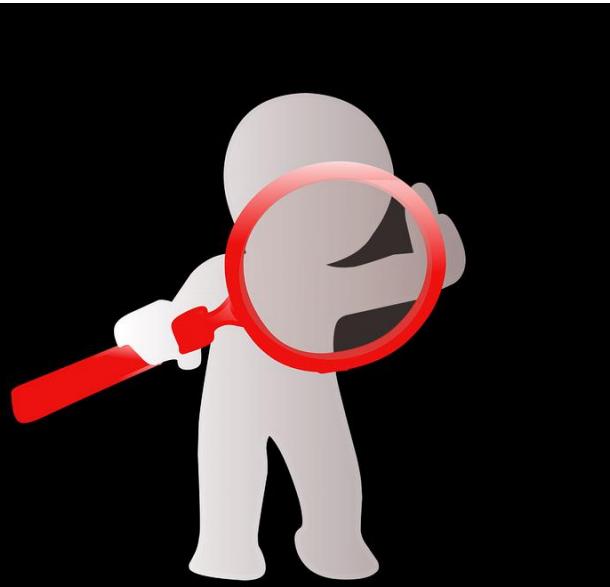


Human Identification

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2019



Learning objectives

- ▶ 1. To learn the methods of establishing identity of dead or living for forensic purposes

- ▶ 2. To learn how to assist law enforcement authorities to establish the identity of dead or living

Instances where the identification is necessary



In a living person

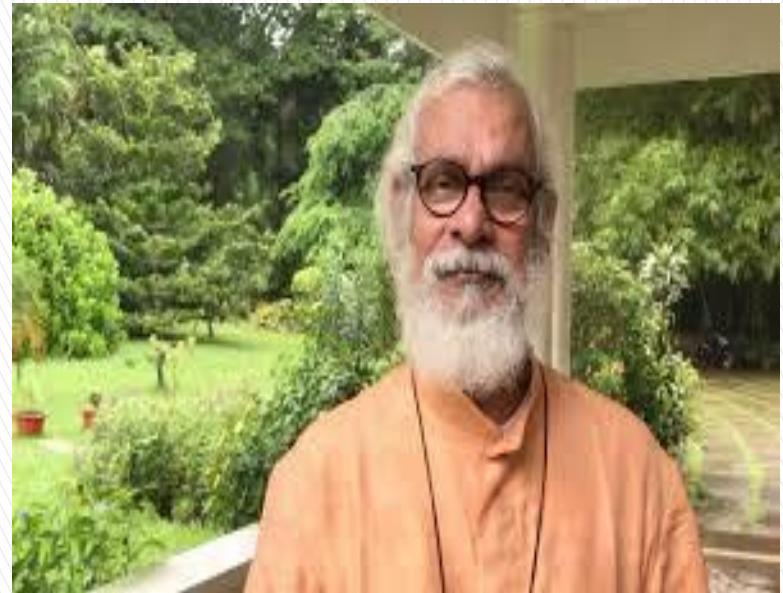
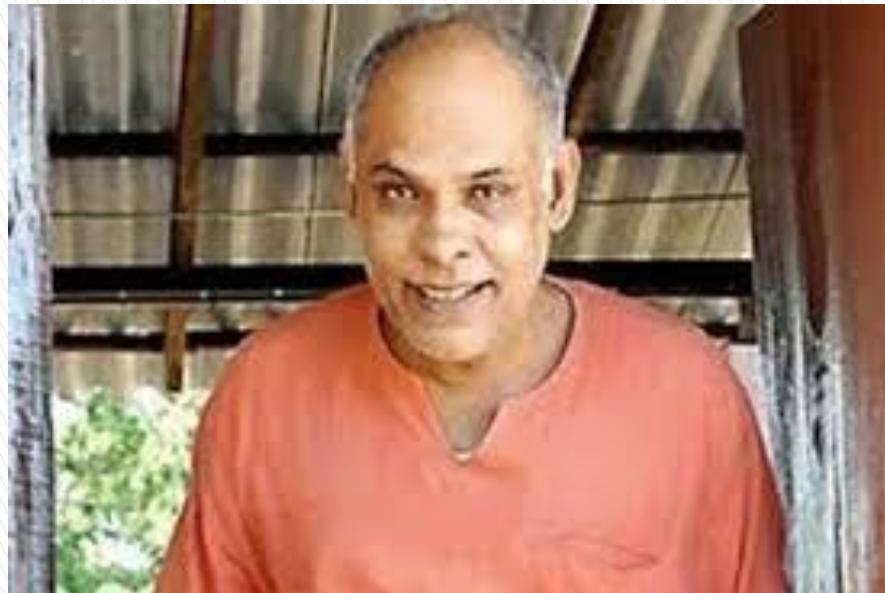


In a dead person

Instances where the identification is necessary- Living

- ▶ Infants in mass disasters
- ▶ Cases of coma, amnesia, unconscious
- ▶ Relevant to the rights of the individual person
 - (to obtain birth certificate, national identity card, passport)
- ▶ Imposters

Same person



KP

Same person with different appearance

Instances where the identification is necessary- Living

- ▶ Relevant to the crime and identification of criminals
- ▶ Disputed paternity
- ▶ Relevant to the specific age groups referred in penal code (criminal responsibility, age of consent, rape)

Instances where the identification is necessary – Dead

- ▶ Statistical and legal purposes
(registration of death)
- ▶ Disposal of dead
(for burial or cremation)
- ▶ To establish ownership of the body

Instances where the identification is necessary –Dead

- ▶ Economical and property related reasons
- ▶ (insurance claims, pension claims, savings, transfer of property)

- ▶ Facilitate police investigations to solve crimes
- ▶ (Identification of victim is needed to identify assailant)

Identification is established with

- ▶ General identification features
- ▶ Specific identification features

General identification features

- ▶ Height
- ▶ Weight
- ▶ Built of the person
- ▶ Complexion
- ▶ Appearance

Specific identification

- ▶ Facial features
- ▶ Clothes and ornaments
- ▶ Scars, marks, tattoos, occupational stigmata
- ▶ Facial reconstruction
- ▶ Photo superimposition
- ▶ Finger prints
- ▶ Dental identification
- ▶ DNA

Interpol criteria of Identification

Minor criteria

Personal description

Medical findings

Evidence and clothing found on
the body

Interpol criteria of Identification – Major criteria

Fingerprint analysis

Comparative dental analysis

DNA analysis

Identification of the person in a case of death

- ▶ Scene visit
- ▶ Collect all the personal belongings of the person with the body in a body bag

Mass disasters



Central bank

Before autopsy

- ▶ Take good photographs of the facial features and special features on the body and preserve them for later identification.
- ▶ Body is refrigerated and allow to identify at least for 2 weeks.

