CONTENTS

Chapter 1
METHODS FOR DENTAL PATIENT EXAMINATION AND ASSESSMENT

The objective of examining any patient is to make a diagnosis based on a thorough analysis of presentations, medical history and objective examination (**Table 1.1**).

Table 1.1. Classification of methods for dental patient examination and assessment

Basic (clinical)		Additional (paraclinical)
Questionnaire/interview: • chief concern (clarification of complaints); • dental history; • medical/social history (life history, including past and concomitant diseases)	Inspection: • visual inspection; • palpation; • probing; • percussion	Clinical methods: • X-ray; • thermometric (thermal test); • staining test (by CDDs); • EPT; • fluorescent methods; • periodontal test; • index score

An examination of a dental patient includes these tests carried out by a dentist to assess his general condition and to identify diseases. Based on the data obtained, a diagnosis is made, general and local etiological and pathogenetic factors in the development of the disease are determined. Diagnosis of a disease is one of the main components of the medical specialty. The future diagnosis of a particular nosological entity depends on the ability to examine a dental patient.

As a rule, the examination of the patient begins with a survey, clarification of complaints and history of the disease, past and concomitant diseases, and allergic status. Survey data allows the doctor to assume the correct diagnosis (preliminary diagnosis) from the very beginning and outline further examination methods.

Specific methods:

- Kulazhenko method;
- McClure–Aldrich test;
- laser dopplerography;
- bone density test.

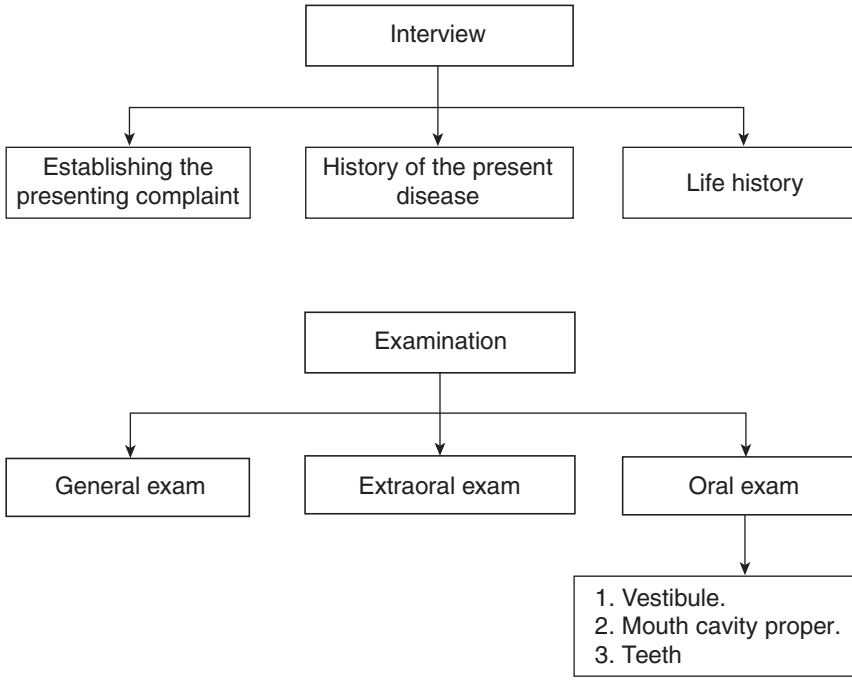

Fig. 1.1. Algorithm for examining a dental patient

Laboratory methods:
- cytology;
- histology;
- bacteriology;
- serology;
- examination of blood, urine, saliva, gastric contents.

During dental patient examination and assessment, a particular order of examination is important (**Fig. 1.1**).

BASIC DIAGNOSTIC METHODS

1. Questionnaire/interview

During the interview, it is necessary to establish a confidential contact with the patient, determine his/her neuropsychiatric status, intelligence, and on this basis analyze complaints, stage and progression of the disease.

Presenting complaint

Most patients consult a dentist with complaints of toothache, bleeding gums, broken or falling out fillings, poorly functioning dentures, aesthetic defects, or for the purpose of a preventive examination. By asking targeted questions to the patient, the dentist clarifies and guides the patient's presentation of complaints to make a correct diagnosis.

