assessing willingness to quit. It includes the following concept of stages of “change readiness” or willingness to quit:

- **Precontemplation** – clients who are not ready to quit in the next six months. Remind client that services are available when they are ready to use them.
- **Contemplation** – clients who are ready to stop in the next six months, who have not attempted to stop in the last year. Offer them self-help material, refer them to other health professionals and an opportunity to discuss plans to quit, assistance planning or setting a quit date.
- **Preparation** – clients who are ready to quit in the next month, who have made an attempt in the last year. Offer them self-help material, refer them to other health professionals and an opportunity to discuss plans to quit, assistance planning or setting a quit date.
- **Action** – clients who are making a quit attempt. They can be provided with encouragement and information about relapse. Maintenance – clients who are maintaining their quit attempts. They can be provided with encouragement and information about relapse.
Individuals cycle through these stages and a relapse may be followed by beginning again at the precontemplation stage. The cycle through the stages above may be repeated at least two to three times. The concept of “decisional balance” includes an understanding of the reasons to smoke including pleasure, tension relief, and concentration, and the benefits of quitting including health, embarrassment to smoke, and social pressures to quit. Having self-insight into these reasons allows a person to strengthen the reasons to quit and to find other ways to meet the needs that stimulate their smoking.

The applicability of the central concepts of the transtheoretical model are currently being studied with adolescents. Early findings suggest that adolescents and adults exhibit similar behaviour at different stages of the smoking cessation process. Adolescents, however, may progress through the stages very quickly and enter the action stage prematurely, which makes them poorly prepared for cessation. This may indicate that youth could benefit from a heavier emphasis on the first two stages of change.

RESEARCH EVIDENCE ON TOBACCO USE CESSATION INTERVENTIONS

An evidence-based approach to providing TCS includes an examination of research on different types of tobacco use cessation interventions. The findings from this research can assist in referring clients to appropriate, effective tobacco cessation services. This section provides research evidence on a number of approaches including, brief and intensive clinical intervention, self-help programs, telephone hotlines, quit smoking contests, community programs, exercise, hypnotherapy, and acupuncture.

Three reviews of randomized controlled trials on brief and more intensive clinical intervention show they are an effective method for delivering tobacco use cessation services. The first review found that intensive advice was no more effective than brief counselling. The second review, of 31 randomized controlled trials examining physicians’ smoking cessation advice, found that brief
intervention has a small effect on smoking cessation (odds ratio 1.69, 95% confidence interval 1.45 to 1.98) when brief intervention is compared with no advice or usual care. The review also found that more intensive interventions are marginally more effective than brief interventions (odds ratio 1.44, 95% confidence interval 1.23 to 1.68). The third review of 29 studies shows that clients who received brief tobacco use cessation services from a non-physician or a physician were twice as likely to quit their tobacco use compared with clients who received no TCS.  

Although most of the studies do not generally examine the interactions and synergies across these intervention elements, there is some evidence that combining pharmacotherapy and counselling produces better quit rates than either treatment alone.  

Self-help may be described as structured programming or informational material that encourages tobacco use cessation without intensive contact with a therapist. A systematic review of randomized clinical trials of self-help materials showed that they may increase quit rates compared with no intervention, but the effect is small. This review also showed that self-help materials tailored to the individual as opposed to standard self-help materials are more effective when used alongside other interventions such as advice from a health care professional or nicotine replacement therapy. A randomized clinical trial on the efficacy of computerized self-help material based on the transtheoretical model of change (TMC) found quit rates of 17% to 21%. The 756 volunteers were randomly assigned to one of four different types of self-help interventions. The study also showed that successful smoking cessation took place over an 18-month period of time.

Telephone hotlines can provide information and support to individuals who are trying to quit smoking or who are considering quitting. A systematic review of 23 randomized or quasi-randomized controlled clinical trials found that proactive telephone counselling increases quit rates by 1 and a half times compared with less intensive intervention without personal contact (OR 1.56, 1.38 - 1.77).

Over the past three years, more than 35,000 smokers have entered an Ontario province-wide quit smoking contest. An evaluation of this program shows that 31% of the participants were smoke-free one year after the contest.

Community intervention programs and social marketing use multiple channels to provide reinforcement, norms, and support for not smoking. A review of 32 controlled trials of community intervention in tobacco use showed that the net decline in tobacco use ranged from –1% to 3% in men and women.
There is some evidence that combining pharmacotherapy and counselling produces better quit rates than either treatment alone.

Exercise may assist people to quit smoking, since it may moderate the effects of nicotine withdrawal. A review of eight randomized controlled trials, comparing exercise programs as an adjunct to cessation programs and cessation programs alone, shows that one of the eight trials indicated a significant benefit from an exercise program. However, the other seven randomized controlled trials were too small to conclude that the results were reliable. Therefore further research is required in this area.

Hypnotherapy is thought to assist with smoking cessation by working on the underlying impulses to weaken the desire to smoke and/or increase the desire to stop smoking. However, a review of randomized controlled trials shows that hypnotherapy is not an efficacious treatment, as it does not have a greater effect on quit rates than no intervention or other interventions. A second review of 59 studies indicates similar results.

A systematic review of randomized controlled clinical trials shows that there is no clear evidence that acupuncture, acupressure, laser therapy, or electrostimulation are effective in smoking cessation. More research is needed in this area.

PHARMACOTHERAPY

Numerous effective pharmacotherapies now exist for treating smoking addiction, as an adjunct to counselling. These therapies are divided into two categories, first-line and second-line. First-line pharmacotherapies such as nicotine replacement therapy and the anti-depressant sustained release (SR) bupropion should be recommended initially, as there is substantial evidence of their efficacy and there are fewer side effects than the second-line pharmacotherapies. Second-line pharmacotherapies include clonidine and nortriptyline. Other medications used to treat tobacco addiction include other anti-depressants, anxiolytics, mecamylamine, and silver acetate. “At least one of the first or second line medications should be used with all clients attempting to quit smoking, except in the presence of contraindications.” For further details on pharmacotherapies, please see Appendix A. The U.S. Department of Health and Human Services has a very useful chart that includes a list of pharmacotherapies for smoking cessation, contraindications, side effects, dosage, duration, availability, and cost per day. This can be found at <www.surgeongeneral.gov/tobacco/clinicaluse.pdf>.

CONCLUSIONS

There is compelling evidence that tobacco use has a devastating effect on general health and a significant negative impact on oral health. There is also clear evidence that dental hygienists can successfully assist individuals to quit tobacco use. In addition, the majority of oral health clients expect dental hygienists to provide TCS. When these three pieces of information on health impact, efficacy of dental hygiene service provision, and public expectations are considered together, the
logical conclusion is that dental hygienists must play an important role in tobacco cessation. However, both cancer screening and tobacco use cessation services are underutilized by dental hygienists. Thus there is a wide opportunity for change in this area. Dental hygienists can provide these services in numerous practice settings, where they are in uniquely effective settings to potentially reduce the morbidity and mortality of tobacco-related disease.

In the best interests of the public, the dental hygienist should become a member of the interdisciplinary team that is currently addressing tobacco use. Dental hygienists can collaborate with a variety of other health professionals in delivering a consistent message about tobacco cessation. This will strengthen the health system capacity for tobacco reduction. The future role of dental hygienists in tobacco use cessation is very clear. It is time to make tobacco use cessation and prevention services an integral part of oral health services.
Appendix A. PHARMACOTHERAPY

Nicotine Replacement Therapy

Nicotine replacement therapy (NRT) is the most widely used pharmacotherapy for treating tobacco addiction.¹⁰¹ NRT replaces nicotine from tobacco, reducing nicotine withdrawal symptoms and the urge to smoke thus making it easier to quit smoking. NRT is available in Canada in both prescription and non-prescription form. The nonprescription NRT is available in as a transdermal patch, chewing gum, and an oral inhaler. The prescription NRT is available in lozenge form. Health Canada is currently consulting the public regarding their proposal to make the NRT lozenge, with 4 mg or less of nicotine, available in non-prescription form. In several other countries, nasal spray and tablets are also available.

A review of 108 randomized controlled trials¹⁰² found that all forms of commercially available NRT are effective for smoking cessation and that they increase quit rates by 1.5- to 2-fold, independent of the additional support provided to the client. A consensus statement published by the World Health Organization recommends that NRT should be recommended to smokers with stable cardiovascular disease who have tried to quit and failed without such help.¹⁰³ This consensus statement also suggests that regulators change the wording on the NRT labels to allow smokers to continue use after the recommended treatment period if they feel that it would result in long-term tobacco use cessation, since the potential risks of long-term use are far less than the risks of smoking. The Ontario Medical Association position statement on smoking cessation medications is in keeping with these two recommendations. This document states that “nicotine patch and gum should be used for as long as needed to maintain or prolong tobacco abstinence” and “given the seriousness of their medical condition, cardiac patients who cannot quit should be among those first considered for NRT.”¹⁰³
There is some evidence that pharmacotherapy agents have not been proven successful for spit tobacco users and there are mixed reviews on the use of NRT this type of tobacco use.

Specifically, studies with nicotine gum and nicotine patch found a lack of efficacy. In addition, a review of randomized controlled trials on nicotine replacement therapy found a very low impact on spit tobacco use, with an odds ratio of 1.3; 95% CI, 1.0-1.6. More research is needed in this area.

Antidepressants (Non-Nicotine Agents) and Anxiolytics

There are two possible reasons why anxiolytics and antidepressants may help in smoking cessation. First, anxiety and depression may be a symptom of nicotine withdrawal and these drugs help to reduce these symptoms. However, there is some evidence that the efficacy of bupropion is not due to its anti-depressant effects. Second, smoking may be due to deficits in norepinephrine, dopamine, and serotonin, all of which are increased by anxiolytics and antidepressants.

Some common antidepressant drugs include bupropion (marketed as Zyban for smoking cessation), doxepin, fluoxetine, imipramine, moclobemide, nortriptyline, selegiline, sertraline, tryptophan, and venlafaxine. A systematic review of eight randomized controlled trials found that the antidepressants bupropion and nortriptyline can aid in smoking cessation; however, nortriptyline has more side effects than bupropion. There is also some preliminary evidence from one randomized clinical trial that bupropion is more effective than nicotine replacement therapy (NRT), either alone or in combination with NRT. The combination of the two drugs, bupropion and NRT, increases effectiveness. However, the initial “quit rate” is usually less than 50%.

A meta-analysis of randomized controlled trials using bupropion sustained-release (SR) to treat spit tobacco use showed an odds ratio of 2.1; 95% confidence interval (CI), 1.0-4.2. The following are some examples of anxiolytics: buspirone, diazepam, doxepin, meprobamate, ondansetron, and beta-blocker’s such as metoprolol, oxprenolol, and propanolol. A systematic review of six randomized controlled clinical trials using anxiolytics showed that there is no consistent evidence that anxiolytics aid in smoking cessation, but the evidence does not rule out a possible effect. More research is needed in this area.

Mecamylamine

Mecamylamine is a nicotine antagonist that works by blocking the rewarding effect of nicotine and reducing the urge to smoke. A systematic review of two randomized controlled trials that looked at the effects of mecamylamine on smoking cessation found that nicotine patch combined with mecamylamine is more effective than nicotine patch alone. However, the studies were small and further research is needed before a clinical protocol is recommended.

Clonidine

Clonidine was initially used to lower blood pressure and there is some evidence that it may decrease withdrawal symptoms in clients with multiple drug addictions who also use tobacco; however, important side effects limit its usefulness. It is considered a second-line pharmacotherapy for tobacco use.

Silver Acetate

Silver acetate produces an aversion stimulus, since it produces an unpleasant taste when combined with smoking. Commercially available silver acetate comes in gum, lozenge, and spray form. A systematic review of randomized controlled trials studying the effects of silver acetate concludes that it has little effect on smoking cessation (odds ratio 1.05, 95% confidence interval 0.63 to 1.73).
Appendix  B. RESOURCES

- Action on Smoking and Health – This UK public health charity aims to “achieve a sharp reduction and eventual elimination of the health problems caused by tobacco.” Its website offers data and fact sheets on tobacco’s effects on body systems; tobacco’s impact on less-developed countries; environmental smoke and tobacco in the workplace; and insights into the economics of smoking. The “quitting smoking” section has a fact sheet on nicotine and addiction, tips for quitting and what to expect in the process, e-mail counseling, case studies of successful quitters, and links to smoking-cessation sites. www.ash.org.uk
- Alberta Alcohol and Drug Abuse Commission
www.zoot2.com/justthefacts/tobacco/who_smokes.asp
- Allen Carr’s Easy Way to Stop Smoking
www.allencarrseasyway.ca
- America Lung Association
www.lungusa.org/tobacco/index.html
- American Academy of Periodontology
www.perio.org/consumer/stop-smoking.htm
- B.C. Cancer Agency, Clinical Tobacco Intervention for Dental Hygienists
www.bccancer.bc.ca/HPI/CME/CTIRP/Dental+Hygienists/
- California Dental Association – Smokeless tobacco
www.cda.org/public/cch5fs.html
- Campaign for Tobacco Free Kids
http://tobaccofreekids.org/
- Canadian Cancer Society
www.cancer.ca/ccs/internet/cancer/0,,3172,00.html
Toll-free cancer information service (1-888-939-3333)
- Canadian Cancer Statistics
www.cancer.ca/ccs/internet/standard/0,,3543_12851__langId-en,00.html
- Canadian Lung Association www.lung.ca
- Centres for Disease Control and Prevention, Office on Smoking and Health, Tobacco Prevention and Information Source (TIPS) www.cdc.gov/tobacco/
- The dental hygienist’s role in tobacco use prevention and cessation [audiocassette + study guide]
- Getting Rid of An Old Flame: A tobacco use cessation program for the dental team. Available from the CDHA library
- Health Canada www.hc-sc.gc.ca/hecs-sesc/tobacco/
- Health Canada: Canadian Tobacco Use Monitoring Survey
www.hc-sc.gc.ca/hecs-sesc/tobacco/research/ctums/index.html#cha

Source: CANADIAN JOURNAL OR DENTAL HYGIENE (CJDH) NOVEMBER-DECEMBER 2004, VOL. 38, NO.6
Dentistry’s Role in Tobacco Control

Source: The Journal of the American Dental Association (November 2001) 132, 30S-35S

1. SCOTT L. TOMAR D.M.D Dr.PH

Abstract

Background. Cigarette smoking remains the nation's leading preventable cause of premature mortality. Tobacco use also is responsible for 75 percent of deaths resulting from oral and pharyngeal cancer, more than one-half of the cases of periodontitis and numerous other oral health effects.