Action taken by the police



Coroner finds body in woods

Unidentified man a victim of homicide

By CHRISTIAN STINE • Christian
County Daily Review

Marion County Coroner Dennis J. Langford said his brother discovered a dead body early Saturday while mowing his bushes.

"It's a very unusual" Marion County Sheriff Lawrence E. Jones, who was called about the coroner finding a homicide victim, was also there. "They just happened up on these bushes."

The bushes in which the body was later found are near Interstate 70, located off Hwy. 100, between Marion and the northern part of the county, near the Clark and Bluegrass County lines. It was discovered about 15 yards off the road on other roads.

"I think it's a homicide," Langford said. "There was a good deal of blood."

According to officials, the victim has short brown hair, blue eyes, is approximately 5 feet 10 inches tall and weighs about 185 pounds. His face was disfiguring, indicating that the sheriff and coroner might well bury him under the body.

See BODY, Page 2A

Publish in papers

Action taken by the police

- ▶ Finger prints are obtained by the police for possible matching.
- ▶ Bring the post mortem order and body is disposed with government expenses if there are no relatives.

Autopsy of a unknown body

Take History from

Eye witnesses

Police

Those who claim the body

History

History related to the incident

History related to the identification

Preliminary investigation

If necessary take pre autopsy x'rays



Examination of body

External examination

Internal examination

Examination of clothing

Type of clothing

Size of clothing

Images:



General description of the body

Age

Gender

Weight

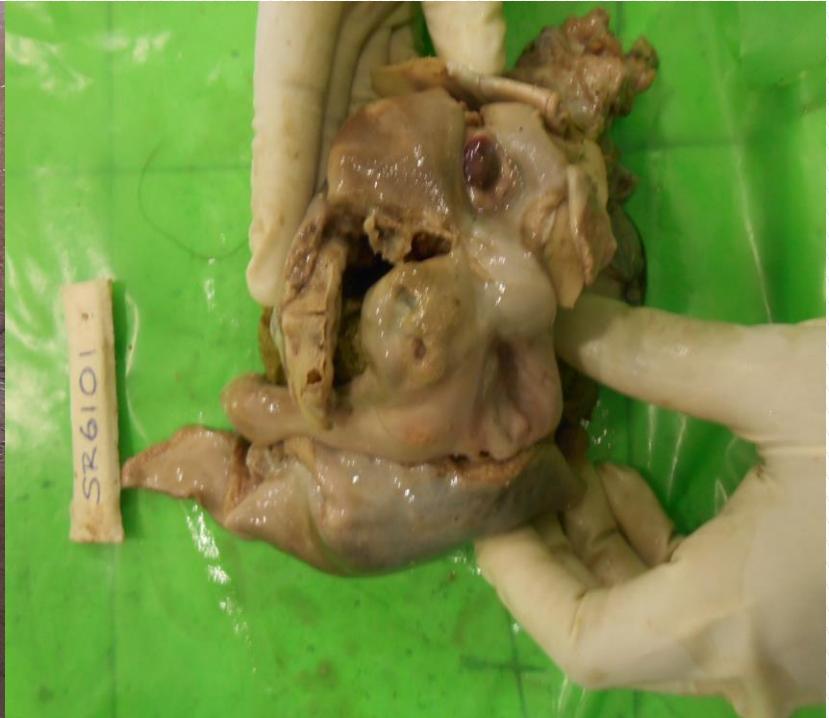
Built

Possible ethnicity

General features



Fresh body



Mutilated decomposed

Determination of stature

Head – heel measurement



Determination of sex

Presumption of sex

Clothing

Body contour

Distribution of hair

External genitalia

Determination of sex

Confirmation of sex

Internal organs – presence of uterus, ovary, prostate

Nuclear sex

Skeletal features – Morphological features of skull, pelvis or long bones

Estimation of age –

Estimation criteria of age

in living and dead

Foetus

Ossific centers, crown heel length, crown rump length, weight
Head circumference, limb buds, appearance of nails, hair

0-10 days

Cord changes

10 days -6 months

Length and weight, foetal Hb

6 months-2 years

Primary dentition, anterior frontanelle, ossific centres

2 years-24 years

Growth chart, secondary dentition, calcification of roots, epiphyseal unions, pubertal changes

After 25 years

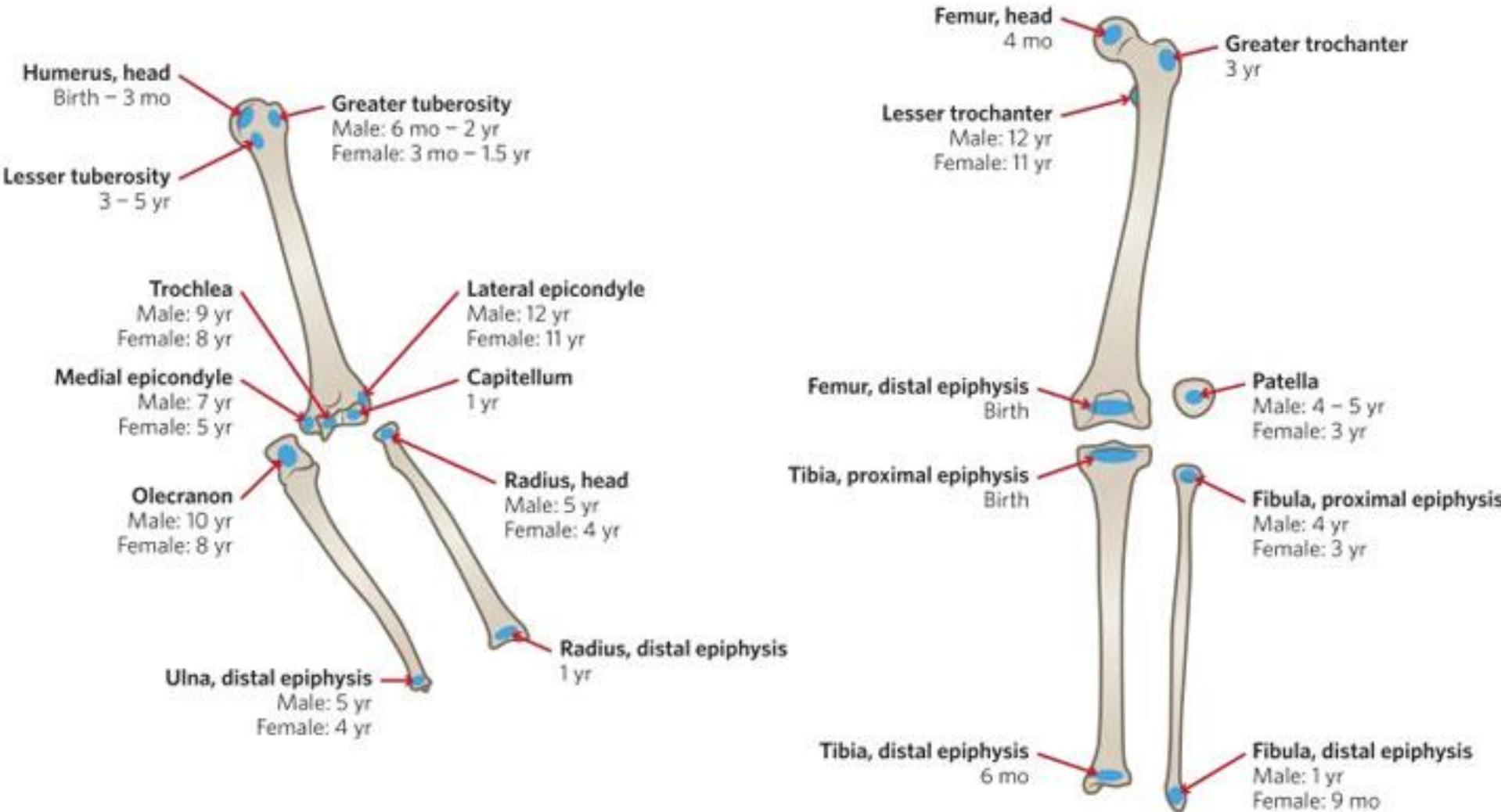
It is very difficult, balding ,graying of head hair, facial hair, pubic hair

