IDENTIFICATION

DR MOUSAMI SINGH
ADDITIONAL PROFESSOR
FORENSIC MEDICINE AND TOXICOLOGY
KGMU

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LEARNING OBJECTIVE

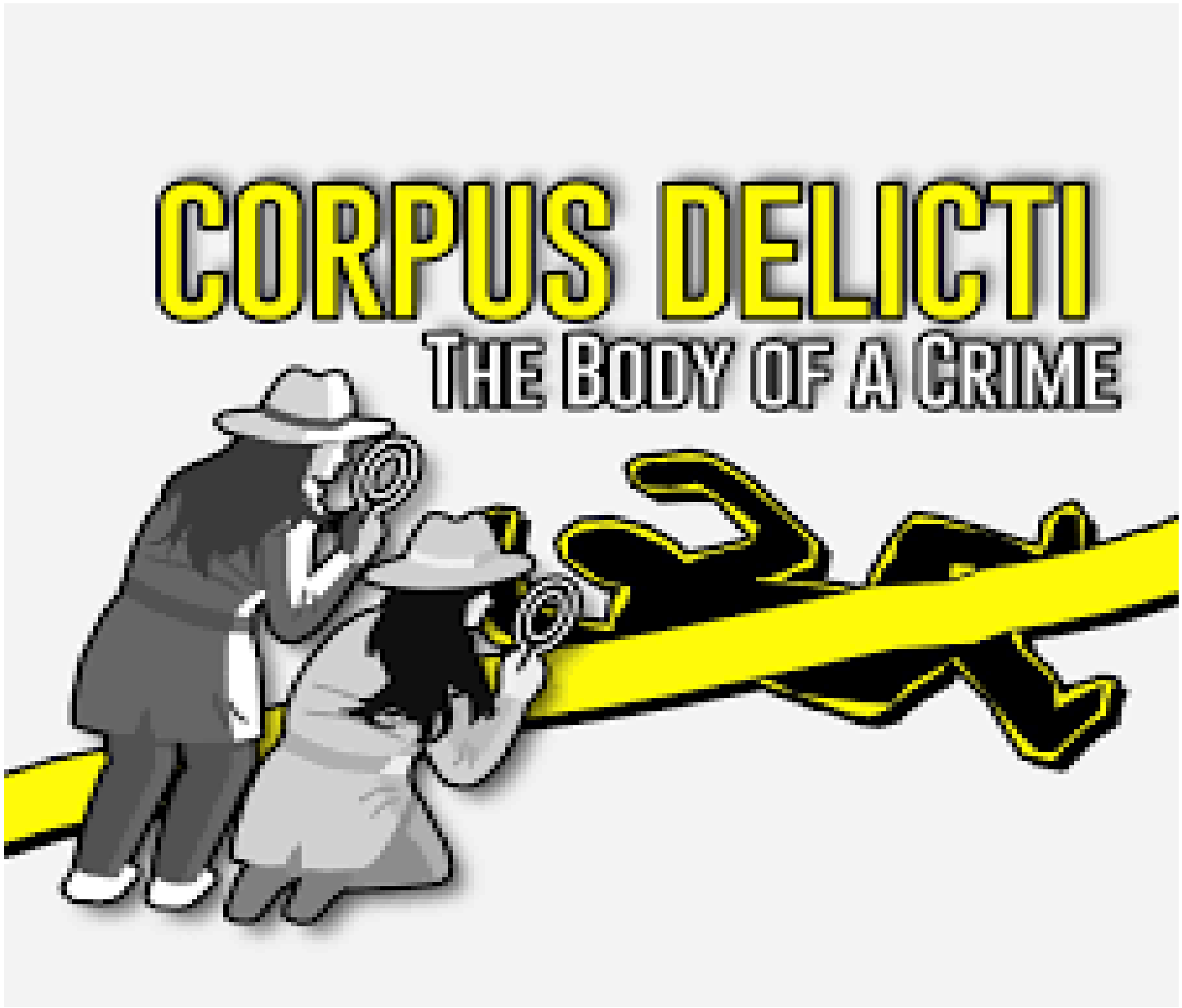
- Corpus Delicti
- Establishment of identity of living persons including race , Sex , religion , complexion , stature
- age determination using morphology, teeth-eruption, decay, bitemarks , bones-ossification centres
- medico-legal aspects of age

- Identification of criminals ,unknown persons, dead bodies from the remains-hairs, fibers, teeth
- Anthropometry
- Dactylography
- Footprints
- Scars
- Tattoos
- Poroscopy and superimposition

CORPUS DELICTI

- Corpus – body
- Delicti – offence

- Body of offence
- Body of crime
- Foundation of crime
- Essence of crime


CORPUS DELICTI
THE BODY OF A CRIME

INTRODUCTION

- Absolute identification
- Partial identification

ABSOLUTE IDENTIFICATION

- COMPLETE OR POSITIVE IDENTIFICATION

- Identity of an individual is fixed beyond doubt.
- Means identification of person living or dead is 100% correct.

- For criminal prosecution, the identification must be absolute.

PARTIAL IDENTIFICATION

- Incomplete identification
- Identity of an individual can not be fixed with certainty
- Only some parameters like sex or height or age of the individual can be determined due to decomposition, mutilation or skeletonization of the body.

- Sometime we provide partial identification to the police and police establishes the absolute identification.

NECESSITY OF IDENTIFICATION

- Decomposed bodies
- Badly burnt bodies
- Mutilated bodies in aircraft accidents , earthquakes , explosion
- If only a part of body is recovered like a limb
- Skeleton
- If only a bone or fragment of bone found

IN CIVIL CASES

1. Death benefits
2. Disputed sex
3. Inheritance
4. Collecting life insurance
5. Marriage
6. Missing persons
7. Passport
8. Workmen's compensation

IN CRIMINAL CASES

1. Interchange of babies in hospitals
2. Impersonation
3. Person accused of criminal charges asserts he is some other individual
4. To establish corpus delicti

HUMANITARIAN

1. Correct identification of dead permits prompt notification of anxious family

2. Dead persons has a right to be disposed of with the ceremonies of their own religion

IDENTIFICATION DATA

- Race
- Religion
- Sex
- **Age**
- Stature
- Complexion
- Hair
- Moles/scar

IDENTIFICATION DATA

- Tattoos
- Anthropometry
- Dactylography
- Foot prints
- Lip prints
- Poroscopy and Superimposition

AGE ESTIMATION

- General examination
- Dentition
- Ossification of bones

GENERAL FEATURES

BOYS

Weight(Kg)	Height(Cm)	AGE	Weight (Kg)	Height (Cm)
3.3	50.5	At the time of birth	3.2	49.9
6	61.1	3 months	5.4	60.2
7.8	67.8	6 months	7.2	66.6
9.2	72.3	9 months	8.6	71.1
10.2	76.1	1 year	9.5	75
12.3	85.6	2 year	11.8	84.5
14.6	94.9	3 year	14.1	93.9
16.7	102.9	4 year	16.0	101.6
18.7	109.9	5 year	17.7	108.4
20.7	116.1	6 year	19.5	114.6
22.9	121.7	7 year	21.8	120.6
25.3	127	8 year	24.8	126.4
28.1	132.2	9 year	28.5	132.2
31.4	137.5	10 year	32.5	138.3
32.2	140	11 year	33.7	142
37	147	12 year	38.7	148

