

THE MINISTRY OF HEALTH OF UKRAINE
THE HIGHER STATE EDUCATIONAL INSTITUTION OF UKRAINE
"UKRAINIAN MEDICAL STOMATOLOGICAL ACADEMY"

Approved
at the meeting of orthodontics department
«____»_____20____y.
protocol №____ by _____
Head of department_____ L.V. Smaglyuk

METHODICAL RECOMMENDATION
for independent work of students during the preparation
to practical lessons and on the lessons

Academic discipline	Orthodontics
Module № 1	Orthodontia. Diagnostic of dentognathic anomalies and deformations.
The theme of the lesson № 7	Anthropometric measurements of the head in three mutually perpendicular planes. Photometry in ortodontics. The study of KDM by Tonn, Pont, Korkhaus. Snagina' method. Geometrically-graphic method of studying the shape of the dental arches by Hawley-Herber-Herbst.
Course	III
Faculty	Preparation of foreign students

Poltava 2016

1. The relevance of the topic. Full diagnostics plays a crucial role in the success of etiopathogenetic treatment of malocclusion. After the clinical examination, formulate a preliminary diagnosis. The final diagnosis is established only after conducting additional research. Anthropometric, photometric, and morphometric methods of research are required for more research in orthodontics.

2. Specific objectives:

To interpret the results of anthropometric measurements of the head.

To analyze the results of the photometric studies.

To analyze the results of measurements by the method of KDM by Tonn.

To analyze the results of measuring KDM techniques by Pont, Korkhaus.

To explain the study of KDM according Snagina' method.

To draw a diagram of the normal form and dimensions of the dental arch by the method of Hawley-Herber-Herbst.

3. Basic knowledge's, abilities, skills necessary for studying the topic (interdisciplinary integration)

Name of previous disciplines	Skills
1. Anatomy	to describe the features of structure of bones of the facial skeleton; to depict schematically the structure of the temporomandibular joint in different age periods; to determine the anatomical characteristics of different groups of temporary and permanent teeth; group identity the temporary and permanent teeth.
2. Prevention of dental diseases	to describe timing, order, sequence of eruption of permanent teeth; the number of teeth in periods of temporary, removable and permanent occlusion.
3. Propaedeutics of therapeutic dentistry	to describe the difference between the structure of temporal and permanent teeth.

4. Tasks for independent work during preparation to the lesson and on the lesson

4.1. A list of the main terms, parameters, characteristics that need to learn by the student during the preparation to the lesson:

Terms	Definition
1. Anthropometric methods	Allow to study the size and shape of the face and its parts, the relationship of the size and shape of the face and dental

	arcs.
2. Photometry	It is a necessary and required method, which is a patient card orthodontic patient. Allows in statics and dynamics to observe the growth and formation of the entity, its change during orthodontic treatment.
3. Mesiodistally (M-D) size of the teeth	Measurements mesiodistal size of the teeth is carried out in the widest part of the tooth (upper incisors – in the equatorial zone, lower in the zone of the cutting edge).
4. Absolute macrodontia upper incisors	Diagnosed if the amount mesiodistally sizes of the four upper incisors is >35 mm.
5. Absolute macrodontia lower incisors	Is diagnosed if the amount mesiodistally sizes of the four upper incisors is >27 mm.
6. Absolute microdontia incisors of the upper jaw	Is diagnosed if the amount mesiodistally sizes of the four upper incisors is <28 mm.
7. Absolute microdontia incisors of the lower jaw	Is diagnosed if the amount mesiodistally sizes of the four upper incisors is <20 mm.
8. Indexes of proportionality incisors of the upper and lower jaws.	Index of incisors proportionality = SI / Si , where SI is the sum of M-D sizes 4 upper incisors; Si – sum of M -D size 4 lower incisors. At permanent orthognathic bite Tonn index – 1,33-1,35. In direct (orthogenic) permanent dentition – 1.23 (Gerlah). The temporary orthognathic bite – 1,3 (Z.Dolgoplova). At the deep permanent dentition – 1.42 (Y.M. Malygin)
9. Measuring points by Pont.	On the first upper premolar located in the middle intercuspal fissures, in the mandible - the contact point between the premolars. On the first upper molars – the frontal longitudinal deepening fissures, in the first lower molars – the apex of the distal buccal cusp.
10. Pont and H. Linder, G. Hart indexes	$\text{Premolar index} = \frac{\text{the sum of M-D 4 upper incisors}}{\text{the distance between premolars}} \times 100\% = 80$
	$\text{Molar index} = \frac{\text{the sum of M-D 4 upper incisors}}{\text{the distance between molars}} \times 100\% = 64$
11. The width of the dentition	Transversally determine the dimensions of the upper and lower dentition between the premolars and the first