Old age

Arcus senilis, osteo-arthritis changes, skin elasticity

Ossific centers - Foetus

Time of appearance of secondary ossification centres

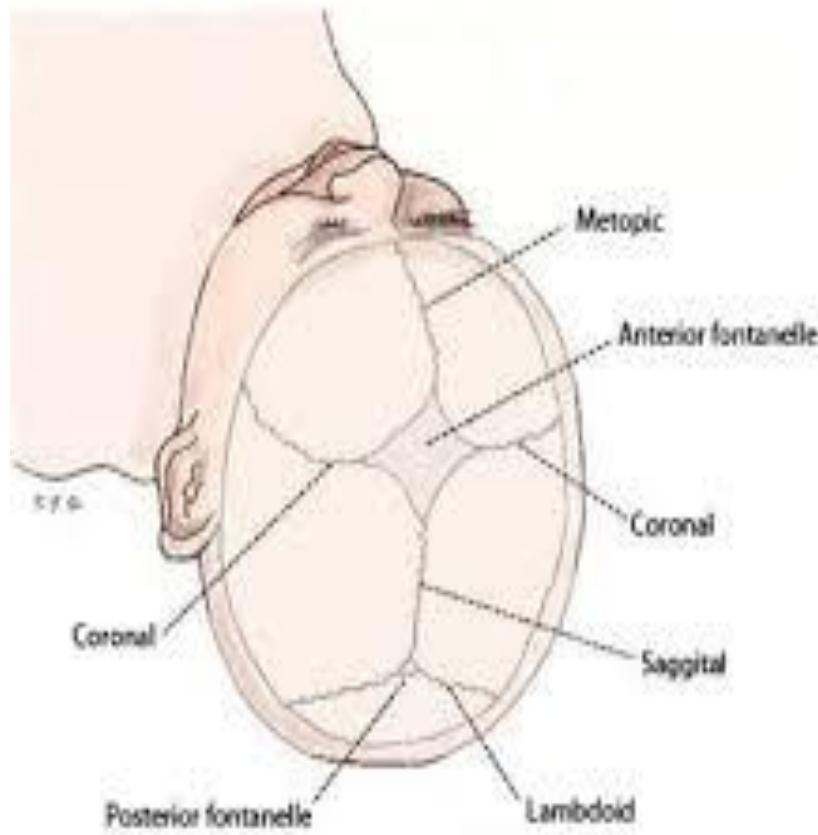


Fontanelles

- Anterior Fontanel – Largest Fontanel – closes 18 – 24 months after birth
- Posterior Fontanel – Closes 2 months after birth
- Anterolateral Fontanel – Closes 3 months after birth
- Posterolateral Fontanel – begins to close 1 – 2 months after birth and finishes closure at 12 months

