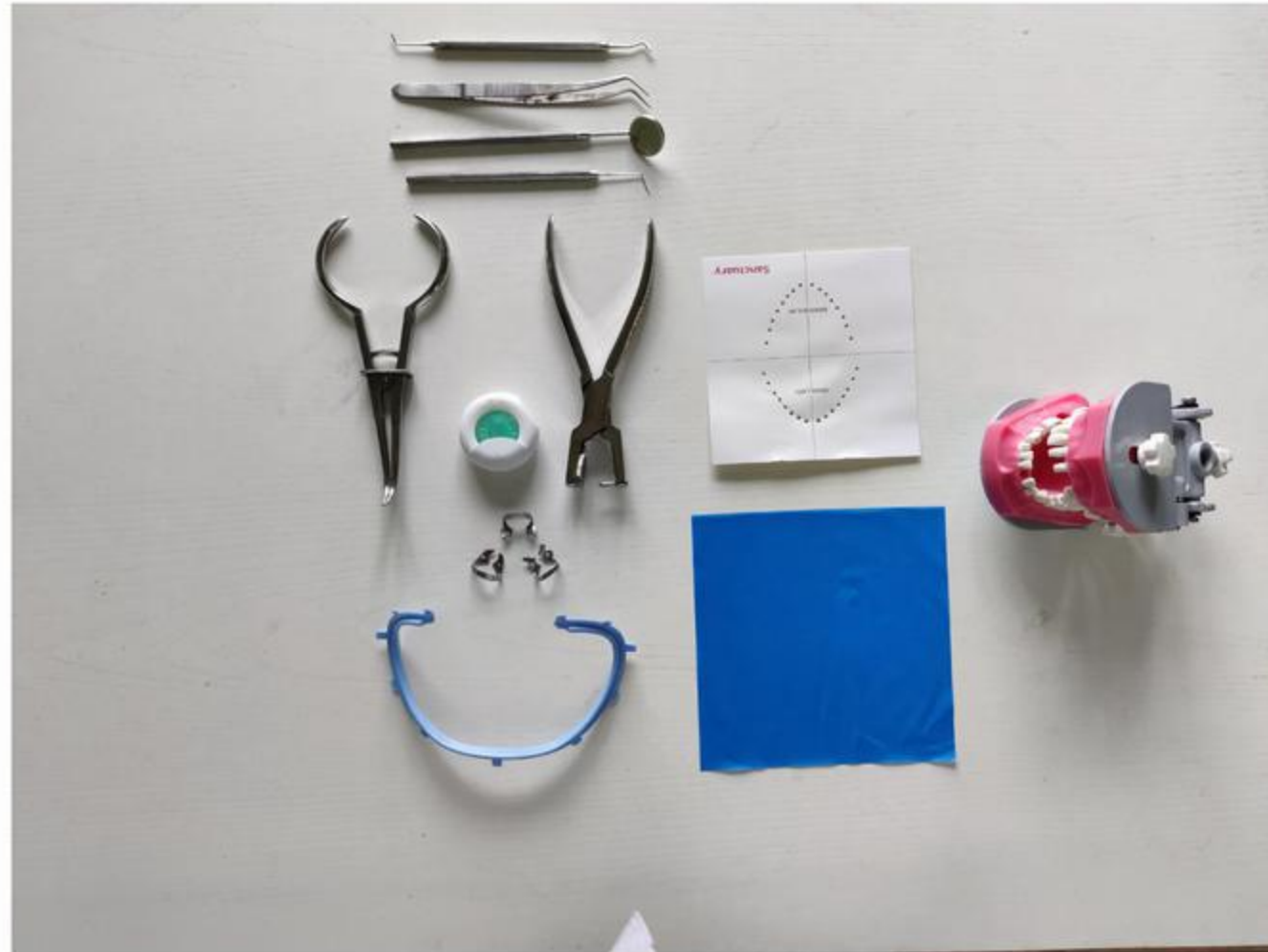
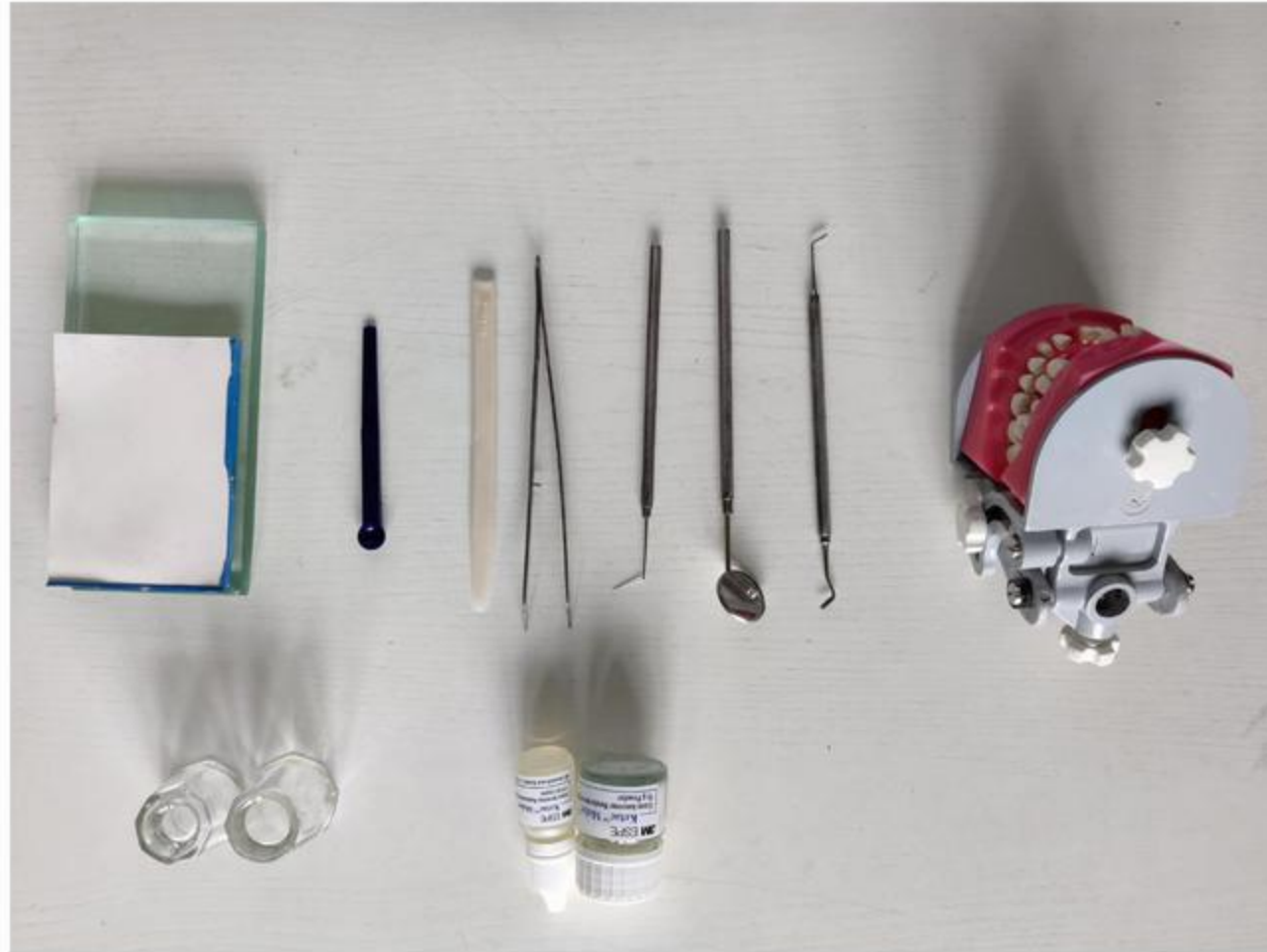


