

Pathological Effects of Tobacco



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Products

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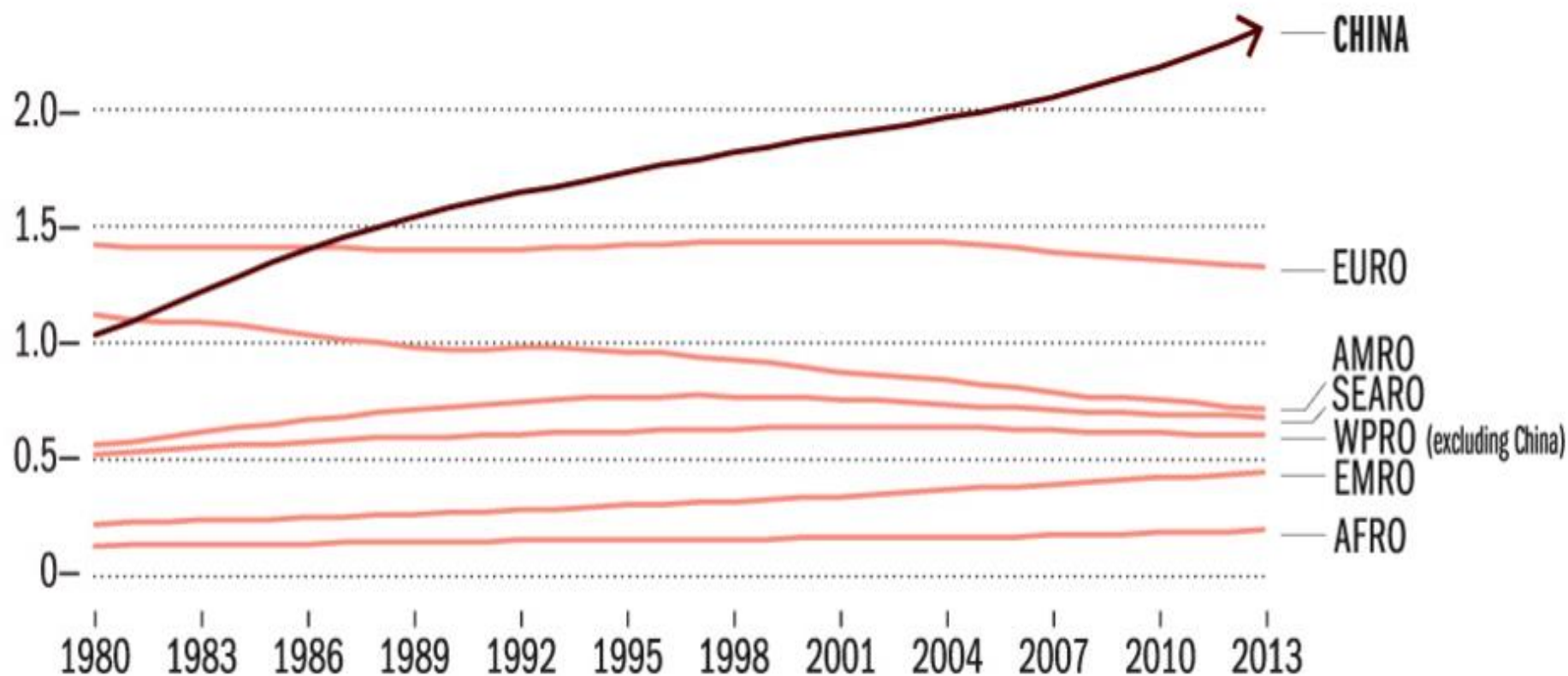
- Introduction
- Mechanism of Action - Adverse Health Effects
- Harm from Tobacco
- Physiological effects
- Pathological effects
 - Cancer
 - Cardiovascular disease
 - Diabetes and Insulin Resistance
 - Reproductive outcomes
 - Sexual disorders
 - Immune system disorders
 - Dental Conditions
 - Addiction
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Scenario

- Tobacco, or the Big 'T' is one of the most widespread global epidemic.
- Current burden – 1.3 billion users (WHO 2015). Expected to decrease up to 1.1 billion users by 2025.
- Fortunately, with Tobacco control measures, the number is slowly coming down.
- India alone has 275 million users (163 million smokeless users, 69 million smokers and 42 million 'both' users).

