Occlusion:

Classification of Malocclusion

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Lec 3

Session outline

- Classification of Malocclusion
- Dental and Chronological age
- Temporomandibular joint dysfunction

Classification of Malocclusion

Occlusion: when the teeth in the mandibular arch come into contact with those in the maxillary arch in any functional relation.

Malocclusion: a condition in which there is a deflection from the normal relation of teeth

Classification of Malocclusion

Qualitative Methods:

1. Angle classification
2. Andrew’s Classification
3. Incisor relationship
4. Canine relationship

Classification of malocclusion

Quantitative method:

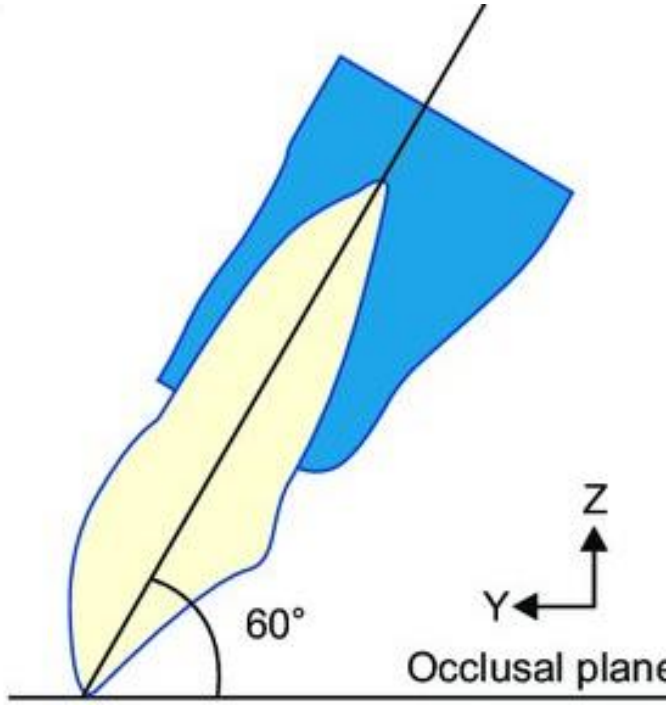
- Bar index
- IOTN index

1) Intra arch Malocclusion

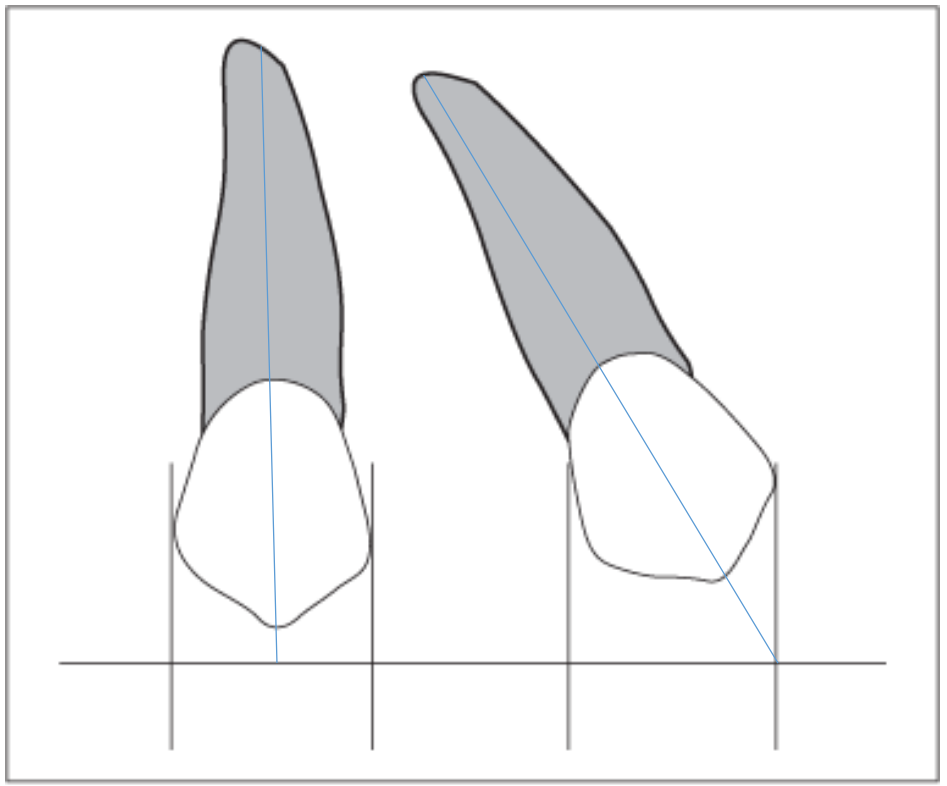
A tooth can be abnormally related to its neighbouring teeth, such abnormal variations are called individual tooth malpositions or intra arch malpositions.

- **Inclination:** Lingual inclination, Buccal inclination
- **Angulation:** Distal angulation, Mesial angulation
- **Displacement:** Lingual displacement, Buccal displacement
- **Supraocclusion or infraocclusion**
- **Rotation:** Mesio buccal rotation or disto buccal rotation,
- **Transposition**

