

CANCER PREVENTION AND TREATMENT

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What is cancer ?

There are trillions of the cell in human body. Normally they grow in well regulated pattern.

Cancer is an abnormal growth of a body cell or group of cells.

Tumor can be benign- harmless

*Malignant tumors
never stop growing or spreading*

Is cancer modern day/ new disease ?

Cancer is as old as human civilization.

Egyptian mummies also show evidence of cancer

Cancer has increased by about 20 times in last 100 years. 10 million new cancer patients , 6 million deaths, 13 % of the total deaths , 15 million new cases and 10 million deaths by 2020.

Presently in India every year more than 10 lack new cancer cases detected. By 2020 the incidence will be over 18 lack cancer patients and every 6 th cancer patients will be Indian

Cancer is second largest killing disease and with the increasing trend it will be the main cause of death.

Cancer is a disease of lifestyle. Changing food habits & life style has added to cancer risk factors. **Delhi – 13 % of GI cancers.** Domestic dogs- 19 times more risk of cancer than wild dogs.

Cancer registry- Delhi, Bangalore, Chennai, Mumbai, Bhopal- Urban based- incidence of cancer is 1200 – 1500/ 1 million population

Barsi- rural based- cancer incidence is 390/ 1 million population. Rajasthan about 50,000- 60,000 new cancer cases every year.

Cancer causation factors

1. Physical
2. Chemicals
3. Environment
4. Radiation- Leukemia, Melanoma (Au)
5. Genetic
6. Food & life style
7. HPV/ Hepatitis. B
8. AIDS induced cancer

Smoked food, Asbestos, Arsenic, tar, Chimney smoke

Body immune system fails to recognize/ overcome the abnormal cell growth. Increase the body immunity.

Terrorist – antisocial element in society

Risk factors increase likelihood of developing cancer. Scientists don't know exactly why normal cells become **abnormal**, but they know that contact with cancer-causing agents called carcinogens is a major culprit. Some risk factors are avoidable, while others can't be controlled. One of the most avoidable risk factors is tobacco. Smoking is linked with a number of cancers including cancer of the lung, bladder, mouth, and cervix. Smoking, chewing, and dipping tobacco are also the most common risk factors for oral cancer. Alcohol is the second leading avoidable risk factor associated with stomach, esophagus, breast, throat, oral cavity, and liver cancers. A family history of cancer and age is another unavoidable risk. The older you get, the more prone you are to developing some forms of cancer. Some environmental pollutants are also thought to act as carcinogens. Knowing which carcinogens are avoidable may reduce risk of developing cancer.

Tobacco is the major causative factor for Lung, mouth, cervix, bladder and GI track malignancies. More than 50 % of cancer are due to tobacco consumption. In India over 20 Crore male and 8 crore female consume tobacco in different form- chewing, pan masala, Ghutaka, bidi/ cigar smoking, tobacco paste etc.

Way of life & food

Balanced diet rich in vegetable, fruit- high fiber food- cereals, rice, breads –control body weight- exercise

Environment and Cancer

Causes of fatal Cancers :

Tobacco smoke -----	50 %
Diet	20 %
Infection	15 %
Work (asbestos , benzene etc.)....	5 %
Radiation	3 %
Medical treatment	3 %
Pollution	2 %
Others (age-genetic. parity etc) ...	2 %

Tobacco & Cancer

**BIGGEST HEALTH
HAZARD OF THE
CENTURY :
(IN INDIA) →**

**→ INCREASING
USE OF
SMOKELESS
TOBACCO**



- Tobacco consumed in paan, snuff or as a dental paste can also cause cancer and these are not safer than smoking.

स्वच्छ मुंह, स्वस्थ शरीर ।

मुहँ का मजा, मौत की सजा ॥

धूम्रपान



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Tobacco & Cancer

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PASSIVE SMOKING

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- The risks of passive smoking do not stop with cancer. There is an increased incidence of heart disease in passive smokers. Children of parents who smoke have an increased incidence of cough, bronchitis, ear infection and pneumonia. Children exposed to their parents cigarette smoke have six times the number of respiratory infections.
- If a pregnant woman smokes or chews tobacco it will have an adverse effect on the foetus.

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मुहँ का मजा, मौत की सजा ॥

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Two thirds of smoke from a burning cigarette does not reach the smokers lung, but instead goes directly into the air. The effects of this smoke are similar to tobacco smoke inhaled by active smokers. An increased risk of lung cancer has been shown in wives of husbands who smoke. Inhaling of air containing tobacco smoke is called **passive smoking**.



Tobacco is chewing your life
(Advanced cancer cheek)

**TOBACCO USE IS THE
BIGGEST HEALTH HAZARD
OF THE NEW MILLENNIUM**

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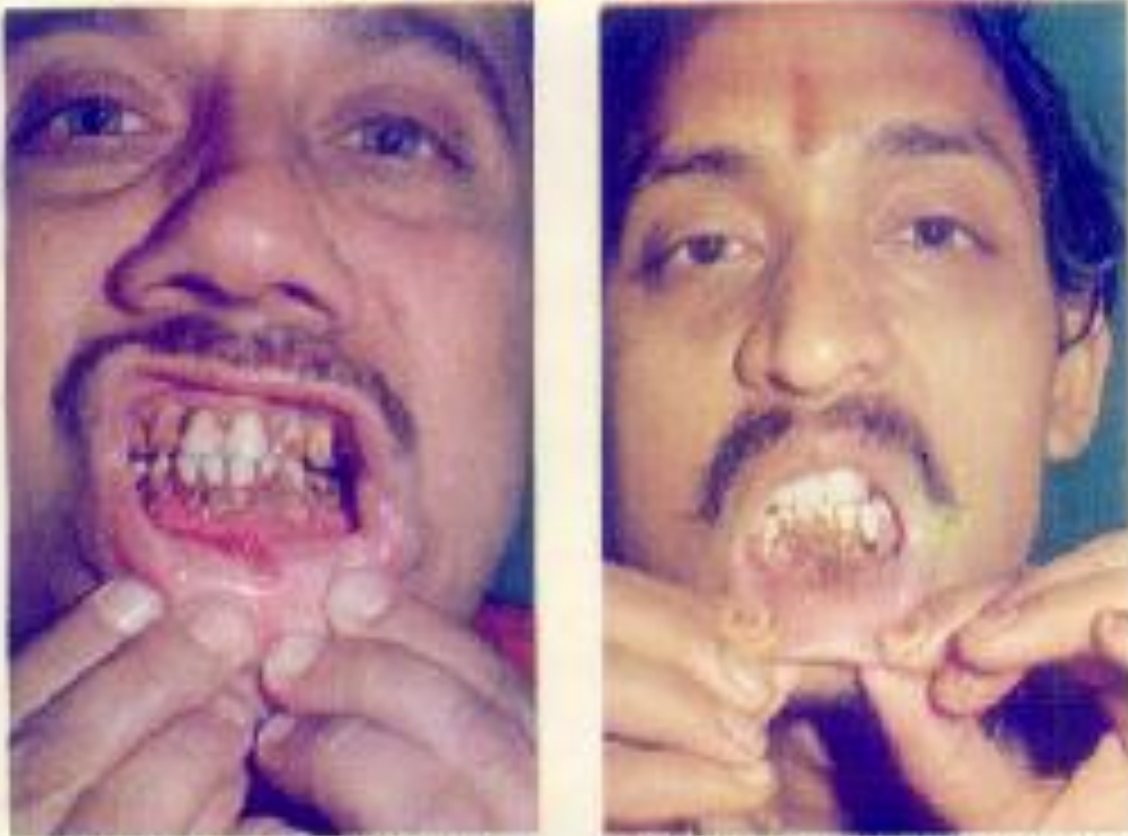
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Tobacco & Cancer

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जर्दे का जहर - हर पीढ़ी में
Every age is Vulnerable to tobacco use



Take
care
of
your
teeth

जसली घोंलों की ददंश, दोंत घाले की तेवरें में।
Tobacco is chewing your teeth & gums

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दाँत है तो देह है, देह है तो दुनियाँ है।