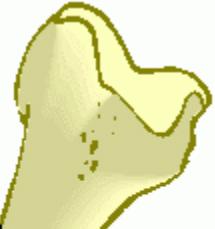
Cranial Sutures

View from top of head

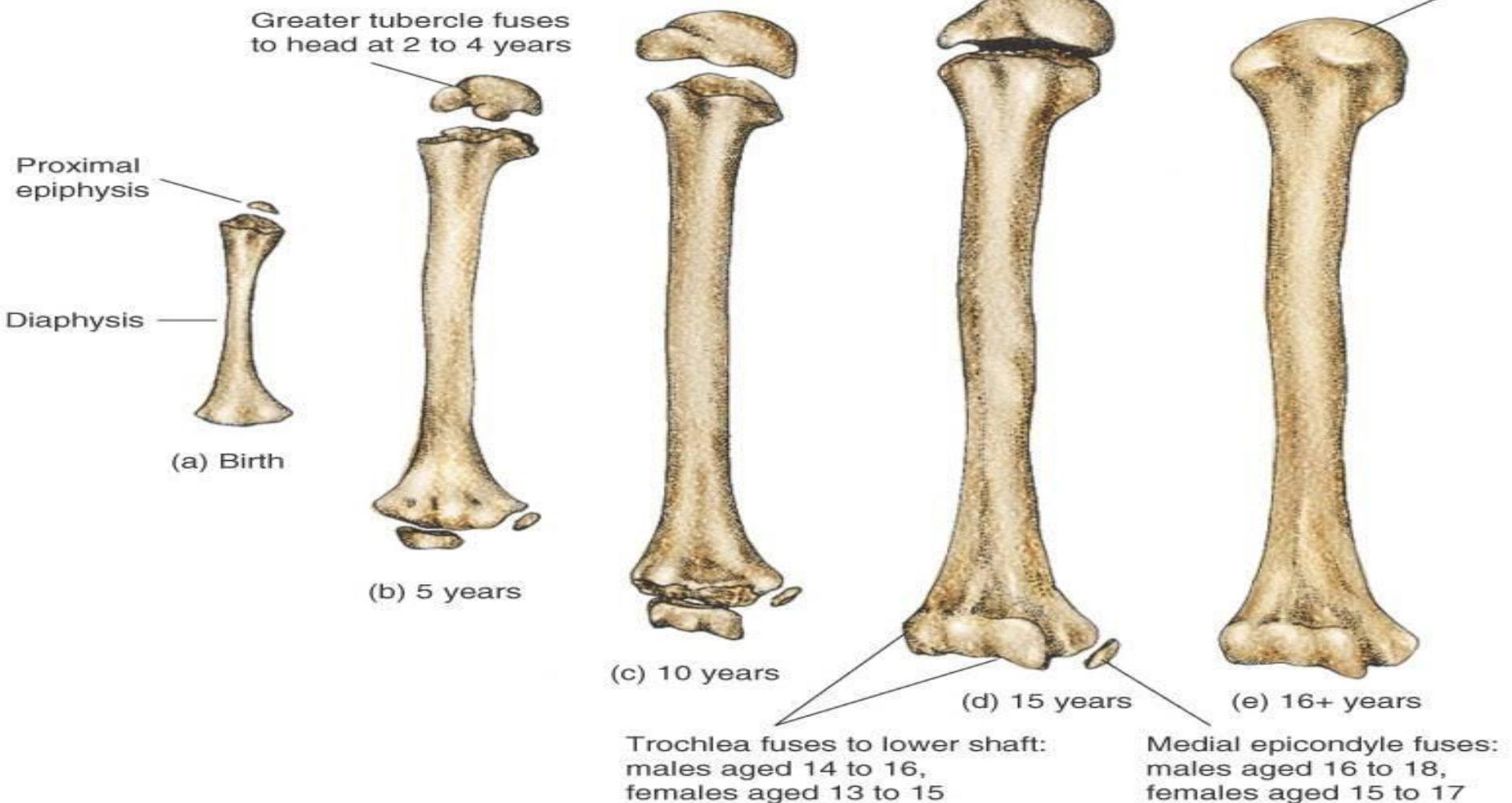


Epiphyseal fusion in children

Epiphysis:
The cap at the end of a long bone that develops from a secondary ossification center.



Head fuses to shaft:
males aged 16 to 18,
females aged 15 to 17



External examination

Describe ornaments, personal belongings

Jewelry, valets, personal identification documents such as ID cards, credit cards

External examination



Personal belongings

Record features of facial recognition



Hair – strait or curly, gray, black





Eye colour – Brown, black



Appearance of cheek
bones, chin, forehead,
mustache

Record features of facial recognition

Special features on the face (scars -cleft lip, birth marks)

If there are facial injuries, reconstruction of face is important

Identification by facial features is difficult not only due to post mortem changes but at severe decomposition, burns and other injuries



Identification using external bodily features

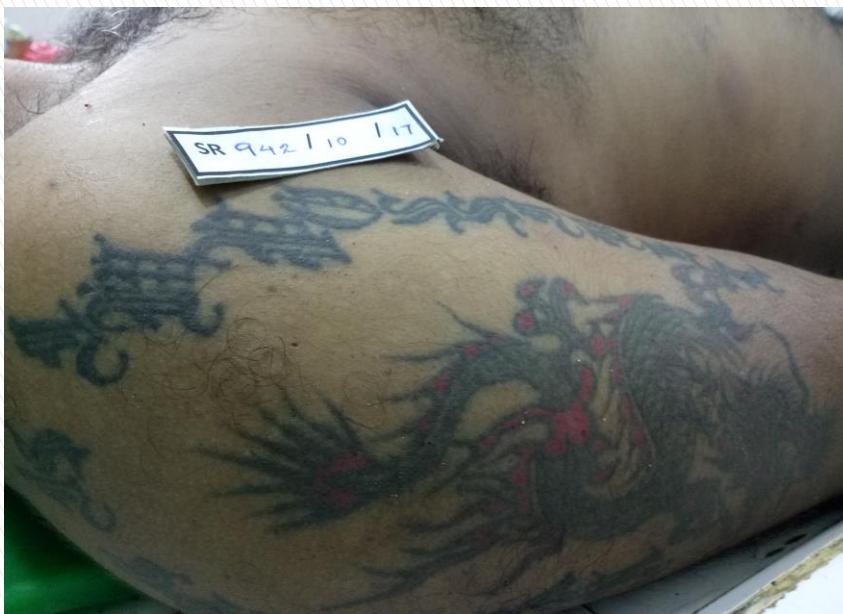
Stigmata of occupation – paints, saw dust, callosities in manual workers, puncture marks on fingers in tailors

Congenital anomalies – additional fingers, cleft palate, kyphosis

Scars- natural disease, trauma,
surgical procedures

Marks- birth marks, warts

Tattoo marks – preserved in decomposition since dye is injected into the dermis



Identification using external bodily features

Acquired deformities –
fractures, loss of fingers

Stigmata of natural disease –
Finger clubbing, goiters,
lumps, rash



Internal findings

Evidence of natural disease – carcinoma

Surgical procedures – pins, grafts,
removal of internal organs

Evidence of previous trauma – presence
of pellets, bullets, healed fractures

Insertion of medical devices – Unique numbers found on heart pace-makers and prosthetic devices, plates and pins

Recode these findings with photographs

Establishing Identity following autopsy

If there is a party who claims the body collect information from them and compare those with the records.

If the body is in the mortuary relatives are allow to view the body under good light to recognize the person by external features and with preserved items.

Allow them to view the photos and personal belongings if post mortem is already performed.

If relatives are in doubt or JMO is not satisfied with external identification, proceed with the investigations.

