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President’s Message

I am happy to know that Dental Probe Journal is committed to continuously reporting new research finding & exploring new idea, concepts, methods & technology. We are confident that our journal will devote to bring the new update and advances in dentistry from clinical aspect and academic point of view.

Your’s In IDA

Dr. Manoj Chandak
President, IDA - Nagpur Branch

Hon. Secretary’s Message

Dental probe journal is committed to continuously reporting developments in the field of dental sciences that would help dentists to recognize & address the patients problem in an efficient and comfortable manner.

Your’s In IDA

Dr. Vaibhav Karemore
Hon. Secretary, IDA - Nagpur Branch

EDITORIAL

Sharing of information & knowledge, exchange of experience and expertises are very important for successful dental practice.

Dental probe brings a new research work and advances in dentistry which is mandatory for the growth and success of day to day dental practice. We have been making sincere efforts to bring to you articles with new knowledge & information.

Your’s In IDA

Dr. Anand N. Wankhede
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Most Neglected yet important in clinical practice
“Denture Adhesive” a review

Abstract
Since people began using denture adhesives more than 200 years ago, dentists have been slow to acknowledge their place in prosthetic dentistry. Denture Adhesives are material used to adhere a denture to the oral mucosa. Most dentist advice the use adhesive in the clinical practice but yet not have clear idea of denture adhesive literature states it is used in clinical practice yet a neglected topic of discussion. In current article it is an attempt to discuss various adhesive available in market, their composition, its mechanism of action, method of application and removal of denture adhesive and the side effects of it.

Introduction
With increasing life expectancy, complete denture is one of the major treatment modalities in Prosthodontics for Indian scenario. One of the major contributing factors for the success of a complete denture is perceived retention of the prosthesis by the patient. Those who wear complete dentures, are often confronted with varying degrees of looseness of their prosthesis and complain of discomfort and/or reduced masticatory function or speech.

Retention is defined in GPT as that quality inherent in the dental prosthesis acting to resist the force of dislodgment along the path of placement. The enhancement of retention and stability, which are major properties that determine the performance of a removable prosthesis, has always been a goal of prosthetic dentistry. Retention of dentures in the oral cavity is controlled by a complex interrelationship of physical, biological, physiological and mechanical properties. Denture adhesive has become a common adjuvant in complete denture treatment which not only improves the retention but also positively impacts the patient comfort and confidence level. Denture adhesive refers to a commercially available, nontoxic, soluble material that is applied to the tissue surface of the denture to enhance denture retention, stability, and performance.

In the present article denture adhesive has been reviewed in detail.

History
The use of denture adhesives, started in the late 18th century, before which adhesives were not part of the dentist’s armamentarium. Adhesives or fixatives used in the 19th century, were formulated by mixing vegetable gums to produce a material that absorbed moisture from the saliva and swelled to a mucilaginous substrate that adhered to the mucosa of the mouth and denture. The earliest patent pertaining to adhesives was issued in 1913 followed by others in 1920s and 1930s. The first reference by the American Dental association to denture adhesives

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came from the Accepted Dental Remedies of 1935 in which the Council of Dental Materials, Instruments, and Equipment admitted that these products were nonmedical.1

**Ideal Requirements of Denture Adhesive**

1. It should be biocompatible and non-toxic, odour less and tasteless.
2. It should be easy to remove, clean and replace.
3. It should not cause damage to denture base material and soft liner.
4. It should exhibit antimicrobial properties.
5. It should have a longer shelf life.
6. It should be long lasting (8-12 hours)
7. It should be economic.

**Classification**

Denture adhesive can be classified in various ways such as on based on its solubility as soluble and insoluble. It can also be classified on bases of its composition as, zinc containing and zinc free, with medicaments and without medicaments some of denture adhesive has antifungal agent which can be used to treat denture stomatitis. It can also be classified on its base composition as oil based and water based adhesive (Table 1).