Inclination

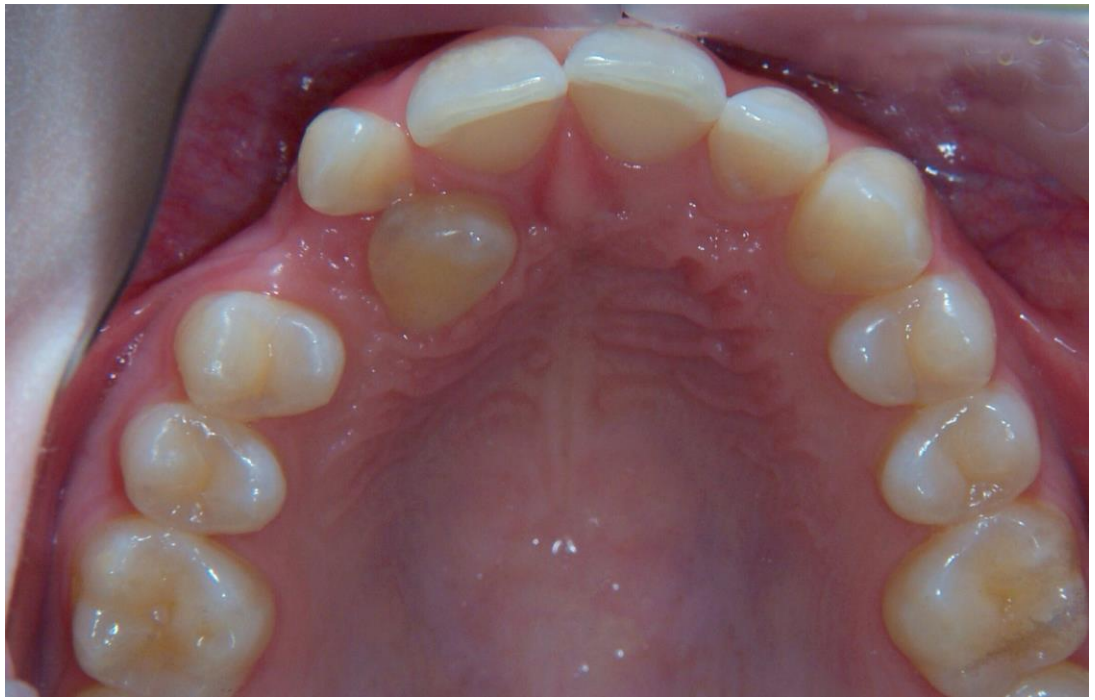


Angulation



Displacement

Buccaly displaced

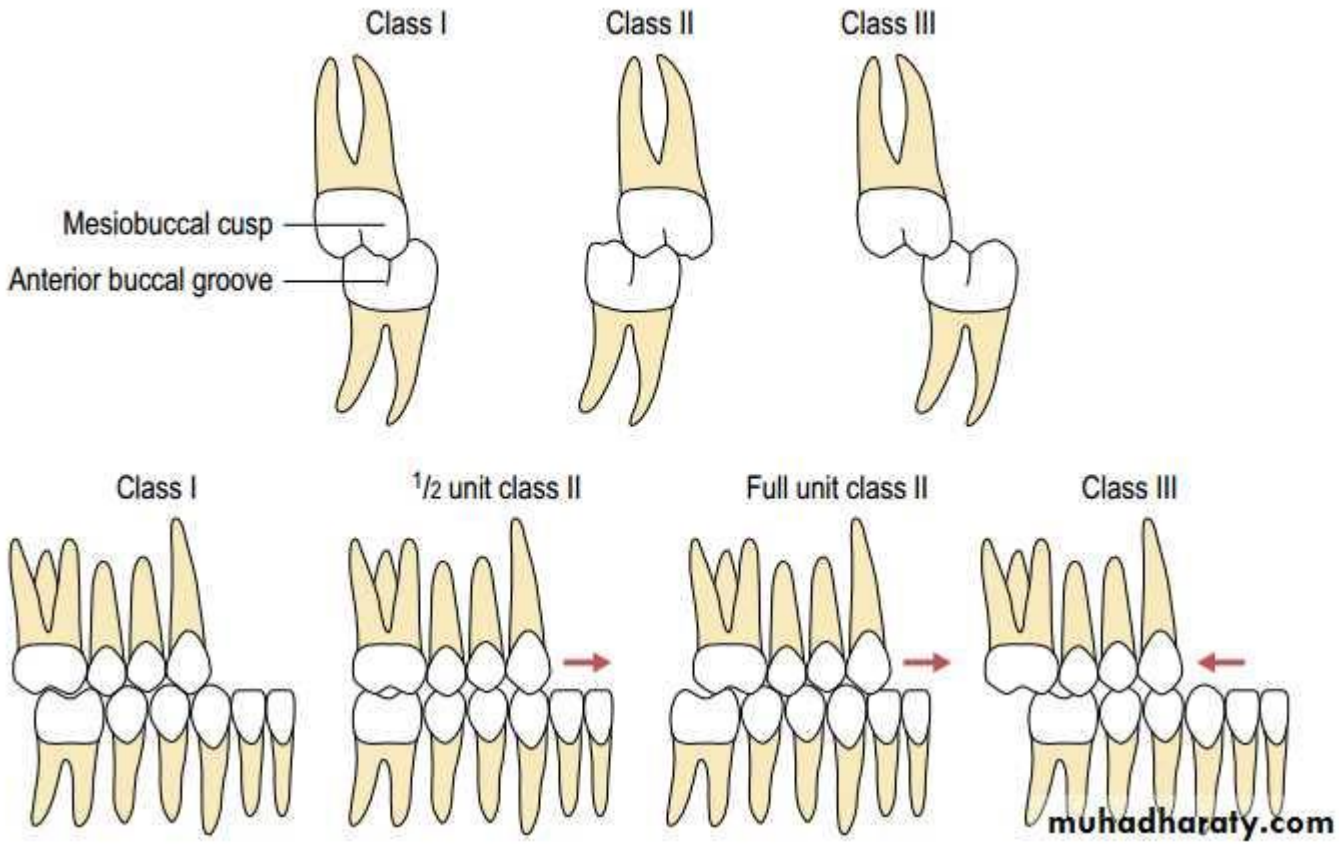


Palataly displaced

2) Interarch Malocclusion

These malocclusions are characterised by abnormal relationships between two teeth or groups of teeth of one arch to the other arch. These inter arch malocclusion can occur in sagittal plane, vertical plane and transverse plane.