Characteristics of pain:

- short-term pain from temperature, chemical and mechanical stimuli is characteristic of caries;
- acute paroxysmal spontaneous night pain: pulpitis;
- constant pain intensifying when biting: periodontitis;
- complaints about changes in facial configuration; the presence of swelling is characteristic of inflammatory diseases of the jaws, soft tissues of the face, salivary glands, tumors and other diseases;
- difficulty opening the mouth indicates a disease of the TMJ (temporomandibular joint), eruption disturbances of teeth, problems with performing anesthesia, or difficult tooth extraction.

Dental history (*anamnesis morbi*)

During interview and questioning the practitioner should identify and clearly understand the onset time of clinical manifestations, their changes over time, duration, and possible etiologies.

It should be clarified how often the patient visits the dentist, the date of the last appointment, the treatment performed and its outcome.

Thorough questioning allows you to clarify and determine the course of the disease and to establish whether it arose for the first time, whether it is acute, chronic, or whether there is an exacerbation at the moment.

To make a final diagnosis, the history data must be supplemented with the results of an objective examination.

Medical/social history (*anamnesis vitae*)

Includes the following parts:

- Allergy history.
- Systems review:
  - diseases of the cardiovascular system (including blood pressure);
  - diseases of the endocrine system;
  - diseases of the gastrointestinal tract;
  - liver diseases;
  - lung diseases;
  - blood diseases;

- Data on hospital stays over the past 10 years, frequency and reasons for hospitalizations.
- Data on examination by a general practitioner, therapist, cardiologist, endocrinologist and other specialists over the past 5 years.
- Data on taking medications: their type, duration of use, doses.
- Identification of conditions that limit the duration of treatment.
  - general serious condition of the patient (6 months after myocardial infarction, hypertensive crisis);
  - epilepsy;
  - difficulty opening the mouth.
- Identification of the following risk factors or aggravating factors:
  - smoking;
  - alcohol consumption;
  - hereditary predisposition.

2. Inspection

General inspection

Visual assessment of the physical and psycho-emotional state according to the clinical dental scale by Bizyaev A.F. Determination of constitutional features. In case of an altered physical status, measure the pulse, blood pressure, body temperature.

External examination (extraoral)

Perform visual assessment and palpation:

- visual assessment of facial configuration (symmetry, proportionality/asymmetry);
- determine the type of skin (color, integrity, palpation);
- determine the degree of severity of nasolabial, chin and neck folds (in case of malocclusion, describe the severity, depth, asymmetry);
- assess the condition of the red border of the lips, visible mucous membranes (color, size, nature of the closure of the lips, contour, presence of scales, crusts; mucous membranes of the nose and conjunctiva of the eyes are normally moderately moist, pink, without violated integrity);
- measurement of mouth opening [opens freely (to the width of the index, middle and ring fingers), opens with difficulty, presence of paresis];
- assess the condition of the temporomandibular joint (by palpation, examined at rest and when opening/closing the mouth);
- examine the lymph nodes (by palpation, determine the size, consistency, tenderness, single or packet group);

- examine the bones of the facial skeleton (visually and by palpation, assessing the load symptom, determining irregularities, pain, mobility, displacement);
- examine the branches of the trigeminal nerve (normally they are slightly sensitive and painless).

Oral examination

Visual inspection, palpation and instrumental examination are carried out using a mirror, probe and tweezers, using percussion and probing methods.