GIRLS

TEETH

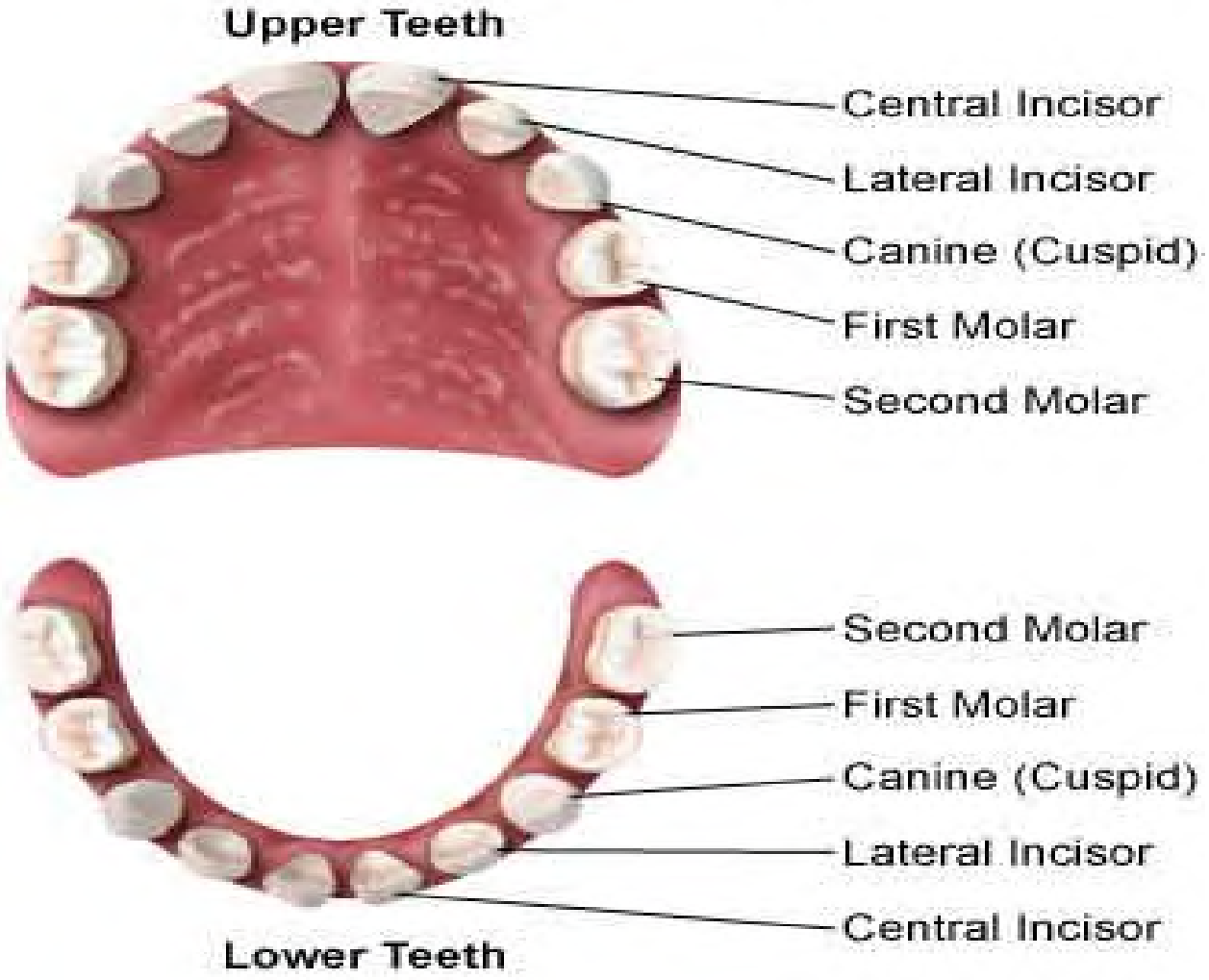
- Eruption and calcification of teeth and root resorption
- Aspartic acid racemization
- Tooth development stages

ERUPTION AND CALCIFICATION

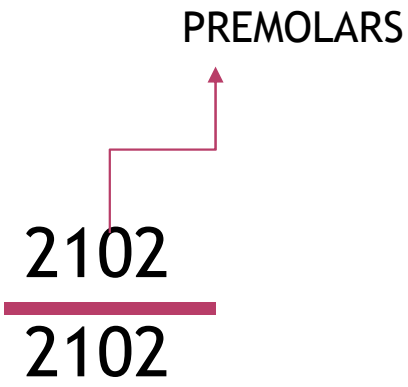
TEMPORARY TEETH

- MILK TEETH
- DECIDUOUS TEETH
- PRIMARY TEETH
- 20
- 10 IN EACH JAW
- Four incisor
- 2 canine
- 4 molars

