GUIDELINES FOR RESTORATIVE DENTISTRY

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INTRODUCTION

Dubai Health Authority (DHA) is the responsible entity for regulating, licensing and monitoring health facilities and healthcare professionals in the Emirate of Dubai. The Health Regulation Sector (HRS) is an integral part of DHA and was founded to fulfil the following overarching strategic objectives and program:

Objective #1: Position Dubai as a global medical destination by introducing a value-based, comprehensive, integrated and high quality service delivery system.

Objective #2: Direct resources to ensure healthy and safe environment for Dubai population.

Strategic Program #5: Oral & Dental Care-This program focuses on improving the oral health outcomes and ensure that all individuals have access to high quality treatments and effective prevention programs for dental care.

ACKNOWLEDGMENT

This document was developed by Dental Services Department, Primary Healthcare Services Sector (PHCSS). It has further been reviewed by the Health Policy and Standards Department (HPSD).

HRS would like to acknowledge and thank all parties that participated and worked toward developing these guidelines to ensure improving the quality and safety of healthcare services.

The Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Clinical guidelines to enhance the standard of care in health facilities are increasingly becoming part of current practice and will become more common over the next decade. These Clinical Guidelines aim to improve the quality and the level of healthcare provided to the clients. Healthcare providers can use these guidelines to answer specific questions in day-to-day practice and as an information source for continuing professional education.

This document presents a framework for dentists to:

- Assist dental healthcare providers to standardize decision making regarding restorability of teeth, ensure proper referrals to prosthodontic specialty and increase patient confidence and satisfaction with the service.
- Assist dentists to facilitate a successful pulp capping procedures. It also contributes to an overview of the topic of pulp capping, to assist them make informed choices in management of mature permanent teeth that need pulp capping, in order to achieve successful results.
- Discuss the etiological factors of loss of tooth structure rather than dental caries including attrition, erosion, abrasion and abfraction and manage the different cases will by a standardized decision-making process when the clinicians encounter such a situation.
- Assist dental healthcare providers to facilitate a successful management of post-operative hypersensitivity in resin composite restorations through proper identification

of the causes in order to develop a standardized decision-making process when the clinicians encounter such a situation.

- To assist in facilitating successful teeth whitening service in dental clinics.

DEFINITIONS

Abfraction: is the loss of tooth substance located in the cervical area caused by flexural forces during function and parafunction.

Abrasion: is the physical loss of tooth substance caused by materials other than tooth contact, in non-occluding surfaces.

Attrition: is the loss of tooth substance or a restoration as a result of mastication or contact between occluding surfaces.

Bleaching: is a cosmetic dental procedure that brings the dark shade of the tooth to lighter shade.

Chromogenic Bacteria: are well known for causing black stains on teeth. This bacteria produce hydrogen sulphide that reacts with saliva in mouth and form black stains on teeth.

Colour: is a combination of, Chroma (type of colour), value (intensity of colour –the relativity of lightness or darkness) and hue (a dimension of colour).

Crown-Root Ratio: is the physical relationship between the portion of the tooth not within the alveolar bone, as determined by a radiograph, compared with the portion of the tooth within alveolar bone.

Direct pulp capping: It is the procedure of covering exposed vital pulp using capping material to promote healing and preserve pulp integrity and vitality.

Erosion: The loss of tooth substance by chemical processes not involving bacterial action.

Extrinsic: is adherence of bacteria or discolouring agents to dental enamel that cause the tooth to assume an unusual colour or tint. It varies in shade according to the agent: coffee, tea, and tobacco cause brownish-black stains; chromogenic bacteria green to brown; and leaks from amalgam restorations bluish-grey to black.

Indirect pulp capping: Placement of protective dressing over thin remaining dentin, which if removed might expose the pulp, to protect the pulp and permit healing.

Inlay: is a fixed intracoronal restoration; a dental restoration made outside of a tooth to correspond to the form of the prepared cavity, which is then luted into the tooth

Intrinsic: is discolouration of internal tooth structure due to factors derived from within the body; an effect of Substances such as the antibiotic tetracycline. Such stains are not usually removable but may be treated through cosmetic dental procedures.

Occlusal Trauma: is trauma to the periodontium from functional or parafunctional forces causing damage to the attachment apparatus of the periodontium by exceeding its adaptive and reparative capacities; it may be self-limiting or progressive.

Onlay: is a partial-coverage restoration that restores one or more cusps and adjoining occlusal surfaces or the entire occlusal surface and is retained by mechanical or adhesive means

Prosthodontics: is the dental specialty pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of the oral function, comfort, appearance and health of patients with clinical conditions associated with missing or deficient teeth and/or maxillofacial tissues using biocompatible substitutes.