Rubber Dam Demonstration



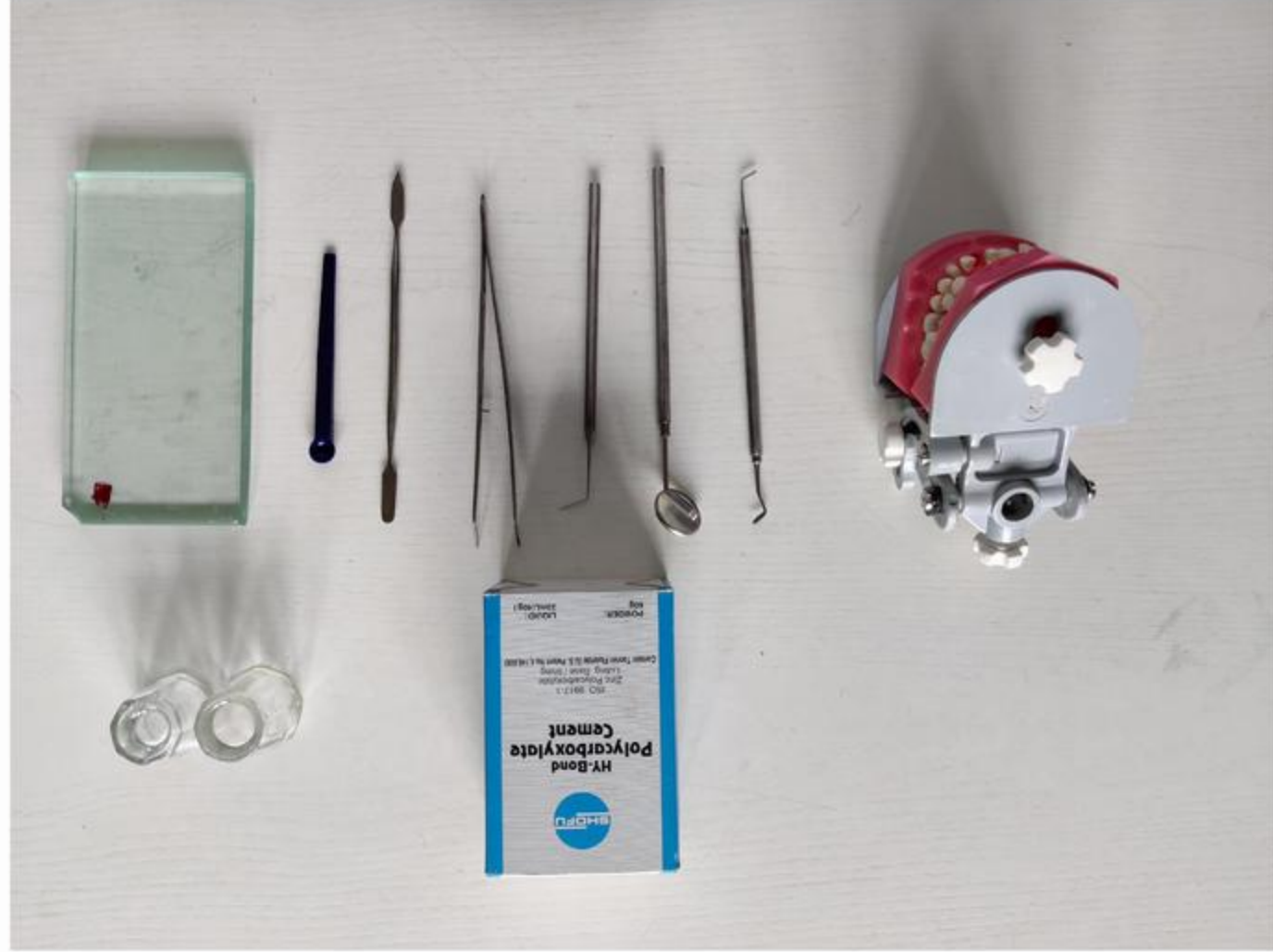
GIC Demonstration



Zinc Phosphate Demonstration



Polycarboxylate Demonstration



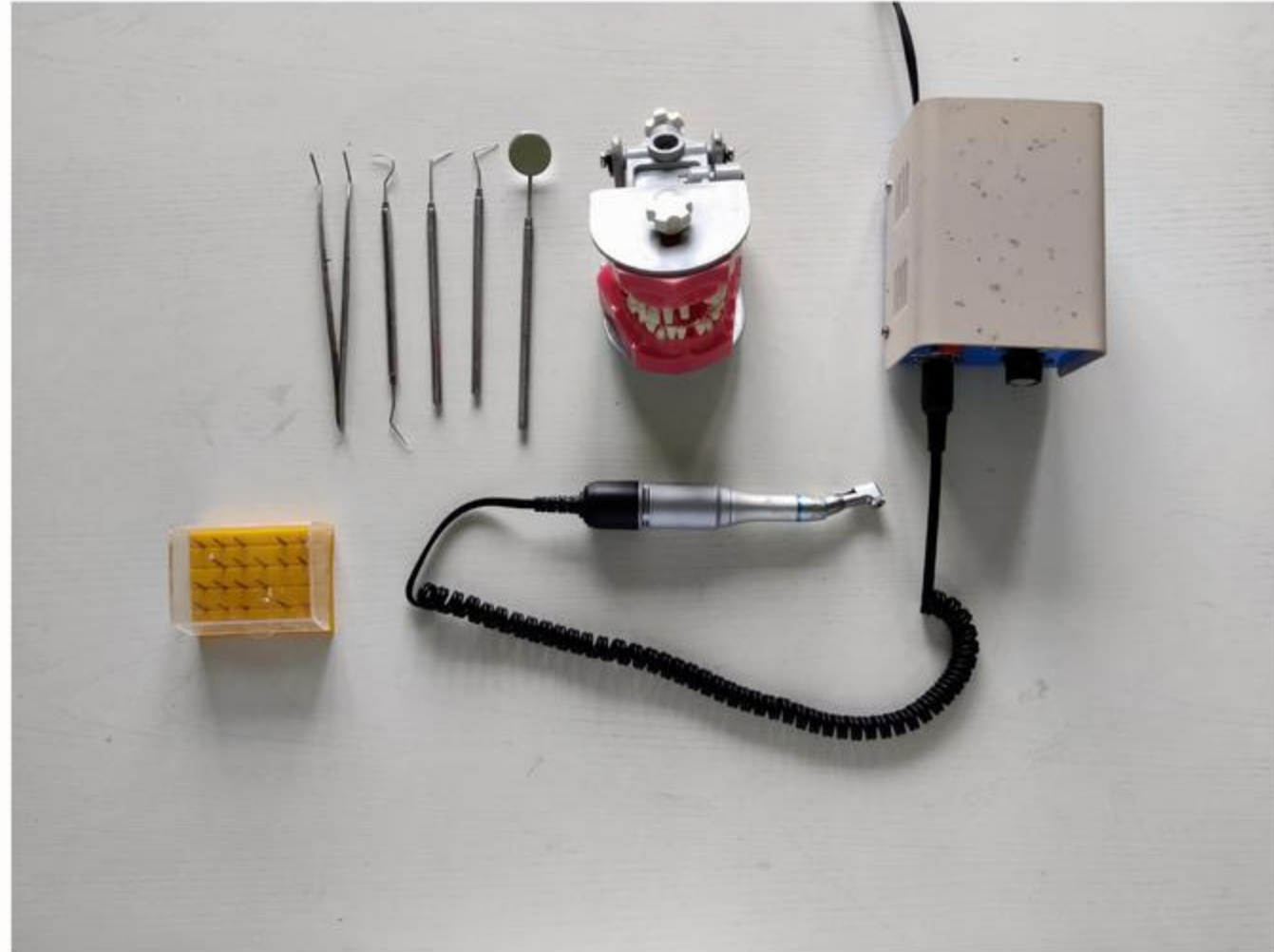
Zinc Oxide Eugenol Demonstration



Silver Amalgam Alloy Demonstration



Cavity Preparation demonstration



Composite Restoration Demonstration



Demonstration on Typhodont



Demonstration Under Microscope



Demonstration on Patient



Posters - UG

Silver amalgam

AMALGAM : This is an alloy of mercury with any other metal.



DENTAL AMALGAM: This is an alloy of mercury with silver, tin & varying amount of copper, zinc & other minor ingredients.

DENTAL AMALGAM ALLOYS: These are silver-tin alloys with varying amount of copper, zinc & any other metal.

Classification of dental amalgam alloys:

- NUMBER OF ALLOYED METAL**
 - Binary: contain silver & tin
 - Ternary: contain silver, tin & copper.
 - Quaternary: contain silver, tin, copper & zinc
- PARTICLE SHAPE OF THE ALLOY**
 - Irregular: in the form of spindle or shavings.
 - Spherical: have a smooth spherical shape
 - Spheroidal: spherical with irregular surfaces
- COPPER CONTENT**
 - Low copper: copper - 2% to 6%
 - High copper: copper - 12% to 30%
- ZINC CONTENT**
 - Zinc containing: zinc - 0.01% to 1%
 - Zinc-free - <0.01% zinc
- UNMIXED OR ADMIXED**
 - Single composition: each particle has same chemical composition
 - Admixed: physical blend of lathe-cut & spherical particle
- PRESENCE OF NOBLE METAL**
 - Noble metal alloys: small amount of palladium or gold
 - Non-noble metal alloys - do not contain any noble metals.

SILVER AMALGAM



PROPERTIES OF AMALGAM

- DIMENSIONAL CHANGES** : excessive delayed expansion can occur if a zinc containing amalgam is contaminated by saliva or moisture during trituration or condensation. Delayed expansion can start 3 to 5 days after the restoration is placed & continue for several months.
- STRENGTH** : silver amalgam exhibits good compressive strength & poor tensile & shear strength
- CREEP** : it refers to the progressive permanent deformation of the set amalgam under dynamic loading during function. Low Cu amalgam exhibit high creep rate of over 2.5%. High Cu amalgam exhibit <0.2% creep rate.
- RIGIDITY** : compared to low copper amalgams high copper amalgams are more rigid.
- THERMAL PROPERTIES** : THE linear CTE of amalgam is 2.5 times more than tooth.
- CORROSION RESISTANCE** : amalgam restorations undergo tarnish & corrosion in the oral environment. Low Cu amalgam -corrosion is due oxidation of gamma 2 phase. High Cu amalgam -corrosion is due to Eta phase.
- BIO COMPATIBILITY** : biocompatibility of amalgam is related to the toxicity of mercury & belief that mercury create toxic reaction in patients.



COMPOSITION OF ALLOYS

ALLOY	Ag	Sn	Cu	Zn	Pb
LOW COPPER	65-	26-	2-	0-	0%
ADDMIXED	40-	26-	13-	0-	0%
	70%	30%	30%	1%	
UNS	40-	22-	13-	0%	0-
COMPO	60%	30%	30%		5%

POST RESTORATION STEPS

- Do not chew or bite on the treated tooth until you have had it restored by your dentist.
- Be sure to brush and floss your teeth as you normally would.
- Contact your endodontist right away if you develop any symptoms.
- Patient should not eat any thing for 2 hours & patient should not eat any thing hard for 24 hours same side of restored tooth.

ADVANTAGES OF AMALGAM

- Ease of use
- High compressive strength
- Excellent wear resistance
- Favorable long term clinical results
- Economic
- Can be bonded to tooth structure
- Self sealing ability

DISADVANTAGES OF AMALGAM

- Lack of esthetics
- Less conservative
- Non-insulating
- Corrosion & galvanism
- Lack of reinforcement of weakened tooth structure
- Difficulty in restoring proper anatomy

Prepared by :
1. AKIL DEBAI
2. SINA DEBAI
3. NIKMAL DEBAI

**DEPARTMENT OF
CONSERVATIVE DENTISTRY
& ENDODONTICS**

Control of pain during operative procedure

CONTROL OF PAIN DURING OPERATIVE PROCEDURES

DEFINITION: Pain can be defined as the unpleasant sensation experience initiated by noxious stimulus and transmitted over a specialized neural pathway.

CAUSES OF PAIN: Pain can be caused due to diseased state, psychology of patient, dentist's mistakes like over reflection, defective instruments etc.

WHY PAIN CONTROL IS NECESSARY:

- 1) Rapport 2) patient's satisfaction 3) confidence of patient on operator 4) psychological benefit.

METHODS TO CONTROL PAIN IN OPERATIVE DENTISTRY

LOCAL ANAESTHESIA

- 1) Local anaesthetic agents
 - a) Lidocaine 2% + adrenaline
 - b) Lidocaine 2% + apraprine
 - c) Articaine 4% + apraprine
- 2) Topical anaesthetics
 - a) Benzocaine
 - b) Chlorbutol gel or spray
- 3) Technique of administering local anaesthetics

There are infiltration and regional block anaesthetics

 - a) Infiltration anaesthesia consists of subcutaneous injection where anaesthetic is deposited near endings. This technique is applied while working on mandibular teeth.
 - b) Regional block anaesthesia consists of a nerve block where anaesthetic solution is deposited near a nerve trunk. It is employed while working on mandibular posterior teeth.
 - c) Conduction block: The LA is injected around nerve trunks so that the area distal to injection is anaesthetized and paralysed.
 - d) Surface anaesthesia is produced by topical application of a surface anaesthetic to mucous membrane and abraded on the surface.
- 4) Patient factors

Before administering drug following factors have to be assessed

 - A) Systemic health: the health status of patients cardiovascular system, central nervous system, liver, kidneys, thyroid etc. should be kept in mind.
 - B) Allergy: The anaesthetic solution of patient's history of reaction or sensitivity to local anaesthesia should be taken care of.
 - C) Psychology: Dental patients are usually nervous about receiving oral anaesthesia. A confident positive approach can improve patient's co-operation.
- 5) Precautions during injection
 - a) The patient should be kept in supine or semisupine position to maintain blood flow and fill.
 - b) The solution should be deposited slowly.
 - c) Injection into infected tissues should be avoided to prevent infection spread.
 - d) The syringe should have an aspirating feature.
 - e) Only the smallest amount of anaesthesia that is required should be aspirated.

ALTERNATIVE METHODS TO CONTROL PAIN

- 1) Psychological methods
 - Relaxation: applied to the use of deep gaze to the administration of an anaesthetic agent, with maximum relaxation through mouth loose lips and least aggressive behaviour.
 - Hypnosis
 - Sedation: conscious sedation and general anaesthesia with sedating properties.
 - Acupuncture: stimulation of specific points and relief of pain through electrical and manual stimulation.
 - Hypnotic anaesthesia: a form of anaesthesia.
- 2) Herbal agents

Herbal agents used are:

 - a) Eucalyptol: 2% to 10% in gel or spray form.
 - b) Clove oil: 2% to 10% in gel or spray form.
 - c) Menthol: 2% to 10% in gel or spray form.
 - d) Capsaicin: 2% to 10% in gel or spray form.
- 3) Laser therapy

The laser application method of anaesthesia pain is by blocking the nerve pathway. Capable of producing analgesia. The variety of laser has fiberoptic and gas anaesthesia available and available in all ages. Laser available in 670nm, 810nm and 1064nm are used in this technique. The laser is available in various channels, thermal and non-thermal.

AFFLICTS:

 - a) Pain reduction
 - b) Inflammation
 - c) Swelling
 - d) Infection
 - e) Hypertension
 - f) Hypotension
 - g) Hypertension
 - h) Hypotension
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 - t) Hypotension
 - u) Hypertension
 - v) Hypotension
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 - x) Hypotension
 - y) Hypertension
 - z) Hypotension
- 4) Transcutaneous electrical nerve stimulation (TENS)
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- 5) Transcutaneous magnetic stimulation (TMS)
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- 6) Transcutaneous ultrasound (TUS)
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- 7) Transcutaneous laser therapy (TLL)
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 - x) Transcutaneous laser therapy (TLL)
 - y) Transcutaneous laser therapy (TLL)
 - z) Transcutaneous laser therapy (TLL)

CONTRAINDICATIONS:

Indications	Contraindications
1) Local anaesthesia	1) Hypersensitivity to the drug or its components
2) Topical anaesthesia	2) Hypersensitivity to the drug or its components
3) Psychological methods	3) Hypersensitivity to the drug or its components
4) Herbal agents	4) Hypersensitivity to the drug or its components
5) Laser therapy	5) Hypersensitivity to the drug or its components
6) TENS	6) Hypersensitivity to the drug or its components
7) TMS	7) Hypersensitivity to the drug or its components
8) TUS	8) Hypersensitivity to the drug or its components
9) TLL	9) Hypersensitivity to the drug or its components

Prepared By: Tanisha Datta, Pratap Movvina, Nandani Gande, Sakshi Chakraborty, 2nd BDS 2011-12

DEPARTMENT OF CONSERVATIVE DENTISTRY AND ENDODONTICS
COLLEGE OF DENTAL SCIENCES AND RESEARCH CENTRE

Pulp anatomy

PULP ANATOMY

Dental pulp can be defined as a richly vascularized and innervated connective tissue of mesodermal origin enclosed by dentin with lamellae adjacent to periodontal ligament.

The dental pulp occupies the center of each tooth and consists of soft connective tissue. The pulp is housed in the pulp chamber of crown and in the root canal of the root.

The pulp present in the crown is called "coronal pulp" where as in root it is called "radicular pulp".


The **coronal pulp** in young individuals resembles the shape of outer surface of crown dentin. It passes on surfaces namely occlusal, mesial, distal, buccal, lingual, and floor.

The **radicular or root pulp** is that pulp extending from the cervical region of the crown to the root apex. In anterior teeth the radicular pulp are single and in posterior ones multiple.