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जहरीला, जानलेवा जर्दा

Tobacco use is Life threatening Hazard No.1

Tobacco & Cancer

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स्वच्छ मुंह, स्वस्थ शरीर ।

मुहँ का मजा, मौत की सजा ॥

Tobacco & Cancer

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गुटका खाओ — गाल गलाओ

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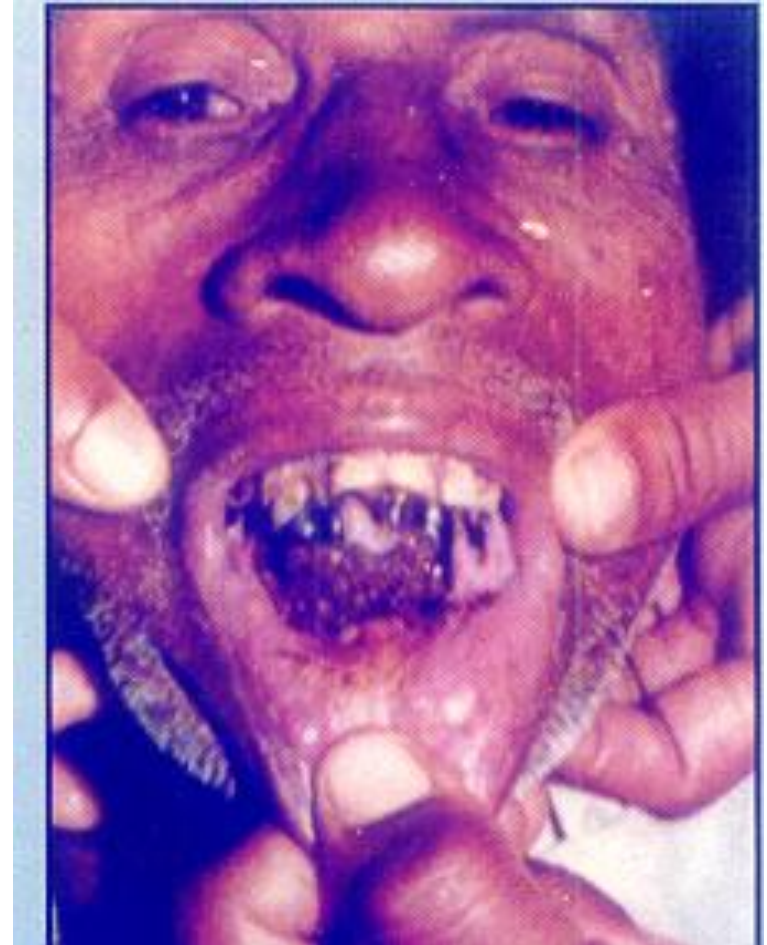
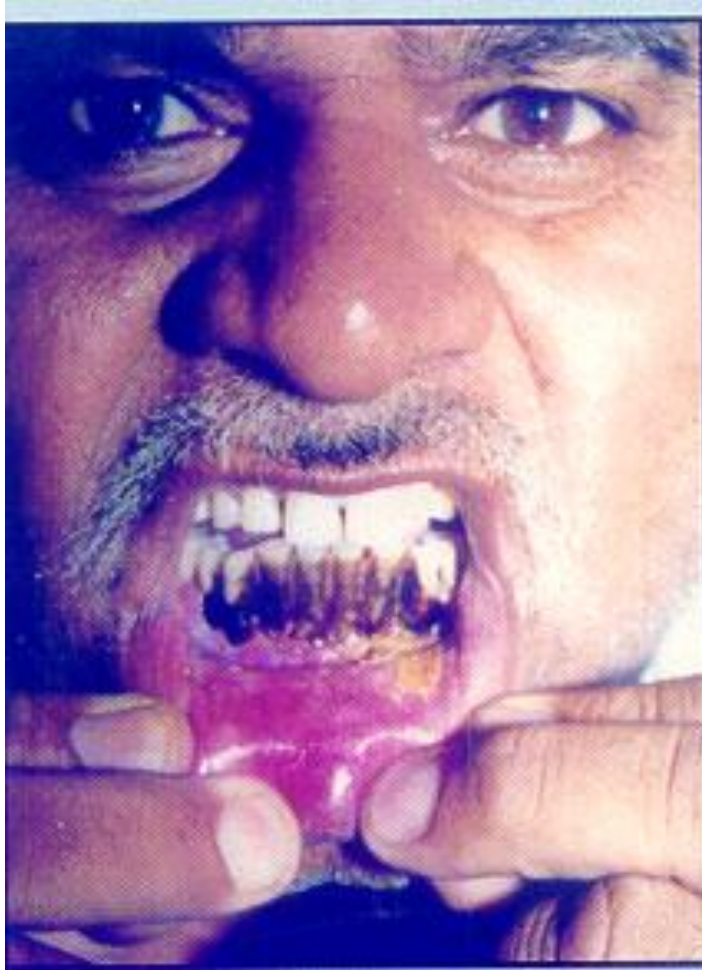
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होंठ बने है, मधुर स्वरों के लिये ।

बॉसुरी का स्थान, बीड़ी,बोतल,बीयर को तो न दो ॥

Tobacco & Cancer



आपका मुँह ऐंशट्रे या कूड़ादान नहीं है

Tobacco & Cancer

पान मसाला मौत मसाला



समय से पूर्व मृत्यु का बुलावा (जीवन 32 साल)

MOUTH
IS MEANT
FOR
NOURISHMENT
AND NOT
FOR
PUNISHMENT



गाल का कैंसर

AWARENESS
WILL
AVOID
BECOMING
CANCER
VICTIM

धूम्रपान



— खतरा में जान



FIVE LAC
PEOPLE DIE
OF CANCER
EVERY YEAR
IN OUR
COUNTRY

मुँह का मजा मौत की सजा



SPORTS
&
CULTURAL
EVENTS
WITHOUT
TOBACCO
SUPPORT

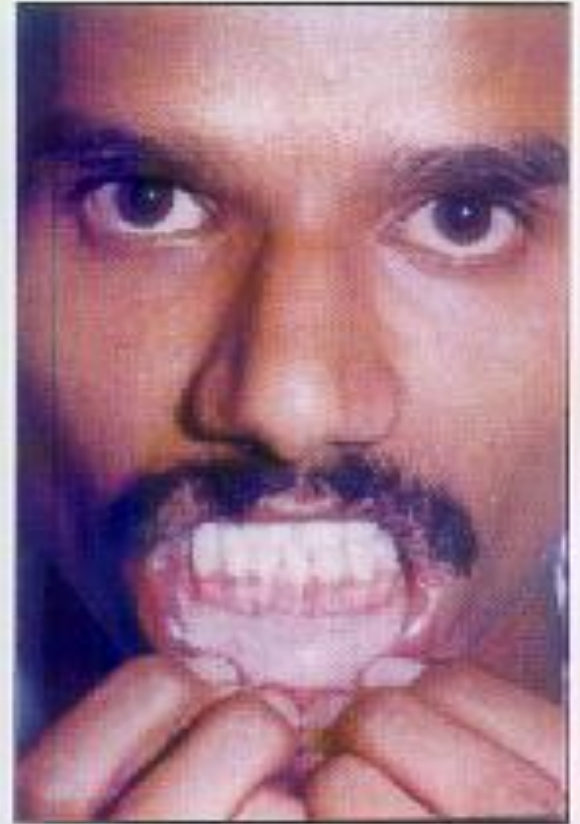
जुर्दे ने जबड़े को जाम कर दिया

Tobacco & Cancer

गुटखा खाओ गाल गलाओ



YOU ARE
NOT CHEWING
TOBACCO,
TOBACCO IS
CHEWING
YOUR LIFE



धूम्रपान / मदिरापान
खतरे में जान

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को
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द्वार
सा
गन्दा
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बादाम 900रु किलो / गुटखा 4,300रु
काजू 800रु किलो / सिगरेट 5,000रु
शुद्ध घी 600रु किलो / तंबाकु 1,700रु
सेब 100रु किलो / सुपारी 600रु
दूध 50रु लीटर / शराब 560रु

और फिर कहते हैं कि मंहगाई में अच्छी
चीज़ कैसे खाएं।

देश के हाल खराब नहीं हैं, हमारी आदतें खराब हैं।



ज्ञानी जी

तंबाकू से होने वाली बीमारियों की खबर पढ़ राजस्थान के हनुमानगढ़ की 12 साल की बच्ची ने लिखा पिता को भावुक पत्र

पापा सुना है तंबाकू खाने से लोग मर जाते हैं, प्लीज! इसे छोड़ दीजिए

दीपक भारद्वाज/हनुमानगढ़

‘पापा मैं आपके हर सपने को पूरा करूंगी, लेकिन आप ही नहीं होंगे तो इन सबका क्या फायदा’