Consumption

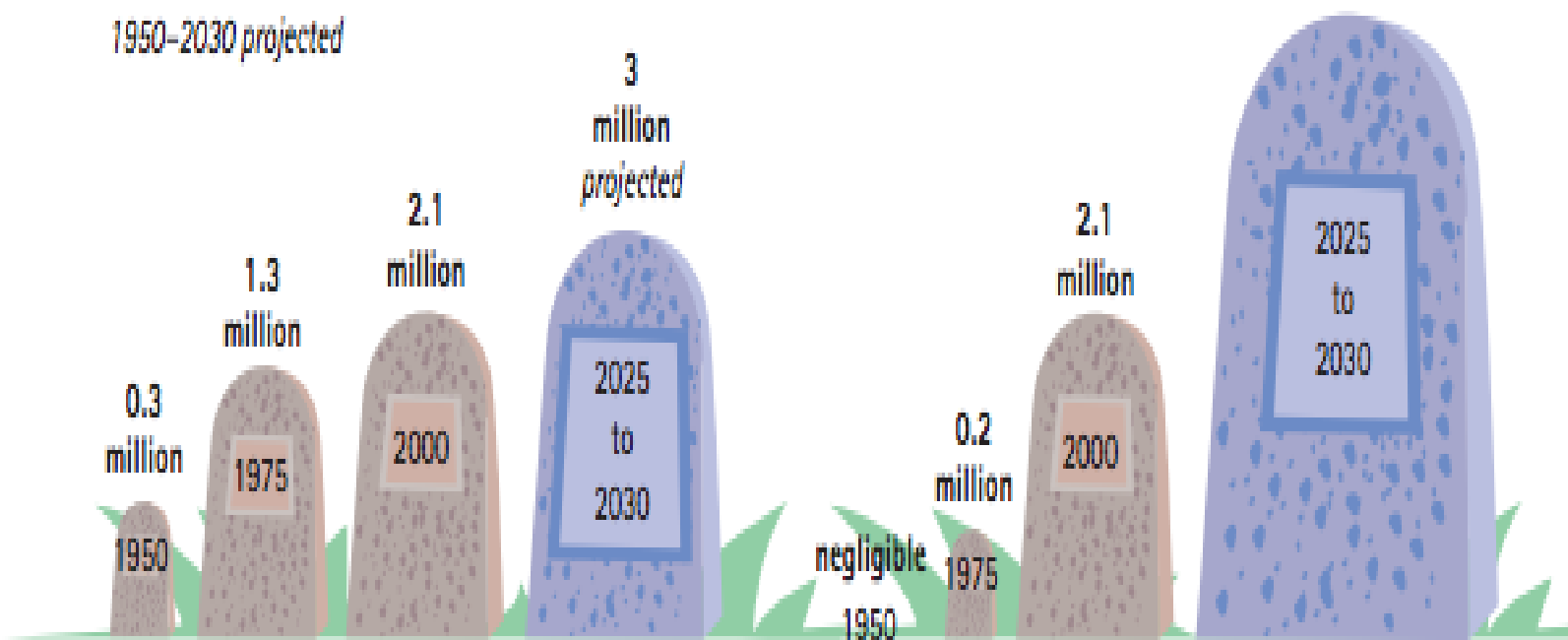
Global Cigarette Consumption by WHO Region, 1980–2013, in trillions