	permanent molars (measurement points by Pont)
12. Length of the anterior portion of the dentition by Korkhaus	Measurements between the contact point on the labial surface of the cutting edges of the central incisors to the point of intersection with a line drawn through the points Pont on the first premolars
13. Width of apical bases of the jaws by Snagina	Normal width of upper jaw apical basis is equal to 44%, and lower jaw – 43% from amount of M-D sizes of 12 permanent teeth of each jaw. The narrowing of the dentition and is usually accompanied by constriction of the apical basis. According to Snagina, it can be two degrees: I degree - the width of the apical basis of equal 42-39% on the upper jaw and 38-41% for lower jaw. II degree – the width of the apical basis is 32-39% on upper jaw and 34-38% for lower jaw
14. Length of apical bases of the jaws by Snagina	Normal length of apical basis of upper jaw is 39%, lower - 40% from M-D sizes of 12 permanent teeth of each jaw. Snagina distinguishes two degrees of narrowing: I degree – the length of the apical basis is 35-37% on upper jaw and 36-38% for lower jaw. II degree – the length of apical basis is 26-35% for upper jaw and 31-36% on lower jaw
15. Diagram of Hawley-Herber-Herbst	A graphical image of the normal form and dimensions of the dental arch of the upper jaw

4.2. Theoretical questions to the lesson:

1. How to determine mesiodistal size of teeth?
2. Method of determining the proportionality of the incisors of the upper and lower jaws by Tonn.
3. What is the index Tonn, Malygin, Gerlah.
4. What is the absolute and individual macro - and microdontia.
5. How to determine premolar and molar indices.
6. Definition of transversal size of the dentition by Pont and Linder - Hart.
7. What is the method of determining the length of the front section of dental arch by Korkhaus.
8. What is the definition of the width and length of apical bases of the jaws by Snagina.
9. Photometry – what kind of method is it, and for what purpose is it used?
10. What parameters are detected in a photograph to characterize the dimensions of the head and face of a patient?
11. How to measure the face height in the photograph of a patient?
How to detect the morphological facial index of Izard and what information does it give?
12. Characterize the form of face profile with the help of the esthetic plane by Ricketts. What profile can be concave, and what – convex?

13. What is full morphological height of face?
14. How to evaluate the morphological height of face?
15. The face depth is estimated by four dimensions. What are they?
16. What indices are used to characterize the form of head?
17. What is the value of the cross-longitudinal index at dolichocephalic head shape?

4.3. Practical works (task) which are executed at the lesson:

- the definition of mesiodistal sizes of teeth;
- the definition of proportionality incisors of the upper and lower jaws according to the Tonn method;
- identification of narrowing or expansion of the dentition according to the Pont and H. Linder, G. Hart method.
- the definition of sagittal size of the dentition according to the G. Korkhaus method.
- to determine the width and length of apical bases of the jaws by Snagina.
- to compare the diagnostic model of the upper jaw with the obtained normal form of the upper dentition by Hawley-Herber-Herbst.

The content of the topic:

During the first visit of the patient jaw impresses are obtained with the help of impress mass. This is done to see clearly the alveolar processes, apical bases, palatine vault, sublingual region, frenula of tongue and lips. Models are cast in gypsum or supergypsum. Models bases can be shaped with the help of special devices, rubber moulds, or cut in such a way that the socle angles correspond to the line of canine teeth, the bases are parallel to the mastication surfaces of teeth. The patient's name, surname and age, the date of obtaining impresses are marked on the models. Such models are called control or diagnostic.

To study the dimensions of teeth, dental arches, apical bases of jaws it is expedient to use a meter or a special slide gauge, and also different devices like orthocross, symmetroscope, orthometer.

Models study is conducted in three mutually perpendicular axes: sagittal, occlusive, frontal, and corresponding to them directions: sagittal, transversal, and vertical.

Teeth Measuring

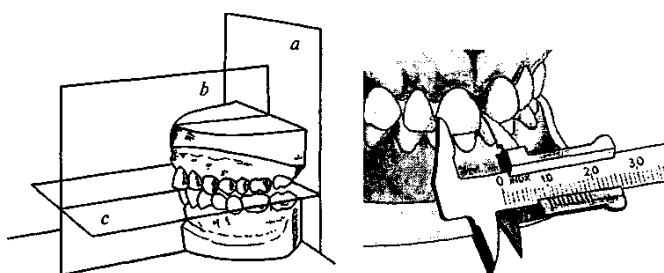
The width, height, and thickness of the coronal part of tooth are measured. The width is detected in the widest part of the tooth – in all teeth at the level of equator, and in lower incisors – at the level of scalprum. For the frontal group of teeth it is the mediolateral dimension of tooth, for lateral – mesiodistal; though in contemporary literature, both domestic and foreign, the width of the coronal part of all teeth is spoken of as the mesiodistal dimension.

The height of the coronal part of permanent teeth is measured from the

cutting edge of tooth to its border with the gingival margin: of the frontal teeth – along the middle of the vestibular surface, of the lateral ones - along the middle of the buccal tubercle.

The thickness of the coronal part of tooth is its mesiodistal dimension for the incisors and canine teeth and mesiolateral dimension for the premolars and molars.

