Poltava State Medical University
Department of Orthodontics

Ukraine NOW ua

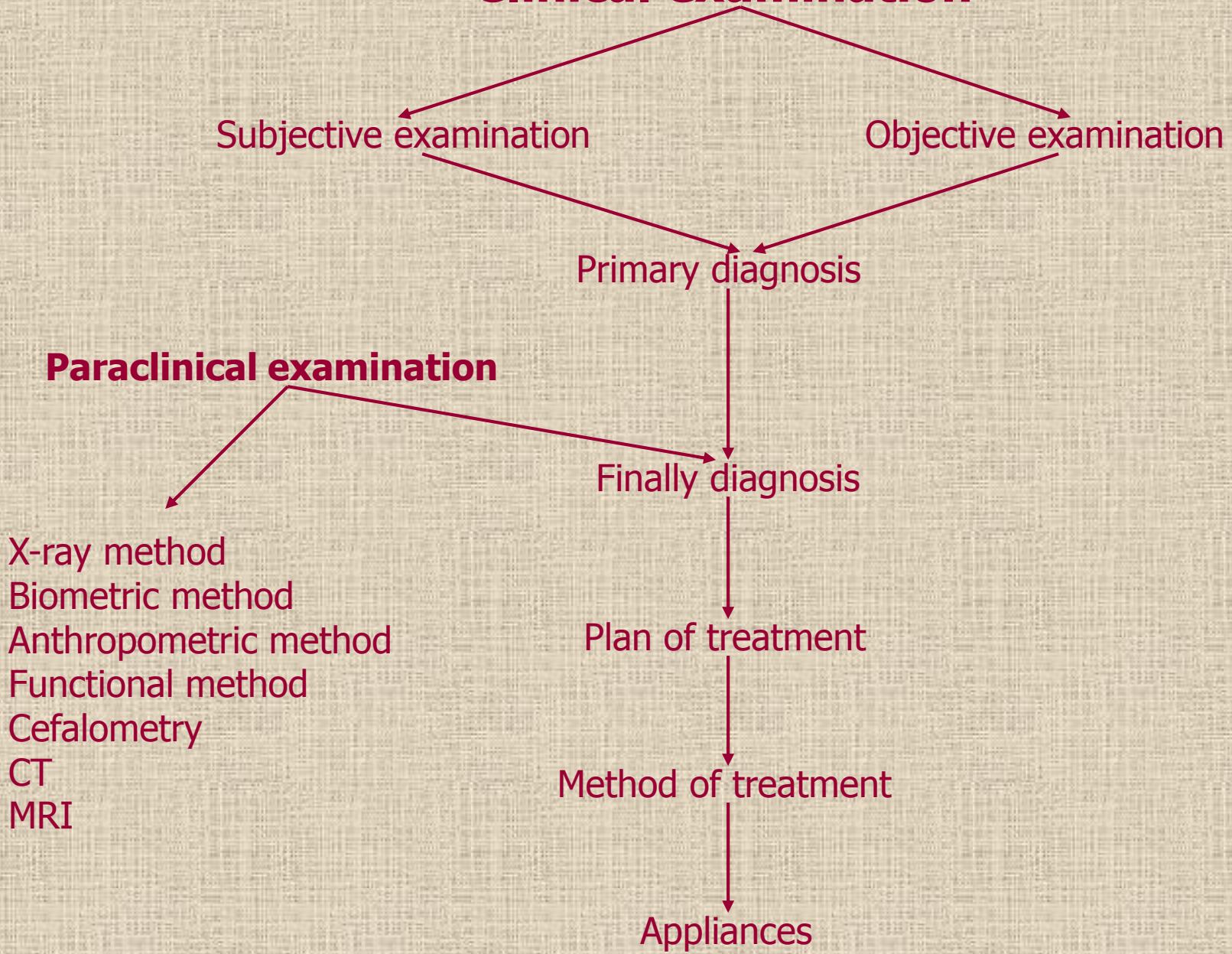
Features of orthodontic patient' clinical examination. Diagnostic and classification of the malocclusion. Laboratory methods of orthodontic patients' examination with malocclusion. Orthodontic diagnosis making

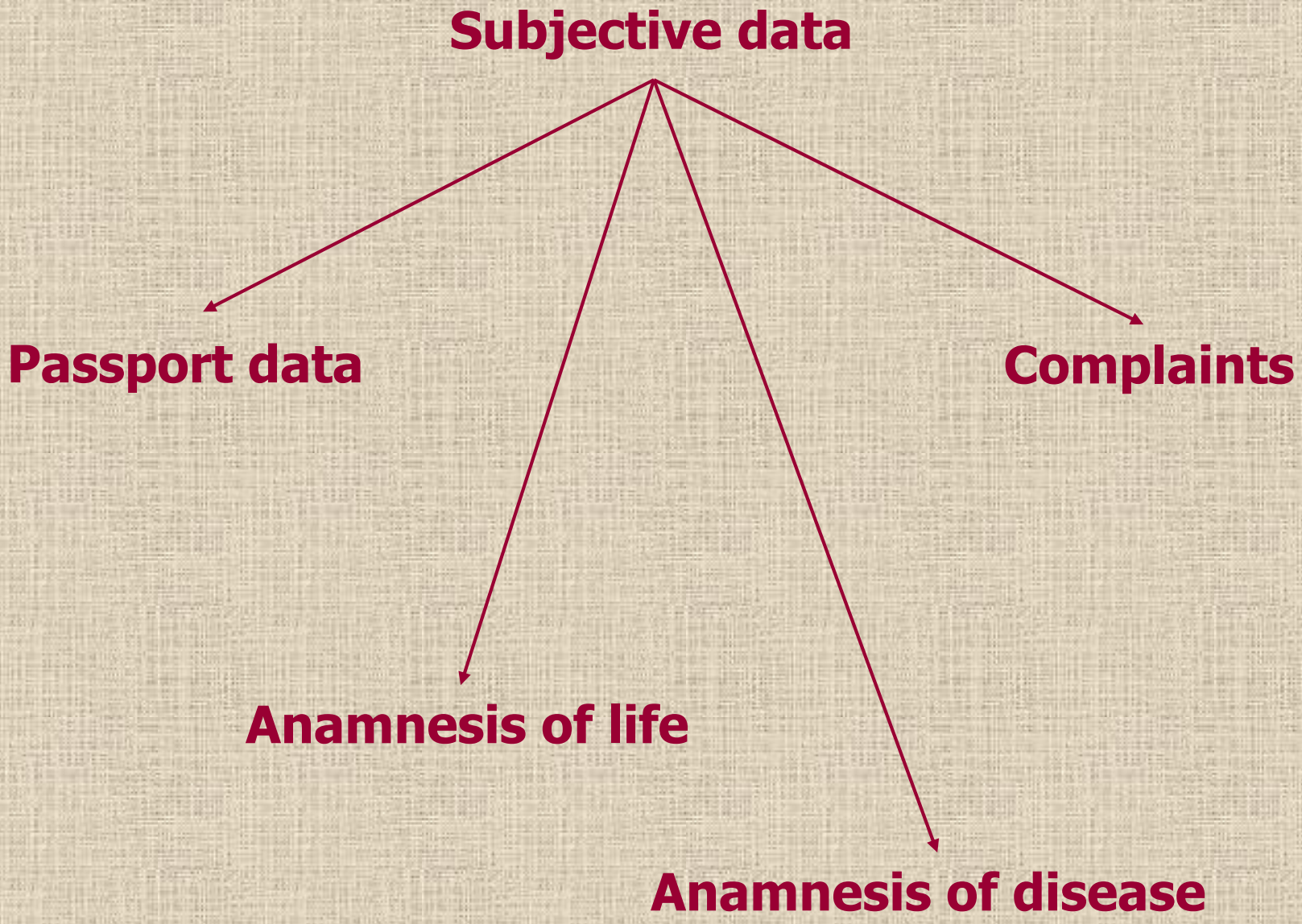
2022

Plan of lecture:

1.Orthodontic patient' clinical examination.
2.Laboratory methods of orthodontic patients' examination with malocclusion.
3.Diagnostic and classification of the malocclusion.
4.Orthodontic diagnosis making.

Clinical examination




Subjective data
Passport data
Complaints
Anamnesis of life
Anamnesis of disease

Passport data

Name

Age:

Passport

Dental

Biological

Bone

Passport data

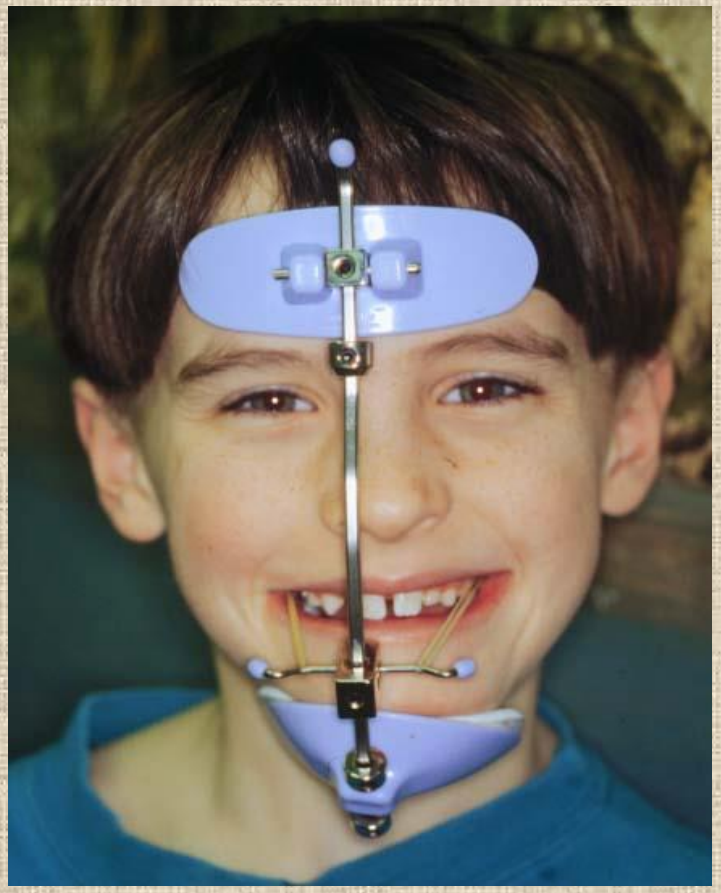
Address

Amount of sunny days

Minerals in the water

Passport data

Sex

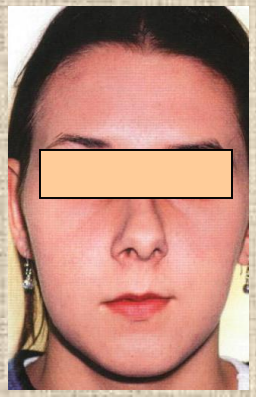


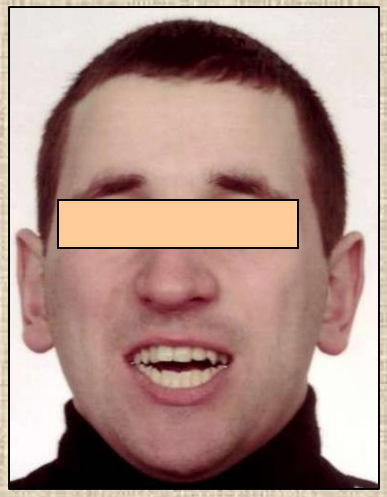
Passport data

School or kindergarten

Complaints

- Aesthetic disorders;
- Incorrect position of some teeth or groups of teeth;
- Incorrect speech function;
- Incorrect functions (breezing, swallowing, masticatory, lips closing);
- Disorders of appliances fixation;
- Pain.

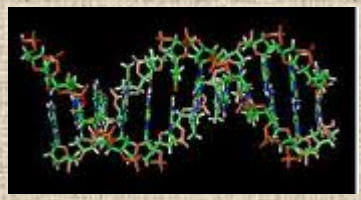




Anamnesis of life

-parents' age;

-biological deficiency of the sexual cells;



-viruses diseases;

-toxics of 1 or 2 part of pregnancy;

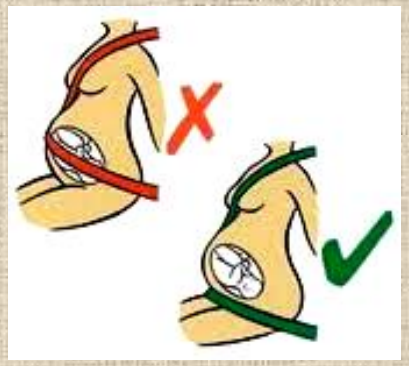
-triplet or quadruplet pregnancy;

Anamnesis of life

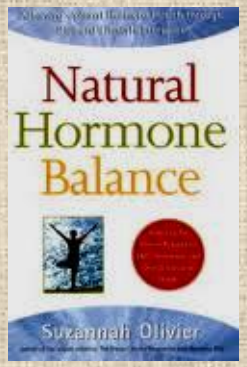
- medicines using during pregnancy;

- bad habits during pregnancy;

- mechanical (trauma);



- nitro paints or benzine vapors influence;



- hypoxia.

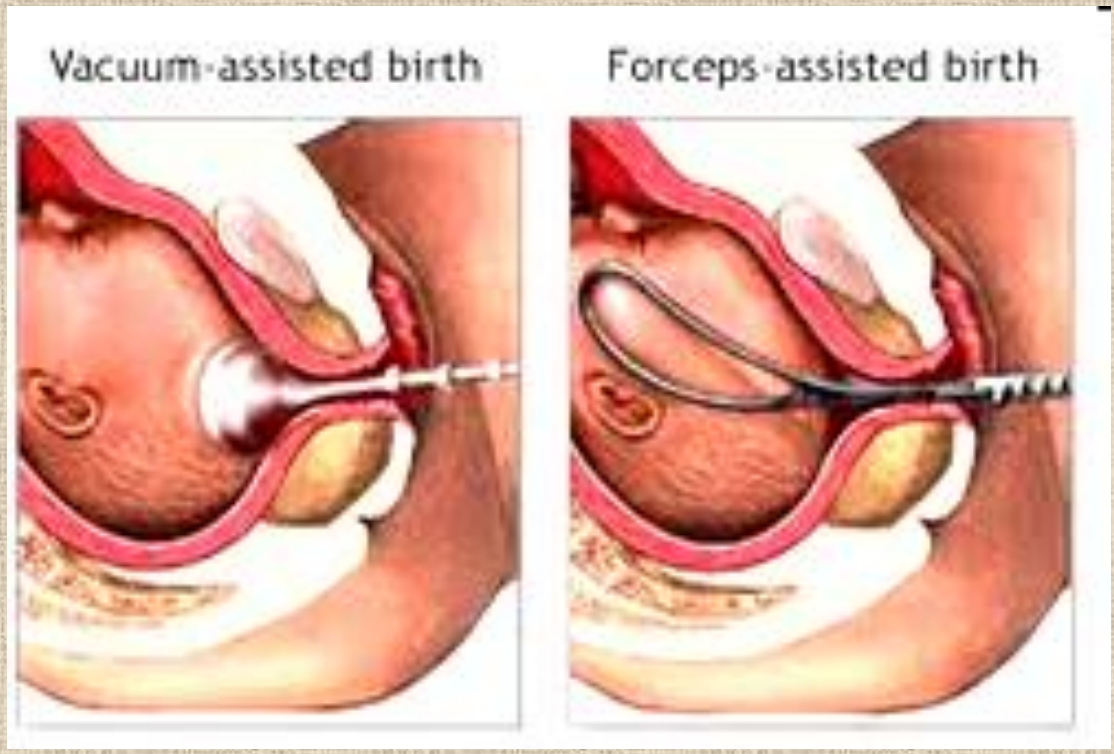
Anamnesis of life

- premature baby;

-type of delivering;

- embryo position;

- assisting of birth.