**Composition**

Denture adhesive mainly contains adhesive group i.e carboxymethylcellulose it is a short acting polymer, polymethylvinyl ethermaleic anhydride it is a long acting polymer. These adhesives are mainly used in food industry. But due to its short acting action divalent salts like zinc and calcium were added to denture adhesive to prolong its action by Shah et al. there have been several reports that excess of zinc intake from denture adhesive, results in bone marrow suppression.4,9 These haematological abnormalities are due to zinc induced copper deficiency; copper supplementation with removal of external zinc source, which was identified as zinc containing denture adhesive promptly resolved the symptoms.4,9 Copper deficiency has the potential to induced neurological disorder in human and animal, but this requires relatively long duration of exposure to zinc.1,4,9 Zinc containing formulations of denture adhesive are being phased out of the market; however, the adverse effect resulting from improper use of denture adhesive emphasise the importance of patient education when using these material.1 Adhesive contain a binder in it binds all the composition together binder such as Petrolatum, mineral oil, polyethylene. For prevention of clumping it has

<table>
<thead>
<tr>
<th>Based on Solubility</th>
<th>Soluble e.g. Fixodent, fitty dent</th>
<th>Insoluble e.g. secure comfort strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on Composition</td>
<td>Zinc Containing e.g. Super Poligrip Original Fixodent Original Fixodent Fresh Fixodent Control Fixodent Complete Fixodent Comfort Fixodent Control Plus Scope Flavor Super-Haftcreme Extra Stark</td>
<td>Zinc Free e.g. Super Poligrip Free Super Poligrip Comfort Seal Strips Super Poligrip Powder Protefix Adhesive Cream, Extra-Strong Fittydent Super Adhesive Cream</td>
</tr>
<tr>
<td>Based on base composition</td>
<td>With Medicament e.g. Geiserpharma</td>
<td>Without Medicament e.g. Fixodent plus, Fitty dent</td>
</tr>
<tr>
<td>Base on base composition</td>
<td>Oil based eg Olivafix</td>
<td>Water based eg Fixodent plus, Fitty dent</td>
</tr>
</tbody>
</table>
Mechanism of action

The physical factors effecting denture retention are based on a principle derived by Stefan over a century ago, which states that the force required to pull two disks or plates apart is directly proportional to the viscosity of the liquid between them. Denture adhesive increases the viscosity of the saliva, it swells 50-150% by volume in presence of water, and fills space between the intaglio surface of denture and basal seat. Thus enhance the physical factors adhesion, cohesion, interfacial surface tension.

The correct application of denture adhesive to a denture is as follows:

1. Clean and dry the tissue-bearing surface of the denture.
2. A proper amount of denture adhesive should be used. For maxillary denture 3-4 pea sized increments of the adhesive cream can be applied to the anterior ridge, midline and palate. For mandible, 3 pea sized increments to different areas of the base should be sufficient. When using powder adhesive the base of the denture should be wet before application. Pad adhesive should have the correct size and be trimmed to fit the shape of the denture, if needed. 1
3. Seat denture and hold it firmly by hand pressure for 5 to 10 seconds.
   a. Remove excessive adhesive (extruded beyond the denture borders) by gauze or tissue wipes.
   b. Instruct patient to close the jaw into centric occlusion several times to distribute the adhesive in an even thin layer between the mucosa and the denture bases.

Method of Removal of denture adhesive.

1. Powders removed by brush from the denture using warm water and from the oral cavity with a soft brush and toothpaste.
2. Creams are removed by scrubbing the denture under very warm water with a denture brush and from gums by first holding hot water in your mouth to help soften the adhesive.
3. Residual adhesive material remaining in the dentures can be removed with tissue wipes and cotton

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Content</th>
<th>Example</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adhesive</td>
<td>Sodium carboxymethyl cellulose Polymethyl vinyl ether–maleic anhydride Polyvinylpyrrrolidone(povidone).</td>
<td>27-54</td>
</tr>
<tr>
<td>2</td>
<td>Divalent salts for long lasting effect</td>
<td>Zinc &amp; Calcium</td>
<td>3-16%</td>
</tr>
<tr>
<td>3</td>
<td>Binders</td>
<td>Petrolatum, mineral oil, polyethylene</td>
<td>10-16%</td>
</tr>
<tr>
<td>4</td>
<td>Anticlumping agents</td>
<td>Silicon Dioxide, Calcium Sterate</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Flavouring agents</td>
<td>Menthol, Peppermint Oils.</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Colouring agents</td>
<td>Red Dye</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Preservatives</td>
<td>Methyl Paraben, PolyParaben</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Composition of denture adhesive
applicators soaked with orange solvent.