The data of average value of the coronal part of milk teeth is shown in the table by Wetzel, and permanent - in the table by V.D. Ustymenko.



Tooth width measuring with the help of the caliper

Planes for the study of jaw models: *a* – transversal; *b* – sagittal; *c* – occlusal

Dimensions correlation of the upper and lower permanent incisors is defined by P. Tonn's index, which normally equals 1.33:

$$\frac{4 \text{ upper incisors width total}}{4 \text{ lower incisors width total}} = 1.33$$

Z.I. Dolhopolova studied the correlation of the totals of the milk upper and lower incisors width by Tonn's method and confirmed their interconnection at physiological occlusion. Z.I. Dolhopolova's index makes 1.30.

Dental Arches Measurements

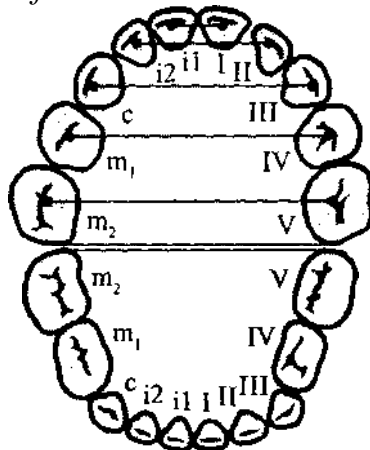
Dental arches measurements are performed in the transversal (cross) and sagittal (longitudinal) directions. In the transversal direction the width of dental arches is studied, in the sagittal – their length.

Transversal Dimensions of Dental Arches

Z.I. Dolhopolova offered to measure the width of dental arches on the upper

and lower jaws between the central and lateral incisors, canine teeth, the Ist and 2nd milk molars in children in the period of milk teeth occlusion. The measuring points in the central and lateral incisors and canine teeth are located on the apices of teeth tubercles, in the Ist and 2nd milk molars – on the masticatory surfaces in the frontal recess in the intersection point of the longitudinal and transversal sulci.

Detecting transversal dimensions of dental arches in children in the period of milk occlusion

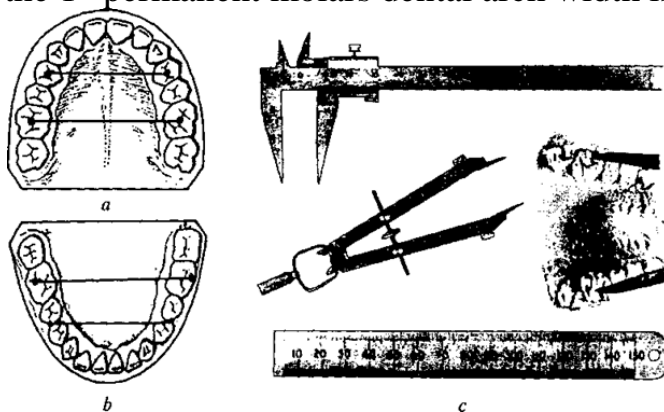


In the period of permanent teeth occlusion *Pont's technique* is used for detecting the transversal dimensions of dental arches. The technique is based on the dependence between the mesiodistal dimensions total of the 4th upper incisors and the distance between the 1st premolars and the 1st molars on the upper and lower jaws. With this purpose Pont offered measuring points, which coincide at the closure of the upper and lower teeth. So, their dental arches width is identical.

In the region of the 1st premolars dental arch width is measured, according to Pont:

- on the upper jaw - between points in the middle of the intertubercular fissure;
- on the lower jaw – between distal contact points on the clivus of the buccal tubercles.

In the region of the 1st permanent molars dental arch width is measured:



*Pont's measurement points and dental arches width measurement:
a – upper jaw; b – lower jaw; c – measuring instruments.*

- on the upper jaw – between points in the frontal recesses of the longitudinal fissure;

- on the lower jaw – between the posterior buccal tubercles.

In the period of transitional dental arch the distal foveolae of the upper 1st milk molars or their posterior buccal tubercles on the lower jaw are taken instead of the measuring points (by Korkhaus).

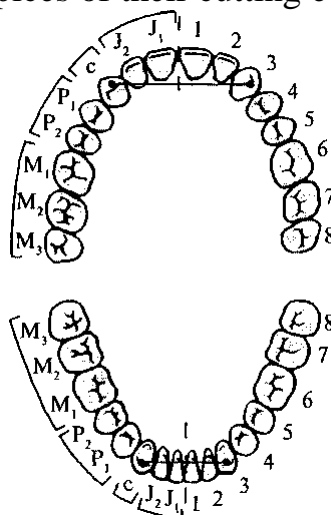
Pont derived the premolar and molar indices, by which the indices of dental arches width in the region of premolars and molars within the mark can be detected depending on the total of the mesiodistal dimensions of the 4th upper incisors:

$$\text{Premolar index} = \frac{4^{\text{th}} \text{ upper incisors transversal dimensions total}}{\text{Distance between premolars}} \times 100 = 80$$

$$\text{Premolar index} = \frac{4^{\text{th}} \text{ upper incisors transversal dimensions total}}{\text{Distance between molars}} \times 100 = 64$$

H. Linder and G. Harth checked Pont's method and made corrections in the index figures. According to the scholars, the premolar index equals 85, and the molar one – 65. These indices can be used in the period of transitional dentition and in the period of permanent occlusion. In practical work it is recommended to use their table.

