



TOBACCO AND SENSORY ORGANS

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Quit Tobacco International, including development of the curriculum, is a team effort, in which individuals have different responsibilities as described below:

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Islamic University of Indonesia, Yogyakarta

TOBACCO AND SENSORY ORGANS

I. GOAL OF MODULE: Provide students with knowledge about the harmful effects of tobacco on different sensory organs like the eye and skin causing blindness, cataract, macular degeneration, premature aging and delayed wound healing.

II. TARGET AUDIENCE

- a. Undergraduate students
- b. 6–7th semester- *Course or Subject: Ophthalmology & Dermatology (Medicine)*

III. LEARNING OBJECTIVES

- To identify how tobacco use is a risk factor for changes in the skin
- To understand how tobacco causes aging and acts detrimentally on wound healing
- To understand the value of cessation in the prevention of premature aging and poor wound healing.
- To know that tobacco is associated with risk for developing various eye diseases
- To understand how tobacco causes different types of eye diseases
- To understand the importance of smoking cessation in reducing the risk of eye diseases

IV. CURRICULUM STANDARDS ADDRESSED:

India: 6–7th semster during general medicine and ophthalmology postings. Under ophthalmology there are 244 hrs. allotted, wherein

- Lectures of 76 hrs.
- Practicals of 144 hrs. are allotted, spread over 4 semesters: 4th, 5th, 6th, and 7th.

Under general medicine there are 174 hrs. allotted to dermatology and sexually transmitted diseases of which

- Lectures of 30 hrs.
- Practicals of 44 hrs. are allotted over 4 semesters: 4th, 5th, 6th, and 7th.

Objectives are:

- Students shall have knowledge of common problems affecting the eye, principles of management of emergencies, main systemic diseases that affect the eye, effects of local and systemic diseases on the vision and actions needed to minimize the sequelae, adverse drug recations, magnitude of blindness in India and its causes, national programmes, eye care education to prevent problems, role of PHC in eye care, eye bank organisations.
- Students will develop skills to elicit a history pertinent to general health and ocular status, assist in diagnostic procedures and treatment of common eye problems, interpret ophthalmic signs of systemic diseases, assist in therapeutic procedures, provide first aid in emergencies, assist community surveys for visual check ups, use effective means of communication to educate the public on preventing eye diseases, and motivate eye donation.

- Students shall be able to demonstrate sound knowledge of common diseases; clinical manifestations, including emergencies in dermatology; various modes of topical therapy; modes of action of different drugs, their doses, and side effects; toxicity and acquire skills for conducting clinical examination; interpreting physical findings; diagnosing; performing routine procedures; skin biopsy; and management of different skin disorders.

V. MINI-LECTURES

MINI LECTURE 1: TOBACCO AND SKIN

CORE SLIDES

1. Tobacco and Premature Aging of Skin
2. Tobacco and Premature Aging: Mechanisms
3. Cessation and Premature Aging
4. Tobacco and Wound Healing
5. Tobacco and Wound Healing: Mechanism
6. Cessation and Wound Healing

OPTIONAL SLIDES

1. Host Factors that Affect Wound Healing

MINI LECTURE 2: TOBACCO AND THE AGING EYE (CATARACT AND AGE-RELATED MACULAR DEGENERATION)

CORE SLIDES

1. Global Epidemiology: Blindness
2. Epidemiology: Blindness (Indonesia)
3. Epidemiology: Blindness (India)
4. Impact of Smoking on the Eye
5. Tobacco and Cataract: Evidence from India
6. Smoking and Cataract: Suggested Mechanisms
7. Smoking Cessation and Cataract
8. Smoking and Age-Related Macular Degeneration (AMD)
9. Smoking and AMD Mechanisms
10. Smoking Cessation and AMD
11. Cessation Messages