Methods. The author summarized the prevalence of tobacco use in the United States, evaluated recent literature on the status of tobacco control activities in dental schools and dental practice, and reviewed new guidelines on clinical and community-based interventions for tobacco use.

Results. Nearly 25 percent of adults and 35 percent of high-school students smoke cigarettes, and many use other forms of tobacco. More than one-half of adult smokers and nearly three-fourths of adolescents see a dentist each year. However, more than 40 percent of dentists do not routinely ask about tobacco use, and 60 percent do not routinely advise tobacco users to quit. Meanwhile, less than one-half of dental schools and dental hygiene programs provide clinical tobacco intervention services.

Conclusions. At least 50 dental organizations have adopted policy statements about tobacco use, but much work needs to be done in translating those policy statements into action. Tobacco use remains prevalent in the United States, and dentistry has not yet maximized its efforts to reduce it.

Practice Implications. The recently issued U.S. Public Health Service guidelines on treating tobacco use and dependence provides evidence-based, practical methods for dentists and other primary care providers to incorporate into their practice. Because dentists and dental hygienists can be effective in treating tobacco use and dependence, the identification, documentation and treatment of every tobacco user they see need to become a routine practice in every dental office and clinic.

Use of tobacco has a devastating effect on the health and well-being of the public. More than 400,000 Americans die each year as a direct result of cigarette smoking, making it the nation’s leading preventable cause of premature mortality. The direct medical care costs for smoking-attributable disease in this country exceeds $72 billion per year. Worldwide, the picture is even more bleak; with current smoking patterns, about 500 million people alive today will eventually be killed by tobacco use. By 2030, tobacco is expected to be the single biggest cause of death worldwide, accounting for about 10 million deaths per year. One-half of these deaths will occur among people 35 to 69 years of age, losing an average of 20 to 25 years of life.
Dental schools need to incorporate into their curricula not just didactic instruction on the oral health impact of tobacco use, but practical training in clinical intervention.

The effects of tobacco use on the public’s oral health also are alarming. All forms of tobacco—including cigarettes, cigars, pipes and smokeless tobacco—have been established as causal for oral and pharyngeal cancer and are responsible for more than 75 percent of deaths caused by these malignancies in the United States. The evidence is sufficient to consider smoking a causal factor for adult periodontitis, and one-half of the cases in this country may be attributable to cigarette smoking. Tobacco use substantially worsens the prognosis of periodontal therapy and dental implants, impairs oral wound healing and increases the risk of the patient’s experiencing a wide range of oral soft tissue changes.¹

Unfortunately, tobacco use remains highly prevalent in the United States. Nearly one in four adults smoke cigarettes,⁸ and almost 10 percent of men smoked at least one cigar in the past month. Among high-school students in 1999, nearly 35 percent overall said they smoked cigarettes, more than 25 percent of boys and 10 percent of girls said they smoked cigars, and more than 14 percent of boys in high school said they used snuff or chewing tobacco.¹⁰

These statistics provide a compelling case for a concerted effort by organized dentistry and individual dentists to help reduce tobacco consumption. There is some evidence that dentistry is moving in that direction; at least 50 dental organizations have adopted policy statements about tobacco use. But much work needs to be done to translate those policy statements into action. The American Dental Association’s 1997 Survey of Current Issues in Dentistry: Tobacco Use Cessation Efforts Among Dentists reported¹¹ that more than four of 10 dentists do not routinely ask about tobacco use (which was virtually unchanged from 1994), and six of 10 dentists do not routinely advise tobacco users to quit. Disappointingly, just 24 percent of smokers who had seen a dentist in the past year reported that their dentist had advised them to quit, and only 18 percent of smokeless tobacco users reported that their dentist ever had advised them to quit¹². Slightly more than one-half of dental schools include didactic training in counseling tobacco users to quit, and less than one-half of dental schools and dental hygiene programs provide clinical tobacco intervention services to any significant extent. As many as²⁵ percent of dental schools use health history forms that do not even ask about tobacco use, and another 25 percent ask about it with just a single question.

The quit strategies are designed to be brief, requiring three minutes or less of direct clinician time.

**OPPORTUNITIES FOR CHANGE**

The dental office provides an excellent venue for providing tobacco intervention services, as more than one-half of adult smokers and nearly three-fourths of all adolescents see a dentist each year¹²,¹⁶. Dental patients are particularly receptive to health messages at periodic checkups, and oral effects of tobacco use provide visible evidence and a strong motivation for tobacco users to quit. The recently issued U.S. Public Health Service, or PHS, guidelines on treating tobacco use and dependence provide evidence-based, practical methods for dentists and other primary care providers to incorporate into their practices.¹⁷ Because dentists and dental hygienists can be effective in treating tobacco use and dependence, the identification, documentation and treatment of every tobacco user they see need to become a routine practice in every dental office and clinic. Tobacco intervention must be viewed as an integral part of quality dental care.
Many tobacco users visit a dental office every year, so it is important that dentists and dental hygienists be prepared to intervene with those who are willing to quit. The five major steps (the “5 As”) to intervention in the primary care setting are listed in Table 1. It is important for the dental care provider to ask the patient if he or she uses tobacco, advise him or her to quit, assess willingness to make a quit attempt, assist the patient in making a quit attempt and arrange for follow-up contacts to prevent relapse. The strategies are designed to be brief, requiring three minutes or less of direct clinician time. Office systems that institutionalize tobacco use assessment and intervention will greatly foster the adoption of these strategies.

**STRATEGIES FOR HELPING PATIENTS QUIT USING TOBACCO.**

The first step in the process is to identify patients who use tobacco and to characterize their patterns of consumption and tobacco use history. An officewide system should be implemented to ensure that tobacco-use status is queried and documented at every patient visit. In a clear, strong and personalized manner, dental care providers should urge every tobacco user to quit. Dentists and dental hygienists should assist their patients who want to quit using tobacco by helping them with a quit plan, providing practical counseling, offering social support, helping them identify external sources of social support, and recommending or prescribing the use of nicotine replacement therapy or bupropion SR (sustained-release bupropion). Bupropion SR is the first nonnicotine medication shown to be effective for smoking cessation and approved by the U.S. Food and Drug Administration for that purpose.

For patients who use tobacco but are not ready to make a quit attempt, dental professionals should provide a brief intervention designed to promote the motivation to quit. Patients unwilling to make a quit attempt may lack information about tobacco’s harmful effects, may lack adequate financial resources, may have fears or concerns about quitting or may be demoralized by previous relapses. These patients may respond to a motivational intervention built around the “5 Rs”: relevance, risks, rewards, roadblocks and repetition (Table 2U). Dental professionals can encourage their patients to identify reasons why quitting is personally relevant. Patients can be educated on the oral health risks of tobacco use, and dental care providers often can point out clinical changes in patients’ mouths. Dentists and dental hygienists can highlight rewards that patients can experience from quitting and can help the patient identify roadblocks to quitting. For a detailed description of the components of an effective tobacco intervention treatment plan and a review of the evidence supporting those recommendations, readers should consult the U.S. PHS guidelines.17
THE “5 Rs” OF ENHANCING MOTIVATION TO QUIT TOBACCO USE

Relative to other reimbursed treatments, treatment of tobacco use and dependence is a highly cost-effective intervention, and dentists should be fairly compensated for this service. Organized dentistry needs to take an active role in promoting reimbursement by dental care plans to dentists for tobacco-dependence treatments.

In addition to helping current users quit, dental offices may provide an excellent setting for delivering tobacco prevention messages to young people. Adolescents substantially underestimate their personal risk of disease or death from the use of tobacco, and overestimate the ease of quitting. Health care providers can play an important role in educating their patients (including nonusers) on the risks of using tobacco. One unique aspect of dentistry is that some of the adverse health effects of tobacco use are clinically apparent in the oral cavity in even relatively early stages of use. Oral manifestations can help personalize the interventions and increase their effectiveness, particularly among young users in the early stages of tobacco initiation.

To help achieve individual behavioral change, whole communities must change the way tobacco products are marketed, sold and used. At the community level, local dental societies and dentists can become involved in local tobacco control coalitions, which function to mobilize and empower the community to make the changes that support nonuse of tobacco. Community-based programs have included activities such as educating the public on the health hazards of environmental tobacco smoke, promoting smoke-free restaurants, and encouraging policies and programs that support prevention and cessation of tobacco use.

Dental schools need to incorporate into their curricula not just didactic instruction on the oral health impact of tobacco use, but practical training in clinical intervention (for example, role-playing discussions between dentists and patients). The next generation of dentists and dental hygienists should graduate with competency in assessing and treating tobacco use.

CONCLUSION

We are at a unique point in time in the history of attempting to reduce tobacco use. There is potentially more money available than ever for the full range of tobacco control activities, and the majority of Americans favor reduction of societal tobacco use and decreased exposure to environmental tobacco smoke. A great deal has been learned about what is effective in communities and clinical settings. The few states that have implemented comprehensive tobacco control programs have seen significant reductions in the prevalence of smoking, particularly among young people.

Dental practice in the 21st century will increasingly move from a restorative orientation to one of broader promotion of health and well-being. It is unconscionable to not include aggressive tobacco intervention in that new paradigm. To paraphrase the Massachusetts Tobacco Control Program, it’s time we made tobacco history.
Footnotes

Dr. Tomar is an associate professor, University of Florida College of Dentistry, Division of Public Health Services and Research, 1600 S.W. Archer Road, P.O. Box 100404, Room D8 38, Gainesville, Fla. 32610, e-mail “stomar@dental.ufl.edu”. Address reprint requests to Dr. Tomar. © 2001 American Dental Association

References


INSTRUCTIONS TO
PATIENTS/ TOBACCO USERS

Focus: NRT Chewing Gum at NRT Clinical Service.

Guideline Protocol

NRT Clinic and Addiction Research Unit,
Department of Oral Biology & Genomic Studies,
AB Shetty Memorial Institute of Dental Sciences, Nitte University

[In compliance with NHS Stop Smoking, ASH and NICE, DoH, UK]
**Quitting for first-time: one to one approach**

[28 DAYS PLAN OF QUITTING SMOKING – generic regimen]

**FIRST WEEK**: In 72 hours, the nicotine of your cigarette will completely go.

Day 1 : Start a smoke-free day for you

Day 2-3: Craving are at worst for first couple of days

Day 4 : You may chew gum, drink water, and eat fruits or snacks if you are hungry

Day 5 : You may need coughing to relive your lung

Day 6 : You will feel that your taste has been improved a lot

Day 7 : You are smoke-free. You hardest part is over

**SECOND WEEK**: Stay non-smoking an encourge yourself

Day 8 : Get some fresh air and exercise if you have trouble with sleep

Day 9-14 : You are doing better: You are smoke-free for 2 weeks

**WEEK 3 & 4**: Reinforce your will-pwer and decided activities over the week whilst staying smoke-free

The Day 1 stop smoking should be between day 8 and day 14

“Therefore, the day 1 stop smoking will be________________
Content of intervention (Generic)

1. **MOTIVATION**: Reinforcement of motivation to quit

2. **QUIT DATE**: Set a quit date

3. **ASSESSMENT**: Assessment of nicotine dependence and providing appropriate feedback to the Clint (smokers)

4. **COMPREHENSIVE ADVICE**: Discussion with the client regarding suitable anti-smoking drug and its method of administration

5. **COPING STRATEGY**: It will need to develop a strategy for coping with adverse condition whilst on replacement therapy

6. **WITHDRAWL SYMPTOM**: You need to inform the client about the withdrawal symptoms and its management

7. **CARCON MONO-OXIDE (CO) CHECKS**: You have to offer carbon mono-oxide (CO) checks at a regular interval as a method of assessment and feedback

8. **ONGOING MONITORING**: You need to monitor the overall condition of your client over the period of stop tobacco regimen.

9. **TROUBLESHOOTING**: You need to consult with physician about any medical problem and side-effect of anti-smoking drugs

10. **CO-VARIFICATION**: The CO will be verified on 4th Week of the quitting of smoking from the data of smoking

11. **REVIEW OF PLAN**: At the end of the treatment, a strict follow-up schedule the clients will be establishment. Any consequence of pharmaconotherapy will be properly monitored upon consultation with a physician.

