

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



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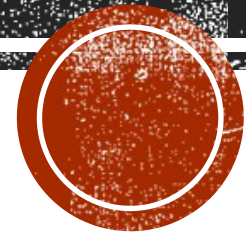
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LEARNING OBJECTIVES

- Determination of stature from unknown human remains
- Special techniques for identification in mass disaster
- Narcoanalysis and polygraphy
- Medicolegal issues related to HIV patients



STATURE DETERMINATION IN HUMAN REMAINS



STATURE DETERMINATION IN HUMAN REMAINS

Complete skeleton

Fully extended arms

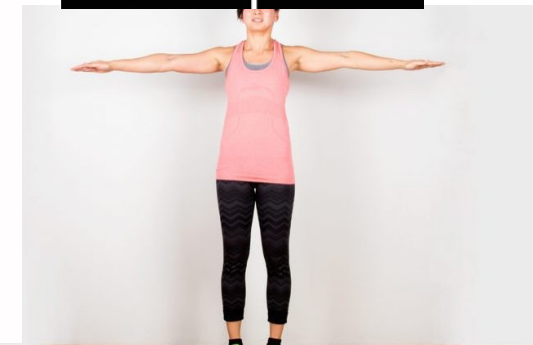
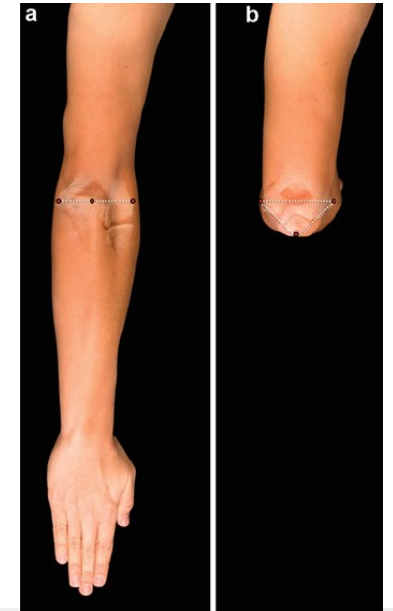
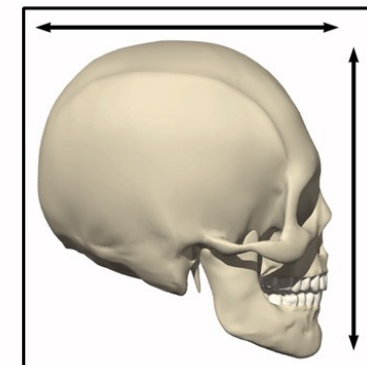
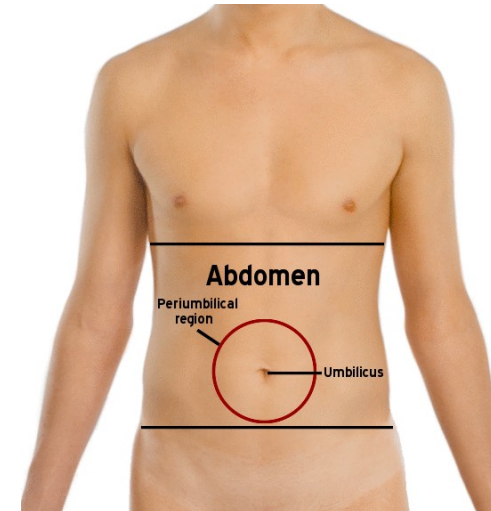
Pubic symphysis

One complete upper limb

Forearm

Upper torso without head

Skull



STATURE DETERMINATION

STATURE FROM DISMEMBERED
BODIES

STATURE FROM SKELETAL REMAINS



STATURE FROM DISMEMBERED BODIES

Length of entire skeleton plus 2.5-4 cm (For the soft parts thickness) is equal to the height (stature)

Length of cadaver is 2cm more than living except when in rigor mortis

Stature = length measured from the tip of the middle finger to the tip of the opposite middle finger

Length of one arm $\times 2 + 30$ cm for 2 clavicles + 4 cm for the sternum is equal to the height (stature)

Length of arm multiplied by 2 plus 34cm

Symphysis pubis form the centre of the body from 20th to 25th year onwards

Length of forearm from the tip of middle finger to the olecranon process makes 5/19 of the stature



CONT..