4. Avoid scratching or mutilating the tissue-bearing surface of the denture.

**Literature on denture adhesive says**

There is no longitudinal report of local tissue reaction to denture adhesive. However, there have been several reports that excess of zinc intake from denture adhesive results in bone marrow suppression. Various studies based on biocompatibility of denture adhesive show that, keratin level of mucosa decrease with prolong use of adhesive. Studies did not show any inflammatory response of adhesive to the mucosa except in those patient with poor oral hygiene. Studies also indicate that there is no statistical alteration in population of C.albicans, streptococcus M in saliva, palate denture between adhesive uses & non users.

Studies showed that there is an increased denture base retention and stability, but substantial loss of retention in mandibular dentures after mastication and sipping. There was no recognizable effect of denture adhesives on denture mobility in patients with mild alveolar resorption but have more significant results in individuals with poor denture bearing tissues. Improvement in occlusal forces & Significant improvement of maximum incisal force seen for both new and previous complete dentures patients with unfavourable bearing tissues.

**Indication**

1. To improve retention stability and masticatory efficiency.
2. Provide psychological benefits to the patient.
3. Secure interim immediate or new dentures.
4. Apply medications via the oral mucosa.
5. Simplify placement for specific condition, like patients with xerostomia, geriatric patients, patient with poor muscle tone (such as those with Parkinson’s disease).
7. Retention of maxillofacial prosthesis.

**Contraindication**

1. Denture adhesive should aid but not substitute well-fitting denture.
2. Denture adhesive should not be used with ill-fitting dentures or by patients who tend to overuse denture adhesives.
3. Denture adhesive should not be used by patients who have medication induced xerostomia where adhesives require ample saliva.
4. Not for use with immediate, temporary or transitional dentures where trauma could result from inadequate hygiene or adherence to suture.

**Conclusion**

As dentists, it is our responsibility to be knowledgeable and caring enough to assist each patient in adapting to dental prostheses. This may require recommendation of denture adhesives and counselling on their use. Also, continued research and vigilance into the use of denture adhesives is essential.

**Reference**

Infection Control in The Dental Clinic And Laboratory: A Review

Introduction:

The oral cavity contains a wide variety of microorganisms which can cause various infectious diseases. Since dental professionals work in an environment that is bathed by blood and saliva of the patients, they are at a higher risk of contacting infectious diseases. In 2003, the Centre for Disease Control and Prevention of the United States of America (CDC) updated their guidelines for infection control in dental settings.

The use of effective infection control procedures and universal precautions in the dental office will prevent cross contamination that could extend to dental professionals, dental office staff, dental technicians and the patients. Technicians are particularly vulnerable to microbial cross-contamination from the impressions they receive from dental offices. Casts poured from impressions can also harbour infectious microorganisms that can be distributed throughout the laboratory when the casts or dies are trimmed.

The aim of this review is to provide a background about the possible ways of transmission of infection spreading, and procedures recommended for preventing their spread in the discipline of prosthodontics.

Sterilization is a process by which all forms of microorganisms are destroyed, including virus, bacteria, fungi, and spores. Disinfection is a less lethal process than sterilization. It eliminates all recognized pathogenic microorganisms but not necessarily all microbial forms i.e. bacterial endospores on inanimate objects.

Infection control procedures:

R.R. Runnels in 1988 gave basic infection control procedures as mandatory for the control of infectious diseases in dental practice. These are:

* All dental treatment personnel should wear latex gloves during treatment.
* All dental treatment personnel should wear masks covering the nose and mouth during treatment.
* All dental treatment personnel should wear protective eyewear during treatment.
* All items used in the oral cavity should be sterilized.

* All “touch & splash” surfaces should be disinfected with an EPA registered disinfectant.
* Contaminated material should be carefully disposed by placing it in sealed and marked containers.