12. **ASSESSMENT OF CLIENT’S SATISFACTION**: You need to assess the level of satisfaction of your client and needful intervention will be provided.
Further information

Smoking situation int’l : http://www.ash.org.uk/information/international


Detail info from ASH : http://www.ash.org.uk/information

Stop tobacco helplines NHS : http://smokefree.nhs.uk/why-quit/

P.S. Various NRT products and route of administration: Detail is with National Institute of Health and Clinical Excellence (NICE) Behavioural and social management of stop-tobacco: Available with Dept Oral Biology & Genomics of ABMIDS, NITTE University NRT Clinical Service and Addiction Research Unit

Reviewed & Adopted by

Chitta Choudhury, Professor and Director int’l Centre for Tropical Oral Health, Poole NHS (during 2002-6)
Bournemouth Nuffield Hospital GCDHTF King’s College London UK  |  NICE stakeholder
ST control for SE Asian Population | Nov 2011
Appendix

- Varinicline (Champix): Prescribing Guidance
- About Varencicline (Champix)
- Nicotine Chewing Gum
- Effect of Tobacco Smoking Withdrawal on Medicine Explained
- Smokerlyzer Chart, The Safe and Hygienic Use of Smokerlyzer
- Spirometry- A Simple Breathing Test (Lung Association of Canada)
- Sum-up for Quick Assessment

[At NRT Clinical & Addiction Research Unit of ABSMIDS, Nitte University, Mangalore, India]
The Use of Nicotine Replacement Therapies

It is vital that NRT product are used correctly and at an effective dosage. Using too little, especially at the start, can lead to early relapse.

<table>
<thead>
<tr>
<th>Product</th>
<th>Technique</th>
<th>Dosage</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Cautions</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal Spray</td>
<td>Prime the spray before first use or if not used for 2-3 days: press the shoulders of the spray appears. Keeping the head level, gently tilt the spray and insert the nozzle into the nostril. Press the shoulders of the bottle to activate the spray.</td>
<td>1-dose: 1 spary into each nostril. 1-2 doses/hr, no more than 3 doses/hr Max 64 sprays (32 doses) in 24 hours Treat for 3 mths before weaning off for 6-8 week. Treatment beyond 6 mths not recommended</td>
<td>Very fast acting mics that of cigarettes</td>
<td>Sneezing and watering eyes. Throat irritation. Allergic reactions</td>
<td>Peptic ulcer Chronic nasal disorders</td>
<td>For heavily dependent smokers</td>
</tr>
<tr>
<td>Microtabs</td>
<td>Place the tablet under the tongue and allow to dissolve slowly. Do not chew or swallow. Avoid acidic drinks for 15 mins before use.</td>
<td>1. tab/hr if less dependent (-20 cigs/day). 2. tabs/hr if more dependent (+20 cig/day) Ave daily dose: 8-12 tabs (low dependency) 16-24 tabs (high dependency) Max 40 Tabs/day Full dosage for 2mth then gradually reduce dosage. Stop when using 1-2 tabs/day. Treatment beyond 120 mths not recommended</td>
<td>Fast acting Oral stimulation Direct Good control</td>
<td>Hicups Mouth and throat irritation Cough Nausea Dyspepsia</td>
<td>Gastric or peptic ulcer</td>
<td>For light to moderate smokers and those reducing from a high strength product</td>
</tr>
<tr>
<td>Lozenges</td>
<td>Suck one lozenge until the taste becomes. Park the lozenge between.</td>
<td>1 Lozenge every 1-2 hrs Average se: 8-12 lozengus Full dosage for 3 mths then gradually reduce the dosage. Stop</td>
<td>Fast acting</td>
<td>Hicups Mouth and throat irritation</td>
<td>Gastric or peptic ulcer</td>
<td>For light to moderate smokers and</td>
</tr>
</tbody>
</table>
The Use of Nicotine Replacement Therapies

It is vital that NRT product are used correctly and at an effective dosage. Using too little, especially at the start, can lead to early relapse.

<table>
<thead>
<tr>
<th>Product</th>
<th>Technique</th>
<th>Dosage</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Cautions</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gum</td>
<td>Start chewing slowly-around 15 chews are needed for initial release of nicotine. When you feel tingling sensation or the gum becomes strong park the gum between the cheek and teeth. When the tingle or taste has almost gone start chewing again. Chew each place for 20-30 mins. Avoid acidic drinks for 15 mins before and during chewing.</td>
<td>2mg gum if less dependent (-20cigs/day) 4mg gum if more dependent (+20 cig/day) initially use an average of 1pc of gum per waking hr (12-15 pcs/day) Full dosage for 3 mths then gradually taper off . Stop when when down to 1-2 pcs/day Treatment beyond 12mth not recommended.</td>
<td>Fast acting Oral stimulation Good control</td>
<td>Hicups Mouth and throat irritation Cough Nausea Dyspepsia</td>
<td>Gastric or petic ulcer</td>
<td>For light to moderate smokers and those reducing from a high strength product</td>
</tr>
<tr>
<td></td>
<td>when reduced to 1-2 lozenges/day Treatment beyond 6 mths not recommended</td>
<td>Cough Nausea Dyspepsia</td>
<td>Sneezing and watering eyes. Throat irritation. Allergic reactions</td>
<td></td>
<td></td>
<td>those reducing from a higher a higher strength product</td>
</tr>
</tbody>
</table>
The Use of Nicotine Replacement Therapies

It is vital that NRT product are used correctly and at an effective dosage. Using too little, especially at the start, can lead to early relapse.

<table>
<thead>
<tr>
<th>Product</th>
<th>Technique</th>
<th>Dosage</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Cautions</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalator</td>
<td>Pull the two parts of the mouthpiece apart, insert a cartridge and re-assemble the mouthpiece. This breaks the cartridge inhale through the mouthplace-shallow puffing or deep inhalations are equally effective. The number, frequency and duration of inhalation will depend on the individual and their previous smoking.</td>
<td>6-12 cartridge daily to start Reduce daily dosage gradually over 6-8 weeks Treatment beyond 6 months not recommended</td>
<td>Fast acting Oral stimulation Hand to mouth activity</td>
<td>Heartburn Nausea Cough Mouth and throat irritation</td>
<td>Peptic ulcer For smoker who miss the ritual of smoking</td>
<td></td>
</tr>
<tr>
<td>16 hour patches</td>
<td>Apply to clean dry intact areas of hairless skin on the hip or upper arm. Using a different site every day. Reapply a new patch every day (usually in the morning) ad remove patch at night after approx 16 hrs wear Dispose of patch by holding in half with the gummed edges innermost and wrap in the original foil pack or a piece of kitchen foil. Exercise may increase absorption of nicotine and therefore side effects.</td>
<td>Never start on the lowest strength High strength patch for 8 weeks Mid strength patch for 2 weeks Low strength patch for 2 weeks Review after 3 months and consider a further treatment period if abstinence not achieved but motivation is still strong Treatment beyond 12mth not recommended.</td>
<td>Once daily application Discreet</td>
<td>Relatively slow acting Erythema and itching Adhesives can cause allergies</td>
<td>Chronic skin condition For those who smoke regularly through the day</td>
<td></td>
</tr>
</tbody>
</table>
## The Use of Nicotine Replacement Therapies

It is vital that NRT product are used correctly and at an effective dosage. Using too little, especially at the start, can lead to early relapse.

<table>
<thead>
<tr>
<th>Product</th>
<th>Technique</th>
<th>Dosage</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Cautions</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hour patches</td>
<td>Remove mental backing, out on the skin and hold in place with the palm of the hand for 10-20 seconds. Apply to clean dry intact areas of hairless skin on the hip or upper arm. Using a different site every day. Reapply a new patch every day. Dispose of patch by holding in half with the gummed edges innermost and wrap in the original foil pack or a piece of kitchen foil. Exercise may increase absorption of nicotine and therefore side effects.</td>
<td>High dependence (+20 cigs/day) High strength patch for 2-4 weeks Mid strength patch for 3-4 weeks Low strength patch for 3-4 weeks Low dependence (-20 cigs/day) Mid strength patch for 3-4 weeks Low strength patch for 3-4 weeks</td>
<td>Once daily application Discreet 24-hour cover (no breakthroug h craving)</td>
<td>Nightmares sleep disturbance Relatively slow acting Erythema and itching Adhesives can cause allergies Chronic skin condition</td>
<td>For regular smokers who light up within 20 minutes of waking.</td>
<td></td>
</tr>
</tbody>
</table>
VARENICLINE (CHAMPIX ) FOR SMOKING CESSATION

Source: Bournemouth and Poole NHS Community Health Service

Please note that the General Physician/ Stop Smoking Advisor can prescribe or recommend Bupropion ((Zyban(R). The Patient should still be referred to the stop smoking support service if Bupropion is prescribed by the GP.
Contra-indicated patient, Pregnancy, Breastfeeding, Under 18 yrs old, or have a Hypersensitivity to Varenicline

Is Champix the most appropriate?

- Yes, with Caution
  - Yes, with Caution
  - No

Champix is unsuitable
Consider use of another NRT

Caution to be taken if patient has epilepsy psychiatric condition or renal impairment

Risk V Benefit

Prescribe with caution

Consider alternative NRT

Days 1-3
0.5mg once a day for 3 days, (pack = 1 x Starter pack containing 11x0.5mg varenicline titrate tabs) then;
Days 4-7
0.5mg twice a day for 7 Days
(Pack = 14x 1mg Varenicline titrate tabs).
In smoking cessation therapy, risk for relapse to smoking is elevated in the period immediately following the end of treatment. In patients with a high risk of relapse, dose tapering may be considered

Note 1. As smoking induces CYP1A2*, smoking cessation may alter the pharmacodynamics of some drug (e.g. theophylline, warfarin, insulin and clozapine).

Note 2. Smoking cessation with or without pharmacotherapy has been associated with exacerbation of underlying psychiatric illness (e.g. depression)

Note 3. No clinically significant interaction have yet been found. Does not inhibit cytochrome enzyme P450*. Mostly excreted as unchanged drug in urine.

*Cytochrome Enzyme

If you want to stop smoking, taking varenicline (trade name Champix®) is likely to more than double your chance of success
A brief overview of smoking and nicotine addiction

Nicotine is a drug that is inhaled from the tobacco in cigarettes. It gets into the bloodstream, and stimulates the brain. Most regular smokers are addicted to nicotine.

If you are a smoker, when the blood level of nicotine falls, you usually develop withdrawal symptoms such as restlessness, increased appetite, inability to concentrate, irritability, dizziness, constipation, nicotine craving, or just feeling awful. These symptoms begin within a few hours after having the last cigarette. If they are not relieved by the next cigarette, withdrawal symptoms get worse. If you do not smoke any more cigarettes, the withdrawal symptoms peak after about 24 hours, and then gradually ease over about 2-4 weeks. So, most smokers smoke regularly to prevent withdrawal symptoms.

About 2 in 3 smokers want to stop smoking but, without help, many fail to succeed. The main reason why so few smokers succeed, even though they want to stop smoking, is because nicotine addiction is strong and difficult to break. This is where varenicline can help.

What is varenicline and how does it work?

Varenicline (trade name Champix®) is a medicine that was first licensed in the UK in December 2006. It was developed to help smokers to stop smoking. Varenicline mimics the effect of nicotine on the body. Therefore, it both reduces the urge to smoke and relieves withdrawal symptoms.

The precise action of varenicline is that it interferes with the receptors in the brain that nicotine stimulates. (The nicotine in cigarettes attaches to receptors in brain cells to stimulate part of the brain - this is how nicotine has its effect.) What varenicline does is to partly stimulate the nicotine receptors. This mimics the effects of nicotine, to reduce cravings and withdrawal effects when you stop smoking. However, at the same time, it partially blocks the receptors and prevents nicotine from attaching to the receptors. This blocks or blunts the effect of nicotine in people who give in to temptation and have a cigarette.

How effective is varenicline?

Varenicline does increase the chance of quitting smoking. Some studies have looked at this issue. The studies compared varenicline to a dummy (placebo) tablet in people who were keen to stop smoking. The results from the studies showed that, on average, about 21 in 100 people who took varenicline successfully stopped smoking. This compared to about 8 in 100 who took the dummy (placebo) tablets. In other words, taking varenicline more than doubled the rate of success.
How do I take varenicline?

Varenicline does not make you stop smoking. You still need determination to succeed, and to break the smoking habit. A combination of varenicline with counselling from a nurse, doctor, pharmacist, or other health professional is likely to increase your chance of successfully stopping smoking. Therefore, most doctors will only prescribe varenicline to people who really want to stop smoking as part of a stopping smoking programme.

- You need a prescription to obtain varenicline - you cannot buy it at pharmacies.
- Decide on a quit date - the date you intend to stop smoking.
- Start taking the tablets one week before the quit date. The aim is to build up the dose so your body gets used to the medicine before the quit date. The usual advice is to start with 0.5 mg daily for the first three days. Then 0.5 mg twice daily on days four to seven. Then, 1 mg twice daily for 11 weeks.
- Take each dose with a full glass of water, preferably after eating. So, ideally, after breakfast, and after your evening meal.
- Tell your doctor if you develop any side-effects. A reduction in dose may be an option if the side-effect is not serious.