OPTIONAL SLIDES

1. Cataract Management
2. Smoking and Graves' Ophthalmology (GO) or Thyroid Eye Disease (TED)
3. Smoking and Graves' Ophthalmology: Mechanism
Cessation and Graves' Ophthalmology (GO) or Thyroid Eye Disease (TED)

VI. CASE DISCUSSION / CLINICAL SCENARIO

CASE SCENARIO – asking patient about smoking

Overview

In this module, students are asked to practice integrated communication during case discussion under the supervision of instructors, in order to develop their smoking cessation skills. Students will be trained to routinely ask about patients' smoking status in every case. After obtaining patients' current smoking status, students will then practice how to assess patients' readiness to quit, advise and assist patients to quit smoking, and also arrange follow ups to monitor patients' smoking cessation progress. Therefore, students will also learn how to deliver efficient encouragement and provide proper explanation about the harm of tobacco on health and to help patients on their smoking cessation attempts.

Introduction

It is proven beyond a doubt that tobacco is associated with various eye and skin disorders like cataract, blindness, macular degeneration, premature aging, and delayed wound healing. Nicotine in particular has an impact on the working of the eye and is one of the most important causes of blindness. It is also well known that nicotine causes wrinkling and aging in the skin and also delays wound healing, leading to complications.

Learning Objectives

Upon the completion of this skills laboratory practice, students are expected to be able to:

- Routinely ask all patients about their smoking status
- Assess patients' readiness to quit
- Advise patients with cardiovascular problems to quit smoking
- Assist patients to quit
- Arrange follow ups on patients' smoking cessation progress
- Explain the harm of smoking on the cardiovascular system

Asking the patients' smoking history

The health consequences of cigarette smoking are well known; there is no part of the human body that is not affected by tobacco.

In a survey done by QTI, 77% of Indian doctors did not routinely ask patients about smoking. Research studies show that if doctors have a reminder to ask about smoking, e.g. smoking status is part of the vital signs, doctors are three times more likely to advise patients to quit. Simple advice from a physician has been shown to increase abstinence rates significantly (by 30%) compared to no advice (Fiore et al. 2000).

There are several important factors that should be considered when we are asking the patients' smoking history, i.e. 1) ask the smoking status of all patients (including women and

teenagers); 2) if a patient does not smoke, they should be asked if they have ever smoked (because even after quitting, a smoker can start again); 3) questions should be delivered in a non-critical manner; 4) evaluate the patients' smoking history as to how many cigarettes they smoke daily, do they use any other forms of tobacco; and 5) make a note of the patients' smoking status in the medical record (maybe you can indicate patients' smoking status in your patients' card). Women and children should not be excluded and they should also be asked about passive smoking.

Case Scenario

A 45 year old man has a history of appendectomy one month back. The post-operative wound was not healing well and he had complications like infection and gaping of the wound, which was resutured. He has been experiencing pain and oozing in the wound area and is dressing the wound every day.

He started smoking at the age of 15 years and smoked around 2 packs of cigarettes in a day. He used to smoke till one week before the surgery although the frequency had decreased to 10 cigarettes per day. Patient is a businessman and his wife is a homemaker. He has two children in school.

Vital Signs

Blood Pressure: 148/92mm of Hg

Pulse: 76/min

Body Weight: 80kg

Temperature: 98.4F

Smoking Status: Smoker Ex-Smokers Never Smoke (Circle one)

Smoking Status of spouse: Smoker Ex-Smokers Never Smoke (Circle one)

Checklist for Case Scenario

S.No.	Aspects	Please tick if student has covered this aspect
	Ask	
1.	• Ask patient whether he/she smokes or not	
2.	• If the patient doesn't smoke, ask whether he/she ever smoked before	
3.	• If the patient smokes, ask how many cigarettes he/she takes per day	
	Assess	
4.	• Assess patient's readiness to quit.	
	Advise	
5.	• Advise patient to quit smoking	
6.	• Personalize advice by using the tobacco user's health status/disease	
	Assist	
7.	• Assist the patient to quit by giving him/her	

	pamphlets, brochures	
	Arrange for Follow-up	
8.	• Arrange to follow up on tobacco use	

Points for Discussion

Smoking status of the patient clearly shows an addiction of around 30 years and complications of surgery are as a result of this. The patient had also not stopped smoking until the last week before surgery, which again is a cause for the complications.