Major criteria of identification

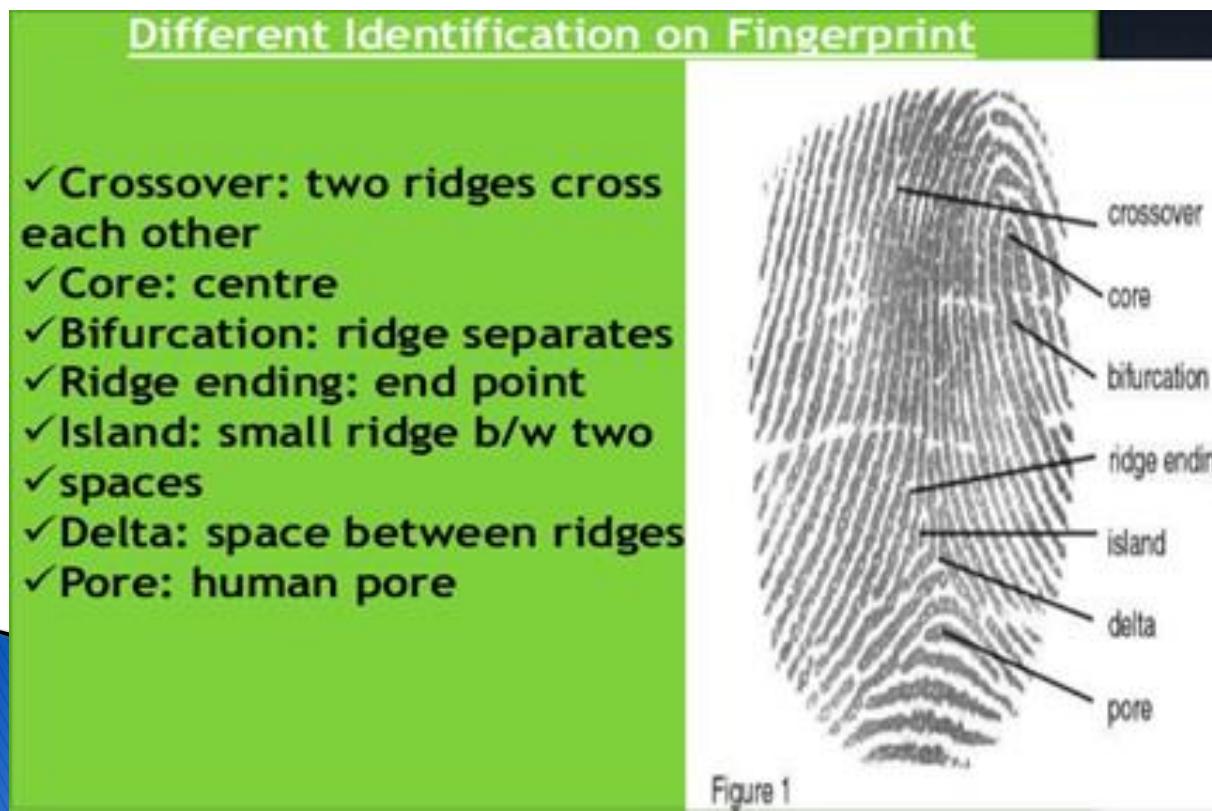
Fingerprint analysis

Comparative dental analysis

DNA analysis

Identification by finger prints (dactylography) – Major criteria

- ▶ Fingerprints are unique
- ▶ Fingerprints do not change
- ▶ Fingerprints can be classified

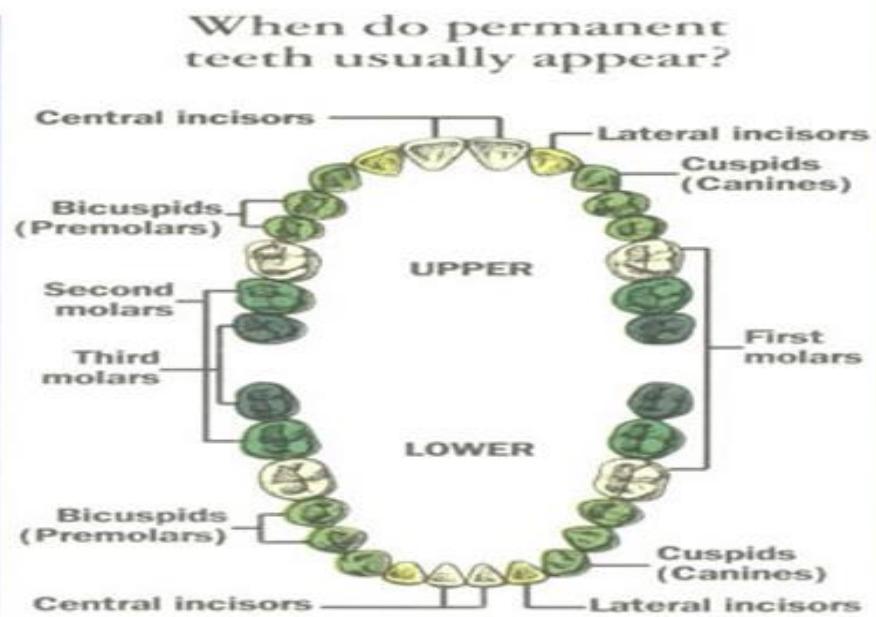
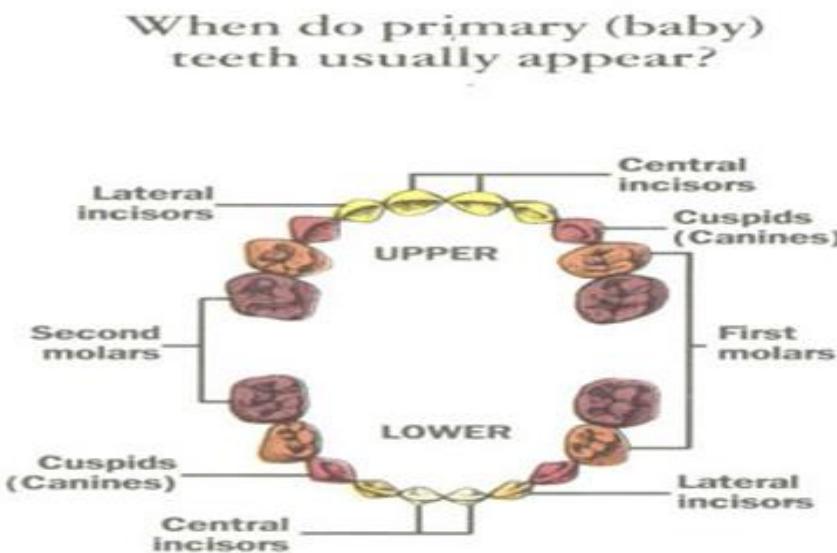


Identification by dental features – Major criteria



- ▶ Previous dental charts
- ▶ Eruption of teeth according to the age

TOOTH DEVELOPMENT



[Yellow box]	6-10 months
[Yellow box]	8-13 months
[Yellow box]	10-16 months
[Orange box]	13-19 months
[Red box]	16-23 months
[Dark red box]	23-33 months

[Yellow box]	6-8 years
[Yellow box]	7-9 years
[Yellow box]	9-12 years
[Green box]	11-13 years
[Dark green box]	17-21 years



Dental fillings

DNA finger printing/profiling - Major criteria

In a DNA chain there are silent adjacent sequences which are constant for a given individual and that they are transmitted, like blood groups, from the DNA of each parent.

DNA testing

Positive identity of the person can be established using DNA samples.

Samples that can be used for DNA identification

Fresh blood

Dried blood stains

Buccal mucosa

Tissue samples (muscle, bone, hair, teeth)

Sperms

DNA sample collection

- ▶ Collect these samples into sterile container
- ▶ Keep them in (-18 c)

Donors for DNA comparaison

Monozygotic / identical twins/ Siblings
of the victim

Biological mother and biological father
of the victim

Biological children

Establishing identification

- ▶ Review ante mortem and post mortem findings
- ▶ Narrow down identification during comparison
- ▶ Establish individual identity
- ▶ Rejection of identity

Establishing identity in skeletal remains

1. Are the remains actually bones?

Sometimes stones, or even pieces of wood are mistaken by the public or police for bones: the anatomical shape and texture helps in identification.