डियर पापा, आई लव यू

पापा, आज मैं आपसे कुछ कहना चाहती हूँ। आप बहुत अच्छे हैं। दुनिया के सबसे अच्छे पापा। आपने मुझे हमेशा लाड-प्यार दिया है। मेरी हर ख्वाहिश पूरी की है। आपके भरोसे पर ही मैं अपने दोस्तों के बीच बड़ी से बड़ी चुनौती स्वीकार कर लेती हूँ, क्योंकि मुझे पता है कि आप उस चुनौती को पूरा करने में हर तरह से मेरी मदद करेंगे। इसी तरह चुनौतियों को पार करते हुए मैं आपके हर सपने को सच करने में जुटी हूँ। लेकिन पता नहीं क्यों पापा, मुझे डर लग रहा है। मुझे ऐसा लगता है कि जब मैं आपके सपने पूरे कर रही होऊँगी, तब आप मेरे साथ नहीं होंगे। मुझे पता चला है कि जो लोग सिगरेट या बीड़ी पीते हैं

या तंबाकू-जर्दा खाते हैं, वो बहुत जल्दी मर जाते हैं। पापा, आप भी तो तंबाकू भी खाते हों। इसलिए मुझे डर लग रहा है कि कहीं आपके साथ भी ऐसा न हो जाए।

पिछले दिनों मैंने अखबार में पढ़ा था कि तंबाकू के इस्तेमाल से होने वाली बीमारियों के कारण भारत में हर साल दस लाख लोग मर जाते हैं। पूरी दुनिया के लिहाज से यह आंकड़ा हर साल 50 लाख मौतों का है। दुनिया में होने वाली हर पांच मौतों में से एक मौत तंबाकू की वजह से होती है। हर आठ सेकेंड में होने वाली एक मौत तंबाकू और तंबाकू जनित उत्पादों के सेवन से होती है। कितना डरावना है यह सब। पापा, कहीं ऐसा न हो जाए कि आने वाले किसी साल

मैं इन लोगों में से एक बन आऊँ। तब मैं क्या करूँगी पापा मेरे साथ कौन होगा जो मेरी मदद करेगा और अगर मैं कुछ बन भी गई तो आप तो यह देखने के लिए दुनिया में नहीं होंगे वा।

प्लीज पापा! मेरे कहने से आप तंबाकू खाना छोड़ दीजिए। मेरे साथ रहिए। मेरा भरोसा बनकर, मेरे सबसे बड़े मददगार बनकर। मुझे यकीन है कि आप मेरी बात जरूर मानेंगे। बस, यही कहना था पापा कि मुझे आपसे बहुत प्यार है। और मुझे ये भी पता है कि आप भी मुझसे बहुत प्यार करते हो। मेरे कहने पर आप सिगरेट पीना छोड़ दो। आपको मेरी कसम पापा। आपको मेरी कसम।

आपकी प्यारी बेटी, कशिश

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Some early signs of cancer

1. ***C**hange in bowel or bladder habits*
2. ***A** sore that does not heal*
3. ***U**nusual bleeding or discharge*
4. ***T**hickening or lump in breast or elsewhere*
5. ***I**ndigestion or difficulty in swallowing*
6. ***O**bvious changes in wart or mole*
7. ***N**agging cough or hoarseness*

Major cancers

1. Head & neck	35–40 %
2. Cancer cervix & uterus	20- 30 %
3. Cancer breast	10 – 15 %
4. Cancer Lung	10 – 12 %
5. Cancer esophagus	8 - 10 %
6. Bone tumors	1.5 – 2 %
7. Pediatric cancers	4 – 6 %
8. Miscellaneous (Bladder, blood,rectum)	4 – 6 %

**Any age, any part of body but disease of old age
due to decreased immunity**

Abnormal signs and symptoms Breast Cancer

- Puckering
- Dimpling
- Retraction
- Nipple discharge
- Thickening of skin or lump or “knot”
- Retracted nipple

Abnormal signs and symptoms

- Change in breast size
- Pain or tenderness
- Redness
- Change in nipple position
- Scaling around nipples
- Sore on breast that does not heal

Signs and Symptoms

Most common:
lump or thickening in breast. Often painless



Lump in breast or underarm area



Change in size or shape of breast

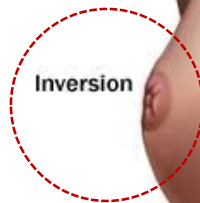


Discharge or bleeding from the nipple

Nipple changes

Discharge or bleeding

Change in size or contours of breast



Inversion



Crusting

Change in color or appearance of areola



Redness or pitting of skin over the breast, like the skin of an orange

Noncancerous Conditions

- **Fibrocystic changes:** Lumpiness, thickening and swelling, often associated with a woman's period
- **Cysts:** Fluid-filled lumps can range from very tiny to about the size of an egg
- **Fibroadenomas:** A solid, round, rubbery lump that moves under skin when touched, occurring most in young women
- **Infections:** The breast will likely be red, warm, tender and lumpy
- **Trauma:** a blow to the breast or a bruise can cause a lump

Risk Factors for Breast Cancer

- Female (1% male)
- Aging
- Relative (mother or sister)
- Menstrual history
 - early on set
 - late menopause
- Child birth
 - After the age of 30



Exogenous Estrogen

- Hormonal replacement therapy(HRT)
 - 30% increased risk with long term use
- Oral Contraceptives(OC)
 - risk slight
 - risk returns to normal once the use of OC's has been discontinued



Risk Factors for Breast Cancer

- Radiation exposure
- Breast disease
 - Atypical Hyperplasia
 - Intraductal carcinoma in situ
 - Intralobular carcinoma in situ
- Obesity
- Diet
 - Fat
 - Alcohol



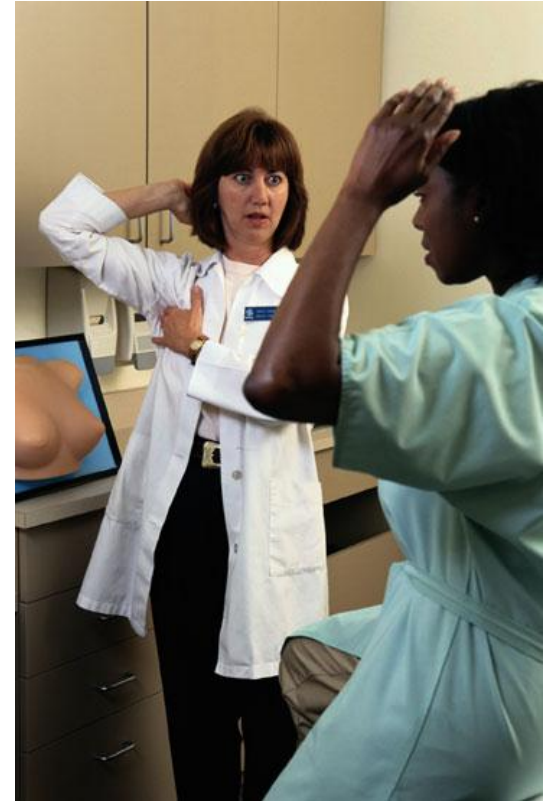
Genetics

- BRCA-1
- BRCA-2
- P53, Rb-1
- Her-2/neu, c-erB2,
c-myc



Breast Self Examination

- Opportunity for woman to become familiar with her breasts
- Monthly exam of the breasts and underarm area
- May discover any changes early
- Begin at age 20, continue monthly



When to do BSE

- Menstruating women- 5 to 7 days after the beginning of their period
- Menopausal women - same date each month
- Pregnant women – same date each month
- Takes about 20 minutes
- Perform BSE at least once a month
- Examine all breast tissue