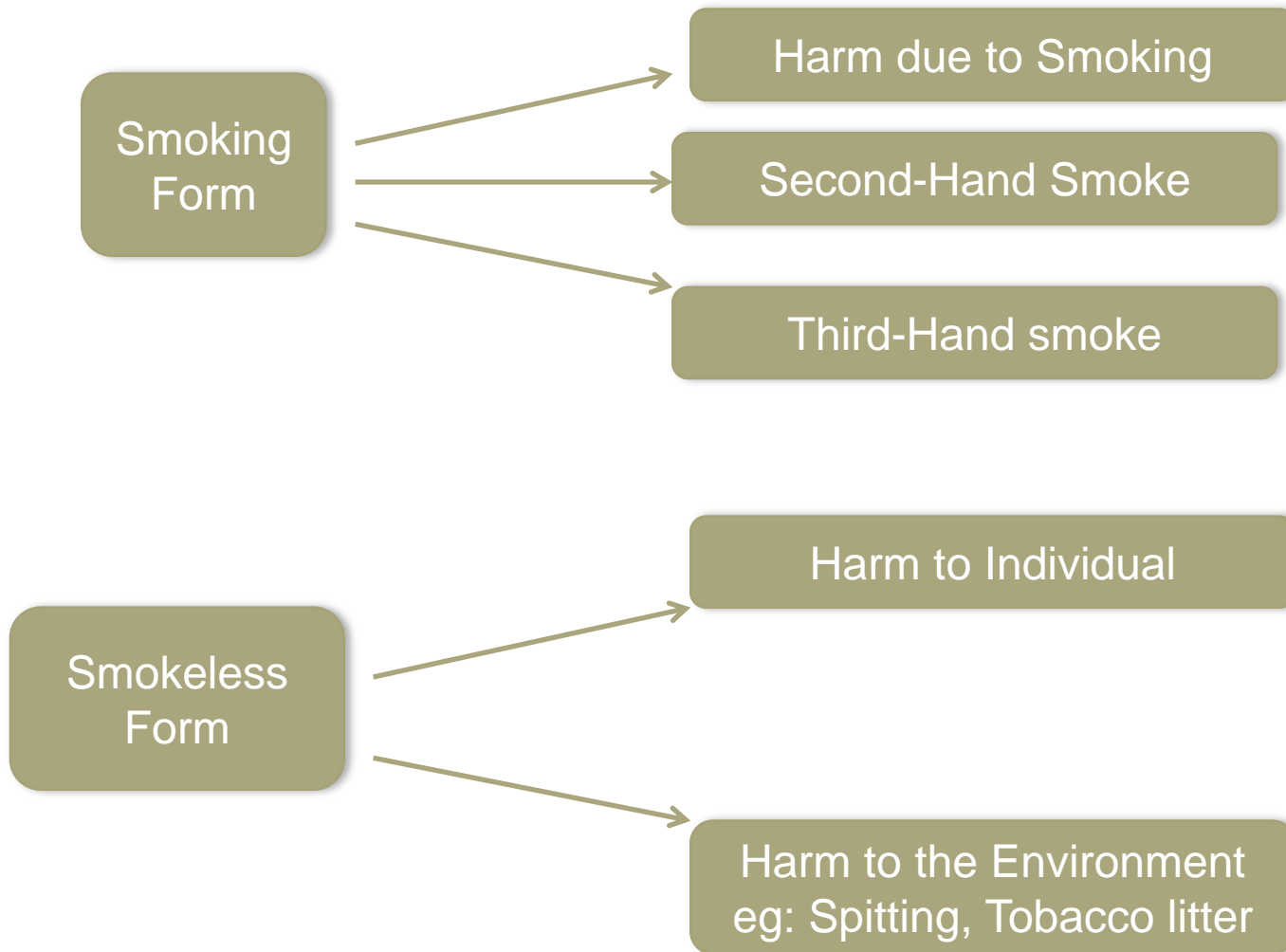
Past and future

Annual deaths due to tobacco
estimated worldwide
1950-2030 projected

will eventually be killed by tobacco

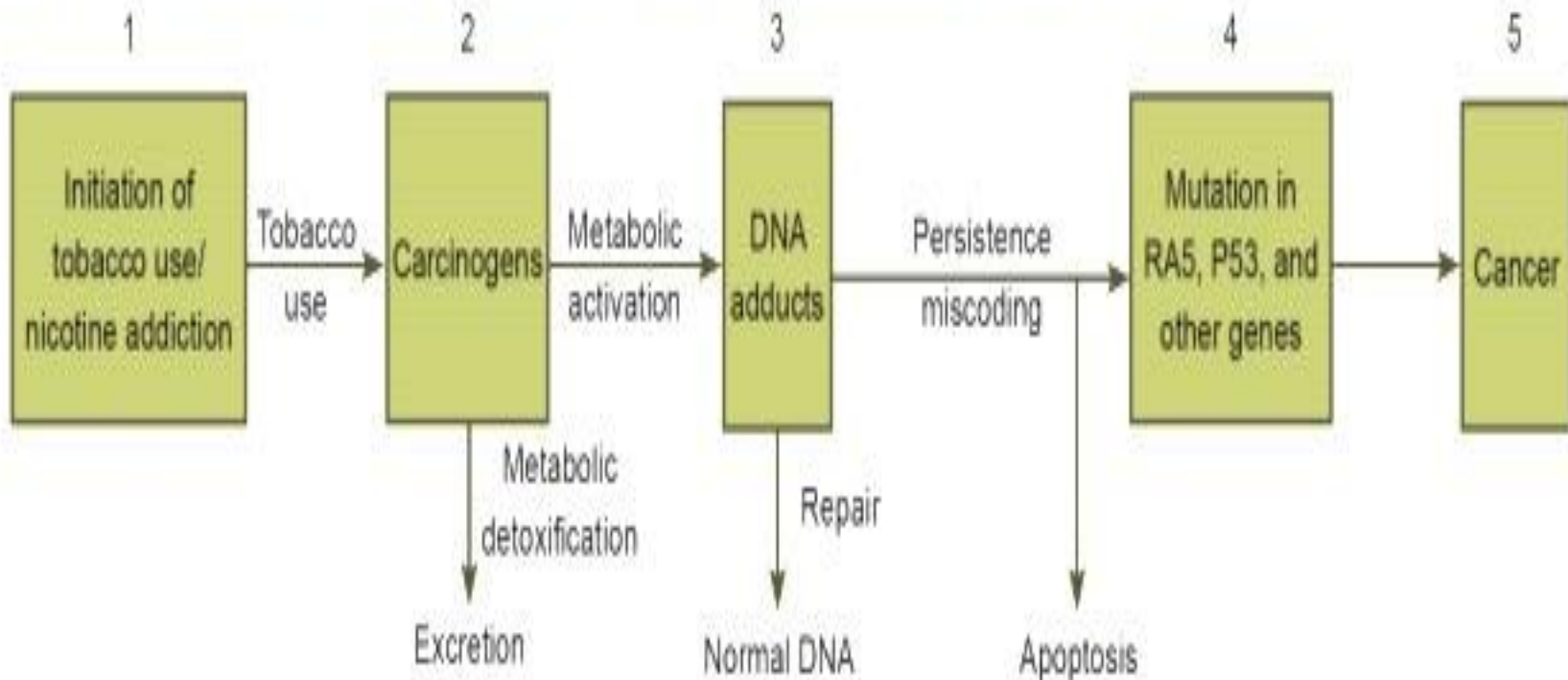


Harm from Tobacco



Mechanism of Action - Adverse Health Effects