2.Are the remains human?

Appearance of long bones and large bones help in identification. It may be extremely difficult with small bones or with cremated, fragmented bones.

3. How many individuals are present?

If there are two skulls or two left femurs it is easy to identify number of individuals as 2.

However, if there are no obvious duplications, it is important to examine each bone carefully to assess whether the sizes and appearances match with other bones.

4. What sex are the bones?

The skull and the pelvis offer the best information on identifying sex, other bones provide less assistance.

Male and female skull differences

▶ Male Skull

- Generally larger than female
- Larger brow ridges, with sloping, less rounded (slanting) forehead
- Greater muscle attachment areas on the back of the head
- Larger mastoid processes
- Square chin with a more vertical (acute) angle of the jaw



Square chin

Large brow ridge & sloping forehead



Acute angle

Developed ridge where neck muscles attach

Mastoid process

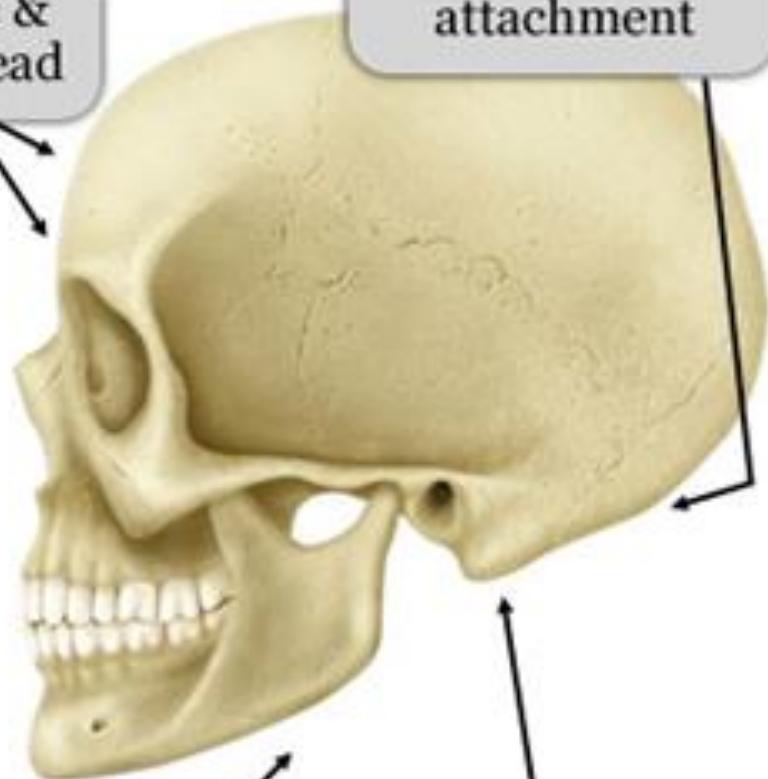
Skull

▶ Female Skull

- Smoother bone surfaces where muscles attach
- Less pronounced brow ridges, with more vertical forehead
- Sharp upper margins of the eye orbits
- Smaller mastoid processes
- Chin more pointed, with a larger, obtuse angle of the jaw



