



D Y PATIL DENTAL SCHOOL

---

DEPARTMENT OF  
PUBLIC HEALTH DENTISTRY



# Oral cancer

---

Epidemiology  
Prevention and Control



# Introduction

---

- Oral cancer is an important public health issue because its occurrence is strongly associated with tobacco and alcohol.
- Oral cancer is often associated with severe loss of function, disfigurement, depression and reduces quality of life.
- Oral cancer still remains as highly lethal and disfiguring disease.



# Epidemiology

---

- Oral cancer is one of the ten leading cancers in the world.
- 3-5% of all cancers in highly industrialized countries.
- 40% of all cancers in developing countries.
- Tongue remains most common intraoral site worldwide.



## Indian Scenario:

---

- India has one of the highest incidence of oral cancer in the world because of betel quid chewing and tobacco and also other forms of tobacco.
- Among different cancers oral cancer ranks number one among men and number 3 among women.



## Indian Scenario contd...

---

- The oral cancer prevalence ranges from 15-70% of all cancers diagnosed. At any given time there are half million cases of cancer in the country
- 7% of all cancer deaths in males and 4% in females is due to oral cancer .
- Maximum prevalence in 5<sup>th</sup> and 6<sup>th</sup> decade of life.



# Etiology

---

Host factors

Agent factors

Environmental factors



# Host factors

---

**Age** : In Western countries 98% of cases are patients over 40 years of age and in eastern countries (South east Asian countries) it is seen more commonly before age of 35 years.

**Race** : Odontogenic tumors more common in black races



## Host factors

---

**Ethnicity:** Ethnicity strongly influences prevalence due to social and cultural practice. In different culture, different habits are strongly related to the risk factors (use of tobacco)



# Host factors

---

**Gender :** In industrialized countries men are more affected than women problem because of higher indulgence in risk factors such as alcohol and tobacco.

**Genetic factors :** Genetic elements in in the initiation and progression of malignant disease have been identified.



## Host factors contd...

---

**Occupation** : More in textile workers.

**Immunity** : Kaposi sarcoma is more common in AIDS patients.

**Social class** : More in low-income groups.

**Customs and habits** : Smoking increases the incidence of  
cancer.



---

## Site distribution:

Lip cancer is the most common in fair skinned races who work outdoors.

In Western countries, the most commonly affected sites are:

- Lateral border of tongue
- Floor of the mouth



---

In South Asian countries:

- Buccal mucosa
- Retromolar area
- Commisural mucosa.



# Agent factors

---

**Biological** : Viruses ( HIV, HSV)

Fungus ( Candida)

**Chemical** : Arsenic, dyes, etc.

**Mechanical** : Sharp tooth, ill-fitting dentures.

**Nutritional agents** : Protein deficiency , increased

consumption of red chilly power, etc.



# Environmental factors

---

**Water contaminants** :Like chloroform.

**Air pollution** :Gases from automobiles and factories, Eg :CO<sub>2</sub>

**Geographic variations** : Netherlands: Buccal mucosa

Switzerland: lip and tongue

**Solar heat** : Prolonged exposure to sunlight causes melanoma.

**Industrialization** :Various toxins by industries cause cancer.



# Tobacco

---

**a) Bidi :** It is the most popular form of tobacco in India. Out of the total production of tobacco in India about 34% is used for the manufacturing of Bidi. The nicotine content has been estimated to be 1.7 to 3mg and tar as much as 45-50mg.



## Tobacco contd...

---

**b) Chillum** : It is a straight 10-14cm long conical clay pipe used for smoking tobacco. The chillum is held vertically and to prevent tobacco from entering the mouth, a pebble or a stopper is introduced into the chillum.

**c) Chutta** : A somewhat cylindrical coarsely prepared cheroot. Cured tobacco is wrapped in a dried tobacco leaf.



Fig. 8. *Chilums.*



## Tobacco contd...

---

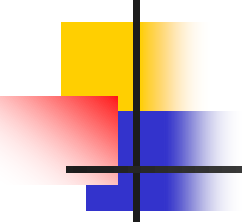
**d) Cigarettes :** About 1gram of tobacco cured in the sun or artificial heat is covered with paper. The tobacco is generally treated with a variety of sugars, flavoring and aromatic ingredients. They are estimated to contain 1-1.4mg of nicotine and 19-27mg of tar.