1. **Examination of the vestibule of the oral cavity.**
   It is performed with closed jaws and relaxed lips using a dental mirror:
   - determine the depth of the vestibule of the oral cavity: measure the distance from the neck of the tooth to the mucogingival junction [normal (1.5 cm), shallow, deep];
   - determine the level of attachment of the frenulum of the upper and lower lips, the strands of the mucous membrane;
   - determine the condition of the mucous membrane of the cheeks and the inner surface of the lips (color, moisture, presence of erosions, ulcers);
   - determine the condition of the gums: free, attached, mucogingival junction (taking into account color, moisture, shape of the gingival papillae, receding gum, bleeding);
   - determine the bite (physiological, abnormal, pathological).
2. **Examination of the oral cavity proper.**
   This is done visually and with palpation using a dental mirror.
   - The tongue is examined by fixing it with the thumb and forefinger using a gauze pad. determine the amount of plaque, size of the frenulum, the presence and condition of the papillae.
   - Examination of the mucous membrane of the floor of the mouth: assess the condition of the salivary glands, the amount of saliva, its transparency, consistency, and examine the choroid venous plexus.
   - Examination of the soft and hard palate includes determining the condition of the mucous membrane: color, moisture, relief (uneven surface); in the area of the soft palate, a large number of mucous glands with orifices and secretion are found.
3. **Teeth examination.**

When examining the oral cavity, it is necessary to examine all teeth, and not just the causal one, according to the patient. The examination should be carried out from right to left, starting with maxillary teeth (molars), and then from left to right to examine the teeth of the mandible. In this case, a mirror, a probe and tweezers are used.

- Visual examination (determine the color, number, shape of teeth).
- Probing (determine the presence of a carious cavity, its depth, pain, condition of fillings, presence of artificial crowns, orthopedic or orthodontic structures).
- Percussion (lightly tapping the tooth in horizontal and vertical directions using a probe or tweezers).
- Assessing tooth mobility. There are 3 degrees of mobility (determined with tweezers or with handles of the two instruments by rocking the tooth).

ADDITIONAL EXAMINATION METHODS

1. Staining test (with CDDs or caries markers)

Use a 2% solution of methylene blue (**Fig. 1.2, see color insert**). Application time is 3 minutes (or according to CDD instruction). The color of the tooth changes due to the presence of caries and dental plaque. Coloring is carried out to achieve the following goals:

- patient motivation;
- determination of hygienic indices;
- differential diagnosis of caries and non-carious lesions;
- determining the effectiveness of preventive measures;
- determining the presence of softened dentin in a carious cavity.

2. Thermal test

Apply ice or heated water to the tooth (60–70 °C), heated gutta-percha. Based on the nature (characteristics) of the pain or its absence, caries or pulpitis and pulpitis or periodontitis are distinguished (**Table 1.2**).

Table 1.2. Thermal tests

Thermal tests	
Heat test	Use a dry prophy rubber cup on the tooth, with friction creating heat on the tooth
	Isolate an individual tooth with a rubber dam and bathe the tooth with warm water
	Apply heated gutta-percha
Cold test	Cold spray (Endo ice) is applied to a small piece of cotton, or a Q-tip, and is then placed on the neck of the affected tooth for 5–10 sec
	Taking a small piece of ice, isolate and touch individual teeth to determine if the tooth is reactive to cold, then compare the responses between adjacent teeth

3. Electric pulp test

The study is carried out using devices EOM-1 (Russia), PULPOTESTER PT-1 (Lithuania), Digitest (USA), which allow determining the sensitivity threshold of the dental pulp to direct current irritation. In case of intact tooth it shows 2–6 μA, in caries — 10–15 μA, in acute pulpitis — 20–30 μA, in chronic apical periodontitis — more than 100 μA.

4. Transillumination test

The method is based on the glow of hard tooth tissues when a beam of light passes through them. This study is carried out using a special lamp with an optical fiber or a halogen lamp. Demineralized tissues appear as a dark zone. This method allows you to identify caries, enamel cracks (fractures), and pulpless teeth.

5. Laser-induced fluorescence (LF) diagnosis of dental caries using the DIAGNOdent device (KaVo, Germany)

The laser diode of the device produces pulsed light waves with a length of 655 nm and a power of 1 mV (**Fig. 1.3**). When demineralized hard tissues are excited by this light, later it begins to fluoresce with light waves of varying wavelength, which the device converts into digital indicators and displays on the display. Values 7–11 correspond to white spot caries, 12–18 to superficial caries, 20–80 to medium caries.