Apical Foramen
 The average size of the apical foramen of maxillary teeth is adult is 0.6mm and in mandibular teeth it is slightly smaller, being 0.5mm in diameter. The location and the shape of apical foramen may undergo changes as result of functional influences on tooth.

MAJOR DIAMETER - It is the main apical opening of the root canal. It is frequently eccentrically located away from the anatomic or radiographic apex.


MINOR DIAMETER/ Apical Constriction - It is the apex portion of the root canal having the narrowest diameter.




Labels: Enamel, Dentin, Pulp, Apical foramen, Radicular pulp, Coronal pulp.

Accessory canals leading from the radicular pulp laterally through the root dentin to the periodontal tissue may be seen anywhere along the root but are most numerous in the apical third of root.




Apicoectomy
 A root end surgery, also known as **apicoectomy** is apex resection & removal of a root tip or apical tooth socket pathology wherein a tooth's root tip is removed and a root end cavity is prepared and filled with a biocompatible material.



Root Canal Classification

Wheeler's classification for root canal

Type I (1)	Type II (2-3)	Type III (1-1-1)	Type IV (1-1)
Type V (1-1-1)	Type VI (1-1-1-1)	Type VII (1-1-1-1-1)	Type VIII (1-1)



Wheeler's classification of root canal configurations: Type I - single canal from pulp chamber to apex, Type II - two canals leaving the chamber and merging to form a single canal closer to the apex, Type III - two separate and distinct canals from chamber to apex, Type IV - one canal leaving the chamber and dividing into two separate and distinct canals.

Prepared by: Department of Endodontics, MGR Dental Institute, Chennai

Department of Conservative Dentistry and Endodontics

Biomechanical preparation


BIOMECHANICAL PREPARATION

Cleaning: Comprises of removal of all potentially pathogenic substance from root canal system
Shaping: Establishment of specifically shaped cavity which performs dual role of three dimensional progressive access into canal and creating apical preparation which will permit final obturation, instrumentation & material to fit easily


OBJECTIVES
(Solitor's criteria)

- Tapering Form (Narrow Apically, Wider Coronally)
- Keeping the apical foramen as small as possible
- Obtaining Easy Flow
- Avoid Transportation of Canal


MOVEMENTS




Reaming







Filing



Balanced Force



Watch Winding

STANDARDIZED TECHNIQUE	STEP BACK TECHNIQUE (Telescopic / Serial Root Canal Preparation)	CROWN DOWN TECHNIQUE (Pressure less)	BALANCED FORCE TECHNIQUE (Pressure less)	ANTI CURVATURE FILING	OTHER TECHNIQUES
<p>Standardized Working Length</p> <ul style="list-style-type: none"> ● Coronal Preparing ● Length of 1 Step Greater than Initial Part of File 	<p>Phase 1 Preparation of Coronal 1/3 File Working Length With File</p> <ul style="list-style-type: none"> ● Watch Winding Motion (Clockwise Anticlockwise with Maximum Apical Pressure) ● Angulae and Reapposition ● Repeat at 2/3 File to Working Length  <p>Phase 2 Preparation of Coronal And Middle 1/3 File</p> <ul style="list-style-type: none"> ● Don't let have Short of Working Length ● Watch Winding ● Reapposition ● Prepare Middle & Coronal Part With Larger No. File ● Finally with Smaller Apical File to Produce Smooth Taper 	<p>Preparation of Coronal 1/3 File with file</p> <ul style="list-style-type: none"> ● First Large Taper Rotation ● Impulse & Reapposition ● After Coronal & Middle 1/3 File Shorten Working Length with Smaller Instrument ● Introduce Larger File to Coronal Part Temporarily Smaller No. File 	<p>Introduce File Short of Working Length</p> <ul style="list-style-type: none"> ● Watch Clock wise ● Greater Clock wise with Apical Pressure ● Then Again Clock wise  <p>ADVANTAGES</p> <ul style="list-style-type: none"> 1. Decrease Chance of Canal Transportation 2. File can be Manipulated at any Point without Lodge / Blockage 	<p>Introduction of Filing to wide apical area</p> <ul style="list-style-type: none"> ● Coronal Filing with Heavy instrument After use of Hand Instrument ● End use of Medium Instrument 	<ul style="list-style-type: none"> ● Crown Down Technique ● Helical Technique ● Coronal Tap And - Rotate / Clean Step ● Step Down Technique
<p>RECAPITULATION</p> <p>Returning to a similar standardized Root Area by some means producing a single lead back or producing the passing of dental Storage & ensures ability of the root canal through to the apex treated</p>					

Department of Conservative Dentistry & Endodontics, College of Dental Science & Research Centre
 PREPARED BY: Poojitha Menon, Pratik Mavanya, Shantanu Shastri, Ozza Parth, Poojitha, Dhara Pansuriya, Shrinidhi

Complex amalgam restoration


COMPLEX AMALGAM RESTORATION

DEFINITION
It is defined as the restoration involving more than two tooth surfaces. When large amount of tooth structure are missing, while level of entire cusps need covering and when increased resistance and strength forms are needed.

CLASSIFICATION
(1) Casted restorations in which two or more approximation palatal or periodontal projections. (2) Casted restorations in teeth with acute and square cusps. (3) Synthetic local restorations. (4) Foundation.


It contains two techniques: (1) Bonded amalgam restoration. (2) Pin retained amalgam restoration.

PIN RETAINED AMALGAM RESTORATION



RETENTION LOCKING PIN

- Developed by Dr. Sanderson in 1960. Made up of stainless steel with thread.
- Its diameter is 0.25" smaller than retention pin. It is used in place with metal.
- The preparation is difficult. It requires the retention threads.
- It is made from stainless steel retention pins.
- It is used in place with the gold across the top of locking the pin.



CASTED RETENTION PIN

- Developed by Dr. Gandy in 1965. Another in stainless steel with gold facing.
- With length of pin has been designed. Its diameter is 0.2" smaller than the retention pin.
- It is placed in tooth crown in certain angle level area.
- Its preparation is easy. It is made from stainless steel.
- It is used in place with the gold across the top of locking the pin.

COMPOSITE PIN

- Developed by Dr. Vohr in 1962. Made of stainless steel with thread or stainless.
- Its diameter is 0.25" to 0.3". Its thickness is 0.02" to 0.03".
- Lock with standard metal spring. Also attached in the preparation process may be used for locking these pins.
- Easy to adapt. Low thermal expansion.
- Low thermal expansion.
- Used to lock the foundation of restorations.

CLASSIFICATION OF PINS

BONDED AMALGAM RESTORATION

MECHANISM OF BONDING

Prepared by: Dr. Jyoti Chavhan, Mumbai, India. © 2019. All rights reserved.

Composite resin



COMPOSITE RESIN



DEFINITION : It may be defined as a systemic composition of a mixture of two or more macromolecular which are essentially insoluble in each other & differ in form.

CLASSIFICATION

<p>1) CONVENTIONAL COMPOSITE RESIN</p> <ol style="list-style-type: none"> 1. Bulkfill 2. Flowable 3. Microfill 4. Hybrid 	<p>2) BONDING COMPOSITE RESIN</p> <ol style="list-style-type: none"> 1. Single Cure 2. Microfill 3. Hybrid 4. Microfill 5. Hybrid 	<p>3) SELF-CURING COMPOSITE RESIN</p> <ol style="list-style-type: none"> 1. Self-curing 2. High cure 3. Fast cure 4. Rapid curing 	<p>4) THE GEL EFFECT</p> <ol style="list-style-type: none"> 1. High cure 2. Fast cure
---	---	--	--

ADVANTAGE:

1. Esthetic
2. Conservative tooth structure
3. Adhesion
4. Low thermal conductivity
5. Universal application
6. Economical and
7. Reasonable

DISADVANTAGE:

1. Polymerization shrinkage
2. Technique sensitivity
3. Time consuming & expensive
4. Difficult to finishing & polish
5. Increased coefficient thermal expansion

2) FACTOR

Higher the C-factor, greater is the potential for bond shrinkage than polymerization effects. Class IV with C-factor 3.2 is at low risk compared to class I with C-factor 3 is at high risk.

COMPOSITION & STRUCTURE:

<p>Matrix components:</p> <ul style="list-style-type: none"> 1. Bis-GMA 2. Urethane 3. Dimethacrylate 	<p>Filling components:</p> <ul style="list-style-type: none"> 1. Inorganic 2. Organic 3. Hybrid
---	---

INDICATION

Type	Indication
1. Posterior composite	Anterior & posterior restoration
2. Posterior hybrid	Class II restoration
3. Hybrid composite	Class I & II restoration
4. Microfill	Class III & IV restoration
5. Bulkfill composite	Class III & IV restoration

CONTRAINDICATION

1. High caries incidence lower oral hygiene
2. Malocclusion
3. Severe & chronic bruxism
4. Subgingival recession
5. Patient unable to follow instructions

1) DIMACER:

1. Low shrinkage on polymerization
2. High abrasion resistance
3. Release fluoride, Calcium, Phosphorus ions
4. There is suitable in applying on anterior & posterior region of mouth.

2) COMPOSER:

They were developed to combine the stability of composite resin & the fluoride releasing ability of the GIC.

3) NANOFILLED COMPOSER:

These particles are smaller than wavelength of visible light & virtually invisible so not interfering with esthetic properties.

4) FIBER REINFORCED COMPOSITES:

Fiber reinforced composites have the following properties:

1. Very high compressive & tensile strength
2. High flexural strength

BALAR NIDHI

BABRIYA TABASSUM

BANKER ANGAD SINGH

Pulp protection

PULP is a soft tissue of mesenchymal origin residing within the pulp chamber and root canal of each tooth of the body with a conservative dentistry to preserve the health of the tooth pulp but the pulp is subjected to various stimuli due to caries, trauma, operative procedures and restorative materials.

Direct irritants

- **Chemical irritants** - acids, alcohols, acetone, friction
- **Mechanical irritants** - excessive heat, pressure and oscillation during cavity preparation
- **Electrical irritants** - phosphoric acid of zinc phosphate cement and acid cements
- **Thermal irritants** - metallic instruments at high central temperatures changes in the pulp
- **Microbiological** - which often bacteria and release products to gain access to the pulp

Indirect pulp protection is needed against all irritants.

Pulp protective agents may be classified as follows:

- 1. Zinc Phosphate**
 - A. Thin Film Resin (1-2µm)
 - B. Thick Film Resin (10-20µm)
- 2. Zinc Silico-phosphate cements**
 - A. Glass ionomer cements
 - B. Resin based agents
- 3. Calcium hydroxide**
- 4. Zinc phosphate cement**
- 5. Zinc silico-phosphate cements**
- 6. Glass ionomer cements**

1. Zinc Phosphate

A. Thin Film Resin (1-2µm)

1. **Sealant Resin**
2. **Sealant Resin**
3. **Sealant Resin**

B. Thick Film Resin (10-20µm)

2. Zinc Silico-phosphate cements

- A. **Glass ionomer cements**
- B. **Resin based agents**

3. Calcium hydroxide - This is employed as a liner in deep cavity preparations for the following reasons:

- **Pulpal biocompatibility**
- **Ability to stimulate reparative dentin formation**
- **Anti bacterial activity**
- **Glass ionomer cements** - This material is used as a liner and a base primarily because of its highly desirable properties like fluoride release and chemical adhesion to tooth structure. It may be placed in moderate to deep cavities. It has good biocompatibility with the pulp and good strength. It is used as a liner under amalgam, cast gold and composite restorations.

4. Zinc phosphate cement - Traditionally, this has been the material of choice as base under metallic restorations. It has superior physical properties and provides excellent thermal insulation. But since it is not adhesive to dentin it is not recommended under tooth colored restoration.

5. Zinc silico-phosphate cements - Its advantages over zinc phosphate cement are its biocompatibility and adhesion to tooth structure.

6. Glass ionomer cement

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Department of Conservative Dentistry Endodontics

Glass ionomer cement



GLASS IONOMER CEMENT



GLASS IONOMER IS THE GENERIC NAME OF A GROUP OF MATERIALS BASED ON THE REACTION OF SILICATE GLASS POWDER & POLYACRYLIC ACID.