Primary Teeth

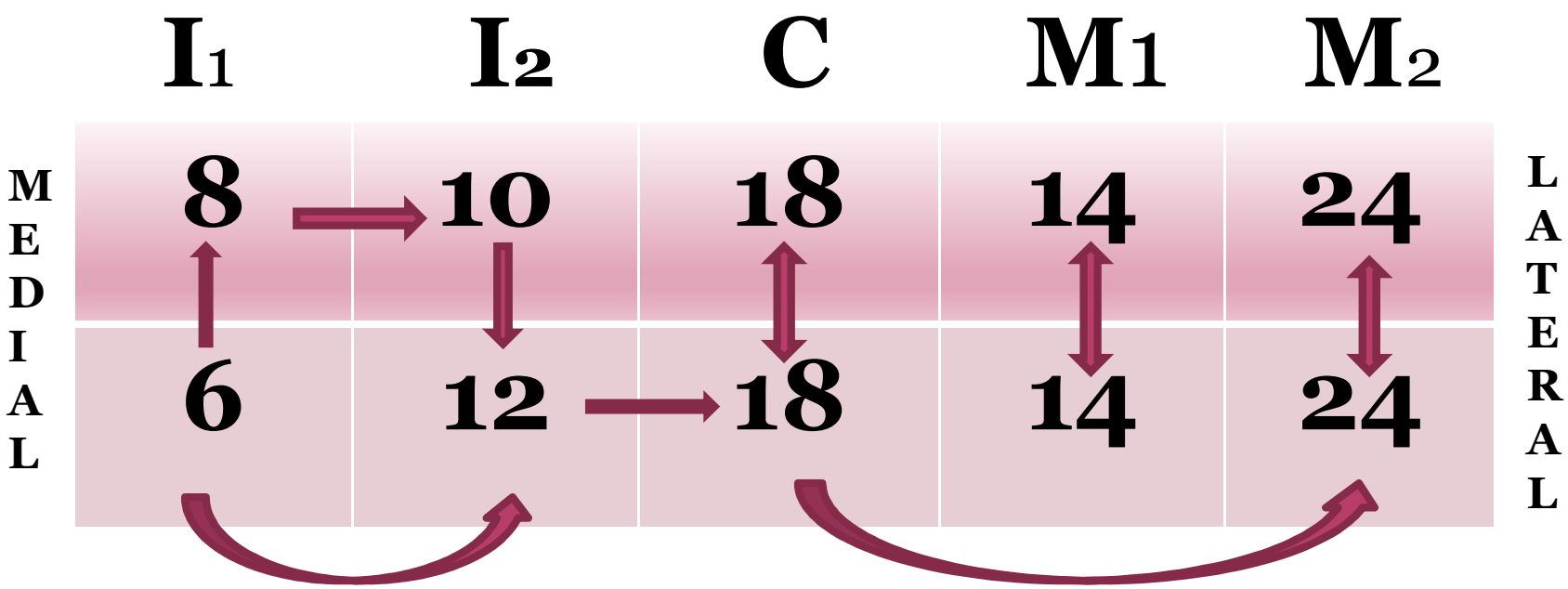


DENTAL FORMULA

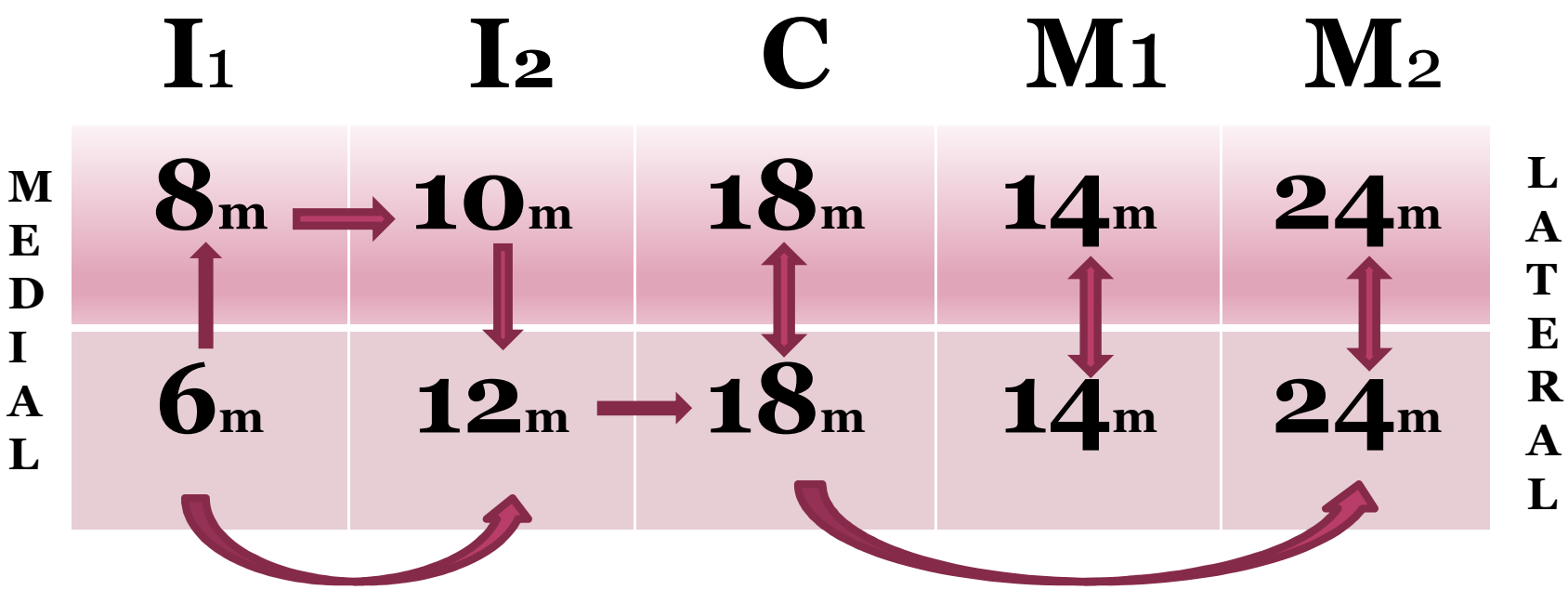


Premolars kahte hai ki hum permanent hi banenge hum pahle aayenge hi nahi.

TEMPORARY TEETH ERUPTION



TEMPORARY TEETH ERUPTION



CAUSES OF EARLY DENTITION

- Predeciduous teeth
- Natal teeth
- Neonatal teeth
- Congenital teeth/fetal teeth
- Precocious dentition
- Dentitia praecox
- Dens cannatalis
- Hyperpituitarism
- Hyperthyroidism
- Syphilis

s.no.	Tooth	Eruption	Calcification begins	Calcification of root complete	Resorption of root begins
1.	LOWER **CI**	6	14 wkIU	1.5 – 2 Y	4Y
2.	UPPER **CI**	8	14wkIU	1.5 – 2 Y	5Y
3.	UPPER **LI**	10	16wkIU	1.5 – 2 Y	5Y
4.	LOWER **LI**	12	16wkIU	1.5 – 2 Y	5Y
5.	1ST **Mo**	14	15.5wkIU	2 -2.5 Y	6Y
6.	**Can**	18	17wkIU	2.5 – 3 Y	8Y
7.	2ND **Mo**	24-30	18-19wkIU	3Y	7Y

PERMANENT TEETH

AGE OF MIXED DENTITION

- 6-11 years
- During this period a child has both temporary and permanent teeth
- In mixed dentition the no. of teeth are always 24

AGE OF MIXED DENTITION

Number of permanent teeth=(Age in years-5)x4

SUCCESSIONAL TEETH

- Successional teeth are those permanent teeth which replace some other teeth
- Thus their eruption does not change the total number of teeth of the individual
- Incisors, canine and premolars are successional teeth

Successional teeth : Those permanent teeth that follow into a place in the arch once held by primary tooth