Management of Instruments

According to the CDC, dental instruments are classified into three categories depending on the risk
of transmitting infection:

1) Critical instruments such as forceps, scalpels, bone chisels, scalers and surgical burs which penetrate soft tissue or bone, or enter into or contact the bloodstream should be sterilized after each use.
2) Semi-critical instruments like mirrors, impression trays and amalgam condensers that do not penetrate soft tissues or bone but contact mucous membranes or non-intact skin should also be sterilized after each use.
3) Non-critical instruments that come into contact only with intact skin such as external components of x-ray heads have a relatively low risk of transmitting infection; and, therefore should be disinfected.

Disinfection of Impressions

Many studies have been performed to evaluate effects of various disinfectants on different types of impression materials. No single disinfectant is compatible with all impression materials.

Impression must be rinsed to remove saliva, blood and debris and disinfected before being sent to the laboratory. Simple washing removes 90% surface bacteria. By disinfection 100% removal is achieved.

Disinfection by spraying: The rinsed impression is sprayed with an acceptable disinfectant and put in plastic zipped bag and sprayed. The bag is sealed to create a “charged atmosphere”. After the end of the exposure time, the impression is rinsed in running water to remove the excess.

Advantages of this method include use of less disinfectant as compared to immersion but the disadvantage is that it is not as effective as immersion and the disinfectant may be released into air increasing occupational exposure.

Disinfection by immersion:

Preferred over spraying as it provides a constant contact of the disinfectant with all surfaces of the impression. It is done by placing the impression in a zipped plastic bag with the appropriate disinfectant.

Disinfection of Impressions

1) Irreversible hydrocolloid: Alginate

Current CDC protocol is to use synthetic phenols as disinfectants. Ten minutes spray with sodium hypochlorite is also effective. Spraying with disinfectants does not affect the dimensional stability as compared to immersion.
Recommended: Chlorine compounds or iodophors

2) Reversible hydrocolloid: Agar

Spraying with sodium hypochlorite 1:10 for 10 min or Iodophor 1:213 is effective. The impression should not be immersed in alkaline gluteraldehyde.

3) Polysulfide

The impression should be rinsed and immersed in sodium hypochlorite 1:10 for 10 min. Disinfectants requiring more than 30 minute exposure time are not recommended.
Recommended: Glutraldehyde, chlorine compounds, iodophors, phenols

4) Addition silicone

The material is susceptible to damage by neutral gluteraldehyde. Immersion longer than 15 min because longer time may cause the surfactant in the hydrophilic polysiloxane to leach out and render the impression less hydrophilic.
Alternative-iodophor

5) Condensation silicone
The impression material is unaffected by immersion disinfectant provided that the disinfection time is short. 
Recommended: 2% gluteraldehyde, Sodium hypochlorate- 1:10 for 10 min

6) Polyether

The impression is subjected to dimensional change if immersed for more than 10 minutes because of the hydrophilic nature of the material. ADA recommends any of the disinfectant classes, with short term exposure to avoid distortion. 2% Gluteraldehyde provides satisfactory disinfection. Recommended: chlorine compounds or iodophors

Zinc oxide eugenol impression material

Immersion is preferred. Spraying may be used for bite registrations. The material is not compatible with chlorine compounds. Recommended: Gluteraldehydes or iodophors

Impression compound

For the disinfection of this material, phenolic spray can be used. Recommended: Iodophors or chlorine compounds.

Impression trays

Plastic disposable trays should be discarded after single use. Sodium hypochlorite can be used as a disinfectant on aluminium or chrome-plated trays but these should be monitored for corrosion. Impression trays can also be heat-sterilized.

Custom acrylic resin impression trays should be disinfected by spraying with surface disinfectants or immersing in either 1:213 iodophor or 1:10 sodium hypochlorite. After disinfection, they should be rinsed to remove any residual disinfectant.

Disinfection of Other Materials or Instruments

Disinfection of gypsum cast

It is preferable to disinfect the impression so that the cast will not have to be disinfected as these are difficult to disinfect without causing damage. ADA recommends that stone casts be disinfected by the spraying until wet or immersing in a 1:10 dilution of sodium hypochlorite or an iodophor. Investigators submerged die stone models in a variety of disinfectants and found that with 1:10 sodium hypochlorite and 1:213 iodophor, undesirable physical effects on set die stone ranged from none to minimal.