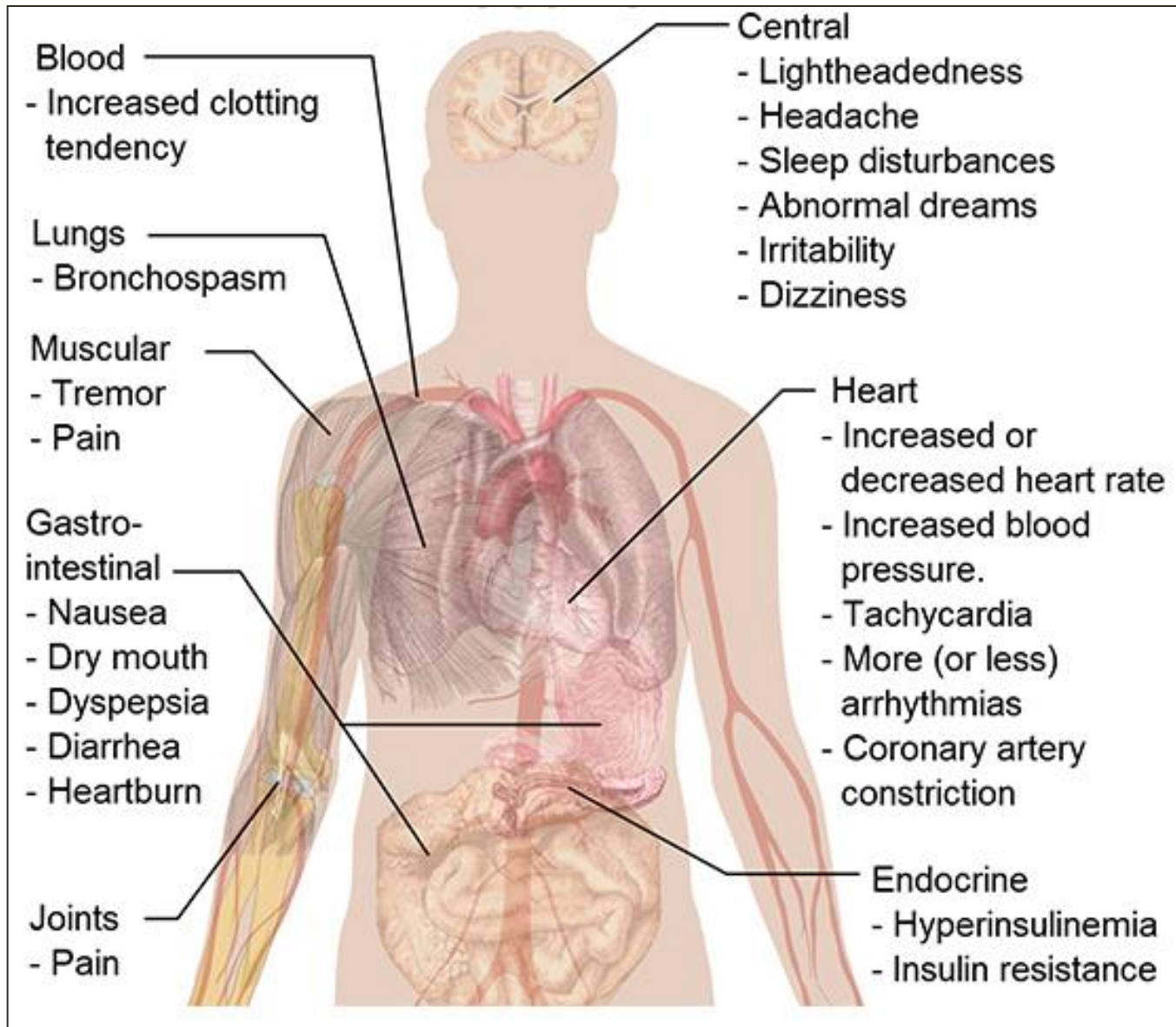
Figure 4-1. Conceptual model of carcinogenesis of smokeless tobacco use



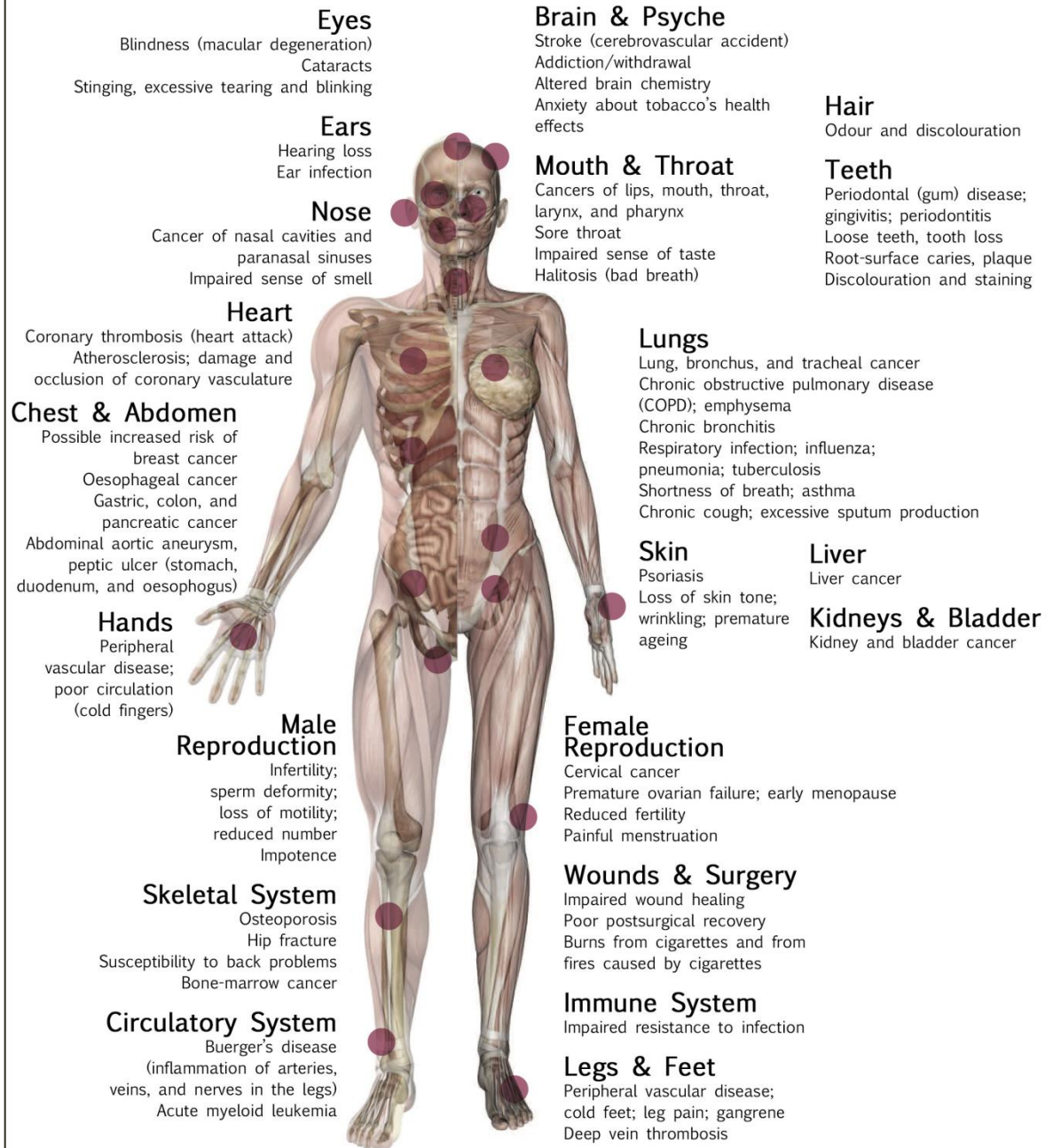
Abbreviations: DNA = deoxyribonucleic acid; Hb = hemoglobin

Sources: Boffetta et al. 2008 (18); Hecht 1999 (19). Reproduced with permission.