Sternal notch to symphysis pubis $1/3^{\text{rd}}$ of the stature

Sternal notch to symphysis pubic length $\times 3.3$ is equal to height (stature)

Top of head to chin = $1/7$ of the stature

Length of skull = $1/8$ of the stature

In general humerus represents 20%, tibia 23% femur 27% spinal column 35% of the stature





STATURE FROM SKELETAL REMAINS

Stature can also be determined from skeletal bones by mathematical calculations or formula.

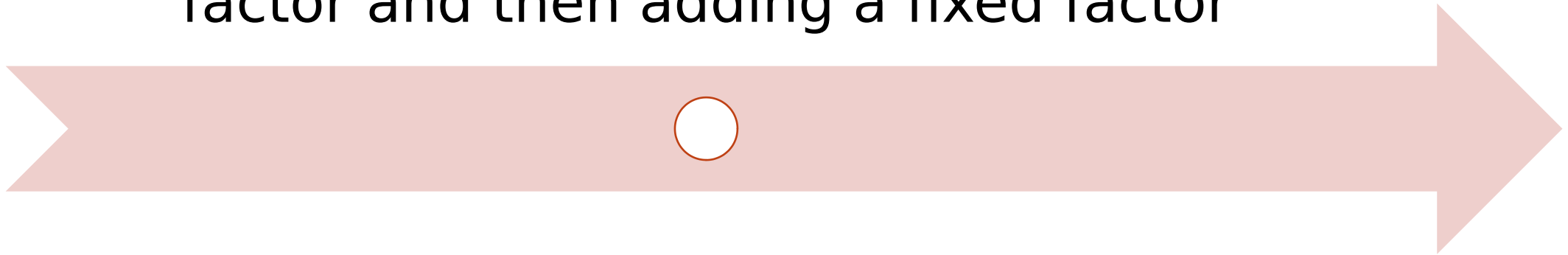
Usually long bones are ideal for determining stature.

There are few formulae, which are often used in routine medicolegal practice and they are

- Karl Pearson's formula
- Trotter and Glaister's formula
- Dupertius & Hadden
- Breitinger
- Telkka



The principle of these formulae is to measure length of a long bone, multiply it by a given factor and then adding a fixed factor



KARL PEARSON'S FORMULA

Table 11.27 Karl Pearsons formula for adult long bones in dry state for European used in estimating the **stature** in cms

Bone	Karl Pearson's Formula [Constant × Length of the bone]	
	Male	Female
Femur	$81.306 + 1.880 \times \text{Length of femur}$	$72.884 + 1.945 \times \text{Length of femur}$
Tibia	$78.664 + 2.376 \times \text{Length of tibia}$	$74.774 + 2.352 \times \text{Length of tibia}$
Humerus	$70.641 + 2.894 \times \text{Length of humerus}$	$71.475 + 2.754 \times \text{Length of humerus}$
Radius	$89.925 + 2.271 \times \text{Length of radius}$	$81.224 + 3.343 \times \text{Length of radius}$



MULTIPLICATION FACTORS

<i>Bone</i>	<i>Multiplication factor</i>	
	<i>Male</i>	<i>Female</i>
Humerus	7.08	5.31
Radius	6.01	6.27
Ulna	6.40	6.85
Femur	3.60	3.75
Tibia	4.20	4.39
Fibula	4.44	4.55