Smoking causes post-operative complications. Smoking delays wound healing after surgery and may cause infections at the wound sites. If smoking continues, healing of an operation site will take a longer time and discomfort like pain, nausea, irritation will be more likely. Current smokers exhibit less healing and less microbial response to mechanical therapy than do former smokers and nonsmokers.

Patients should be encouraged to quit before surgery. Patients who smoke two or more packs per day are at nearly three times the risk of developing a wound complication. Smoking cessation three months or more before surgery may reduce the risk of wound complication, and patients who are smokers should be encouraged to quit before surgery.

Cessations benefits wound healing post-operatively only if done several weeks before the surgery is scheduled. In general, the rate of wound-related complications in former smokers is similar to those who have never smoked, suggesting that prolonged tobacco abstinence reduces risk. Recent studies show a substantial benefit in the rate of wound-related complications in orthopedic surgery patients who quit smoking several weeks before surgery. If preoperative smoking intervention can reduce the complications, the savings in personal suffering and financial expense should be substantial.

FACT SHEETS TO SUPPORT DISCUSSION (STUDENT HANDOUTS)

Tobacco and Sensory organs

1. Cataract is the major cause of blindness representing 48% of global blindness.¹
2. India has a large cataract burden, accounting for 44% of total blindness.²
3. Tobacco smoking is an independent and modifiable risk factor for development of a range of eye diseases including: cataract, age-related macular degeneration (AMD), Graves' Ophthalmology (GO), or thyroid eye disease (TED).³
4. Current smokers are three times more likely to develop cataract than never smokers, with the risk increasing with number of cigarettes smoked.⁴
5. Smokeless tobacco use was more strongly associated with cataract.⁵
6. Ex-smokers have lower risk of cataract, indicating beneficial impact of smoking cessation.⁴
7. Compared to current smokers, those who stopped smoking for >25 years had a 20% lower risk for cataract.⁶
8. Promoting tobacco cessation among ophthalmic patients could contribute to significant improvements in eye health in India.⁷
9. There is a 3–4 fold increase in risk of AMD among current smokers compared with never smokers.⁸
10. Tobacco acts by reducing macular pigment and plasma levels of antioxidants, degradation of Bruch's membrane, and causing vascular insufficiency.^{8,9}
11. Smokers have 1.3 times increased risk of developing Graves' ophthalmology, higher risk of progression and have poorer outcome of treatment.^{9,10}
12. The fear of going blind may be more motivational than health warnings and advice from ophthalmologists and could potentially facilitate cessation.³
13. Tobacco smoke and UVA cause wrinkle formation independently of each other.¹¹
14. Cigarette smoking causes occurrence of yellow fingers, enhanced wrinkling, especially in the faces of females, precancerous lesions and squamous cell carcinomas on lips and oral mucosa, and vasospasms and obliterations of large arteries as well as of small skin vessels.¹²
15. Dermatologists can play an integral role in promoting smoking cessation by providing expert opinion and educating the public about the deleterious effects of smoking on the skin.¹³
16. Smokers are at increased risk for complications, not only at the surgery sites, but rather at the flap's interface with the wound or overlying skin graft.¹⁴
17. SHS stimulates proteins that enhance cell survival and inhibit cell migration, processes that may result in abnormal repair and remodeling and/or lead to excess scarring.¹⁵
18. Nicotine causes increased vasoconstriction and damage to the epithelial layer of the vessel, interactions with collagen metabolism, induction of an inflammation reaction and immunosuppression.¹⁶
19. Smoking cessation three months or more before surgery may reduce the risk of wound complication.¹⁷
20. If preoperative smoking intervention can reduce the complications, the savings in personal suffering and financial expense should be substantial.¹⁸