The usual course of treatment is for 12 weeks. If you have successfully stopped smoking by this time:

- In many cases, treatment is stopped and that is it. You are a non-smoker!
- In some cases, an additional 12 weeks of treatment may be advised. You can discuss this with your doctor. It may be useful for people who are not confident off the cigarettes.
- In some cases, a short tapering off of the dose over a week or so may be helpful. This is because at the end of treatment, if the medicine is stopped abruptly, in about 3 in 100 people there is an increase in irritability, an urge to smoke, depression, and/or sleeping difficulty for a short time. These problems can be eased by a gradual reduction of dose.
- If you have not succeeded in quitting after 12 weeks there is no point in continuing with treatment at this time. Perhaps it is best to discuss things with your doctor as to your future options.

Are there any possible side-effects?

Most people who take varenicline do not develop any side-effects, or they are only minor. However, it is strongly advised that you read the information that comes with the medicine for a full list of possible side-effects and cautions. The following highlights the most common and the most potentially serious side-effects.

Common but not usually serious side-effects

The most commonly reported side-effect is nausea (feeling sick). This is often mild and tolerable. Nausea is thought to be less of a problem if you take the tablets just after a meal with a full glass of water. Some other reported side-effects that occur in some people include: insomnia (difficulty sleeping), abnormal dreams, headaches and flatulence (wind). Taking the evening dose after your evening meal, and not just before bedtime, is thought to reduce any sleep-related side-effects.
A possible increase in the risk of heart problems

In June 2011 the US Food and Drug Administration (FDA) posted a warning that varenicline may increase the risk of heart complications (such as a heart attack) in people who have existing cardiovascular disease. (Cardiovascular disease means diseases of the heart or blood vessels, such as angina or peripheral vascular disease.) The warning was based on a research study that followed 700 smokers with cardiovascular disease who were treated with varenicline or placebo (dummy tablets). The results of the study confirmed that varenicline was effective in helping people to quit smoking. Also, that adverse cardiovascular events such as heart attack were uncommon overall. But, certain cardiovascular events, including heart attack, occurred slightly more frequently in people who took varenicline compared with those treated with placebo.

However, the increased risk of cardiovascular events was not statistically significant. (That is, the small increased number of cardiovascular events could have happened by chance.) Therefore, the FDA has said it will continue to monitor the situation and has asked the manufacturer to provide more information on the data they hold. In the meantime, they advise people who take varenicline to report to their doctor any new or worsening symptoms of cardiovascular disease. For example: shortness of breath or trouble breathing; new or worsening chest pain; new or worse pain in the legs when walking.

A possible increase in mood and behavioural changes

Since it has been introduced, there have been various reports of a possible link between varenicline and behavioural or mood changes. The suspected symptoms include hostility, agitation, depressed mood, suicidal thoughts and attempted suicide. There is no proof that these symptoms are any more common in people taking varenicline compared with the general population. Also, a study published in 2009 was reassuring in that it didn't find any link between varenicline and depression or suicidal thoughts. However, it concluded that a small increased risk of self harm with varenicline could not be definitely ruled out. So, to play safe, if you take varenicline, you should get in touch with your doctor if you experience any behavioural or mood changes.

Who should not take varenicline?

Varenicline is generally thought to be a safe medicine for most people. However, it is a relatively new medicine and so caution is used in certain people. For example, it is not licensed to be used in people who are pregnant or breast-feeding, those under the age of 18, and those with severe kidney failure. It may also be used with more caution in people who have certain conditions, such as certain mental health disorders. Also, the possible concerns about heart problems and mood and behaviour are discussed above. Your doctor or practice nurse will advise if you are suitable for this medicine.
Further help and information

The manufacturer's information on varenicline
Web: http://emc.medicines.org.uk/ingredient/2242/varenicline+tartrate/
Provides detailed information about varenicline as supplied by the manufacturer of the medicine.
Includes the Summary of Product Characteristics and the Patient Information Leaflet (PIL) that comes with each packet of varenicline.
Quit A charity that helps people to stop smoking.  www.quit.org.uk

Smokefree- from the NHS
Free smoking Help  www.smokefre.nhs.uk
For advice on stoping smoking, and for details of your local NHS stop Smoking Service.

Reference
- ASH Guideline; Varencline- Guidance for health professionals on a new prescription-only stop smoking medication (2007)
- Cahill K, Stead LF, Lancaster T; Nicotine receptor partial agonist for smoking cessation, Cochrance Database Syst Rev. 2011 Feb 16; (2): CD006103. [abstract]
- Smoking cessation- varenicline, NICE Technology Appraisal Guidance (2007)
- FDA Drug Safety Communication: Chantix (varenicline) may increase the risk of certain cardiovascular adverse events in patients with cardiovascular disease (June 2011)
NHS National Institute for Health and Clinical Excellence: Smoking cessation - varenicline
Varenicline for smoking cessation

Description
Varenicline recommended as a possible treatment to help smokers who have said they want to stop smoking. Varenicline should normally be used as part of a programs that include from a healthcare professional or other types of support.

NICE Pathway
The guidance has been incorporated into the following NICE pathway along with other related guidance and products. Visit NICE pathway: chronic obstructive pulmonary disease | smoking

Please NOTE:

Professor Chitta Chowdhury PILs, Dept OBGS- NRT Clinic and Addiction Research Unit, ABMIDS-NU, India
[Translated version of PILs (patients information leaflet and other media) in Malaylam, Kannada languages are available. Bengali and other regional languages will be available too]
VARENICLINE (Nicotine dependence)

Indications see notes above

Cautions risk of relapse, irritability, depression and insomnia on discontinuation (consider dose tapering on completion of 12-week course); history of psychiatric illness (may exacerbate underlying illness including depression)

Suicidal behavior and varenicline

| Patients should be advised to discontinue treatment and seek prompt medical advice if they develop agitation depressed mood, or suicidal thought with history of psychiatric illness should be monitored closely while taking |

Renal impairment if eGFR less than 30 mL/minute/1.73m². Initial dose 500 micrograms once daily, increased after 3 days to 1 mg once daily

Pregnancy avoid - toxicity in animal studies

Breast-feeding present in milk in animal studies

Side-effect gastrointestinal disturbance, appetite, dry mouth, taste disturbance, headache, drowsiness, dizziness, sleep disorders, abnormal dreams, less commonly thirst, weight gain, aphthous stomatitis, gingival pain, chest pain, hypertension, tachycardia, atrial fibrillation, palpitation (see MHHRA/ CHM advice above), and Steven-Johnson syndrome also reported.

Dose adult over 18 years, start 1-2 weeks before target stop date, initially 500 micrograms once daily for 3 days, increased to 500 micrograms twice daily for 4 days, then 1 mg twice daily for 11 weeks (reduce to 500 micrograms twice daily if not tolerated); 12-week course can be repeated in abstinent individuals to reduce risk of relapse

Champix® (Pfizer) PoM

Tablets, f/c varenicline (as tartrate)
500 micrograms (white), net price 56-tab = £ 54.60; starter pack of 11x500-micrograms tabs with 14 x 1-mg tabs £27.30. Label; 3;

© British National Formulary (March 2011) EMIS Updated: 5 May 2011 Version: 61
GUIDANCE FOR THE USE NRT IN PREGNANCY AND BREASTFEEDING (1)

Assess smoking status as early as possible in pregnancy

Source: NHS, UK Stop Smoking Service

Consideration should be given to Risk versus Benefit when using NRT in pregnancy.

Is the client motivated to quit?

↓

Yes

1st line treatment:
Advice and support from Stop Smoking Services
Encourage client to quit without NRT

↓

2nd line treatment:
Oral Nicotine Replacement Therapies: Lozenge, Gum
(not liquorice flavoured), Microtab or Inhalator

↓

3rd Line treatment:
Patches: to be worn for a maximum of 16 hrs. suitable for clients
unable to tolerate oral preparation due to nausea/vomiting.
Allow this to be 1st choice for clients more suited to patches

↓

In pregnancy, if relapse occurs, a 2nd course of NRT
maybe issued without waiting the 6/12 recommended

1NB Nasal spray, 24 hr patches and liquorice flavoured gum not recommended in pregnancy. Clients are informed that not all product are fully licensed for use in pregnancy, zyb an (bupropion) or Champix (varenicline) SHOULD NOT be used in pregnancy or breastfeeding
About NRT Chewing-Gum

Purpose: Nicotine chewing gums release controlled quantities of nicotine in the mouth. That are absorbed directly through the mucous membrane. The nicotine that is swallowed is not absorbed as the liver destroys it. Maximum nicotine levels in the blood (7-8 NG/ML) are reached some 30 minutes after chewing begins, this is a lot slower and a lot lower than the nicotine levels attained through smoking (20-25 NG/ML in about 5 minutes.).

[Images By Courtesy of a Drug Manufacturing Co]

Format: The nicotine chewing gum is available in two strengths -4mg for heavy smokers (more than 20 cigarettes a day) and 2mg for moderate and light smokers. Various brands offer a selection of flavours to choose from: mint, lemon, fruit, or original (nicotine). It should be noted that only half the dosage indicated is actually absorbed. For example, only 1mg of nicotine is absorbed by chewing a 2mg piece of gum, the rest stays in the gum.

Directions: The nicotine gum may be chewed either on a regular basis throughout the day, or intermittently as the craving arises. If craving persists, increase the dosage or supplement the chewing gum with either a patch or a nicotine inhaler. If you smoke less than 20 cigarettes a day, you can save money by cutting a 4mg piece into 2 and chewing only ½ a piece at a time.

IMPORTANT

For optimal results:

→ Chew slowly: the flavour will appear little by little
→ After approximately 10 chews place it between your cheek and gum and let the nicotine be absorbed
→ Wait for flavour to dissipate
→ Slowly resume chewing (one piece of gum = 30 minutes)

Chewing the gum too quickly releases too much nicotine, produces a strong and acrid flavour, decreases the gum's potency, and can provoke hiccups or stomach pains.

Avoid drinking coffee or fruit juices (acid) before and while chewing nicotine gum because these types of drinks reduce the gum's potency.

Duration of treatment: From 8 weeks to a maximum of 3 months. Nicotine chewing gum is available through chemists, or can be prescribed by a doctor.

Side effects: Nicotine chewing gum does not produce serious side effects. The following side-effects have been observed in 1 in 5 users, particularly at the start of treatment: vertigo, headaches, nausea, heartburn, hiccups, discomfort of the gums, inflammation of the mouth and throat. Most side effects can be avoided by closely following the directions given above.

Important: Do not cease treatment prematurely as this will decrease your chances of success.
**Issues on Chewing -Gum NRT [Cost factor]**

Chewing gums meant to help chain smokers kick the butt, could cost a lot lesser soon. Being used globally as a from of nicotine replacement therapy (NRT), including in India, the Union health ministry is planning to ask National Pharmaceutical Pricing Authority to subsidize the price of nicotine chewing gums. This will help a lot more Indian access to “ this life-saving therapy” Now NRT is not available in the government’s tobacco control programme. Those wanting to quit smoking have to shell out money to buy these chewing gums. India is home to nearly 12 crore smokers. Of these experts say only 2% manage to quit smoking every year. The data from India’s 19 tobacco cessation centres reveal that the quit rate is around 14%. A Union health ministry official told TOI. “The World Health Organization recently included NRT under essential medicines list. So should India. Two forms of NRT to help people quit their addictions to tobacco were placed in WHO’s list—transdermal patches and chewing aaren’t available but chewing gums are. We will write to the NPPA to subsidize its price soon”

A pack of 10 gums cost around Rs. 45- Rs. 90. A chain smoker wanting to quit will need around two pack a day for a maximum of six months. Since the government does not provide it., smokers have to pay for it, which is a huge deterrent. Dr. K Srinath Reddy, head of India’s Public Health Foundation of India, told TOI from US, “NRT act as a bridge to cessation. It has to be doubled with strong counseling. Cost is a major factor why NRT’s haven’t caught on in India. They have around 15% efficacy. Reducing their price will get more Indians trying to quit smoking to use NRT. But India has to increase its tobacco cessation centres. Now, there are only 19 across India”.

Chewing nicotine gum, which comes in two strength, helps control smoking craving. Nicotine gums comes in two strengths. If you smoke 18 or more cigarettes a day then you will need to chew the maximum strength (4mg) gum, else the regular (2mg) will suffice. Globally, over 35 million smokers try to quit smoking each year, yet fewer than 5% reach their first anniversary. Worldwide nearly six million people die each year from tobacco use and exposure to second-hand smoke. This expected to rise to eight million by 2030. It is also estimated that up to one billion people could die from tobacco use across the world in 21st century. In the WHO’s South East Asia Region over 240 million adults smoke tobacco, and nearly the same number of adults use smokeless forms of tobacco in different forms.

**CHEWING TOBACCO POPULATION IN INDIA- source The Hindu**

Having nearly 275 million tobacco user, India second globally and very close to China (approximately301 million users). But unlike China, where nearly all are smokers and nearly 95 per cent smoke manufactured cigarettes, India accounts for more of smokeless tobacco users- 206 million, says a study published today (August17) in *The Lancet*

The study analysed the data from the Global Adult Tobacco Survey (GATS) conducted between October 2008 and March 2010. The data from 14 low and middle-income countries that “collectively contribute to most of the disease burden attributable to tobacco use” was compared with that of the U.K. and the U.S. The number of people surveyed was different in the case of each country. India had the highest number surveyed, both of men and women.
Chewing tobacco accounted for almost all of the smokeless tobacco consumption in India. “Various forms of loose-leaf chewed tobacco are commonly consumed in the India subcontinent,” states the paper “Smokeless tobacco use is particularly prevent in India, Bangladesh, and in Thai women.