Apparatus used to measure
length of a long bone is called
OSTEOMETRIC BOARD



OSTEOMETRIC BOARD

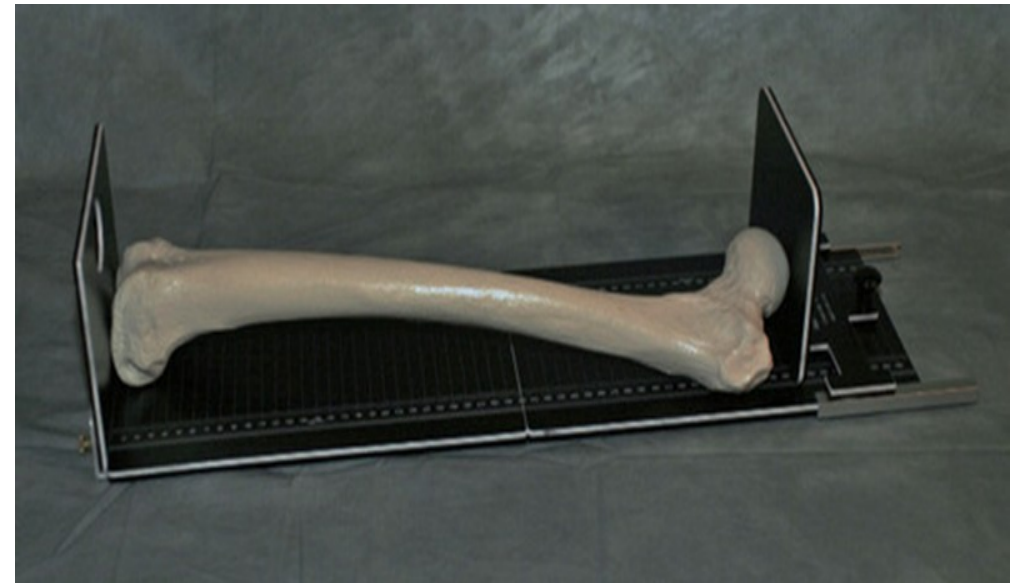
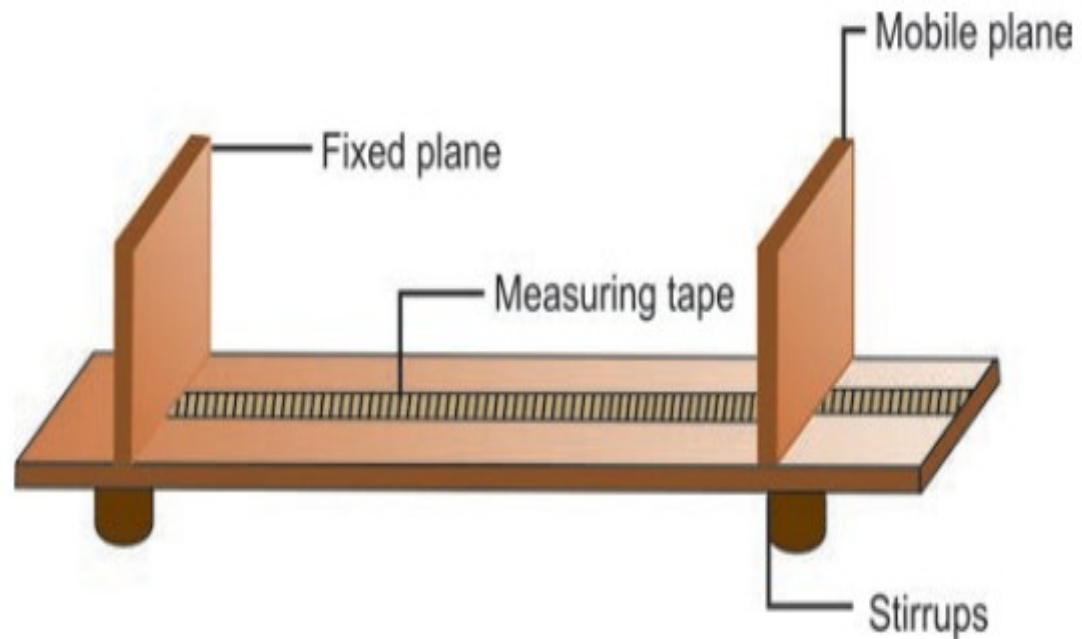
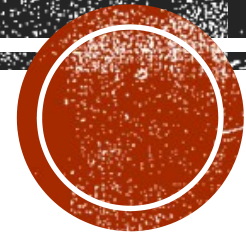


Fig. 11.45: Hepburn osteometric board



SPECIAL TECHNIQUES USED FOR IDENTIFICATION IN MASS DISASTER





MASS DISASTER

“ Death of more than 12 victims in a single event, like fire, air crashes or floods etc.”

OR

The number of victims far exceeds the capacity of local death investigation system to handle.