Smaller brow ridge &
more vertical forehead



More pointed chin,
wider angle of jaw

Neck muscle
attachment

Less pronounced
mastoid process

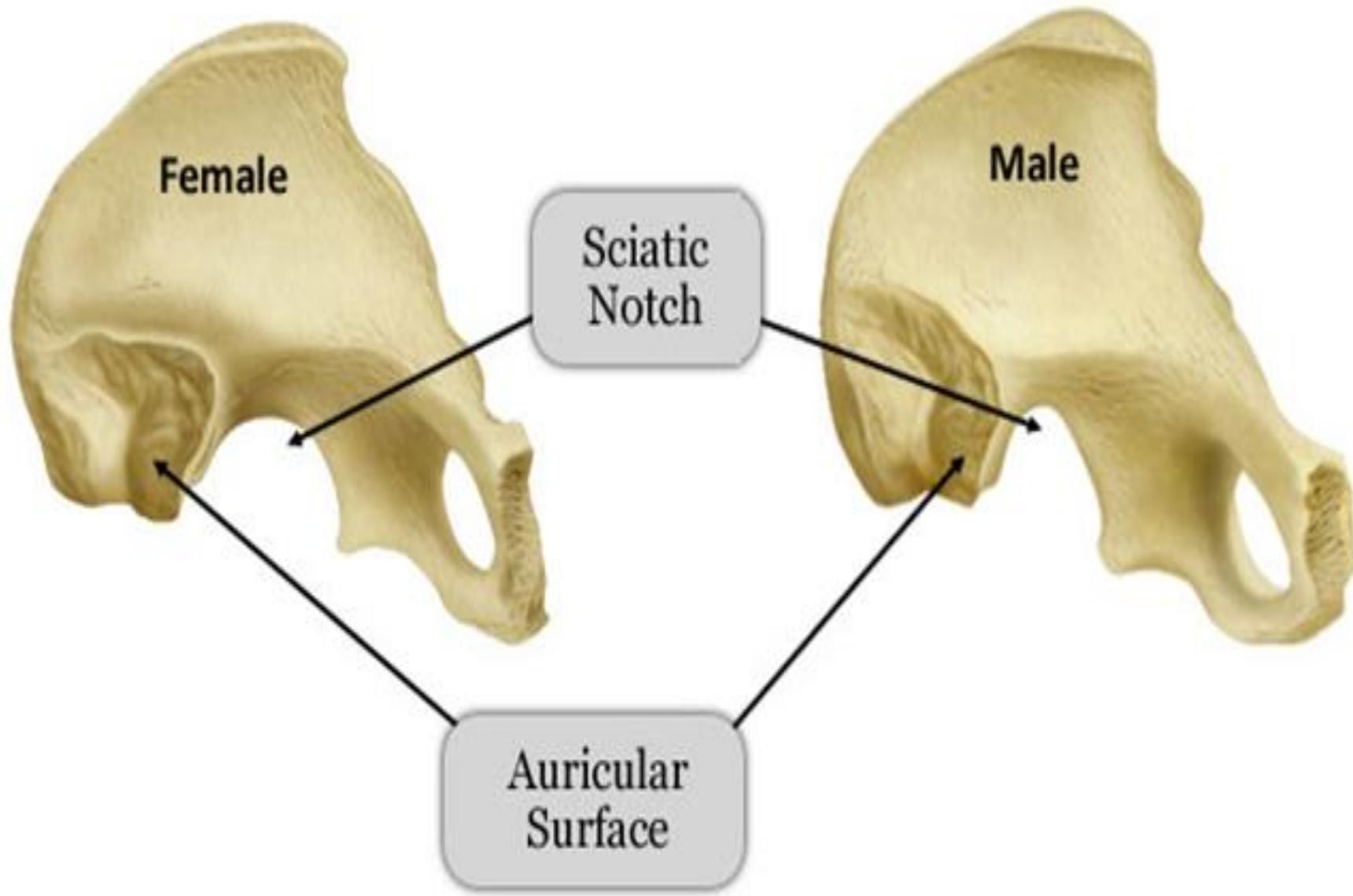
Male and female pelvis

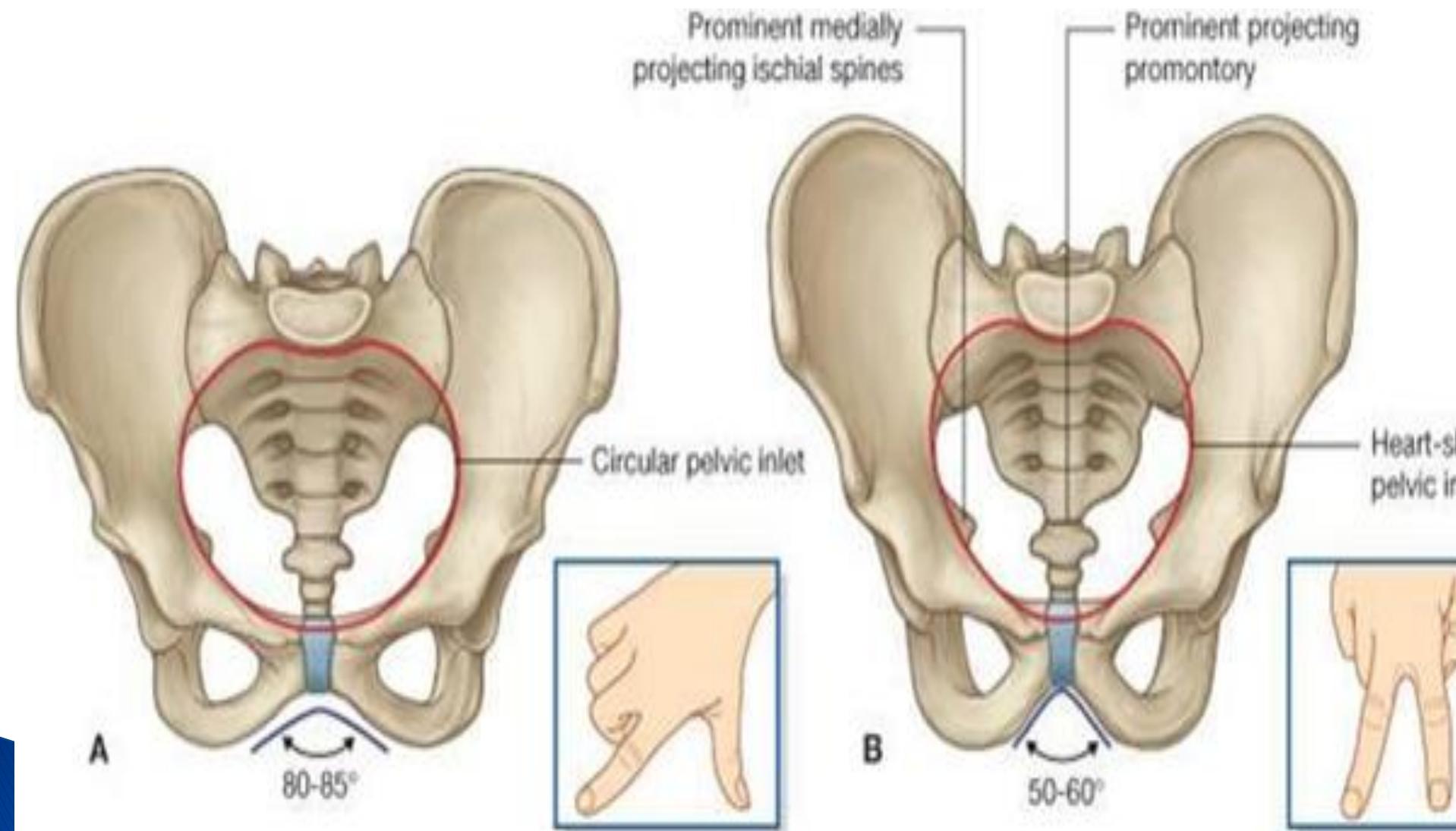
Female Pelvic Bones

- Broader sciatic notch
- Raised auricular surface
- Circular pelvic inlet
- Wider pubic angle

Male Pelvic Bones

- Narrower sciatic notch
- Flat auricular surface
- Heart shape pelvic inlet
- Smaller pubic angle





Stature

- ▶ 5. What is the height (stature) of the person?
- ▶ If whole skeleton is present approximate height is calculated.
- ▶ Otherwise using measurement of long bones height is calculated using charts.

6. Can a special identity of the individual be established?

This is difficult without proper evidence. Presence of metal prostheses , healed fractures, comparison of frontal sinus pattern in skull x'ary provide useful evidence.