In the case of India, 23 per cent of men were smokers during 2008-2010. This is comparable with the percentage seen in the U.S. and slightly higher than U.K. figure. Brazil was the only country that had lesser percentage os smokers. With more than 60 per cent, Russia has the highest number of smokers, and is closely followed by China at 53 per cent. With 6.1 mean cigarettes a day smoked, India has the lowest figure among the 16 countries.

But this is more than compensated by the number of men who chew tobacco. At nearly 33 per cent, India has the highest male smokeless tobacco user, just above Bangladesh (26.4 per cent). The other countries have it well below 5 per cent. “Approximately 52 per cent of oral cancer in India are attributable to the use of smokeless tobacco products”, the study underlines.

Once again it is clear that the percentage of men in India who smoke and also use smokeless tobacco products is as high as 9.3 per cent. The country ranks second in this category after Bangladesh (13 per cent)

For men, smoking of bidis is common in Bangladesh (21.4 per cent) and India (16.1 per cent). Bidis produce risks for several diseases that are at least as high as those for manufactured cigarettes”. the study warns.

In the case of women in India, the percentage of current smokers is 2.9, ythus figuring as the forth from the bottom of the 16 countries ananlysed. But smokeless tobacco use women is 18.4 per cent, second only to Bangladesh (28.7 per cent)

The prevalence of male smokers in the 15-19 age group in India is 5.4 per cent, much less than Russia’s 38 percent.

“In both the crude and age standardised data, quit ratios were low in China, India, Egypt, Russia, and Bangladesh [less than 20 per cent overall], and substantially higher in the U.K., U.S.A., Brazil, and Uruguay [greater than 35 per cent]”, states the study.
EFFECTS OF TOBACCO SMOKING WITHDRAWAL ON MEDICINES EXPLAINED.

The attached table has been compiled to highlight the potential issues associated with the withdrawal of tobacco smoking on medicines.

The effects of the drugs are changed two ways:
A) By the withdrawal of nicotine and / or
B) The withdrawal of polycarbons in tobacco smoke.

Stopping smoking may result in slower removal of the drug from the body and an increase in blood levels of drugs because the inhalation of polycyclic aromatic hydrocarbons (that cause quicker removal from the body has stopped).

Nicotine Replacement Therapy (NRT) differs from tobacco smoking because of the absence of the tobacco smoke which contains these polycarbons, but its use may still be associated with effects on medication. Clinicians must consider the clinical significance in individual cases and monitor patients for signs of any adverse effect during withdrawal and substitution therapy.

On the PGD guidelines (2006) there are several drugs mentioned:

- Theophylline
- Insulin
- Adrenergic agonists and antagonists
- Fluvoxamine
- Clozapine
- Clomipramine
- Imipramine
- Olanzapine
- Flecainide
- Tacrine
- Pentazocine
Explanations below:
· Theophylline

**Respiratory System**

| Bronchodilator - Makes Respiratory passages wider. Used with patients who suffer from Asthma, Bronchitis (inflammation of the Bronchus / Bronchioles), and Emphysema. Taken both to prevent problems and also to deal with an acute event | Theophylline, (Nuelin®, Slo-Phyllin® Uniphllin Continus®) Aminophylline, (Phyllocon tin Continus®) | Affected by polycarbons in Tobacco Smoke | Smoking reduces blood plasma levels. An increase in plasma level may be seen as smoking stop or is reduced. Over dosage can show as Headaches, Agitation or Palpitations (see Dr immediately if Palpitations). Smokers may need lower doses of Theophylline and Aminophylline as they stop smoking. These medicines have a narrow therapeutic to toxic ratio (5-20ug / mL). In other words there is not much room for manoeuvre and patient should be under supervision of Hospital or Primary Care Doctors. (Clinically Significant) |

**· Insulin**

Insulin is a hormone formed in the beta cell of the pancreatic Islets of Langerhans. This is major Fuel Regulating Hormone and responds to help to reulate the level of Glucose And Amino Acids in the blood. In Insulin dependent diabetics (people who have a high level of glucose in their blood and cannot produce enough insulin naturally to bring glucose level down); Insulin is given in the form of an injection that goes just under the skin. Their diet is also controlled and these days Diabetics are taught to manage their own Diabetes as much as possible and will regulate their level of insulin injections around their daily exercise and dietary needs. One way of doing this is to prick their finger and place a drop of blood onto their Glucometer Machine. This machine tells them their blood level and then the patient adjusts the amount the amount of insulin accordingly. If the patient lets their blood sugar get to high, (Hyperglycaemia) the patient can go into a coma and major organs can be damaged. If the blood sugar get too low, (Hypo Glycaemia), they can show symptoms as if they were drunk, e.g., dizziness, slurring of speech, incoherent though, excessive sweating, the shakes and fainting. This should it happen, often can also cause organ.

Patients should be monitored to assess their insulin requirement as smokers have been observed to require 15-30% more insulin than non smokers (if heavy smoker).

There are several ways that smoking can affect insulin absorption and utilisation in the body and it is unclear as to the precise reasons why smokers may develop a resistance to insulin (reduce effectiveness):

148
Cardio-Vascular System,

<table>
<thead>
<tr>
<th>Beta Blocker</th>
<th>Atenolol (Tenormin ® Tenoret 50 ®, Tenoretic ®, Beta Block Joint)</th>
<th>Affected by Polycarbons in Tobacco Smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angina attacks, Cardiac Arrhythmias</td>
<td>Betaxolol, Bisoprolol (Cardicor ®, Emcor ®, Monocor ®, Monozide ®).</td>
<td>Effects of smoking on heart rate and blood pressure may reduce effect of Beta-Blockers. May need lower does when stopping smoking. Side effects of too high dose can be Very Low Blood Pressure (Feels faint on standing). Gastric Disturbances, Sleep Disturbance. <em>(Clinically Significant)</em></td>
</tr>
<tr>
<td>(Change form normal Rhythm), Anxiety Symptoms; Anxiety Tachycardia, Hypertension Heart Failure, Myocardial Infarction, Myocardial Infarction Prevention Migraine Prevention, Slows Hear Rate down</td>
<td>Carvedilol (Eucardic ®)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Celiprolol (Cector ®) Esmolol (Brevibloc ®)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Inderal ®, Half Inderal LA ®, Inderetic ®, Inderex ®. Sotalol (Beta Cardone ®, Sotacor ®), Timolol (Betim ®, Moducoren ®, Prestim ®).</td>
<td></td>
</tr>
</tbody>
</table>

1. Smoke in Tobacco interferes with an enzyme that responds to some drug and removes them from the body quicker causing the need for higher doses of the drug (so far this theory is still under debate),

2. Many Components, notably Nicotine, have been found to reduce the width of small blood vessels that lie nearer the surface of the skin (this is why when patient stop, they look a healthier colour). Because Insulin is injected under the skin, it may be that the blood vessels are not efficient enough to take in the insulin quickly enough and so more may be required.

3. The general condition of the skin may be proper and less poorer and less prorous, (harder), because Diabetics can have circulation problems anyway and tend to inject very often into a similar area.

Either way, tobacco smoking does play a part in reducing insulin’s effectiveness. In some patients it may only be slight. they should be instructed to tell their Diabetic Nurse or GP if their level of control causes concern. If some patients Unstable Diabetic (one whose blood sugar remain a challenge to get level), then they, the pharmacist or the smoke stop specialists should contact the medical professional who is caring for the patients diabetes prior to the quit date.

- **Adrenergic (receptor) Agonists and Adrenergic (receptor) Antagonists:** These drugs encourage the release of Adrenaline (amongst other things, they body’s fight or flight response) and Noradrenaline or can mimic their effects. These can further can further be broken down into “Agonist” (the prime mover or mediator), or “Antagonists” a drug that inhibits another drug or enzyme.
Adrenergic (receptor) Agonists work on the Autonomic (think Automatic and Non Conscious) Nervous System Stimulating such things as the dilation (Widening) of eye pupils. Constriction (Narrowing) of the blood vessels, increased strength of heart beat, relaxing of respiratory muscles and widening of the airways, control of bladder muscles (contracts sphincter muscle), increasing Saliva production and Insulin Secretion in the pancreas. A good example of agonists include drugs called alphas- adrenergic agonists such as Methyldopa and Clonidine which have been used to help regulate high blood pressure and Migraines and beta - adren agonists such as the well known asthma and respiratory Broncho Dilators Dilators (widnes lung passages), inhalers like Salbutemol (ventolin), Salmeterol (Serevent), and Long Acting Eformeterol although it is not clear whether these are affected by tobacco smoke or nicotine.

The Adrenergic actions are blocked by:
Adrenergic (receptor) Ant Agonists: or Blockers such as Alpha adrenoreceptor Blockers and beta adrenoreceptor Blockers that are well known cardiac. Alpha Blockers are drug such as Doxazosin, (Cardura and cardura XL), Indoramin, Prazosin Terazosin.

Beta Blockers are listed below.

- **Fluvoxamine : Faverine:**
  Acts on the brain, Centrally Acting

| Antidepressants and also used for obsessive behaviour-Selective serotonin reuptake inhibitors Also known as “SSRI(s)” | Fluvoxamine, (Faverin ®) | Affected by Polycarbons in Tobacco Smoke | Smoking reduce blood plasma levels. May ned lower dose when stopping smoking to prevent side effects of too higher dose which generally include drowsiness, palpitations, increased heart rate (or possibly decreased heart rate in some patients), confusion (disorientation) and in sever cause Convulsions (fits) (Clinically Significant) |

- **Clozapine**

| Classed as “Atypical (Perhaps best interpreted not usual but tried everything else) Antipsychotic drug” for: Schizophrenia (see defination) and Mania (a violent or extreme form of personality). | Clozapine, (Clozaril ®) | Affected by Polycarbons in Tobacco Smoke | Smoking Causes lower blood plasma levels. On average, level are around 18% lower in smokers. may need lower dose of Clozapine when stopping smoking. It is recommended to take a baseline (before change), trough plasma level before conversion to NRT and after 2 weeks, or sooner if side effects develop. This is ablood test is called a “Clozapine Assay Test”and is usually arranged by either the patient's Psychiatric Team (often community Psychiatric Nurse ["CPN"]. Gps usually do not initiate this. It is important and is strongly encouraged by the manufacturers sho provide a service called the clozapine Plasma Monitoring Services (CPMS), The test just for info costs about £25 a test. The effects of smoking cessation can be quite serious (a small amout of people have died after having a major seizure [fit] Other serious symptoms include fits, seizures, tachycardia, and postural hypotension (blood rushes to lower extremities causing brain to be temporarily starved of oxygen) and sedation (Clinicall Significant) |
**Clomipramine**  
An antidepressant drug in the same class as Trycyclic Drug

| Antidepressants tricyclic (Also used for severe nerve pain). | Clomipramine  
(Anafranil®  
Amitriptyline  
(Triptafen®  
Triptafen®).  
Imipramine  
(Toframil®.)  
Discontinued 2005.  
Nortriptyline,  
(Allegron  
®, Motival®.) | Affected by Polycarbons in Tobacco Smoke | When smoking, serum level fall but not necessarily with great significance. Some smokers may require lower doses when they stop smoking. It has been reported that there has been a 25% reduction of plasma in imipramine |

**Some of the Side Effects**  
Patients may experience drowsiness, Tachycardia, Nausea, Postural Hypotension, Headache, Confusion (in elderly), Blurred Vision and if these symptoms cause concern the patients should seek medical advice.

**Olanzapine:**

| Atypical Antipsychotic drug for Schizophrenia/Maniapain. | Olanzapine  
(Zyprexa®) | Affected by Polycarbons in Tobacco Smoke | May need lower dose when stopping smoking. Smoking causes lower plasma levels. Effects of smoking cessation include, fits, seizures, tachycardia, postural hypotension and sedation. These effects may not be evident immediately and have developed at 4, 14 or 28 days after smoking has ceased (Clinically Significant) |

**Flecainide**

| Management of Arrhythmia (Change of heart Rhythm from the Norm) | Flecainide (Tambocor®).  
Amiodarone, (Cord arone®) | Affected by Nicotine and Polycarbons in Tobacco Smoke | Smoking reduce plasma levels therefore may need lower dose when stopping smoking or using NRT. (Clinically Significant). Side Effects could include further instability of heart rate including reduced heart rate. Nausea, Visual Disturbances difficulty in breathing and vertigo (dizziness). |
· Tacrine: Tacrine/ Cognex (a drug used mainly in America), is used to treat Alzheimer’s disease which is associated with low level of a chemical called acetylcholine in your brain). The exact way that Tacrine works is unknown. However, it is believed that Tacrine prevents the breakdown of acetylcholine in your brain. This affects how you think and remember things. Tacrine is used to improve thinking and memory in patients with Alzheimer’s disease Side effects can include: upset stomach, vomiting, diarrhoea, loss of balance, heartburn, muscle aches, headache, loss of appetite and difficulty in passing urine.

· Pentazocine: (Fortral)

<table>
<thead>
<tr>
<th>Opioid analgesic/ Pain Killer</th>
<th>Pentazocine (Fortral®)</th>
<th>Affected by Polycarbon s in Tobacco Smoke</th>
<th>Smoking may reduce analgesic effect by 40-50%. May need lower doses when smoking stopped (Clinically Significant)</th>
</tr>
</thead>
</table>

Glossary:

Acute- a term applied to a disease in which an attack is sudden, severe and of short duration

Agonists - A drug that causes an action.