CLASSIFICATION



NATURAL DISASTERS



MAN MADE
DISASTERS



NATURAL DISASTERS

1. Biological:

Disease epidemics

Mass poisoning (food/ liquor)

2. Non-biological:

Earthquake

Cyclone

Flood

Drought

Heat wave

Volcanic eruption

Landslides

Most recently, 'Earthquake' & 'the tsunami'.



MAN MADE DISASTERS

Accidental—transportation (road, rail, sea, river, and air), building collapse, mining accidents, dam bursts, food poisoning, fires, crush tragedies at Hajj, etc.



Industrial—fires, explosions, leakage of toxic substances/ gases.



Civil disturbances—riots and demonstrations.



Warfare—conventional (bombardment, exchange of fire, shelling) and non-conventional (nuclear, biological and chemical warfare, terrorism).





SPECIAL TECHNIQUES USED FOR IDENTIFICATION IN MASS DISASTER

X rays

UV light

Photography

Finger printing, Lip prints and footprints

Post-mortem serology

DNA profiling



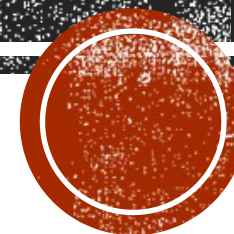
X rays provide an information related to

- Age
- Sex and race
- Occupation
- Diagnosis to certain conditions
- Identification
- Cause of death





POLYGRAPHY







POLYGRAPHY

Also called mechanical lie detector

It is a process by which a study of functioning of different body systems is studied to detect lies

Principle:

It is based on principle that if a person is telling lie, and if there is fear that the lie will be detected, the emotional fear results in stimulation of sympathetic nervous system that causes physiological changes and some of the changes will be recorded



Do polygraphs detect lies?

Polygraph or "lie detector" exams continue to be used by law enforcement and government agencies for various screenings even though most criminal courts ban polygraph evidence.

How reliable?

Supporters claim an 85-95 percent accuracy rate

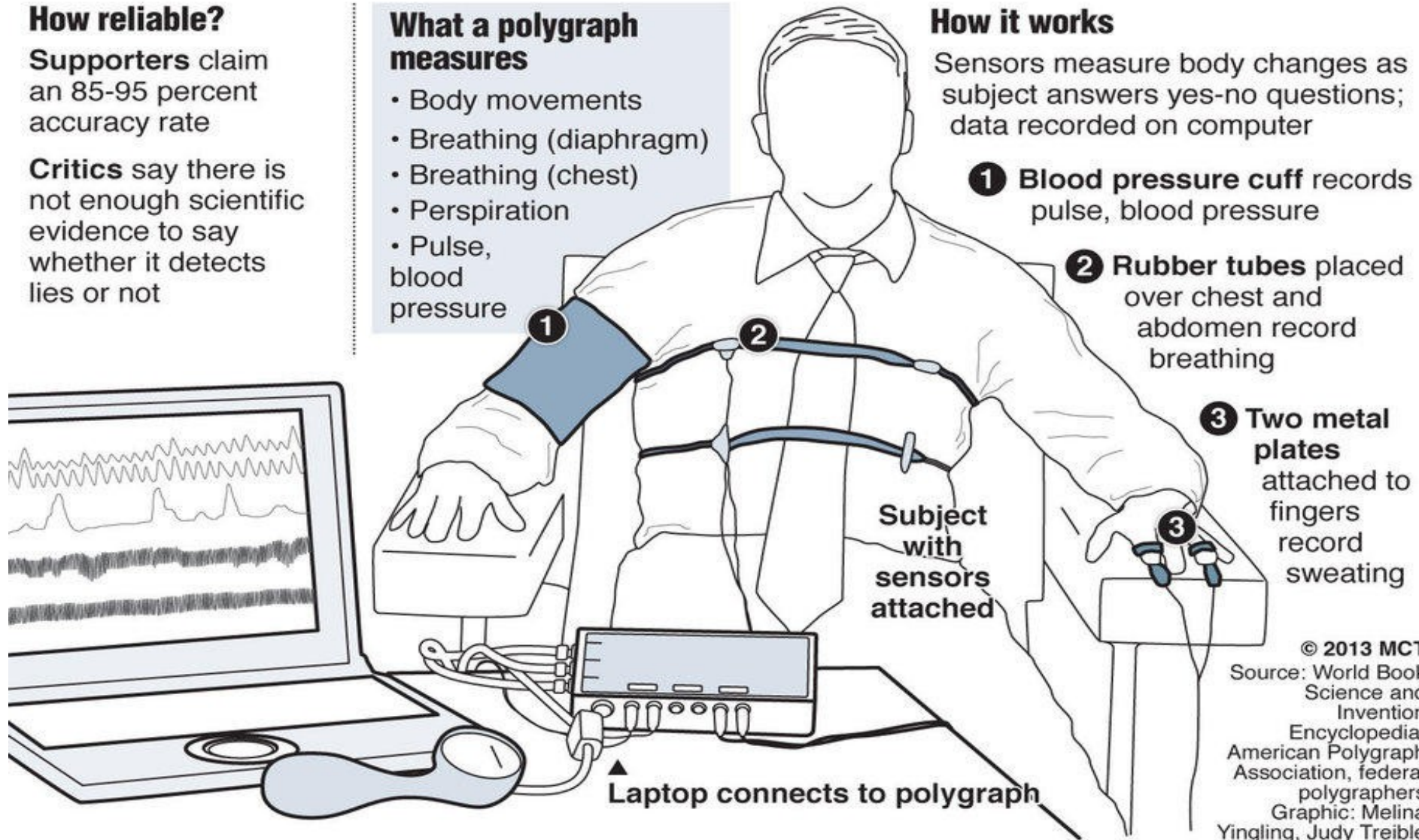
Critics say there is not enough scientific evidence to say whether it detects lies or not