Provisional Prosthesis: is a fixed or removable dental prosthesis, or maxillofacial prosthesis designed to enhance aesthetics, stabilization, and/or function for a limited period of time, after which it is to be replaced by a definitive dental or maxillofacial prosthesis; often such prostheses are used to assist in determination of the therapeutic effectiveness of a specific treatment plan or the form and function of the planned definitive prosthesis.

Tooth discolouration: is defined as any change in the hue, colour, or value (translucency), of a tooth. It varies in etiology, appearance, localization, severity and adherence to tooth structure.

ABBREVIATIONS

DHA	:	Dubai Health Authority
DHIC	:	Dubai Health Insurance Corporation
EDTA	:	Ethylenediaminetetraacetic Acid
GP	:	General Dental Practitioner
H_2O_2	:	Hydrogen Peroxide
HPSD	:	Health Policy and Standards Department
HRS	:	Health Regulation Sector
NaOCl	:	Sodium hypochlorite
OPG	:	Orthopantomograph
OVD	:	Occlusal Vertical Dimension
PHCSS	:	Primary Healthcare Services Sector
PL	:	Periodontal Ligament
RCT	:	Root Canal Treatment
RMGI	:	Resin Modified Glass Ionomer
TMD	:	Temporomandibular Disorder
TMJ	:	Temporomandibular Joint

A. GUIDELINES FOR CLINICAL JUDGEMENT OF RESTORABILITY OF TEETH AND REFERRAL TO PROSTHODONTIC SPECIALTY

1. BACKGROUND

Appropriate referral is an integral part of complete quality health care management. Referrals should be based on the education, training, interest, and experience of the referring dentist and the unique needs of the patient. Dentists are expected to recognize the extent of the treatment needs of their patients and when referrals are necessary. This protocol assume the dentist has the requisite skill and knowledge in diagnosis and treatment planning to determine when a referral is needed.

In situations where two or more GPs are involved in the treatment of the patient, communication between all parties is essential. The GP usually manages the overall dental health care of the patient, although there may be times when this role is assumed by another dentist.

The guidelines are mainly addressing the clinical judgment of restorability of teeth and the referral protocol from GP to prosthodontic specialty. Any care rendered by a prosthodontist should be coordinated with that of the GP, and any other dentists involved in the treatment. Each dentist should have a clear understanding of the role each is playing in providing care to the patient.

2. SCOPE

2.1. Decision making regarding when to treat, refer, or extract through evidence-based clinical judgment of restorability of teeth.

2.2. Standardized management of teeth with questionable prognosis.

3. PURPOSE

3.1. To increase the awareness among general dental practitioners regarding the when to treat, refer, or extract a questionable tooth.

3.2. To increase the awareness among general dental practitioner regarding reasons of referral to prosthodontics specialty.

3.3. Ensure that all patients with questionable teeth will receive the same evaluation criteria and eventually the same justified decision.

4. APPLICABILITY

4.1. DHA licensed general dental practitioners.

5. RECOMMENDATION ONE: REASONS FOR REFERRING PATIENTS REQUIRING FIXED PROSTHODONTICS TREATMENT TO PROSTHODONTICS SPECIALTY

5.1. Patients with special needs.

5.2. Psychological behaviour of the patient.

5.3. Head and Neck Cancer patients.

5.4. Medical complications.

5.5. Excessive incisal/occlusal wear.

5.6. Occlusal collapse.

5.7. Where restorative treatment will require multi-disciplinary management.

5.8. Teeth with questionable restorability for consultation.

6. **RECOMMENDATION TWO:** CLINICAL JUDGMENT OF RESTORABILITY OF TEETH

6.1. The development of a treatment plan which is predictable to achieve long-term success requires careful evaluation of many factors which will influence the prognosis of involved teeth and the possible choice of keep them or not in the oral cavity.

6.2. One of the biggest dilemmas in dental clinic is the identification of when a tooth by the unfavourable prognosis and low predictability of other therapeutic options is indicated for extraction.

6.3. The main factors that determine the decision-making of extract or not a tooth include the patient expectation, the finances, the commitment of the patient which the treatment and aesthetic. These factors cannot be measured objectively, but have critical relevance on developing the treatment plan.

6.4. Other factors that influence the compromised teeth's prognosis, such as periodontal features, endodontic and restoratives, also should be carefully evaluated during the development of planning, for the treatment to be predictably a long-term success.