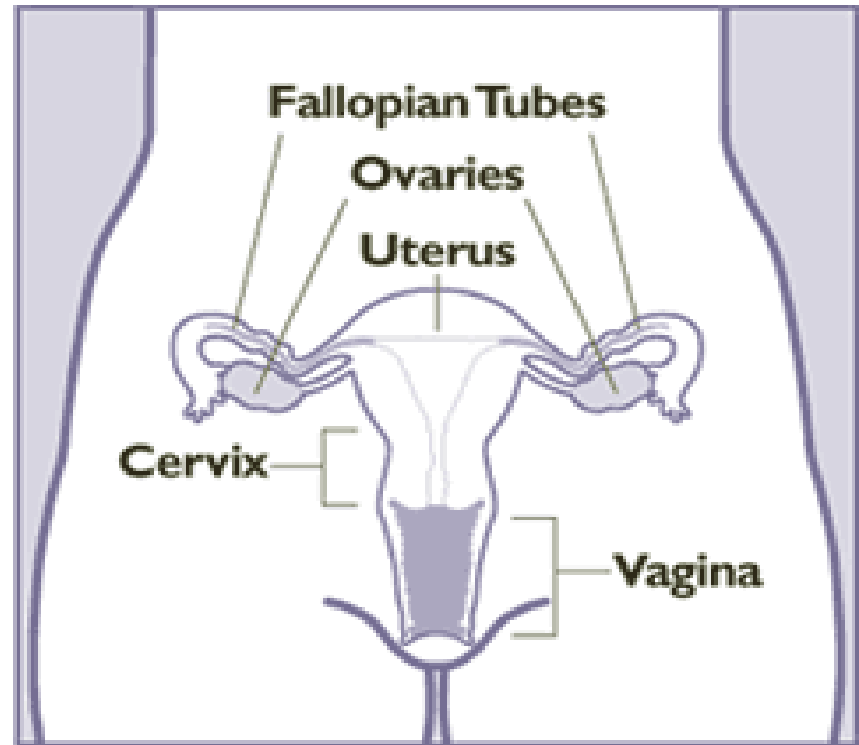
Why don't more women practice BSE?

- Fear
- Embarrassment
- Youth
- Lack of knowledge
- Too busy,
forgetfulness



What is the Cervix [*ser-vix*]?

- The cervix is one of the female organs
- Other female organs include the:
 - Vulva [*vul-vah*]
 - Vagina [*ve-juy-nah*]
 - Uterus [*yoo-tuh-ris*]
 - Fallopian tubes [*fuh-loh-pee-an toobs*]
 - Ovaries [*o-vuh-reez*]



Finding early cell changes

Normal cervical cells



Precancer cells



Risk Factors

- Multiple sexual partners (> 1)
- Promiscuous partner
- Age of first intercourse experience
- Early childbearing
- Prior STDs (HSV II, genital warts, vaginal infections)
- Cigarette Smoking
- Oral Contraceptive usage
- Immunodeficiency

Risk Factors

- Human papillomavirus infection (HPV) – Primary factor
 - HPV 16, HPV 18, HPV 31, HPV 33, HPV 45
 - 50% are caused by HPV 16 AND 18
- Sexual behavior
- Smoking
- HIV infection
- Chlamydia infection
- Diet
- Oral contraceptives
- Multiple pregnancies
- Low socioeconomic status
- Diethylstilbestrol (DES)
- Family history

Signs and Symptoms

- Vaginal bleeding
- Menstrual bleeding is longer and heavier than usual
- Bleeding after menopause or increased vaginal discharge
- Bleeding following intercourse or pelvic exam
- Pain during intercourse

Symptoms

- CIN: Asymptomatic
- Invasive Cancer
 - No classic presentation
 - May present with abnormal vaginal bleeding
 - May present with postcoital bleeding

When to Get Pap Smears

- ACOG Recommendations
 - 1st Pap Smear at age when patient becomes sexually active (or by age 18)
 - Yearly pap smears thereafter
- Others contend that monogamous women with no history of abnormal pap smears can have them done every 3 years

Vaccine

Gardasil HPV 6,11,16, 18

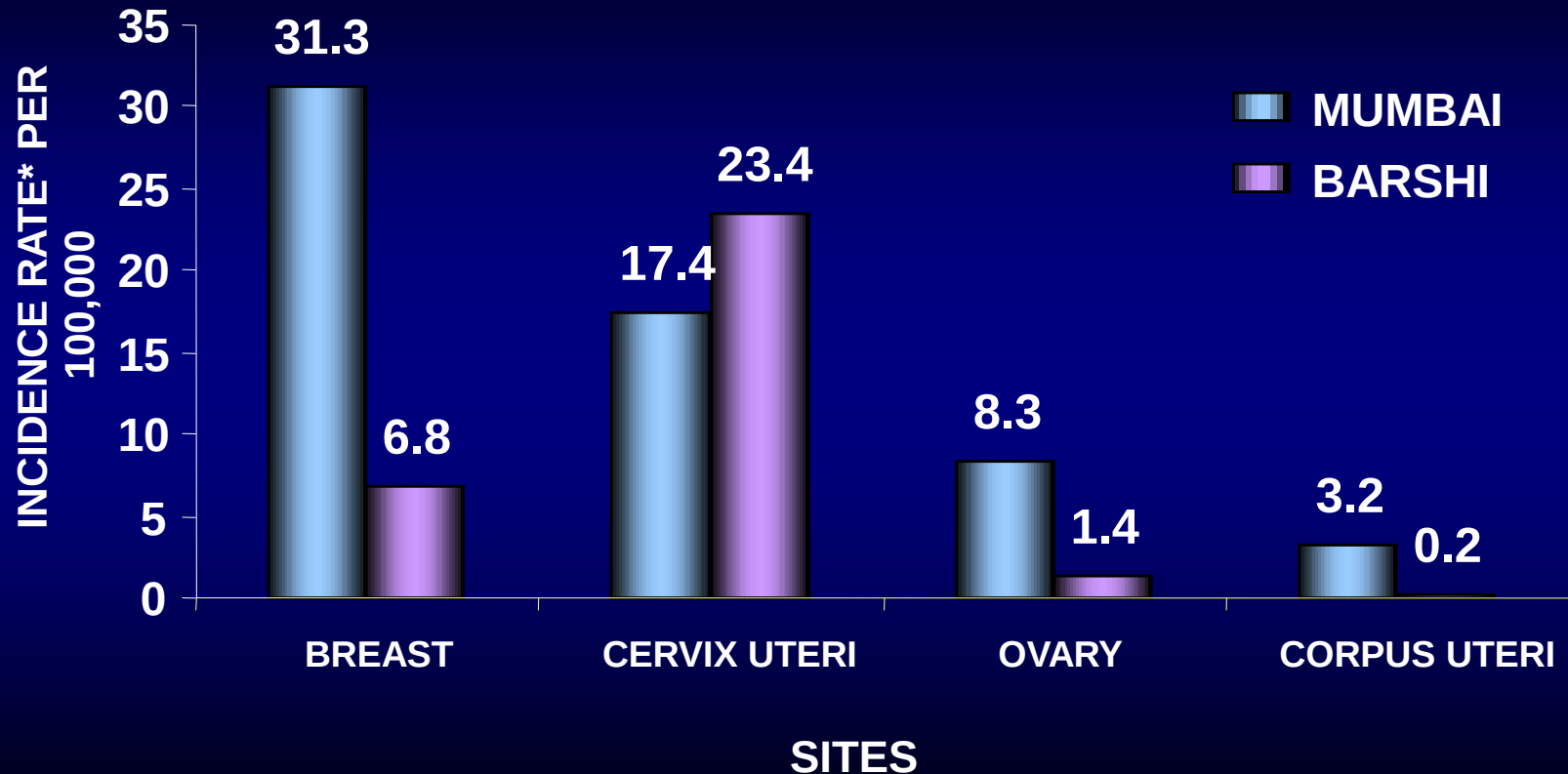
Cervarix 16, 18

9- 26 years

Not exposed to virus

COMPARISON OF URBAN (MUMBAI#) VS RURAL (BARSHI+) IN MAHARASHTRA

FEMALE BREAST AND GENITAL TRACT CANCERS



* AGE STANDARDISED TO WORLD POPULATION

Cancer is preventable, treatable and curable

If cancer is diagnosed at early stage chances of cure are very high.