What a polygraph measures

- Body movements
- Breathing (diaphragm)
- Breathing (chest)
- Perspiration
- Pulse, blood pressure

How it works

Sensors measure body changes as subject answers yes-no questions; data recorded on computer



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Source: World Book
Science and
Invention
Encyclopedia,
American Polygraph
Association, federal
polygraphers
Graphic: Melina
Yingling, Judy Treible



Polygraphy process uses following parameters:

- BP
- Pulse
- Respiration
- Galvanic skin reaction



PROCEDURE

Consent is taken

The process is explained to the concerned person. The person has to answer the questions in yes or no.

The person on whom the test is to be conducted is asked to sit comfortably in chair and instruments are attached to him. Arm cuff is placed for recording bp and pulse. A belt is placed on the chest to record respiration and an electrode connection is attached to the tip of one side of the index finger to record galvanic skin changes. Response is recorded graphically on a single paper.

Usually no more than 10 questions are asking at any single setting. Three types of questions are asked.:

- Irrelevant
- Relevant questions
- Control questions



Among all responses, the galvanic skin changes and the response to the change to respiration are assumed to be more reliable.

Following people are unsuitable for the test:

- Mentally ill/unsound person
- Over reactive personality
- Drug addicts
- Persons suffering from diseases of respiration and cvs
- Restless and non cooperative





MEDICOLEGAL ASPECTS OF POLYGRAPHY

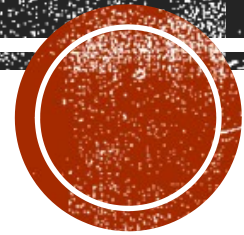
It is established that classification of guilty can be made in 75 to 97% accuracy but the rate of false positive is sufficiently high

Results of such tests are inadmissible in courts

Due to high false positive results, questions are raised regarding the efficacy of this test to use as the sole arbiter of guilt or innocence



NARCOANALYSIS







NARCOANALYSIS

Introduction:

Also known as TRUTH SERUM TEST

- **Narcoanalysis** is a chemo-physiological test administered to a crime suspect to extract when he is not willing to tell the truth and tell lies in normal interrogation.
- **It** is interrogation of the suspect after giving him an injection, intravenously, of a suitable dose of a hypnotic drug- a barbiturate most of the time.
- **The** term NARCO is derived from a Greek word “NARKC” meaning anesthesia.
- **The** most common barbiturate used in Narcoanalysis is Sodium Pentothal or Sodium Amytal



NARCOANALYSIS

Narcoanalysis is a procedure of investigation of mental content of a person done after the application of a light anaesthetic agent

The investigation technique is based on the principle that at a point very close to unconsciousness i.e. semiconscious (natural sleep-like state), the subject would be mentally incapable of resistance to questioning, and incapable of inventing falsehood that he has used to conceal his guilt.



