# Sheet no. : 1

# Refer to slide no. :1

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***Field isolation for restorative dentistry***

# Goals of isolation #

**1) moisture control ::** A clean dry field is required for operative procedures. It refers to exclude sulcular fluids, saliva and gingival bleeding from operating field . The only acceptable moisture is that from 3 in 1 syringe .

 **2) Retraction and access ::** You have to deal with to tongue , lips and Buccal tissue on cheeks . So the aim of isolation is not only to prevent infection as in moisture control but to isolate the tooth from the surrounding soft tissues . It provides maximal exposure of the operating site and involves maintaining an open mouth.

 **3) Harm prevention ::** Prevent harming the patients by small instruments or aspiring depries Prevent soft tissue accidental damage, Lead to more patient comfort and alleviate the patient's anxiety toward dental treatment. Your self confidence will transfer to the patient increase trusting in you and feeling comfort .

# Advantages of field isolation #

1. **dry , clean operative field** , important in infection control . It's important to wear face shield to protect yourself from infections.
2. **Access and visibility** by Retraction of the surrounding tissues .
3. **improve properties of Dental materials** . It's important to have a precise powder: liquid ratio , if the liquid percentage increased, the material will be more soluble with low strength and mechanical properties. So isolation is important for the properties of the used materials .

For example : **\* amalgam** especially that contains zinc if it contaminates with water or saliva it will expand ( hygroscopic expansion) which is a delayed expansion that result in cracking the amalgam filling itself and getting outside the tooth (If it was on class II) or it will break the tooth ( if it was on class I)

\*\* Bad isolation in **composite** restoration , here any contaminated bonding surface by saliva or blood will lead to bonding failure .

1. **protection of the patient and the operator**  by minimizing any fluid contact between them, so we make infection control .
2. **operating efficiency**, Saving time by stopping conversations
3. **for the sake of tooth**, It's important to know that isolation is essential for the sake of the patient and the tooth not only for the material.

" Isolation must be before cavity preparation ,in other words assure that you isolate the tooth before reaching dentin otherwise the bacteria will enter the pulp through dentinal tubules ."

 # Disadvantages #

1. Time consuming , it take 3-5 min .
2. Maybe patients objectionable for example: talkative patients reject rubber dam, and Patients who have gag reflex .

# Ways of isolation #

《1》 Rubber dam isolation

* was introduced into dentistry in 1864
* used to define the operating field by isolation of one tooth (single tooth isolation) or more teeth (multiple teeth isolation) from the oral environment .
* it's the most successful method of isolation

# # Materials of rubber dam ..

**1) Dam material**

* Could be sterile (individually packed) or non-sterile
* Different sizes (5×5 or 6×6) , colors (dark or light) and thicknesses (we usually use medium and heavy)
* latex or latex-free (for patient who are sensitive from latex)

**2) rubber dam holder or frame**

* could be plastic or metal
* it maintains the borders of rubber dam in position

**3) retainer or clamp**

* It anchor the rubber dam , sometimes we put it on the adjacent tooth not the tooth we're working on like in class II ,so we do multiple teeth isolation ,and we put it on the most posterior isolated tooth .
* it also used to retract the gingival tissue
* it consist of 4 prongs and 2 jaws connected by bow
* Different sizes ( small for premolars , large for molars , and special shape and size for anteriors ) -Different shapes (winged or winged less)
* in posterior teeth the rubber dam can't be fixed without the retainer
* The clamp is not usually required for anterior teeth because the contact areas are strong anteriorly , so rubber dam is anchored passively or by using wedges , dental floss or by folding then placing some pieces of rubber dam; Except if there was a malformation, missing ant. tooth or diastema, here you have to use a retainer

For safety purposes, the clamps hold be tied with long dental floss ( if you put the clamp on tooth before putting the rubber dam) because for any reason the clamp might be accidentally swallowed ,so this step help us to pull it easily .

# Instruments used with rubber dam ..

**1》 punch**

it makes holes at the sutable site on the rubber dam

\*hole size : it make different sizes of holes

\*\*Hole position : it's better to use the guide (templates or stamps) .

" only the tooth to be restored should be isolated ,although isolating more teeth will ensure access and visibility" .

**2》 Napkin**

* used to absorb any saliva or fluids .
* it reduces sensitivity by reducing direct contact between the patient and the rubber dam material .

**3》 retainer forceps**

 Used to place the retainer on the tooth . There is holes on the retainer to be holded by the forceps .

 **4》 water-based lubricant**

 Placed on the corners of the mouth.

 \* it's water based not oil based or Vaseline because these will mess everything and you will not be able to control the rubber dam.

 \*\*Note\*\* Under the rubber dam you have to put the suction to prevent saliva accumulation under the rubber dam .

#Placing the rubber dam..