Anamnesis of life

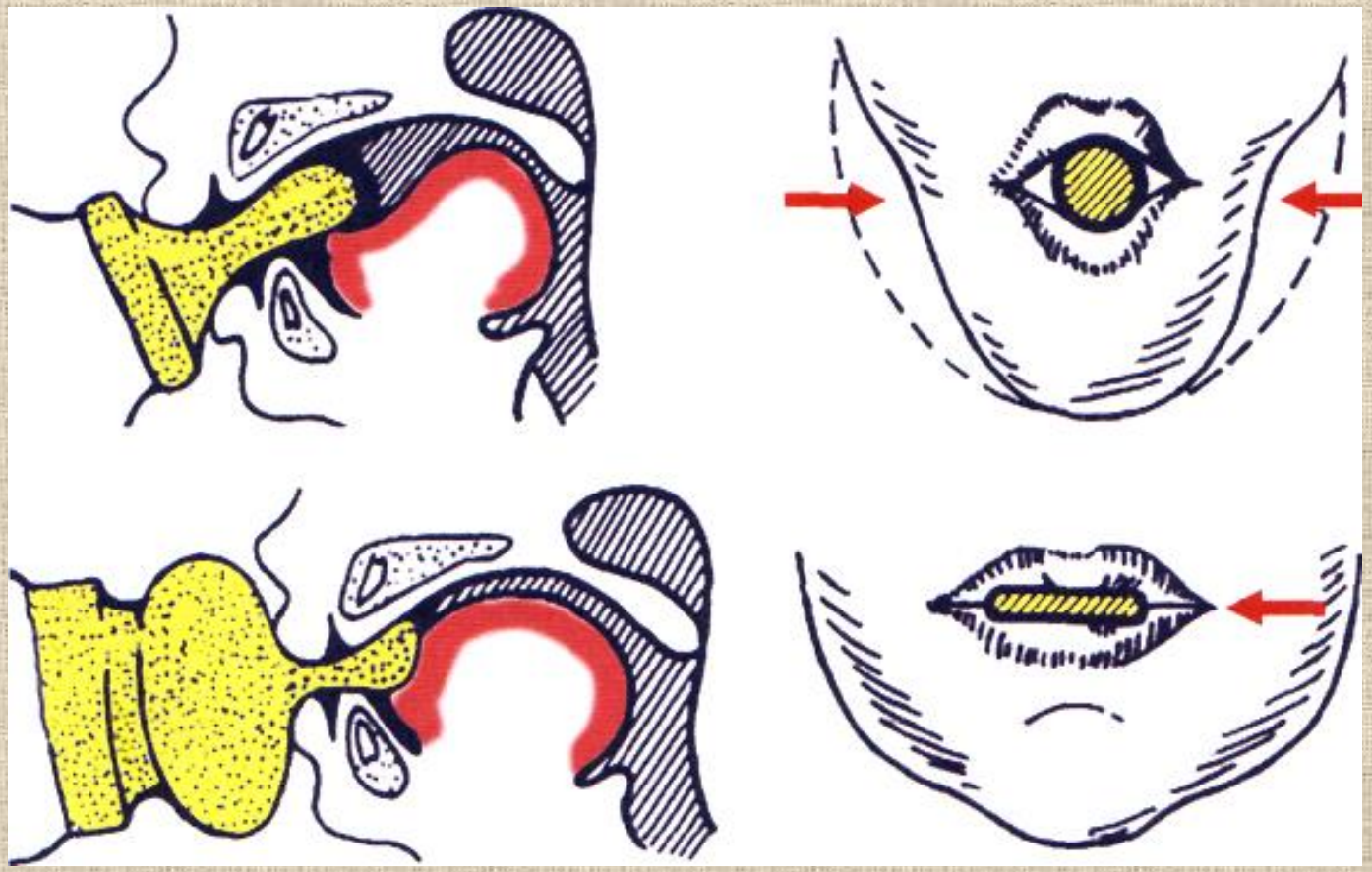
Relation of alveolar processes

Anamnesis of life

Type of feeding

Anamnesis of life

In case of artificial feeding – length and shape of dummy



Anamnesis of life

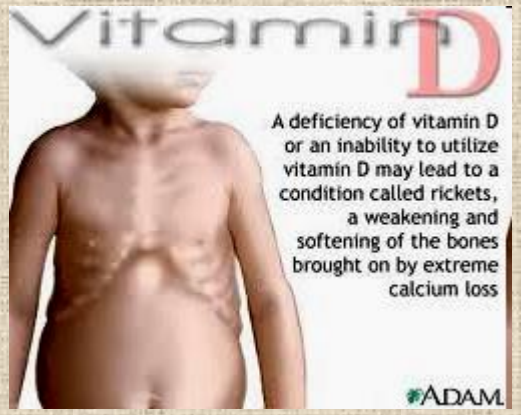
Durable bottle feeding

Anamnesis of life

Durable dummy using

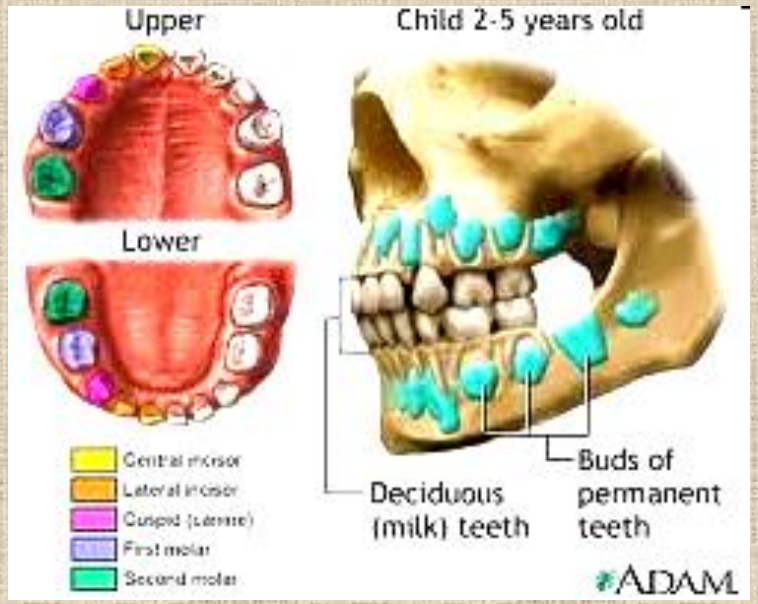
Anamnesis of life

Diseases of childhood (rachitic)



Anamnesis of life

Disorder of teeth eruption' terms



Anamnesis of life

Hypo- or hyperdentia

Anamnesis of life

Macro-, microdentia

Anamnesis of life

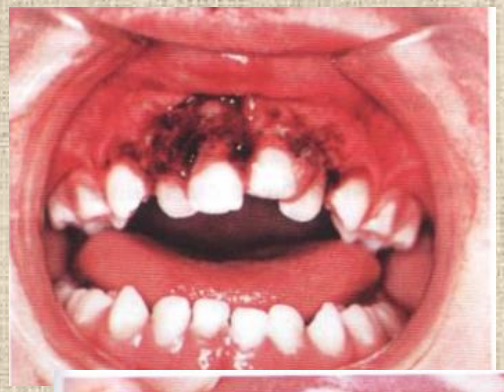
Early teeth extraction

Anamnesis of life

Hypertrophy of palatal tonsils

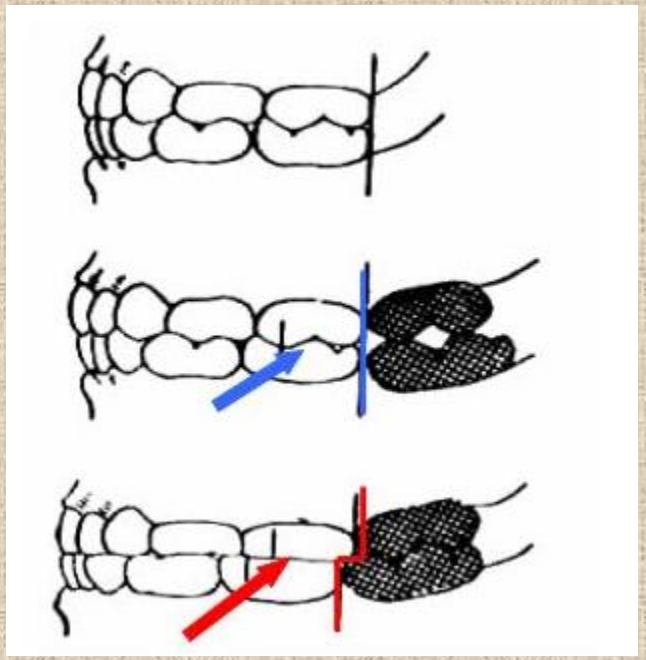
Anamnesis of life

Trauma



Anamnesis of life

Untimely, uneven abrasion of the temporary teeth or it absence, incorrect symptom by Tsylinskyi



Anamnesis of life

Classification of bad habits

(by Okushko V.P.)

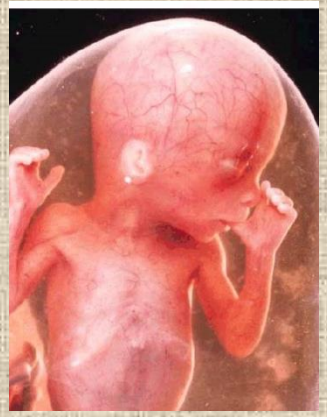
1 group – habit of sucking (fixed moving reactions):
-habit of finger sucking;
-habit of sucking and biting of lips, cheeks, different things;
-habit of sucking and biting of tongue.

2 group – functional disorders (fixed abnormal functions):
-disorder of masticatory function (chewing);
-disorder of swallowing function or habit of tongue pressing on the teeth;
-oral breathing;
-disorder of speech.

3 group – incorrect different body part's position during the day and sleeping (fixed posetonic reflexes).

Anamnesis of life

I. Habit of sucking (fixed moving reactions):



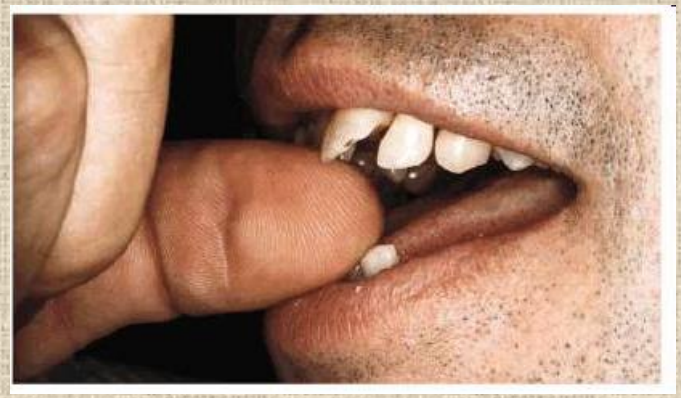






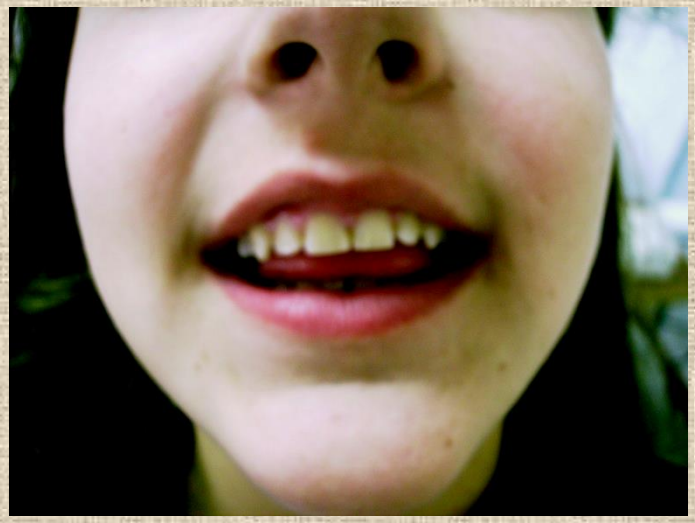






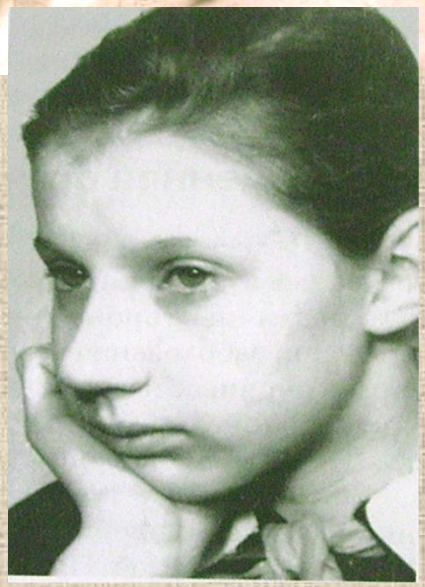
Anamnesis of life

II. Functional disorders (fixed abnormal functions):



Anamnesis of life

III. incorrect different body part's position during the day and sleeping (fixed posetonic reflexes).



Anamnesis of life

Heredity (similar mother and daughter)

Anamnesis of life

General diseases:

- Lungs system;

-Endocrine system;

-Neurological system;

-Allergy status.

Anamnesis of diseases

- Duration and dynamic of diseases;

- Methods of treatment and they effectiveness;

- Heredity.

General examination

Disorders of bearing:

-Normal;

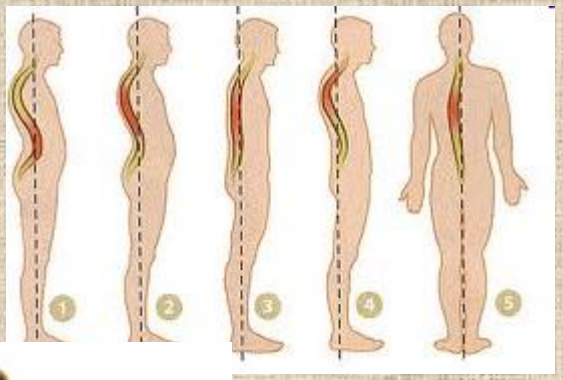
-Rectified;

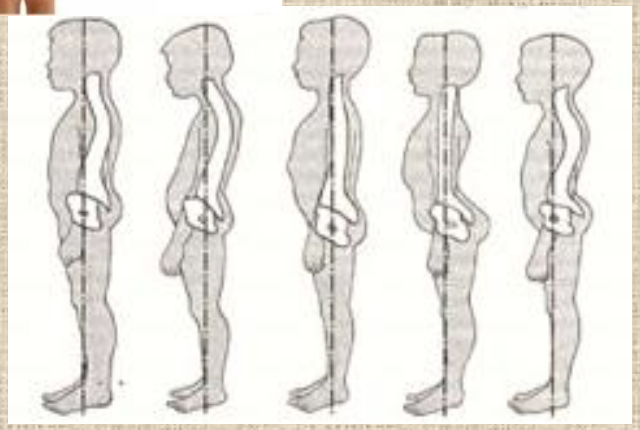
-Round-shouldered;

-Kyphosis;

-Lordosis;

-Scoliosis.





General examination

General data:

Constitution:

-normal;

-hypersthenia;

-hyposthenia;

Stage of fatness:

-middle;

-lower;

-heightened;

-obesity.

Examination

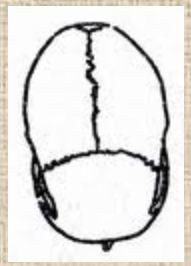
Head examination:

-proportionality;

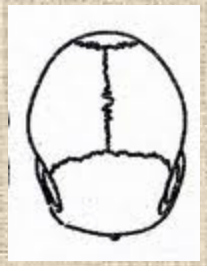
-sizes;

-shape:

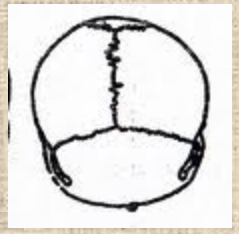
- dolichocephalism

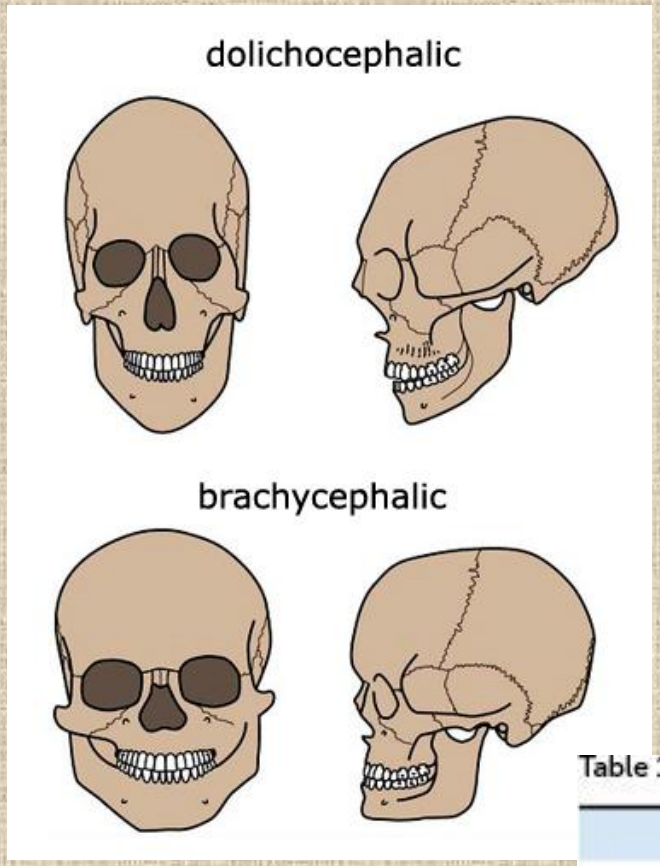


- mesocephalism



- brachicephalic





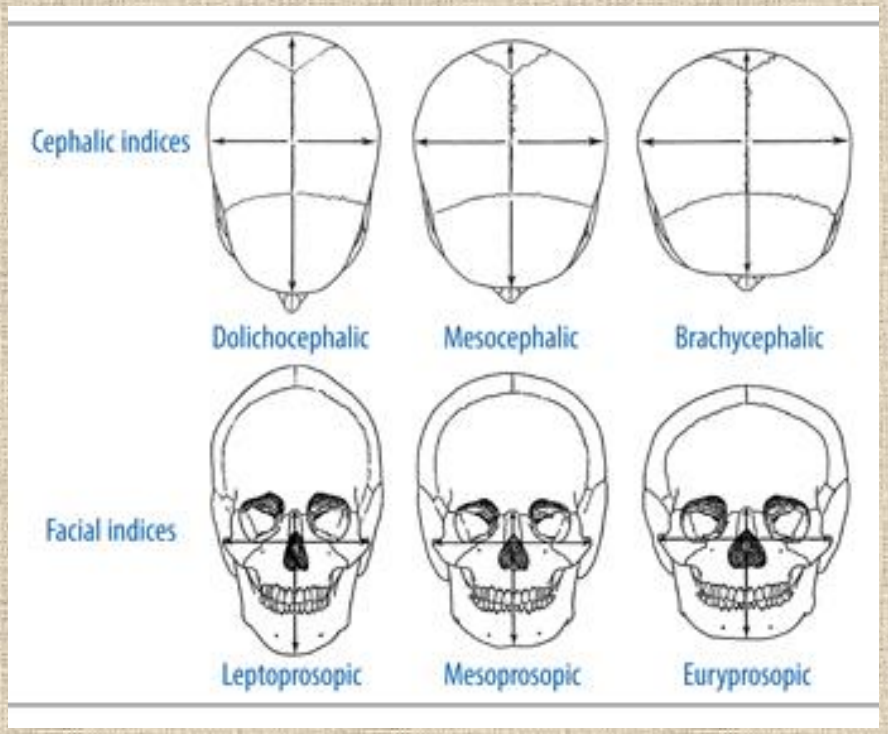


Table 1 - Head classification according to the cephalic index.

Ultradolichocephalic	x - 64.9
Hyperdolichocephalic	65.0 - 69.9
Dolichocephalic	70.0 - 74.9
Mesocephalic	75.0 - 79.9
Brachycephalic	80.0 - 84.9
Hyperbrachycephalic	85.0 - 89.9
Ultrabrachycephalic	90.0 - x
Cranial index	Maximum skull width x 100 / Maximum skull length

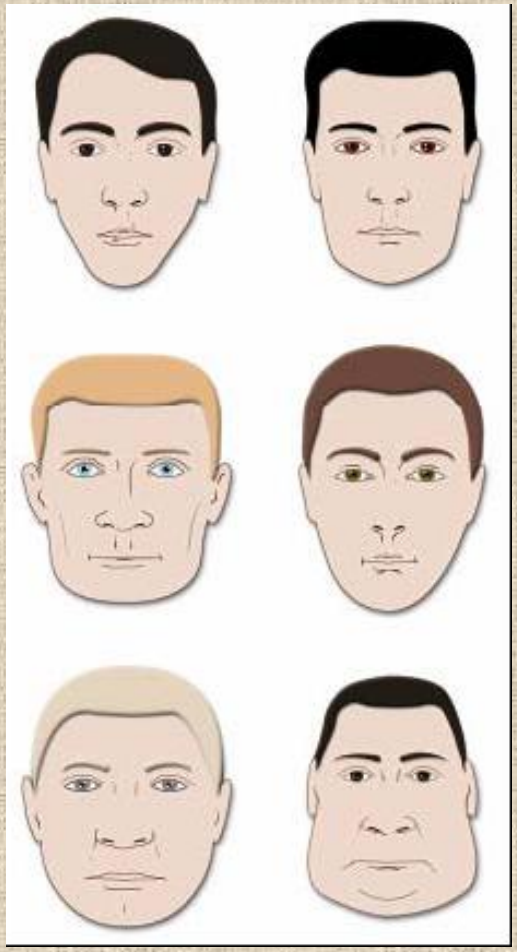
Examination

Shape and size of the face:

- width (narrow, wide, middle);

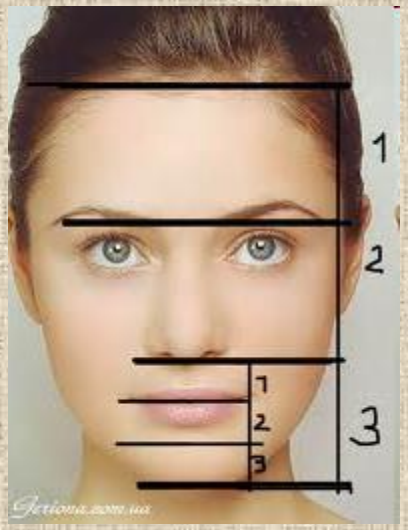
- length (long, middle, short);

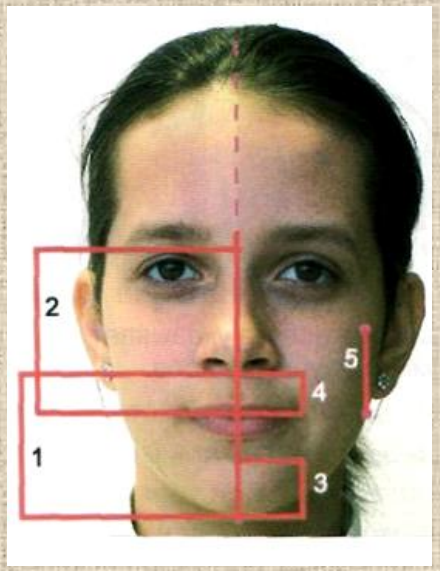
- shape (round, square, oval, triangle with base to up or down, hexahedron).

