2. TREATMENT PLANNING AND ORAL DIAGNOSIS

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1. What are the objectives of pretreatment evaluation of a patient?

1. Establishment of a diagnosis
2. Determination of underlying medical conditions that may modify the oral condition or the patient's ability to tolerate treatment
3. Discovery of concomitant illnesses
4. Prevention of medical emergencies associated with dental treatment
5. Establishment of rapport with the patient

2. What are the essential elements of a patient history?

1. Chief complaint
2. History of the present illness (HPI)
3. Past medical history
4. Social history
5. Family history
6. Review of systems
7. Dental history

3. Define the chief complaint.

The chief complaint is the reason that the patient seeks care, as described in the patient's own words.

4. What is the history of the present illness?

The HPI is a chronologic description of the patient's symptoms and should include information about duration, location, character, and previous treatment.

5. What elements need to be included in the medical history?

- Current status of the patient's general health
- Hospitalizations
- Medications
- Allergies

6. What areas are routinely investigated in the social history?

- Present and past occupations
- Occupational hazards
- Smoking, alcohol or drug use
- Marital status

7. Why is the family history of interest to the dentist?

The family history often provides information about diseases of genetic origin or diseases that have a familial tendency. Examples include clotting disorders, atherosclerotic heart disease, psychiatric diseases, and diabetes mellitus.

8. How is the medical history most often obtained?

The medical history is obtained with a written questionnaire supplemented by a verbal history. The verbal history is imperative, because patients may leave out or misinterpret questions on the written form. For example, some patients may take daily aspirin and yet not consider it a "true" medication. The verbal history also allows the clinician to pursue positive answers on the written form and, in doing so, to establish rapport with the patient.

9. What techniques are used for physical examination of the patient? How are they used in dentistry?

Inspection, the most commonly used technique, is based on visual evaluation of the patient. Palpation, which involves touching and feeling the patient, is used to determine the consistency and shape of masses in the mouth or neck. Percussion, which involves differences in sound transmission of structures, has little application to the head and neck. Auscultation, the technique of listening to differences in the transmission of sound, is usually accomplished with a stethoscope. In dentistry it is most typically used to listen to changes in sounds emanating from the temporomandibular joint and in taking a patient's blood pressure.

10. What are the patient's vital signs?

- Blood pressure
- Pulse
- Respiratory rate
- Temperature

11. What are the normal values for the vital signs?

- Blood pressure:120mmHg/8O mmHg
- Pulse: 72 beats per minute
- Respiratory rate: 16—20 respirations per minute
- Temperature: 98.6°F or 37°C

12. What is a complete blood count (CBC)?

A CBC consists of a determination of the patient's hemoglobin, hematocrit, white blood cell count, and differential white blood cell count.

13. What are the normal ranges of a CBC?

Hemoglobin: men, 14—18 g/dl
women, 12—16 g/dl
Hematocrit: men, 40—54%
women, 37—47%
White blood count: 4,000—10,000 cells/mm^3

Differential white blood count
Neutrophils, 50—70%
Lymphocytes, 30—40%
Monocytes, 3—7%
Eosinophils, 0—5%
Basophils, 0—1%

14. What is the most effective blood test to screen for diabetes mellitus?

The most effective screen for diabetes mellitus is fasting blood sugar.

15. What is the technique of choice for diagnosis of a soft-tissue lesion in the mouth?

With few exceptions, biopsy is the diagnostic technique of choice for virtually all soft-tissue lesions of the mouth.

16. Is there any alternative diagnostic technique to biopsy for the evaluation of suspected malignancies of the mouth?

Exfoliative cytology may be used as a screening technique for oral lesions. This technique is analogous to the Papanicolaou smear used to screen for cervical cancer. Unfortunately, a high rate of false negatives makes exfoliative cytology a dangerous practice in the screening of suspected oral cancers. It has value mainly in the diagnosis of certain viral, fungal, and vesiculobullous diseases.

17. When is immunofluorescence of value in oral diagnosis?

Immunofluorescent techniques are of value in the diagnosis of a number of autoimmune diseases that affect the mouth, including pemphigus vulgaris and mucous membrane pemphigoid.