Sagittal interarch discrepancies



Transvers discrepancy (Cross bite)

Crossbite

Crossbite

Vertical discrepancies (Openbite and deepbite)

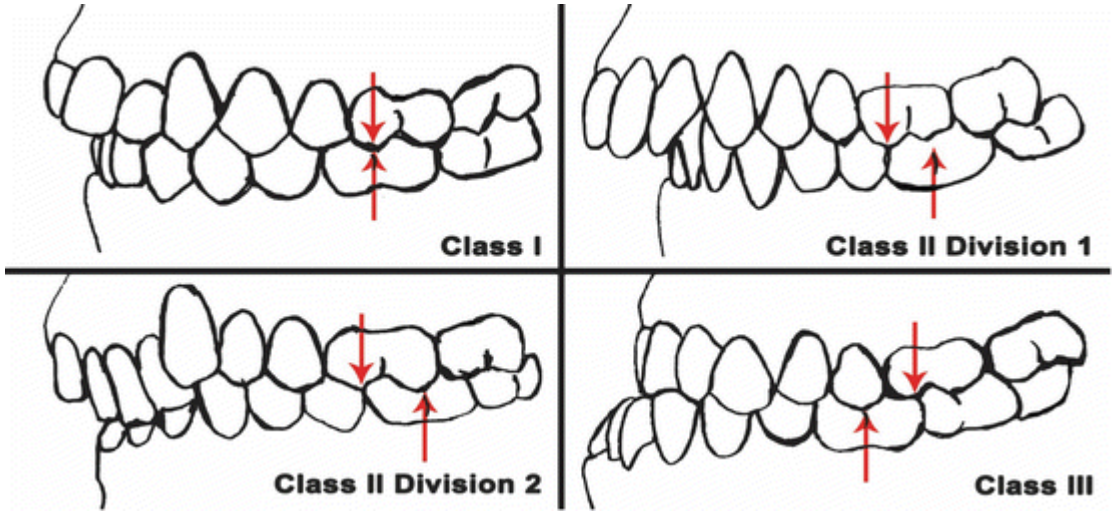
Openbite

Deepbite

Angle Classification

- 1899 Edward Angle

- Based on the relation of the mesiobuccal cusp of maxillary first molar and the buccal groove of the mandibular first molar.



Class I Malocclusion

Characterized by normal anteroposterior molar relationship, which may be associated with transverse and/or vertical malrelationships.

Class II div 1 Malocclusion

Class II div 2 malocclusion

Class III malocclusion

Advantages of Angle classification

- Easy
- No instrument
- Teaching and research

Limitation of Angle classification

- Sagittal dimension
- Not applicable with missing 1st molar
- Not applicable in deciduous dentition
- Skeletal problems are not considered

ANDREW'S SIX KEYS(1970)

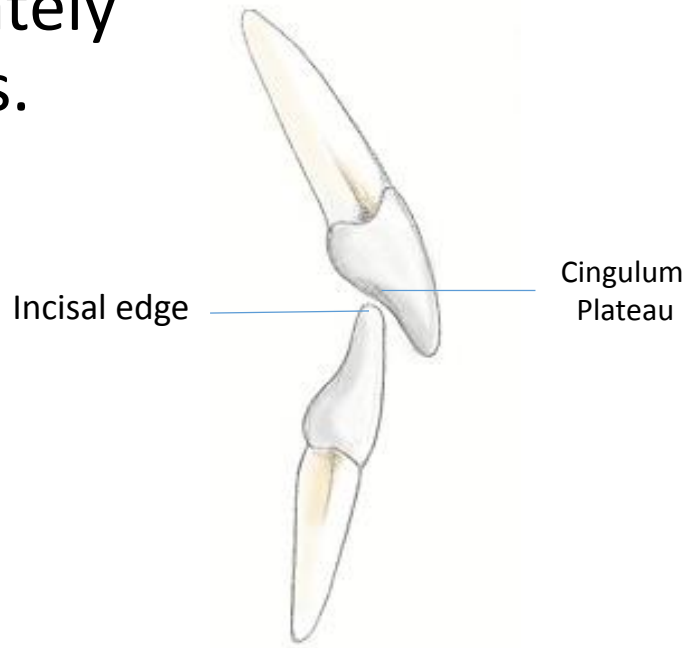
Andrew extended Angle's classification:

1. Correct molar relationship.
2. Correct crown angulations.
3. Correct crown inclination i.e. Class I incisor relationship.
4. No rotation present.
5. Teeth in tight contact with no spacing.
6. Occlusal plane/ curve of spee should be flat i.e. it should not be deeper than 1.5mm.
7. No tooth size discrepancies. (Bannet & McLanghlan's)

British Classification of Incisor relationship

CLASS I INCISOR RELATIONSHIP

The lower incisor edges occlude with or lie immediately below the cingulum plateau of upper central incisors.



Class I

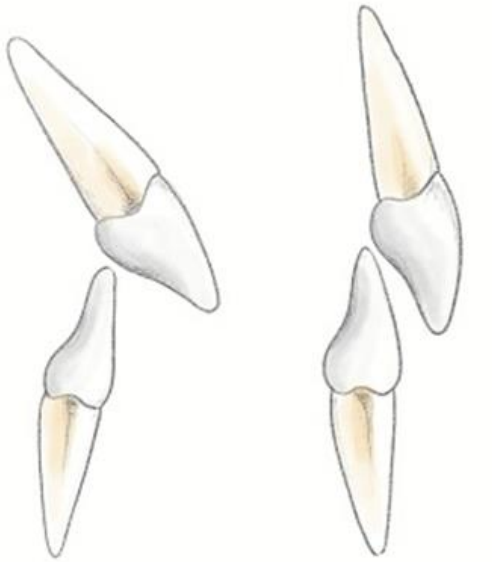
Incisor relationship

CLASS II INCISOR RELATIONSHIP

The lower incisor edges lie posterior to the cingulum plateau of the upper incisors. There are two sub-divisions:

DIVISION 1: The upper central incisors are proclined or of average inclination & there is an increase in overjet.

DIVISION 2: The upper central incisors are retroclined. The overjet is usually decreased.



Class II div I

Class II div II

Incisor relationship

CLASS III INCISOR RELATIONSHIP

The lower incisor edges lies anterior to the cingulum plateau of the upper incisors. The overjet is reduced or reversed.