Diagnosis of cancer

1. Physical examination
2. X – ray investigation
3. Sonography
4. CT / MRI scans
5. Mammography
6. Isotope scans
7. PET
8. Blood and Biochemical tests
9. Specific tumor markers

Confirmation by FNAC / Biopsy

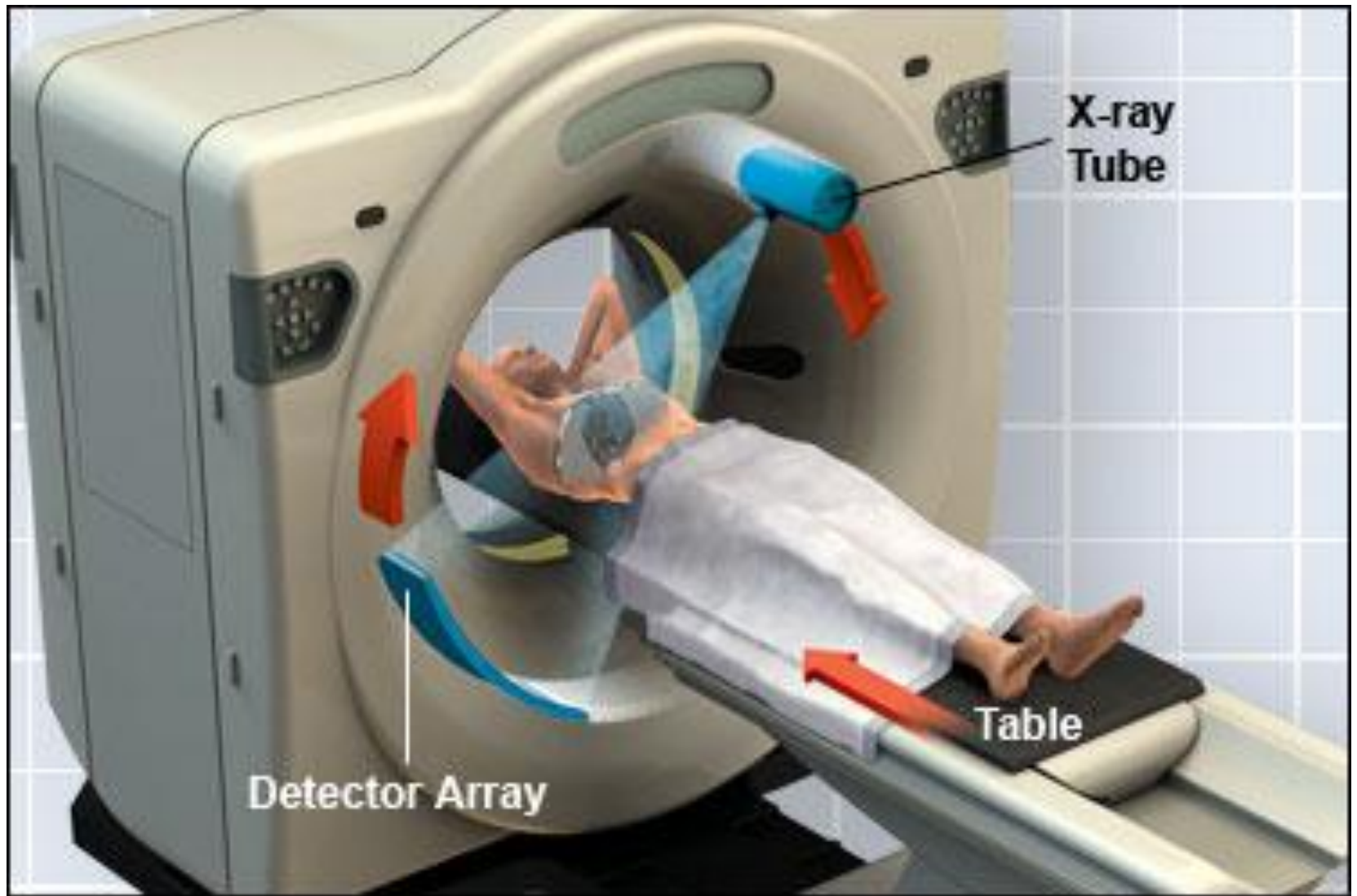
Before 1895

Medical diagnosis based on

1. Symptoms
2. Palpitation
3. Auscultation
4. Physical Examination

After 1895

1. X – ray imaging
2. USG
3. CT
4. MRI
5. Gamma Camera
6. PET - CT-PET
7. Computer radiography- CR- DR- DSA
8. PACS 9. Teleradiology



CT Scan Machine

Siemens KV CBCT & MV CBCT both in-line



Treatment of cancer

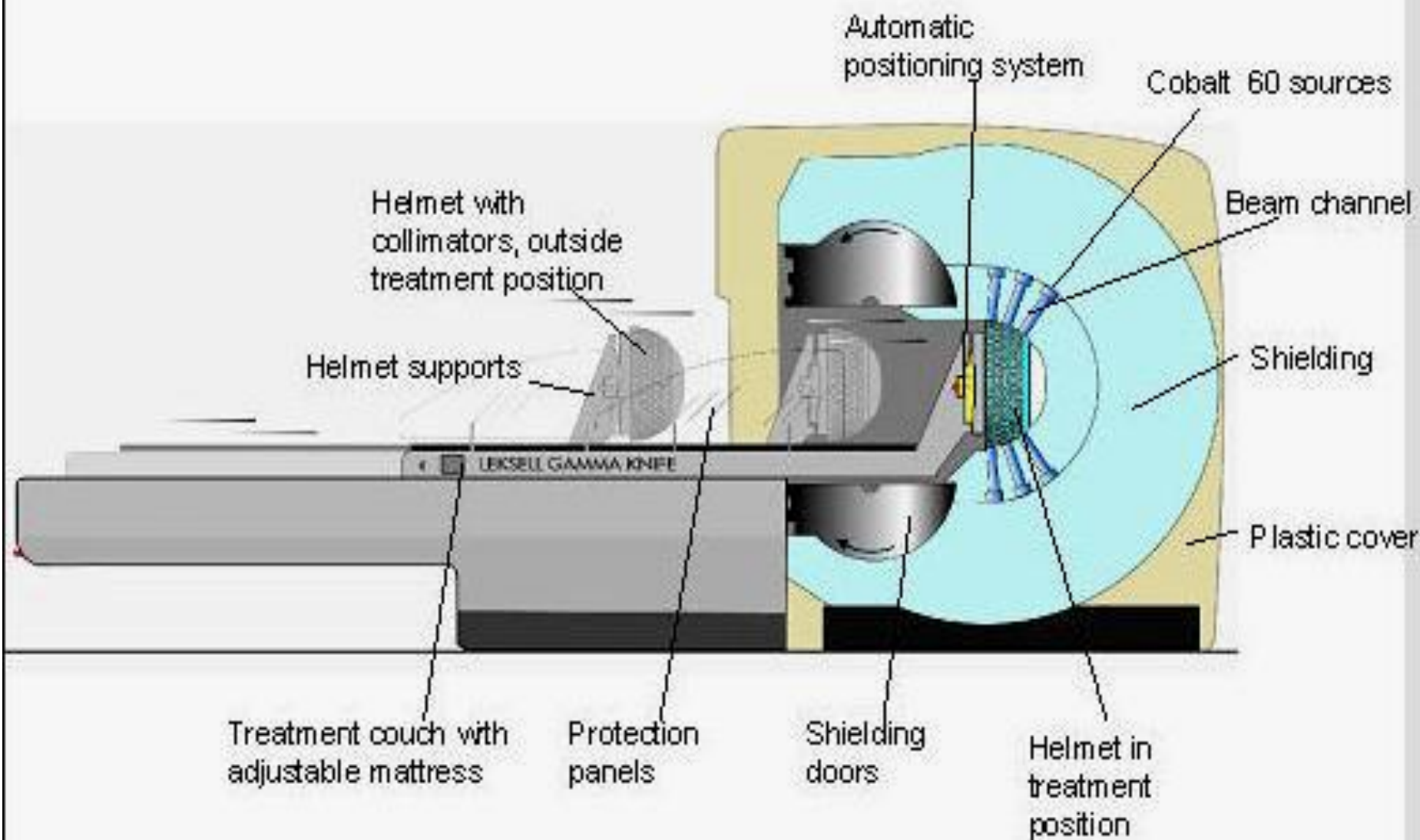
1. Surgical oncology
2. Medical Oncology
3. Radiation Oncology
4. Hormone Therapy
5. Genetic Engineering