E.g.-Incisors, Canines, Premolars

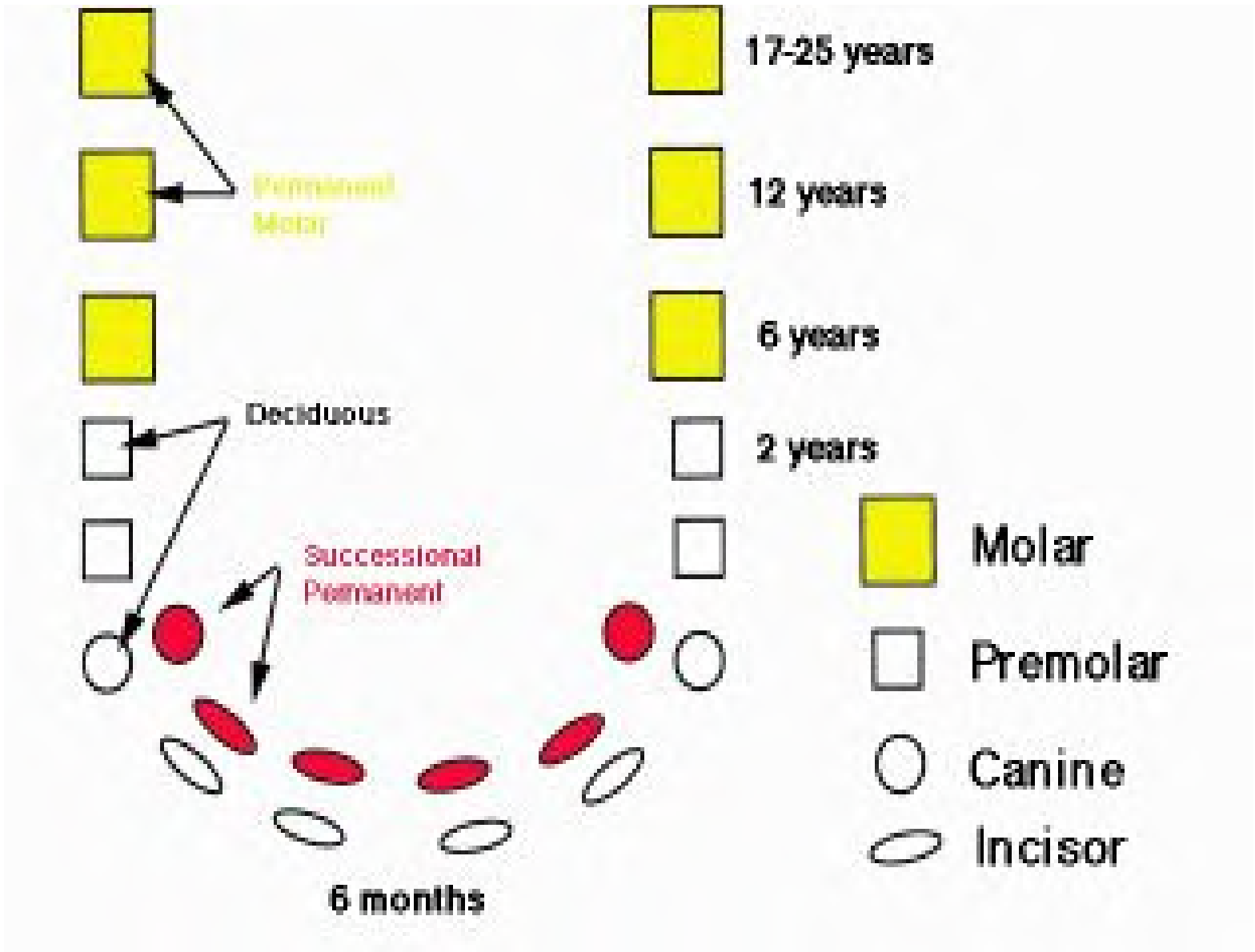
Accessional teeth : Those permanent teeth that erupt posteriorly to the primary teeth

E.g.-Molars

SUPERADDED TEETH

- Superadded teeth are those which are added to the existing set of teeth
- They do not replace any teeth
- Thus their eruption always increases the number of teeth
- All molars are superadded teeth

- Permanent incisors replace temporary incisor
- Permanent canine replace temporary canine
- Permanent premolars replace temporary molars


17-25 years
12 years
6 years
2 years
Permanent Molar
Deciduous
Successional Permanent
6 months
Molar
Premolar
Canine
Incisor

PERMANENT TEETH

- 32
- Dental formula

- $\frac{2123}{2123}$

Dental Formula: Permanent Teeth

- A shorthand way of indicating the number and relative position of teeth
  - Written as ratio of upper to lower teeth for the mouth
  - Primary: 2I (incisors), 1C (canine), 2M (molars)
  - Permanent: 2I, 1C, 2PM (premolars), 3M

2I	1C	2PM	3M	X	2 (32 teeth)
2I	1C	2PM	3M		

SEQUENCE OF ERUPTION OF PERMANENT TEETH

Mama (6 years)	**Molar 1st**	Papa (10 years)	**Premolar 2nd**
Is (7 years)	**Incisor 1st**	Can (11years)	**Canine**
In (8 years)	**Incisor 2nd**	Make (12years)	**Molar 2nd**
Pain (9 years)	**Premolar 1st**	Medicine (18-25 years)	**Molar 3rd**

ERUPTION OF PERMANENT TEETH

I1	I2	C	PM1	PM2	M1	M2	M3
7	8	11	9	10	6	12	18

ERUPTION OF PERMANENT TEETH

I1	I2	C	PM1	PM2	M1	M2	M3
7y	8y	11y	9y	10y	6y	12y	18y

AGES OF CALCIFICATION AND ERUPTION OF PERMANENT TEETH

S.NO.	Tooth	Calcification begins	Eruption	Calcification of tooth complete
1.	1st Molar	At birth	6y	9y
2.	1st (central) incisor	4m	7y	10y
3.	2nd (lateral) incisor	1y	8y	11y
4.	1st premolar	11/2 y	9y	12y
5.	2nd premolar	2y	10y	13y
6.	Canine	4m	11y	13y
7.	2nd molar	21/2 -3y	12y	15y
8.	3rd molar	8-10y	18-25y	18-25y