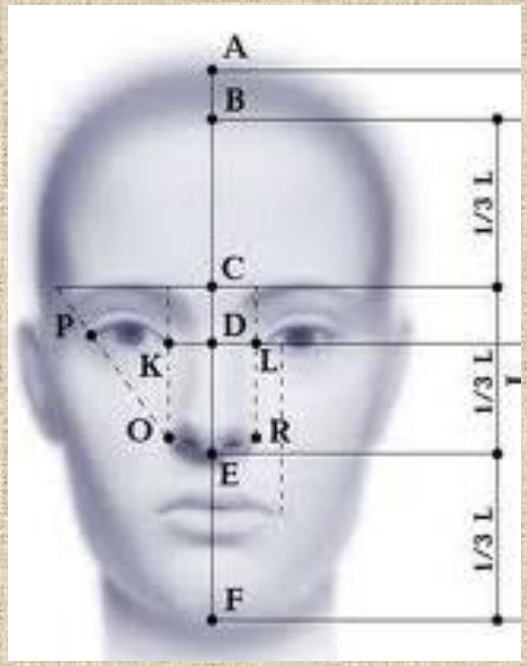


Examination

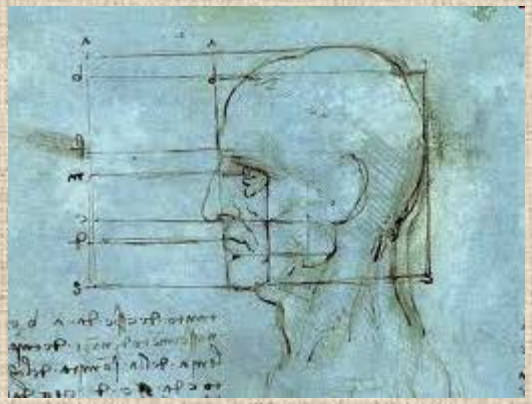
Proportionality of the face:





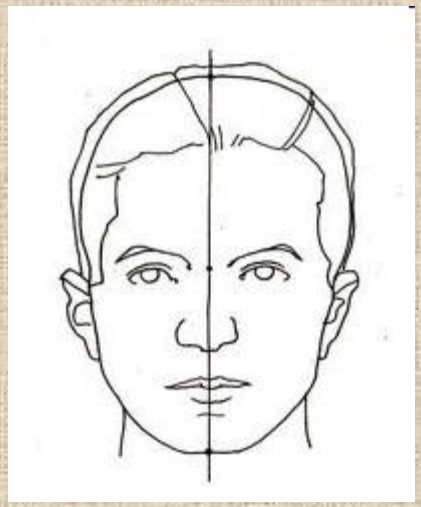


Points for face measuring:
1- Tr;
2- Oph;
3- Sn;
4- Gn.



Examination

Symmetry of the face:



Examination

Profile of the face:

Strait

Convex

Concave

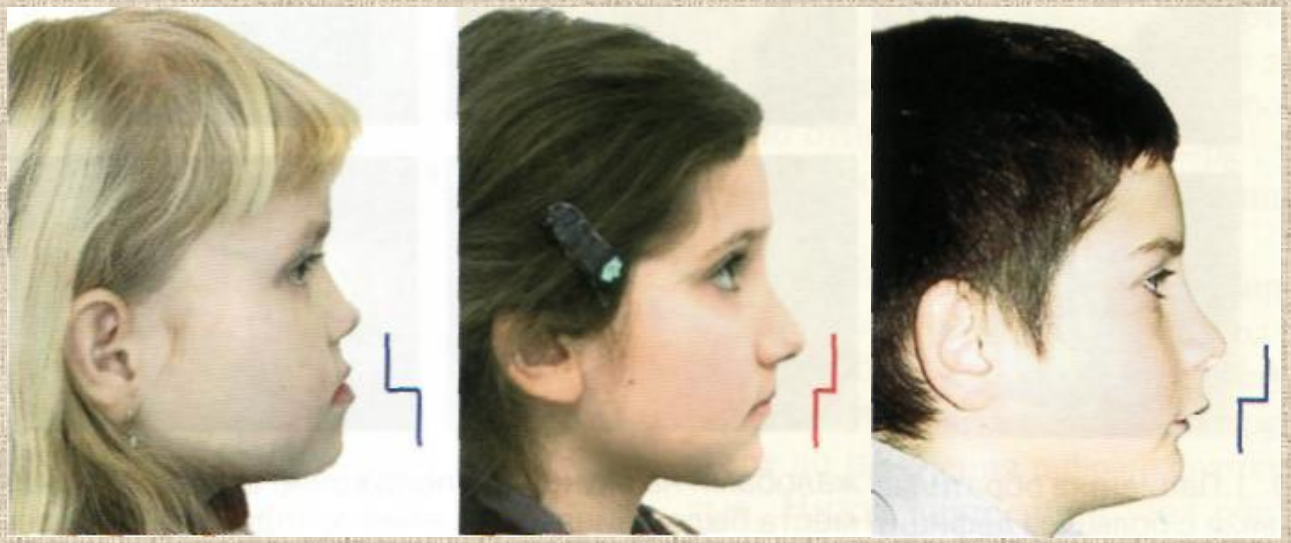
Examination

Contour of front:

sloping protrusive flat

Examination

Lips stair by Korkhaus



Positive lip stair

Normally negative lip stair

Very negative lip stair

Examination

Expressing of natural folds

Folds:
-naso-labial;
-labial-chin.

Expressing of fold:
-smoothed;
-deep;
-middle.

Examination

Lips closing (symptom of the thimble or lemon crust)

Lips closing:

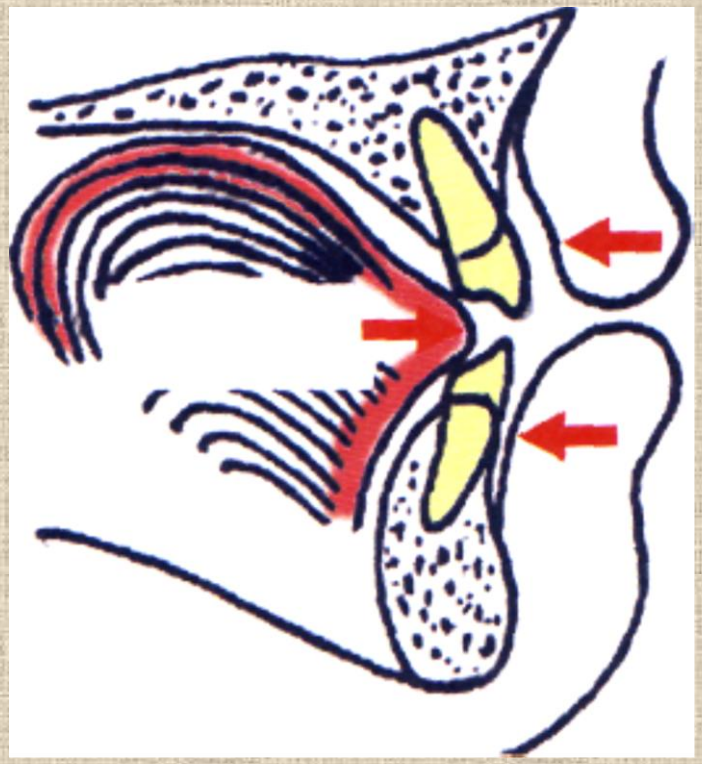
-free;

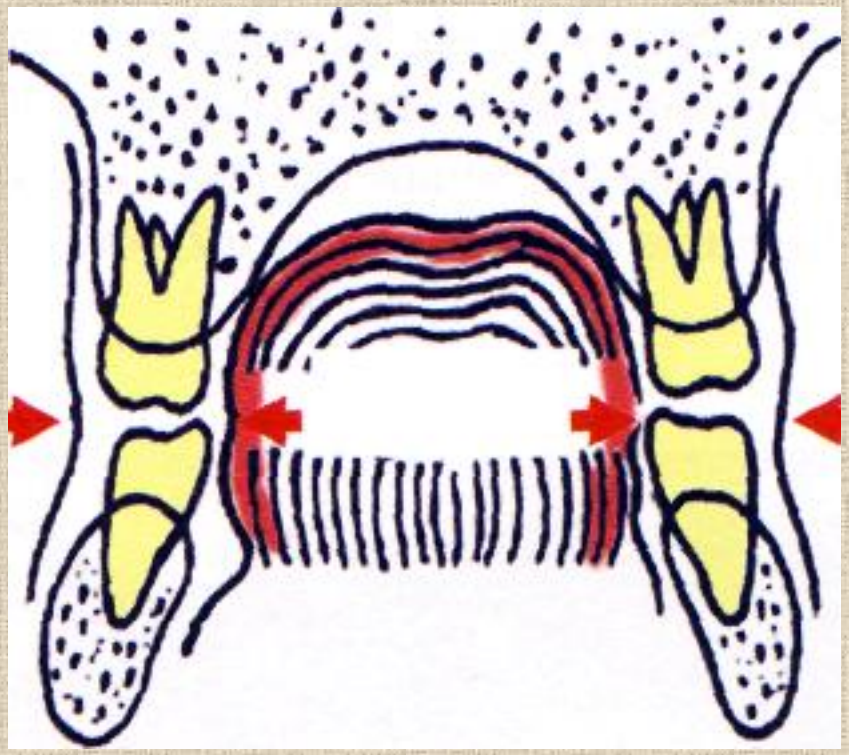
-tensely;

-open mouth.

Examination

Miodinamic balance by Vinders





Oral cavity examination

Vestibulum examination

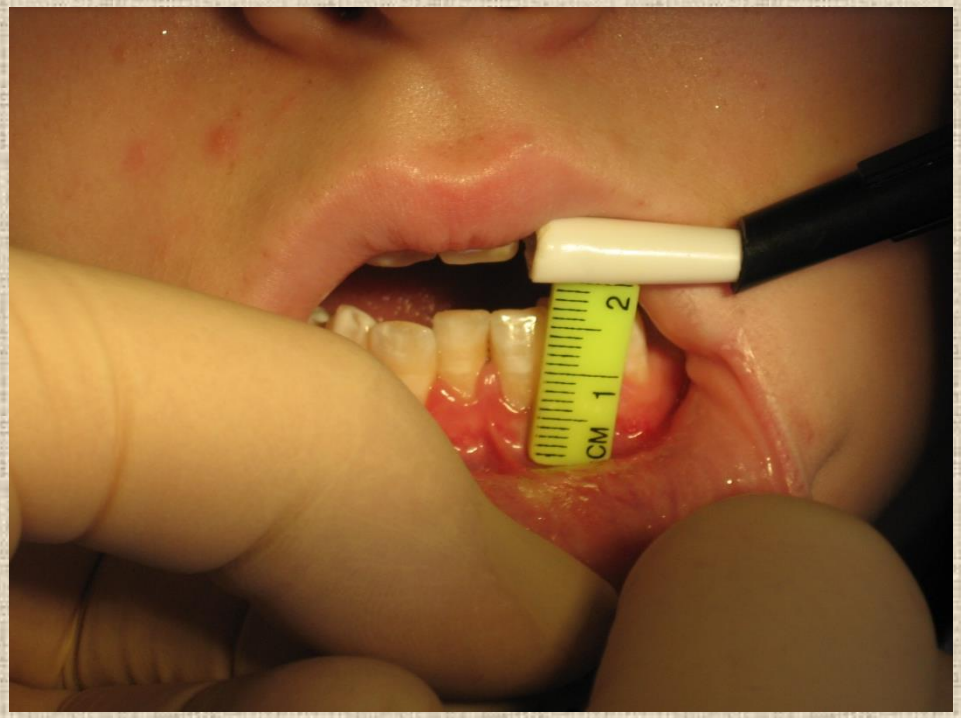
Depth of vestibulum by Obrazcov:

-very short – up to 3 mm;

-short – up to 5 mm;

-middle – 5-10 mm;

-deep – more then 10 mm.

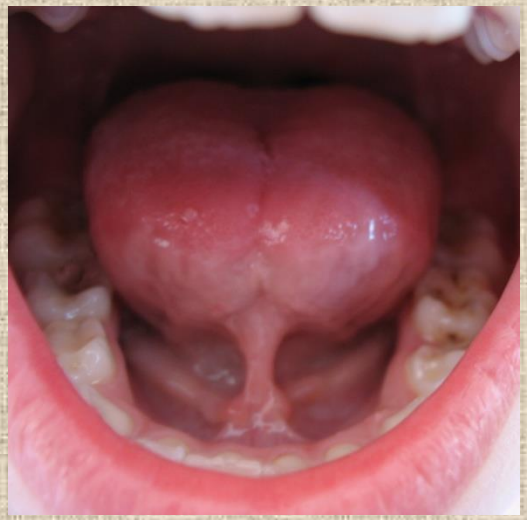


Oral cavity examination

Frenulums fixation

Oral cavity examination

Tongue frenulum fixation



Oral cavity examination

Bite condition:

a) in the sagittal plane:

- Incisors covering;
- Presents of the overjet, its size -_____mm;
- Canines relation: neutral, distal, mesial;
- First permanent molars relation: neutral, distal, mesial;



Oral cavity examination

b) in the vertical plane:

-depth of incisors covering (normal, up to 2/3, more then 2/3);

-size of the vertical gap (in mm - _____,
in area of some teeth - from___ to____);

-presents of contact between lateral teeth.

Oral cavity examination

c) in the transversal plane:

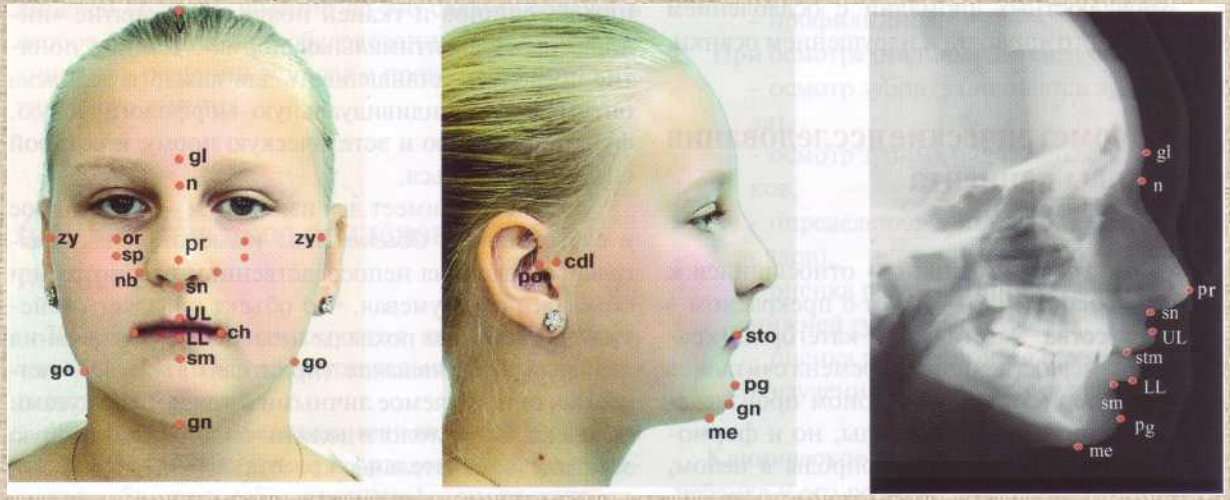
- Alignment of lips frenulums;

-Displacement of the lower jaw;

-Relation of lateral teeth:

- Upper dental arch bigger then lower dental arch on the size of buccal cusp;

Anthropometric examination

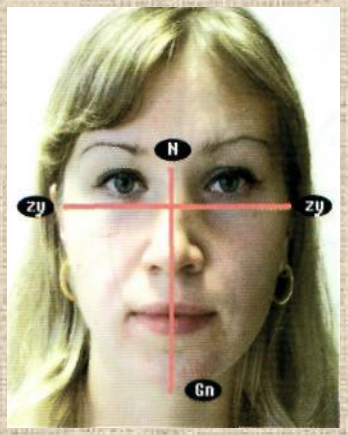


Points for soft tissues examination

gl (glabella) – most anterior point at the lower part of the front;
n (nasion) - point at the crossing of N-S plane with a face skin;
pr (pronasale) – top of the nose;
sn (subnasale) - point between the nose and upper lip skin;
UL (labiale superius) - most anterior point at the upper lip;
sto (stomion) - point at the crossing of lip closing line and middle face line;
LL (labiale inferius) - most anterior point at the lower lip;
sm (supramentale) - most posterior point of the chin-labial groove;
pg (pogonion) - most anterior point at the chin soft tissues;
gn (gnathion) – lowest point at the chin soft tissues;
me (menton) - lowest point at the contour of chin soft tissues;
or (orbital rim) - lowest point at the orbit;

Determination of the face width (IFM - index facial morphological)

The width and height of a face for Garson method.