Facial reconstruction from the skull

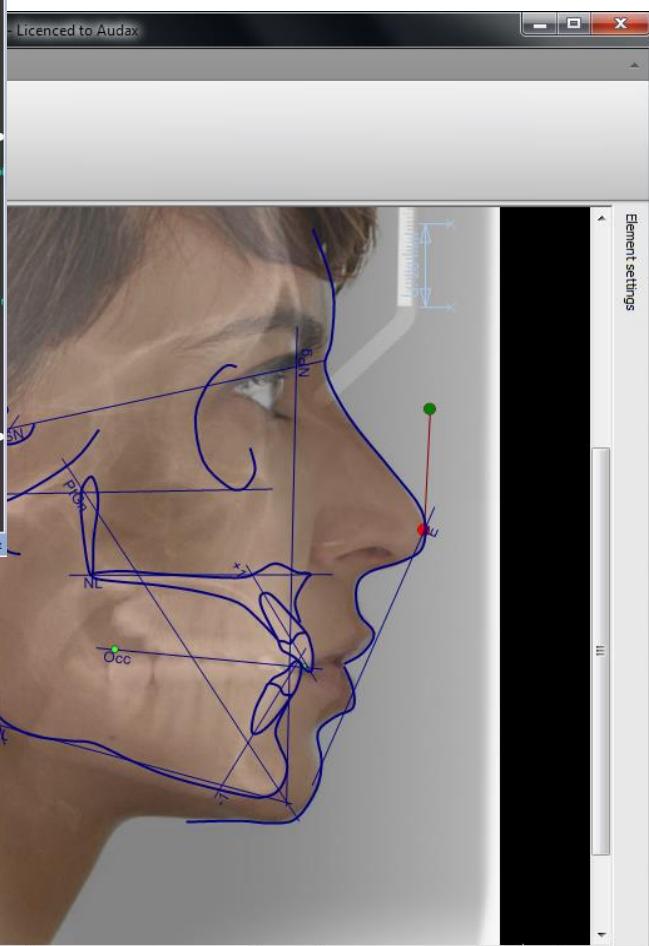
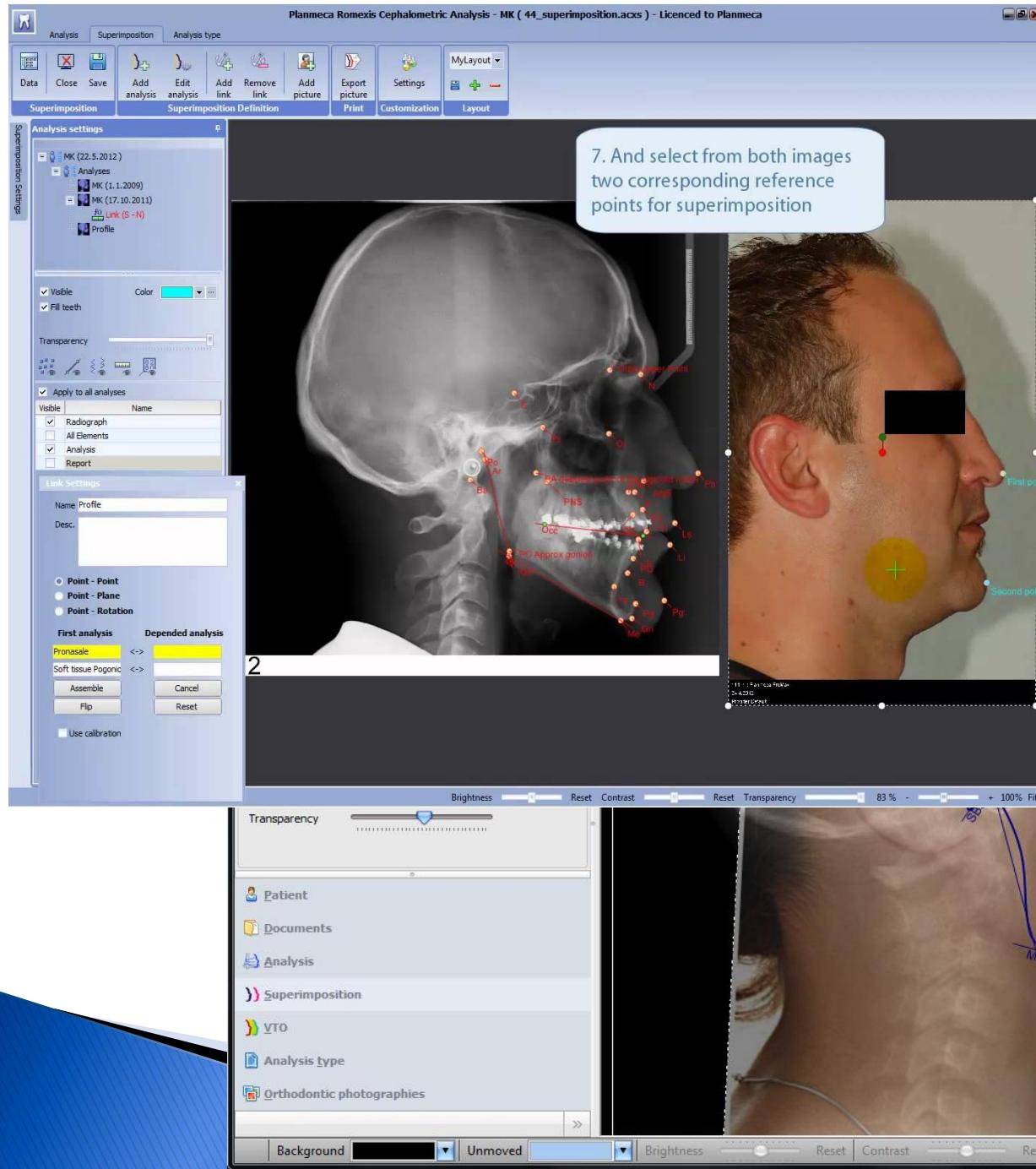
Average soft tissue thicknesses are filled on the available skull creating an facial image of the person using soft wear.





Photo superimposition

A photograph of the possible individual is overlaid with a photographic transparency of the skull, which has been scaled to size and orientated to match the angle of the head in the portrait.



Analysis of ante mortem and postmortem data

Compare and analyze ante mortem data and post mortem data
If identification is established body will be handed over to
criteria are not adequate for a positive identification.
There should be children, parents or siblings of the
deceased can be obtained for DNA analysis.
DNA samples can be obtained from relatives.

Disaster victim identification and mass graves



Mannar exhumation





Scene management team

The team consist of police, SOCO, armed forces, fire brigade, medical officers, para medics, government analyst department and medico legal officers.

They are supposed to take measures to minimize casualties, prevent further damage, attend to the casualties and manage the dead.

Preservation of scene

Police has to take measures to protect evidence and to minimize contamination of evidence by cordoning the area.

Scene safety

Police, fire brigade, bomb disposal unit etc. has to take measures and confirm the scene is safe to prevent further casualties and to create a safe environment for the team members.

Mass disaster -Search and rescue

Immediately after the safety of the scene is assured rescue all the injured personal.

Mass disaster –Separation of dead from living

Medical officer has to take the responsibility of separating dead from living

Tsunami Sri Lanka



Scene photography

SOCO officers take photographs from the scene to facilitate forensic investigation and identification.

Tagging

Tagging of the bodies
with unique reference
number

Documentation

**Documentation of
bodies at the
scene**

Transportation

Placement of bodies in the body bags.

Tag the body bags with the same number and keep the personal effects of the person in the same body bag.

Transportation of bodies to the mortuary with the assistance of the police.

Temporary mortuary





At the mortuary

Preliminary investigation, photography and preservation of bodies

Ante mortem data collection

History

Examination

Reconciliation

Display photos

Allow bodies to be
identified

Reconciliation





Identification



Release of bodies

Bodies are released to
relatives

If no relatives buried by
the government.



Summary

- ▶ Importance of identification
- ▶ Major and minor criteria of identification
- ▶ Process of identification