<p>COMPOSITION The Glass Ionomer Powder is an acid soluble calcium fluoroaluminosilicate glass.</p> <p>POWDER</p> <ul style="list-style-type: none"> - Silica (SiO₂) 41.9 - Aluminum (Al₂O₃) 26.6 - Aluminum Fluoride (AlF₃) 1.6 - Calcium Fluoride (CaF₂) 15.7 - Sodium Fluoride (NaF) 9.3 - Aluminium Phosphate (AlPO₄) 3.8 <p>LIQUID</p> <ul style="list-style-type: none"> - Polyacrylic Acid in the Form of Copolymer with Itaconic acid & Tricarboxylic Acid - Tartaric acid - Water <p>CLASSIFICATION</p> <p>TYPE - I For Luting</p> <p>TYPE - II For Restorations</p> <p>TYPE - III Liners & Bases</p> <p>TYPE - IV Pit & Fissure Sealant</p> <p>TYPE - V Orthodontic Cements</p> <p>TYPE - VI Core Build Up</p> <p>TYPE - VII High Fluoride Releasing</p> <p>TYPE - VIII ARI</p> <p>TYPE - IX Pediatric GIC</p>	<p>SETTING REACTION</p> <p style="text-align: center; font-size: x-small;">SILICA GEL SHEATH</p>  <p>LEACHING: When the powder & liquid are mixed together, the acid attacks the glass particles thus calcium, aluminum, sodium and fluoride ions leach out into the aqueous medium.</p> <p>CALCIUM CROSS LINK: The initial set occurs when the calcium ions cross links the polyacrylic acid chains, this forms solid mass.</p> <p>ALUMINUM CROSS LINK: In the next phase aluminum also begins to crosslink with poly acrylic acid chains.</p> <p>SODIUM & FLUORIDE IONS: These ions do not take part in the cross linking. Some of the sodium ions may replace the hydrogen ions in the carboxylic groups. The rest combine with fluoride to form sodium fluoride which is uniformly distributed within the cement.</p> <p>HYDRATION: Water plays a very important role in the cement initially it serves as the medium later it slowly hydrates the matrix adding to the strength of the cement.</p> <p>SILICA GEL SHEATH: The untreated glass particle is sheathed by a silica gel. It is formed by the leaching of the ions (Ca⁺, Al⁺, Na⁺, F⁻) from the outer portion of the glass particle.</p>	<p>INDICATIONS</p> <ul style="list-style-type: none"> - Anterior esthetic restorative material for class III cavities - For eroded areas and class V restoration - As liners & bases - For core build up - To a limited extent as pit and fissure sealants - Tunnel preparation - In root caries restoration of deciduous tooth - As an interim restoration  <p>CONTRA INDICATIONS</p> <ul style="list-style-type: none"> - In stress bearing area - Labial bulidups - Cuspal coverage - In mouthbreather <p>ADVANTAGES</p> <ul style="list-style-type: none"> - Adhesion to enamel & dentin - Anticariogenic effect - Esthetic appearance - Low solubility - Biocompatibility - Less technique sensitivity  <p>DISADVANTAGES</p> <ul style="list-style-type: none"> - Low fracture resistance - Low water resistance - Sensitivity to moisture soon after setting
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Prepared by Interns : Oshin, Khushbu, Ruzuta, Kinjal, Yogini, Pallavi
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Dental chair and chair position

DENTAL CHAIR AND CHAIR POSITION

INTRODUCTION: To improve the health and endurance of the dentist as well as to enhance the comfort of the patient, most restorative procedures are now performed with the dentist seated and the patient in a reclined dental chair. The dental chair should support the patient's head, back and arms. Modern dental chairs are constructed to provide total body support and comfort for the patient in any chair position. The patient's head is supported by the head rest cushion which is attached to the chair back and is adjustable or articulated.

PATIENT'S POSITION
For operation should use of the following positions:
Almost supine
Reclined 45 degrees
Reclined position: In this the patient's head, and feet approximately at the same level, however, the head should not be positioned lower than the feet except when the patient is in syncope.
Reclined 85 degrees: In this position, the chair is reclined at 45 degrees so that when the patient is seated, the mandibular occlusal surfaces are almost at 45 degrees to the floor.

OPERATOR POSITIONS
OBJECTIVES
Accessibility to the operating field.
Mobility of the operating field without any obstruction.
Comfort of both operator and patient. Safety.

ZONES OF THE OPERATIVE FIELD
RIGHT-HANDED OPERATOR

1 OPERATORS ZONE
3 o'clock to 12 o'clock position. This is the zone where Operator sits.

2 TRANSFER ZONE
4 o'clock to 7 o'clock position. Zone where instruments and Matter are transferred between the operator and the assistant.

3 ASSISTANT ZONE
2 o'clock to 4 o'clock position. This is the zone where the assistant

4 STATIC ZONE
12 o'clock to 2 o'clock position. This is the zone which contains auxiliary material.

ADDITIONAL CONSIDERATIONS the dentists should maintain enough distance from the patient such as while reading a book.
A very important aspect of proper operating position is to reduce body contact with the patient. The dentist must never rest his forearm on patient's shoulders or hands on the patient's face or forehead.

LEFT-HANDED OPERATOR

1 OPERATORS ZONE
9 o'clock to 12 o'clock position. This is the zone where Operator sits.

2 TRANSFER ZONE
5 o'clock to 8 o'clock position. Zone where instruments and Matter are transferred between the operator and the assistant.

3 ASSISTANT ZONE
8 o'clock to 10 o'clock position. This is the zone where the assistant sits.

4 STATIC ZONE
12 o'clock to 2 o'clock position. This is the zone which contains auxiliary material.

OPERATOR'S CHAIR POSITION
12 o'clock direct rear position. Operator sits directly behind the patient. Looks down over the patients head. Employed during the treatment of Mandibular anterior teeth.






11 o'clock right rear position: This position provides access to all areas of oral cavity either direct or indirect vision.

9 o'clock direct right position: operator sits directly right of the patient.

7 o'clock right front position: Operator sits almost in the front of the patient.

CORRECT AND INCORRECT POSITION

PREPARED BY GAURI VADVA AND DEVAISHI VAGHELA

Infection control


INFECTION CONTROL

• Routes of transmission of dental infection

1. Airborne contamination
2. Hand to surface contamination
3. Cross-infection
4. Patient vulnerability
5. Nosocomial vulnerability

• PERSONAL BARRIER PROTECTION

1. Personal hygiene
2. Protective coverings/masks
3. Barrier protection
4. Hand washing
5. Treatment gloves
6. Protective eyewear/masks and hair protection
7. Goggles/masks
8. Rubber dam isolation and high-volume evacuation
9. Pre-procedural mouthwash
10. Handling of sharp instruments and needles
11. Immunisation




Item	Method of decontamination	Minimum exposure	Temperature	Notes
1. Hot water	1. Hot air oven	120°C for 15-20 min	121°C for 15 min	1. Use for non-heat labile items
2. Cold water	1. Cold water	121°C for 15 min	121°C for 15 min	1. Use for heat labile items
3. Autoclave	1. Autoclave	121°C for 15 min	121°C for 15 min	1. Use for heat labile items
4. Cold water	1. Cold water	121°C for 15 min	121°C for 15 min	1. Use for heat labile items

• OPERATORY ASEPSIS

- Critical Items**
 - It includes needles, scalpels, endodontic instruments
 - It should be discarded whenever possible/sterilized after use
- Semicalritical Items**
 - It includes air/water syringe tip, handpieces etc.
 - It should be sterilized after every use
- Non-critical Items**
 - These are environmental surfaces such as chairs, benches, floors, walls and supporting equipments of dental units
 - It should be disinfected if they are contaminated

• DEFINITION

This is the process by which there is complete destruction of all microbial life from an article



Sterilization of the dental equipment


Equipment	Process
Hand pieces, probes, explorers, burs	Autoclave
Endodontic instruments, files, reamers, burs	Autoclave
Hand lens	Autoclave
Light and dental unit	Autoclave
Unit receptacles, cartridges	Chemical Sterilization
Needles	Chemical
Injection site equipment	Hot water
1. Control chair equipment	1. Autoclave
2. Handpiece	1. Autoclave
3. Handpiece	1. Autoclave
4. Handpiece	1. Autoclave
5. Handpiece	1. Autoclave

This is a table of dental equipment for sterilization. It lists various items and the methods used to sterilize them, such as autoclaving or chemical sterilization.

Caries progression


PROGRESSION OF CARIES


◆ **CLINICAL PROGRESSION OF CARIES**



1) Pit and fissure caries


- These caries "fall out" as it penetrates into enamel.
- It is a cone shaped defect with its base towards the DEJ junction.






2) Smooth surface caries


- These caries have a broad area of origin and a vertical extension towards the pulp.
- It is a cone-shaped area with its base towards the enamel surface and its apex towards the DEJ junction.





3) Root surface caries

- These caries begin directly on dentin.
- It is U-shaped in cross section and spreads more rapidly because dentin is less resistant to caries attack.




◆ **HISTOPATHOLOGY OF CARIES**

A) Progression of caries in ENAMEL

- Enamel becomes carious due to demineralization and attack of bacteria. Enamel shows are:


- 1) Surface zone
- 2) Body of the lesion
- 3) Dark zone
- 4) Translucent zone



B) Progression of caries in DENTIN


- Caries spreads more rapidly in dentin due to its lesser mineral content. Dentinal zones are:

- 1) Normal Dentin
- 2) Subtransparent Dentin
- 3) Transparent Dentin
- 4) Turbid Dentin
- 5) Infected Dentin



C) Progression of caries in PULP

- In slowly advancing carious lesions, the protective response of the pulp cut wall of the spread of caries.
- In moderate levels, pulpal inflammation is seen.
- Very rapidly spreading caries can lead to necrosis of pulp.



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Clinical examination of oral cavity

Clinical examination of oral cavity

EXTRAORAL EXAMINATION	INTRAORAL EXAMINATION	
<p>• Facial symmetry :</p> <p>Facial asymmetry swelling</p> 	<p>Soft tissue examination</p>	<p>Hard tissue examination</p>
<p>• Temporomandibular joint :</p> <p>Palpation of pterygus-patient should be requested slowly open and close the mouth while doctor bilaterally palpates the pterygus depression with his index finger.</p> <p>Intra auricular method-it is performed by inserting the small finger into the ear canal and pressing anteriorly</p> 	<p>• Hard palate & soft palate :</p> 	<p>• Caries :</p> 
<p>• Lymph nodes :</p> <p>Cervical nodes, Submandibular nodes Submental nodes</p> 	<p>• Tongue :</p> 	<p>• Mobility :</p> 
<p>• Salivary gland examination :</p> <p>Parotid, Sub Mandibular gland, Sub Lingual gland are palpated.</p> 	<p>• Floor of the mouth :</p> 	<p>• Sensitivity to percussion :</p> 
<p>• Sinus tract examination</p> 	<p>• Buccal, Labial and Alveolar mucosa :</p> 	<p>• Sensitivity to palpation :</p> 
	<p>• Gingiva :</p> 	<p>• Pathological wear :</p>  <p>Erosion Attrition Abrasion</p>
	<p>• Sinus tract examination</p> 	<p>• Tooth discolouration :</p> 
		<p>• Fractured tooth :</p> 

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Principal of tooth preparation

PRINCIPLES OF TOOTH PREPARATION

DEFINITION: It is a mechanical alteration of defective, injured, or diseased tooth to receive restorative material that re-establishes a healthy state for the tooth including esthetic correction where indicated along with neutral for m and function.

STEP I: DEFINE FORM AND INITIAL DEPTH
Having the preparation design in the position they will occupy in the final preparation stage for finishing, the tooth with wax.
Preparing "hard copy" of a final preparation from the wax.

STEP II: FINISH RESISTANCE FORM
Finish the shape and dimensions of the crown with the wax using both the restoration and the tooth as a guide, without breaking the resistance form addition primarily along the long axis of the tooth.

STEP III: FINISH A SMOOTH SURFACE
Finish the shape of each preparation with a diamond wheel or metal bur cutting in the shape.
Check because the anterior-surface form gives better resistance form.

STEP IV: CONFIRM FORM
Check the shape in form of the cavity and prepare the:

1. Alignment
2. Accessibility
3. Ease of insertion by use of the instrument
4. Retention by locking the tooth.

STEP V: CHECK THE PREPARATION
Check the preparation for the following:

1. Mechanical features
2. Retention groove and wall
3. Smooth margins
4. No sharp Margins
5. No sharp angle and give finishing procedure
6. Working and Waxing

STEP VI: PREPARE THE COLLAR, WALL OF THE PREPARATION
Collar: A shallow, circular margin between the preparation and the tooth. The collar should be finished by the use of a diamond wheel or metal bur.

STEP VII: FINISH THE WALLS
Finish the walls of the preparation with a diamond wheel or metal bur. The walls should be finished by the use of a diamond wheel or metal bur.

STEP VIII: FINISH THE MARGINS
Finish the margins of the preparation with a diamond wheel or metal bur. The margins should be finished by the use of a diamond wheel or metal bur.