Class III

Overjet and Overbite

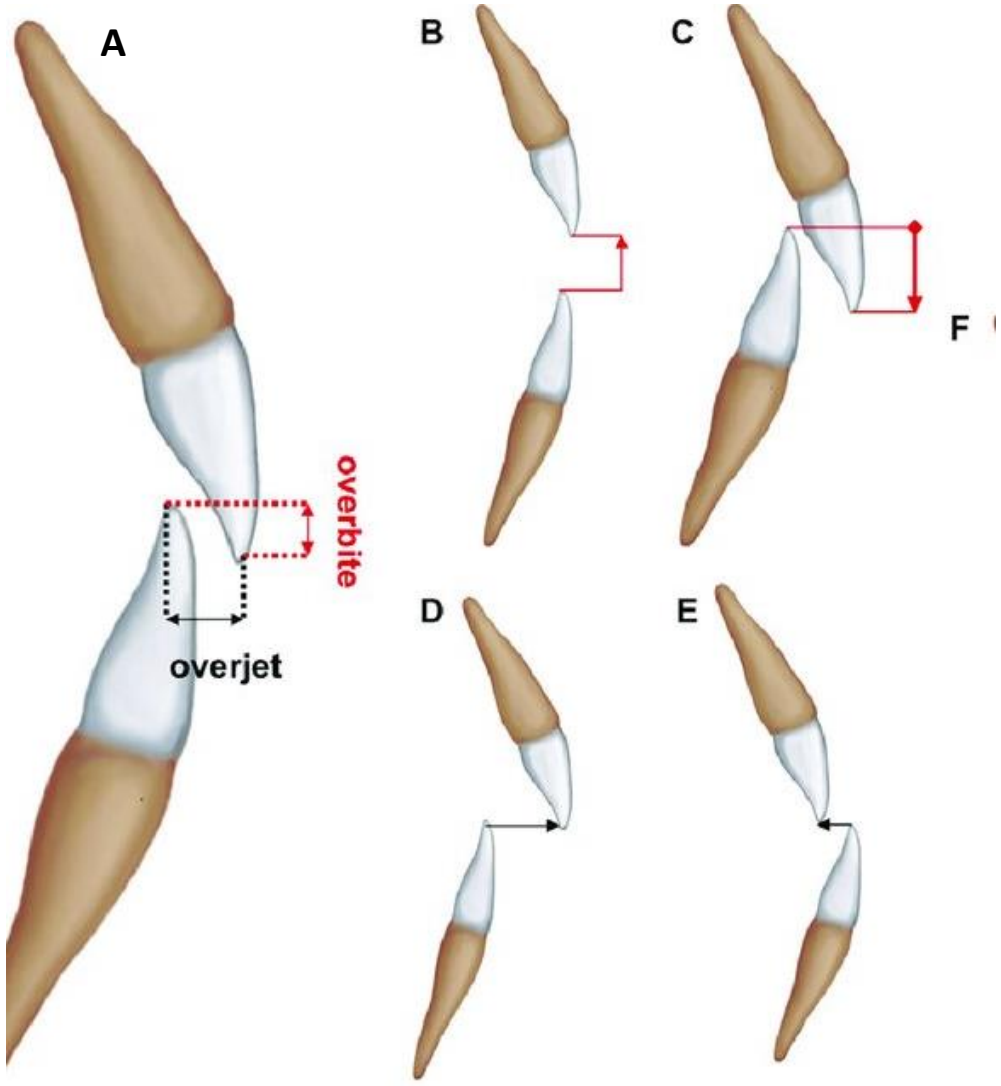
A Class I incisor relationship (normal OJ & OB)

B Open bite

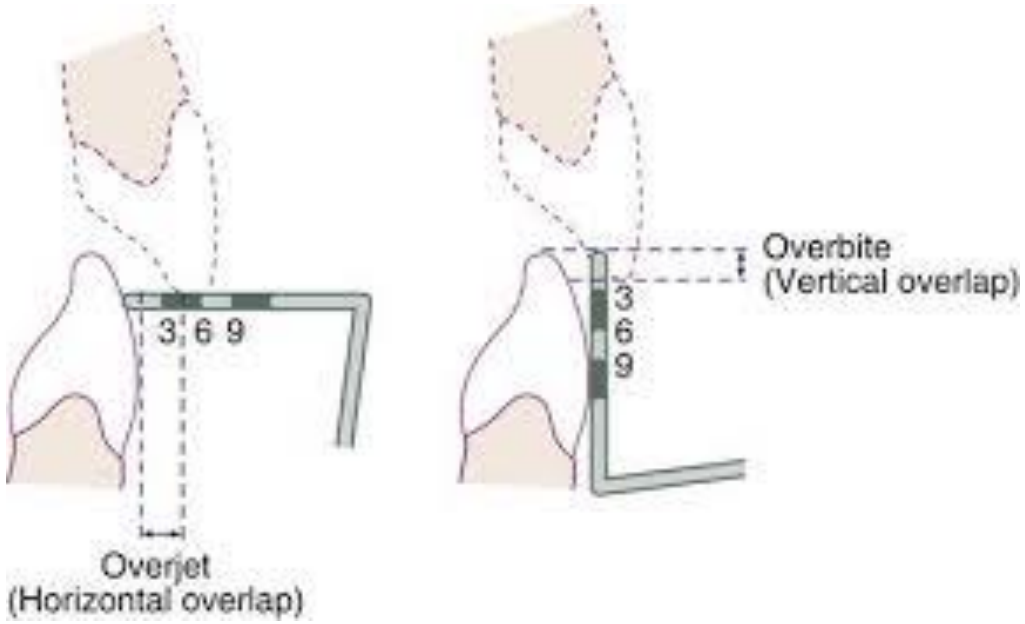
C Deepbite

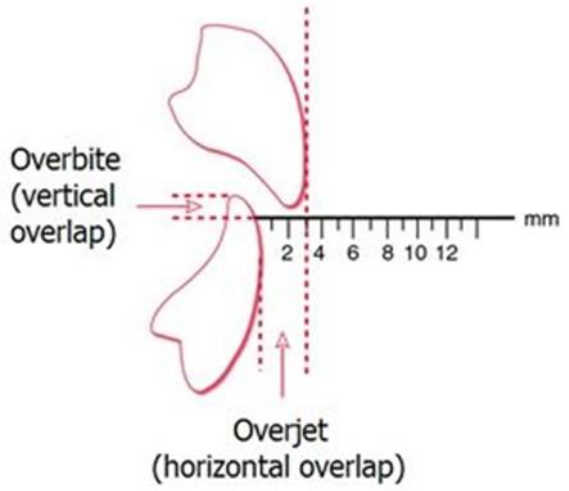
D Class II (increased OJ)

E Reverse Overjet (-2 mm)



How to measure them?