Except for studying dental arches width in the region of premolars and molars it is expedient to study dental arches width in the region of canine teeth, which is measured between the apices of their cutting edge.



Dental arches width detection in the region of canine teeth

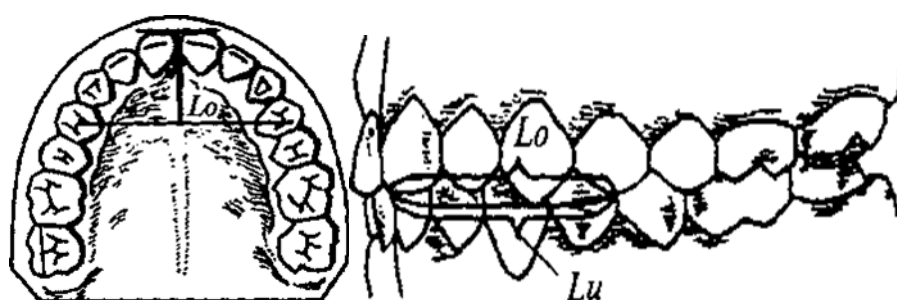
Sagittal Dimensions of Dental Arches

Sagittal dimensions of dental arches in children at the age from 3 till 6–7 years (in the period of milk teeth occlusion) are measured by Z.I. Dolhopolova's method. At that, the length of the anterior part and the total sagittal dental arch length are detected.

The length of the anterior dental arch part is measured from the middle of the distance between the mesial angles of the central incisors from their vestibular surface on sagittal plane to the point of intersection with the line joining the distal

surfaces of the milk canine teeth crowns; the total sagittal length – to the point of intersection with the line joining the distal surfaces of the 2nd milk molars.

In the period of permanent occlusion the length of the anterior part of the upper and lower dental arches in the sagittal direction is measured by *G. Korkhaus' method*. G. Korkhaus supplemented Pont's method, having offered to measure the length of the anterior dental arch part depending on the sum of mesiodistal dimensions of the 4th upper incisors/ The measurement is conducted from the contact point on the superior surface of central incisors sculpri to the point of intersection with the line drawn through Pont's points in the region of the 1st premolars. Korkhaus comprised a table of the values of the length of the anterior upper dental arch part at different totals of the 4th upper incisors width. These figures, reduced by 2 mm (according to the upper incisors thickness), may be used to detect the length of the anterior lower dental arch part.



*Detection of the length of the anterior part of the dental arch.
Indices of the Length of the Anterior Part of the Upper and Lower Dental
Arches (according to G. Korkhaus)*

Total of the 4 th upper incisors width, mm	Length of the anterior part of the upper dental arch, mm	Length of the anterior part of the lower dental arch, mm	Total of the 4 th upper incisors width, mm	Length of the anterior part of the upper dental arch, mm	Length of the anterior part of the lower dental arch, mm
27.0	16.0	14.0	32.0	18.5	16.5
27.5	16.3	14.3	32.5	18.8	16.8
28.0	16.5	14.5	33.0	19.0	17.0
28.5	16.8	14.8	33.5	19.3	17.3
29.0	17.0	15.0	34.0	19.5	17.5
29.5	17.3	15.3	34.5	19.8	17.8
30.0	17.5	15.5	35.0	20.0	18.0
30.5	17.8	15.8	35.5	20.5	18.5
31.0	18.0	16.0	36.0	21.0	19.0
31.5	18.3	16.3	36.5	21.5	19.5

Measuring the Longitudinal Length of Dental Arches

Measuring the longitudinal length of dental arches is conducted by N. Nance's method with a ligature wire by means of locating it from the distal surface of the 1st molar to the distal surface of the 1st molar of the opposite side, shaping the wire in the region of lateral teeth the wire is located along the middle of the masticatory surface, of frontal teeth – along the cutting edges. The longitudinal length of dental arch normally equals to the total of the mesiodistal dimensions of the 12 teeth.

The apical basis measurement.

The apical basis is a conditional line going at the level of teeth roots apices on the upper and lower jaws. In the mouth vestibule it is projected onto the transitional fold. Apical basis dimensions are studied in the transversal (width) and sagittal (length) directions by H. Howes' technique in N.G. Snagina's modification.

The width of the upper jaw apical basis is detected on a plaster model along the straight line between the deepest points in the fossa canina region (in the recess between the apices of the canine teeth and 1st premolars), and on the model of the lower jaw measuring is conducted between the same teeth, receding from the level of the gingival margin by 8 mm.