It involves administration of light anaesthetic agents or drug intravenously

Drugs commonly used are:

- Thiopentone sodium
- Scopolamine
- Sodium secnol
- Benzodiazepines



Adverse effects of Thiopentone sodium include



- Laryngospasm
- Shivering
- Delirium may occur after recovery.
- It can precipitate acute intermittent porphyria in susceptible individuals.





MEDICOLEGAL ASPECTS

Since its inception in criminal jurisprudence, the human rights activists have pointed a finger against subjecting a person without his consent to the test on two grounds that,

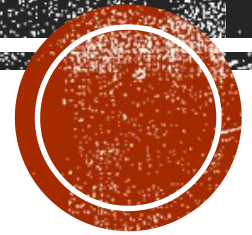
- firstly, it violates the principle of 'Right against Self Incrimination' guaranteed under Constitution
- Secondly, it violates the Fundamental Right of 'Right to Privacy' under the Constitution.

The procedure of Narcoanalysis and subsequent interrogation has raised serious ethical issues for involvement of medical professionals in the procedure.

Many think that Narcoanalysis is a form of torture. Involvement of physician in such procedures means torturing a human and using medical knowledge For inflicting torture. Therefore, the procedure of Narcoanalysis suffers from problem of torture. It also violates dignity of a person



MEDICOLEGAL ISSUES RELATED TO HIV PATIENTS





HIV TESTING



The result of the HIV test must be kept confidential and even health care workers who are not directly involved in the care of the patient should not be told about the result.



Surveillance of HIV positive cases in the country does not require reporting of the identification data of the patient.



Purpose of HIV surveillance is to measure the level and trends of HIV infection in a given geographical area over a period of time.



HIV AND LAW

Constitution guarantees right to life and personal liberty. It is fundamental right of HIV positive individuals to have access to adequate treatment provided by government.

A writ can be filled in the High Court or in the Supreme Court if a person is unjustly or illegally isolated alleging him to be HIV positive.

A civil suit under the law of tort may be filled to claim compensation for violation of fundamental right to personal liberty.



The disclosure of HIV status of the person should not in any way affect his:

- Rights To Employment
- Position At Workplace
- Right To Medical Care
- Other Fundamental Rights.



HIV & PREGNANCY, LACTATION

HIV positive women should have the complete choice to make decisions about pregnancy and childbirth, and proper counseling should be given to them to enable them to decide whether to continue or terminate the pregnancy.

They should be advocated to avoid pregnancy as there is a one in three chance of having an infected child.

There should be no forcible abortion or even sterilization.

As far as the breast-feeding is concerned, it may result in transmission of HIV from mother to child





IMPLICATIONS OF HIV TRANSMISSION

A legal action can be initiated against a person who is infected with HIV if:

- A person **unlawfully or negligently** do the act to spread infection of disease dangerous to life, shall be punished with imprisonment of either description for a term which may extend to 6 months or with fine or with both
- A person **willfully or malignantly** does any act to spread the infection of disease dangerous to life shall be punished with imprisonment of either description for a term which may extend to 2 years or with fine or with both .

Action against blood bank can be initiated supplying infected blood to a person resulting in death of that person due to HIV infection.



HIV AND MARTIAL ISSUES

If a person suffering from AIDS, knowingly marries or has sexual intercourse with a normal person and thereby transmits the infection to other person, he would be guilty of offences:

Punishment:

- (imprisonment for 6 months with/without fine)
- (imprisonment for 2 years with/without fine).

He may even be charged under Sec. 302, if the person intentionally has sexual intercourse in order to infect the other person.

A civil suit may be filed to claim compensation for violation of the fundamental rights to personal liberty





HIV AND MEDICAL PRACTICE

It is unethical on part of doctor to refuse treatment or investigation to a person infected with HIV.

A doctor may be held guilty for professional misconduct for this unethical behavior.



THANK YOU