# Tobacco contd...

**e) Dhumti :** They are somewhat conical cheroots. Rolled leaf tobacco is used inside a leaf of fruit tree. Sometimes dried leaf of the banana plant is used.



Fig. 5. Dhumti preparations.



---

**f) Gudakhu** : is paste of powdered tobacco, molasses (brown sugar) and other ingredients primarily used to clean tooth. It is used predominantly by women in Bihar.

# Tobacco contd...

**g) Hookah :** It is also called water pipe or Hubble-bubble. It is used in places with strong Moghul cultural influence.

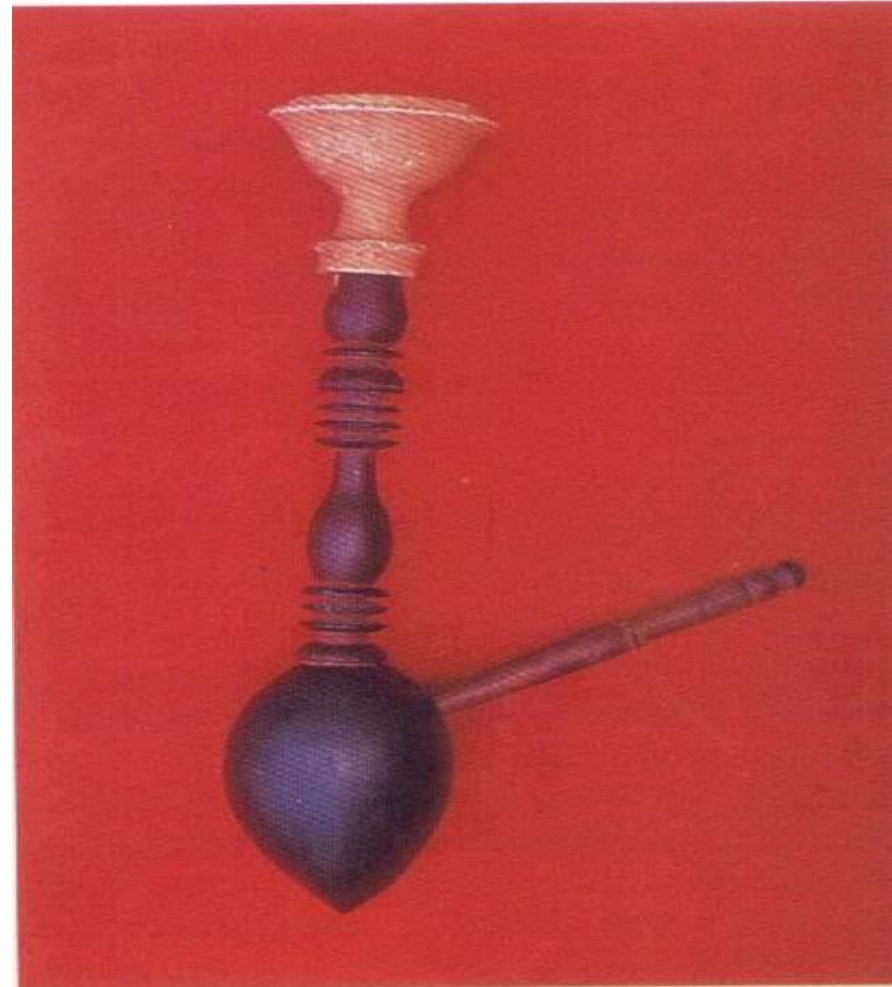
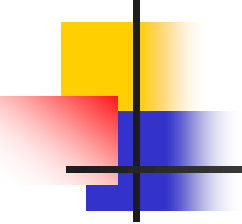


Fig. 9. A hookah.



---

**h) Hookli :** It is a clay pipe of rather short stem varying from about 7 to 10cms with a mouth piece and a bowl. It is commonly used in Bhavnagar district of Gujarat.



## Tobacco contd...

---

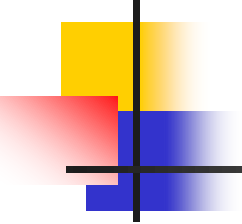
**i) Khaini :** It is a powdered sun-dried tobacco, slaked lime (calcium hydroxide)-paste mixture occasionally used with arecanut. It is simply placed in the mouth or chewed. This form of smokeless tobacco is widespread in use in Maharashtra and several states in North India.