The apical basis length is measured on the upper jaw from the point A (the place of the intersection of the median palatine suture with the line joining the central incisors in the region of neck from the palatine surface) along the median palatine suture to the line joining the distal surfaces of the 1st permanent molars; on the lower jaw – from the point B (the anterior surface of the central incisors) along the perpendicular to the intersection with the line joining the distal surfaces of the 1st permanent molars. The dependence of the length and width of the apical basis on the sum of the mesiodistal dimensions of 12 permanent teeth is given in the table.

Normally, the width of the upper jaw apical basis makes 44 %, lower – 40 % of the sum of the mesiodistal dimensions of 12 permanent teeth of every jaw. With this very parameter the dentitions width in the region of premolars (39.2 %) and molars (50.4 %) is connected. Thus, for example, if the sum of the mesiodistal dimensions of 12 teeth makes 100 mm, the width of the upper jaw apical basis makes 44 mm, lower – 40 mm; dental arch width in the region of premolars makes 39.2 mm, in the region of molars – 50.4 mm.

GRAPHICAL METHODS OF INVESTIGATION

Dental Arches Form Study

The form of the upper and lower dental arches in the period of milk teeth occlusion is a semicircle; in the period of permanent teeth occlusion the upper dental arch has the form of a semiellipse, the lower – a parabola.

Dental arches form can be evaluated with the help of graphical methods, using different devices or geometrical constructions (symmetroscopy, photosymmetroscopy, symmetrography, parallelography, Hawley–Herber–Herbst's diagram).

Symmetroscopy. With the help of this method the location of teeth in the

transversal and sagittal directions is studied. The orthocross (orthodontic cross) is used in instant diagnosis. It is a transparent plate, onto which a cross is plotted with millimeter points or millimeter net with points in 1–2 mm. The plate is put over a plaster model of the upper jaw, the cross is orientated toward the median palatine suture, and the location of teeth relative to the medial and transversal lines is studied.

The Scheu-Dental company (Germany) produces the Arco-Zet, which allows studying dental arches models to a high degree of accuracy.

Photosymmetroscope is a method of symmetroscope of diagnostic jaw models with their following photographing in a certain mode. The photograph of jaw models with a millimeter net projected onto it is further studied and measured.

Symmetrography. The authors of symmetrographs of different construction are Van Loon, P.W. Simon, G. Korkhaus, Phillips, H. Bruckl, V.N. Volodkin. In these devices the diagnostic model of the jaw under study is orientated and then fixed relative to perpendicularly located measuring graticules. For convenience and precision of investigation the base, on which the jaw model is fixed, is rotated. It has graduation, which allows rotating the model at the necessary angle to the measuring graticules. Then the model is marked with the help of the sliding vane of the symmetrograph, and the symmetry of teeth location and dental arch form are studied.

If the vane of Simon's gnathograph, Korkhaus' symmetrograph or other similar measuring instrument is connected to the transmission system, it is possible to represent on the plane dental arch circuits of natural or enlarged size, dental arches projection onto one another, or palatine vault curves in different sections (more often on scaled paper).

Parallelography. It is expedient to use this method when applying the measuring instrument offered by M.Z. Migradzov with co-authors. It is an advanced parallelometer with goniometric mechanism, which allows conducting sagittal, transversal and angle measurements. On a jaw model a conditional basic reference point is found. As such point authors use the point of the intersection of the sagittal and transversal planes with the mesial surface of the 1st permanent molars.

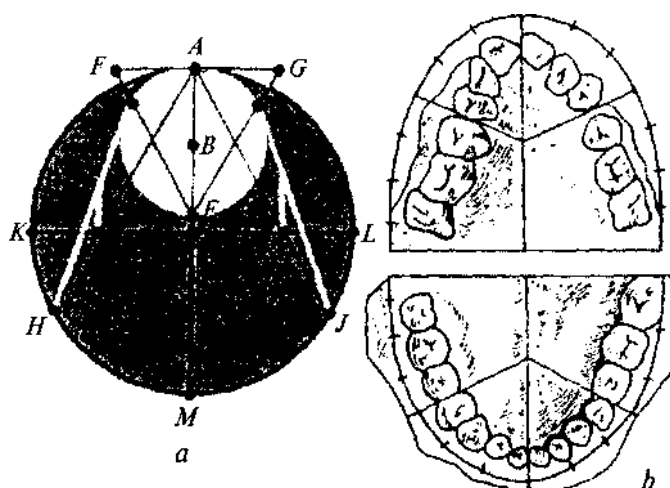
Hawley–Herber–Herbst's diagram. To build the diagram the total of the mesiodistal dimensions of three upper teeth (central and lateral incisors and a canine tooth) is detected – the AB radius, with which a circle is drawn from the point B. Then, on the circumference with AB radius from the point A the segments AC and AD are laid off. The CAD arch is a curve of the location of six frontal teeth. To detect the location of lateral teeth one more circle is drawn. For this purpose from the point E of BE radius straight lines are drawn through the points C and D to the intersection with the tangent to the point A, as a result of which an equilateral triangle EFG is obtained. With the radius, equal to one side of this triangle, from the point A on the extension of AE diameter the point O is marked, from which a circle is drawn with EE radius.