Medline shift

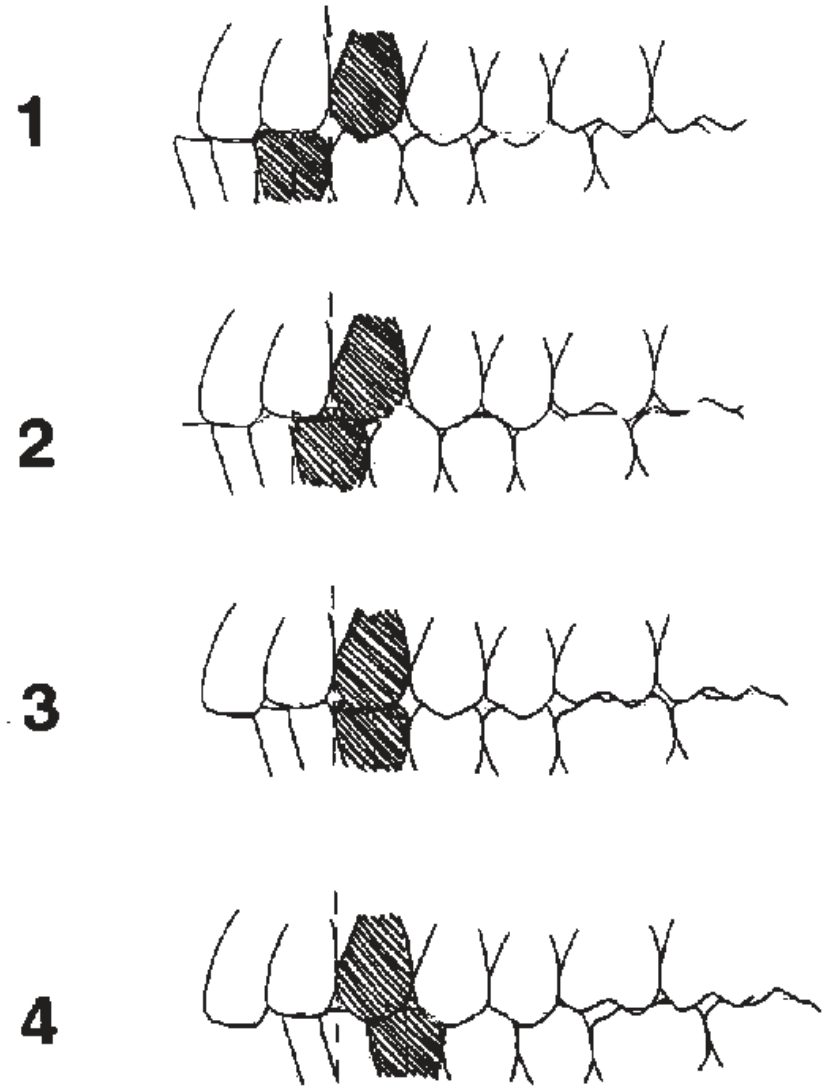
Canine Relationship

CLASS I : When the mesial slope of upper canine coincides with the distal slope of lower canine.

CLASS II : When the mesial slope of upper canine is ahead of the distal slope of lower canine.

Class III : When the mesial slope of the upper canine lies behind the distal slope of the lower canine.

- Class III
- Class I
- Class II
- Class II



Canine relationship measurement

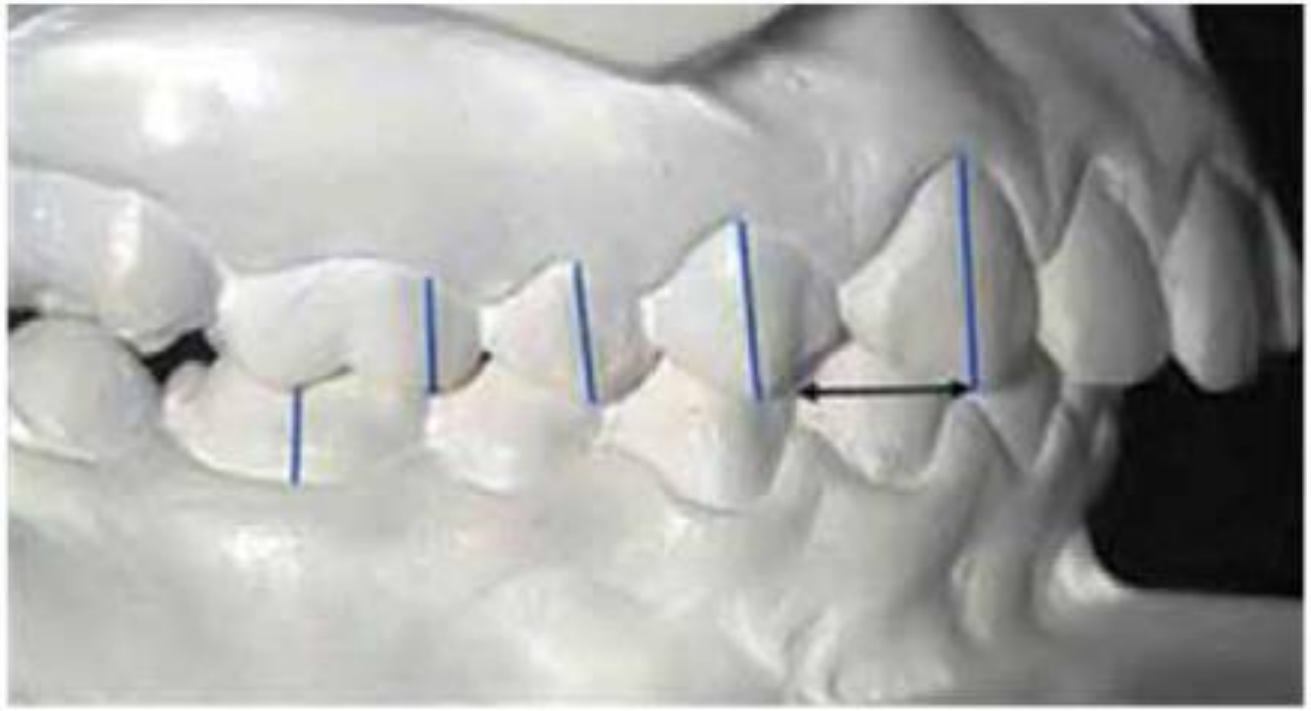


Figure 4 - Canines relationship measurement.

DENTAL AND SKELETAL AGE

Dental Age

Measure of dental development based on the number of permanent teeth. It Can be related to skeletal and chronological age but with some variation in relation eruption time due to general and local factors.