Fig. 1.3. DIAGNOdent device

6. X-ray diagnosis

It is used in the following cases:

- to identify hidden carious cavities;
- for diagnosis of trauma of teeth and jaws;
- to determine the depth of the carious cavity, closeness to the tooth pulp;
- for differential diagnosis of caries and apical periodontitis;
- to establish the type of pathological process in the marginal and apical periodontium;
- to assess the quality of endodontic treatment;
- to evaluate the effectiveness of treatment of periodontal diseases;

- to study the structural features of the TMJ and identify changes;
- for simultaneous display of the entire dentition and the alveolar process of the upper or lower jaw;
- in orthodontics, to identify the structural features of the facial skull, determine the size and location of the jaws in relation to each other and other bones of the skull, study the dynamics of growth of the bones of the facial skeleton, localize abnormalities and monitor changes occurring during the growth process under the influence of orthodontic treatment;
- to study the state of the ducts of the salivary glands by introducing a contrast agent (iodolipol®).

Types of X-ray examination in dentistry:

- intraoral radiography (periapical X-ray);
- orthopantomography (a panoramic single image of the entire dental system) (**Fig. 1.4**);
- bitewing radiography (BW X-ray);
- teleradiology (in Russian it is called ТРГ-телерентгенограмма), which allows us to identify structural features of the facial skull in orthodontics;
- tomography (CT-computed tomography which in Russian is called КТ, компьютерная томография) (layer-by-layer radiography);
- sialography (study of salivary ducts).

7. Examination of periodontal tissues

It is done visually, by palpation, using a periodontal probe and the periotest (**Fig. 1.5**). The condition of the gingival sulcus, the presence of periodontal pockets, bleeding gums, and bone tissue resorption of the interdental septa are determined.

The Periotest device determines the dynamic mobility of teeth and also evaluates the stability of intraosseous implants. The measurement results are received in a sound signal and in the form of a digital index on the display.

Fig. 1.4. Orthopantomogram

Fig. 1.5. Periotest device

8. Determination of tooth color

This is done in esthetic dental restoration. For this purpose, we use shade guides with a set of standard colors, for example, Vita (**Fig. 1.6, see color insert**), Chromascop, Biodent vita lumin vacuum, or digital instruments: colorimeter, spectrophotometers and digital cameras.

9. Index assessment of the level of oral hygiene

This is done visually using a mirror, probe and dyes (Schiller–Pisarev solution, Fuchsine, Erythrosine). The Fedorov–Volodkina and Greene–Vermillion indexes are determined. When there is dental plaque, dental biofilm, supragingival tartar, and inflammation of the gums, the tissue is stained. Using special formulas, we work out a qualitative and quantitative assessment of the hygienic condition of the oral cavity and establish the presence of gum inflammation (**Fig. 1.7**).

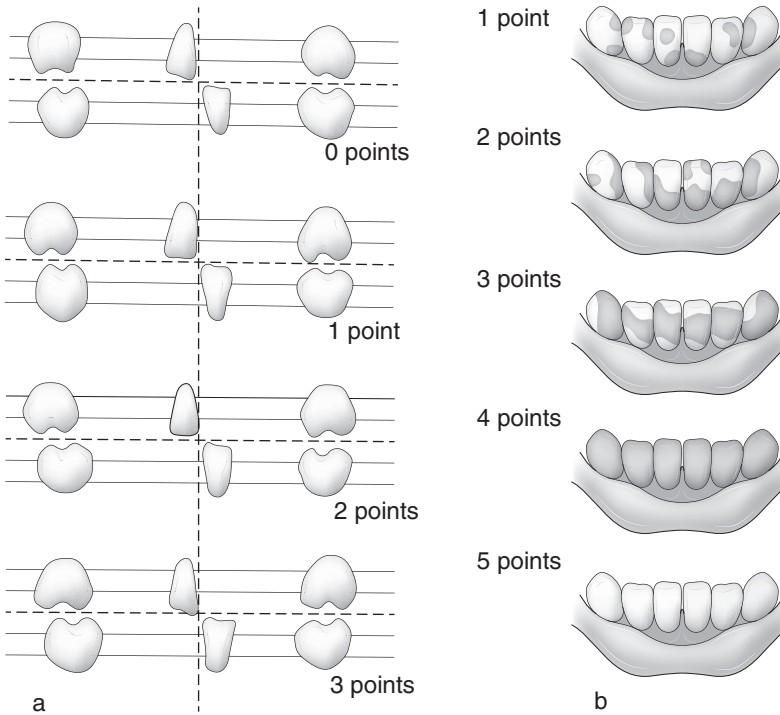

Fig. 1.7. Determination of oral hygiene index: a — according to Greene-Vermillion, b — according to Fedorov–Volodkina

10. Laboratory methods

Clinical blood test.