CAUSES OF DELAYED DENTITION

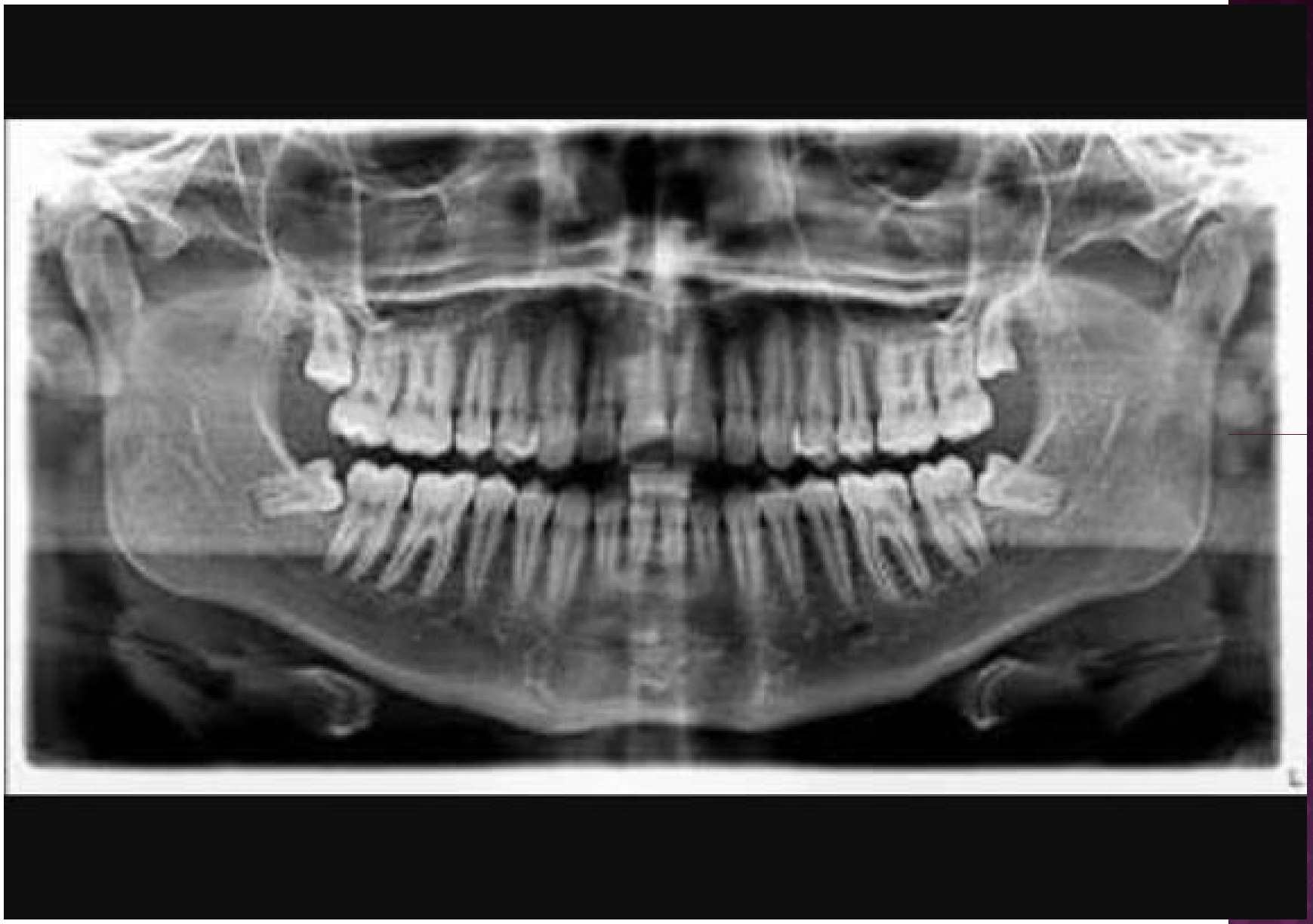
- Supernumerary teeth
- Anemia
- Celiac disease
- Chromosomal or genetic disorders like down syndrome
- Heavy metal intoxication
- Phenytoin
- Endocrine disorders like hypothyroidism, hypopituitarism, hypoparathyroidism,
  Pseudo hypoparathyroidism
- HIV infection
- Radiotherapy
- Vitamin D resistant rickets

SUPERNUMERARY TEETH

HUCHINSON'S TEETH

FOURNIER TEETH


R



SPACING OF JAW

DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Criteria	Temporary teeth	Permanent teeth
size	smaller	Heavier
	Lighter	Stronger
	narrower	broader

Exception is temporary molars are however larger than the permanent premolars who replace them

DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Criteria	Temporary teeth	Permanent teeth
Direction of anterior teeth	Vertical	Usually inclined a little forward
Color	China white	Ivory white
Rate of attrition	Shows quick attrition because of less mineralization	less

DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Criteria	Temporary teeth	Permanent teeth
Enamel	Thinner	Thicker
	More constant in thickness	Less constant in thickness
	Bulges out close to the cervical line	Shows gradual tapering close to the cervical line
Neck Crown and root junction	More constricted	Less constricted

DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Crown of anterior teeth

Criteria	Temporary teeth	Permanent teeth
Labial surfaces	Smoother	Show depressions or perikymata
Incisal edges		

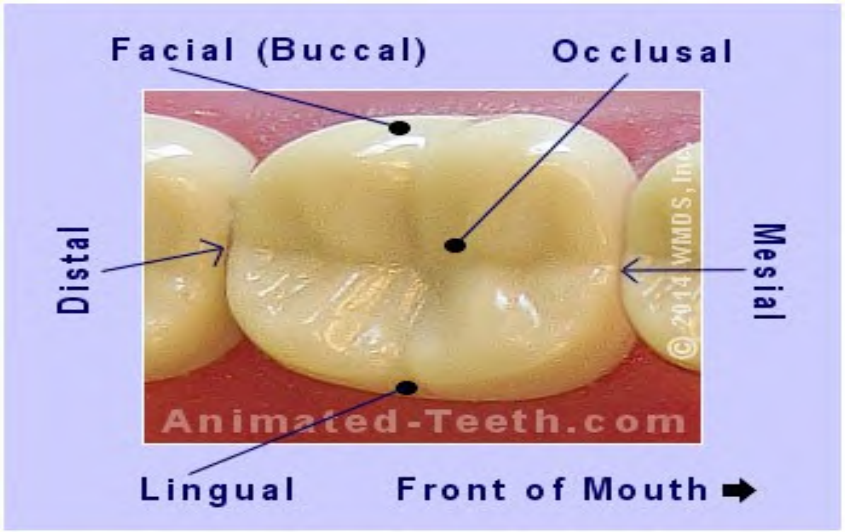
DIFFERENCES OF THE CROWN

Mammelons absent	Mammelons are present on newly erupted teeth
	

DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Crowns of posterior teeth

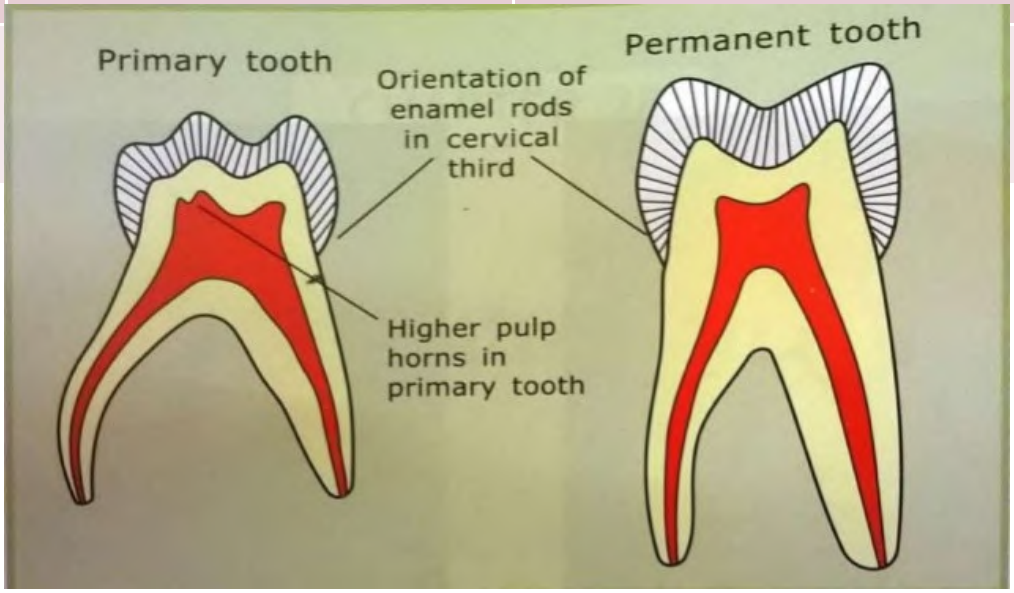
Criteria	Temporary teeth	Permanent teeth
Molars	Buccal and lingual surfaces are flatter	Less flat



DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Roots

Criteria	Temporary teeth	Permanent teeth
Roots of molars	Smaller and more divergent	Larger and less divergent

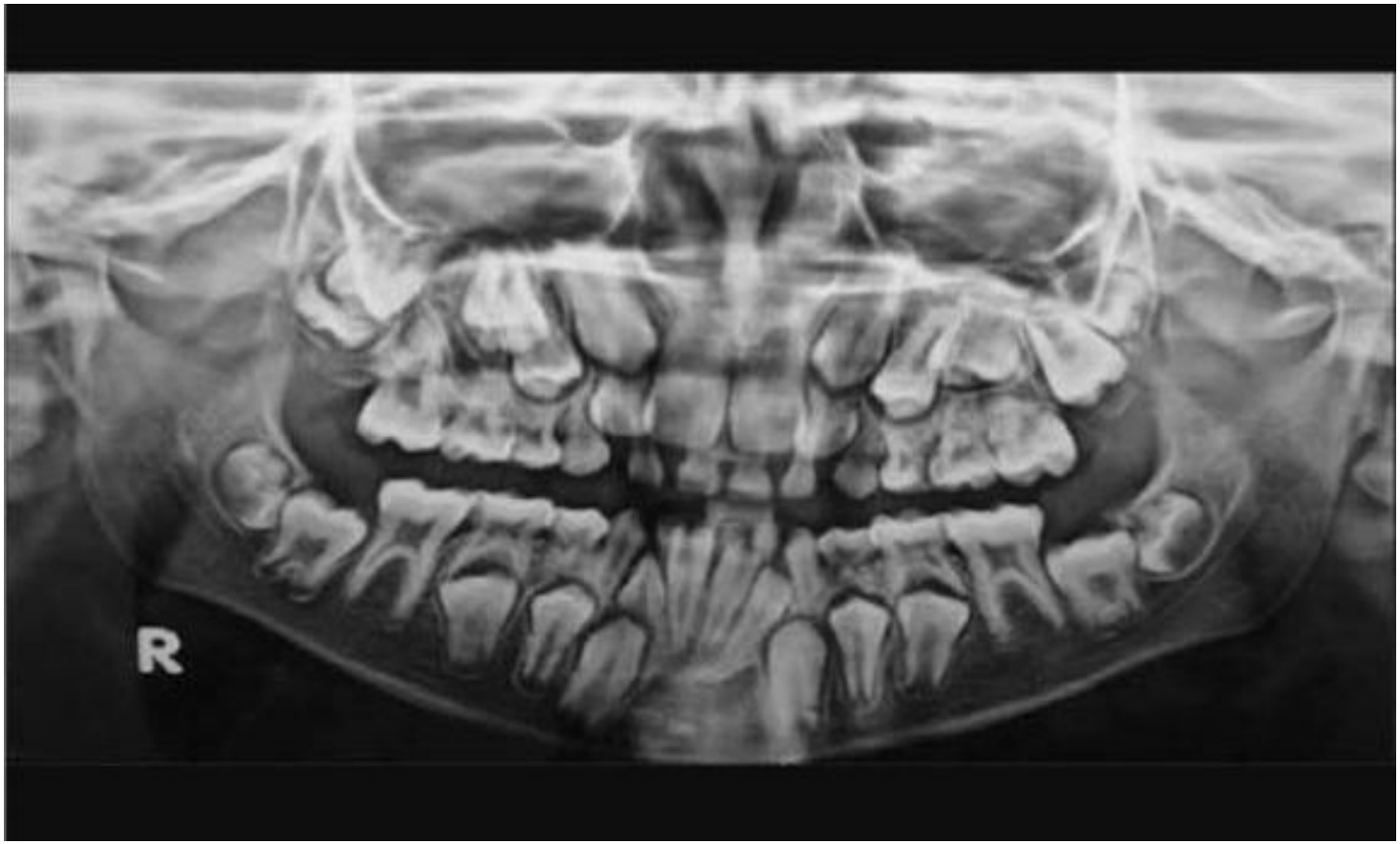


DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

Criteria	Temporary teeth	Permanent teeth
X ray	Presence of tooth germ beneath the tooth, if seen in x ray will suggest that tooth is temporary	No such thing is visible in x ray in case of permanent teeth