Disinfection of prosthesis

The ADA recommends disinfection by immersion in iodophors or chlorine compounds. Although both of these disinfectants are corrosive, studies have shown little effect on chrome cobalt alloy with short-term exposure (10 minutes) to iodophors or 1:10 hypochlorite. Damage of heat cured denture base resin has been shown to occur after only 10 minutes of immersion in a glutaraldehyde with phenol buffer, although immersion in 2% alkaline glutaraldehyde did not damage the acrylic surfaces. Fixed metal/porcelain prosthesis may be disinfected by immersion in gluteraldehydes, diluted hypochlorite.

Oral Safe is a germicide-deodorant that is harmless if ingested. It destroys 99 percent of microbes on removable appliances during 10 minutes of submersion. A three-minute procedure that combines the use of a germicide-deodorant with ultrasonic energy kills 10 times more microorganisms than passive submersion. Also, microwave disinfection for 3 minutes at 650 kilowatts has shown good result. After disinfection and
thorough rinsing, acrylic items can be stored in
diluted mouthwash until inserted.

**Polishing lathes** (pumice and dry) should be
disinfected by pumice solution which can be made by
suspending the pumice in tincture of green soap or
other surfactant and adding an effective disinfectant
solution to the mix.

**Rubber items** (spatula & rubber bowls) and
saliva ejectors are sterilised byethylene oxide
sterilization. Dry or moist heat sterilization may cause
damage to these, hence are avoided.

**Hand pieces** may be sterilised by steam, dry
heat or ethylene oxide sterilization and Airrotor burs
may be sterilised by either moist heat or dry heat
sterilisation.

**Shade guides** should be cleaned and
disinfect ed to avoid cross contamination. If iodophors
are used on shade guides, they should be wiped with
water or alcohol after the exposure time to remove
any residual disinfectant.

**Wax bites / rims**, bite registrations should be
disinfect ed by the spray wipe spray method using an
iodophor as recommended by the ADA. Rinse spray
may be more appropriate for wax bites. These
itemsshould be rinsed again after disinfection to
remove any residual disinfectant.

Bite registrations made of various materials
such as ZOE or compound can be handled in the same
manner as impressions of the same materials. These
registrations also can be disinfected, using the rinse
spray rinse technique, with most EPA registered
hospital level tuberculocidal disinfectants used as
sprays (chlorine compounds should not be applied to
ZOE).

Non-sterilizable equipments such as some
face bow components must be cleaned with soap and
water and disinfected with a hospital-level
disinfectant if they become contaminated. The
method of choice is spraying or soaking these items in
the disinfectant in a separate container or bag.
Iodophors, chlorine solutions, glutaraldehydes or
phenols are all acceptable for this step. It is important
to remember that most immersion disinfectants can
only be used once.

**Conclusion**

The increased awareness of the consequences
of cross- contamination with hepatitis B virus (HBV)
and HIV during dental procedures is having a
growing impact on attitudes towards infection control
in the dental clinic and laboratory.

Dentists must ensure that a basic infection
control procedure is observed when treating patients
and additional control procedures are observed in the
fabrication and handling of the impressions and
dental prosthesis.

Dental offices and dental laboratories should
co-ordinate to control the potential cross-infections
between the two disciplines.

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Abstract:
Successful osseointegration is a prerequisite for functional dental implants. Continuous monitoring in an objective and quantitative manner is important to determine the status of implant stability. Historically, the gold standard method used to evaluate degree of osseointegration was microscopic or histologic analysis. However, due to the invasiveness of this method and related ethical issues, various other methods of analysis have been proposed: radiographs, cutting torque resistance, reverse torque, modal analysis, and resonance frequency analysis. This review focuses on the methods currently available for the evaluation of implant stability.