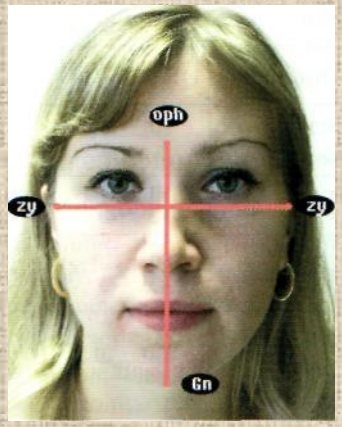


N-Gn : Zy-Zy · 100%

Very wide - 78,9;
Wide - 79,0-83,9;
Middle - 84,0-87,9;
Narrow - 88,0-92,9;
Very narrow - 93,0 >.

The width and height of a face for Izard method.

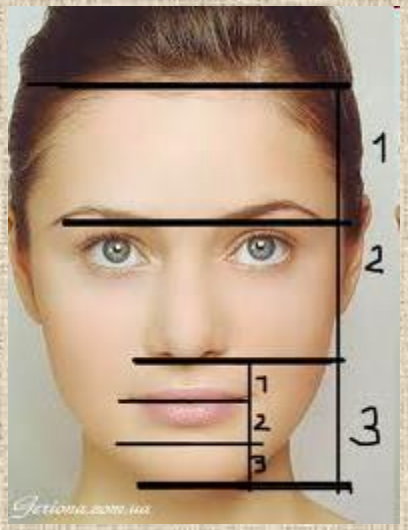
Oph-Gn : Zy-Zy · 100%

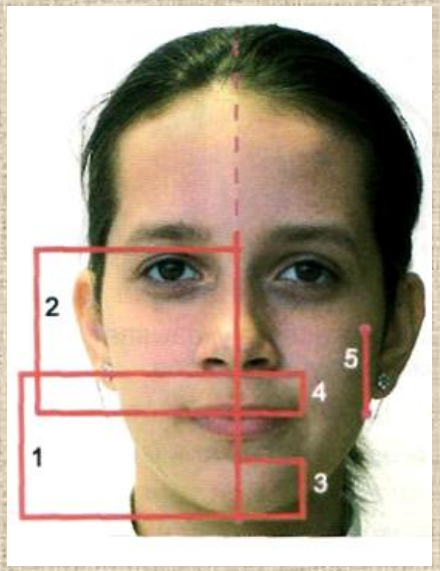


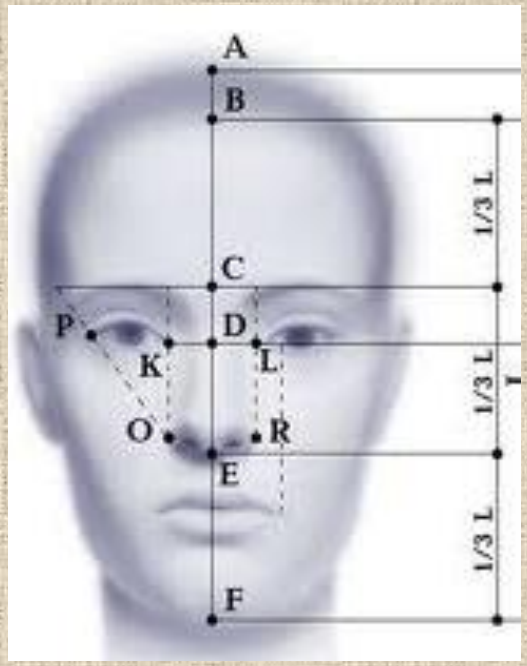
Wide – 96 <;
Middle - 97-103;
Narrow – 104 >.

Examination

Proportionality of the face:







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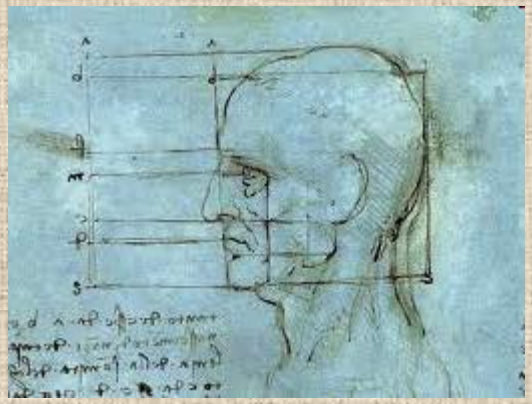
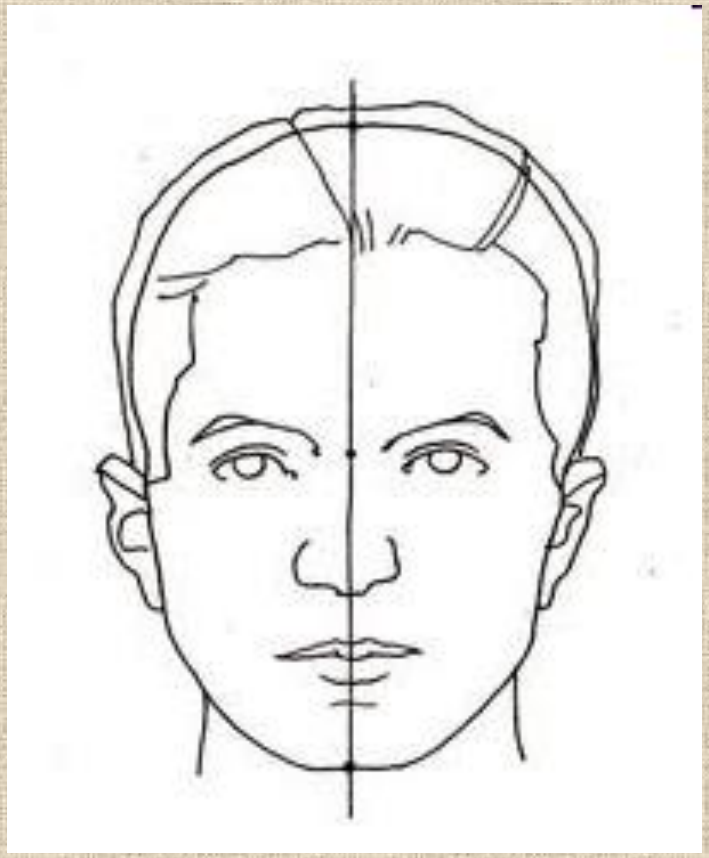
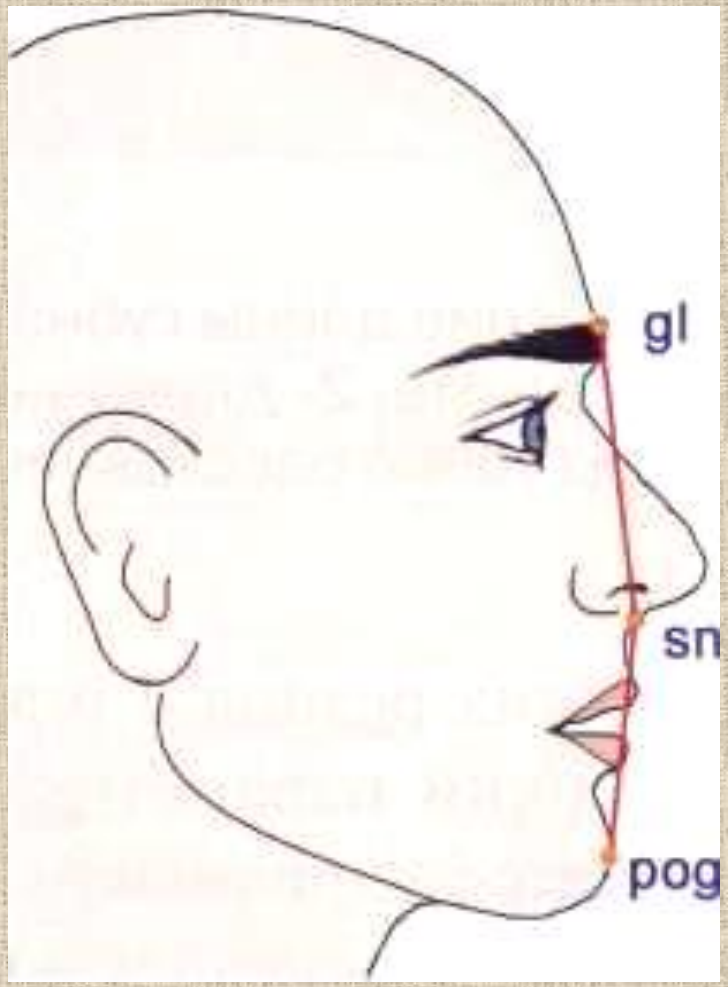


Symmetry of the face:



Ideal face:
one-fifth rule



gl-sn-pg 165°-175° - normal occlusion.
gl-sn- pg < 165° - distal occlusion,
gl-sn-pg > 175° - mesial occlusion.

R.M.Ricketts (1957)

upper lip - 2-3 mm,

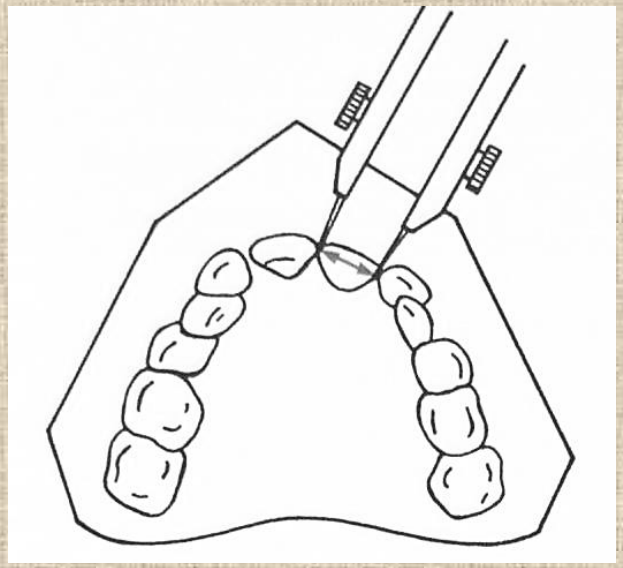
lower lip - 1-2 мм.

Biometric research methods

Mesio-distal sizes disproportion

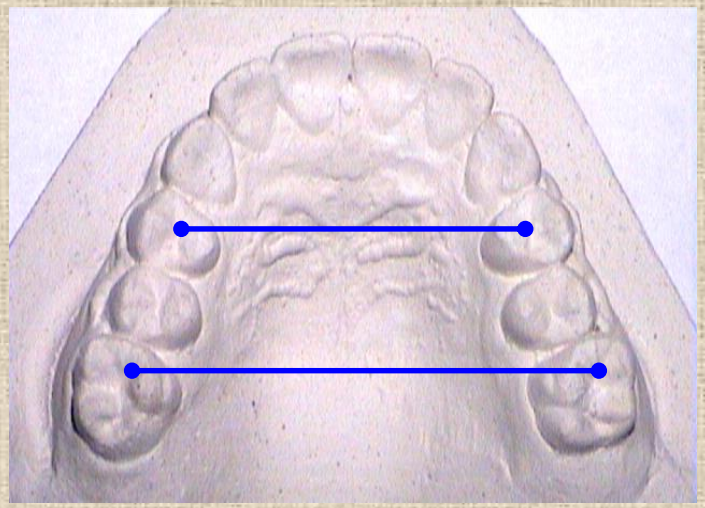
Tonn's method

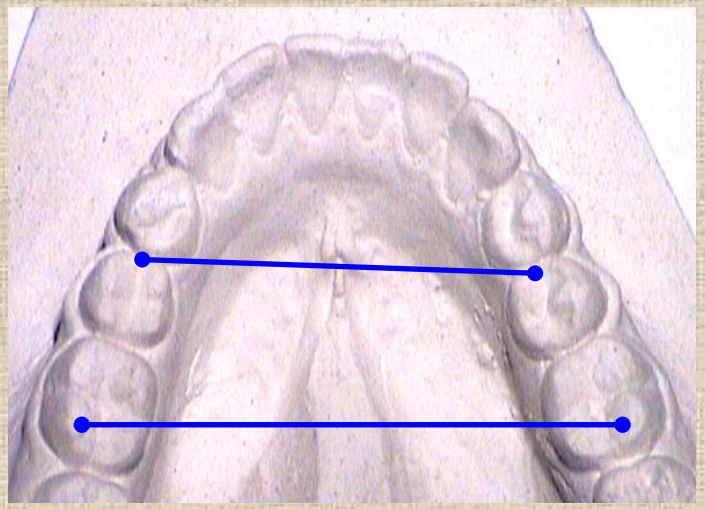
SI : Si = 1.33



Teeth crowns height and wide definition

Pont method (1907)

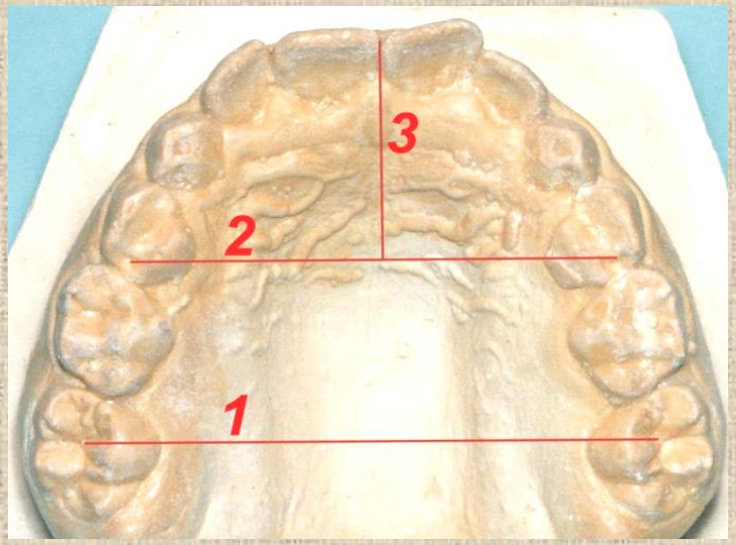


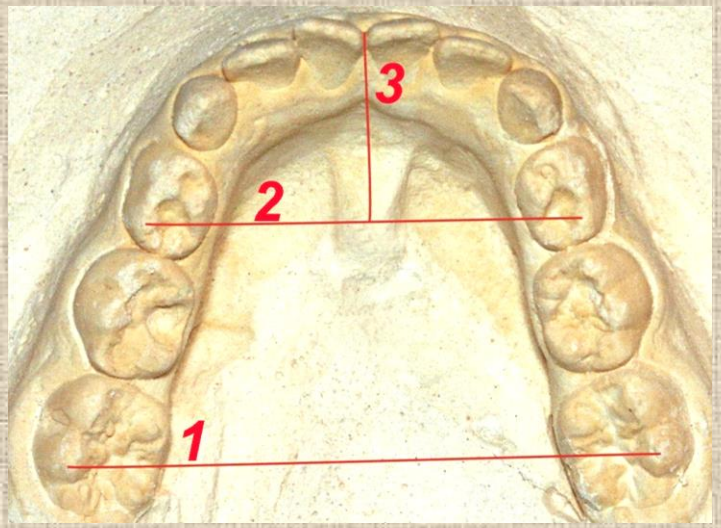


$$\text{Premolar index} = \frac{\text{Sum of mesio-distal sizes of 4th upper incisors}}{\text{Distance between premolars}} \times 100\% = 80$$

$$\text{Molar index} = \frac{\text{Sum of mesio-distal sizes of 4th upper incisors}}{\text{Distance between molars}} \times 100\% = 64$$

Linder, Hart (1939) amendments

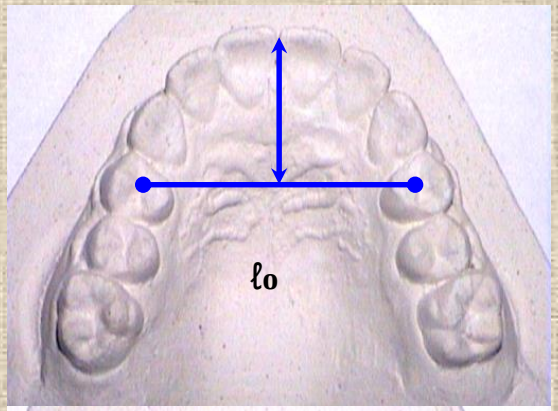


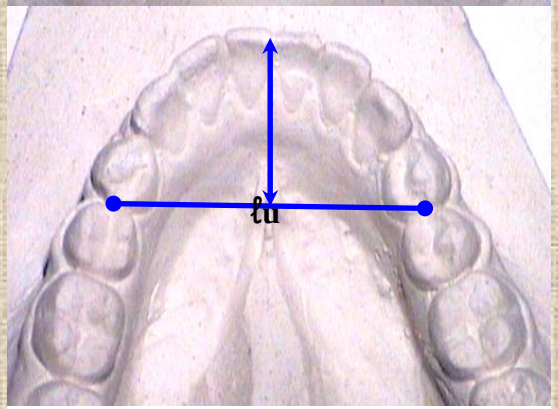


$$\frac{SI \times 100}{85} = m1\text{-}m1$$

$$\frac{SI \times 100}{65} = M1\text{-}M1$$

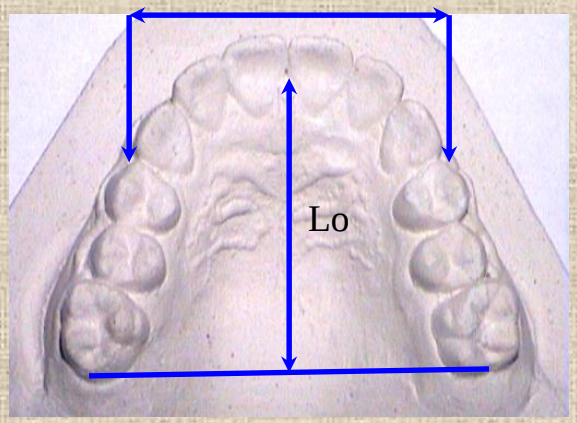
Метод G.Korkhaus (1939)





SI	ℓo	ℓu
27,0	16,0	14,0
27,5	16,3	14,3
28,0	16,5	14,5
28,5	16,8	14,8
29,0	17,0	15,0
29,5	17,3	15,3
30,0	17,5	15,5
30,5	17,8	15,8
31,0	18,0	16,0
31,5	18,3	16,3
32,0	18,5	16,5
32,5	18,8	16,8
33,0	19,0	17,0
33,5	19,3	17,3
34,0	19,5	17,5
34,5	19,8	17,8
35,0	20,0	18,0
35,5	20,5	18,5
36,0	21,0	19,0