On an additional circle from the point M with AM diameter the points / and

H are laid off with AO radius. Having connected the point if with the points C, J, and D, HCADJ curve is obtained, which is the curve of all the surface of the upper dental arch according to Hawley. Lateral teeth are to be located on the HC and DJ segments. Herbst substituted lateral straight lines with CN and DP arches. The centers of these arches are L and K, which lie on the diameter (KL), perpendicular to the AM diameter. The CN arch is described with LC radius, the DP arch – with KD radius. Thus, Hawley–Herber–Herbst's NCADP arch is a curve of the correctly shaped upper dental arch. To get the right curve of the lower dental arch at - drawing the diagram the initial radius, to Hawley's point of view, is to be by 2 mm less. Besides, not only incisors and canine teeth, but also the 1st premolars are located on the CAD curve.

To define the form of dental arch a model is laid on the diagram in such a way, that its median line, which goes along the palatine suture, would coincide with the AM diameter, and the sides of the equilateral triangle PEG would go between canine teeth and premolars. After that the dental arch circuit is drawn out with a sharpened pencil and the obtained shape is compared with the diagram's curve.

At the Chair of Orthodontics and Children's Prosthetics H.V. Kuznetsova and I.V. Popova performed the patterns of dental arches on plexiglas depending on the mesiodistal dimensions of the upper incisors and canine teeth (from 18 to 26 mm). It has been determined that the larger size of teeth and dental arches, the farther they are located from the coordinating point K, formed at drawing a perpendicular from the point Po onto the occlusal plane.



*Constructing the Hawley– Herber–Herbst's diagram:
a — diagram; b — schematic drawing of the obtained form on the existing one.*

PHOTOMETRIC METHODS OF INVESTIGATION

Anthropometric investigation is based on the regularities of the structure of the facial and cerebral parts of the skull, proportionality of the correlation of

different parts of head and their relations to certain planes.

The study is conducted on the head of the patient, on photographs of the face, teleroentgenograms.

To characterize the dimensions of the patient's head and face the following parameters are determined: width, length and depth.

The width of head is studied in its upper, middle, and lower parts:

- the head width ($eu-eu$) – between laterally prominent points (eu) on the lateral surface of head on the right and on the left;
- the morphological width of head ($zy-zy$) – between the most protruding points (zy) of the temporal arch on the left and on the right;
- the face width ($go-go$) – between the inferior and downwards located points (go) of the lower jaw angles on the right and on the left (the upper jaw width is measured similarly).

The head length ($gl-op$) is measured between the most protruding point on the lower part of forehead along the medial-sagittal plane above the root of nose between the eyebrows and the most backwards protruding point (op) of the occiput on the medial-sagittal plane.

The head height ($t-v$) is detected from the point (t), located on the tragus of ear, along the perpendicular to the line $gl-op$ to the protruding point (v) on head circumference.

Except for the head height, the face height is also studied: morphological (upper, lower, and full) and physiognomic.

The upper morphological height of face ($n-pr$) is measured between the point (n) located on the intersection of the median plane with the nasofrontal suture and the most anterior point (pr) of the alveolar crest of the upper jaw in the median intersection at the orientation of the skull by the Frankfort plane.

The lower morphological height of face ($pr-gn$) is detected between the points (pr) and (gn) of the joining of the circuit of the lower jaw inferior margin and the external circuit of symphysis.

The full morphological face height ($n-gri$) is measured between the points n and gn .

The physiognomic face height ($tr-gn$) is detected between the point (tr), located on the sagittal plane between the forehead and the pilary part of head, and the point gn .

The face depth is estimated by four dimensions, detected from the point t to the point n , cutaneous, the most posteriorly located point in the place of lower circuit of nose transition to the upper lip (sn), the most anterior point of the mental protuberance (pg) in the median intersection at the orientation of head by the Frankfort plane, the point gn .

To characterize the form of head and face there are used the indices, which are a percentage ratio of one head and face dimension to another.

The head shape is detected by cross-longitudinal, height-longitudinal, and altitude- transversal indices. The most important and the most often used in practical work is the cross-longitudinal (cranial, head) index – percentage ratio of

the head width to its length. If this value is less than 75.9, the head has dolichocephalic shape, 76.0-80.9 – mesocephalic, 81.0-85.4 – brachycephalic, 85.5 and more – hyperbrachycephalic.