Key words: cutting resistance analysis, implant stability evaluation, radiographic assessment, resonance frequency analysis, reverse torque test

Introduction:
Fruitful osseointegration is primary for practical dental implants, and primary implant stability is primary for effective osseointegration. Implant stability is the absence of clinical mobility. Implant instability could bring about fibrous encapsulation with resultant disappointment. Primary implant stability at placement is a mechanical wonder that is identified with the nearby bone quality and amount, the sort of implant and arrangement procedure utilized. Secondary implant stability is the expansion in dependability inferable from bone arrangement and rebuilding at the implant/tissue interface and in the encompassing bone. \[1,2\]

Under defined conditions, early and immediate loading protocols have now been perceived to be reasonable other options to the established 1-or 2-stage delayed loading approaches. Hence, the clinician needs dependable and strong target rules to decide on an individual premise the visualization of a given implant, if immediately loaded, early loaded within 6-8 weeks or left traditionally to heal for a 3-6 months’ time span. \[3\]

Generally, the gold standard technique used to assess the level of osseointegration was microscopic or histologic analysis. \[4\] However, due to the invasiveness of this strategy and related moral issues, different techniques for analysis have been proposed; clinically checking for mobility with the assistance of limit finished instruments, radiographs, cutting torque resistance, reverse torque and resonance...
frequency analysis (RFA).
Measuring insert stability underpins using sound judgment about when to load, permits profitable convention decision on a patient-to-patient basis, demonstrates circumstances in which it is best to unload, bolsters great correspondence and expanded trust and gives better case documentation.\textsuperscript{[5]} The techniques to decide implant stability clinically are clinical observation, percussion test, switch torque test, cutting torque protection analysis, Periotest, RFA.

**Clinical Perception:**

The clinical view of primary implant stability is much of the time considering the portability identified by limit finished instruments. It’s an exceptionally inconsistent and irregular strategy. It can likewise be checked by the cutting protection of the implant amid its addition. The sentiment "great" stability might be highlighted if there is the feeling of an unexpected stop at the seating of the implant. Root types of tapered implants frequently have a geometry that will give a firm stop and maybe a bogus impression of high security.\textsuperscript{[6]}

**Percussion Test**

The percussion test may include the tapping of a mirror handle against the implant carrier and is intended to evoke a ringing sound from the implant as a sign of good stability or osseointegration. Percussion tests most likely give more data about the tapping instrument, and will, best case scenario just yield poor subjective data.\textsuperscript{[6]}

**Reverse torque test**

Use of a reverse or unscrewing torque has additionally been proposed for the appraisal of implant stability at the time of abutment connection.\textsuperscript{[7]}

Implants that turn under the connected torque are considered disappointments and are then removed. Nevertheless, the implant surface during the time spent osseointegrating, though gradually, may break under the connected torque stretch. Besides, as animal tests have exhibited the re-integration of released and rotationally mobile implants, the invert/reverse torque testing has fallen into notoriety\textsuperscript{[8]}

**Cutting torque protection analysis**

The energy required for a current-fed electric engine in removing a unit volume of bone amid implant surgery is measured.\textsuperscript{[9,10,11]} The energy corresponds to bone thickness, which is one of the variables deciding implant stability. Nonetheless, as far as possible value has not been set up, which can indicate potential disappointment of the implant. Also, it must be utilized amid the surgery and not as an analytic guide, and it can't evaluate the secondary stability by new bone arrangement and remodeling around the implant.\textsuperscript{[3]}

**Periotest**

It is a gadget which is an electrically determined and electronically observed tapping head that percusses the implant for a total of 16 times. The whole measuring methodology takes around 4 seconds. The instrument incorporates a tapping bar that effects the projection/implant gathering. The bar is drawn by an impetus curl toward the affecting surface and basically moves at a steady speed from the minute it leaves the hand piece until the point that it impacts the surface. This implies over a specific separation (around 4 mm), the tapping pole is moving at a similar speed and is intended to affect the surface whenever amid this steady speed travel. The finish of
the pole inside the hand piece is inflexibly associated with an accelerometer, which creates a yield relative to its increasing speed. The readings are from −8 to +50 and are deciphered as in [Table 1].

<table>
<thead>
<tr>
<th>Reading</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>−8 to 0</td>
<td>Good osseointegration, implant can be loaded</td>
</tr>
<tr>
<td>+1 to +9</td>
<td>Clinical examination is required, in most cases loading is not possible</td>
</tr>
<tr>
<td>+10 to +50</td>
<td>Osseointegration is not sufficient, implant cannot be loaded</td>
</tr>
</tbody>
</table>

The variables that impact the Periotest value are the nature of the hard tissue in the locale of the implant, with the goal that no values can be considered as proper for higher or bring down degrees of coordination. It is an element of the separation from the implant spine to the time when the bar impacts the projection. These varieties recommend that for implants, there is no supreme value that can be viewed as satisfactory; rather, varieties that happen after some time might be more significant.

