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***Prevention In Elderly Patients***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Elderly patient have special considerations in regards to prevention ; that are different than children or adults. In this lecture we will talk about these aspects.*

*The Dr will send some articles in regards to this lecture.*

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***Caries***

* Root caries are more prevalent in elderly patients
* The type of responsible bacteria is different in elderly patients.

-The physiological aging of dentition results in gradual exposure of root surfaces, which can be prone to caries in later life  
 i.e **a new susceptible** site emerges and consequently **the pattern of disease** experience changes with age.

-So the preventive measures followed in young children or young adults will not work with elderly patients ; they have different protocols .

-Central to this philosophy is assessing the **caries risk** of our patients and recognizing that this assessment can **change** with age.

**Caries assessment for elderly patients**

In general , caries risk assessment as we all know is defined as the risk that a patient will develop new carious lesions or the possibility that the existing lesions will continue to progress , assuming that all the other etiological factors that could cause caries such as diet , time , susceptible surface and plaque surface would remain equal .

i.e. How prone is this person to caries just because of **the aging** process , regardless of anything else.

-Individuals are assessed as being at a high, medium or low risk of developing further lesions.

**FACTORS TO CONSIDER :**



* Looking at this table and starting with **the diet** -which is the main risk factor in caries assessment :

If the patients’ diet is high in fermentable carbohydrates he is definitely in the high risk category otherwise he is in the low risk category.  
  
Recall : **Frequency** of intake has an effect in addition to the type of diet.  
More frequent consumption of fermentable carbohydrates puts the patient at a higher risk for caries.

* Plaque score.
* Saliva amount and nature.

-Salivary flow **does not** reduce in amount purely because of aging , the cause is **mainly** contributed to the **medications or diseases** that cause a dry mouth.

-The **amount and nature** of saliva is affected . As we all know saliva contains bacteria in its’ normal components and as we get older the type of

bacterial strains changes and we will have more Lactobacilli and Streptococcus bacteria .

Lactobacilli are responsible for root caries , so the increased amount of lactobacilli in elderly patients contributes to increased **root caries** .

* Socio-economic status

There is plenty of systematic reviews and met analysis to prove that people with low socio-economic status are more prone to caries and have a greater chance of being edentulous.

Note : Preventive measures also consider edentulous patients in regards of how to take care of their appliances. so preventive measure do not only apply to dentate patients .

* Past disease experience

By this we mean **caries** experience ; higher DMFT score for the patients indicates more susceptibility for caries .(Same applies to current caries)

Note: (DMFT) > decay-missing-filled teeth

* Attendance pattern

Regular attender are in the low risk category and non-regular attenders are in the high risk category .

* Fluoride and chlorohexidine.

Regular application of fluoride and regular use of chlorohexidine places patients at a low caries risk.

* Medical history

The most prominent thing is the **medications** that cause xerostomia and **the syndromes** that cause learning difficulties, as well as **other diseases** such as arthritis that affects the patients manual dexterity to maintain their oral hygiene especially if they are using partial dentures .   
Quite frequently the use of implants to stabilize appliances works very well until the patient reaches the age of 70 , after that (75-80 years old patients ) manual dexterity will not be enough to take these dentures out to clean them due to the retentive mechanisms in the implant prosthesis , so this should be taken into consideration .

* Existing restorations and bridge work

-check the margin placement and if there are any overhangs

* Partial dentures and ability to retain plaque

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After this thorough assessment we depend on how many factors our patient has in order to categorize him/her at a high, medium or low risk.

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**Protocol for high risk elderly patients**

* Baseline radiographs, by which we mean a panoramic and 4 bitewings.
* Prophylaxis application of chlorhexidine for 1 minute followed by rinsing.
* Apply sealant to pits and fissures, which must be checked for integrity at recall.
* Fluoride varnish application.   
  Patient should be advised not to brush, eat hard foods or rinse for 10 hours ( the regular protocol ).

Three applications of fluoride varnish are recommended over a 3-month period (monthly over a 3 months period).

* Brushing twice a day with fluoridated toothpaste containing high percentage of fluoride.
* Rinsing daily for 1 minute with a fluoride mouthwash (0.05% NaF) at bedtime.   
  so the patient will be using a chlorohexidine mouthwash in addition to a fluoride mouthwash.
* Then Rinse weekly rather than daily with a chlorhexidine solution for 6 weeks
* After 6 months, recall and repeat baseline radiographs to compare if there are any progressing lesions, to monitor proximal lesions and to restore any lesions which have reached the middle third of dentine.