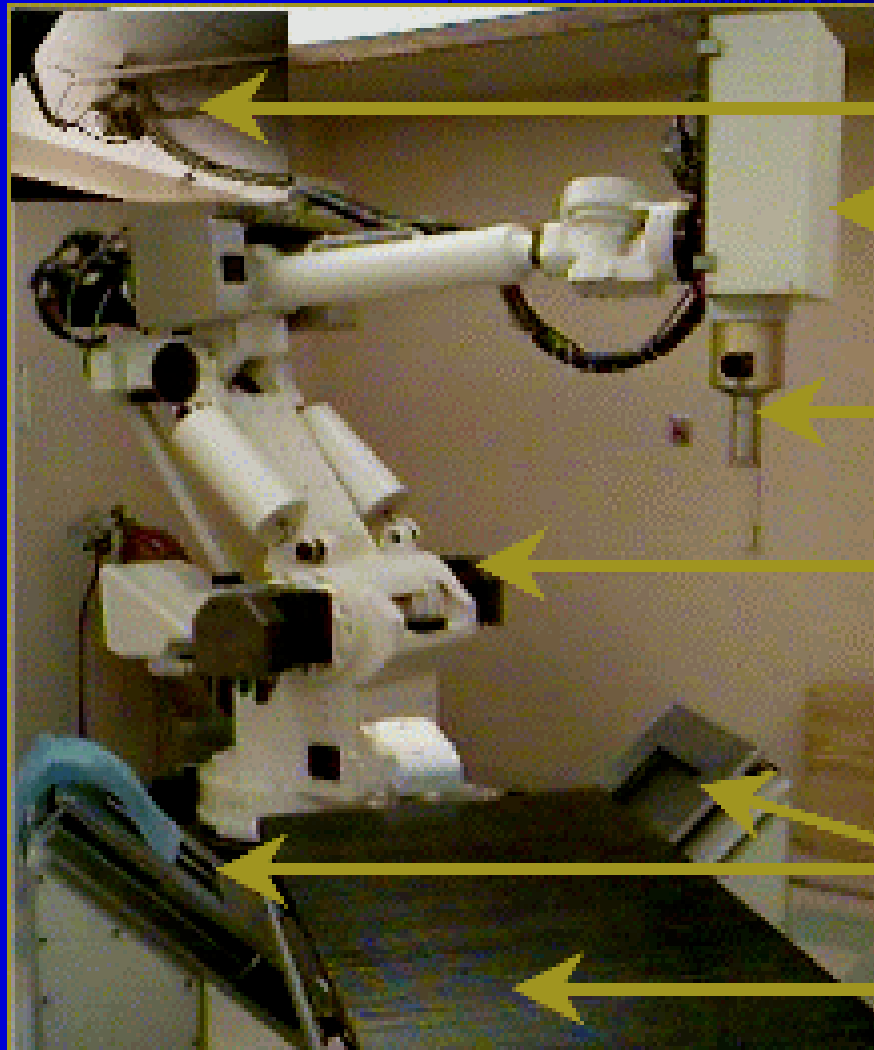




A Cross-Section Diagram of Gamma Knife



CYBERKNIFE™ Image-Guided Stereotactic Radiosurgery System



Diagnostic x-ray tube

6 MV linear accelerator

Secondary Collimator

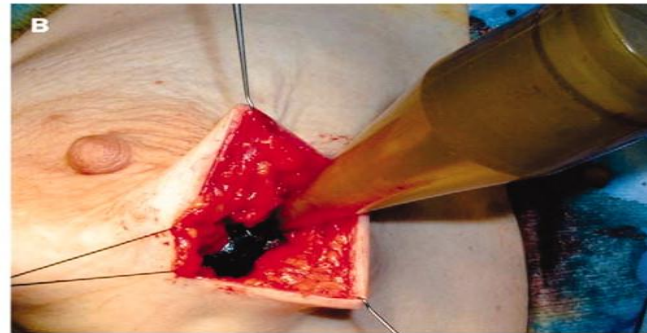
Robot Gantry

Silicon x-ray detectors

Patient couch



Intra Operative Radiotherapy [IORT]



Radiation Oncology @ AMC

- **11 Varian Linac, 2 Tomo, 1 CK, 1 HDR**
- **20 MDs, 60 RTTs, 13 MPs (7 MP staffs)**
- **450 pats/day**
- **10-15 SBRT cases/day**
 - **Lung, Liver, Pancreas, Prostate, Spine**

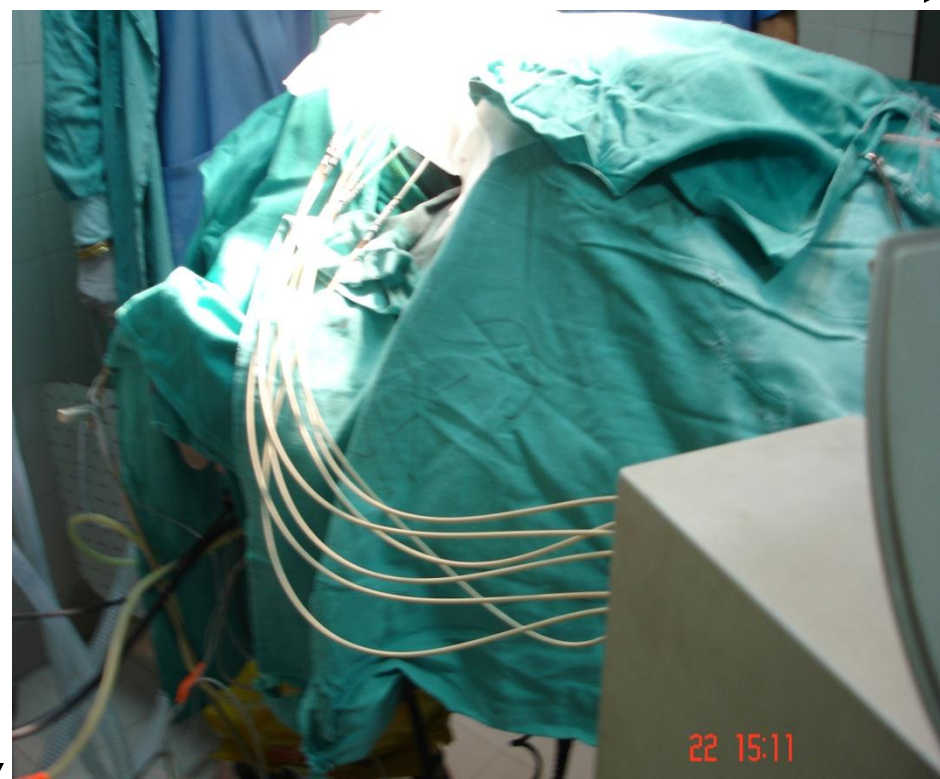
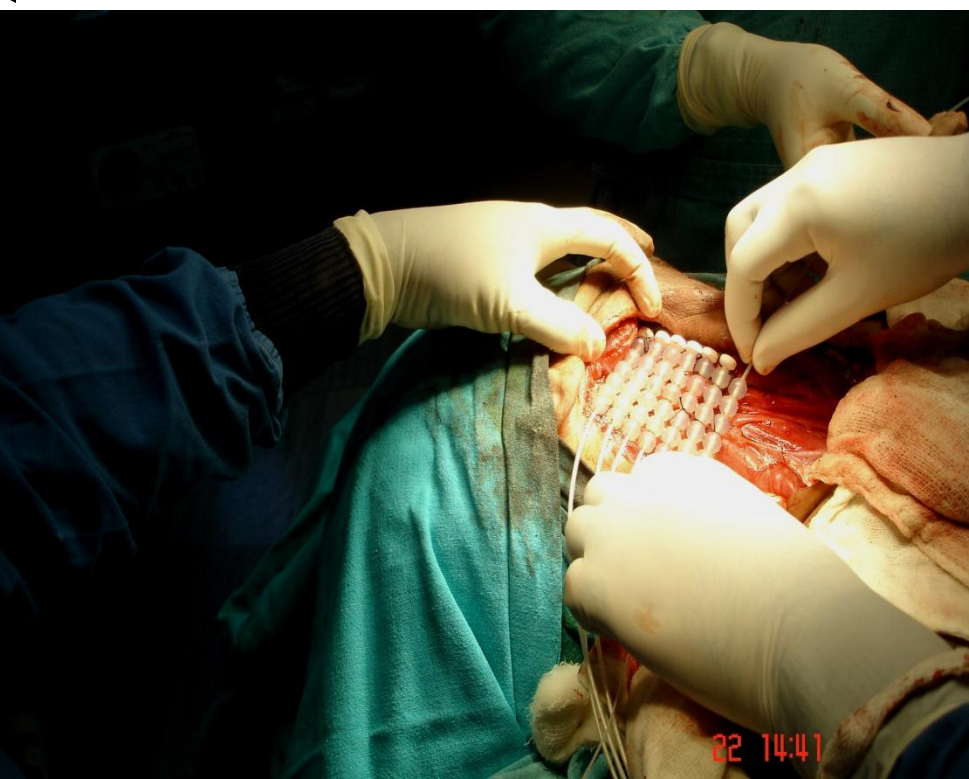
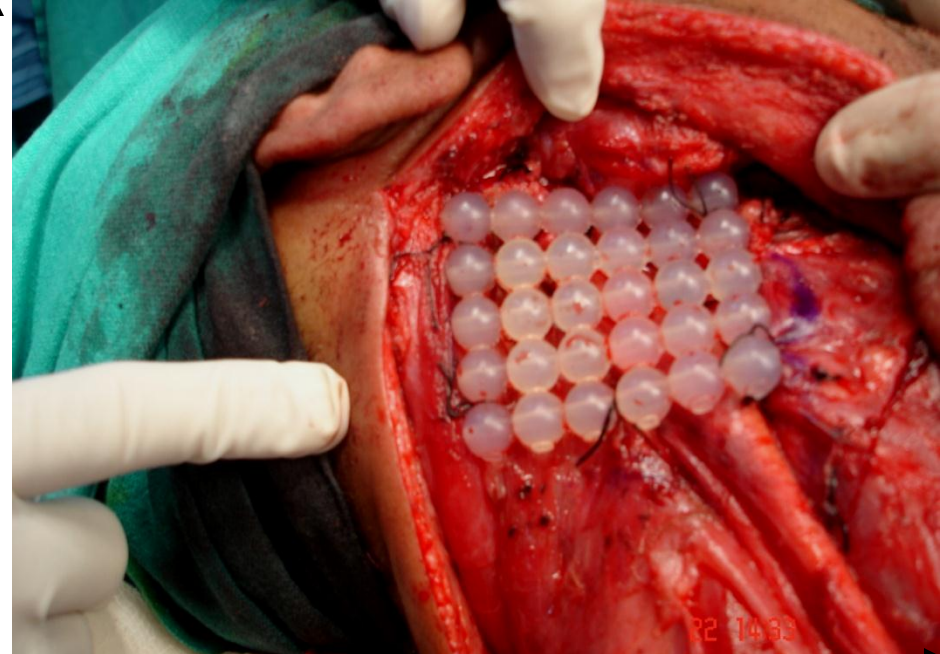