H. Howes - N. Snagina (1957-1965)

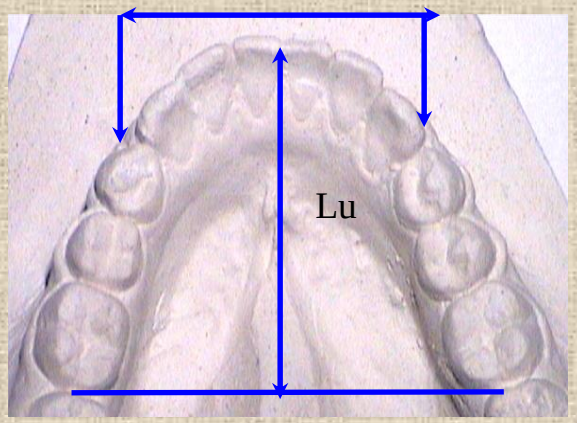


$$\frac{Bo}{\Sigma\ 12d\ M_1\text{-}I_1} \times 100 = 44 \pm 2\%$$

$$\frac{Bu}{\Sigma\ 12d\ m_1\text{-}i_1} \times 100 = 43 \pm 2\%$$

$$\frac{Lo}{\Sigma\ 12d\ M_1\text{-}I_1} \times 100 = 39 \pm 1\%$$

$$\frac{Lu}{\Sigma\ 12d\ m_1\text{-}i_1} \times 100 = 40 \pm 1\%$$

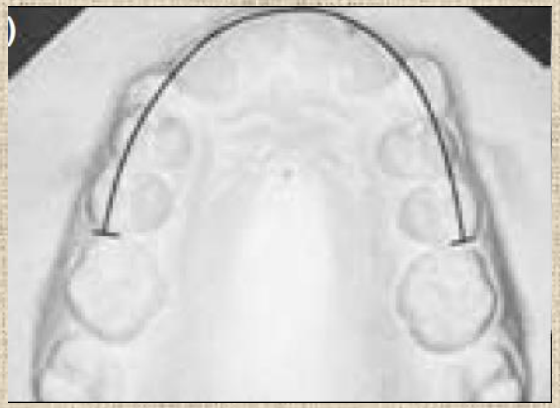


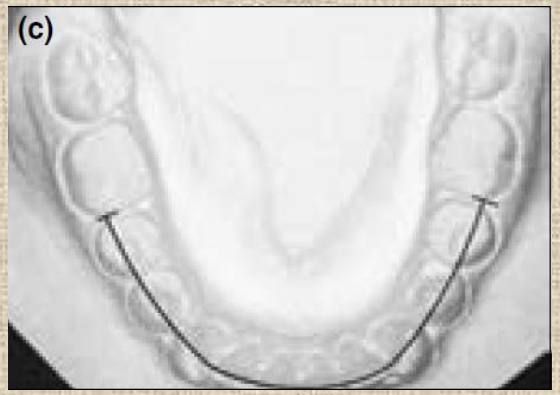
Interpretation of results

the degree of reduction	The parameters of the apical base	The value of the parameter %
I	Bo	39-42
	Bu	38-41
	Lo	35-37
	Lu	36-38
II	Bo	32-39
	Bu	34-38
	Lo	26-35
	Lu	31-36

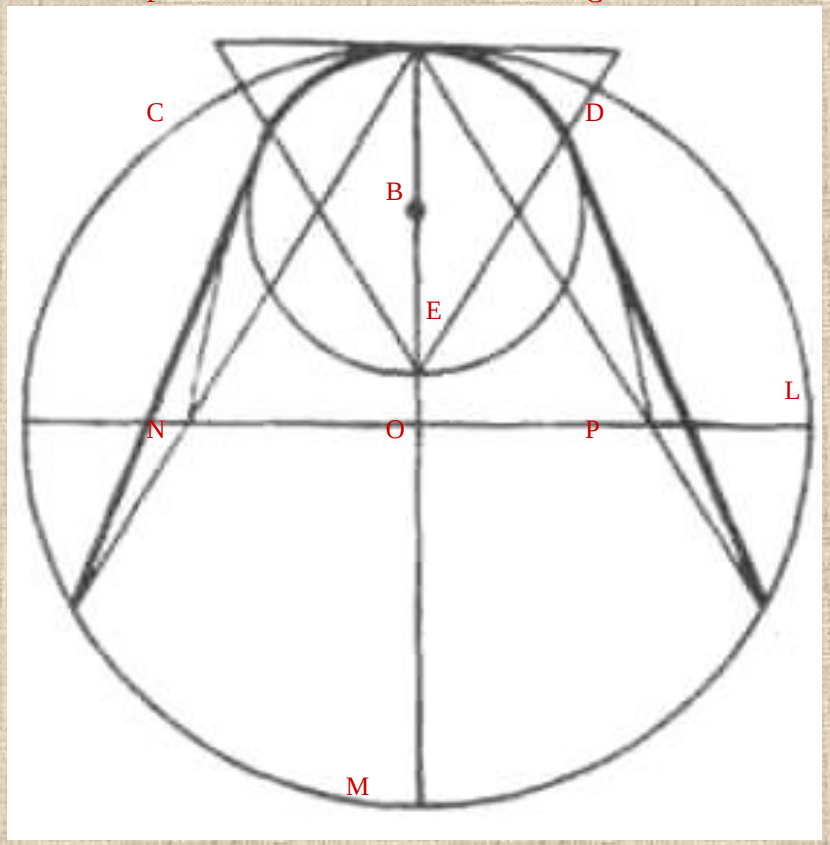
Nance method (1940)

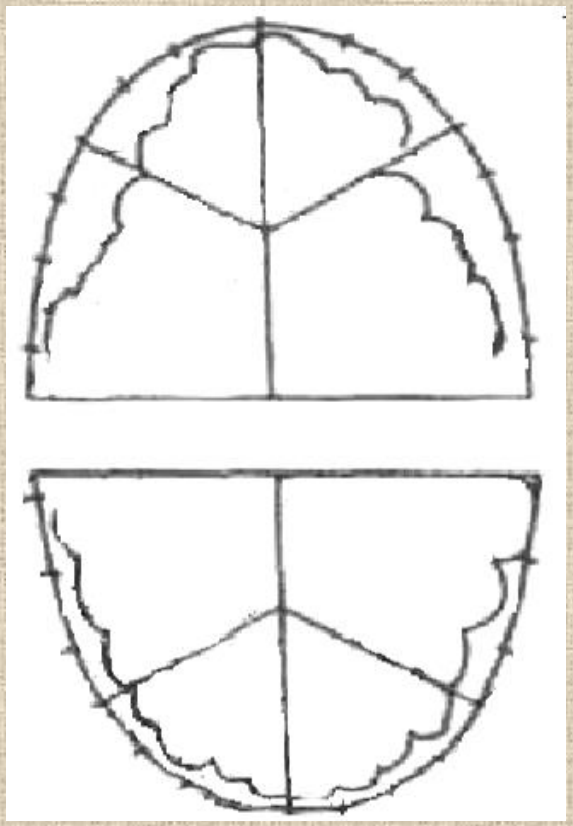
Determining the place needs in the dental arch



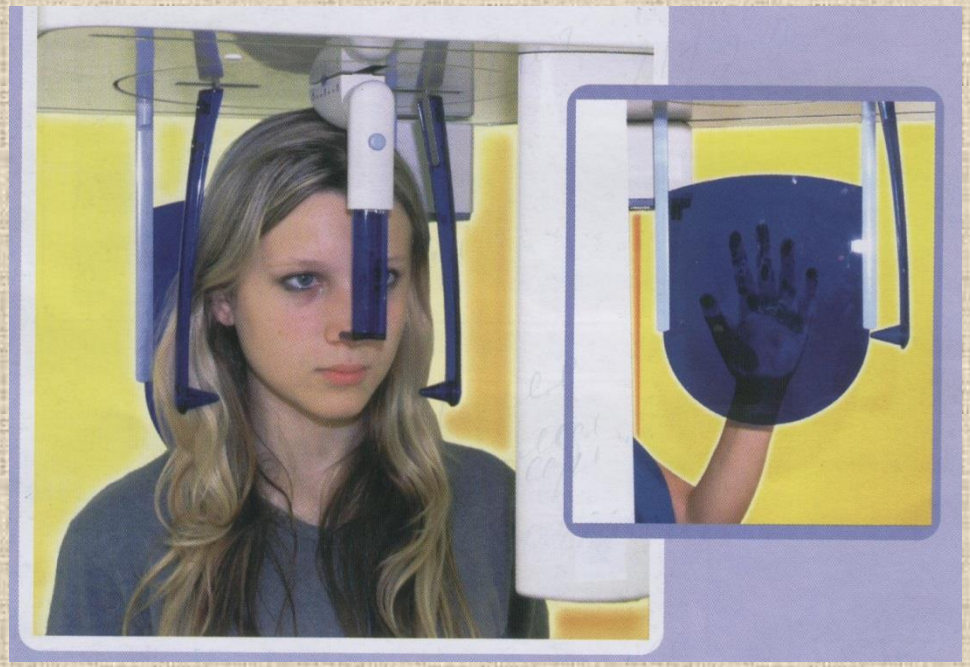


Hawley-Herber-Herbst method (1904-1907)