Stage of Eruption

- Determination of dental age from observation of eruption has been the only method available for a long time.
- In certain cases however, the accuracy of the method is limited.
- During the quiescent period in eruption, this approach is inadequate.

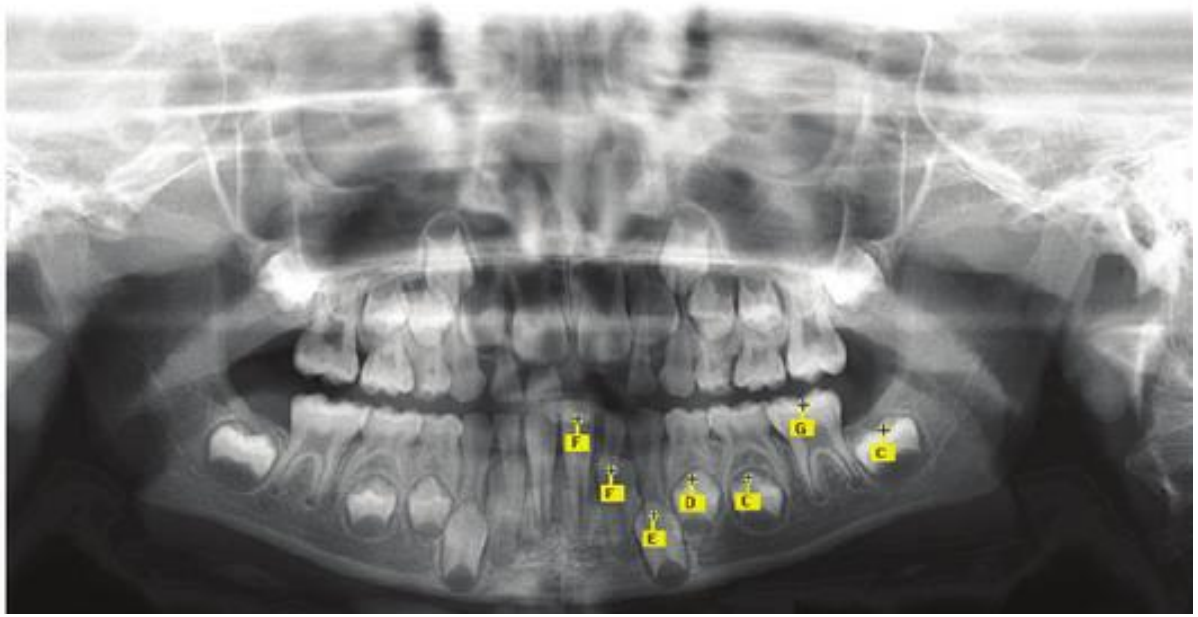
Stage of tooth mineralization

- Stage of tooth mineralization on radiograph (Demirjian et al 1973)
- When determining dental age radiographically according to the stages of germinations, the degree of the development of individual teeth is compared to a fixed scale.
- For age determination one does not rely on the last stage of tooth formation but on the entire process of dental mineralization.
- The procedure can be used for the entire deciduous and mixed dentition period, and is not influenced by early loss of deciduous teeth.

Dental Age

Methods to determine dental age:

1. Eruption time table (Stage of eruption)
2. Radiographical assessment (stage of tooth mineralisation)



- **Chronological age** is defined as the time period from the birth to till date and is often not sufficient for assessing the developmental stage and somatic maturity of the patient.

- **Biological age** is determined from the skeletal, dental and morphologic age and onset of puberty.

- **Morphologic age** is based on the height . A child’s height can be compared with those of his same age group and other age groups to determine where he stands in relation to others. Height is useful as a maturity indicator from late infancy to early adulthood.

Sexual age refers to development of secondary sexual characteristics. This type of indicator is useful only for adolescent growth.

Skeletal age Assessment is often made with the help of hand-wrist radiograph which can be considered the ‘Biological clock ’.