6.5. All of these factors, whether local or systemic, must be identified in clinician initial evaluation.

7. RECOMMENDATION THREE: EXTRACTION VERSUS CONSERVATION DECISION CHART

	FACTOR	AILING	FAILING	SCORE
1.	Pocket depth	5-7 mm	>7 mm	
2.	Mobility	2	3	
3.	Recurrent periodontal abscess	No	Yes	
4.	Root proximity	No	Yes	
5.	Root anomalies	No	Yes	
6.	Root canal therapy	Successful/not necessary	Treatment failed	
7.	Faulty restorations and fractures	Restorable	Not restorable	
8.	Extensive caries	No	Yes	
9.	Crown : Root ratio	1:1	Unfavourable	

2	Long-term survival unfavourable
1	Proceed with caution recommended
0	Long-term maintenance favourable

Extraction is recommended	≥4
Attempt to treat “According to the factors detecting the treatment needed the referral can be determined”	2 to 3
Tooth conservation is recommended “No referral needed”	≤1

8. RECOMMENDATION FOUR: ELEMENTS OF DENTAL PATIENT REFERRALS AND APPLICATION OF THE RESTORABILITY CHART

8.1. Clinical and radiographic examination

8.2. The following diagnostic findings and investigations are needed for assessment of restorability and prior to referral to the prosthodontist:

8.2.1. Vitality test

8.2.2. Periapical radiograph; to check for example:

a. Periapical changes

b. Widening of the Periodontal Ligament (PL) space.

8.2.3. Bitewing radiograph; to check for example:

a. The level of caries interproximal.

b. The level of interproximal bone.

8.2.4. OPG; to check for example the tooth relationship, to adjacent or opposing teeth, in a full mouth rehab case.

8.2.5. Pocket depth: after control of local factors “plaque or calculus”. “Pocket depth and gingival recession, can determine the severity of attachment loss”.

8.2.6. Mobility: mobility can be assessed:

a. After control of any inflammatory condition.

b. Endodontic stabilization.

c. Exclusion/treatment of any trauma from occlusion.

8.2.7. Check the occlusal trauma.

8.3. Using the chart, before the referral decision, can check the following

8.3.1. Patient compliance “in the initial assessment” by checking the history of the tooth and the last visit the patient attended.

8.3.2. Periodontal condition of the tooth should be stabilized before any Endodontics or Prosthodontics referral.

8.3.3. Assessment of all the etiological factors:

a. Presence of any local factor such as, over-hanging filling or calculus.

b. Root proximity.

c. Evaluation of the Root Canal Treatment (RCT) done.

8.3.4. The remaining tooth structure after removal of all the caries, any old filling and/or crown. Then bitewing radiograph should be taken without the temporary filling.

8.3.5. Presence of any para-functional habit that indicates the fabrication of an occlusal stabilizing appliance prior to referral.

8.3.6. The current status of occlusion and the even distribution of stresses that may indicate modifying the occlusal contacts in eccentric excursions.

9. **RECOMMENDATION FIVE:** REFERRING PRACTITIONER RESPONSIBILITIES PRIOR TO REFERRAL

9.1. Improve and maintain oral hygiene.

9.2. Restore carious teeth and extract hopeless ones following the previously described guidelines.

9.3. Provision of temporary restorations is essential to ensure the stability of the remaining dentition while awaiting a specialist appointment.

B. GUIDELINES FOR PULP CAPPING OF MATURE PERMANENT TEETH

1. BACKGROUND

Removal of caries is one of the most basic activities in dentistry. When caries is deep, every restorative dentist faces with the question of the best way to proceed: to remove all caries regardless of pulpal consequences or to stop exposure.

Different excavation methods to avoid pulp exposure is suggested. The classical "invasive" approach is to excavate caries fully, i.e. to hard dentin. Approaching the pulp, without exposure, is the pulp capping procedure.

The success of the pulp capping greatly depends upon the circumstances under which the dentist carried out the steps, suggesting the prognosis of such procedure.

2. SCOPE

2.1. Standardize decision-making process when the clinicians encounter a situation requiring management of mature permanent teeth that need pulp capping, focusing on case selection, Clinical steps of management, type of intervention and influence of the materials applied to dentin or exposed pulp.

3. PURPOSE

3.1. Management of pulp capping to help General Dental Practitioners to identify the indications, diagnosis and management of pulp capping.