# Tobacco contd...

The ingredients are vigorously mixed with the thumb to make the mixture alkaline and is placed in the premolar region of the mandibular groove.

Fig. 14. Preparation of *khaini*.



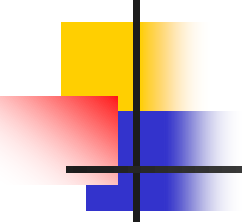


---

**j) Mainpuri Tobacco** : Ingredients are tobacco, slaked lime, finely cut arecanut, camphor and cloves.



Fig. 12. *Mainpuri* tobacco.  
Note finely-cut areca nut.

- 
- 
- **k) Mishri/Masheri** : It is prepared by roasting tobacco on a hot metal plate until it is uniformly black. It is then powdered. It is used with or without catechu.



## Tobacco contd...

---

**1) Mava :** It is a preparation containing thin shavings of arecanut with the addition of some tobacco and slaked lime. It is usually sold wrapped in cellophane papers and tied in the shape of a small ball. Before consumption the packet is rubbed vigorously to mix the contents and the mixture is chewed until it becomes softer after which it transferred to the mandibular groove.



Fig. 13. A *mawa* preparation.



## Tobacco contd...

---

**m) Paan** : Paan chewing is the most common habit of smokeless tobacco usage in India. Paan refers to the betel leaf (from piper betel wine) itself and often to the quid.

**n) Snuff** : Finely powdered air-cured and fire-cured tobacco leaves. It may be dry or moist, used plain or with other ingredients and may be used orally or nasally.



## Tobacco contd...

---

***Bajjar*** is a dry snuff used by about 14% of the women in Gujarat. It is carried in a metal container, a twig is dipped into it and applied over the tooth and gingiva.

***o) Zarda :*** Tobacco leaf is boiled in water along with lime and spices until evaporation. The residual tobacco is then dried and coloured with dyes. It is chewed.



# Constituents in tobacco

---

The following are the constituents of tobacco and the adverse effects caused by each one of them :

1. Polycyclic aromatic Hydro Carbon : It causes carcinogenesis.
2. Nicotine : It is the potential carcinogenic agent.
3. Phenol : It produces ganglionic stimulations and depression and tumour promotion.



# **Constituents in tobacco**

---

4. Benzopyrene : It plays an important role in tumour promotion and irritation.
5. Carbon Monoxide : It produces impaired oxygen transport and repair.
6. Formaldehyde and oxides of Nitrogen : Toxicity to cilia and irritation.
7. Nitrosamine : It is also a potential carcinogenic agent.



# Habits

---

## ***a) Betel tobacco quid chewing and bidi smoking :***

Cancer of lip, tongue and other parts of mouth.

i) Betel quid chewing : Paan has four main ingredients betel leaf, arecanut, slaked lime and catechu. It is alkaline. Hence, there is a chronic alteration to the oral mucosa in habitual paan chewers because of the pH alteration, due to slaked lime, many times a day.