Spherical applicators.



Positioning of distractors after fixation of the mobilized breast tissue close to the applicator surface by means of a purse-string suture.





Surgical Placement of Catheter

The lumpectomy wound is open, the catheter is placed with the balloon in the lumpectomy site.



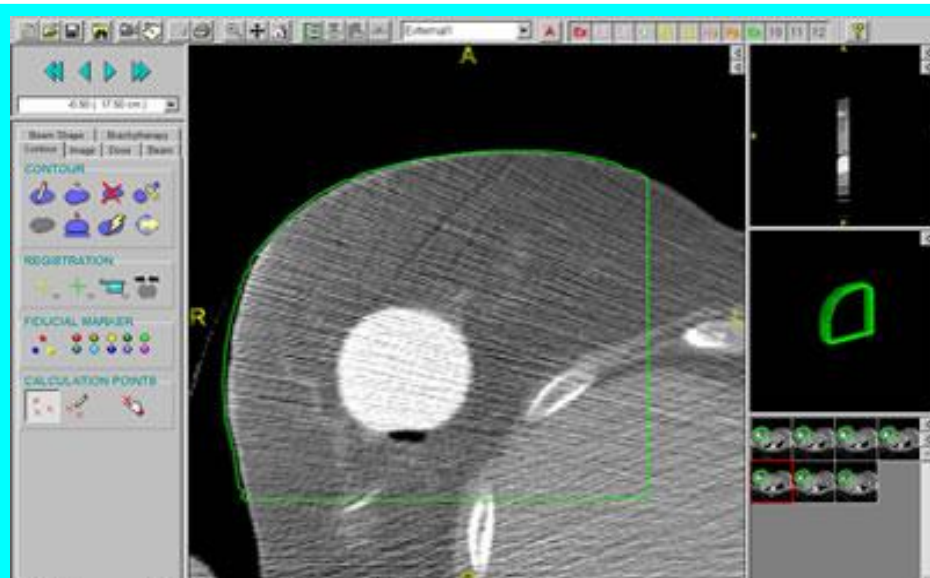
Surgical Placement of Catheter, Continued

The wound is closed and you can see the catheter exiting the skin.



Delivery of High Dose Rate Radiotherapy

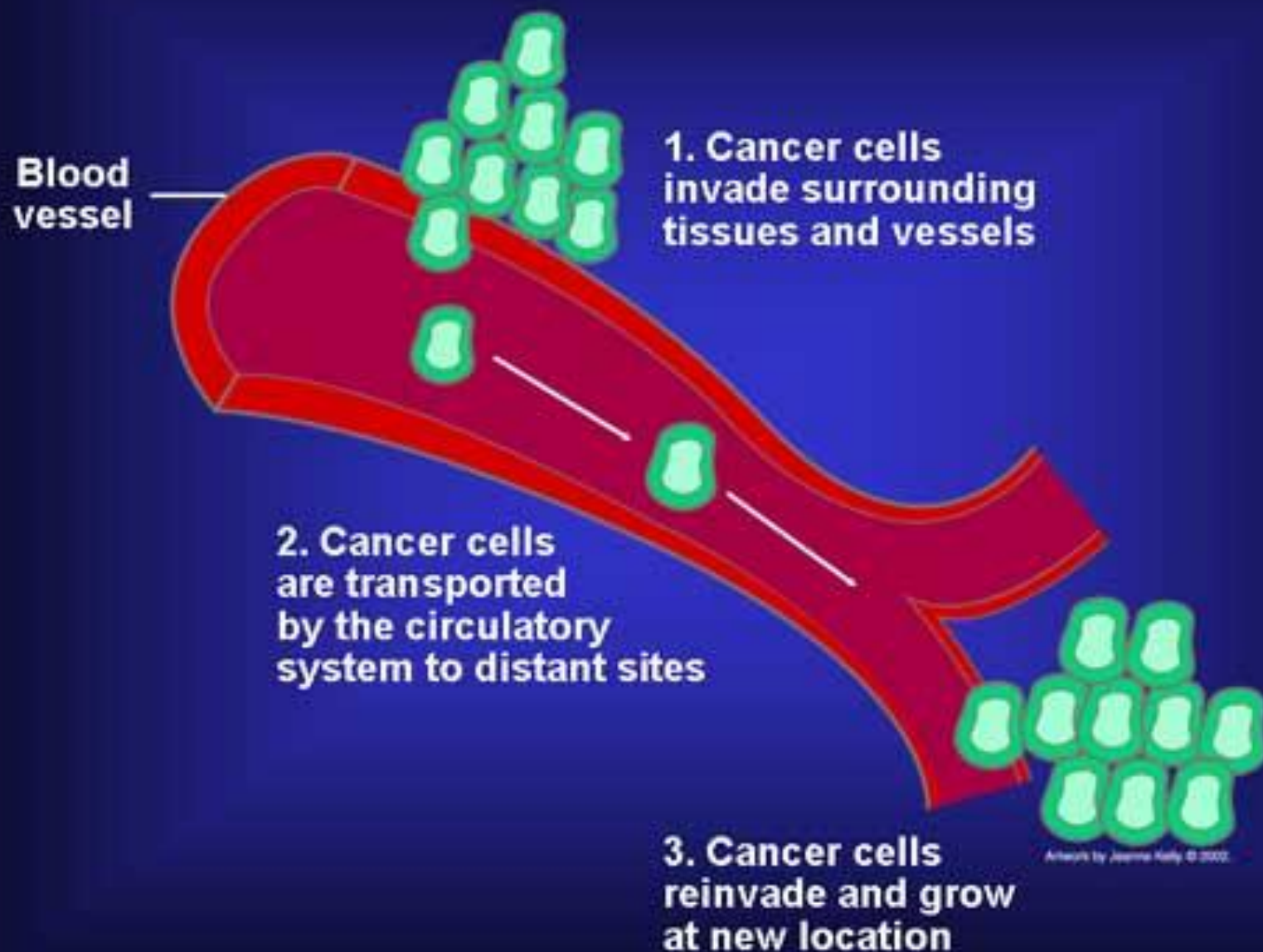
The patient lies comfortably on a table for a few minutes while the machine puts the radioactivity in and then removes it.