18. What elements should be included in the dental history?

1. Past dental visits, including frequency, reasons, previous treatment, and complications
2. Oral hygiene practices
3. Oral symptoms other than those associated with the chief complaint, including tooth pain or sensitivity, gingival bleeding or pain, tooth mobility, halitosis, and abscess formation
4. Past dental or maxillofacial trauma
5. Habits related to oral disease, such as bruxing, clenching, and nail biting
6. Dietary history

19. When is it appropriate to use microbiologic culturing in oral diagnosis?

1**. Bacterial infection.** Because the overwhelming majority of oral infections are sensitive to treatment with penicillin, routine bacteriologic culture of primary dental infections is not generally indicated. However, cultures are indicated in patients who are immunocompromised or myelosuppressed for two reasons: (1) they are at significant risk for sepsis, and (2) the oral flora often change in such patients. Cultures should be obtained for infections that are refractory to the initial course of antibiotics before changing antibiotics.

2. **Viral infection.** Immunocompromised patients who present with mucosal lesions may well be manifesting herpes simplex infection. A viral culture is warranted. Similarly, other viruses in the herpes family, such as cytomegalovirus, may cause oral lesions in the immunocompromised patient and should be isolated, if possible. Routine culturing for primary or secondary herpes infections is not warranted in healthy patients.

3. **Fungal infection.** Candidiasis is the most common fungal infection affecting the oral mucosa. Because its appearance is often varied, especially in immunocompromised patients, fungal cultures are often of value. In addition, because candidal infection is a frequent cause of burning mouth, culture is often indicated in immunocompromised patients, even in the absence of visible lesions.

20. How do you obtain access to a clinical laboratory?

It is easy to obtain laboratory tests for your patients, even if you do not practice in a hospital. Community hospitals provide virtually all laboratory services that your patients may require. Usually the laboratory provides order slips and culture tubes. Simply indicate the test needed, and send the patient to the laboratory. Patients who need a test at night or on a weekend can generally be accommodated through the hospital's emergency department. Commercial laboratories also may be used. They, too, supply order forms. If you practice in a medical building with physicians, find out which laboratory they use. If they use a commercial laboratory, a pick-up service for specimens may well be provided. The most important issue is to ensure the quality of the laboratory. Adherence to the standards of the American College of Clinical Pathologists is a good indicator of laboratory quality.

21. What is the approximate cost of the following laboratory tests: complete blood count, platelet count, PT, fasting glucose, bacterial culture, and fungal culture?

CBC	$18	Fasting glucose	$13
Platelet count	$18	Bacterial culture	$32
PT	$29	Fungal culture	$42

22. What are the causes of halitosis?

Halitosis may be caused by local factors in the mouth and by extraoral or systemic factors. Among the local factors are food retention, periodontal infection, caries, acute necrotizing gingivitis, and mucosal infection. Extraoral and systemic causes of halitosis include smoking, alcohol ingestion, pulmonary or bronchial disease, metabolic defects, diabetes mellitus, sinusitis, and tonsillitis.

23. What are the most commonly abused drugs in the United States?

Alcohol	Prescription medications
Marijuana	Tricyclic antidepressants
Cocaine	Sedative-hypnotics
Phencyclidine (PCP)	Narcotic analgesics
Heroin	Anxiolytic agents
	Diet aids

24. What are the common causes of lymphadenopathy?

1. Infectious and inflammatory diseases of all types. Common oral conditions causing lymphadenopathy are herpes infections, pericoronitis, aphthous or traumatic ulceration, and acute necrotizing ulcerative gingivitis.

2. Immunologic diseases, such as rheumatoid arthritis, systemic lupus erythematosus, and drug reactions 3. Malignant disease, such as Hodgkin's disease, lymphoma, leukemia, and metastatic disease from solid tumors

4. Hyperthyroidism

5. Lipid storage diseases, such as Gaucher's disease and Niemann-Pick disease

6. Other conditions, including sarcoidosis, amyloidosis, and granulomatosis

25. How can one differentiate between lymphadenopathy associated with an inflammatory process and lymphadenopathy associated with tumor?

1. Onset and duration. Inflammatory nodes tend to have a more acute onset and course than nodes associated with tumor.

2. Identification of an associated infected site. An identifiable site of infection associated with an enlarged lymph node is probably the source of the lymphadenopathy. Effective treatment of the site should result in resolution of the lymphadenopathy.

3. Symptoms. Enlarged lymph nodes associated with an inflammatory process are usually tender to palpation. Nodes associated with tumor are not.

4. Progression. Continuous enlargement over time is associated with tumor.

5. Fixation. Inflammatory nodes are usually freely movable, whereas nodes associated with tumor are hard and fixed.

6. Lack of response to antibiotic therapy. Continued nodal enlargement in the face of appropriate antibiotic therapy should be viewed as suspicious.

7. Distribution. Unilateral nodal enlargement is a common presentation for malignant disease. In contrast, bilateral enlargement often is associated with systemic processes.