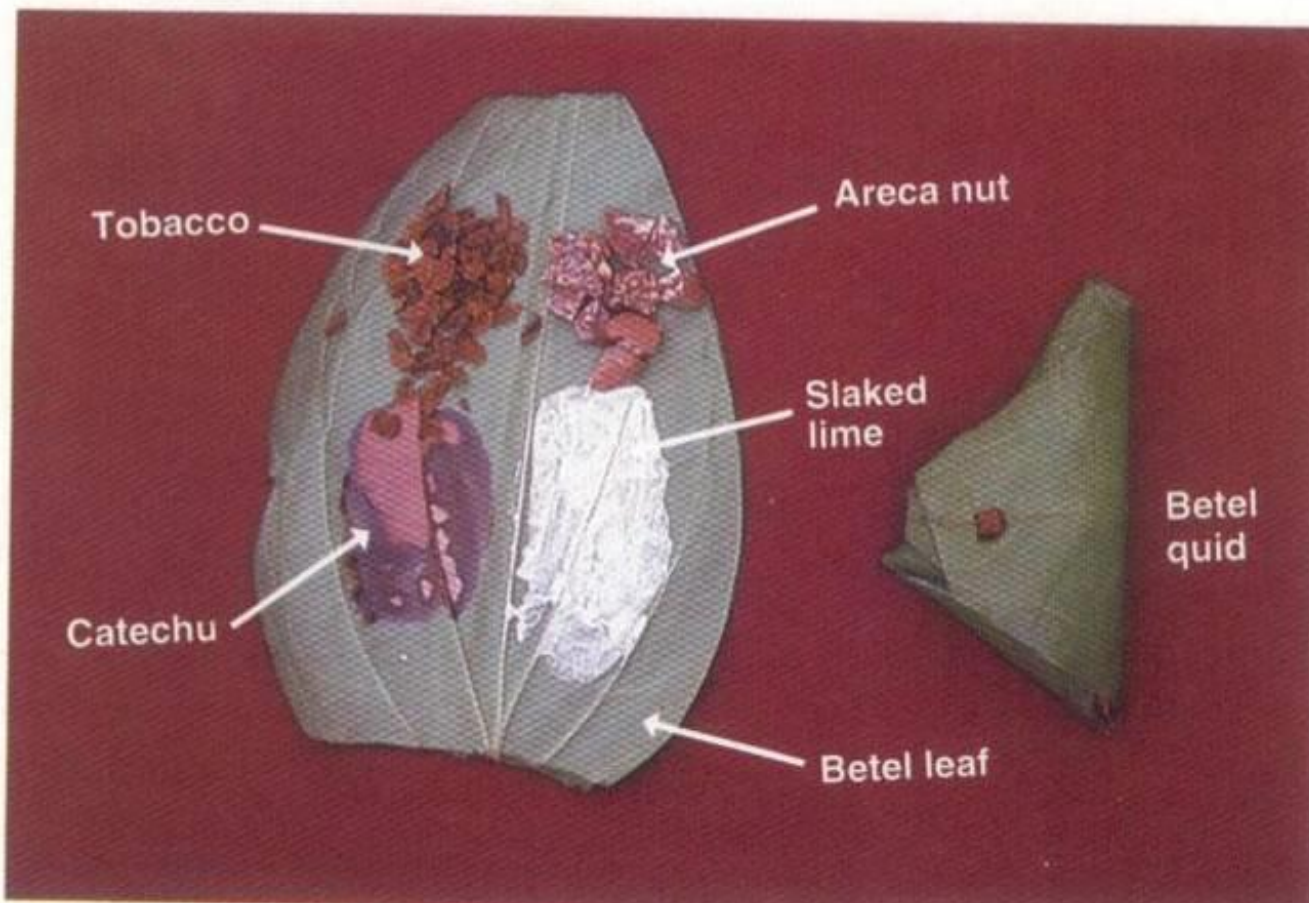


Fig. 10. A betel-quad (*pan*) preparation.



# Habits

---

***b) Other tobacco-lime preparation :*** The use of Khaini is widespread in Maharashtra and several states of North India. The two ingredients are carried separately in a double-ended metal container.

Khaini is placed in the canine-premolar region of the mandibular groove. The mixture is not chewed as such but is sucked from time to time for about 10 to 15 minutes till it becomes bland.



# Habits

---

**c) Other forms of powdered tobacco :** The use of snuff had gained respectability. The site of placement of the snuff is primarily a matter of customs and social habits.

Mishri is also used as a substitute for chewing tobacco. It has been reported that by the age of 10 years. 50% of the poor Mumbai females use it. It is believed by them that roasted tobacco is good for the teeth.



# Habits

---

## **d) Smoking :**

**i) Reverse smoking :** The habit of tobacco smoking with the lighted end inside the mouth (reverse smoking) is found in people of the lower socio-economic states in Colombia, Panama.