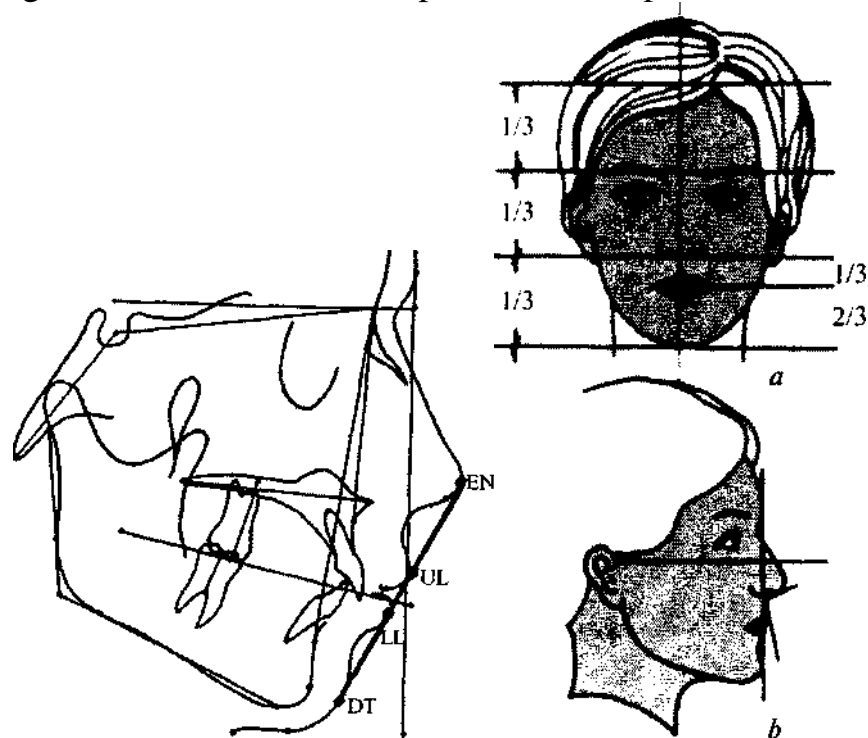
The face form can be determined with the help of the facial indices, offered by Kollman, I. Uzhumetskene, Garson, G. Izard. The facial index by Garson is detected by the percentage ratio of the morphological height of face ($n-gn$) to the width of face in the region of temporal arches ($zy-zy$). By this index value the following types of face are singled out: very wide, wide, average, narrow, very narrow.

Izard offered the index of facial morphology (IFM), which equals to the percentage ratio of the distance from the point (oph) of the intersection of the median face line and the tangent to the superciliary arches to the point gn to the width of face in the region of temporal arches ($zy-zy$). Index value from 104 and more characterizes a narrow face, from 97 to 103 –average, from 96 and less – wide face.

$$\text{IFM} = \frac{\text{Oph} - \text{gn}}{\text{zy} - \text{zy}} \times 100\%$$

The patient's face is studied en face and in profile. En face the symmetry of the right and left halves is estimated, and also the proportionality of the upper, middle, and lower thirds of face.

Face profile is estimated by its appearance: it can be concave, straight and convex depending on the correlation of the position of the points n , sn , and pg .



Studying the face fillface (a) and in profile (b)



Face profile types: a — straight; b — convex; c — concave

When estimating face profile lips position relative to the esthetic plane, offered by Ricketts, is taken into account; it goes through the point (*EN*) on the apex of nose and the point (*DT*), which corresponds to the point *pg*.

Face profile is detected by means of estimating the position of the upper lip (*UL*) and the lower lip (*LL*) relative to the esthetic plane. Protruding of the lower lip corresponds to the convex profile of face. Concave face profile is marked by the reclinate lower lip by more than 2.0 mm relative to the esthetic plane.

Materials for self-control:

A. Tasks for self-control (tables, diagrams, drawings, graphs):

1. To record the album the formula for determining the width of the dental arches in the region of premolars and molars by Pont.
2. To sketch in the album schema to determine the length of the frontal part by Korkhaus.
3. To draw in the album the diagram by Hawley-Herber-Herbst.
4. To draw in the album the face profile types.

B. Tasks for self-control:

1. What method is used to determine the width of the dental arch:

Pont

Korkhaus

Tonn.

Gerlach

Howes

2. To determine the width of the dental arch the following instruments using:

caliper

school line

the bronze-aluminum wire fragment

the of orthodontic wire segment

the part of thread

3. To determine the width of the dental arch in the area of upper jaw premolars the such measuring points use:

the middle of inter cusp fissure

the contact point between the premolars

distal deepening

frontal deepening of the first premolars

the contact point between the molars

4. To determine the width of the dental arch in the lower jaw premolar region such measuring points use:

the contact point between the premolars

frontal deepening of the first premolars

distal deepenings

the middle of inter cusp fissure

the contact point between the molars

5. To determine the width of the dental arch in the upper jaw molars area such measuring points use:

frontal deepening of the longitudinal fissure

the contact point between the premolars

distal deepening

the middle of inter cusp fissure

the contact point between the molars

6. To determine the width of the dentition in the lower jaw molars area such measuring points use:

distal buccal cusps

the contact point between the premolars

distal deepening

the middle of inter cusp fissure

the contact point between the molars

7. The dental arch frontal segment length carried out by using the method:

Korkhaus

Pont

Tonn

Gerlach

Hawley

8. The dental arch frontal segment length of the upper jaw more than the same lower in norm:

2 mm

3 mm

4 mm
5 mm
1 mm

9. The upper and lower incisors size proportionality in normal covering depth determined by:

Tonn
Pont
Korkhaus
Gerlach
Howes.