26. What is the most appropriate technique for lymph node diagnosis?

The most appropriate technique for lymph node diagnosis is biopsy or needle aspiration. Needle aspiration is preferred, but is technique-sensitive (see question 63).

27. What are the most frequent causes of intraoral swelling?

The most frequent causes of intraoral swelling are infection and tumor.

28. Why does Polly get parrotitis?

Too many crackers.

29. Why do humans get parotitis?

Infection of viral or bacterial origin is the most common cause of parotitis in humans. Viruses causing parotitis are mumps, Coxsackie, and influenza. Staphylococcus aureus, the most common bacterial cause of parotitis, results in the production of pus within the gland. Other bac teria, such as actinomyces, streptococci, and gram-negative bacilli, also may cause suppurative parotitis.

30. What are common causes of xerostomia?

- Advanced age
- Certain medications
- Radiation therapy
- Sjögren's syndrome

31. What is the presentation of a patient with a tumor of the parotid gland? How is the diagnosis made?

The typical patient with a parotid gland tumor presents with a firm, fixed mass in the region of the gland. Involvement of the facial nerve is common and results in facial palsy. Fine-needle biopsy is a commonly used technique for diagnosis. However, the small sample obtained by such technique may be limiting. CT and MRI are also often helpful in evaluating suspected tumors.

32. What are the major risk factors for oral cancer?

Tobacco and alcohol use are the major risk factors for the development of oral cancer.

33. What is the possible role of toluidine blue stain in oral diagnosis?

Because tolujdjne blue is a metachromatic nuclear stain, it has been reported to be preferentially absorbed by dysplastic and cancerous epithelium. Consequently, it has been used as a technique to screen oral lesions. The technique has a reported false-positive rate of 9% and a false-negative rate of 5%.

34. What are the common clinical presentations of oral cancers?

The two most common clinical presentations for oral cancer are a nonhealing ulcer or an area of leukoplakia, often accompanied by erythema.

35. What percent of keratotic white lesions in the mouth are dysplastic or cancerous?

Approximately 10% of such oral lesions are dysplastic or cancerous.

36. What is a simple way to differentiate clinically between necrotic and keratotic white lesions of the oral mucosa?

Necrotic lesions of the mucosa, such as those caused by bums or candidal infections, scrape off when gently rubbed with a moist tongue blade. On the other

hand, because keratotic lesions result from epithelial changes, scraping fails to dislodge them.

37. How long should one wait before obtaining a biopsy of an oral ulcer?

Virtually all ulcers caused by trauma or aphthous stomatitis heal within 14 days of presentation. Consequently, any ulcer that is present for 2 weeks or more should be biopsied.

38. What is the differential diagnosis of ulcers of the oral mucosa?

- Traumatic ulcer
- Aphthous stomatitis
- Cancer
- Tuberculosis
- Chancre of syphilis
- Noma
- Necrotizing sialometaplasia
- Deep fungal infection

39. Why is it a good idea to aspirate a pigmented lesion before obtaining a biopsy?

Because pigmented lesions may be vascular in nature, prebiopsy aspiration is prudent to pre vent hemorrhage.

40. What are the major causes of pigmented oral and perioral lesions?

Pigmented lesions are due to either endogenous or exogenous sources. Among endogenous sources are melanoma, endocrine-related pigmentation (such as occurs in Addison's disease), and perioral pigmentation associated with intestinal polyposis or Peutz-Jegher's syndrome. Exogenous sources of pigmentation include heavy metal poisoning (e.g., lead), amalgam tattoos, and changes caused by chemicals or medications. A common example of medication-related changes is black hairy tongue associated with antibiotics, particularly or bismuth-containing compounds, such as Pepto-Bismol.

41. Do any diseases of the oral cavity also present with lesions of the skin?

Numerous diseases can cause simultaneous lesions of the mouth and skin. Among the most common are lichen planus, erythema multiforme, lupus erythematosus, bullous pemphigoid, and pemphigus vulgaris.

42. What is the appearance of the skin lesion associated with erythema multiforme?

The skin lesion of erythema multiforme looks like an archery target with a central erythema tous bullseye and a circular peripheral area. Hence, the lesions are called bullseye or target lesions.

43. A 25-year-old woman presents with the chief complaint of spontaneously bleeding gingiva. She also notes malaise. On oral

examination you find that her hygiene is excellent. Would you suspect a local or systemic basis for her symptoms? What tests might you order to make a diagnosis?