* you make the hole then you place the rubber dam then you put the clamp, or you can put the clamp then firm the rubber dam around it.
* In anterior teeth we have something called knifing ( when you put the rubber dam between the teeth first you have to make it thin by pulling it , then you insert it between the teeth , make sure that you insert it enough gingivally
* When you are working on more than one tooth , like when you are doing veneers , or when you want to make etching for more than one tooth ( when you become an expert) , in these cases you make isolation for more than one tooth.
* As we said sometimes we can use dental floss instead of the retainer (clamp) , which can retain the rubber dam and pull it gingivally.
* In class V , (you want to work at the gingival side ) so we need maximum access gingivally , so we bring periodontal probe or excavator or floss (any things that has blunt end in order not to heart the gingiva ) and we push the rubber dam more gingivaly , this step is not needed if you are working in class I or II

# Removing the rubber dam…

first we remove the retainer or the floss , then we use scissor to cut the rubber dam , make sure that you remove any excess rubber dam , don't harm any oral soft tissue during cutting.

\*Note : always check and count for what you have , sometimes you may miss a piece ,most probably you will find it in the patient's mouth .

#WHEN the rubber dam can't be used??

* In case of partially erupted tooth as in wisdom tooth ( it is small unable to support a retainer) , although there is small retainer but usually we don't use them.
* in class II , because it will cover the working field .
* in extremely malpositioned teeth.
* In asthmatic patient, or patient who has gag reflex

" **Gag reflex**: it is a case when the patient has a very sensitive palate so the patient will vomit if you put anything inside his mouth ,In this case if you want to take impression or you need to make crown, you have to give the patient relaxant and anesthesia in the palate."

# Errors in application and removal of rubber dam …

Usually the errors in the rubber dam occur due to mistakes in making the holes (punching)

* You may make the holes very close to each other so when you put them between the teeth you have to pull them (so the rubber dam become very thin and it may tear)
* Or you may make the holes very far, so when you place them you will have excess amount of the rubber dam between the teeth
* Or you maybe the patient have a missing tooth and you didn't notice that

So positioning of the holes is important to be accurate.

\*\*\*Other methods for isolation:

**《**2**》** Cotton role

 if I don't have enough time, or I have patient with gag reflex or I want to make class 1, I can use cotton role instead of rubber dam.

* you have to use dry cotton role, and change them continuously whenever it soaked with saliva.
* you have to use at least 3 cotton role in the patient's mouth (one at the molars area because you have the parotid gland orifice there,
* One on the lingual sulcus under the tongue because you have the sublingual gland there ,and One on the buccal sulcus near the tooth that you are working on)
* Also don't forget to use the saliva ejector with the cotton role

There is a device for holding the cotton role but we don't have them in the university.

**《**3**》** Cellulose wafers

we put them on the buccal cheek (they absorb 6 times more than the cotton role)

And give us a good field of isolation, they are very good absorbent to an extent that you may harm the patient if you remove them before wetting them , So you have to wet them before removing in order not to tear the epithelial tissue of the cheek (remove part of the mucosa).

**《**4**》** Throat shield

 it is a gauze sponge , you put it in the patient mouth to avoid aspiring or swallowing small objects, these accidents is common in the crown tray in !

**《**5**》** Suction

 there is two type of suction

1) **Saliva ejector** (only remove saliva and water)

2) **High volume evacuator** (they remove saliva blood and even objects; if you put a crown and there is excess cement it will remove it also), Although ideally we should use them in normal procedure but we don't , it is commonly used only in surgical procedures.

**《**6**》** Svedopter

 it is an advanced instrument that makes suction, it has a mirror for indirect vision and it make retraction for the tongue .(3 in 1)

**《**7**》** Hygoformic saliva ejector

like the normal saliva ejector but made of plastic (more comfortable for the patient)

**《**8**》** Retraction cords

cord with different sizes that is commonly used in class V (to retract the gingiva in order to improve the visibility)

It has 2 jobs: 1) retract the gingiva 2) isolate the tooth from the saliva

It may be: \* **impregnated cord**: contain noradrenalin (to decrease the bleeding, it constricts the blood vessels)

\* **Plane cord (non-impregnated)** : doesn’t have noradrenalin

You have to be careful if the patient has a heart or blood pressure problems, we prefer to use the plane one.

Also you have to be careful while using these cords because you may tear the epithelial tissue in the gingiva, and if you leave it for more than 7 min; gingival recession will occur in the future! So don't leave it in the patient mouth while you are preparing something else, you have to remove it immediately after you finish from them, because If you leave it for long time it will make irreversible tissue damage.

**《**9**》** Mirrors & saliva ejector

 sometimes you can use the saliva ejector or the mirror for retraction and isolation to improve access and visibility in the working field.

**《**10**》** Mouth props

it is a method to keep the mouth of the patient opened passively in long procedure (because sometimes the patient will get tiered from opening his mouth actively (he may have pain in his muscles))

So you use the props, it composes of 2 types:

 1) Block

2) Ratchet (used in surgical procedure)

 Notice that you have to tie everything with floss to avoid the falling in the patient throat! (you don't know to what extent the patientcan swallow :p )

**《**11**》** Cheek retractor

 used usually when you want to take a photo of your work :P

**《**12**》** Drugs

 rarely indicated, like atropine (make hypo salivation)

**《**13**》** Isolate system

 new advanced device, 3 in 1 (retraction, suction, give a light) you may not see it in your whole life: P

Note: we wrote every word that was mentioned, but you have to refer to the slides.