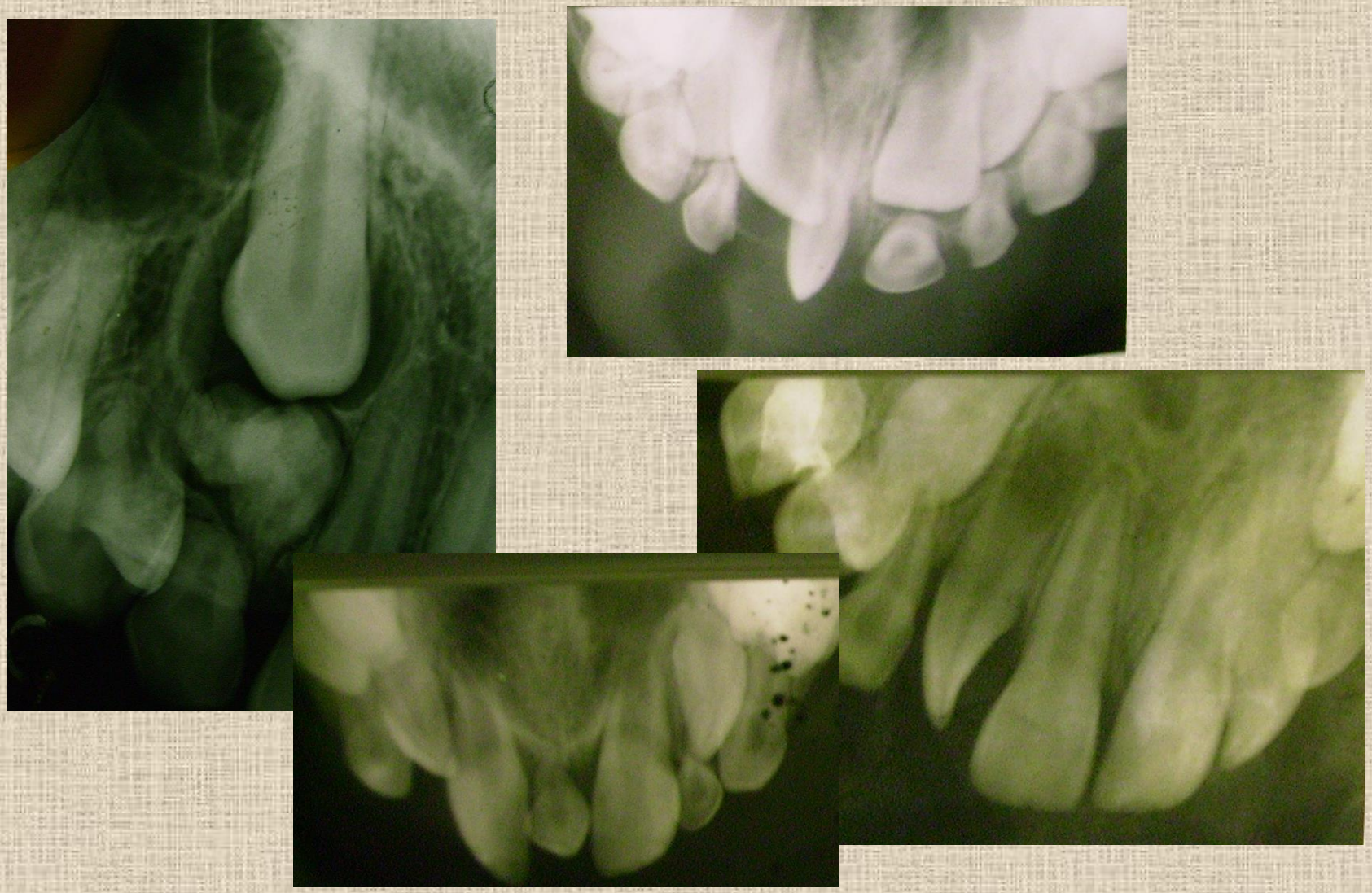




X – ray methods

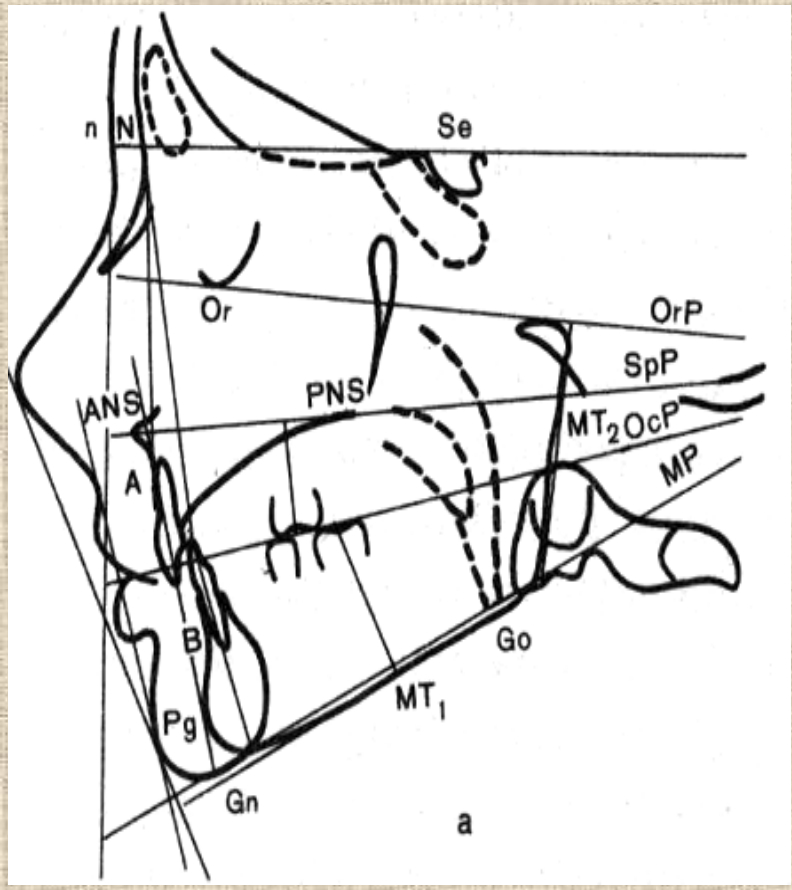


Intraoral X-ray

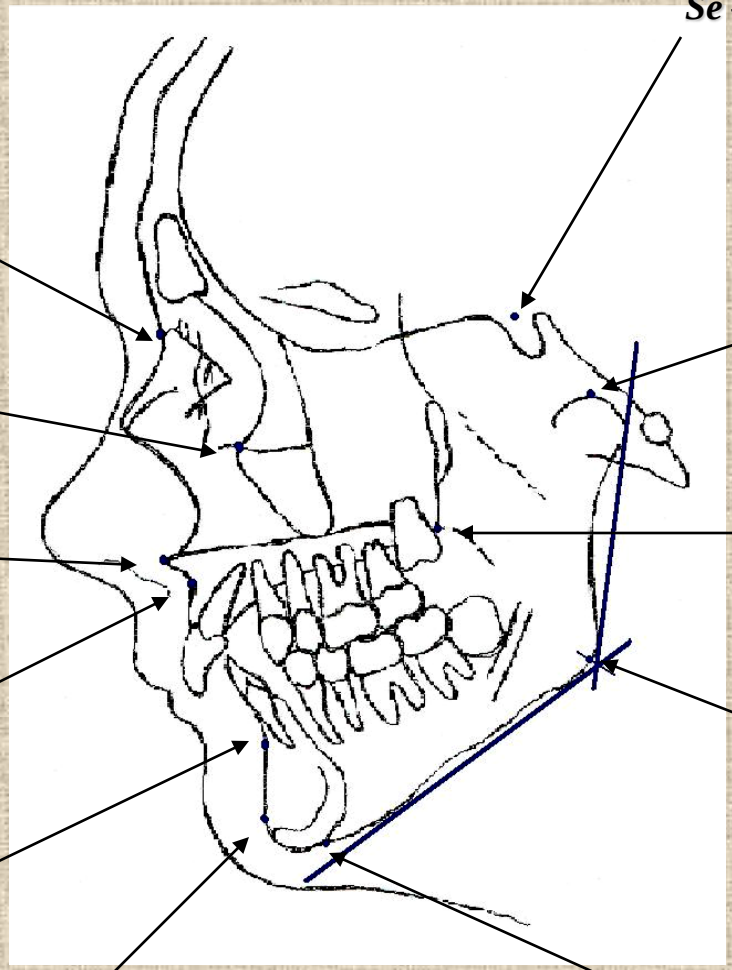


Orthopantomography

Cephalometry by Shwartz



Bone points



Se – sela turcika

N – nasion

Co - condilon

Or – orbitale

ANS – spina nasale anterior

PNS – spina nasale posterior

A – subspinal point by Downs

Go - gonion

B – supramentnal point by Downs

Gn – gnation

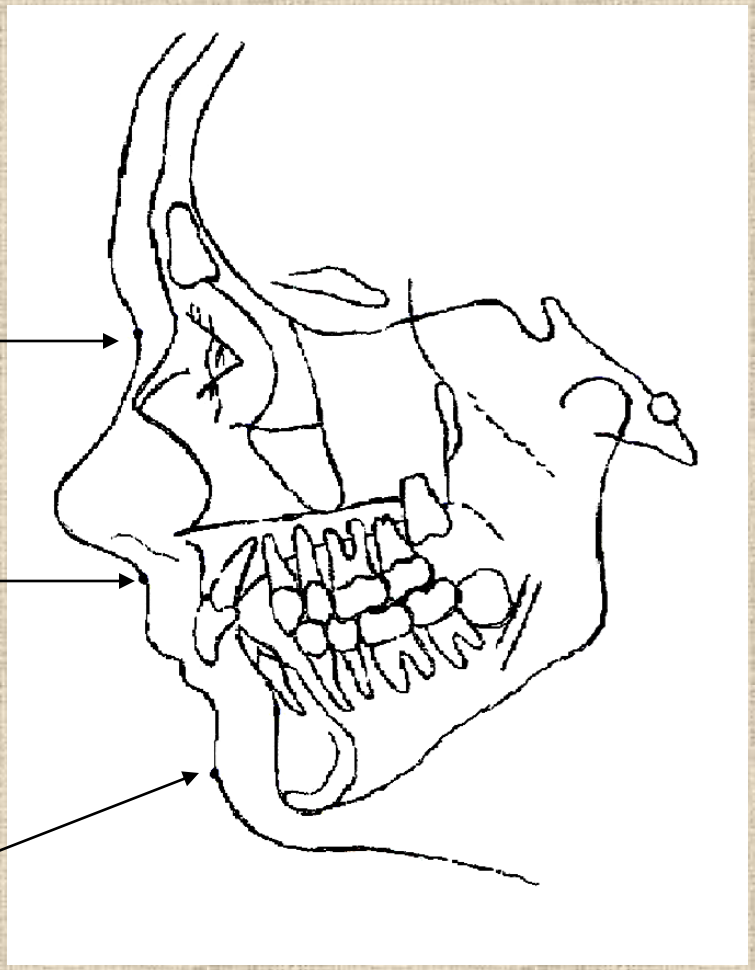
Pg – pogonion

Skin points

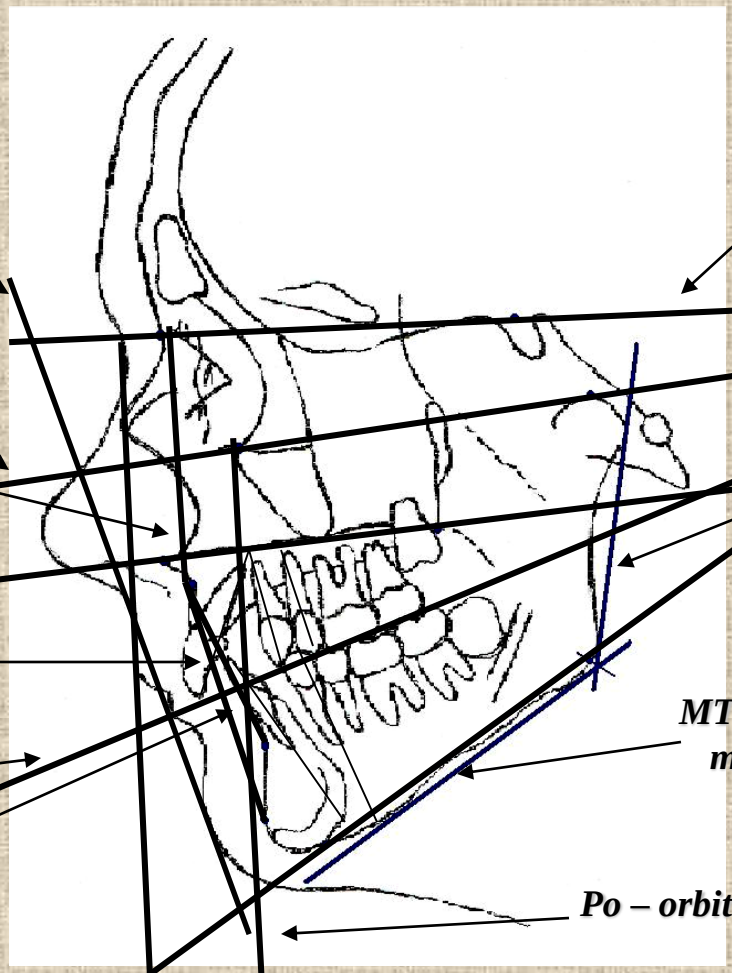
n – skin nasion

sn – subnasale

pg – skin pogonion



Lines and panes



NSe – cranial plane

T – tangent line

H – horizontal plane

NA

MT₂ – tangent to the mandibular rumus

SpP – spinal plane

APg

MT₁ – tangent to the mandibular body

OcP – occlusion plane

AB

Po – orbital plane by Dreifus

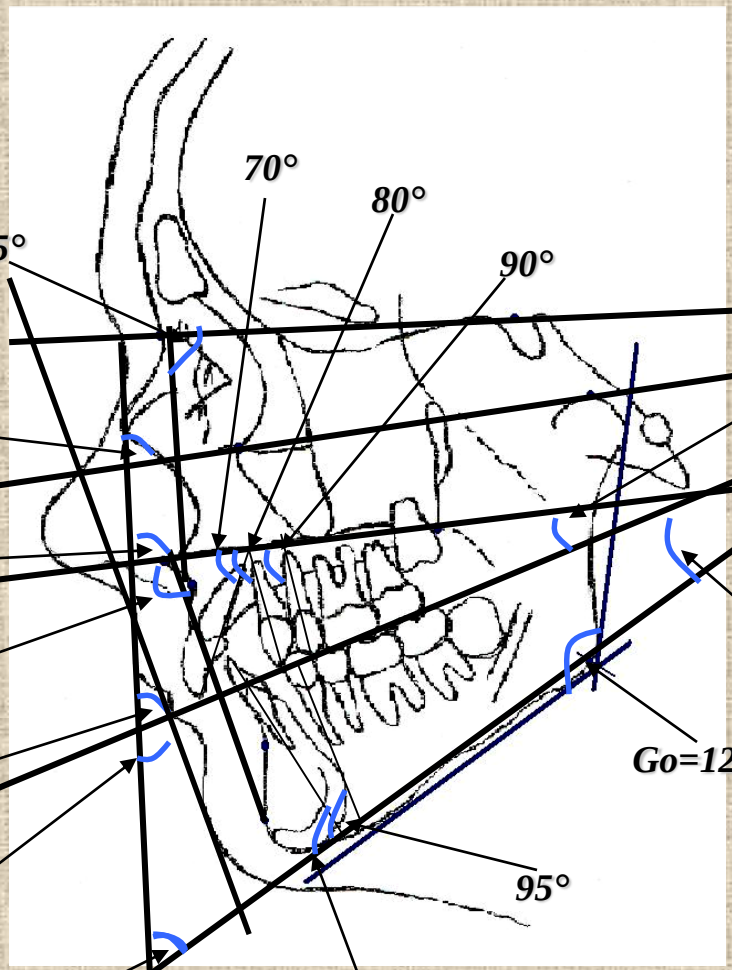
Pn – nasal plane by Dreifus

MP – mandibular plane

KPF – field by Dreifus

ТЕЛЕРЕНТГЕНОГРАФИЯ (ТРГ)
РАСШИФРОВКА ПО ШВАРЦУ

Углы



Line sizes

Proportional relation of jaw sizes:

The length of the anterior cranial fossa N-Se (1).
N-Se – 70±3 мм.

Отношение размеров челюстей:

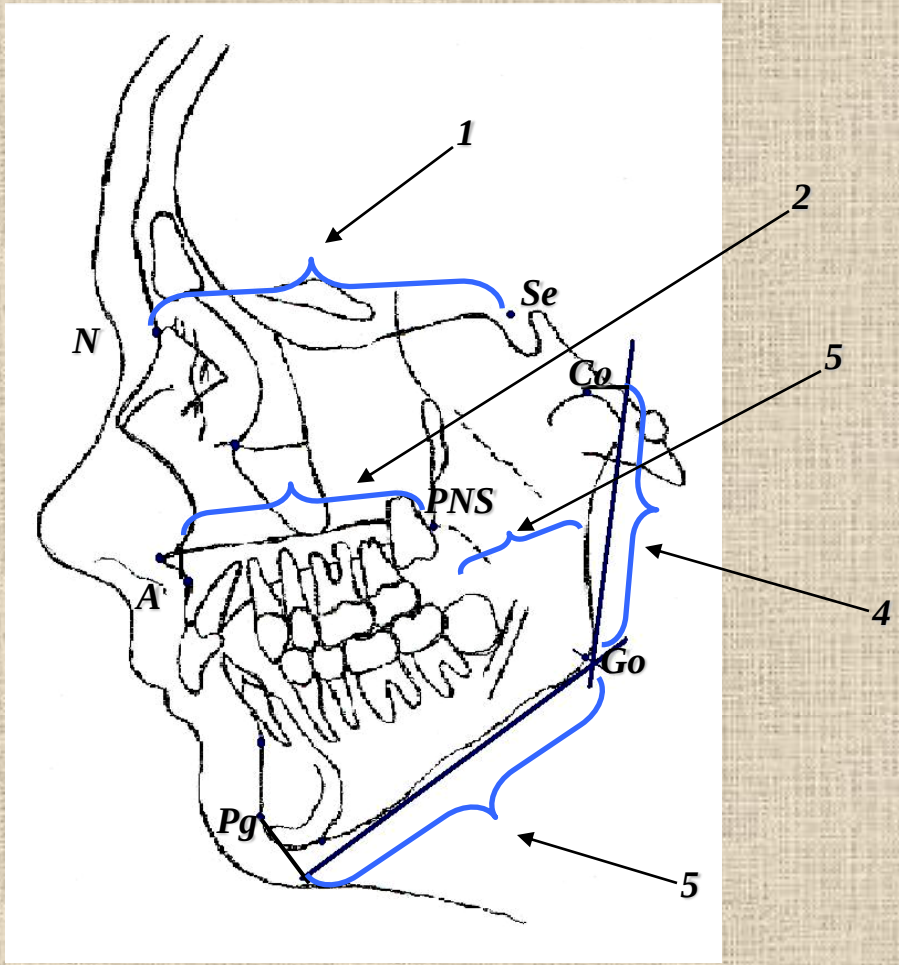
(2) Maxilla: N-Se = 7 : 10

(3) Mandible = N-Se + 3

Maxilla : Mandible = 2 : 3

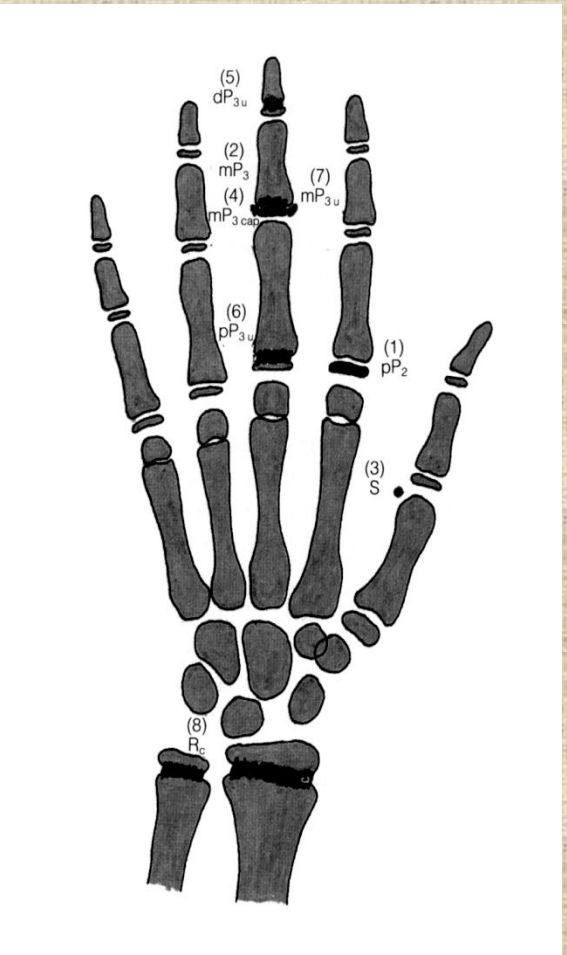
Body of Mandible: (4) ramus of Mandible = 7 : 5

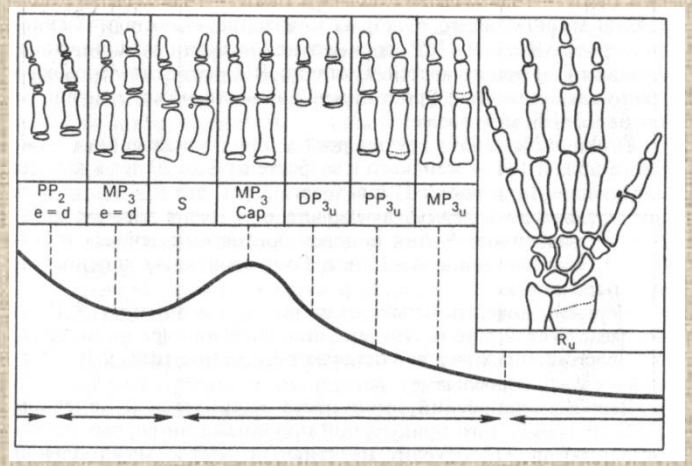
Body of Mandible : (5) wide of Mandiblar ramus = 5 : 2



Comparison

X – ray of the hand





Stage 1 – Undeveloped hand. Epiphysis of the middle phalanx is not to wide like diaphysis.

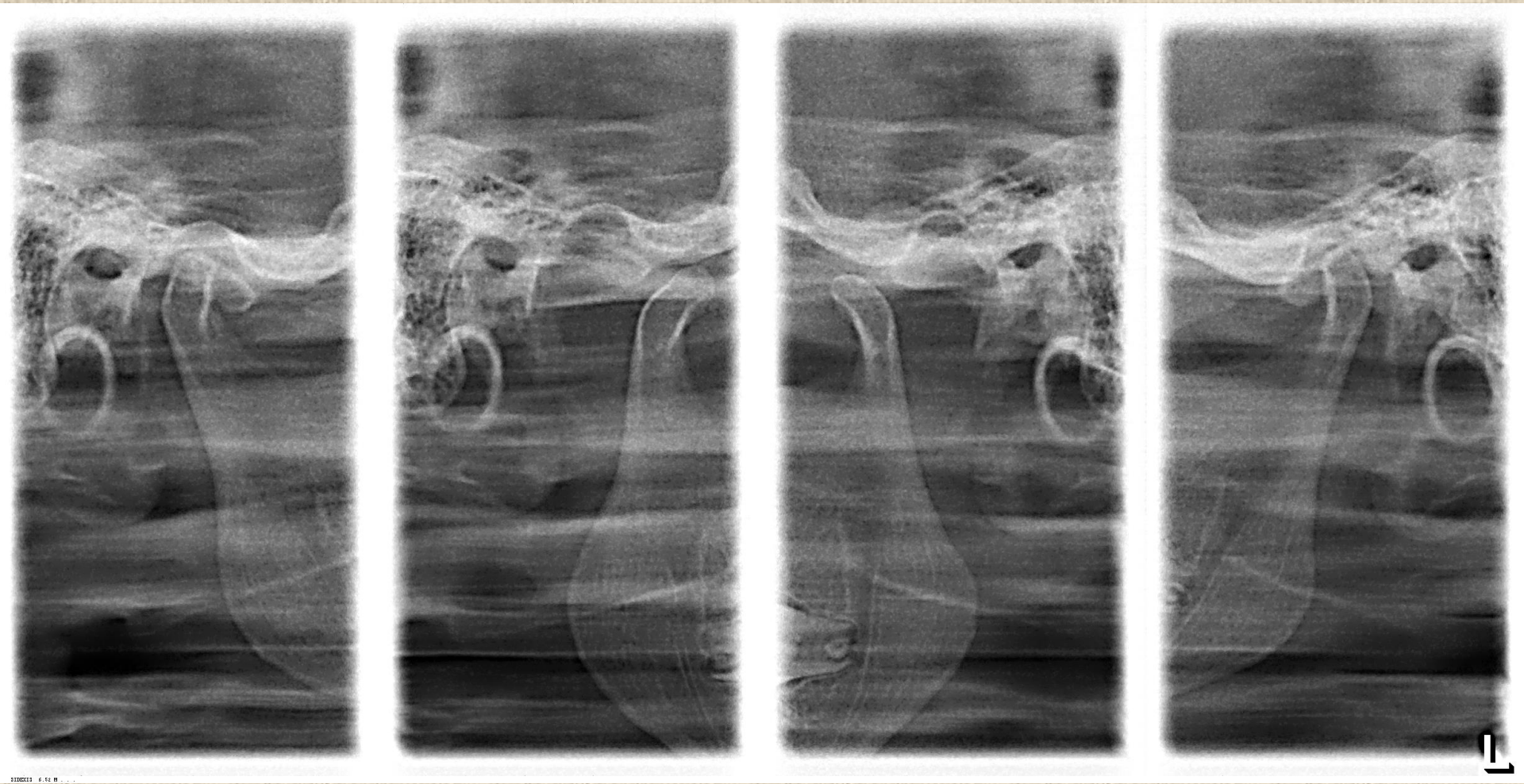
Stage 2 – Epiphysis of the middle phalanx like diaphysis.

Stage 3 – Epiphysis of the middle phalanx in the "cap" stage. Sesamoid bone is present. The peak of the puberty growth.

Stage 4 – Connecting of epiphysis and diaphysis of the middle phalanx. The growth zone of humeral and ulnar bones are open.
The peak of the puberty growth is finishd.

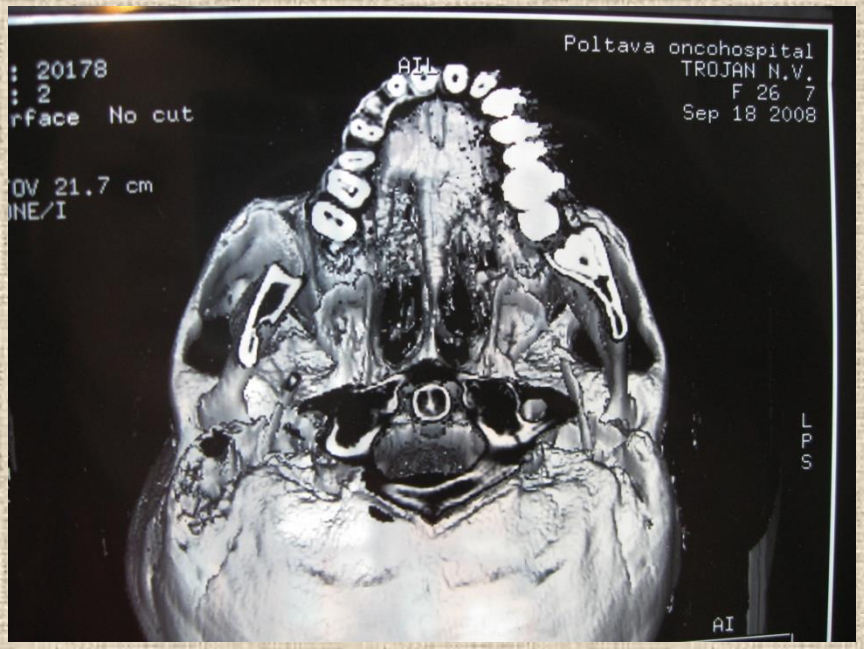
Stage 5 – All epiphysis and diaphysis are closed. The growth zone of humeral and ulnar bones are open. The puberty growth is finishd.