Spontaneous bleeding, especially in the face of good oral hygiene, is most likely of systemic origin. Gingival bleeding is among the most common presenting signs of acute leukemia, which should be high on the differential diagnosis. A complete blood count and platelet count should provide data to help to establish a preliminary diagnosis. Definitive diagnosis most likely requires a bone marrow biopsy.

44. A 45-year-oh, overweight man presents with suppurative periodontitis. As you review his history, he tells you that he is always hungry, drinks water almost every hour, and awakens four times each night to urinate. What systemic disease is most likely a cofactor in his periodontal disease? What test(s) might you order to help you with a diagnosis?

The combination of polyuria, polyphagia, polydipsia, and suppurative periodontal disease should raise a strong suspicion of diabetes mellitus. A fasting blood glucose test is the most efficacious screen.

45. A 60-year-old woman presents with the complaint of numbness of the left side of her mandible. Four years ago she had a mastectomy for treatment of breast cancer. What is the likely diagnosis? What is the first step you take to confirm it?

The mandible is not an infrequent site for metastatic breast cancer. As the metastatic lesion grows, it puts pressure on the inferior alveolar nerve and causes paresthesia. Radiographic evaluation of the jaw is a reasonable first step to make a diagnosis.

46. What endocrine disease may present with pigmented lesions of the oral mucosa?

Pigmented lesions of the oral mucosa may suggest Addison's disease.

47. What drugs cause gingival hyperplasia?

- Phenytoin
- Cyclosporine
- Nifedipine

48. What is the most typical presentation of the oral lesions of tuberculosis? How do you make a diagnosis?

The oral lesions of tuberculosis are thought to result from the presence of organisms brought into contact with the oral mucosa by sputum. A nonhealing ulcer, which is impossible to differentiate clinically from carcinoma, is the most common presentation in the mouth. Ulcers are most consistently present on the lateral borders of the tongue and may have a purulent center. Lymphadenopathy

also may be present. Diagnosis is made by histologic examination and demonstration of organisms in the tissue.

49. What are the typical oral manifestations of a patient with pernicious anemia?

The most common target site in the mouth is the tongue, which presents with a smooth, dorsal surface denuded of papillae. Angular cheilitis is a frequent accompanying finding.

50. What is angular cheilitis? What is its cause?

Angular cheilitis or cheilosis is fissuring or cracking at the corners of the mouth. The condition typically occurs because of a localized mixed infection of bacteria and fungi. Cheilitis most commonly results from a change in the local environment caused by excessive saliva due to loss of the vertical dimension between the maxilla and mandible. In addition, a number of systemic conditions, such as deficiency anemias and long-term immunosuppression, predispose to the condition.

51. What is the classic oral manifestation of Crohn's disease?

Mucosal lesions with a cobblestone appearance are associated with Crohn's disease.

52. List the oral changes that may occur in a patient who is receiving radiation therapy for treatment of a tumor on the base of the tongue.

- Xerostomia
- Cervical and incisal edge caries
- Osteoradionecrosis
- Mucositis

53. A patient presents for extraction of a carious tooth. In taking the history, you learn that the patient is receiving chemotherapy for treatment of a breast carcinoma. What information is critical before proceeding with the extraction?

Because cancer chemotherapy nonspecifically affects the bone marrow, the patient is likely to be myelosuppressed after treatment. Therefore, you need to know both the patient's white blood cell count nd platelet count before initiating treatment.

54. What oral findings have been associated with the diuretic hydrochlorothiazide?

Lichen planus has been associated with hydrochlorothiazide.

55. Some patients believe that topical application of an aspirin to the mucosa next to a tooth will help odontogenic pain. How may you detect this form of therapy by looking in the patient's mouth?

Because of its acidity, topical application of aspirin to the mucosa frequently causes a chemical burn, which appears as a white, necrotic lesion in the area corresponding to aspirin placement.

56. What are the possible causes of burning mouth syndrome?

1. Dry mouth
2. Nutritional deficiencies
3. Diabetes mellitus
4. Psychogenic factors
5. Medications
6. Acid reflux from the stomach
7. Hormonal imbalances
8. Allergy
9. Chronic infections (especially fungal)
10. Blood dyscrasias
11. Anemia
12. Iatrogenic factors
13. Inflammatory conditions such as lichen planus

57. What is the most important goal in the evaluation of a taste disorder?

The most important goal in evaluating a taste disorder is the elimination of an underlying neurologic, olfactory, or systemic disorder as a cause for the condition.