X RAY

- DENTAL PANORAMIC TOMOGRAPH
- ORTHOPANTOGRAM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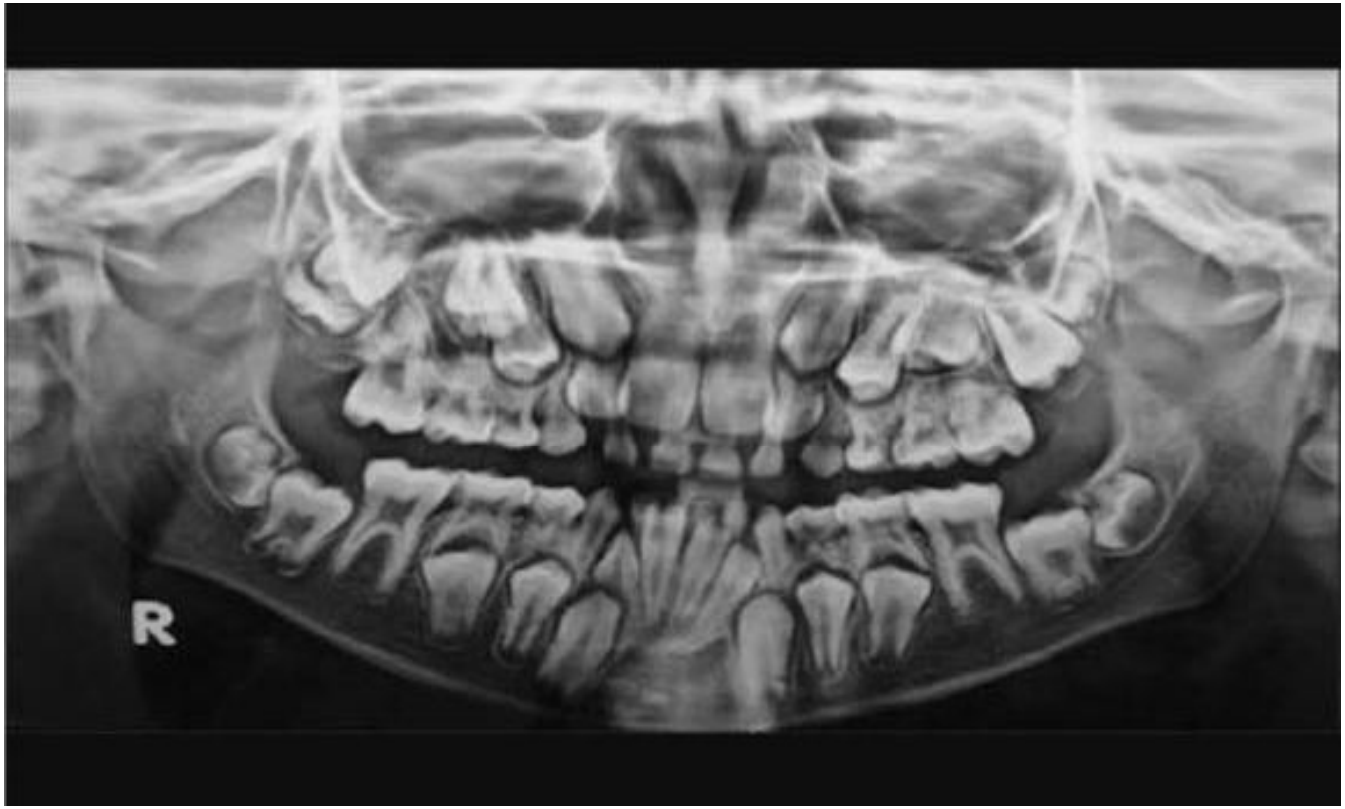
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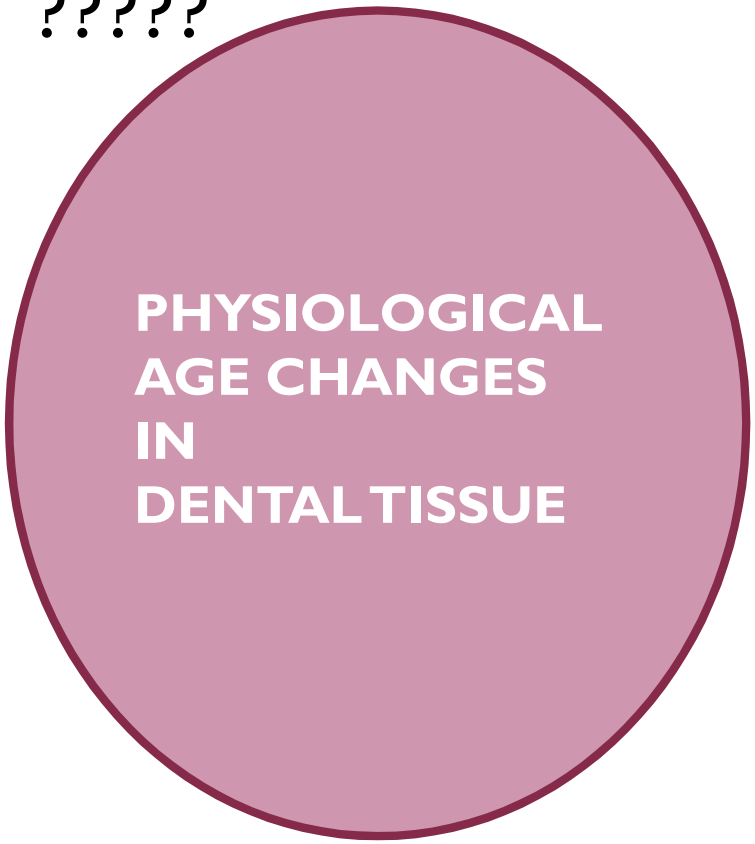
- 17 -25 YEARS WITH THE HELP OF TOOTH ERUPTION AND CALCIFICATION

- THEN >25 YEARS ?????



GUSTAFSON'S METHOD

1. Attrition
2. Periodontosis
3. Secondary dentin
4. Cementum apposition
5. Root resorption
6. Transparency of root

- Stage 0 no change in dental tissue
- Stage 1 beginning of change
- Stage 2 obvious change
- Stage3 maximum change

ATTRITION

- Destruction of occlusal surface of teeth due to wear and tear because of mastication
- It first involve the enamel ,then dentin at last pulp at old ages

ATTRITION-A

- A0 no attrition
- A1 enamel
- A2 dentin
- A3 dental pulp

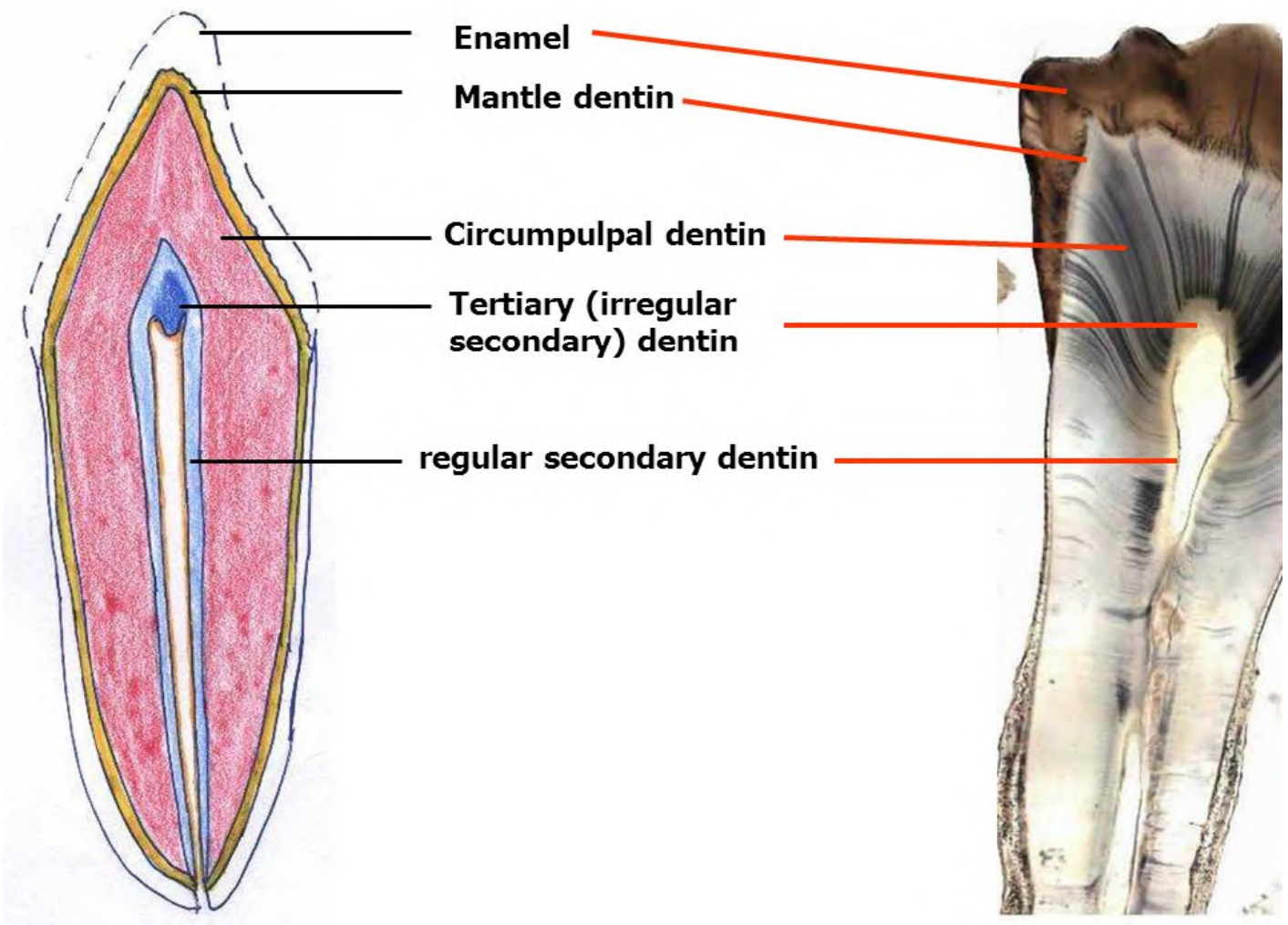
PERIODONTOSIS

- Regression of gums and periodontal tissues surrounding teeth
- Gradually exposing neck and adjacent parts of roots due to which teeth becomes loosen and fall off

