

Chairside investigations in dentistry

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Abstract

21st century is the era of “smart work.” It is not how hard you work but how much you get done! So everyone is trying to run with the time. Being oral medicine practitioners, it is our duty to diagnose quickly at the same time accurately. Chairside investigations are simple procedures which are performed by a dentist along the chairside. They are easy to perform, non-invasive, quick diagnostic techniques which make diagnosis earlier and easier. They are not only beneficial in dentist’s point of view but also in patient’s point of view as they are cost-effective. Therefore, to become a capable dental practitioner, dentists must know the importance of these diagnostic procedures and perform these investigations routinely in their dental practice.

Instead of making this narrative review unnecessarily lengthy, here we have put forth a detailed classification of the chairside investigations in dentistry which will increase the curiosity of readers to go to the depth of each investigation using references provided in the article. In this overview article, we are trying to give a bird’s eye view about important chairside investigations in dentistry.

Introduction

21st century is the era of “smart work.” It is not how hard you work but how much you get done! So everyone is trying to run with the time. Being oral medicine practitioners, it is our duty to diagnose quickly at the same time accurately. Case history and proper chairside investigations could diagnose the disease better.

Investigations are an extension of the physical examination which include chairside investigations, radiographic investigations, and lab investigations.^[1] Chairside investigations are simple tests performed along the chairside. Chairside investigations are easy to perform, non-invasive, rapidly doing procedures which even do not require big, expensive equipment.^[1] These investigations are useful in both dental hard and soft tissue examination.^[2] Moreover, we can get the results of these investigations within very less time, which helps in early and effective management of the patients. They play a key role in narrowing of differential diagnosis of the patient’s disease. In recent decades, these investigations have showed astonishing results and gained popularity among dental practitioners. Early diagnosis would help in conservative therapeutic approaches and a short recovery time with better prognosis.

Most of the time they serve as an “extra eye” to the practitioner. They do not only help in diagnosing oral diseases but also in diagnosing systemic diseases which the patient might be unaware of. Moreover, as the tests are simple and results are

quick, patients are seen to be comfortable and relaxed and they believe on the test results when they see the results with their own eyes. By performing these investigations, we can provide efficient healthcare, enhancing the quality of care and most importantly in low cost! Being a dentist, everyone should know these investigations thoroughly. There are some upcoming advances in such investigations. But at the end, the oral practitioner should decide what is suitable for the patient.

In this review article, we are trying to give a bird’s eye view about important chairside investigations in dentistry. The only aim of this article is to spread awareness of chairside investigations among general dental practitioners who balk to confidently diagnose the oral diseases.

Commonly Done Chairside Investigations in Dentistry

1. Investigations for teeth examinations
 - a. Pulp vitality tests^[3,5]
 - i. Thermal tests Commonly done diagnostic pulpal tests
 - a. Cold test
 - b. Heat test.
 - ii. Electric pulp testing
 - iii. Other tests
 - a. Pulse oximetry^[3,4]
 - b. Test cavity^[3,4]
 - c. Selective anesthesia^[3,4]

- d. Laser Doppler flowmetry^[6]
- e. Photoplethysmography^[7]
- f. Spectrophotometry^[8]
- g. Surface temperature measurement^[9]
- h. Caries detection tests:
 - Using caries dyes^[10]
 - By fiberoptic transillumination and digital fiberoptic transillumination^[11]
 - By laser fluorescence^[12]
 - By diagenodent^[13]
 - By Endoscope^[3,4]
- i. Tests to disclose plaque using plaque disclosing agents^[14]
- j. Mobility test^[2]
- k. Test to detect cracked tooth Bite test.^[3,4]
- 2. Test for detection of vascular lesions
 - a. Diascopy.^[15]
- 3. Tests for detection of potentially malignant lesions and conditions
 - a. Vital staining^[16]
- i. Toluidine blue staining
- ii. Lugol iodine
- iii. Methylene blue
- iv. Rose Bengal.
 - b. Light based detection system^[17]
- i. Tissue fluorescence imaging
- ii. Chemiluminescence.
 - c. Cytological technique^[18]
- i. Oral brush biopsy
- ii. Exfoliative cytology
- iii. FNAC.
 - d. Histological technique^[19]
- i. Incisional biopsy
- ii. Excisional biopsy
- iii. Punch biopsy
- iv. Trepine biopsy
- v. Drill biopsy.
- 4. Investigation for maxillary sinus
 - a. Transillumination test^[20]

Investigations for saliva, taste, and oral malodor evaluation

- a. Collection of whole saliva^[1,21]
- i. Draining technique
- ii. Spitting
- iii. Suction methods
 - a. Parotid collector – Carlson crittenden cup
 - b. Submandibular – Segregator
 - c. Minor salivary gland – Periotron.
 - b. Tests for xerostomia^[22]
- 1. Tongue blade sign
- 2. Lip stick test.
 - c. Tests for detection of taste disorders
- 1. Electrogustometry^[1,23]
- 2. Whole mouth test/sip and spit method.
 - d. Tests for oral malodor^[24]
- i. Organoleptic method
- ii. Gas chromatography

- iii. Portable Sulfide monitors/Halimeter
- iv. Electronic nose
- v. BANA (Benzoyl-DL-arginine- α-Naphthylamide) test.
- 5. Tests for TMJ and muscles of mastication
 - a. Gnathodynamometry.^[25]
- 6. Tests to detect mouth breathing^[26]
 - a. Butterfly test
 - b. Water in mouth test
 - c. Double sided mouth mirror.
- 7. Investigations for allergy
 - a. Skin prick test^[27]
 - b. Patch test.^[28]
- 8. Investigation for neuromuscular disorder
 - a. Diagnostic nerve blocking.
- 9. Miscellaneous
 - a. Test for Measurement of Blood glucose
 - b. Test for trauma from occlusion^[29]
 - c. Fremitus test.
 - d. Tests to evaluate lacrimal function^[30]
- i. Schirmer e test
- ii. Rose Bengal test
- iii. Tear film breakup time.
 - e. Oral fluid nano sensor test (OFNASET).

Conclusion

An early diagnosis of various oral diseases and dysfunctions can be done easily with the help of numerous chairside investigations. Here, we have listed and provided a compiled classification of common chairside investigations performed in dentistry. Instead of unnecessarily exposing patients to expensive, invasive investigations, we should perform these chairside investigations to provide an efficient promising healthcare system. And we hope not only specialists but also general dental practitioners will get themselves well acquainted to these investigations.

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