58. What drugs often prescribed by dentists may affect taste or smell?

1. Metronidazole
2. Benzocaine
3. Ampicillin
4. Tetracycline
5. Sodium lauryl sulfate toothpaste
6. Codeine

59. What systemic conditions may affect smell and/or taste?

1. Bell's palsy
2. Multiple sclerosis
3. Head trauma
4. Cancer
5. Chronic renal failure
6. Cirrhosis
7. Niacin deficiency
8. Adrenal insufficiency
9. Cushing's syndrome
10. Diabetes mellitus
11. Sjogren's syndrome
12. Radiation therapy to the head and neck
13. Viral infections
14. Hypertension

60. What is glossodynia?

Glossodynia, or burning tongue, is relatively common. Although the problem is frequently related to local irritation, it may be a manifestation of an underlying systemic condition.

61. What questions should a clinician consider before ordering a diagnostic test to supple ment clinical examination?

1. What is the likelihood that the disease is present, given the history, clinical findings, and known risk factors?

2. How serious is the condition? What are the consequences of a delay in diagnosis?

3. Is an appropriate diagnostic test available? How sensitive and accurate is it?

4. Are the costs, risks, and ease of administering the test worth the effort? Matthews, et al: The use of diagnostic tests to aid clinical diagnosis. J Can Dent Assoc 61:785, 1995.

62. Distinguish among the accuracy, sensitivity, and specificity of a particular diagnostic test.

The **accuracy** is a measure of the overall agreement between the test and a gold standard. The more accurate the test, the fewer false-negative or false-positive results. In contrast, the **sensitivity** of the test measures its ability to show a positive result when the disease is present. The more sensitive the test, the fewer false negatives. For example, one problem with cytologic evaluation of cancerous keratotic oral lesions is that of 100 patients with cancer, 15 will test as negative (unacceptable false-negative rate). Consequently, cytology for this diagnosis is not highly sensitive. The **specificity** of the test measures the ability to show a negative finding in people who do not have the condition (false positives).

Matthews, et al: The use of diagnostic tests to aid clinical diagnosis. J Can Dent Assoc 61:785, 1995.

63. What is FNA? When is it used?

No, FNA is not an abbreviation for the Finnish Naval Association. It refers to a diagnostic technique called fine-needle aspiration, in which a needle (22-gauge) on a syringe is used to aspirate cells from a suspicious lesion for pathologic analysis. Many otolaryngologists use the technique to aid in the diagnosis of cancers of the head and neck. It seems to be particularly valuable in the diagnosis of submucosal tumors, such as lymphoma, and parapharyngeal masses that are not accessible to routine surgical biopsy. Like many techniques, the efficacy of FNA depends on the skill of the operator and experience of the pathologist reading the slide.

Cramer H, et al: Intraoral and transoral fine needle aspiration. Acta Cytologica 39:683, 1995.

64. Which systemic diseases have been associated with alterations in salivary gland function?

1. Cystic fibrosis
2. HIV infection
3. Diabetes mellitus
4. Affective disorder
5. Metabolic disturbances (malnutrition, dehydration, vitamin deficiency)
6. Renal disease
7. Cirrhosis
8. Thyroid disease
9. Autoimmune disease (Sjogren's syndrome,myasthenia gravis, graft-vs.-host disease)
10. Sarcoidosis
11. Autonomic dysfunction
12. Alzheimer's disease
13. Cancer

65. What is PCR? Why may it become an important technique in oral diagnosis?

Polymerase chain reaction (PCR) is a technique developed by researchers in molecular biology for enzymatic amplification of selected DNA sequences. Because of its exquisite sensitivity PCR appears to have marked clinical potential in the diagnosis of viral diseases of the head and neck.

66. What conditions and diseases may cause blistering (vesiculobullous lesions) in the mouth?

1. Viral disease
2. Lichen planus
3. Pemphigoid
4. Pemphigus vulgaris
5. Erythema multiforme

67. What are the most common sites of intraoral cancer?

The posterior lateral and ventral surfaces of the tongue are the most common sites of intraoral cancer.

68. What is staging for cancer? What are the criteria for staging cancers of the mouth?

Staging is a method of defining the clinical status of a lesion and is closely related to its future clinical behavior. Thus, it is related to prognosis and is of help in providing a basis for treatment planning. The staging system used for oral cancers is called the TNM system and is based on three parameters: T = size of the tumor on a scale from 0 (no evidence of primary tumor) to 3 (tumor> 4 cm in greatest diameter); N = involvement of regional lymph nodes on a scale from 0 (no clinically palpable cervical nodes) to 3 (clinically palpable lymph nodes that are fixed; metastases suspected; and M = presence of distant metastases on a scale from 0 (no distant metastases) to 1 (clinical or radiographic evidence of metastases to nodes other than those in the cervical chain).

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