Biochemical examination of blood and urine.

Cytological examination of scrapings, smear-imprint of the mucous membrane.

Bacteriological examination of material from the surface of the mucous membrane, erosions, ulcers.

Histology: tissue sampling (biopsy).

Examination of oral fluid and gastric juice.

A serological test used to identify sensitization (allergization) of the body by infectious foci.

11. Specific studies

The McClure–Aldrich test, with which you can determine hidden swelling of the oral mucosa. In this case, 0.2 ml of 0.9% sodium chloride solution is injected into the mucous membrane and the time is marked when the appearing blisters become invisible. Blisters normally disappear after 40 minutes; in case of abnormality the time can be reduced to 3 minutes.

Kulazhenko's method. It is based on determining the resistance and permeability of capillaries (small blood vessels) using dosed vacuum (by using ALP, laser semiconductor therapeutic apparatus). If there is inflammation in the frontal part of the jaw, a hematoma forms on the oral mucosa within up to 50 sec, normally within 1 minute.

12. Laser Doppler imaging (LDI)

It is used to study the state of periodontal circulation. For this method, a non-invasive capillary blood flow analyzer LAKK-01 is used.

13. Bone density test

A modern non-invasive research method that allows you to accurately determine mineral bone mass and mineral density of bone tissue both in the entire skeleton and in its individual sections. Using this technique, you can assess calcium balance and determine the risk of fractures due to osteoporosis. X-ray, photon and ultrasonic densitometers are used.

Laboratory tests are carried out according to certain indications. With their help, you can diagnose diseases of the mucous membrane, periodontal disease, salivary glands, bone tissue, and tumors.

ASSESSMENT ACCORDING TO NOSOLOGICAL ENTITY

1. **Caries.**
   Basic methods: questioning, inspection, probing.
   Additional methods: staining, luminescent methods, X-ray (thermal test, EPT, laser diagnosis).
2. **Pulpitis, apical periodontitis.**
   Basic methods: questioning, inspection, probing, percussion, palpation.
   Additional methods: X-ray, thermal test, EPT.
3. **Periodontal diseases.**
   Basic methods: questioning, inspection, probing, percussion, palpation (assessment of tooth mobility).
   Additional methods: index assessment, X-ray, microbiological and biochemical studies, functional diagnostic methods (rheoparodontography, polarography).
4. **Diseases of the oral mucosa.**
   Basic methods: questioning, inspection.
   Additional methods: cytology, histology, microbiology, immunology. Allergy tests, rheography, polarography, biochemistry findings.

PATIENT FILE

The data obtained during the examination is entered into the dental patient file, registration form N. 043/U (**Fig. 1.8**). In addition to passport data, examination findings, diagnosis, treatment plan, treatment performed, complications, recommendations for the patient within the framework of dental rehabilitation and prevention, as well as medications (name and dose) are recorded in the file. All procedures must be dated. A patient file is a legal document; it can be used in court proceedings when considering controversial issues that arise between doctor (clinic) and patient. The patient file is kept in the registry for 5 years, and after that it is transferred to the archive.

The code of the institution according to OKPO

Ministry of Health of the Russian Federation Name of the institution		Medical documentation Form N. 043/U up. Ministry of the Health of the USSR 04.10.80 N. 1030

Medical card of the dental patient N. 20____year

Family name, First name, Father's name

_____

Gender (M/F) _____ Age_____ Address _____

_____

Occupation _____ Diagnosis _____

Complaints _____

_____

Previous and concomitant diseases _____

_____

_____

The development of current disease _____

_____

_____

Fig. 1.8. Dental patient file. OKPO — All-Russian Classifier of Enterprises and Organizations; it is used in formal documents or legal references