10. The upper and lower incisors size proportionality at the depth covering determined by:

Y. M. Malygin
Pont
Korkhaus
Gerlach
Howes.

11. The upper and lower incisors size proportionality at the edge-to-edge covering determined by:

Gerlach
Herber
Herbst
Hawley
Korkhaus

12. To determine the length of the dental arch next method is used:

Nance
Gerlach
Howes
Hawley
Herbst

13. The determination of the dental arch length makes by using such device:
bronze-aluminum ligature wire fragment

school ruler
calipers
orthodontic wire segment
school compass

14. To determine the correct dental arch form builds the diagram by:

Hawley-Herber-Herbst

Howes-Snagey
Tonn-Gerlach
Nance-Korkhaus
Linder-Hart

15. Dreyfus' line is vertical, held perpendicular to the Frankfurt horizontal from the point:

nasion
orbitale
glabella
pogonion
subnazale

16. Which method is most informative for assessment of the occlusion?

cephalometry
Izard
Pont
Hawley-Herbst
Tonn

17. Pont established a relationship between:

sum of upper incisors crowns width and width of dentition in the area of first premolars and molars
sum of upper incisors crowns width and the relation of dentition segments
sum of 12 permanent teeth sizes and the dentition width
the size of the upper incisors, canine teeth and dental arch
sum of upper incisors crowns width and length of the anterior segment

18. Dolgoplova index in the temporary orthognatic occlusion is:

1,3
1,25
1.35
1.4
1,45

19. Tonn Index at orthognatic bite is:

1,33
1,3
1,4
1.45
1,5

20. Gerlach method use for determining:
the relation of the dental arc segments

the width of the lower dental arc
the width of the upper dental arc
the sum of 6 permanent teeth mesio-distal sizes
the sum of 12 permanent teeth mesio-distal sizes

21. Premolar and molar indices by Linder-Hart equal to:

85-65
80-64
82-62
76-62
86-66

22. What method of KDM studying use to determine the width of the dental arches during the period of temporary occlusion?

Dolgopolova
Pont
Snagyna
Kantorovich
Hawley-Herbst

23. How to define an individual macro - and microdentia ?

by Tonn method
by Pont method
by Snagyna method
by Hawley-Herbst method
by Linder-Hart method

24. What method of KDM studying can you define the width of the dental arch depending on the width of 12 teeth?

Snagyna
Pont
Dolgopolova
Gerlach
Hawley-Herbst

25. Which method is used to determine the width of the apical basis in children with temporary occlusion?

Dolgopolova
Pont
Snagyna
Hawley-Herbst
Gerlach

26. What method is used to determine the size of apical basis?

Snagyna
Hawley-Herbst
Kantorovich
Pont
Gerlach

27. What method is used to determine the dental arches with in the mixed dentition?

Pont
Korkhaus
Snagyna
Gerlach
Hawley-Herbst

28. Izard facial index meserment needs:
temporal arches (zy), gonion (go), ophrion (oph) points
gonion (go), nasion (n)
gnation (gn), infraorbitale (or)
ophrion (oph), gonion (go), subnasal (sn)
points of the temporal arches (zy)

29. The size of the facial index by Izard at the narrow type of the face is?

104-108
97-103
96-92
92-86
86-82

30. The size of the facial index by Izard at the wide type of the face is?

96 and less
97-103
104-107
107-111
111-116

31. The size of the facial index by Izard at the average type of the face is?

97-103
104-108
100
92-96
86-92

32. Absolute macrodontia of the upper incisors is diagnosed in that case, if the sum of the four upper incisors mesio-distal sizes is:

>35 mm
>30 mm
<35 mm
>28 mm
<28 mm

33. Absolute microdontia of the lower jaw incisors diagnosed if their sizes is:

<20 mm
<19.5 mm;
<25 mm;
>28 mm;
<28 mm.

34. Gerlach established a relationship between:

sizes of the dentition segments and their correlation
the mesiodistal sizes of 12 permanent teeth and dentition width
the sum of upper incisors crowns width and dentition width in the premolars and molars area
the upper incisors and canines sizes and dental arch form
the sum of upper incisors crowns width and length of the anterior segment

35. Hawley-Herber-Herbst established the relationship between:

the sizes of the upper incisors, canines and dental arch form
the mesiodistal sizes of 12 permanent teeth and dentition width
the sum of upper incisors crowns width and dentition width in the premolars and molars area
the upper incisors and canines sizes and dental arch form
the sum of upper incisors crowns width and length of the anterior segment

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