Alzheimer’s disease- Which is associated with low levels of a chemical called acetylcholine (ah see til KOH leen) in your brain. This affects how you think and remember things.

Analgesic- Pain Killer

Antagonist- a drug that inhibits another drug or enzyme (prevents an action).

Arrhythmias- (change from normal Rhythm).

Asthma- Wheezing (a strained breathing sound) and Difficulty in Breathing out. Can be associated with Stress and Allergies.

Bradycardia- Reduce / Low Pulse/ Heart rate

Bronchitis- Inflammation of the Bronchus/ Bronchioles which are brench like structures in the lungs.

Chronic- Disease or disorder of long duration - opposite to Acute.

Emphysema- The abnormal presence of air in tissues or cavities in the body. Enlargement and hardening of Alveoli (Lung Air Sacs), and bronchioles reducing elastically and making it hard to breath in. Characterised by a barrel like chest.

Hypoglycaemia- Low (Hypo), Glucose (Glyc) in Blood (aemia), if the blood sugar gets too low), Primarily, See Diabetes but also happens after poor diet and excessive exercise in non diabetics.

Hypotension- Low Blood Pressure

Hyperglycaemia- If the Diabetic patient lets their blood sugar get to high, [High (hyper), Glucose (Glyc) in Blood (Aemia)] the patient can go into a coma and major organs can be damaged.

Hypertension- High Blood Pressure

Mania- a violentor extreme form personality

Myocardial Infarction- Heart Attack

Postural Hypotension- Blood Pressure drops on standing or even sitting upright (blood rushes to lower extremities causing brain to be temporarily starved of oxygen)- Patients feel “Giddy” and “Faint”
Schizophrenia:- A general Team encompassing a large group of disorders characterized by mental deterioration from a previous level of functioning and characteristic disturbances of multiple psychological process including Delusions (false Ideas or beliefs which cannot be corrected by reason), paranoia, disassociating themselves from people events around them, decline in content of speech, hearing “voice” inappropriate emotion (e.g., laughing when sad), Self Isolation / Exclusion.
Tachycardia- Raised ? High Pulse/ Heart Rate
## Smokerlyzer Chart

### Dangerously Addicted Smokers
This level is uncommon. It is found in smokers who are rarely seen not smoking! Above this level, serious carbon monoxide poisoning and permanent damage can occur. Premature death or serious diseases may occur as result of smoking.

### Heavily Addicted Smokers
These reading indicate that red blood cells are carrying a lot less oxygen than the body needs. You may have more chance of getting headaches, colds and flu: generally your health will be badly affected.

### Addicted Smokers
These reading indicate that red blood cells are carrying a lot less oxygen than the body needs. You may have more chance of getting headaches, colds and flu: generally your health will be badly affected.

### Frequent Smokers
These levels of CO indicates a serious addiction to nicotine. These levels are 5 times those of non-smokers.

### Smoker
Smokers in this region are addicted to nicotine. Smoking can affect your ability to be successful at sports or even everyday work and leisure.

### Danger Zone
This is a high result for a non-smoker. However, this level could be the result of low frequency smoking. Addiction to nicotine could have already occurred or may just be about to.

### Non- Smoker
This is where you really need to be. The best reading for non-smokers are in this range.
SAFE AND HYGIENIC USE OF THE SMOKERLYZER

1. Decontaminate hands using liquid soap and water or non alcohol hand immediately before using machine

2. Switch on the machine

3. Ask client to place the single-use disposable mouthpiece on the machine, if unable to do so pick up mouth piece at it’s centre and attach to the machine.

4. Instruct the client on how to use the machine and record the CO result

5. Ask the client to remove the disposable mouthpiece and place it in a clinical waste bag (brought along specifically for mouthpiece disposal, if necessary)

6. If for any reason the client is unable to remove their own mouthpiece, a pair of non-sterile disposable gloves must be worn to remove and dispose of it for them

7. Decontaminate hands.

8. Clean the “T- Piece” after each session with a manufacture instrument cleaning wipe.

NB. The Poole NHS Trust Policy for single-use device must be adhered to at all times
Sum-Up and Quick Assessment For Follow-Up

[PS. The information data needs to be entered in excel for each case]

Patient/ Subject ID __________________ Name __________________ Age __________ Sex __________

Date of Examination __________________________ Name of the Examiner __________________________

1. Personal Habit(s) : (Summarize from WHO OMDC format)
   Current / Past : Frequency of tobacco, unit of alcohol
   Drink/ duration

   Smoking (S) _______/ ________ Chewing
   ( C) _______/ ________ Both (SC) _______/ __________
   Alcohol Unit per week) _______/ ________ Other _____/ ________

2. KAP Score : _________________________________
3. FTND Index : _______________________________
4. BP : ________________________________
5. Pulse rate (optional) : _______________________
6. BMI : ________________________________
7. % Body Fat : ______________________________
8. Respiratory Function Test : ___________________
9. CO-level : ______________________________

ORAL HEALTH ASSESSMENT (collect from WHO formats and Questionnaire)

10. DMFT : _________________________________
11. CPI/BPE : _______________________________
12. LOA : ________________________________
13. Score from perio-charting : __________________
14. Periodontal Destruction (radiological): Absent/ Mild/ Moderate/Severe
15. Extrinsic Stain : Absent/ Mild/ Moderate/Severe
16. Halitosis : Absent/ Mild/ Moderate/Severe
17. Oral Mucosal Diseases : Absent/ present, mention_________________

MEDICAL HEALTH CONDITIONS

18. Age-related Macular Degeneration (AMD): Absent/ Mild/ Moderate/Severe
19. Associated Systemic Diseases : Mention____________________

             Metabolic Syndrome? (optional)
20. Psychometric/ Psychological assessment (if needed):
21. H/O Medication, mention _________________________
BIOCHEMICAL and OTHER VALUES

22. Salivary pH: (Paper test) Acidic/Alkaline/Neutral
   Value (by using pH meter)________.

23. Candida Load:
   I) KOH mouth wash: Load of Candidal hyphi: Low/Moderate/High
   II) Gram Staining: Load of Candidal hyphi: Low/Moderate/High

24. Serum creatinine
25. Urinary Creatinine
26. Blood Urea
27. Urinary Protein
28. Level of Cotinine
   I) Salivary Cotinine______________
   II) Serum Cotinine______________
   III) Urinary Cotinine______________

29. Glomerular filtration rate (eGFR) [Optional]
30. 24-h urinary protein (uprot) excretion [Optional]

FOLLOW-UP

31. Follow-up schedule for counseling
   Date for First follow-up________________
   Date for Second Follow-up____________
   Date for Third Follow-up______________
   Any More Follow-up__________________

32. Follow-up schedule for NRT and/or Counselling
   Date for first Follow-up______________
   Date for second Follow-up____________
   Date for Third Follow-up______________
   Any More Follow-up__________________

ANY REMARK/REQUISITION________________________________________________________________________
Guidance for NRT- Chewing Gum Prescription

[Example: A person smokes 5 Cigarettes / (5 ST eg., Gutkha/ Bedda)* per day
Case by case the regimen will vary**

- **Do not** eat or drink while you are chewing Nocotine GUM and preferably do not use the chewing NRT gum with removable dentures.
- **Avoid** any drink for 15 minutes before and after using the Nicotine chewing gum.

**STEPS TO CHEW NRT- GUM**

1. Chew the gum slowly till it releases nicotine taste (Peppery taste)
2. Once you feel the taste, keep the gum in between your check and teeth (Chew and Park). Nicotine will get absorbed through your cheek
3. Chew the gum again once the taste fades.
4. Once you feel the taste, keep the gum in between your cheek and teeth (Chew and Park) at a different location from the first time, in order to avoid irritation in the mouth cavity. *Do not hold (park) the gum in the same location of your mouth cavity. It may cause local irritation or even ulcer*
5. Repeat the procedure similarly till the taste completely fades away (for about 30 minutes).

- **WHEN WILL YOU CHEW THE NEXT NICOTINE GUM?** chew the second Nicotine gum only after 3-4 hour of previous gum.

- **DO NOT SMOKE or GUTKHA/BEEDA/ TAMBULA*.** Do not smoke or Chew *Gutkha (orsimilar)/ Beeda/Paan/ Tambula* while using Nicotine gum.

- **MAXIMUM NUMBER OF NICOTINE GUM/DAY:** Chew maximum of 5 Nicotine-gum per day, do not exceed five (5) gums.

- **REDUCE THE NUMBER OF GUMS GRADUALLY OVER THE WEEKS AND COMPLETELY STOP USING THE GUM BY THE END OF 5TH WEEK**

- **YOUR NICOTINE GUM MAY INTERACT WITH OTHER DRUGS, SO CONSULT WITH YOUR DOCTOR:** Nicotine gums may interact with drug such as Insulin, Papaverine (HCl), Propoxyphene, Theophylline, Tacrine, Clozapine or Ropinirol. If you are taking any of them, you may need to change the dosage or use and alternative drug. Since you cannot change by yourself, better consult with the doctors at NRT clinic and/or your doctor, who is treating you.

- **ANY ALLERGIC REACTION & SIDE EFFECTS:** The side effects are usually dose-dependent and may not be experienced by all the patients. In case, you experience any symptoms/ discomfort or developing any allergic reaction, stop further nicotine gum, and please contact us or a doctor immediately.
• **NICOTINE OVER-DOSE**: Nicotine overdose may cause headache, sickness type of bad-feeling, diarrhea and stomach pain etc. Consult with a NRT team member at our clinic or a doctor.

• **KEEP NICOTINE GUM OUT OF REACH OF YOUR CHILDREN**: Keep this medication away from children. In case a child has chewed or swallowed some nicotine gums, then contact a doctor immediately. Be alert, your child may find it as a confectionary chewing gum. **NOTE**: Nicotine gum is a medicine, not a chewing -gum that many people enjoy.

• **STORE IT PROPERLY**: Do not store inside fridge or near an oven. Temperature around 25 C is ideal to store them. Extreme temperature will affect the action and action and activity of this drug.

• **PROTECT THIS NICOTINE GUM FROM SUNLIGHT**: Keep it away from sunlight. Exposure to sunlight will affect the action and activity of Nicotine Gum.

• **CAUTIONS**:

  1. **IF YOU HAVE FORGOTTEN TO MENTION ABOUT ANOTHER DISEASE YOU ARE SUFFERING FROM**: Nicotine Gum is a drug, and it has side effects. It may cause adverse effects to patients suffering from hart disease, high blood pressure, stroke, kidney or liver disease, diabetes, peptic ulcer gastritis, severe sore throat, ulcer in mouth, over active thyroid or adrenal gland cancer, asthma and you are under medication for that disease(s). For example, if you are under a medicine for asthma eg. Theophylline, you may need close monitoring. Call to a member of our NRT team or a doctor for further instruction.

  2. **PREGNANT & LACTATING MOTHER**: If you are pregnant or breast- feeding your child, you have to consult with our team or your doctor.

  3. **TAKE A NOTE FOR A CHILD UNDER 12- YEARS OLD**: Nicotine gum is not recommended for a child below the age of 12 years.

* Subject to confirm its action among chewers--- progressing for a trial
* Dose Schedule

**A Generic Guidance** *(Vide ref. Nicogum Cipla India 2013-adopted)*

- 4 mg (>20 Cigarettes): As advised by NRT team doctor or by a doctor experienced in NRT
- 2 mg (<20 cigarettes): 8-12 gums in 24 hours.
- Go for gradual reduced dose (Tapering dose)

You better decide and determine a quit day at least a week before starting your Nicotine gum. But, we recommend you try to reduce to 5-6 cigarettes per day (we have structured counseling session for you to do so). Therefore, we want you to start the regimen discussed above first.
Otherwise, a full course of 3 month's tapering dose will be advised as below:

<table>
<thead>
<tr>
<th>Week</th>
<th>Quantity/day</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st week:</td>
<td>12 gums/day</td>
<td>[During 1st - 6 weeks ie. 42 days] 1 gum per 1-2 hours</td>
</tr>
<tr>
<td>2nd week:</td>
<td>11 gums/day</td>
<td></td>
</tr>
<tr>
<td>3rd week:</td>
<td>10 gums/day</td>
<td></td>
</tr>
<tr>
<td>4th week:</td>
<td>9 gums/day</td>
<td></td>
</tr>
<tr>
<td>5th week:</td>
<td>8 gums/day</td>
<td></td>
</tr>
<tr>
<td>6th week:</td>
<td>7 gums/day</td>
<td></td>
</tr>
<tr>
<td>7th week:</td>
<td>6 gums/day</td>
<td>[During 7th - 9th weeks ie. 21 days] 1 gum per 2-4 hours</td>
</tr>
<tr>
<td>8th week:</td>
<td>5 gums/day</td>
<td></td>
</tr>
<tr>
<td>9th week:</td>
<td>4 gums/day</td>
<td></td>
</tr>
<tr>
<td>10th week:</td>
<td>3 gums/day</td>
<td>[During 10th - 12th weeks ie. 21 days] 1 gum / 4-8 hours</td>
</tr>
<tr>
<td>11th week:</td>
<td>2 gums/day</td>
<td></td>
</tr>
<tr>
<td>12th week:</td>
<td>1 gum/day</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE (Golden standard)**
- *Never exceed* 24 gums in 24 hours
- *In 12 week (3 months) period* Nicogum allows your body to gradually adjust to having less nicotine.