Physiological Effects of Tobacco



Pathologic Effects of Tobacco



1. Tobacco Related Cancer

- Global Burden:
 - 14 million new cases
 - 8.2 million deaths
- India
 - 2.5 million cancer cases (35-64 yrs age group)
 - Tobacco contributes to 40% of cancer deaths.
- Tobacco-related cancers:
 - **Commonest is Lung Cancer**
 - Followed by Oral and Esophageal cancer

CANCER: A GLOBAL VIEW



RISK FACTORS



TOBACCO USE:
MAIN CANCER RISK
FACTOR WORLDWIDE



UP TO
20%
OF CANCER
DEATHS



IN LOW- AND MIDDLE-
INCOME COUNTRIES ARE
CAUSED BY VIRAL
INFECTIONS SUCH AS
HBV/ HCV AND HPV

MORE THAN
30%



OF CANCER DEATHS COULD BE
PREVENTED BY CHANGING OR
AVOIDING KEY RISK FACTORS:



BEING
OVERWEIGHT



TOBACCO USE



UNHEALTHY
DIET



ALCOHOL USE



LACK OF
PHYSICAL
ACTIVITY



CERTAIN VIRAL
INFECTIONS

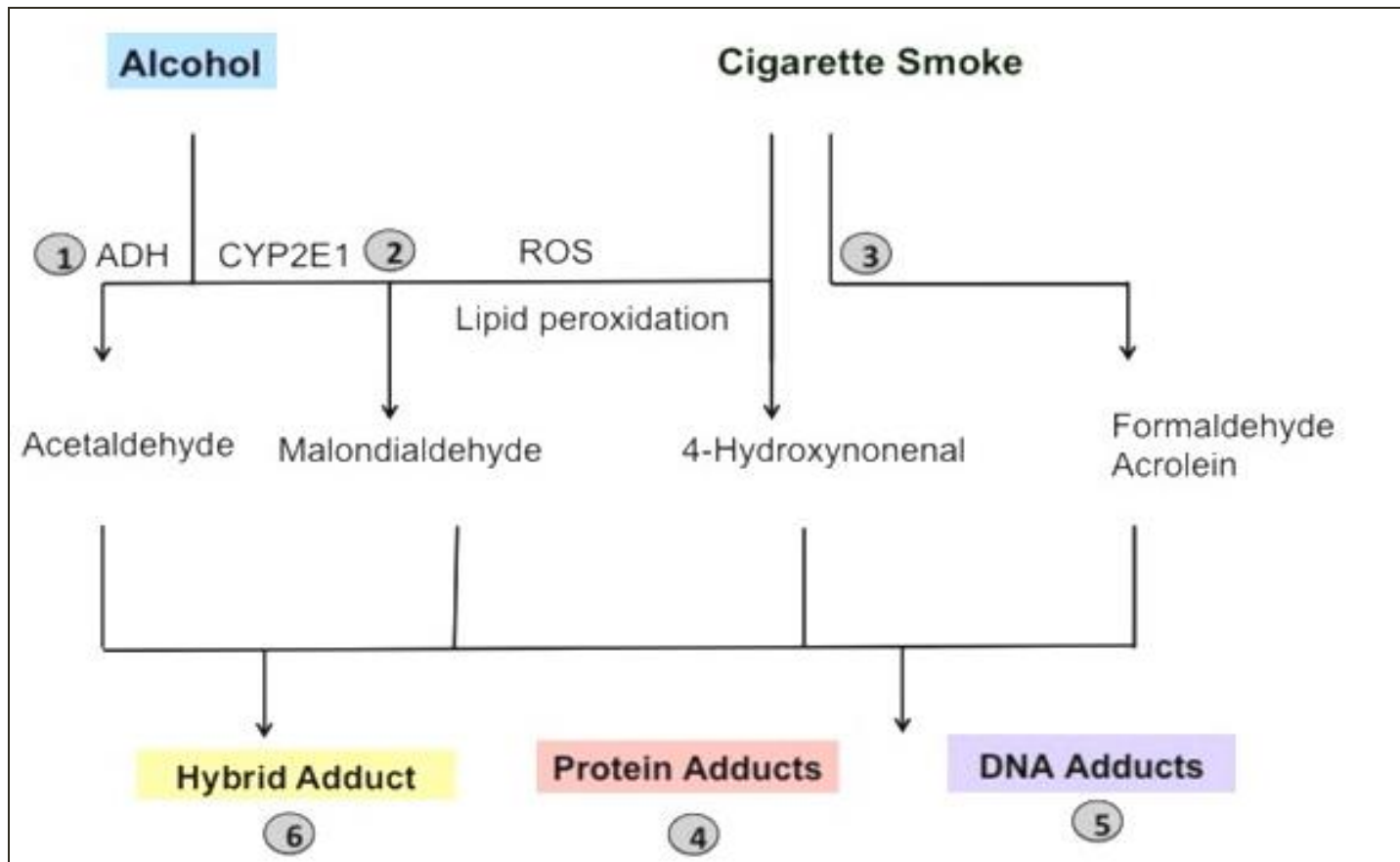


ENVIRONMENTAL
FACTORS

- India - 1 in 17 males and 1 in 50 females have a lifetime risk of tobacco related cancers.