In vitro assessments uncovered that no measurably significant distinction existed in measuring Periotest values from the administrator to administrator, and in addition abnormal state of repeatability between various Periotest units. Effectively incorporated dental implants have yielded an extensive variety of security readings with the Periotest. This range in values is accepted to reflect bone thickness at the implant interface, which is identified with implant area.

The estimations are primarily influenced by excitation conditions, for example, heading and position. The estimations must be made in the mid buccal district and be opposite to the implant tomahawks. Considering the intra oral condition, it is extensively simple to make estimations on front implants while it isn't feasible for molars inferable from the buccal mucosa. The Periotest can't analyze a "marginal" case or "an implant in the process of osseointegration." It doesn't reflect the level of peri-implant bone and in this way, can't be substituted for radiography.

**Resonance Frequency Analysis**

It is a noninvasive indicative strategy that measures implant stability and bone thickness at different time focuses utilizing vibration and auxiliary guideline analysis. Two industrially gadgets have been produced to survey implant soundness. The first (electrical) technique utilizes an immediate association (wire) between the transducer and the resonance frequency analyzer. The second strategy utilizes attractive frequencies amongst transducer and resonance frequency analyzer. In the electronic gadget, the transducer is L formed cantilever shaft which associates with the implant by means of a screw connection. A piezoelectrical crystal on the vertical bit of the L shaft is utilized to animate the implant /transducer complex; second piezoelectric crystal on the inverse side of the pillar is utilized as an accepting component to recognize the reaction of the bar.

The new attractive RFA gadget has a transducer, a metallic pole with a magnet to finish everything, which is screwed onto an implant or abutment. The magnet is energized by an attractive heartbeat from a remote test. The beat span is around 1 ms. After excitation, the peg vibrates unreservedly, and the magnet prompts an electric voltage in the test curl. That voltage is the estimation flag inspected by the resonance frequency analyzer. The electronic gadget and the attractive gadget are fit for measuring comparative changes; however, the attractive gadget
brings about higher implant stability quotient (ISQ) value when measuring the stability of non-submerged dental implant.

With this strategy, implant stability is measured either by deciding the resonance frequency of the implant bone complex or by perusing an ISQ value given by the Osstell device (Integration Diagnostics AB, Gothenburg, Sweden) or Penguin RFA (Neoss, Gothenburg, Sweden). Traditionally, the ISQ has been found to fluctuate near 40 and 80, the higher the ISQ, the higher the implant stability. A significant increment or reduction in implant stability could be recognized with this strategy that generally couldn't be clinically seen. The components influencing the readings are powerful implant length, bone quality and amount, implant length, distance across and shape. Successful implant length is the length of the exposed threads and abutment height. It is contrarily relative to the resonance frequency.

Implant stability can be resolved for implants with an ISQ of 47. All implants with an ISQ more than 49 osseointegrated when left to heal for 3 months. All implants with an ISQ more than 54 osseointegrated when quickly loaded. For implants with low ISQ values a reduction in implant stability should caution the specialist to present these implants to a more tightly follow-up plan and to take extra prudent estimations as far as emptying until implant strength is recovered or if non-loaded to check for mechanical injury or potentially disease. For implants with high ISQ values, diminishment of implant strength amid the first 12 weeks of mending ought to be considered as a typical occasion that ought not require change of routine development.

The downsides with this innovation are that the transducer is restricted to an arrangement of 60 estimations, along these lines making the strategy rather costly. With a specific end goal to play out the RFA, a transducer is fixed to the implant. This bar observing all implants that help a solidified reclamation.

**Conclusion:**

Even though there are different techniques which help to decide implant soundness, the number factors influencing the outcomes makes it hard to go to a basic value which can decide the achievement, disappointment or long-haul guess of an implant. Thus, more research is required to devise a precise instrument which will help gage the implant stability

**References**

8. Ivanoff CJ, Sennerby L, Lekholm U.


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