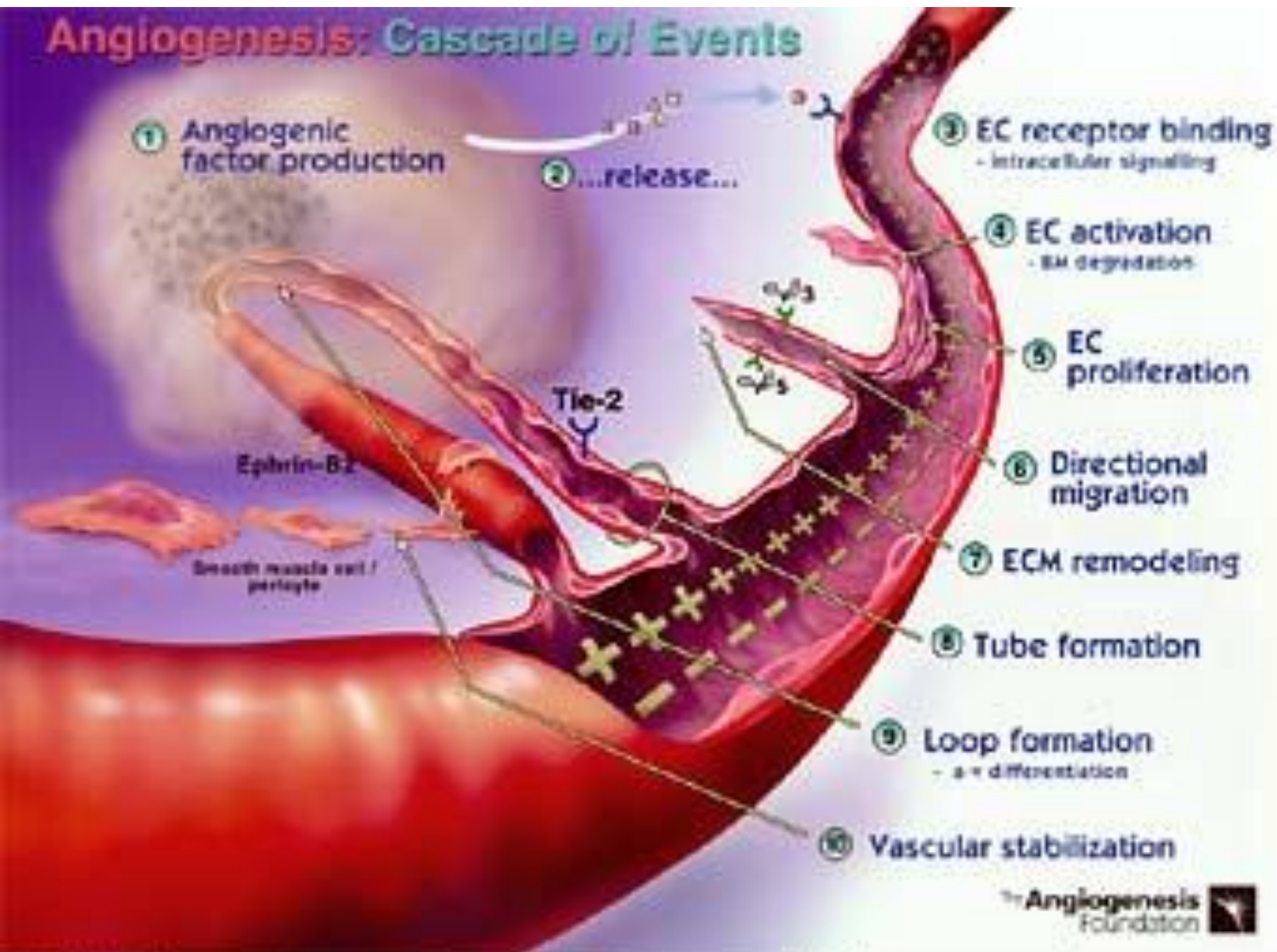
CT Scan Confirmation of Placement

The CT scan confirms good placement of the catheter.

What Is Metastasis?



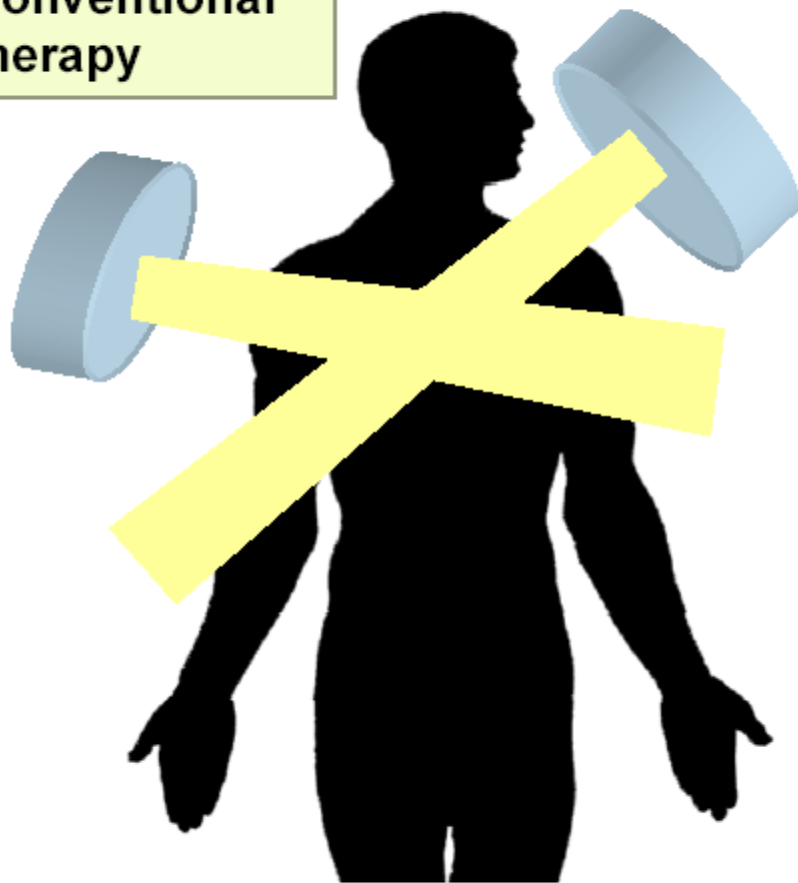
Angiogenesis: Cascade of Events



With molecular targeting, radiation can be mobilized against widespread cancer

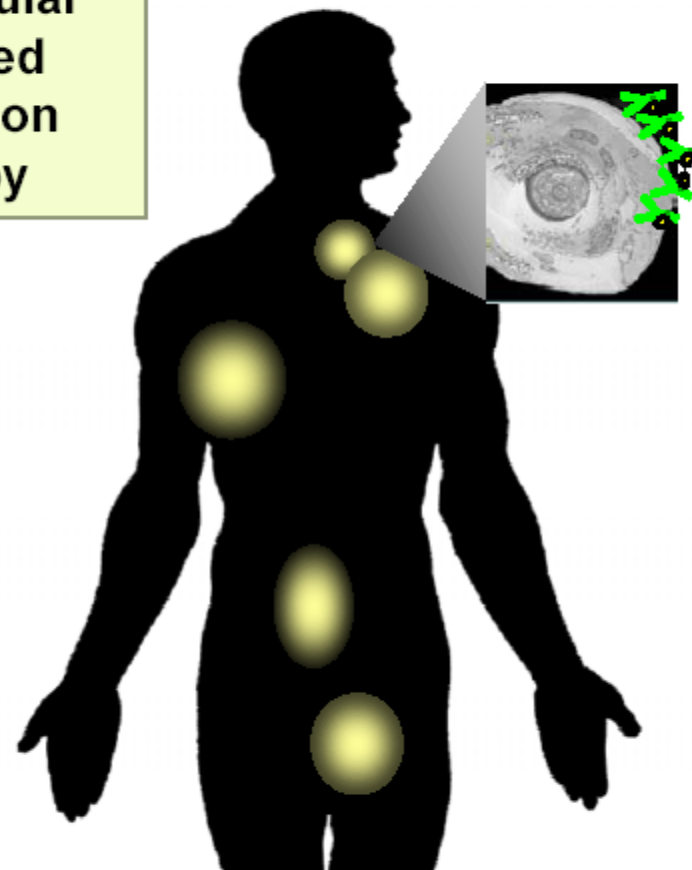


Conventional
therapy



Works well for
local disease

Molecular
targeted
radiation
therapy



Extends radiation
therapy for
widespread
(metastatic) cancer

Thank you