Lung Cancer

- Peak incidence occur between ages 55-65 years.
- 3:1 is the male : female ratio



- Physical signs:

- Excessive Cough
- Chest Pain
- Wheeze
- Tenderness at base
- Hoarseness of voice



- Extra-pulmonary manifestation:

- Endocrinal:
- Neurological:
- Others:

Oral Cancer

- Besides Tobacco, other risk factors are:
 - Alcohol
 - Malnutrition
 - Human Papilloma Virus (HPV-16)
 - Sunlight
- Warning Signs:
 - A sore which does not heal
 - Changes in tissue color (Red or White patch)
 - Trouble opening
 - Chronic Lump in throat
 - Ear pain

The Word of Mouth on **ORAL CANCER**

DIAGNOSIS & SURVIVAL



450,000
new cases of
oral cancer each
year worldwide



In the US, more than
43,000
people were
diagnosed with
oral cancer in 2014



In the U.S.
a person dies from
oral cancer every
hour of every day



More than
of those diagnosed
with oral cancer die
within five years

EARLY DIAGNOSIS
CAN DOUBLE A PATIENT'S
CHANCES OF SURVIVAL TO

40%
DOUBLED TO



80%–90%

RISK FACTORS FOR ORAL CANCER WHAT RAISES YOUR RISK FOR ORAL CANCER?



Tobacco use:
No amount is safe;
risk increases with use



Alcohol use:
7+ drinks per week 14+ drinks per week



**Exposure to the
HPV-16 virus**



The risk is
15X greater
for people who both
smoke & drink

Oral - Potentially Malignant Disorders

Potentially Malignant Lesions: Morphologically altered tissue in which cancer is more likely to occur.



Leukoplakia



Erythroplakia



Palatal Changes with
Reverse Smoking

Potentially Malignant Conditions: Generalized state associated with a significantly increased risk of cancer.



Lichen Planus

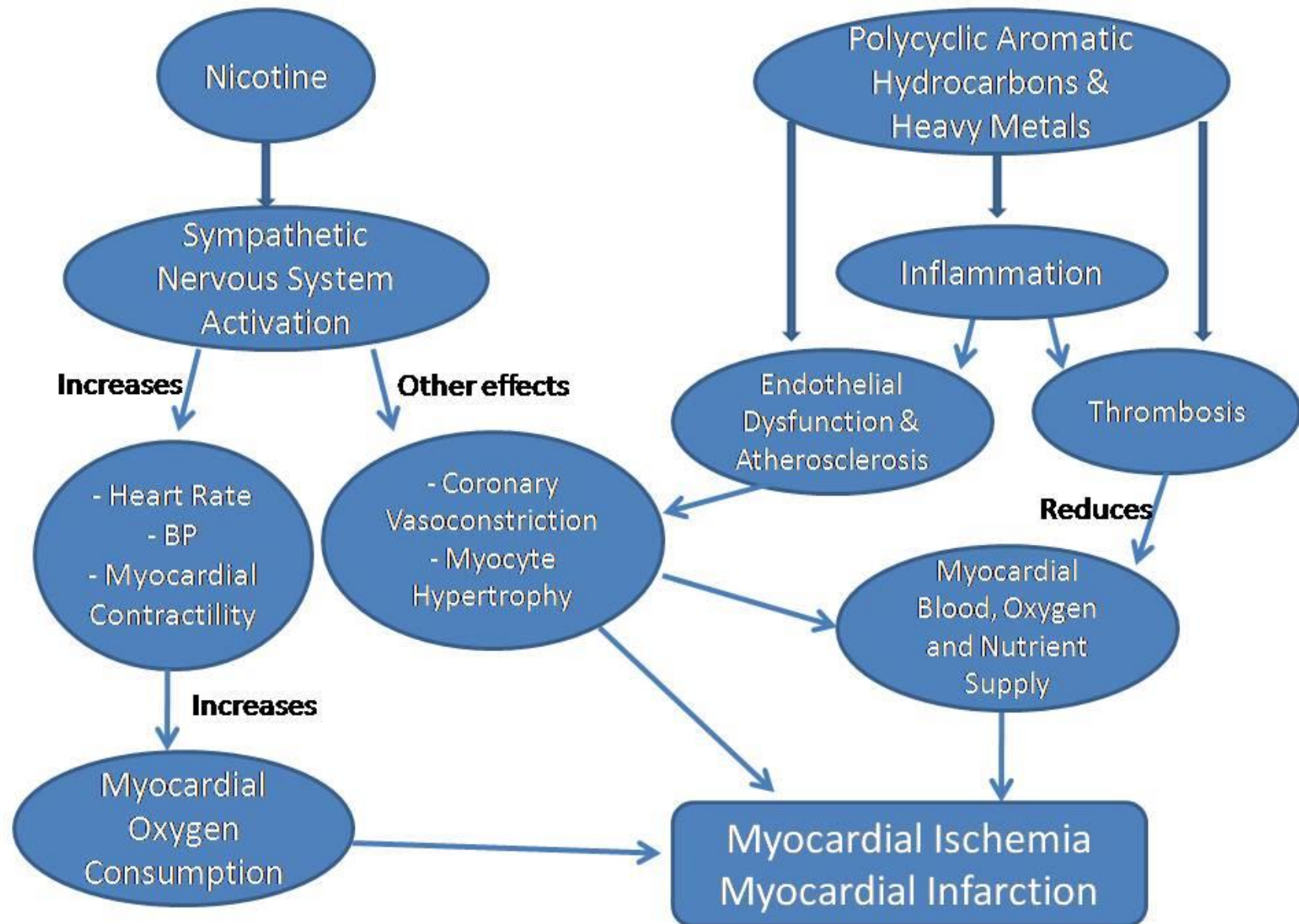


OSMF (see the reduced mouth opening)

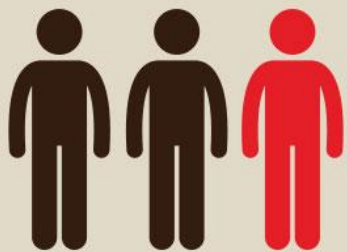
Other cancers

- **Esophageal Cancer:**
- **Pancreatic Cancer:**
- **Cervical Cancer:**
- **Liver cancer:**
- **Cancer of Colon and Rectum:**
- **Acute Myeloid Leukemia:**

2. Cardiovascular Effects



HYPERTENSION WORLDWIDE



Worldwide, 1 in 3 adults has high blood pressure—a condition that leads to heart attack and stroke.