**ii) Pipe Smoking :** A high incidence of lip cancer has been observed in those who smoke with short-stemmed pipes.

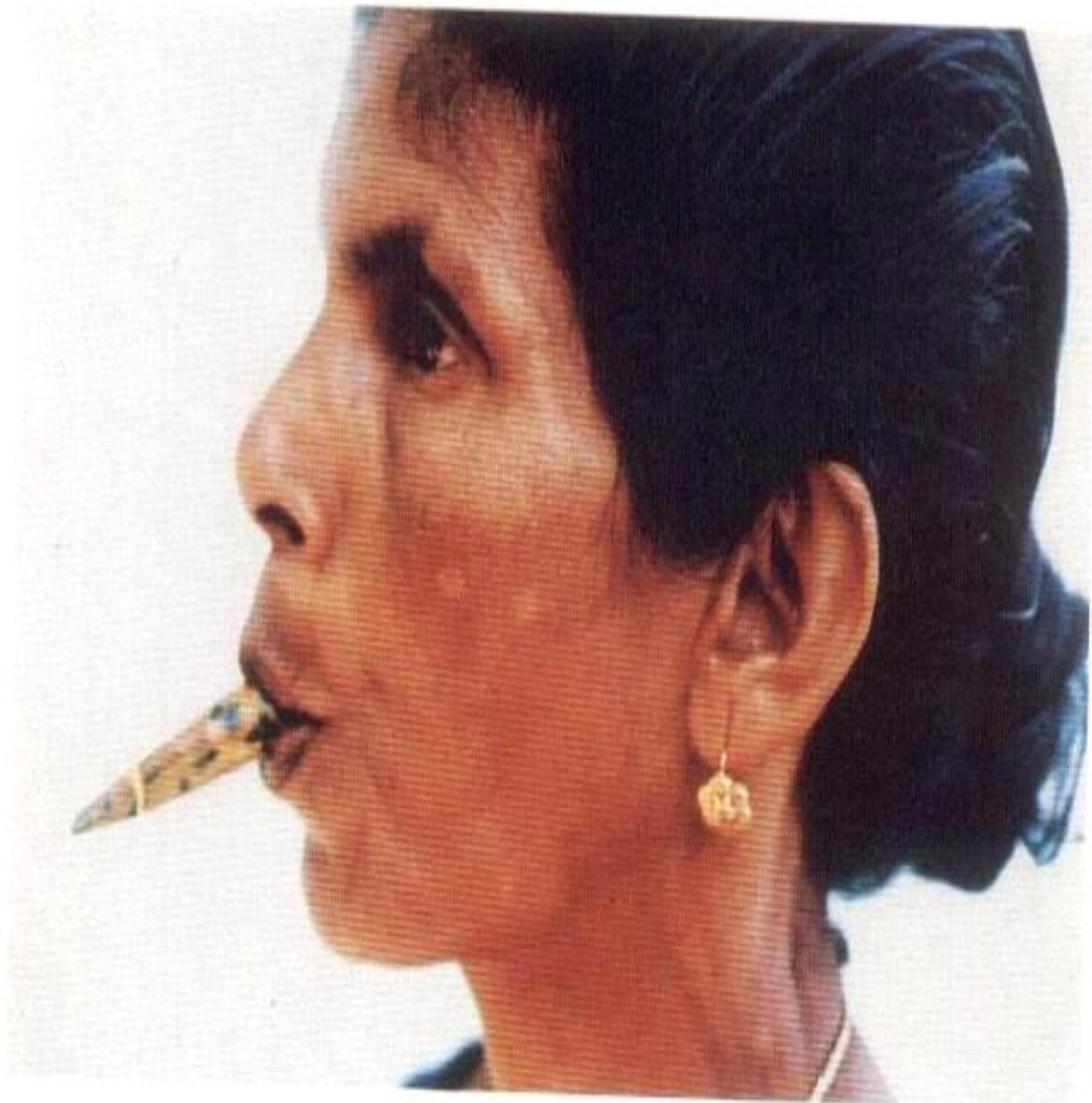


Fig. 6. Reverse *dhumti* smoking by a Christian woman from Goa.



# Habits

---

## *2. Alcohol :*

Alcohol an independent risk factor. A synergistic effect of tobacco and alcohol has been observed. They account for 75% of all oral and pharyngeal cancers and have been implicated in the formation of multiple primary cancer sites found in oropharyngeal patients.



# Habits

---

The risk in consumers of alcohol depends on the type and the amount consumed. Heavy drinkers who smoked over 20 cigarettes per day were observed to be 24 times more likely to have oral cancer.