**STEPS OF NICOTINE GUM CHEWING (vide “Nicogum” Cipla-2013)**

**Step-1:** Chew gum slowly until there is a nicotine taste

**Step-2:** Once you feel Nicotine taste, keep the gum in between cheek and your teeth

**Step-3:** Nicotine is released from the gum which gets absorbed through the cheek

**Step-4:** Chew the gum again when the taste fades
HOW NRT CLINIC OPERATES

[Unit of Nicotine Replacement Therapy (NRT) & Addiction Research in Collaboration with Department of Psychiatry, KSHEMA]

A Project of Oral & Head-Neck Cancer Services (Prevention & Control)

The NRT unit is headed by Professor Chitta Ranjan Chowdhury, the Chair of Oral & Genomic Studies. An extended unit for Psychometric intervention is located at the Department of Psychiatry, headed by Professor Satheesh Rao, KS Hegde Medical Academy (KSHEMA). The NRT clinical service is well linked with the Department of Ophthalmology for detection of Age-adjusted macular degeneration (AMD), led by Professor Vijay Pai. This is an added facility for the tobacco addicts are at risk of developing muscular degeneration- the cases are screened and advised in good time.

SETTING: This kind of essential setting is one of the priority services for Indian population, and is first of its kind in the country, established in an organized approach by the initiative of Professor Chitta Chowdhury within the Nitte University Medical Science Campus. The NRT clinical service helps stop smoking (Beedi, Ciggaretee, any indigenous type etc), and tobacco chewing of any form, eg Guthka (and simialr) and Tambula/Paa/Beeda etc. This NRT unit is unique in terms of clinical services, also create a data base through numberof cohorts on tobacco related addiction, and aims a cost-effective NRT care provision for the undeerserved.

LOCATION: If a tobacco addict wants to stop smoking and/or chewing: Please visit the main NRT unit is located at the 6th Floor within the department of Oral Biology and Genomic Studies of AB Shetty Memorial Institute of Dental Sciences. The major screening is carried out in this main unit, and necessary referral is done to the relevant Department where an addict needs extra checks and care comprehensively.

ARTIFICIAL NICOTINE: We advise nicotine substitute in the form of tablets or chewing gum, so that if a tobacco addict is dependent on nicotine, we can help the person to stop tobacco, and stay non-tobacco, and that helps provide a longer-life and reduce the risk of pre-mature death from cancer, heart disease etc.

FACILITIES: We have all the neccessary advanced machine, such as computer based carbod-monoxide (CO) monitor and Spirometer for lung function test (at the Department of Pulmonary Machine), and machine for screening of macular degeneration of tobacco-addict’s eye at the Department of Ophthalmology. We shall help them with updated and evidence based treatment with proper assessment and follow-up, so that, we can measure their improvements continually.
HEALTH & SAFETY: We also make aware of the user of NRT drug for side-effects and a risk involved to his/her health and disease during treatment-supervised and monitored properly.

COLLABORATION: The unit has collaboration with experts at home and aboard, such as-the University of Warwick of the UK, the National Institute of Health and clinical (NICE) of the UK DoH, and Nara Medical University of Japan. This aims to develop and valid clinical services as well as research outcome in the field.

CONTACT: Professor Chitta Chowdhury. Lead NRT Clinical and Addiction Research Service, Head, Department of Oral Biology & Genomic Studies, AB Shetty Memorial Institute of Dental Sciences, Medical Science Campus, Deralakatte, Mangalore 575 018, Karnataka, India.

Stakeholder, National Institute of Health and Clinical Excellence (NICE) for Smokeless Tobacco (ST) Control in the UK, Visiting Academic, Warwick Dentistry, Department of Education and Development, The University of Warwick School of Medicine, Coventry, UK (Professor Edward Lynch, Head of Warwick Dentistry, Advisor, NRT & Addiction Research Team). Direct Line 0824-2204623, Mobile (0)816315150 Email crc.ob.cod@gmail.com | stop tobacco.nrt@nitte.edu.in

C.R.Chowdhury@warwick.ac.uk

End of the Document
Goodwill Messages | Their Says on The Issue

- Professor SK Banerjee, Director of Medical Education, Govt. of West Bengal
- Professor Ramananda Shetty, Vice Chancellor, Nitte University
- Professor Sridhar Shetty, Founding Dean, ABSMIDS, Nitte University
- Professor Rajendra Prasad, Dean, Nitte University Dental College (ABSMIDS).
- Professor Raman Bedi, Kings College London, UK
- Professor Edward Lynch, Head, Warwick Dentistry, UK
- Professor Steward Harding, Dean, BPP University City of London Dental School, UK
- Dr Arnab Gupta, Director, Saroj Gupta Cancer Centre & Research Institute, Kolkata, India
- Professor Dr. Satheesh K Bhandary, Dean, KS Hegde Medical Academy, Nitte University, India
- Professor Tadaaki Kirita, Chairman, Department of Oral & Maxillofacial Surgery, Nara Medical University, Japan.
Goodwill message from
Professor SK Banerjee, Director of Medical Education, Govt. of West Bengal
Prof. (Dr.) S. Ramananda Shetty, M.D.
Vice Chancellor

MESSAGE

I am delighted to know that Prof. Chitta Ranjan Chowdhury has published a Handbook “Nicotine Replacement Therapy (NRT)”: Tackling Tobacco Addicts in India.

This is an educational booklet for patients who suffers from Oral Cancer and I am sure that the doctors will find this book helpful in educating their patients. India is heavily burdened with tobacco related pre-mature deaths and diseases and efforts like this to educate the masses is indeed a great service.

This book will help many dental professionals and deserves to be read widely.

With best wishes

PROF.(DR.) S. Ramananda Shetty
VICE-CHANCELLOR
Pan (Betel Quid) chewing (eating- popularly spoken in the community) is a huge cultural heritage and tobacco smoking/chewing/snuffing is a fashion started since long ago in this part of India, Dakshina Kannada, Karnataka, like-wise another part of the country. We the professionals in the country quite frequently meet people in our day-to-day practices and we do keep ourselves engage in some of the social activities to help improve life-style related disorders among our population, especially who are habituated with this fashionable personal habits they find a sort of false dignity of life while smoking and chewing tobacco including alcohol drinking.

It’s unfortunate that we don’t have any social or legal boycott to stop these deadly habits either. The fact is that, we come across the community suffering from pre-cancerous oral lesions or full-blown cancer, and we are really at loss to tackle this problem and save their lives from premature deaths and to provide a quality life who are alive. We come across thousands of people who are not aware or who do not have accessibility, availability and affordability to keep themselves away from these deadly habits which leads to a death.

Prof Chitta Chawdhury, head of Oral Biology & Genomic Studies is associated with us at A B Shetty Memorial Institute of Dental Sciences since 1997. His approach for management of these unfortunate addictions is a novel initiative. He managed to help involve students, teachers of the institution to create awareness and attempts to stop these unfortunate personal habits in the population.

He has conducted several short clinical researches and training on Nicotine Replacement Therapy (NRT), and some are ongoing as this NRT services also include research on tobacco habits.

I am very much pleased that he is going to publish a handbook on NRT. This could be a good help and a guide to all of us in the profession are involved and interested to educate the population who are suffering badly with tobacco dependency, and the section of huge population especially the younger generation plan not to start tobacco habit in life.

I thank Chitta for guiding the professionals with his essential services and ideas.

I wish him the best, and hope to he would come up with further publications in future.
NRT Service: Find an Appropriate NRT Medicament for Betel Quid-Chewers

Nicotine replacement therapy (NRT) for Quid-chewers is a challenge – and I think the service initiated by Professor Chowdhury is commendable simply because he is tackling a challenge for getting an appropriate NRT medicament to stop quid-chewing. This kind of service in his unit is not only includes therapy also proper assessment for follow-up, including addiction research on tobacco. A cost-effective NRT product is essential for our community especially the under-served people addicted with tobacco who can’t afford an expensive NRT medicament.

The survey is essentially needful in order to know the social problem of chewing tobacco and understanding of underpinning issues regarding individual’s knowledge, attitude and practice on tobacco habits. The action for national level propaganda would help the community at large. Hence the book gives lots of pros and cons about controlling and motivating the people affected with tobacco habits.

I know Professor Chowdhury and his frontier research group is trying on how a low-cost NRT product could be produced, and in this concern the group highlighted a NRT could abate quid-chewing specifically. Of course, our problem is chewing tobacco – and major concern for us for getting NRT product helps stop chewers. And if any producer claims for that, must be evidence based, otherwise, one would create evidence and come up with a product for the members of the society –in need.

I am sure NRT services with its different fronts (research, clinical and training) will be established properly within our facilities and extending elsewhere. We shall have every support on this. Thanks to Saraj Gupta Cancer Centre to bringing this publication up and hosting an extended NRT unit which is linked with Professor Chitta Chowdhury of our University, and we are happy to collaborate with them.

I wish the NRT services - a grand success.

Professor Rajendra Prasad
Dean, AB Shetty Memorial Institute of Dental Sciences
Nitte University
Deralakatte, Mangalore -575018

Email: principal.absmids@nitte.edu.in
This book is a useful resource for health professionals engaged with patients who wish to stop using tobacco.

It has been written primarily for the Indian market but will be useful to anyone working in developing countries. The editor, Professor Chowdhury has brought together an expert group to provide help for those engaged with the difficult area of providing tobacco control to those who use smokeless tobacco products.

The book is unique in its field and deserves to be read widely but especially in the sub-continent.

I wish the whole team every success in this venture.

Best wishes,

Raman b

Professor Raman Bedi
BDS, MSc, DDS, hon DSc, DHL, FDSRCS (Edin), FDRCS (Eng), honFDSRCS (Glas), FGDP, FFPH

Head, Centre for International Child Oral Health
King’s College London
26-29 Drury Lane    London WC2B 5RL

Formerly, Chief Dental Officer, Department of Health, England
Chairman – Global Child Dental Fund    www.gcdfund.org
Chairman - World Federation of Public Health Associations oral health group    www.wfpha.org
Co-director – Alliance for Cavity Free Future    www.allianceforcavityfreefuture.org


Goodwill message from
Professor Raman Bedi, Director, GCDH, Kings College London, UK
RE: Handbook Nicotine Replacement Therapy and Addiction Research — Chitta Chowdhury

It's my immense pleasure to be associated with Chitta my colleague, who has been involved in prevention of oral cancer and better tertiary care for quality of life of cancer survivors. Anyway, I am indeed privileged to be associated with his educational activities, and happy to contribute to another of his excellent publications: Nicotine Replacement Therapy and Follow-up Assessment. This handbook seems to be an action-outcome oriented publication through a consistent protocol of clinical service and follow-up. It has been documented that the developed countries have substantive strategic plans to reduce tobacco use; of them the UK itself successfully established an extraordinary set of care-services for smokers in order to stop smoking through the NHS. Although the incidence rate of smoking is reduced, the risk of alternative tobacco consumption remains high, and is increasingly growing in popularity in the UK. I have observed in many localities where migrant population live the availability of smokeless tobacco (ST) such as commercial quid sachets and betel-nut (conventional chewing products) and this is common in some communities. Interestingly ST from Sweden Snus is banned in the UK, but quid/betel-nut from SE Asia is unregulated for imports and production. Also a number of young people in the UK are users of another form of smoking practice, known as Shisha smoking—which is traditionally popular in many gulf countries. Therefore risks from tobacco is not really reduced, and if we check statistics, the number of old smokers (especially cigarette smoking) has been reduced, because of the NHS Stop smoking programmes which are free of cost to access, but new types of smoking such as Shisha and e-Cigs (electronic cigarette) are popular among the UK youth and adults and are on a steady rise. I think the NRT handbook also has pointed out these points, and a comprehensive data-collection and effective clinical service actions should be developed.

Secondly, many scopes remain in addiction research, and I think Professor Chowdhury has rightly taken up that area in order to understand the situation by collecting and collating factual information-data from various sources - and that helps contribute to stopping tobacco use of any form provided the policy makers get the right information through an authentic methodology, for example the methods used in this handbook. Chitta discussed with me about the availability and the cost of NRT products in developing countries. NRT (especially the most effective drug Champix) is very expensive - for example, the cost of one course of Champix (56 Tablets) is more than 200 USD. In some developing countries 200 USD is a month's salary for a low to middle-class wage-earner. The low-middle class population suffers more than other groups with tobacco addiction. Therefore, there is a considerable need for a cost-effective product for smokers living in resource poor countries who hope to stop tobacco by NRT. I think addiction research and NRT services will have a considerable amount of scope to bring to market cost-effective products through good research.

This handbook is methodical in terms of protocol for treatment procedures and follow-up assessment. The editor Dr. Chowdhury highlighted a number of important published papers and those can help doctors, dentists, nurses and other health care professionals to be motivated and knowledgeable to run NRT clinical services.

In a word this handbook is a commendable publication, and I sincerely recommend for many to use this handbook for their NRT practice and addiction research planning, especially as tobacco (of any form) affects oral health and their assessments. This publication is really useful for oral health care professionals. I wish all the best for Chitta.

Edward Lynch PhD, t-ond, MA, BDentSc, TCD, FDSRCSEd, FIADFE, FDSRCSLond, FASDA, FICCDE
Head, Warwick Dentistry
Tobacco related oral health problems are not simply a stained tooth, bad mouth breath or perio-destruction but have very high biological cost for implant patients. Smokers have a higher risk of developing peri-implantitis and squamous cell carcinoma compared to non-smokers. Patients with previous periodontitis (controlled) who subsequently re-started smoking following implants risk developing peri-implantitis and eventual implant failure due to peri-implant bone loss. It is imperative that all dental professional involved in the provision of implant therapy support patients to give up their tobacco smoking/chewing habits. One answer is Nicotine Replacement Therapy (NRT).