Everyone can take **five concrete steps** to help prevent high blood pressure:



Healthy diet



Physical activity



Avoiding tobacco



Avoiding harmful use of alcohol

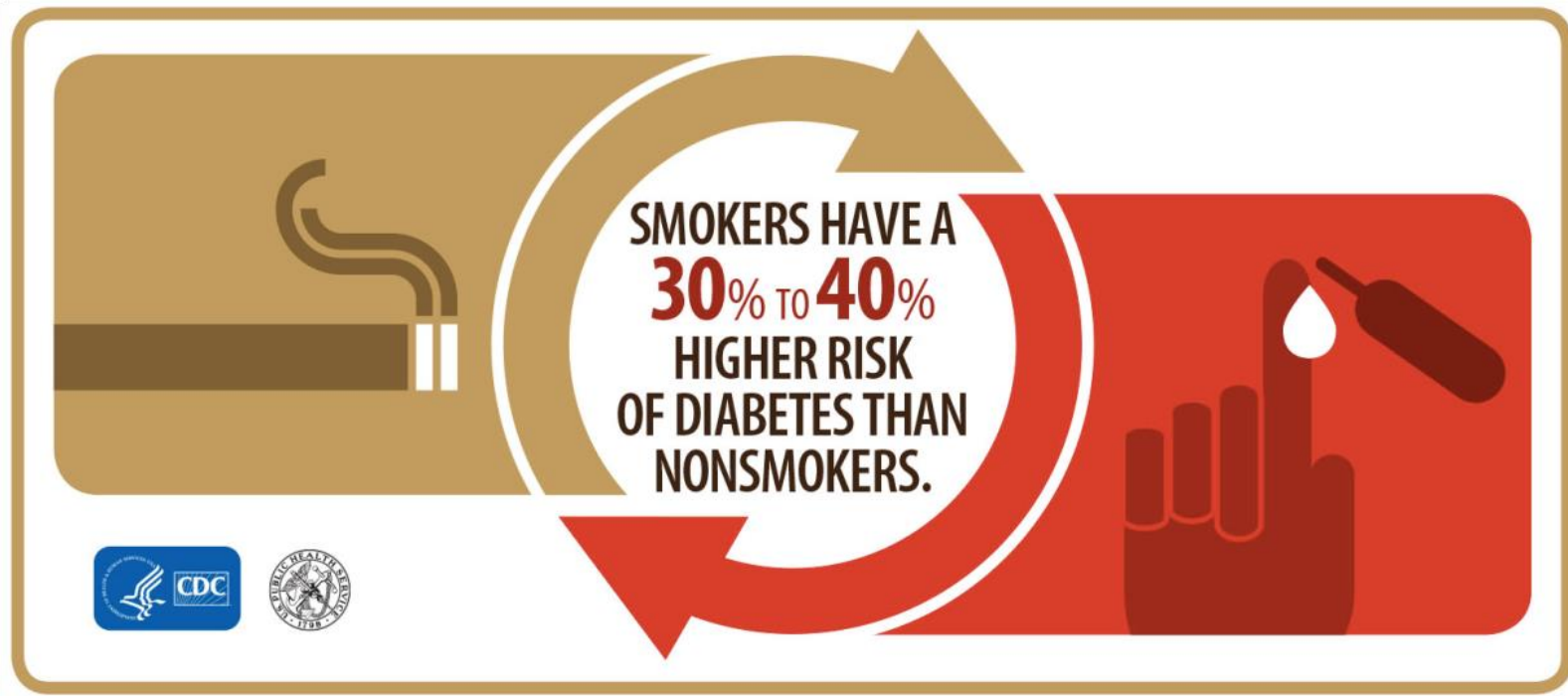


Managing stress in healthy ways



3. Diabetes and Insulin Resistance

- Tobacco:
 - Increases levels of insulin-antagonistic hormones
 - Impairs insulin sensitivity.



4. Reproductive Outcomes

- Adverse effects include:
 - Damage to the umbilical cord structure
 - Miscarriage
 - Increased risk for ectopic pregnancy
 - Low birth weight
 - Placental abruption
 - Preterm birth, and
 - Increased infant mortality.
- Reproductive toxicants are: Nicotine, Areca nut, PAHs and metals – particularly arsenic, cadmium, lead and mercury.