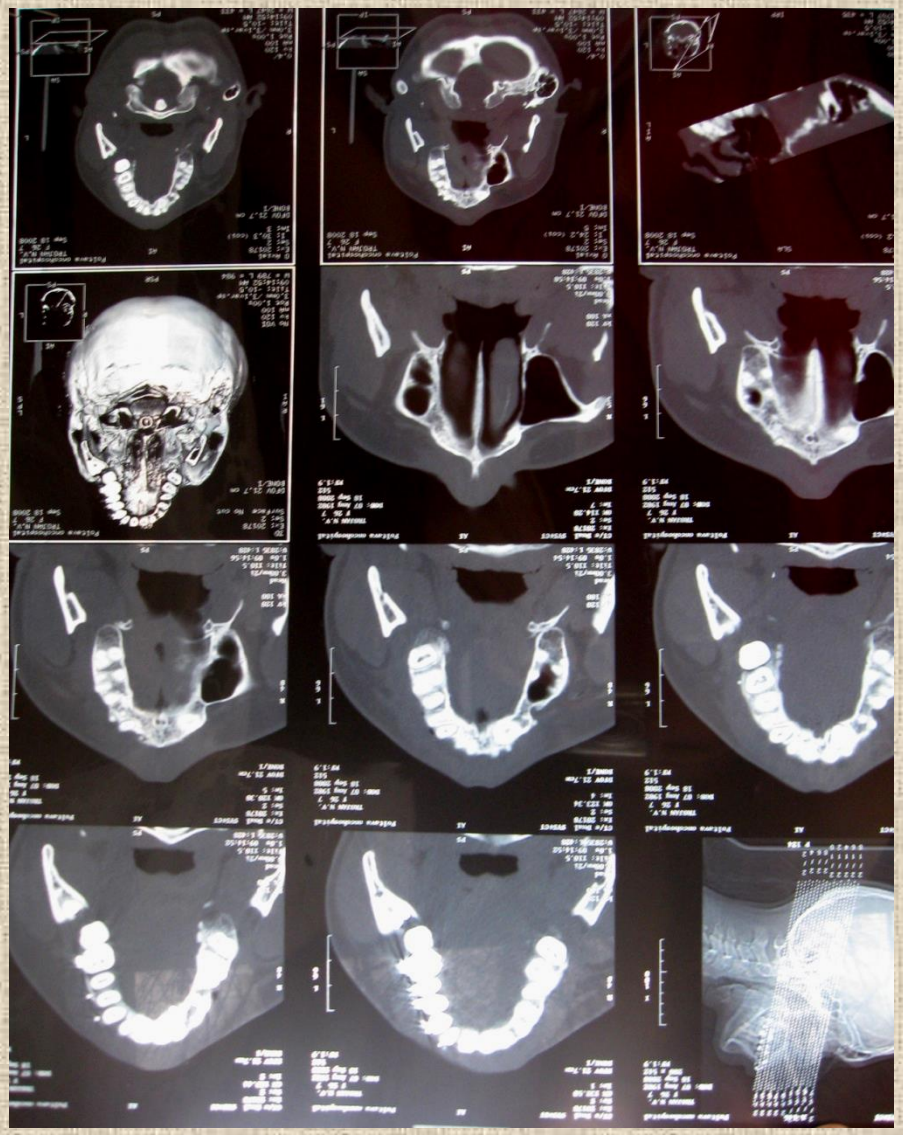
Digital X – ray of TMJ

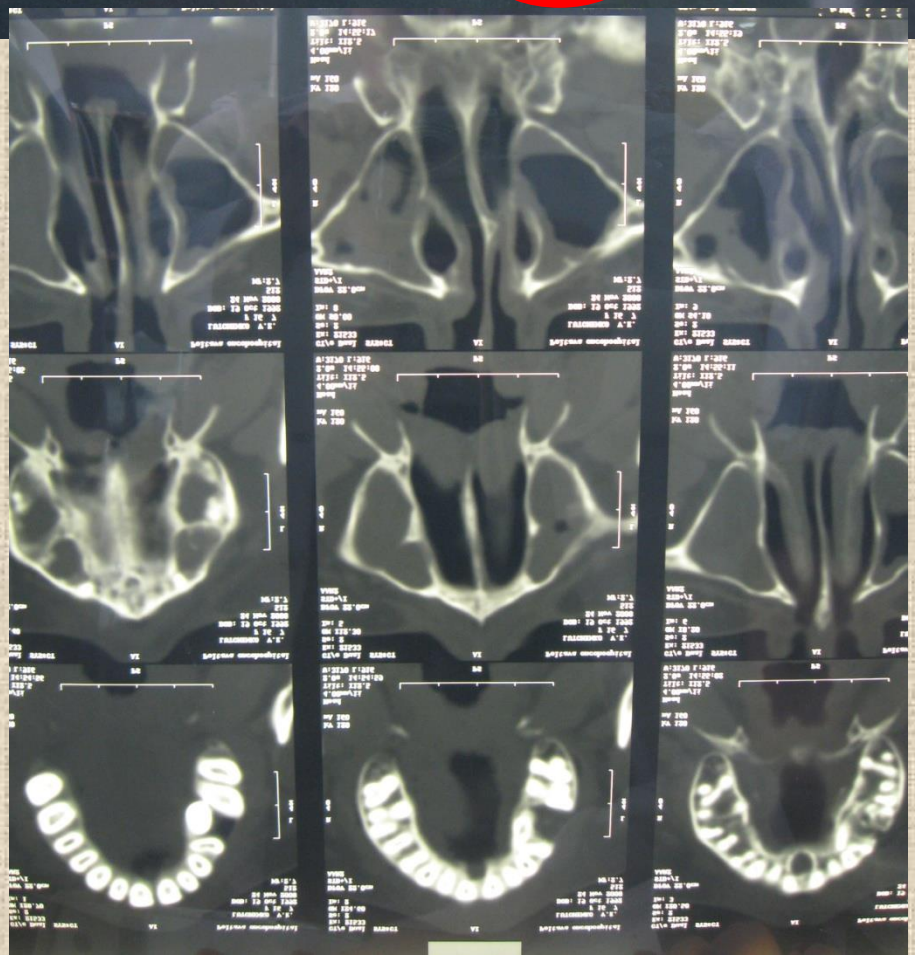


Cone rey computer tomography

Retention of 13,23,25;
Tortoocclusion of
31,32,33,41,42,43.



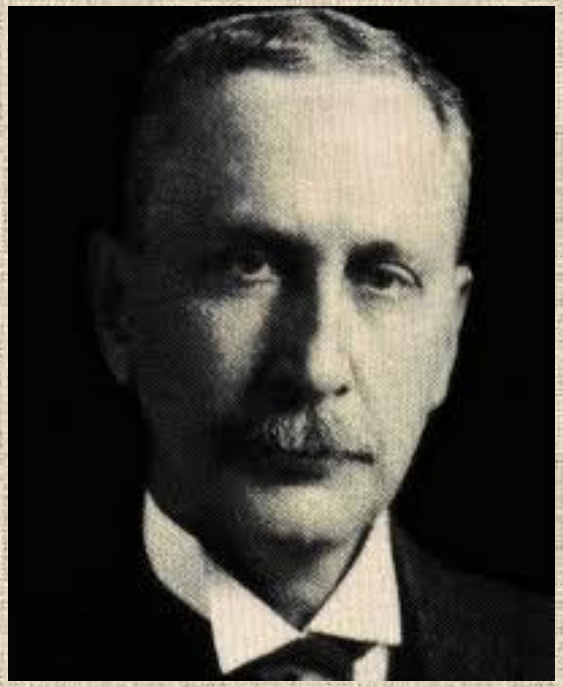




Finally diagnosis: odontoma at 25,26 area. After odontoma extraction 25 can be moved at correct position.

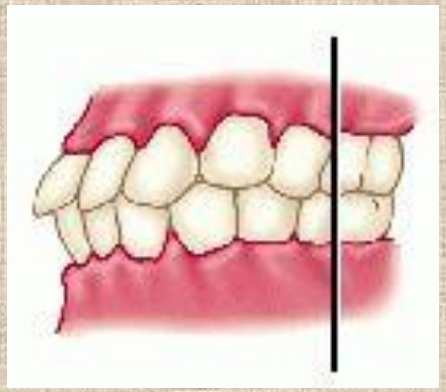
Classifications of the malocclusions

1889



Edward Angle
1855-1930

I class



1. Labial or buccal occlusion

2. Lingual or palatal occlusion

3. Mesial occlusion

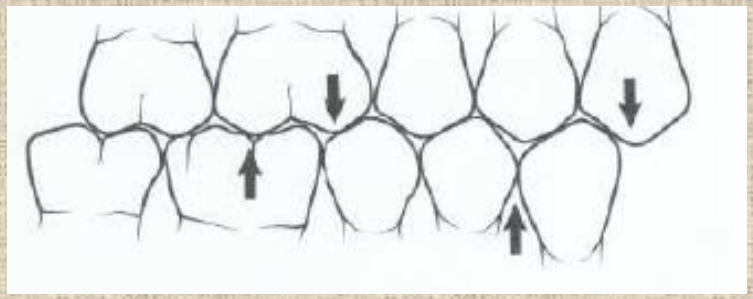
4. Distal occlusion

5. Tortoocclusion

6. Infraocclusion

7. Supraocclusion

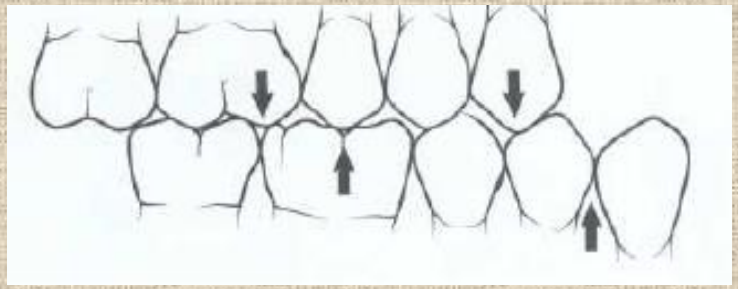
II class



1 division

2 division

III class



Classifications of the malocclusions

A. Betelman
1889-1980

1956

Teeth position abnormalities:

-orally;

-vestibulary;

-mesial;

-distal;

-supraocclusion;

-infraocclusion;

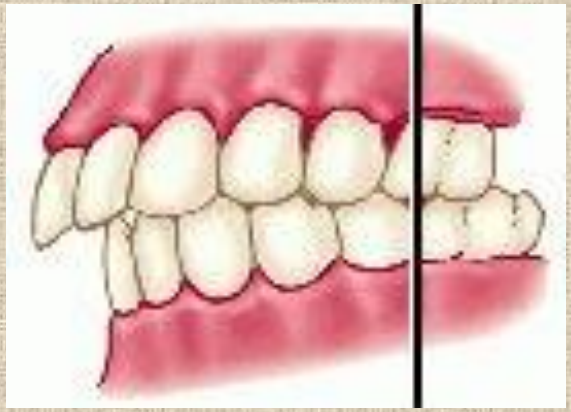
-tooth rotation;

-diastema;

- crowding.

Sagittal anomalous:

Distal bite. Distal bite is characterized by distal position of lower jaw, that is predominance of upper jaw relating to lower one, and also by functional deficiency of moving jaw muscles and orbicular muscle.



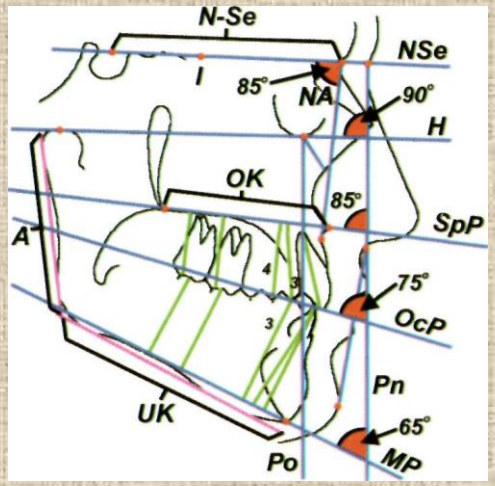
Forms of distal bite:

Lower microgenia

Upper macrognathia

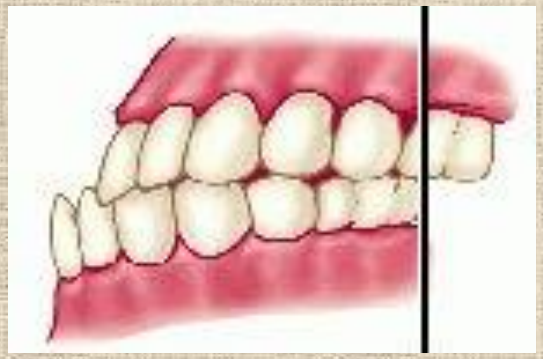
Lower microgenia and upper macrognathia

Narrowing of upper jaw (Compression form).

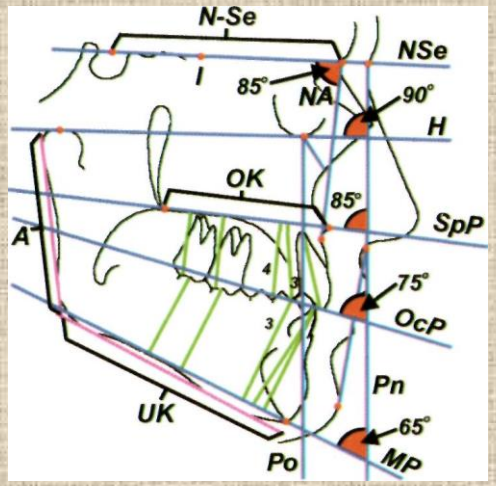


Sagittal anomalous:

Mesial bite. Mesial bite opposite picture is observed:
lower jaw is placed mesial, it is predominate on upper one,
moving jaw muscles overdeveloped, and retractor - is not enough developed.



Forms of mesial bite:
- Upper micrognathia
- Lower macrogenia
- Upper micrognathia and lower macrogenia



Vertical anomalous

Open bite elevator muscle
and orbicular muscle functional insufficiency

Vertical anomalous

Deep bite with frontal moving the jaw muscles insufficiency

Transversal anomalous:
cross bite.

The first variant - on one side teeth articulate like while orthognathia, and on other side lower teeth overbite upper ones.

Transversal anomalous:
cross bite.

Within second variant - on one side lower lateral teeth excessively overbite upper ones, and on other side - upper lateral teeth excessively overbite lower ones, that is closes down not with masticatory cusps, but with lateral surfaces.

Skew bite is characterized by one of moving muscles: right or left, functional insufficiency - depending on that to which side lower jaw is displaced

Classifications of the malocclusions

1957

D.Kalvelis
1903-1988

I. Separate teeth abnormalities:

1. Teeth number abnormalities:
- adentia (teeth number decreasing) partial and full.

- supplemental teeth.

2. Teeth shape and size abnormalities:
- giant teeth,
- acanthoid teeth,
- deformed teeth shape,
- Getchinson, Furnje teeth.

3. Abnormalities of hard teeth tissue:
- hypoplasia of teeth crowns.

4. Eruption of teeth process abnormalities:
- early teeth eruption,
- late teeth eruption.

II. Dentitions abnormalities:

1. Dentitions formation disorder:

1)abnormal position of separate teeth:

a) labiobuccale teeth eruption,
b) palatine-lingual teeth eruption,
c) mesial teeth eruption,
d) distal teeth eruption,
e) lower position (infraocclusion),
f) high position (superocclusion),
g) teeth rotation (tortoocclusion),
h) dental transposition,
i) upper canines malposition.

2) crowding

3) tremas (spacing), diastemas

2. Dentitions shape abnormalities

- narrowed dentition

- saddle-shaped compressed dentition

- V-shaped dentition

- quadrangular dentition

- asymmetric dentition

III. Bite's abnormalities :

Sagittal anomalous:

Prognatia

Progenia
(true, false)

Transversal anomalous:

1. Narrowed dentition

2. Upper and lower dentition width inconformity

a) lateral teeth from both sides correlation disorder (bilateral cross bite);

b) lateral teeth from one side correlation disorder (skewed or single cross bite).

Vertical anomalous

1. Deep bite

a) overlying bite;

b) combined with prognatia
(roof-shape bite);

2. Open bite

a) true open bite (rachitic bite);

b) traumatic open bite
(as a result of bad habits).

Classifications of the malocclusions

World Health Organization

1968

1. Jaws size abnormalities

1.Upper jaw macrognathia.

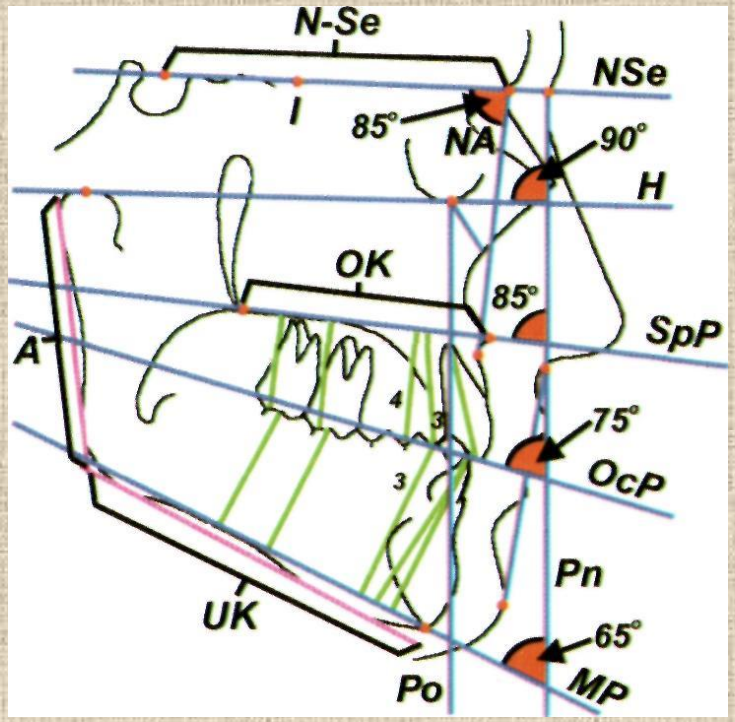
2.Lower jaw macrognathia.

3.Both jaws macrognathia.

4.Upper jaw micrognathia.