Nicotine Replacement Therapy is established in the west, particularly the UK. The NHS provides stop tobacco service free of cost. Although the number of smokers has declined in the country, still the rate is not very high and new types of tobacco users of various forms are increasing. There is no doubt tobacco consumption is a detrimental personal habit and must be taken seriously not only by discussing the problem but also by taking appropriate active measures.

I am very happy to be a part of nicotine replacement therapy (NRT) initiative and tobacco addiction research. As a dental professional and an implantologist I am worried about my implants patients in the event they should start smoking and the very real risk of smoking induced peri-implantitis.

My dear colleague Professor Chowdhury, who is also a faculty member of The City of London Dental School has made enormous efforts to establish an NRT clinical service provided by dentists and supporting research in to tobacco addiction. This book explains in detail the oral health parameters to be assessed while treating a dental patient who is a smoker/ quid chewer. It is strongly recommended that this simple assessment method developed by Professor Chowdhury be used to assess the oral health risk of smokers intending to have implant treatment. At present it is not known how effective NRT works for tobacco chewers and other addictive substances, but if a standardized method of assessment and follow-up monitoring is employed a considerable benefit is predicted.

The handbook is well written, based on valid scientific information, and includes a proven protocol using dental parameters important for assessment and risk management. The work done by Professor Chowdhury promotes patient feedback. Also you may be interested to develop your own NRT clinical service and contribute to conducting addiction research with the help of this book. Our thanks to Professor Chowdhury.

SH
Stewart Harding
Dean, City Of London Dental School Faculty of
Health Science, BPP University
P. +44 (0)1235 468571 Email. Stewart@cl-dental-School.CO.uk www.bppumversity.com

BPP University, in Collaboration with City of London Dental School. Offers Six Programmes of Masters in Clinical Dentistry.
It gives me immense pleasure to note that Prof Chittaranjan Chowdhury is going to publish a Handbook on Nicotine Replacement Therapy (NRT). He has got immense experience in Anti-Tobacco campaign and NRT- working at Warwick University (UK) & NITTE University (Bangalore), running Special NRT clinics, organizing several workshops and having written Books for the common men.

WHO predicts that Incidence of Cancer is going to increase even further and very soon, almost every family will have a member who will be affected by Cancer. It is unfortunate that even now we don’t know the exact cause of Cancer in many instances, but it is even more unfortunate that although the commonest cause is known to us, hardly anything is done about it. Yes, almost 40% of all cancers are related to Tobacco, and if this can be avoided- the incidence of Cancer will come down by 40%. It not only causes Cancer in the particular individual but also to his near and dear ones who are inhaling the smoke passively. Besides, it can also cause different ailments which can kill an individual like Heart Attack, Stroke, Bronchitis, stomach ulcers, gangrene of the legs etc.

Once a person is addicted to Tobacco, it is very difficult to come out of it for the Nicotine content in it, although per se it is not that harmful compared to more than 4000 chemicals that are there in Tobacco. So if only Nicotine can be given in the form of chewing gum or patch, the craving for Tobacco is taken care of, and gradually this too can be withdrawn.

Saroj Gupta Cancer Centre & Research Institute (formerly known as Cancer Centre Welfare Home & Research Institute) at Thakurpukur was started way back in 1976 on a donated piece of land under the able leadership of reputed Oncologist Padmashri Dr Saroj Gupta with the aim of fighting against Cancer with the main focus on underprivileged people. With the help of several individuals, school children, several NGOs, the 25 bedded Welfare Home has become a 310 bedded comprehensive Cancer Institute with all the modern diagnostic and treatment facilities. Regular Academic sessions, conferences for the Doctors, Nurses and Paramedical personnel take place here, and there are several ongoing Researches to find out the causes of all kinds of cancers and their possible remedies.

Prof Chowdhury has already started Workshops on NRT for the Nurses and Doctors in our Centre, which will continue to happen regularly. In addition he is also about to start MCh & PhD programmes in the field of Head and Neck Cancers. In addition, he is soon going to start a NRT Clinic at our centre and also organize several Cancer Awareness programmes in Kolkata especially in Schools and Colleges.

I am sure, with his dynamism, hard work and vast experience, he will be able to achieve every success in all his endeavours.

Dr Arnab Gupta   FRCS (Edin), FRCS (Eng), FIAGES,
Director & Surgical Oncologist,
Saroj Gupta Cancer Centre & Research Institute,
Thakurpukur, Kolkata

Goodwill message from
Dr Arnab Gupta, Director, Saroj Gupta Cancer Centre & Research Institute, Kolkata, India

171
Message

This handbook, “Nicotine Replacement Therapy and Follow-up Assessment” edited by Prof. Chitta Chowdury, fills an important void in the resources available for tackling the menace of nicotine dependence, particularly in developing countries. Nicotine dependence and its management need to be understood in its socio-cultural contexts and such contributions from the perspective of developing countries are particularly welcome.

A group of international experts bring their rich and varied experiences together in this well researched treatise that will no doubt prove to be a useful guide for health care providers in the field of nicotine deaddiction. It is noteworthy that a holistic approach to nicotine addiction is advocated in the handbook including aspects such as assessment of nutritional status, oral health and ocular complications – aspects which have hitherto not received sufficient attention. The handbook also provides much needed guidelines for prescription of nicotine replacement products that are accessible and affordable.

Prof. Chitta Choudhary’s efforts in promoting the understanding of nicotine related health issues and in developing nicotine replacement therapy services are laudable. I congratulate him on the publishing of this handbook and wish him success in his future endeavours in this field.

Prof. (Dr.) Satheesh Kumar Bhandary
Dean, K.S. Hegde Medical Academy
Nitte University, Mangalore – 575018
E-mail: dean.kshema@nitte.edu.in
Tel: 0824 -2204490 / 91
www.kshema.nitte.edu.in
This publication is very much helpful for dental professional wants to be involved in tobacco control programme, because, many oral diseases are related to tobacco habit. Oral Cancer is a fatal disease which is completely preventable, and is strongly associated with tobacco habit as well. Nicotine replacement therapy is one of the measures that helps prevent oral cancer. Dental professionals opt to have a promising role in nicotine replacement therapy. Nicotine replacement therapy (NRT) helps many tobacco dependents; therefore dentists’ role in stopping tobacco can not only help periodontal destructions, bad mouth odor also deadly disease such as oral cancer—in is our big concern.

The handbook on NRT clinical service and assessment edited by Professor Chitta Ranjan Chowdhury is quite comprehensive in terms of clinical operational procedures and quantitative assessment of the values and indices for a research. Therefore, this book helps proper monitoring of the clinical services and tobacco related addiction research. I have my every cooperation with Professor Chowdhury- who is directly involved with us to pursue collaborative research in oral cancer prevention and control. We had joint research supported by Japan Society of Promotion of Science (JSPS), and we are in touch to take the researches on oral cancer prevention and control forward.

This handbook contains many evidence based information from published researches—a good compilation, and an outcome-experience based protocol for NRT clinical services led by Professor Chowdhury. Such instance naturally influences many dental professionals to set up NRT clinical practices elsewhere. Professor Chowdhurys Indian Unit of NRT service also includes addiction research—is an excellent initiative. I am privileged to be involved in his action-based programme and help contribute in publishing the handbook of Nicotine Replacement Therapy and Follow-up Assessment. This useful publication will help many dental professionals who are interested for saving lives by incorporating an effective tobacco cessation programme of its kind. My best wishes to Chitta.

T. Kirita
Tadaaki Kirita
Professor & Chairman
Department of Oral and Maxillofacial Surgery
Nara Medical University, Japan
Phone: 81-744-22-3426
Email. tkirita@naramed-u.ac.jp

Goodwill Message
Professor Tadaaki Kirita, Chairman, Department of Oral & Maxillofacial Surgery, Nara Medical University, Japan
CONTACTS of Editor
Professor Chitta Chowdhury
PhD(Japan), MPH (UK), FFDRCS(Ireland), FRSH(UK), BDS (DU), DND(DU)

crc.ob.cod@gmail.com | C.R.Chowdhury@warwick.ac.uk

UK office
Professor Department of Education & Development, Warwick Dentistry
The University of Warwick Medical School PG Dentistry, Coventry, CV4 7AL, UK
Director, UK Centre for Tropical Oral Health

SE Asian /Indian Office
Head, Department of Oral Biology & Genomic Studies (OBGS)
Oral & Maxillofacial Cancer Services (Prevention & Control)
AB Shetty Memorial Institute of Dental Sciences
Nitte University, Deralakatte, Mangalore 575 018, India

Kolkata (Calcutta) Office
Course Director & Convener, NRT Service, Cancer Prevention & Control
Saroj Gupta Cancer Centre & Research Institute, Thakurpukur, Kolkata 700063

Links / Collaboration
ST for SE Migrants in the UK (Stakeholder) of National Institute of Health & Clinical Excellence (NICE), DoH, UK
City of London Dental School, BPP University, London
Nara Medical University, Japan
Osaka Dental University, Japan.
Professor Chitta Chowdhury is the founding Chairman of the Department of Oral Biology and Genomic Studies and an adjunct Clinical Professor in Oral Surgical Science at AB Shetty Memorial Institute of Dental Sciences of Nitte University, Mangalore. He is also acting as Consulting Dean of Community-Oriented Dental School of Peoples Health University of Dhaka. He established Nicotine Replacement Therapy (NRT) services (clinical and training) and conducts addiction researches for tobacco, particularly for tackling smokeless tobacco (ST) associated oral – head-neck cancer and oral pre-cancerous lesions.

Professor Chowdhury is a Stakeholder of National Institute of Health and Clinical Excellence (NICE, DoH) for ST in the UK. Currently he is the Past-President of UK based Institute of Health Promotion and Education (IHPE, UK).

This year (2014) Professor Chowdhury is elected as the President and CEO of the Indian Academy of Oral Biology.

Professor Chowdhury is also a Visiting Professor at Osaka Dental University, Japan—pursuing collaborative researches in Oral Cancer. He has been appointed as an academic in the Department of Education and Development of the Warwick Dentistry, the University of Warwick Medical School, Coventry, UK. Recently, he initiated Global University Alliance to help promote essential education and researches for the underserved. He is also Director of International Programme of Tropical Oral Health in the UK linked with extended units at Nara Medical University, Japan and Nitte University of India—running number of oral cancer projects within the identified tropical countries in Asia and Africa.

He is also a consultant to the Global Child Dental Health at Kings College London. He entered in the specialist list of oral surgeons with the General Dental Council of the UK, and selected as one of the examiners (for MJDF 2009) of Royal College of Surgeons of England.

He is successful to receive number of grants-in-aids of them—(i) Swedish International Development Agency (SIDA) for a joint study of computer aided pattern recognition of oral pre-cancer hosted at Chalmers University of Technology, Gothenburg; (ii) Japan Society for Promotion of Science (JSPS) for molecular research etc. He published many useful researches on oral cancer prevention, and wrote books, of them “Handbook of Oral Cancer Screening and Education- A Guideline Protocol” -BDJ review http://www.nature.com/BJD/journal/v210/n9/full/sj.BDJ.2011.380.html and “What You Need to do When Oral Cancer and Pre-Cancer is Suspected” are worth mentioning. This year he published another book “Essentials of Health Research – A Guide for Beginners”. He conducted many international working group meeting on oral and head-neck cancer in the UK, Japan, India and came up with several declarations on to the proceeding and outlined road-map to tackle deadly oral and head-neck cancer. Qualifications-wise, after completing his undergraduate studies in Dentistry (1980), he did a Postgraduate Diploma in Applied Nutrition & Dietetics from Dhaka University (1982). He is trained in Oral and Maxillofacial Surgery from Okayama University Dental School Department of Oral & Maxillofacial Surgery of Japan. In 1991, he was awarded with PhD from Asahi University School of Dentistry Department of Oral & Maxillofacial Surgery, Japan, and accomplished research on Oral Cancer epidemiology and immunology. He did his Postdoctoral clinical research and training in Oral & Maxillofacial with the support of prestigious grant from Japanese Society for Promotion of Science (JSPS), and continuing follow-up with bridge fellowship as an alumni of JSPS-London. He did his Masters in Public Health Science (MPH) from School of Community Medicine of the University of Manchester. He also finished his fellowship training and completed the exam for FFD RCS in Oral Surgery with Oral Medicine from the Royal College of Surgeons of Ireland. He has extensive clinical experience in general dentistry of 25 years duration, and specialized practice in oral surgery both in developing and developed countries—specifically in India, Bangladesh, Japan and the UK. Apart from hospital practice, he ran his own surgeries, where he performed the clinical procedures independently, also involved to train the junior dentists, dental/medical students and allied health professionals in the countries. He developed a primary care services for the underserved patients/community—based on the concept of Community/patient involvement for health development. Professor Chowdhury is also given faculty role to teach, guide and examine the MClinDent candidates enrolled at BPP University City of London Dental School, UK. He lives in the UK with his wife and a son (are in NHS, UK), and he divides his time between India, UK and Japan. Chitta is a humanist, loves nature, wild-lives and cognizes dialectics in practice.