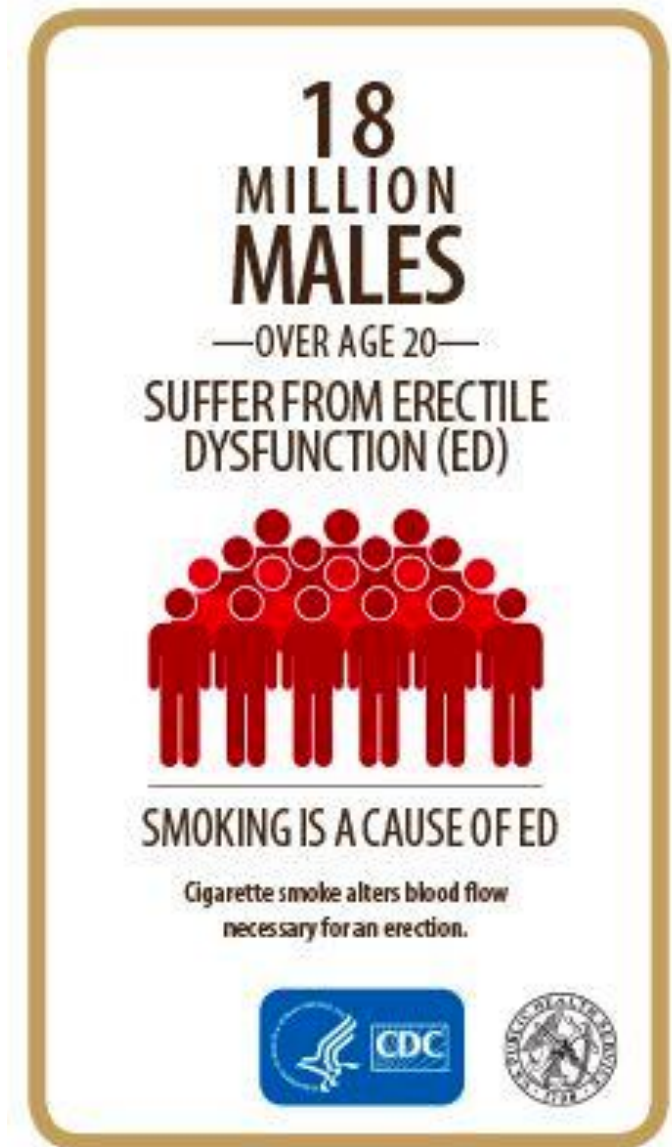


5. Conditions of the Nasal Cavity

- Mainly from Inhaled toxins and tar particles from snuff and smoked products.
- High concentration of free radicals which induce oxidative stress and inflammation, producing ***primary ciliary dyskinesia***.
- Sino-nasal diseases, particularly ***sinusitis*** and ***rhinitis*** are common in smokers.

6. Sexual Disorders

- **Men** - declines in fertility and sexual potency.
- **Women:**
 - Decreased Libido
 - Increased cardiovascular disease, while using oral contraceptives
 - Early menopause



7. Addiction

- Tobacco - first step towards additional substance use
 - Especially in younger age groups.
- Smokers sometimes switch to smokeless forms as a substitute.



8. Dental Conditions

- Besides malignant and potentially malignant lesions, other conditions are:
 - Smoker's melanosis
 - Keratotic patches
 - Nicotinic stomatitis
 - Palatal erosions, and
 - Periodontal disease

*Smoking during pregnancy may develop **Cleft Lip** in the fetus.*



Smoker's Melanosis



Keratotic Patch



Nicotina Stomatitis

9. Other Consequences

- The variety of consequences has been referred to as 'diminished health status' (WHO, 2004).
- Physiologic markers include:
 - Increased oxidative stress,
 - Increased inflammation,
 - Impaired immune status, and
 - Altered lipid profiles.

- Effects are:
 - Poorer Overall Health Related Quality of Life (HRQoL)
 - Impaired Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL)
 - Low Bone Density and frequent fractures
 - Chances of Age related Macular Degeneration (AMD)
 - Poorer sense of Taste and Smell
 - Accelerated ageing
 - Increased absenteeism
 - Decreased work productivity

10. Passive Smoking

Sidestream Smoke: Smoke originating from the cigarette

Mainstream Smoke: Smoke exhaled by the smoker

- Caused 600,000 premature deaths (28% among children).
- Among the adult deaths, about 64% were women.



There is no risk-free level of exposure to Passive Smoke.

ODDS RATIO OF DISEASES FROM PASSIVE SMOKING (95% CI)	
Invasive Meningococcal Disease in Children	2.18 (1.63, 2.92)
Cervical Cancer	1.73 (1.35, 2.21)
Pharyngeal carriage for Meningitides	1.68 (1.19, 2,36)
Pharyngeal carriage for Pneumonia	1.66 (1.33, 2.07)
Food Allergy	1.43 (1.12, 1.83)
Lower respiratory infections in Infancy	1.42 (1.33, 1.51)
Childhood asthma	1.32 (1.23, 1.42)
Lung Cancer	1.27 (1.17, 1.37)
Stroke	1.25 (1.12, 1.38)
Allergic Rhinitis	1.09 (1.04, 1.14)
Allergic Dermatitis	1.07 (1.03, 1.12)

Quit... Please!

Timeline of Quitting Benefits²⁴

At 20 minutes after last cigarette: blood pressure and pulse rate drops; body temperature rises toward normal.

At 12 hours after quitting: carbon monoxide level in blood drops to normal; oxygen level rises to normal.

After 2 weeks to 3 months: circulation improves; walking becomes easier; lung function improves; heart attack risk decreases.

After 1 to 9 months: decrease in coughing, sinus congestion, fatigue, shortness of breath.

After 1 year: excess risk of coronary heart disease is decreased to half that of a smoker.

After 5 to 15 years: stroke risk is reduced to that of people who have never smoked.

After 10 years: risk of lung cancer drops to as little as one-half that of continuing smokers; risk of cancer of the mouth, throat, esophagus, bladder, kidney, and pancreas decreases; risk of ulcer decreases.

After 15 years: risk of coronary heart disease is now similar to that of people who have never smoked; risk of death returns to nearly the level of people who have never smoked.

Conclusion

- The Tobacco Epidemic is huge.
- Prevention of Risk Factors is the key
- Cessation is vital.
- The world is slowly coming together against tobacco now!



"It doesn't matter how old you are or how long you've smoked. You become healthier and stronger each day you are tobacco free."

*National Cancer Institute
(USA)*

HOPE