The guideline for restoration in elderly patients is whether we have reached the middle third of dentine or not if so, we have to restore the tooth.

If progression has been detected we increase the application of chlorhexidine (for example once daily instead of weekly) with reinforcement of oral hygiene.

* apply fluoride varnish two to three times on a six monthly basis . -Dr did not mention this point .

\* Oral hygiene instruction and dietary counseling are required to ensure success.

• Monitor patient at **six months** intervals until patient’s caries risk falls to moderate or low. If they fall into these categories the protocol will be changed.

**Protocol for moderate risk elderly patients**

*in this group we skip baseline radiographs , chlorohexidine , pit and fissure sealants and we start with fluoride varnish application.*

• Prophylaxis followed by fluoride varnish application.   
Patient should be advised not to brush or eat hard foods for 10 hours.   
Three applications of fluoride varnish are recommended 3 times over a 3-month period for every year the patient remains at moderate risk.

• Brushing twice a day with a fluoridated toothpaste

• Rinsing daily for 1 minute with a fluoride mouthwash (0.05% NaF) at bedtime.

In high risk category recall was every 6 months but in the moderate risk category it is every **6-12** months depending on your clinical judgement.

**At recall** we perform the same steps as high risk category with reinforcement of oral hygiene instructions.

• Monitor lesion size and depth and whether new lesions arise at 6–12 monthly intervals until the caries risk moves to low.  
If lesions progress or new lesions arise increase applications of the fluoride varnish and give further dietary advice

We don’t give chlorohexidine mouthwash unless the patient advanced into a higher risk category.

**Protocol for low risk elderly patients**

-Prevention is limited to brushing twice a day with fluoridated toothpaste.

Reviews at **12–18 month** intervals to check for white spot formation and any proximal radiolucency by bitewing radiographs

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**PRESERVING TOOTH TISSUE**

Besides caries we should consider preserving the tooth structure in  
Elderly patients .   
-In young patients as soon as caries advance from enamel to dentine we restore the tooth but in the elderly patients we prefer to preserve what is left rather than restore.

- Elderly patients who were prone to caries in their youth are highly likely to have relatively large restorations as a consequence of the restorative cycle or staircase, and these teeth will be prone to eventual failure.   
What we mean is that when we do a restoration and we face recurrent caries and restore the tooth again each time we will remove more tooth structure so you are going down the stairs of losing that tooth - it’s actually not a cycle but rather a staircase-

Newer elderly cohorts will have progressively more sound teeth, as operative intervention will have been restricted to where indicated. With minimal preparations and where modern adhesive materials will have been used.   
So if we do more prevention and less operative work the whole population will have less amount of fillings, crowns and chances of tooth loss with time.

These patients will require different management strategies and this will pose a challenge for practitioners in the future.  
looking ten years from now all the protocols that we are talking about will not be valid anymore and we have to find new guidelines

Met-analysis finding

Currently on average 60% of restorations placed by practitioners are replacements of restorations that are deemed to have failed in clinical service.   
The most common reason cited for replacing restorations is secondary caries.

-Marginal defects are often misdiagnosed as secondary caries and restorations replaced needlessly.   
Similarly restorations are frequently replaced that could have been repaired, refurbished or simply monitored.

For example an 80 year old patient came to our clinic with a nice class 2 amalgam on the upper 6 with just a chipped margin of the amalgam .  
Should we remover the filling and risk the need of an endo treatment? or should we polish it ?   
so go with this thought process .. we always prefer preventive rather than operative work.  
  
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**NON-CARIOUS TOOTH TISSUE LOSS .. ( abrasion , erosion , attrition)**

Elderly patients frequently exhibit the effects of non-carious tooth tissue loss (NCTTL).   
NCTTL is often multifactorial and a combination of erosion (whether intrinsic and or extrinsic), abrasion and attrition.  
-Extrinsic erosion is due to acid present in the diet. Will affect the labial surface of the anterior teeth , incisal edges and to a lesser extent the occlusal surfaces of the lower permanent molars.   
-Intrinsic erosion due to acid regurgitation (gastric acid) will usually affect the **palatal** surfaces of the upper teeth and occasionally the occlusal surfaces of the lower permanent molars.  
  