PERIODONTOSIS-P

- P0 no periodontosis
- P1 just begun
- P2 1st 1/3rd of the root
- P3 crossed 2/3rd of root

SECONDARY DENTIN

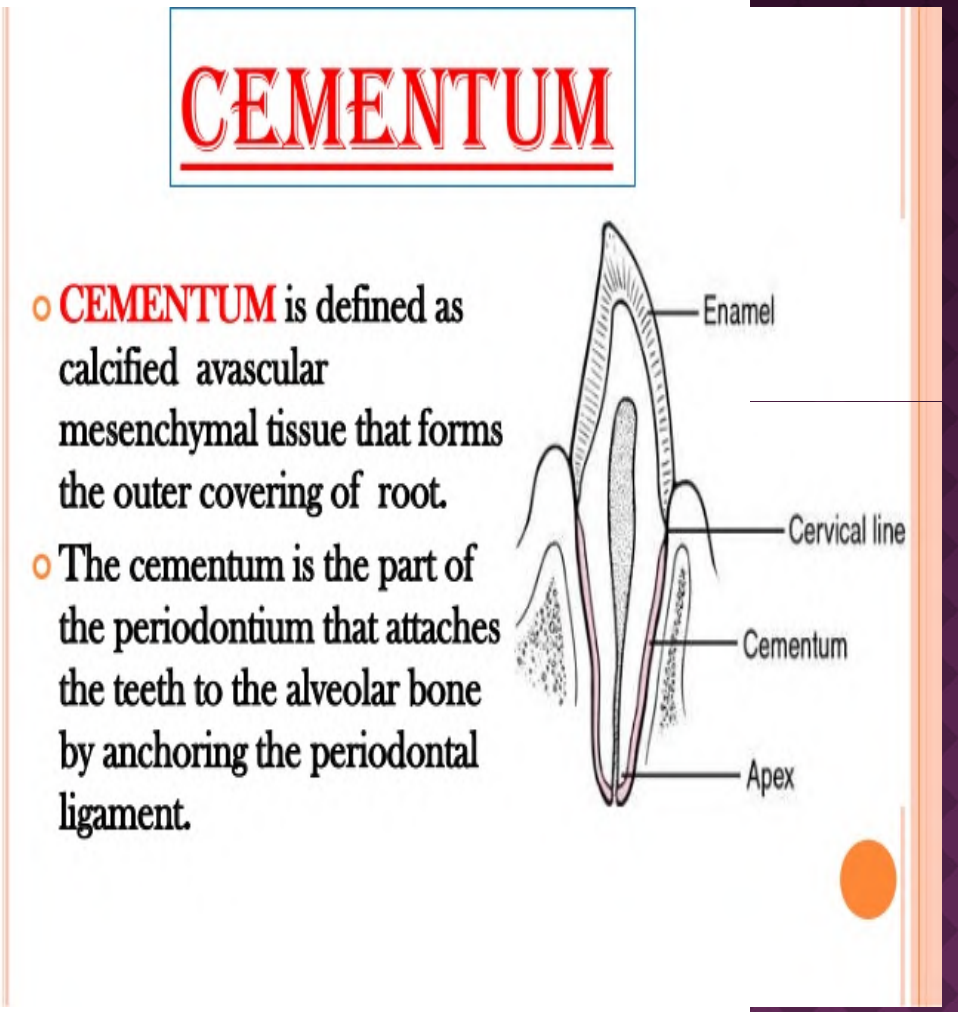


SECONDARY DENTIN-S

- S0 not formed
- S1 just begun in upper part of pulp
- S2 half pulp cavity is filled
- S3 pulp cavity is nearly filled by it

CEMENTUM APPOSITION

- Can be seen on histological section
- Incremental lines
- The age can be calculated by counting the number of lines from the neonatal line onwards.
- This is mainly applicable to infants.



CEMENTUM-C

- C0 normal layer of cementum
- C1 little more thicker layer of it
- C2 more thick
- C3 very thick layer

ROOT RESORPTION

- Absorption of root starts first at the apex and extend upward.
- Usually occurs in the late ages

ROOT RESORPTION-R

- R0 nothing
- R1 resorption on isolated spots
- R2 greater loss of substance
- R3 greater areas of cementum and dentin

TRANSPARENCY OF ROOT

- Most reliable of all criteria
- Not seen till 30 years of age
- Occurs from below upwards in lower jaw and from above downwards in upper jaw

ROOT TRANSPARENCY-T

- T0 nothing
- T1 just started
- T2 apical 1/3rd of root
- T3 apical 2/3rd of root

- That gives an approximate age of the person
- The error is +- 4 to 7 years
- The limit of error increases above 50 years of age

Boyde's method

Count incremental lines from neonatal lines onwards

Stack's method

Age of infant can be determined from weight and height of erupting teeth

FORENSIC ODONTOLOGY

- Deals with the science of dentistry to aid in administration of justice

AGE OF FOETUS

- Embryo – 2st week of gestation upto 3rd month of gestation
- Foetus - from 3rd month of gestation upto full term, until delivery
- Infant- from birth upto 1 year of age

GESTATIONAL AGE DETERMINATION

- Foot length
- Ossification centres

	1st month	2nd month	3rd month	4th month	5th month	6th month	7th month	8th month	9th month
Length	1 cm	4 cm	9 cm	16 cm	25 cm	30 cm	35 cm	40 cm	45 cm
Eyes	2 dark spots		Pupillary membrane appears			Eyebrows and eyelashes	Eyes open Pupillary membrane disappears		
Mouth	cleft								
Nails			appear		Distinct and soft		thick	tips of fingers	
Hands & feet		webbed							
				Sex recognized Lanugo hairs Meconium found in duodenum	Skin covered with vernix caseosa Meconium at the beginning of large intestine	Meconium in transverse colon Testes close to kidneys	Meconium in entire large intestine Testes at external inguinal ring	Left testes in scrotum	Meconium at the end of large intestine Both testes in scrotum
Ossification centres		Clavicle Maxilla Mandible Upper seg of sacrum			Middle seg of sacrum calcaneum		Talus	Lower seg of sacrum	Lower end of femur

RULE OF HASSE

- In 1st five months of pregnancy

  $$\text{Age of foetus in months} = \sqrt{\text{Length of the foetus in cm}}$$

- During last 5 months

  $$\text{Age of foetus in month} = \frac{\text{length in cm}}{5}$$