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SECOND YEAR BDS 2011-2012


Class ii cavity preparation for amalgam

Class 2 Cavity preparation for silver amalgam

Initial steps

Initial steps

1. Establishing the occlusal step - The occlusal outline form is similar to class 1 cavity preparation for amalgam except for nesting a step. A dovetail is provided at early one side. Undercutting is performed wherever required.
2. Extending the occlusal step proximally - The occlusal step in the mesial side is made slightly wider buccally as additional width is needed for the proximal step.
3. Preparation of the proximal box - It begins with the proximal ditch cut, the proximal ditch cut is extended gingivally just beyond the curve of the gingival margin of the enamel area.
4. Finishing the proximal and enamel walls - This is done by finishing smoothback margins and gingival margins with the help of hand or rotary instruments.
5. Primary resistance form - It is done by making 1. Flat base 2. Rounding of internal line angles 3. Providing enough depth of cavity
6. Finishing resistance form - It is done by making 1. Smooth emergence of the facial and lingual walls 2. Smooth margin.




Base filling

Base filling

- If the cavity depth is more than 1.5 mm than cavity liner or enamel are required for pulp capping.
- If cavity depth is between 1.0 to 1.5 mm then suitable base like zinc phosphate is used to protect pulp from thermal and galvanic insults.
- If the cavity depth is less than 0.5 mm then no base is needed.

Main functions of using a base

- Protect pulp from thermal insults
- Protect pulp from galvanic insults
- To prevent micro leakage.



Final step

1. Finishing of any remaining defective enamel proximal surface dentin.
2. Pulp protection.
3. Secondary resistance and resistance form.
4. Finishing enamel walls.

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Amalgam filling

- The amalgam is filled in the cavity after following processes:-
- Proportioning alloy and mercury
- Trituration
- Molding
- Matrix placement
- Condensation

After the amalgam is filled in the cavity processes like

- Carving
- Burnishing
- Shaping
- Finishing
- Polishing

Are done.



Initial tooth preparation stage

INITIAL TOOTH PREPARATION STAGE:-

It is the extension & initial design of external walls specified limited depth provide to caries, defect, fracture of tooth, restorative material in the tooth.

STAGES

1. OUTLINE FORM & INITIAL DEPTH 2. PRIMARY RESISTANCE FORM 3. PRIMARY RETANSION FORM 4. CONVENIENCE FORM

STAGE 1: OUTLINE FORM & INITIAL DEPTH	STAGE 2: PRIMARY RESISTANCE FORM
<p>OBJECTIVES</p> <ol style="list-style-type: none"> 1. Planning preparation depth in preparation. 2. Preparing an initial depth of 0.5 millimeter usually. <p>CHARACTERISTICS</p> <ol style="list-style-type: none"> 1. All angles of external enamel should be removed. 2. All angles of internal enamel should be removed. <p>FEATURES</p> <ol style="list-style-type: none"> 1. Extension of external walls. 2. Extension of internal walls. 3. Extension of axial walls. 4. Extension of axial walls. 5. Extension of axial walls. 6. Extension of axial walls. <p>FEATURES</p> <ol style="list-style-type: none"> 1. Extending axial walls to bridge margins. 2. Extending axial walls to bridge margins. 3. Extending axial walls to bridge margins. 4. Extending axial walls to bridge margins. 5. Extending axial walls to bridge margins. 6. Extending axial walls to bridge margins. 	<p>OBJECTIVES</p> <p>Stage 2 preparation of the preparation walls that have made both the preparation & for both to withstand axial fracture restoring form external preparation in the long axis of tooth.</p> <p>CHARACTERISTICS</p> <ol style="list-style-type: none"> 1. For axial form shape for full form. 2. For axial form shape for full form. 3. For axial form shape for full form. 4. For axial form shape for full form. 5. For axial form shape for full form. 6. For axial form shape for full form. <p>FEATURES</p> <ol style="list-style-type: none"> 1. Extension of axial walls. 2. Extension of axial walls. 3. Extension of axial walls. 4. Extension of axial walls. 5. Extension of axial walls. 6. Extension of axial walls.
<p>OBJECTIVES</p> <p>For the preparation of the axial walls of the preparation that have made both the preparation & for both to withstand axial fracture restoring form external preparation in the long axis of tooth.</p> <p>CHARACTERISTICS</p> <ol style="list-style-type: none"> 1. For axial form shape for full form. 2. For axial form shape for full form. 3. For axial form shape for full form. 4. For axial form shape for full form. 5. For axial form shape for full form. 6. For axial form shape for full form. <p>FEATURES</p> <ol style="list-style-type: none"> 1. Extension of axial walls. 2. Extension of axial walls. 3. Extension of axial walls. 4. Extension of axial walls. 5. Extension of axial walls. 6. Extension of axial walls. 	<p>OBJECTIVES</p> <p>For the preparation of the axial walls of the preparation that have made both the preparation & for both to withstand axial fracture restoring form external preparation in the long axis of tooth.</p> <p>CHARACTERISTICS</p> <ol style="list-style-type: none"> 1. For axial form shape for full form. 2. For axial form shape for full form. 3. For axial form shape for full form. 4. For axial form shape for full form. 5. For axial form shape for full form. 6. For axial form shape for full form. <p>FEATURES</p> <ol style="list-style-type: none"> 1. Extension of axial walls. 2. Extension of axial walls. 3. Extension of axial walls. 4. Extension of axial walls. 5. Extension of axial walls. 6. Extension of axial walls.

PREPARED BY: 2nd Year B. D. S. **1) Dhvani Joshi 2) Dhvani Patel 3) Jinal Patel 4) Hemal Pandya**

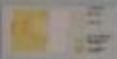
Final stages of tooth preparation

FINAL STAGES OF TOOTH PREPARATION

STEP 5: Removal of any remaining enamel pit or fissure, infected dentin or old restorative material if indicated is the elimination of any infected carious tooth structure or faulty restorative material left in the tooth after final tooth preparation.

Factors:

- Differentiation between infected and affected dentin.
- Performing any indirect pulp capping.
- Assessing integrity of restorative.



STEP 6: Pulp protection if indicated

It is a step in achieving the preparation for receiving the final restorative material. The reason for using traditional liners or bases is to protect the pulp to aid pulp recovery in teeth.

Factors:


- Clinical & patient conditions
- Choice of liner and base
- Applied pH of the enamel
- The pulp pH of the tooth

Some ingredients of various materials:

- Thermal changes conducted through restorative materials
- Factors transmitted through materials to the dentin
- Gelation shrink
- Ingress of noxious products and bacteria through microleakage

Others provide:

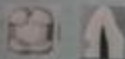
- A barrier that protects the dentin from noxious agents from other restorative material or oral fluids
- Initial electrical insulation
- Thermal protection



STEP 7: Secondary resistance and retention forms

After the above steps, additional resistance and retention features may be deemed necessary for the preparation. The secondary retention and resistance forms are of two types:

1. Mechanical preparation features
 - Retention locks, grooves and cones
 - Groove retentives
 - Slots
 - Beveled enamel margins
 - Pins, ribs, steps and notches



STEP 8: Procedure for finishing the external walls of the tooth preparation.

Finishing the preparation walls is the further development, when indicated, of a specific camersurface design and degree of smoothness or roughness that produces the maximum effectiveness of the restorative material being used.

Objectives:

- Create the best marginal seal possible between the restorative material and the tooth structure
- Afford a smooth marginal junction
- Provide maximal strength of the tooth and the restorative material near the margin


Factors:

- The direction of enamel rods
- Support of enamel rods at -CJ and laterally
- The type of restorative material to be placed in the preparation

STEP 9: Final procedures: Cleaning, inspecting and Swelling

The final procedure includes removing all chips and loose debris that has accumulated during the preparation, and making a final complete inspection. Cleaning is to free the preparation of visible debris with warm water and removing visible moisture.

Eliminating bacterial penetration is so important that the use of disinfecting agents of sealers is likely to become universal.



Prepared by: [Name], [Institution], [Year]

Designed by: [Name], [Institution], [Year]

Disposal of biomedical waste




Tooth numbering systems

Tooth Numbering Systems		
Zsigmondy-palmer system	Federation dentaire international system	American dental association system
<p>It is also called angular or grid system.</p> <p>In this system, the deciduous dentition are denoted by alphabets A to E.</p> <p>It represents the relative position of each side.</p> <p>Permanent dentition are identified by numbers 1 to 8.</p> <p>It represents maxillary right permanent central incisor.</p> <p>Advantages & Disadvantages</p> <p>Advantages:</p> <ul style="list-style-type: none"> The confusion between primary & permanent teeth. Disadvantages: Doesn't represent the actual numbering of teeth based on their position in the dental arch. It is not suitable for orthodontic records. 	<p>It is also referred to as the two digit system.</p> <p>In this system, two digits are used to identify each tooth.</p> <p>1st digit identifies the quadrant to which the tooth belongs.</p> <p>2nd digit denotes the tooth.</p> <p>Both digits have to be pronounced separately.</p> <p>For the permanent dentition, the quadrants are numbered 1 to 4.</p> <p>For the primary dentition, the quadrants are numbered 5 to 8.</p> <p>Advantages & Disadvantages</p> <p>Advantages:</p> <ul style="list-style-type: none"> Each tooth has a separate number. Simple to understand & recall. Easy to pronounce in communication. <p>Disadvantages:</p> <ul style="list-style-type: none"> They are confused with field numbers. 	<p>It is also known as the universal system.</p> <p>The primary teeth are denoted by upper case alphabets.</p> <p>It represents the maxillary right primary central incisor.</p> <p>The permanent teeth are indicated by numbers 1 to 32.</p> <p>It represents the maxillary left permanent 2nd molar.</p> <p>Advantages & Disadvantages</p> <p>Advantages:</p> <ul style="list-style-type: none"> Each tooth has a separate number denoted by its position in the dental arch. <p>Disadvantages:</p> <ul style="list-style-type: none"> Difficult to remember the position of individual teeth.

Dental caries - classification

Dental Caries: Classification

G. V. Black's classification




Class I lesions
Class II lesions
Class III lesions
Class IV lesions
Class V lesions
Class VI lesions

World Health Organization(WHO) system


D1 Clinically detectable enamel lesions with intact (non cavitated) surfaces
D2 Clinically detectable cavities limited to enamel
D3 Clinically detectable cavities in dentin
D4 Lesions extending into the pulp

Based on anatomical site



Proximal caries
Smooth surface caries (enamel & dentin)
Liner enamel caries
Root caries

Based on progression




Acute caries
Chronic caries
Arrested caries

Graham mount's classification


Cavity site	Size 1	Size 2	Size 3	Size 4
	Minimal	Moderate	Enlarge	Extensive
Site 1 Pit & fissure	1.0	2.0	3.0	4.0
Site 2 Cervical area	2.1	2.2	2.3	2.4
Site 3 Cervical region	3.1	3.2	3.3	3.4

Based on pathway of caries spread within the tooth




Forward & backward caries

Based on chronology




Infant caries
Adolescent caries
Adult caries

Based on number of tooth surface involved




Simple caries
Compound caries
Complex caries

Based on extent of caries



Incipient caries
猖獗 caries
Extensive caries
Fulminating caries

Based on new or recurrent lesion



Primary caries
Secondary caries
Recurrent caries

Prepared by: Anshu Parmar, Ashvini Parmar, Jyoti Yelke

Matrix and retainers

MATRIX & RETAINERS

DEFINITION
MATRIX is a fixed used during restorative procedures to hold the direct restorative material within the tooth when it is setting.

POSITIONS OF MATRIX:
 It should always form below the gingival seal & 2mm above the marginal seal.

FUNCTIONS OF MATRIX:
 Larger circumference without edge
 Smaller circumference without edge

CLASSIFICATION

- Depending on band material
 - 1. Stainless steel
 - 2. Copper band
 - 3. Castable plastics
 - 4. Poly wax
- Depending on cavity preparation
 - 1. Class I cavity: round bottomed inferior
 - 2. Class II cavity: single beveled inferior, buccal, lingual
 - 3. Class III cavity: flat bottom
 - 4. Class IV cavity: window type
 - 5. Class V cavity: window type for flat margin
- Depending on its preparation
 - 1. Custom made or automatic
 - 2. Machined matrix
- Depending on mode of retention
 - 1. Direct Retention
 - 2. Indirect Retention

Auto matrix

Window matrix

Tin foil matrix

INDICATIONS
 For restoring a unilateral class II cavity especially when the contact on opposite side is very tight.

CONTRAINDICATIONS
 The matrix consists of band that extends the entire crown of tooth. The circumference of band can be adjusted for adjustment some pressure is released.