Hand-Wrist X-rays in Orthodontics

Epiphysis equal to diaphysis

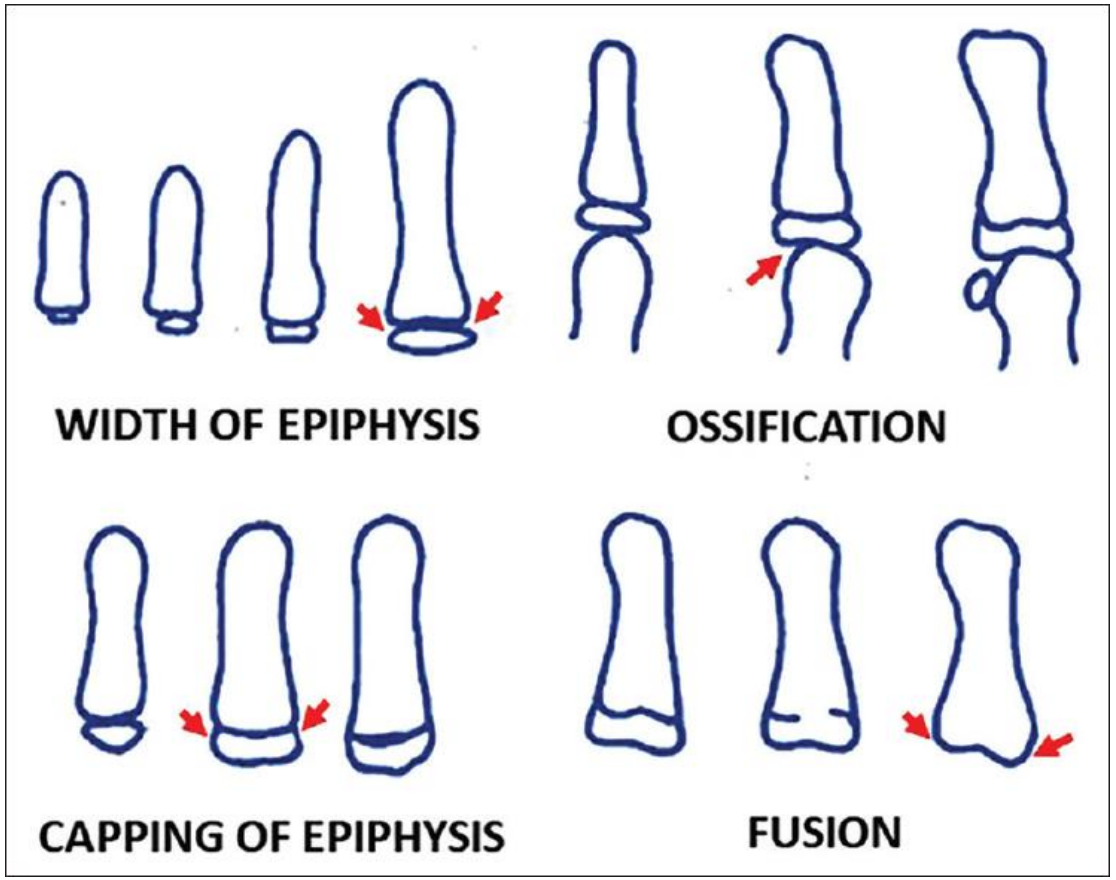
New bone

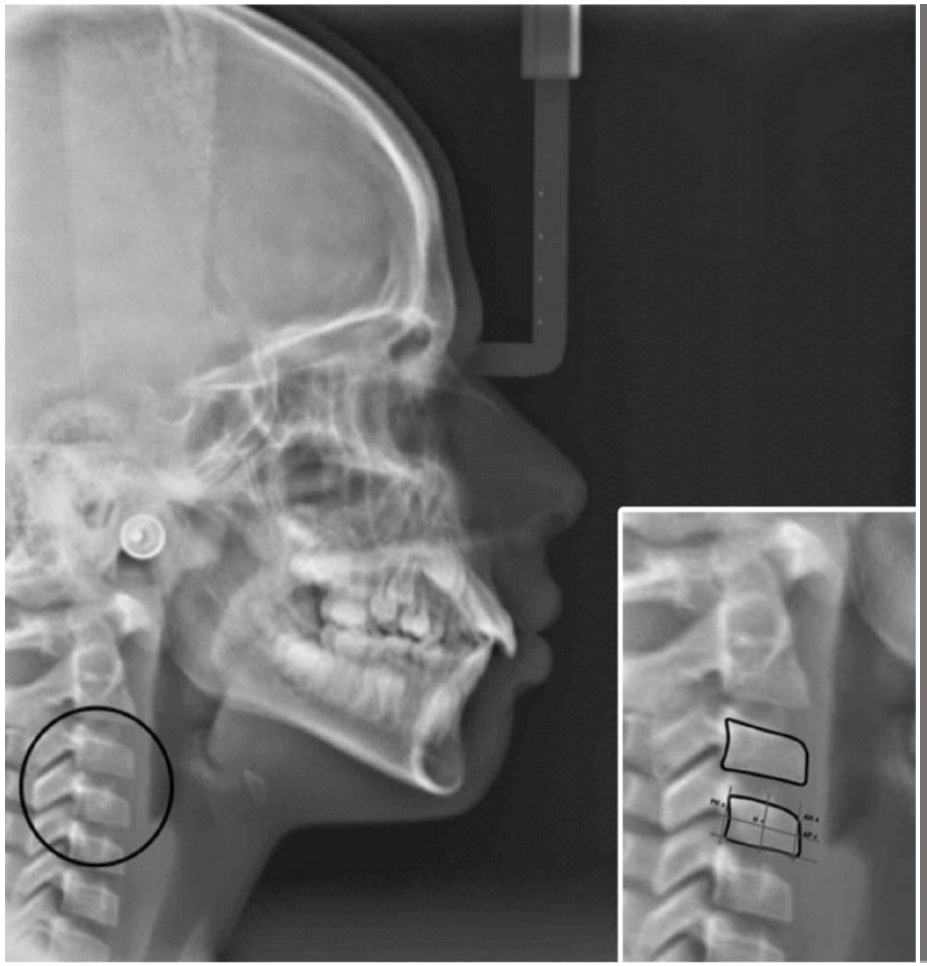
capping

fusion

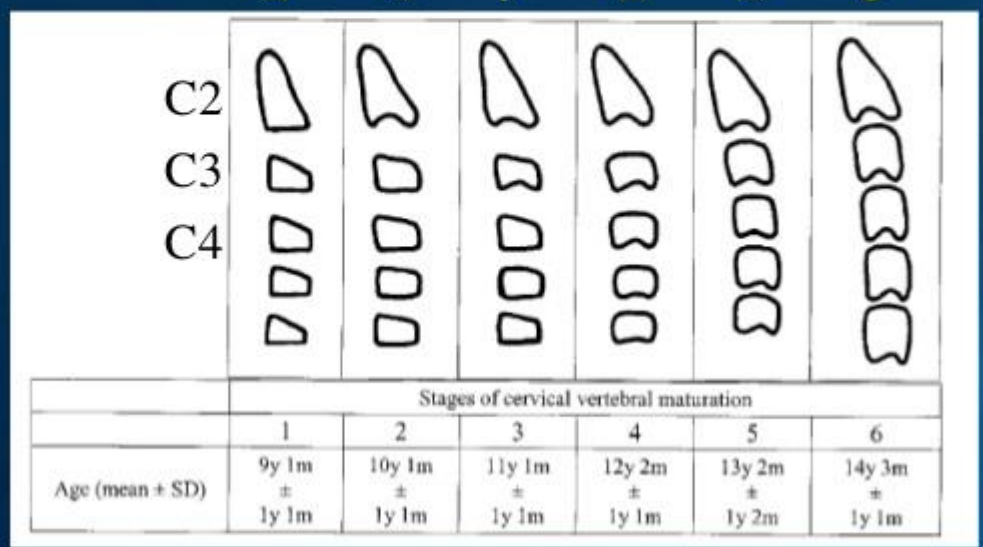
Radiographic identification of skeletal maturity indicators

The development of the epiphysis and diaphysis of growing child not only differs in the timing of the maturational events (width, ossification, capping, and fusion) but also in the sequence of these events.