**Assessment of non-carious lesions**

1. examination intraorally   
2. obtain study casts and perform your dietary analysis ( Liaison with a medical practitioner should intrinsic erosion be diagnosed)   
  
Once a diagnosis is made the prime objective is to stabilize the disease process and prevent further tooth tissue loss before addressing the patient’s functional, aesthetic or occlusal needs.   
A significant number of patients are successfully managed on preventive regimes with relatively few patients needing extensive advanced restorative therapy  
  
Once again , considering an 80 year old case with severe attrition , you have to pause before thinking of a full mouth rehab ( in a 50 year old patient we wouldn’t hesitate about a full mouth rehab )   
  
-75 year old and more we think about stabilizing the disease , we want to study the causes causing this attrition whether it is normal and physiological because of aging , or are there any factors causing this tissue loss.  
  
We obtain study casts for these patients and compare attrition/abrasion/erosion **yearly** to monitor progress.  
  
  
**PREVENTION** OF NON-CARIOUS TOOTH TISSUE LOSS

1. Proper diagnosis  
2.Then our best appliance for prevention is a stabilization splint /night guard/ bite guard /occlusal splint .  
  
We have two types of bite guards soft and hard   
-use of either depend on the diagnosis and what the specific situation necessitates.

- To produce a stabilization splint for a patient on a semi adjustable articulator the laboratory will need the following:

* Full arch impressions for the maxilla and the mandible
* Face-bow record
* Centric and protrusive occlusal records  
    
  Need of face-bow record :  
  -When doing a bite guard in acrylic we are increasing the vertical dimension , and any procedure in dentistry that necessitates an increase in the vertical dimension needs a face-bow transfer.  
  -mounting the cast without a face-bow transfer is wrong and you will redo the whole work ( this applies to bite guards and full mouth rehabs)

Note : we usually construct a maxillary bite guard rather than a mandibular one.  
  
The idea behind the bite guard : when the mandibular teeth hits the flat acrylic this deprograms the proprioception and prevents the muscle of mastication from biting in full form as in bruxism .

Whether we are using soft or hard bite we need to have the following features :

* Have even contact of all teeth in centric relation
* Protrusive and excursive guidance
* No non-working interferences

At the day of delivery we check contacts with the articulating paper to ensure

1. bilateral simultaneous contact as with any appliance   
2. canine guidance in lateral excursion   
3. Anterior teeth in contact while posteriors are separated in protrusion.  
4.No non-working interferences

So to sum up if a patient has a reduced vertical dimension ,angular cheilitis , cheek biting and we can’t do a full mouth rehab this simple appliance will raise the vertical dimension as needed ( 2,3 ,4 mm.. ) and this will be a preventive measure for fungal infections , [angular cheilitis](https://www.google.jo/search?biw=1517&bih=741&q=angular+cheilitis&spell=1&sa=X&ved=0ahUKEwjW5KnV-s7JAhVEtxQKHf_jAw8QvwUIFygA), mixed infections or cheek biting .

Note : the appliance should be removed when eating , some patients are able to eat with it.

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**Dry mouth**

It’s a myth that salivary flow reduces with aging ; it is mainly due to the medications that our elderly patients use due to autoimmune/autonomic effects rather than direct effect on saliva reduction .

-This can change the caries risk of patients and cause new lesions to develop ,

-There are several salivary substitutes in the market and it makes sense to choose ones that contain fluoride.

- chlorohexidine varnish in 10% concentration is used for controlling root caries in adults with dry mouth

At least one randomized controlled trial has shown that 10% chlorhexidine varnish is useful for controlling root caries in adults with a dry mouth.

note : it s different than the rinse which has 0.1% concentration.

**Edentulous patients**

The problem doesn’t end when teeth are extracted , it actually starts !

Since the denture is more prone to calculus and plaque accumulation especially if the elderly patients are in a nursing home and are unable to take care of themselves.

Systematic review on the preventive effect of oral hygiene on pneumonia and respiratory tract infection on elderly people in hospitals and nursing homes were done in randomized control trials ( as we know this has the highest level of evidence )

Terminally ill people usually die from secondary infections and low immunity rather than the disease itself . Mostly from pneumonia and respiratory tract infections rather than the heart problem for example .   
This could be prevented simply by good oral hygiene which is really underestimated !

There are many systematic and met-analysis studied showing the effect of periodontal disease on premature birth , CVD and many other diseases . Same applies to edentulous patients whether they wear complete or partial dentures.  
So not having a denture is better than using one with poor oral hygiene.

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Good Luck ! :)