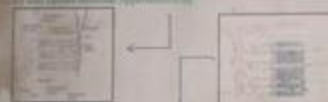

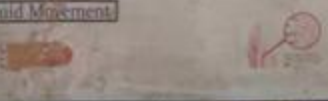
FOR SETTING CLASS II CAVITIES

EX. SAKSHI SALLIWAR, ANA KHANDELA TALALKHATE, DEPARTMENT OF CARPENTARY, SCULPTURE AND DENTISTRY

Dentin hypersensitivity

DENTIN HYPERSENSITIVITY

DEFINITION: It is characterized by short, sharp pain arising from exposed dentin in response to stimuli typically thermal, osmotic, tactile, chemical or mechanical and which cannot be ascribed to any other form of dental defect or pathology.

ETIOLOGY		PREVENTION	MANAGEMENT
ENAMEL LOSS ▶ Occlusal wear ▶ Toothbrush Abrasion ▶ Abrasive Toiletries ▶ Parafunctional habits	CEMENTAL LOSS ▶ Gingival Retraction ▶ Periodontal Disease ▶ Root Planning ▶ Periodontal Surgery	PREVENTION (1) Prevention of consumption of acidic fruits and beverages. (2) Correction of brushing technique. (3) Taking care during operative procedures. (4) Taking care during periodontal procedures.	MANAGEMENT (1) Desensitization by occluding dentinal tubules. (2) Formation of smear layer over exposed dentin. (3) Use of topical agents to occlude exposed dentin. - Calcium hydroxide paste - Fluorides - Dentin adhesive - Placement of restorations - Glass ionomer cements (4) Use of liners. - Chalk liner (5) Irradiation with blocking pulpal sensory nerves. - Propolis in the toothpaste
THEORIES OF DENTIN HYPERSENSITIVITY (1) DIRECT TRANSDUCTION THEORY Direct transmission of stimuli through dentin tubules to pulp nerves when they are exposed and cause dentin hypersensitivity. 			DIAGNOSIS
(2) FLUID MOVEMENT THEORY When oral environment presents the effect. Fluid movement in dentinal tubules and its stimulation of pulp nerves is not as direct as in the direct transduction theory. However, consideration is necessary for tactile, chemical, or pressure stimuli when a fluid movement of dentinal fluid enters towards the pulp or pulp space. Fluid Movement 			
		NON-INVASIVE DIAGNOSIS SIGN AND SYMPTOMS INTENSITY FREQUENCY AND DURATION DIETARY CHANGES	CLINICAL EXAMINATION VISUAL ASSESSMENT PHYSICAL ASSESSMENT DEPTH OF PERIODONTAL POCKET DEPTH PERCUSSION TESTING RESPONSE TO COLD AIR
Prepared By: [Name]			

Class I, class ii & class v cavity preparation for amalgam

CLASS I, CLASS II & CLASS V CAVITY PREPARATION FOR AMALGAM RESTORATION

AMALGAM RESTORATION FOR CLASS I CAVITY

See Fig. 1.14 in part 1 of your text for a typical Class I cavity.

INITIAL CAVITY PREPARATION

1. Remove the carious material.
2. Use a 1/2" round bur.
3. Remove the carious material.
4. Remove the carious material.
5. Remove the carious material.
6. Remove the carious material.
7. Remove the carious material.
8. Remove the carious material.
9. Remove the carious material.
10. Remove the carious material.

FINAL CAVITY PREPARATION

1. The cavity preparation should be prepared with the following steps:

1. The cavity preparation should be prepared with the following steps:
2. The cavity preparation should be prepared with the following steps:
3. The cavity preparation should be prepared with the following steps:
4. The cavity preparation should be prepared with the following steps:
5. The cavity preparation should be prepared with the following steps:
6. The cavity preparation should be prepared with the following steps:
7. The cavity preparation should be prepared with the following steps:
8. The cavity preparation should be prepared with the following steps:
9. The cavity preparation should be prepared with the following steps:
10. The cavity preparation should be prepared with the following steps:

AMALGAM RESTORATION FOR CLASS II CAVITY

INITIAL CAVITY PREPARATION

1. The cavity preparation should be prepared with the following steps:
2. The cavity preparation should be prepared with the following steps:
3. The cavity preparation should be prepared with the following steps:
4. The cavity preparation should be prepared with the following steps:
5. The cavity preparation should be prepared with the following steps:
6. The cavity preparation should be prepared with the following steps:
7. The cavity preparation should be prepared with the following steps:
8. The cavity preparation should be prepared with the following steps:
9. The cavity preparation should be prepared with the following steps:
10. The cavity preparation should be prepared with the following steps:

FINAL CAVITY PREPARATION

1. The cavity preparation should be prepared with the following steps:
2. The cavity preparation should be prepared with the following steps:
3. The cavity preparation should be prepared with the following steps:
4. The cavity preparation should be prepared with the following steps:
5. The cavity preparation should be prepared with the following steps:
6. The cavity preparation should be prepared with the following steps:
7. The cavity preparation should be prepared with the following steps:
8. The cavity preparation should be prepared with the following steps:
9. The cavity preparation should be prepared with the following steps:
10. The cavity preparation should be prepared with the following steps:

AMALGAM RESTORATION FOR CLASS-V CAVITY

The outline form of Class V cavities is based on location & size of cavity.

The outline roughly resembles the shape of a bean or kidney.

INITIAL CAVITY PREPARATION

1. The depth is usually 1.25mm total axial depth.
2. Extended the preparation axially gingivally mesially & distally till the carious surface margins are located on sound enamel.
3. The axial wall is located in dentin cavities as it follows the contour of the facial surface.

FINAL CAVITY PREPARATION

1. Any old restorative material that is present may be retained if it is intact and the tooth is asymptomatic.
2. Since the cavity preparation walls diverge towards the facial aspect proper retention form is necessary for Class V amalgam cavities.
3. Retention form is provided by placing retention grooves along the axiogingival & axioabuccal line angles.
4. Usually the preparation is cleaned using air-water spray.

MODIFICATION OF CLASS II CAVITY DESIGN FOR AMALGAM RESTORATION

- 1 Simple box preparation
- 2 Set preparation
- 3 Conservative design
- 4 Modification of preservative esthetics
- 5 Modification for Retained teeth
- 6 Adjoining restoration
- 7 Modification for abutment teeth for RPD
- 8 Cup capping

PREPARED BY : 1) DEEP MEHTA 2) NIYATI MEHTA 3) AMI MEHTA

Cavity liners and varnish

Cavity liners and varnish

Cavity Liner


Definition
A cavity liner is used to like a cavity varnish to provide a barrier against the passage of irritants from cements or other restorative materials and to reduce the sensitivity of freshly cut dentin.

Functions of Cavity liners

1. Primary purpose → protective seal of exposed dentin surface.
2. Electrical insulation (with newly placed amalgam restoration) from the electrical circuits with restorations in adjacent teeth.
3. Thermal insulation with metallic restoration
4. Pulpal medicat

Types of liners:

1. Thin film liners:
 - A. Solution liners/varnishes: 2-5 µm thick.
 - B. Suspension liners: 20-25 µm.
2. thicker liners:
 - Also known as Cement liners: 200-1000 µm used for thermal protection, pulpal medicatio



Cavity Varnish

Solution liners (varnish)
A varnish is defined as natural gum (copal or resin) dissolved in an organic solvent such as acetone, chloroform, or ether.



- Copal or natural resin dissolved in non aqueous volatile solvent upon drying it will produce a thin film layer.

ADVANTAGES:

- flexible - dry rapidly.
- thick films tend to trap solvent during drying and become brittle.
- low cost, long history of use
- varnish may be applied on the surface of metallic restorations as a temporary protection in case of galvanic shock.
- Thickness of the varnish is 2 to 400 µm.

Limitation

- washes out at margins.



Cavity Liner advantages & Disadvantages

Advantages:

- low cost, long history of use
- antibacterial, long history, sealing ability
- Fluoride release
- adhesive strength

Disadvantages:

- washes out at margins
- most effective when in contact with pulp
- unable to withstand condensation forces
 - low pH
- thickness may inhibit seating of casting
 - moisture sensitive
 - moisture, technique sensitive

Prepared by:

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 2. KRISHNA YACHANG
 3. SHRADHA TRIVEDI

DEPARTMENT OF ENDOODONTICS & CONSERVATIVE DENTISTRY

Tarnish and corrosion

TARNISH & CORROSION

TARNISH
 Process by which a metal surface becomes dull or discolored.
 The surface finish or luster is altered.
 In this process a thin layer is formed on the metal surface by reaction with sulfide, chloride, oxide or other chemicals.

CORROSION
 It is not a surface discoloration but actual deterioration of a metal by reaction with the environment.
 Tarnish causes the formation of hard and soft deposits on the surface of restoration.
 Soft deposit → Plaque.
 Hard deposit → Calculus.
 Discoloration comes through iron and mercury containing drugs, food debris, pigment producing bacteria.
 Oxide, sulfide and chloride films also cause TARNISH.

CLASSIFICATION OF CORROSION
 Two general types of corrosion reactions occur as:



1. In chemical corrosion/dry corrosion there is direct combination of metallic and non metallic element to form a chemical compound by oxidation, halogenation or sulfuration reactions, e.g. discoloration of silver by sulfur.
2. Electrochemical/wet corrosion is formation of free electrons and the electrolyte provides the pathway for the transport of electrons.

ELECTRO MOTIVE FORCE SERIES (EMF)
 The EMF series is the classification of elements in the order of their dissolution tendencies.
 If two metals are immersed in an electrolyte and are connected by an conductor, an electric couple is formed.
 The metal that gives up its electrons and oxidizes is called the Anode.
 The metal with lowest electrode potential corrodes.


PROTECTION AGAINST CORROSION
 Stainless is a formation of strong adherent oxide film on the metal surface which protect it from corrosion. E.g. chromium, titanium are said to be passive metals.
 Since this oxide films are passive to oxidative chemical attacks, their formation is called passivation.
 Increasing noble metal content, alloy with noble metal content below 55%, may tarnish.
 The noble metal in dental alloy should be 50% gold, platinum and palladium to ensure corrosion resistance.
Salivary pellicle pellicular restorations like amalgam and cast metal accelerate corrosion.
 The patient should also maintain good oral hygiene.
Other methods dissimilar metal restorations should be avoided.
 Avoid using a high mercury amalgam.

TYPES OF ELECTROLYTIC CORROSION

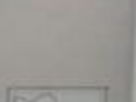
1. **SALVANTIC CORROSION**
 When two dissimilar metals be in direct physical contact with each other galvanic corrosion occurs.
 Eg. if a gold restoration comes in contact with amalgam restoration, the amalgam forms the anode and starts corroding.
 The electric couple is created when the two restoration touch causes a sharp pain called **galvanic shock** usually occurs immediately after insertion.


2. **HETEROGENEOUS COMPOSITIONS**
 When an alloy containing ductile is immersed in an electrolyte the metallic grains with the lower electrode potential are attacked and corrosion results.



3. **STRESS CORROSION**
 A metal stressed by cold working, becomes more reactive at the site of maximum stress.
 If stressed and unprestressed metals are in contact in an electrolyte, the stressed metal will become the anode of galvanic cell and will corrode.
 Eg. if an orthodontic wire has been cold worked, stress corrosion may occur and cause the wire to break.



4. **CONCENTRATION CELL CORROSION**
 A type of concentration stress corrosion.
 Occurs due to microleakage between the restoration and the tooth margins.
 A good oral hygiene is significant for minimizing these corrosion processes.



Prepared By: Srushti Desai, Heena Dethoriya,
Diksha Dobriyal

g.v.black formula for hand cutting instruments

G.V. BLACK'S FORMULA FOR HAND CUTTING INSTRUMENTS

History :
Greene Vardiman first introduced the formula in the year 1895 to generalize the dental formulas used world wide.

INTRODUCTION

- G.V. Black's formula is a four digit formula. An additional or the fifth number indicates the manufacturer's identification number.
- It is presented on the handle of the instrument in the form of 3-4 numbers separated by dashes or spaces.
- It is always in the metric system.

SIGNIFICANCE OF THE NUMBERS IN G.V. BLACK'S FORMULA

1st Number : It denotes the width of the blade or primary cutting edge. It is expressed in mm.

2nd Number : It denotes primary cutting edge angle. (measured from a line parallel to the long axis of the instrument handle in the clockwise direction)
Expressed in the form of degrees.
Traditionally not mentioned in the instrument formula.
Adjustment should be done such that the digit is greater than 50.
Omitted when edge is perpendicular to the blade.

3rd Number : Denotes the length of the blade in mm.

4th Number : Denotes blade angle relative to the long axis of the handle in a clockwise direction.
Expressed in the form of degrees.
Adjustment should be done such that the digit is less than 50.

NEED OF ANGLES

To gain access of working need to various areas.
For balance purpose of the bracket. (balance is generated by contra angling)

PRINCIPLES

Concentrate force at a very thin section of cutting angle.
Thinner the cross-section of the cutting edge, more is the concentration of the force which makes it easy to cut.
Balance of the instrument. If there is no balance then efficient work at different regions and prevention of injury won't be possible.