Cervical Vetebra



	Stages of cervical vertebral maturation					
	1	2	3	4	5	6
Age (mean + SD)	9y 1m ± 1y 1m	10y 1m ± 1y 1m	11y 1m ± 1y 1m	12y 2m ± 1y 1m	13y 2m ± 1y 2m	14y 3m ± 1y 1m

Temporomandibular Joint

Clinical examination: Extra-auricular Examination

Extra auricular examination of TMJ is done by placing index finger in the pre-auricular region about 1.5cm medial to the tragus of ear. The lateral pole of the condyle is accessible during this examination.

Temporomandibular Joint

TMJ dysfunction

- Clicking
- Pian
- Hypermobility
- Deviation
- Dislocation

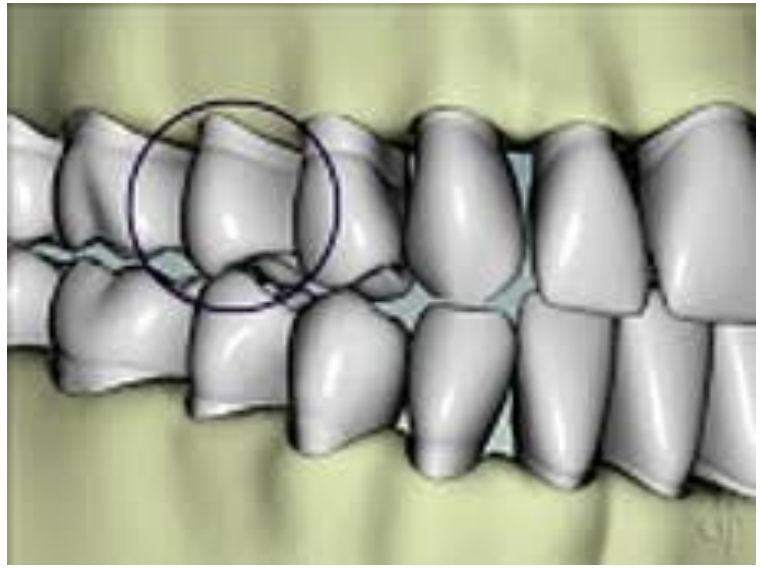
Temporomandibular Joint dysfunction

- Increase with age
- Stress

Temporomandibular Joint dysfunction

After Orthodontic treatment

- Occlusal interference
- Intermaxillary force
- Functional appliance



Management of TMD

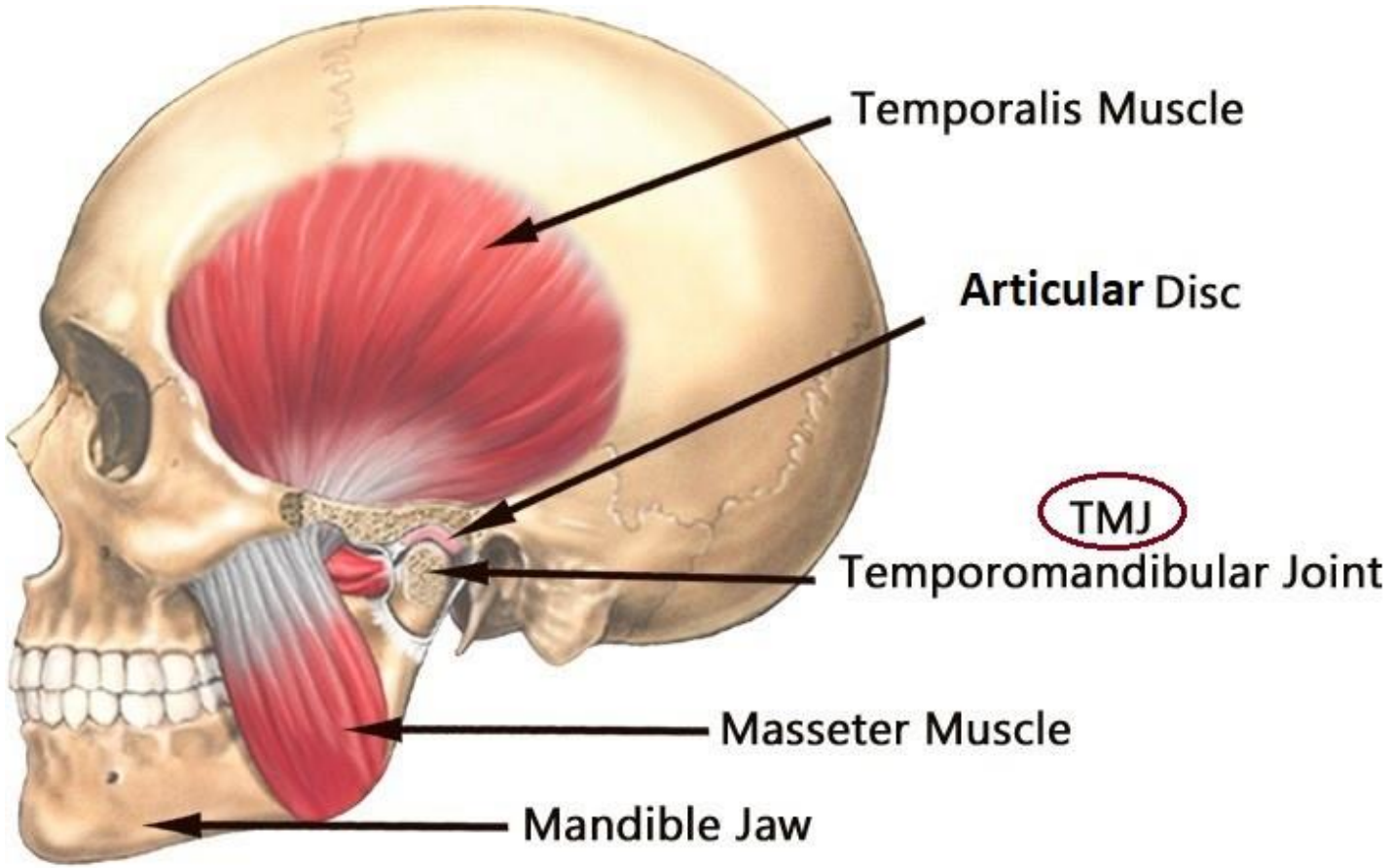
Aim of treatment:

- Elimination muscle spasm
- Restoring correct coordination

Types:

- Medication (Non steroidal anti-inflammatory analgesics)
- Physical exercise
- Splint
- Psychological consoltation

Muscle spasm



Management of TMD

Home exercise