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2. Dandona L, Dandona R, Srinivas M, Giridhar P, Vilas K, Prasad MN, et al. Blindness in an Indian State of Andhra Pradesh. *Invest Ophthalmol Vis Sci.* 2001; 42:908–16.
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11. Yin L, Morita A, Tsuji T. Skin aging induced by ultraviolet exposure and tobacco smoking: evidence from epidemiological and molecular studies. *Photodermatol Photoimmunol Photomed.* 17(4):178–83. Published Online: 21 Dec 2001.
12. Partsch B, Jochmann W, Partsch H. Tobacco and the skin. *Wien Med Wochenschr.* 1994; 144(22–23):565–8.
13. Freiman A, Bird G, Metelitsa AI, Barankin B, Lauzon GJ. Cutaneous effects of smoking. *J Cutan Med Surg.* 2004; 8(6):415–23.
14. Reus WF III, Colen LB, Straker DJ. Tobacco smoking and complications in elective microsurgery. *Plast Reconstr Surg.* 1992; 89(3):490–494.
15. Wong LS, Green HM, Feugate JE, Yadav M, Nothnagel EA, Martins-Green M. Effects of "second-hand" smoke on structure and function of fibroblasts, cells that are critical for tissue repair and remodeling. *BMC Cell Biol.* 2004; 5:13.
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VII. REFERENCE LIST FOR MODULE

Mini Lecture 1: Tobacco and Skin

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Mini Lecture 2: Tobacco and the Aging Eye (Cataract and Age-Related Macular Degeneration)

1. Foster A, Resnikoff S. The impact of Vision 2020 on global blindness, *Eye*. 2005; 19:1133–5.
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VIII. INSTRUCTOR KEY RESOURCES/REFERENCES

Mini Lecture 1:

1. Kelly SP, Thornton J, Edwards R, Sahu A, Harrison R. Smoking and cataract: review of causal association. *J Cataract Refract Surg* 2005; 31:2395–404.
2. Krishnaiah S, Vilas K, Shamanna BR, Rao GN, Thomas R, Balasubramanian D. Smoking and its association with cataract: results of the Andhra Pradesh eye disease study from India. *Invest Ophthalmol Vis Sci* 2005; 46:58–65.
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Mini Lecture 2:

1. *Hautarzt*. 2004 Mar;55(3):301–15; quiz 316, Addiction to tobacco and the consequences for the skin, Krug M, Wünsche A, Blum A.

IX. INSTRUCTOR WEB-SITE RESOURCES

1. <http://www.osteomyelitis.com/images/classification2-big.jpg>
2. http://www.medindia.net/patients/patientinfo/smoking_hazards_skin.htm#ixzz0ILMlfkaB

X. SAMPLE EXAMINATION QUESTIONS

Short Answers

1. How does nicotine cause cataract?
2. What changes occur to the healing wound due to smoking?
3. Can smoking cessation reduce the risk of aging and wound healing? How?

Multiple Choice Questions:

1. Tobacco causes all except
 - a) Delayed wound healing
 - b) Delayed aging
 - c) Cataracts leading to blindness
 - d) macular degeneration
2. Tobacco causes the following in wounds except

- a) Decreased vasoconstriction
 - b) Interactions with collagen metabolism
 - c) Induction of an inflammation reaction
 - d) Immunosuppression
3. tobacco causes the following in premature aging of skin
- a) Decreases the formation of collagen
 - b) Reduces oxygen & water content of skin
 - c) Degradation of elastin in the dermis.
 - d) All of the above
4. Which among the following is a true statement?
- a) Smokers have low prevalence of cataracts
 - b) Smokers develop cataracts at an earlier age
 - c) Smokeless tobacco has stronger association with cataracts
 - d) Tobacco cessation had a protective effect for cataract development