Prepared by :-
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Ravina Khosara Chandni Patel, Sejal Mehra
MEd B.D.S. (2019-21)

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COSAC, Bopal, Ahmedabad.

Guided by :-
Dr. KAMAL BAGDA
Prof. S.H.O.D.

Dental bases

DENTAL BASES

BASES can be considered as restorative substitutes for the dentin that was removed by caries and/or the cavity preparation. They act as a barrier against chemical irritation, provide thermal insulation, and can resist the condensation forces on a tooth when placing a restoration.
Thickness of base: 0.5 mm

ZINC PHOSPHATE

- Zinc phosphate(ZP) is a powder/liquid combination that is an ideal base material since it can provide thermal insulation and will allow the condensation of amalgam several minutes after placement.

CLASSIFIED AS
1) fine grained
2) medium grained

setting time 3 to 5 min **working time** 5 min

Uses- 1) intermediate restoration
2) thermal insulating base

POWDER/LIQUID RATIO
1.4 gm powder to 0.5 ml liquid



ZINC POLYCARBOXYLATE

- A material that is comparable to ZOP is zinc poly carboxylate (ZPC).
- The important difference is the liquid component. The liquid in ZPC is poly acrylic acid, which is quite viscous.
- Zinc poly carboxylate adheres to the tooth via an interaction between the carboxylic acid and the calcium in the dentin.

setting time 6 to 8 min **working time** 2.5 min

POWDER/LIQUID RATIO
1.5 PARTS OF POWDER TO 1 PART OF LIQUID BY WEIGHT



APPLICATIONS
Metal sub structural porcelain
Crown and bridges

ZINC OXIDE -EUGENOL CEMENT

They are cement of low strength. They are the least irritating of all dental cements and they are known to have an obtundant effect on exposed dentin.

POWDER/LIQUID RATIO
4:1 TO 6:1 by weight

setting time 4 to 10 min **working time** 45 sec.

APPLICATIONS
1)As a protective and sedative lining material.
2)As temporary filling



GLASS IONOMER & RESIN

Glass ionomer is the generic name of the group of materials based on the reaction of silicate glass powder and polyacrylic acid.

APPLICATIONS IN DENTISTRY:
-Pit and fissure sealant.
-In pediatric patient in case of carious cavity



POWDER/LIQUID RATIO- 3:1 BY WEIGHT %
setting time 5 to 7 min **working time** 2.5 min.

FLOWABLE BASE

FOR exhibits excellent adaptation to the preparation walls owing to its flowable nature, reducing the possibility of fluid formation on the margins, which could lead to postoperative sensitivity or aesthetic failure of the restoration



PREPARED BY : 1) Janki Tiwa
2) Namrata Trivedi

DEPARTMENT OF CONSERVATIVE DENTISTRY & ENDOODONTICS

Dental caries – etiology and classification



Hand cutting instruments

HAND CUTTING INSTRUMENTS IN OPERATIVE DENTISTRY

Definition: Instrument refers to a tool, device or implement used for specific purpose or type of work and is preferred in professional or scientific fields as precision items are generally required to perform specific procedures.

Hand cutting instruments are manufactured from two main materials:
 - Stainless steel
 - Carbon steel

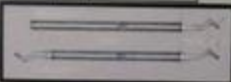
Some instruments are made with carbide inserts to provide more durable cutting edge.

CLASSIFICATION ACCORDING TO CHARBÉNAU

1. Cutting instruments		2. Contouring instruments		3. Finishing instruments	
Hand Waxbit Chisel Rear Die Spatula	Autary Bark Spoon Steel	Pluggers Hand Mechanical	Isotonic Carvers Serrators Finishing instruments		
4. Forming & Finishing Instruments		5. Substitue instruments		6. Miscellaneous Instruments	
Hand Orange-wood chisel Finishing points Finishing strips	Autary Shaping bars Shaped burr Shaped diamond Rubber cups	Rubber dam frame Clamp Forceps Punch Sulcus explorer Cotton roll holders	Mouth retractor Probe Sissors Pliers Others		

Parts of hand instruments

- Handle/shaft
- Shank
- Blade with cutting edge or rib with face




INSTRUMENT FORMULA GIVEN BY S.V. BLACK


1. **Left instrument formula:** Cutting edge of the instrument is at a right angle to the blade.

1. **W** - Width of the blade in cenths of a millimeter.
2. **L** - Length of the blade in millimeters.
3. **A** - Angle the blade forms with the axis of the handle in centigrade.

2. **Right instrument formula:** Cutting edge of the instrument is at an angle other than a right angle to the blade.




Instrument formula of enamel hatchet



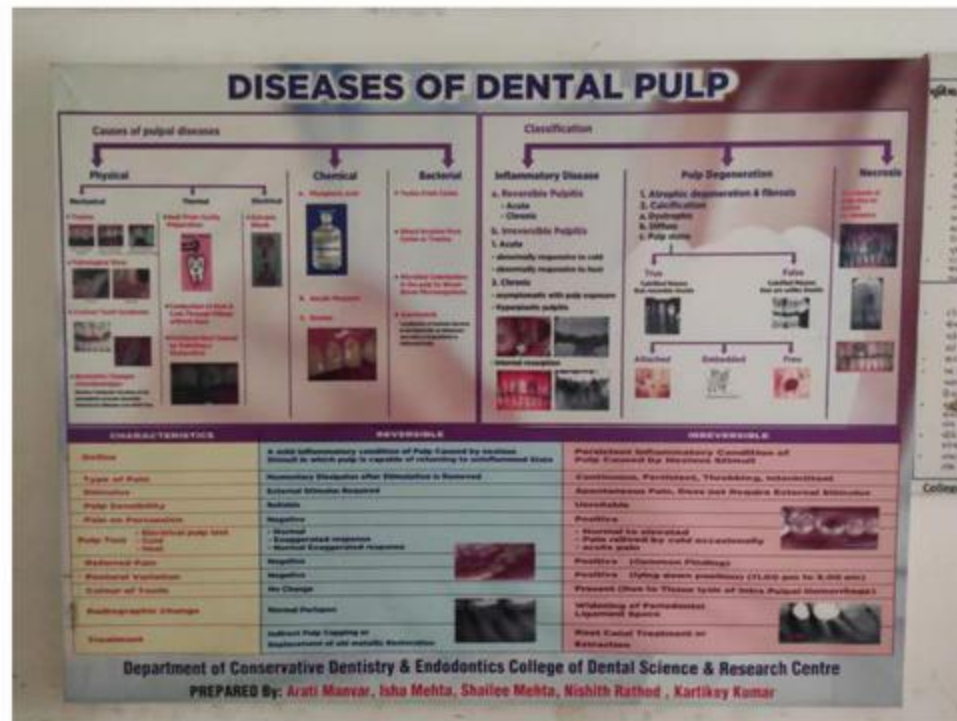
Instrument formula of dental GWT

Types of hand cutting instruments

1. **Chisel**
 - a. **Straight chisel**
Used for planing or cleaning enamel.
 - b. **Bevel angle chisel**
Made is shorter as compared to straight chisel.
Use - To define line and point angles.
 - c. **Double chisel**
Used to clean or split undetermined enamel.
2. **Triple angle chisel**
Used to flatten the pulpal floor.
3. **Excavator**
 - a. **High back**
Use - Preparing extensive areas on anterior teeth.
Shaping internal line angles in DRG restorations.
 - b. **Low back**
Use - Sparring or scraping of softened carious material.
Carving amalgam or direct wax patterns.
3. **Special chisel**
 - a. **Enamel hatchet**
Used for smoothing buccal and lingual walls of proximal box.
Used for breaking enamel of proximal box.
Used for smoothing gingival wall.
 - b. **Bingual marginal trimmer**
Used to give gingival rim surface bevel.
Used for finishing or bevelling into pulpal line angle.
Angle former.
Use - To approximate line and point angles in DRG restorations to establish the restorative form.
d. **Undetermined chisel**
Used for cleaning undetermined enamel and for shaping walls.



Diseases of dental pulp



Posters - PG

Access opening in posterior teeth


ACCESS OPENING IN POSTERIOR TEETH

DEFINES THE SHAPE, SIZE & CORONAL EXTENSION OF PULP CHAMBER WHICH ARE ESTIMATED FROM RADIOGRAPH

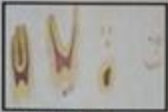
Name of tooth	Access preparation	Canals	Name of the access protocol
MAXILLARY 1 st PREMOLAR	Ovoid	2	BUCCAL & PALATAL
MAXILLARY 2 nd PREMOLAR	Ovoid	1	CENTRAL
MAXILLARY 2 nd MOLAR	Rhomboid oval	3 to 4	MESIOBUCCAL 1, MESIOBUCCAL 2, DISTOBUCCAL & PALATAL
MAXILLARY 2 nd MOLAR	Quadrilateral	3 to 4	FUSED 2 BUCCAL CANALS, PALATAL & MESIOBUCCAL
MAXILLARY 3 rd MOLAR	Quadrilateral	1 to 4	C-SHAPED CANALS ARE PRESENT
MANDIBULAR 1 st PREMOLAR	Ovoid	1	CENTRAL
MANDIBULAR 2 nd PREMOLAR	Ovoid	1	CENTRAL
MANDIBULAR 1 st MOLAR	Trapezoidal	3 to 4	MESIAL ROOT HAS 2 CANALS & DISTAL ROOT HAS 1 OR 2 CANALS
MANDIBULAR 2 nd MOLAR	Rhomboid oval/Ovoid	3	2 MESIAL ROOT CANALS & 1 DISTAL ROOT CANAL
MANDIBULAR 3 rd MOLAR	Rhomboid oval/Ovoid	2	C-SHAPED CANALS ARE PRESENT

Steps in cavity preparation:


- 1) To penetrate through occlusal or lingual surfaces. It can be done using a high speed hand piece with tungsten carbide bur.
- 2) To find the pulp chamber narrow opening is maintained initially and penetrating bur is taken to pre-measured depth. When using tapered instruments, force should not be used but should be allowed to cut their own way; if not done so the tooth will weaken.
- 3) To "DEROOF" the dentin that covers the pulp chamber. This is carefully done with help of thin needle diamond cylinder in order to avoid widening of isthmus.
- 4) To obtain uniform contact of file with access cavity wall. A file is placed in one of the canals and is viewed to evaluate specific points along its length where it is being held up by access cavity or canal dentin. If restraining dentin is determined to be within the coronal portion of canal GG bur can be used.
- 5) The clinician must assess the degree of taper to be imparted to the dentin access wall. Mesio-distal width of access preparation can be kept as small as possible. Average dimensions between walls at the pulp chamber floor are 2.2mm mesio-distally and 1.5mm bucco-lingually.



MAXILLARY PREMOLAR



MAXILLARY MOLAR



MANDIBULAR PREMOLAR



MANDIBULAR MOLAR

PREPARED BY: SHARANYA CHANDRASEKHAR, SHARMA MANISHA, MAHAMMED SHAHEH

Post and core



Access opening - maxillary teeth



Access opening – mandibular teeth



Maxillary pre-molar and molar anatomy



mandibular pre-molar and molar anatomy



Contacts and contours

CONTACTS AND CONTOURS

CONTACTS

❖ **DEFINITION:** It is the area of a point where the tooth contact with adjacent teeth.

❖ **LOCATION:**
 ANTERIOR TEETH: middle one third
 PREMOLARS: junction of middle third or coronal third of tooth
 MOLARS: cervically

❖ **IMPORTANCE:**
 • To maintain balanced occlusion prevent food impaction.
 • Prevents periodontal problems.
 • Prevents tooth movements.

❖ **CAUSES OF DISTURBANCE IN CONTACTS**
 • Physiological disturbance, habits, tooth or jaw fracture and proximal caries.

❖ **PROBLEMS FACED IN CONTACTS:**

Wedge shaped contact	Interproximal space is well protected and with no mobile contact. Advantage: Storage of food. Disadvantage: Food impaction in the sulcus.	
Overcontoured contact	Excessively close contact. Disadvantage: Food impaction. Advantage: No mobile contact. Disadvantage: Food impaction.	
Undercontoured contact	Excessively loose contact. Disadvantage: Food impaction. Advantage: No mobile contact. Disadvantage: Food impaction.	
Open contact	Excessively loose contact. Disadvantage: Food impaction. Advantage: No mobile contact. Disadvantage: Food impaction.	
Wedge shaped contact	Interproximal space is well protected and with no mobile contact. Advantage: Storage of food. Disadvantage: Food impaction in the sulcus.	