# Habits

---

Alcohol may promote carcinogenesis by various mechanisms which may include dehydrating effects of alcohol on the mucosa increasing mucosal permeability and effects of carcinogen in tobacco, nutritional deficiency and solubilizing tobacco. Also liver damage may weaken the immunological status.



# Diagnosis of oral cancer

---

- Biopsy
- Exfoliative cytology
- Toluidine Blue stain
- Computed Tomography Scan
- Ultrasound
- Magnetic Resonance Imaging



# PREVENTION AND CONTROL OF CANCER

---

It has been estimated that 65-80% of cancer is environmental, attributable to lifestyle and thus may be prevented. Out of the approximately 56000 new cancer cases, about 70% have been attributed to tobacco use.



# PREVENTION AND CONTROL OF CANCER

---

There are three well known approaches to public health

1. Regulatory or legal approach
2. Service approach and
3. The educational approach.



# PREVENTION AND CONTROL OF CANCER

---

**1.Regulatory or legal approach :** In India, where a National Cancer Control Programme was launched in 1985, apart from having more eye catching health warning displays, banning of advertisements on tobacco products may need to be done.

## **2.Service Approach :**

- a) Biopsy Techniques
- b) Toludine Blue Vital Staining



# PREVENTION AND CONTROL OF CANCER

---

## **3.Educational Approach :**

The process of becoming a smoker for e.g. involves four stages

- Awareness
- Initiation/experimentation
- Habituation
- Maintenance/dependence



## National prevention programmes.

---

1975- Cigarettes act introduced

NPP – Government officials

In India a national cancer control programme was launched in 1985.

Maharashtra has taken a lead in formulating state policy.



---

## There are two aspects to a PPP

### I. Legislation

- A. Prohibit the sale to minors
- B. Prohibit advertising of tobacco products.
- C. Restrict smoking of tobacco in public places.
- D. Increase taxes on tobacco products.



---

## II. Health education

- A. To encourage school children not to adapt any tobacco habits.
- B. To encourage people not to retain the quid in the mouth during sleep.



# Rehabilitation

---

The rehabilitation team should consist of speech and occupational therapist, physiotherapist, maxillofacial prosthodontist and a psychiatrist.



# Rehabilitation

---

A. De-addiction programme for smokers.

In Oct 1996, Ciba-Giegy the multinational pharmaceutical company introduced in India the first transdermal (skin) patch to wean smokers away from the habit. 90 days programme costs Rs.9000



## Role of dentist in detecting and preventing cancer.

---

- Dentist holds a vital role in prevention and detection of Oral Cancer.
- Screening and examination are both elements of dental practice routine.



# TREATMENT FOR CANCERS

---

1. Surgery
2. Radiotherapy
3. Chemotherapy

**Table 8-4.** Oral cancer: individual, community, and dental professional preventive dentistry services

Preventive services	Primary		Secondary	Tertiary	
	Health promotion	Specific protection	Early diagnosis and prompt treatment	Disability limitation	Rehabilitation
Services provided by the individual	Periodic visits to dental office; demand for preventive services	Avoidance of known irritants	Self-examination and referral; utilization of dental services	Utilization of dental services	Utilization of dental services
Services provided by the community	Dental health education programs; promotion of research efforts; lobby efforts		Periodic screening and referral; provision of dental services	Provision of dental services	Provision of dental services
Services provided by the dental professional	Patient education	Removal of known irritants in oral cavity	Complete examination; biopsy; oral cytology; complete excision	Chemotherapy; radiation therapy; surgery	Maxillofacial and removable prosthodontics; plastic surgery; speech therapy; counseling

Modified from Dunning, J.M.: Principles of dental public health, ed. 4, Cambridge, MA, 1986, Harvard University Press; and Mandel, I.: What is preventive dentistry? J. Prev. Dent. 1:25, 1974.



# Conclusion

---

- Oral cancer is mainly a lifestyle related disease.
- Dentist, Hygienist and other health related personnel, have the responsibility to assist their patient in minimizing the risk factors through effective health education. Oral cancer can be easily detected at the earliest stage.



# Conclusion

---

- Screening for Oral Cancer is easy and inexpensive and causes little discomfort.
- Smaller cancerous lesions are easily treated and the later stage may have to undergo costlier and complex treatment.



# Conclusion

---

**31<sup>st</sup> May - No Tobacco Day**