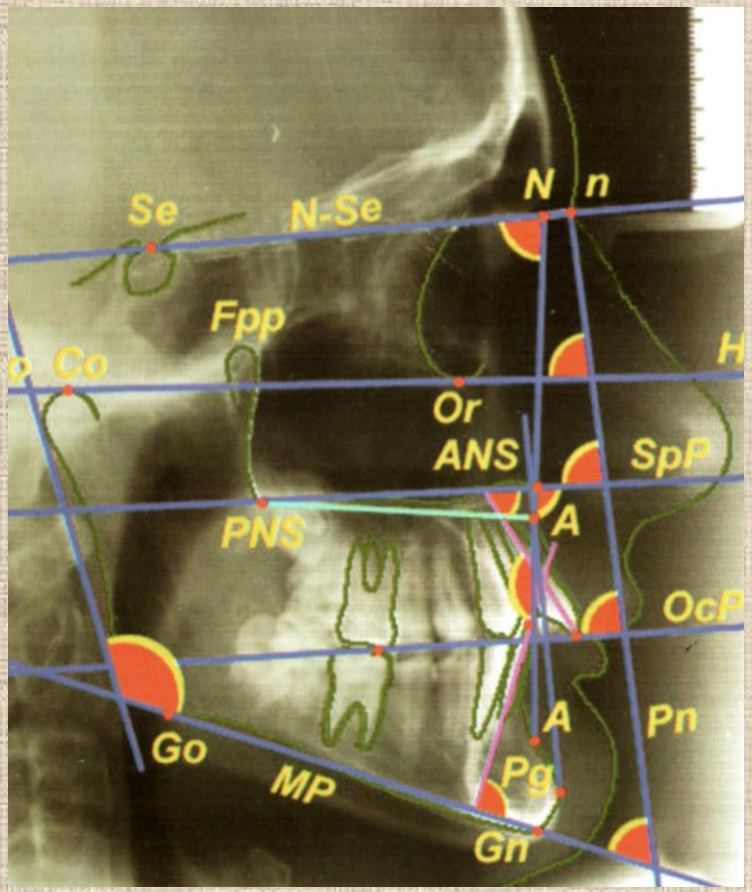
5.Lower jaw micrognathia.

6.Both jaws micrognathia.



2. Jaws positions regarding skull base abnormalities:

1. Asymmetry.
2. Mandibular prognathism.
3. Maxillary prognathism.
4. Mandibular retrognathism.
5. Maxillary retrognathism.



3. Dental arches correlation abnormalities

1.Distal occlusion. 

2.Medial occlusion. 

3.Excessive overbite. 

4.Excessive overbite. 

5.Open bite. 

6.Lateral teeth cross bite. 

7.Lateral teeth lingvooocclusion. 

4. Teeth position abnormalities

1.Crowding.

2.Transfer.

3.Rotation.

4.Spaces between teeth.

5.Transpositions.

Classifications of the malocclusions

Grigoryeva
1927-1997

1984

1. Physiological bites

- orthognatic

- orthogenic

2. Pathological bites

Teeth/Plane	Sagittal	Vertical	Lateral
Frontal	Prognathic Progenic Biprognathic Opisthognathic	Open Deep	Cross bite
Lateral	Neutral Distal Mesial	Open	Cross laterogenic Cross laterognathic

***Sagittal anomalous*:**

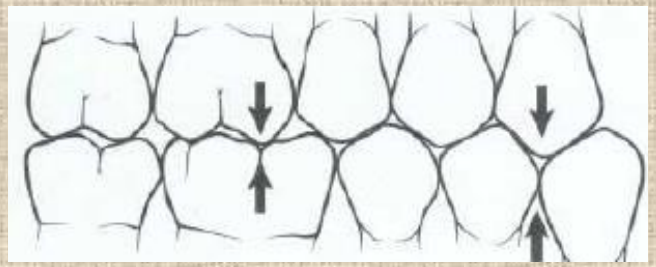
Prognathic

Progenic

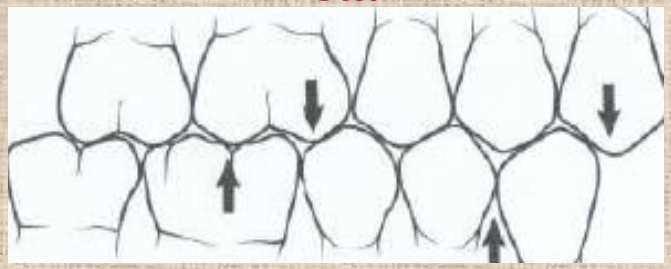
Biprognathic

Opisthognathic

Neutral



Distal



Mesial

Vertical anomalous

Deep

Open

Open

***Transversal anomalous*:**

Cross bite

Cross lateroanterior

Cross laterognathic

A final orthodontic diagnosis

- morphological part
- etiological part
- functional part
- aesthetic part

MORPHOLOGICAL PART

- Separate teeth abnormalities
- Dentitions abnormalities
- Jaws abnormalities (gnatic)
- Cerebral and facial parts of
-the scull abnormalities (cranial)
- Combined abnormalities
-Soft tissue of oral cavity
-abnormalities

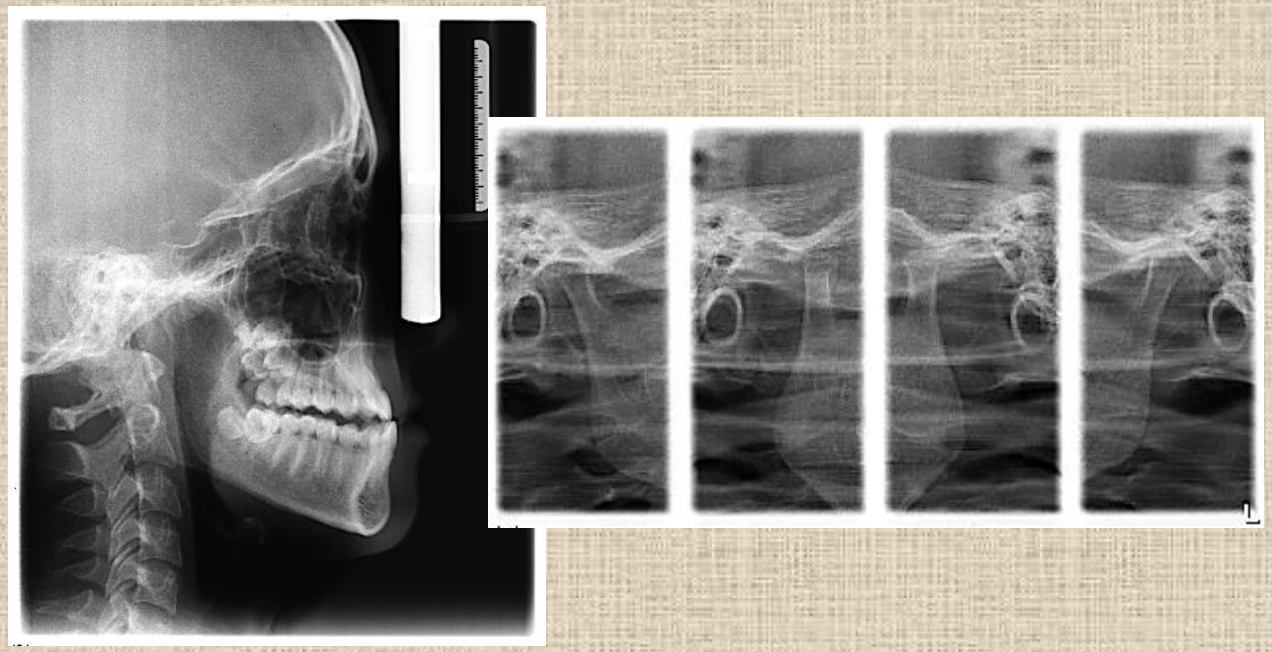
Intensity of morphological abnormalities of a bite:

RESEARCH METHODS:
Morphological
Graphic
Anthropo- and photometric
Roentgenologic

MORPHOLOGICAL PART

Case report

Class II subdivision 1 (by Angle), prognatic deep distal bite (by Grigorjeva); gnatic form – retrognaty of low jaw (by TRG); peak of pubertal growth (by X-rey). Evenly narrowed of upper jaw in area 14 and 24 teeth up to 2,5 mm; lengthening of frontal part of upper jaw up to 4 mm (biometric of KDM)



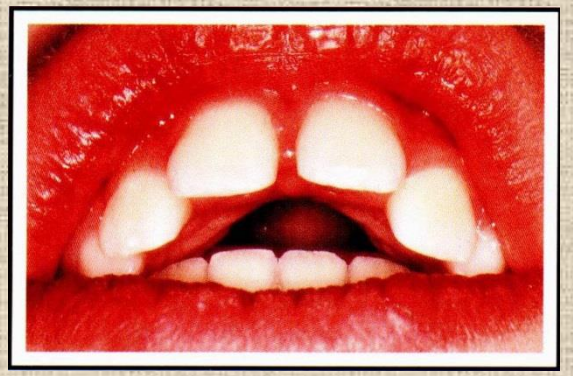
Class III (progenia) by Angle,
progenic mezial bite (by Grigorjeva);
gnatic form – promacrognaty of lower jaw (by TRG);
lengthening of frontal part of lower jaw up to 2 mm
(biometric of KDM)

ETIOLOGICAL PART

Endogenous factors: **- genetic;** **- endocrine;** **- embryonic;**

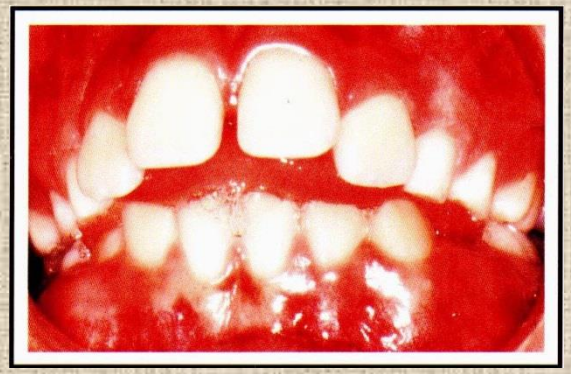
Exogenous factors: **- general;** **- local;**

Uneven abrasion temporary teeth

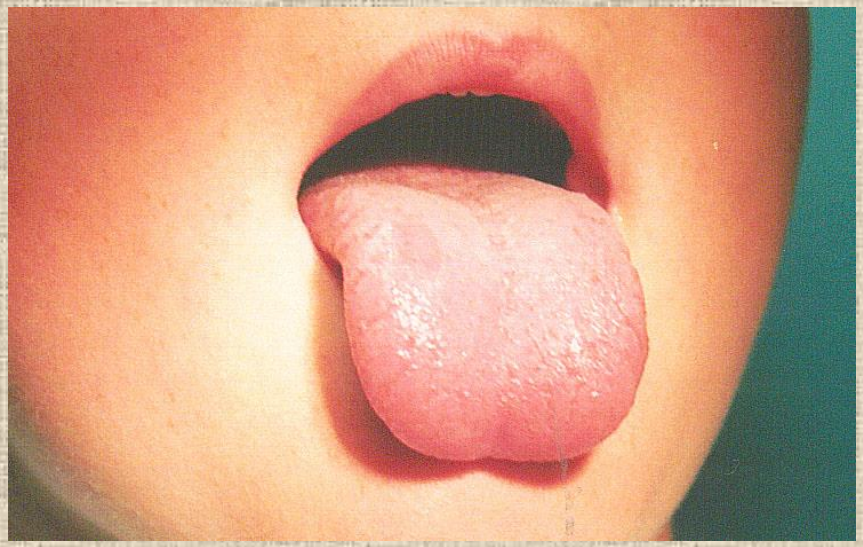


Defects of the teeth and dental arcs, adentia , supplementary teeth

Bad habits:
- sucking;
- anomaly of function;
- positional reflex.



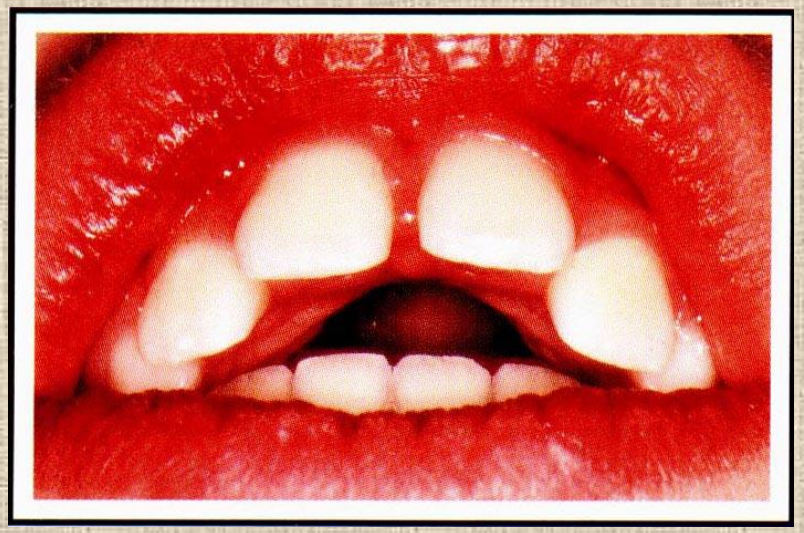
ETIOLOGICAL PART



Shot bridle of the tongue
Shot bridle of upper and lower lips
Shallow threshold of the oral cavity

ETIOLOGICAL PART

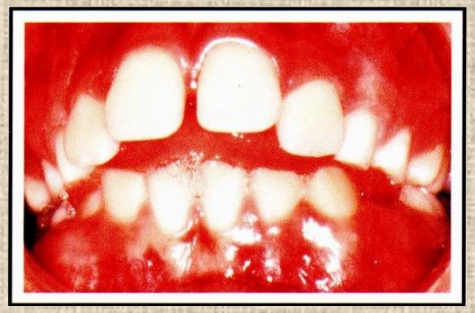
Case report



… OPEN BITE AS RESULT OF THE THUMB SUCKING BAD HABIT

ETIOLOGICAL PART

Functions of oral cavity:



Function of closing of lips
Function of mastication
Function of swallowing
Function of speech
Function of breathing

Violation of function of TMJ

ETIOLOGICAL PART

Clinical functional tests:
Research of:
Function of closing of lips
Function of mastication
Function of swallowing
Function of speech
Function of breathing

Clinical functional tests by L.V. Illina-Markosyan
Clinical functional tests by Eshler-Bitner

Clinical functional tests by L.V. Illina-Markosyan

At *the first test* (study in a state of rest) we examine the face of patient in front and profile, paying attention to position of lower jaw at rest, during a talk. We expose the facial signs of anomaly of a bite.

At *the second test* (study of usual occlusions it is offered to the patient to close teeth, without opening lips. In cases of usual displacement of lower jaw the facial signs of deformation become more expressed according to direction of displacement a jaw. Mesial or distal displacement of jaw is determined by a form of face, profile lateral – by the front form.

At *the third test* (study of lateral displacements of lower jaw) it is offered to the patient to widelly open the mouth and thus we determine displacement of lower jaw aside. At its lateral displacement asymmetry of face increases, diminishes or disappears depending on its cause. We determine the correlation of middle line of face and dental rows.

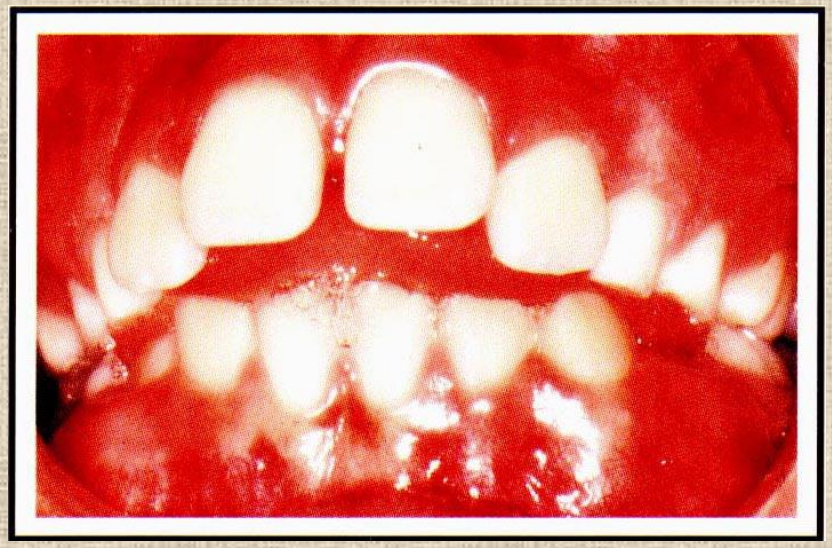
At *a fourth test* (comparative study of usual and central occlusion) we estimate harmony of face after establishment of lower jaw in correct position (without its usual displacement) and compare them from the aesthetic point of view with harmony of face at establishment of lower jaw in usual occlusion (with displacement of lower jaw).

Clinical functional tests by Eshler-Bitner

A diagnostic clinical by Eshler-Bitner is used for differential diagnostics of varieties of distal bite. For this a patient is asked to close teeth in usual occlusion and the form of the profile is memorised. Then we suggest to displace a lower jaw ahead to neutral relation of lateral teeth. If the form of face is here improved, a distal bite is conditioned either aplasia of lower jaw or its distal displacement; if worsened – that cause of deformation of sizes or position of overhead jaw in relation to foundation of skull; if at advancement of lower jaw a face expression first a improveds and then worsens, then a distal bite is caused by anomaly violation of growth and development of both jaws.

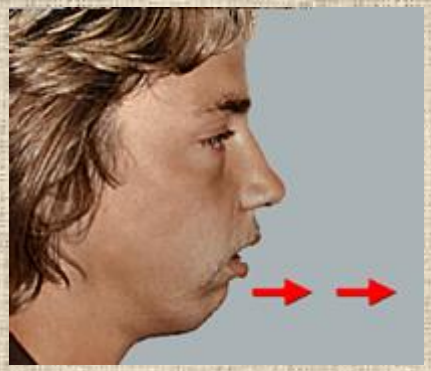
ETIOLOGICAL PART

Case report

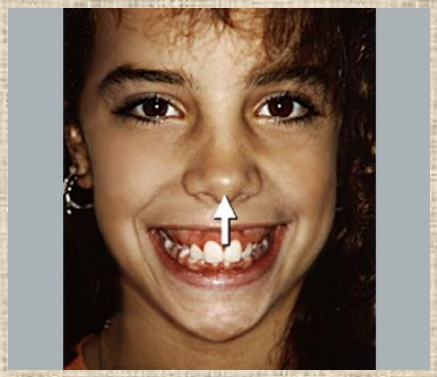


… OPEN BITE AS RESULT OF THE VIOLATION OF FUNCTION OF SWALLOWING – INFANTILE TIPE OF SWALLOWING

AESTHETIC PART



Deep lip-chin furrow



The gingival smile

Flattening of the upper lip

Beetle of the chin

A FINAL ORTHODONTIC DIAGNOSIS

Class II subdivision 1 (by Angle), prognatic deep distal bite (by Grigorjeva); gnatic form – retrognaty of low jaw (by TRG); peak of pubertal growth (by X-rey). Evenly narrowed of upper jaw in the area 14 and 24 teeth up to 2,5 mm; lengthening of frontal part of upper jaw up to 4 mm (biometric of CDM); the bad habit of lower lip biting; shallow threshold of the oral cavity; deformation of the nasal partition.








Thanks!