CONTOURS

❖ **DEFINITION:** Convexity of the tooth on facial and lingual surfaces which affords protection and stimulation of the supporting tissues during mastication.

❖ **USES:**
 Deflection of food.
 Affects the transmission of occlusal force and maintain proper jaw relations.

❖ **LOCATION**
 • ANTERIOR TEETH:
 (1) facial surface - cervical third
 (2) lingual surface - cervical third
 • POSTERIOR TEETH:
 (1) facial surface - cervical third
 (2) lingual surface - middle third

❖ **DIVISIONS IN CONTOURS**

- 1- Face lingual contours
- 2- Proximal contours
 => Proximal contact areas - proximal contours of teeth adjacent of each other
- 3- Occlusal contours
 => Marginal ridges
 => Embrasures

❖ **PROBLEMS FACED IN CONTOURS**

1. Over contoured restoration - Food deflection, causes flabby, red inflamed gingiva.
2. Under contoured restoration - causes irritation and trauma to attachment apparatus.

Prepared by- Sweta satodiya, Dhruvi kathiria, Rajsi kavi, Vishakha kansarkar

Recent advances in caries detection



Non-carious cervical lesions

CER

NON-CARIOUS CERVICAL LESIONS

Non-carious cervical lesions are defined as any gradual loss of tooth structure characterized by the formation of smooth, polished surface irrespective of the etiology. Also called as "Wasting Diseases of the teeth".
The older the patient, greater the number of lesions and deeper is extent of the lesions.

1. Abrasion	5. Dentinogenesis Imperfecta	9. Localised Non-Hereditary Dentin Hypoplasia
2. Abfraction	6. Amelogenesis Imperfecta	10. Localised Non-Hereditary Dentin Hypocalcification
3. Erosion	7. Localised Non-Hereditary Enamel Hypoplasia	11. Discoloration
4. Attrition	8. Localised Non-Hereditary Enamel Hypocalcification	12. Malformation
		13. Trauma

ABRASION

Loss of tooth structure due to mechanical wear of the tooth surface by friction of the tooth against a hard or semi-hard substance.

Causes:
- Toothbrushing with hard toothbrush
- Use of abrasive toothpaste
- Vigorous toothbrushing
- Use of toothbrush with worn bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with stiff bristles
- Use of toothbrush with long bristles
- Use of toothbrush with short bristles
- Use of toothbrush with wide bristles
- Use of toothbrush with narrow bristles
- Use of toothbrush with thick bristles
- Use of toothbrush with thin bristles
- Use of toothbrush with soft bristles
- Use of toothbrush with medium bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with extra hard bristles
- Use of toothbrush with super hard bristles
- Use of toothbrush with ultra hard bristles
- Use of toothbrush with mega hard bristles
- Use of toothbrush with giga hard bristles
- Use of toothbrush with tera hard bristles
- Use of toothbrush with peta hard bristles
- Use of toothbrush with exa hard bristles
- Use of toothbrush with zetta hard bristles
- Use of toothbrush with yotta hard bristles
- Use of toothbrush with nonna hard bristles
- Use of toothbrush with decillion hard bristles
- Use of toothbrush with googol hard bristles
- Use of toothbrush with googolplex hard bristles
- Use of toothbrush with infinity hard bristles
- Use of toothbrush with eternity hard bristles
- Use of toothbrush with forever hard bristles
- Use of toothbrush with ever hard bristles
- Use of toothbrush with always hard bristles
- Use of toothbrush with usually hard bristles
- Use of toothbrush with normally hard bristles
- Use of toothbrush with ordinarily hard bristles
- Use of toothbrush with typically hard bristles
- Use of toothbrush with usually hard bristles
- Use of toothbrush with normally hard bristles
- Use of toothbrush with ordinarily hard bristles
- Use of toothbrush with typically hard bristles

ABFRACTION

Loss of tooth structure due to mechanical wear of the tooth surface by friction of the tooth against a hard or semi-hard substance.

Causes:
- Toothbrushing with hard toothbrush
- Use of abrasive toothpaste
- Vigorous toothbrushing
- Use of toothbrush with worn bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with stiff bristles
- Use of toothbrush with long bristles
- Use of toothbrush with short bristles
- Use of toothbrush with wide bristles
- Use of toothbrush with narrow bristles
- Use of toothbrush with thick bristles
- Use of toothbrush with thin bristles
- Use of toothbrush with soft bristles
- Use of toothbrush with medium bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with extra hard bristles
- Use of toothbrush with super hard bristles
- Use of toothbrush with ultra hard bristles
- Use of toothbrush with giga hard bristles
- Use of toothbrush with tera hard bristles
- Use of toothbrush with peta hard bristles
- Use of toothbrush with exa hard bristles
- Use of toothbrush with zetta hard bristles
- Use of toothbrush with yotta hard bristles
- Use of toothbrush with nonna hard bristles
- Use of toothbrush with decillion hard bristles
- Use of toothbrush with googol hard bristles
- Use of toothbrush with googolplex hard bristles
- Use of toothbrush with infinity hard bristles
- Use of toothbrush with eternity hard bristles
- Use of toothbrush with forever hard bristles
- Use of toothbrush with ever hard bristles
- Use of toothbrush with always hard bristles
- Use of toothbrush with usually hard bristles
- Use of toothbrush with normally hard bristles
- Use of toothbrush with ordinarily hard bristles
- Use of toothbrush with typically hard bristles

EROSION

Loss of tooth structure due to chemical wear of the tooth surface by acids.

Causes:
- Intrinsic acids (e.g., from diet)
- Extrinsic acids (e.g., from gastric reflux)
- Environmental acids (e.g., from acid rain)
- Occupational acids (e.g., from industrial work)
- Recreational acids (e.g., from sports drinks)
- Medical acids (e.g., from chemotherapy)
- Dental acids (e.g., from dental procedures)

ATTRITION

Loss of tooth structure due to mechanical wear of the tooth surface by friction of the tooth against a hard or semi-hard substance.

Causes:
- Toothbrushing with hard toothbrush
- Use of abrasive toothpaste
- Vigorous toothbrushing
- Use of toothbrush with worn bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with stiff bristles
- Use of toothbrush with long bristles
- Use of toothbrush with short bristles
- Use of toothbrush with wide bristles
- Use of toothbrush with narrow bristles
- Use of toothbrush with thick bristles
- Use of toothbrush with thin bristles
- Use of toothbrush with soft bristles
- Use of toothbrush with medium bristles
- Use of toothbrush with hard bristles
- Use of toothbrush with extra hard bristles
- Use of toothbrush with super hard bristles
- Use of toothbrush with ultra hard bristles
- Use of toothbrush with giga hard bristles
- Use of toothbrush with tera hard bristles
- Use of toothbrush with peta hard bristles
- Use of toothbrush with exa hard bristles
- Use of toothbrush with zetta hard bristles
- Use of toothbrush with yotta hard bristles
- Use of toothbrush with nonna hard bristles
- Use of toothbrush with decillion hard bristles
- Use of toothbrush with googol hard bristles
- Use of toothbrush with googolplex hard bristles
- Use of toothbrush with infinity hard bristles
- Use of toothbrush with eternity hard bristles
- Use of toothbrush with forever hard bristles
- Use of toothbrush with ever hard bristles
- Use of toothbrush with always hard bristles
- Use of toothbrush with usually hard bristles
- Use of toothbrush with normally hard bristles
- Use of toothbrush with ordinarily hard bristles
- Use of toothbrush with typically hard bristles

DENTINOGENESIS IMPERFECTA

Genetic defect of dentin formation.

Causes:
- Genetic defect of dentin formation
- Abnormal dentin matrix
- Abnormal dentin mineralization
- Abnormal dentin structure
- Abnormal dentin color
- Abnormal dentin texture
- Abnormal dentin shape
- Abnormal dentin size
- Abnormal dentin location
- Abnormal dentin orientation
- Abnormal dentin direction
- Abnormal dentin movement
- Abnormal dentin vibration
- Abnormal dentin sound
- Abnormal dentin taste
- Abnormal dentin smell
- Abnormal dentin touch
- Abnormal dentin feel
- Abnormal dentin sight
- Abnormal dentin hearing
- Abnormal dentin smell
- Abnormal dentin taste
- Abnormal dentin touch
- Abnormal dentin feel
- Abnormal dentin sight
- Abnormal dentin hearing

AMELOGENESIS IMPERFECTA

Genetic defect of enamel formation.

Causes:
- Genetic defect of enamel formation
- Abnormal enamel matrix
- Abnormal enamel mineralization
- Abnormal enamel structure
- Abnormal enamel color
- Abnormal enamel texture
- Abnormal enamel shape
- Abnormal enamel size
- Abnormal enamel location
- Abnormal enamel orientation
- Abnormal enamel direction
- Abnormal enamel movement
- Abnormal enamel vibration
- Abnormal enamel sound
- Abnormal enamel taste
- Abnormal enamel smell
- Abnormal enamel touch
- Abnormal enamel feel
- Abnormal enamel sight
- Abnormal enamel hearing
- Abnormal enamel smell
- Abnormal enamel taste
- Abnormal enamel touch
- Abnormal enamel feel
- Abnormal enamel sight
- Abnormal enamel hearing

DISCOLORATION

Change in the color of the tooth.

Causes:
- Intrinsic discoloration (e.g., from diet)
- Extrinsic discoloration (e.g., from tobacco)
- Environmental discoloration (e.g., from acid rain)
- Occupational discoloration (e.g., from industrial work)
- Recreational discoloration (e.g., from sports drinks)
- Medical discoloration (e.g., from chemotherapy)
- Dental discoloration (e.g., from dental procedures)

MALFORMATION

Abnormal development of the tooth.

Causes:
- Genetic defect of tooth development
- Abnormal tooth matrix
- Abnormal tooth mineralization
- Abnormal tooth structure
- Abnormal tooth color
- Abnormal tooth texture
- Abnormal tooth shape
- Abnormal tooth size
- Abnormal tooth location
- Abnormal tooth orientation
- Abnormal tooth direction
- Abnormal tooth movement
- Abnormal tooth vibration
- Abnormal tooth sound
- Abnormal tooth taste
- Abnormal tooth smell
- Abnormal tooth touch
- Abnormal tooth feel
- Abnormal tooth sight
- Abnormal tooth hearing
- Abnormal tooth smell
- Abnormal tooth taste
- Abnormal tooth touch
- Abnormal tooth feel
- Abnormal tooth sight
- Abnormal tooth hearing

TRAUMA

Physical injury to the tooth.

Causes:
- Physical injury to the tooth
- Abnormal tooth matrix
- Abnormal tooth mineralization
- Abnormal tooth structure
- Abnormal tooth color
- Abnormal tooth texture
- Abnormal tooth shape
- Abnormal tooth size
- Abnormal tooth location
- Abnormal tooth orientation
- Abnormal tooth direction
- Abnormal tooth movement
- Abnormal tooth vibration
- Abnormal tooth sound
- Abnormal tooth taste
- Abnormal tooth smell
- Abnormal tooth touch
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- Abnormal tooth feel
- Abnormal tooth sight
- Abnormal tooth hearing

LOCALISED NON-HEREDITARY ENAMEL HYPOPLASIA

Localized defect of enamel formation.

Causes:
- Localized defect of enamel formation
- Abnormal enamel matrix
- Abnormal enamel mineralization
- Abnormal enamel structure
- Abnormal enamel color
- Abnormal enamel texture
- Abnormal enamel shape
- Abnormal enamel size
- Abnormal enamel location
- Abnormal enamel orientation
- Abnormal enamel direction
- Abnormal enamel movement
- Abnormal enamel vibration
- Abnormal enamel sound
- Abnormal enamel taste
- Abnormal enamel smell
- Abnormal enamel touch
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- Abnormal enamel hearing
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- Abnormal enamel taste
- Abnormal enamel touch
- Abnormal enamel feel
- Abnormal enamel sight
- Abnormal enamel hearing

LOCALISED NON-HEREDITARY DENTIN HYPOCALCIFICATION

Localized defect of dentin formation.

Causes:
- Localized defect of dentin formation
- Abnormal dentin matrix
- Abnormal dentin mineralization
- Abnormal dentin structure
- Abnormal dentin color
- Abnormal dentin texture
- Abnormal dentin shape
- Abnormal dentin size
- Abnormal dentin location
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- Abnormal dentin sight
- Abnormal dentin hearing

LOCALISED NON-HEREDITARY DENTIN HYPOPLASIA

Localized defect of dentin formation.

Causes:
- Localized defect of dentin formation
- Abnormal dentin matrix
- Abnormal dentin mineralization
- Abnormal dentin structure
- Abnormal dentin color
- Abnormal dentin texture
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- Abnormal dentin sight
- Abnormal dentin hearing

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