3.2. Standardized management of mature permanent teeth that need pulp capping.

3.3. Decrease number of unnecessary temporary fillings and multiple visits for the same treatment.

4. APPLICABILITY

4.1. DHA licensed General Dental Practitioners.

5. RECOMMENDATION ONE: DIAGNOSIS

5.1. The diagnosis of the tooth condition could be done using the four tools mentioned below:

5.1.1. History

5.1.2. Clinical examination

5.1.3. Vitality test

5.1.4. Radiographic examination.

5.2. Diagnostic indications for indirect pulp capping:

5.2.1. Deeply carious teeth.

5.2.2. Teeth with no history of spontaneous pain.

5.2.3. Teeth with normal vital pulp.

5.2.4. No evidence of radiographic or periodontal changes.

5.2.5. Teeth with simple restorative needs.

5.3. Diagnostic indications for direct pulp capping:

5.3.1. Teeth with mechanical pin point exposures(less than 1mm) from sound dentin.

5.3.2. Exposure site clean and uncontaminated.

5.3.3. No evidence of excessive bleeding at exposure site.

5.3.4. Teeth with no history of spontaneous pain.

5.3.5. Teeth with normal vital pulp.

5.3.6. No evidence of radiographic or periodontal changes.

5.3.7. Teeth with simple restorative needs.

6. **RECOMMENDATION TWO:** CLINICAL STEPS FOR INDIRECT PULP CAPPING

6.1. Isolation of operative field preferably by rubber dam.

6.2. Removal of infected and carious dentin. Only hard, discoloured dentin can be left (heavily pigmented, hard, leathery and dry).

6.3. Adequate layer of calcium hydroxide should be applied.

6.4. A layer of Resin Modified Glass Ionomer (RMGI) is placed as a base.

6.5. Final restoration with restorative materials, preferably bonding technique.

7. **RECOMMENDATION THREE:** CLINICAL STEPS FOR DIRECT PULP CAPPING

7.1. Local anaesthesia.

7.2. Operative field should be isolated with rubber dam.

7.3. A sterile cotton pellet moistened with saline should be used to apply moderate pressure to the exposed pulp for five (5) minutes and haemostasis should be achieved.

7.4. Sodium hypochlorite (5.25%) is utilized as a rinse for Two (2) minutes to disinfect the exposure site and the dentin.

7.5. The cavity is lightly dabbed with a dry pellet to remove the excess moisture of the cavity surrounding the exposure site, no air spray.

7.6. Adequate layer of calcium hydroxide should be applied.

7.7. A layer of RMGI is placed as a base.

7.8. Final restoration with restorative materials, preferably bonding technique.

8. RECOMMENDATION FOUR: SPECIAL CONSIDERATIONS

8.1. Teeth with immature roots (open apex): endodontic consultation/referral is required.

8.2. Teeth with future restorative needs (abutment teeth): prosthodontic consultation/referral is required.

8.3. Non-restorable teeth: treatment is valid as an emergency treatment till definitive treatment is decided and scheduled.

8.4. Periodontally affected teeth: periodontal consultation/referral is required.

9. RECOMMENDATION FIVE: FOLLOW-UP

9.1. The patient should be scheduled 1, 3, 6 months for follow up.

9.2. During follow up appointments clinical examination should reveal an intact restoration, absence of any abnormal signs or symptoms, positive normal response to thermal pulp test and normal radiographic findings with dentin bridge formation.

9.3. The patient should be informed about the potential need for root canal therapy in case of relevant signs and symptoms.

C. GUIDELINES FOR MANAGEMENT OF NON-CARIOUS LESIONS

1. BACKGROUND

Tooth wear, or as it is also often referred to as non-carious tooth surface loss, can be described simply as 'the pathological non-carious loss of tooth tissue'. Tooth wear is a common condition affecting patients who often require advice and treatment from dentists.

Pathological tooth wear, by virtue of symptoms or rapid wear, will prompt the need for dental care. It can range from mild sensitivity from an abrasion lesion to gross destruction of the dentition. Similarly, treatment can range from simple operative care to full mouth reconstruction with crowns or complex dentures. Too little or too much treatment can lead to tooth loss and patient complaints.

The management of non-carious lesions aims to restore lost tooth structure, regain lost function and aesthetics, maintain the remaining structure and prevent further loss, alleviate associated symptoms, and improve patient's psychology and life style.

2. SCOPE

2.1. Management of non-carious lesions through distinction between pathological and physiological tooth wear and develop a proper treatment plan to restore lost function and aesthetics.

2.2. Standardized management of non-carious lesions.

3. PURPOSE

3.1. To increase the awareness among general dental practitioners regarding the types, diagnosis and management of non-carious lesions.

3.2. To increase the awareness among general dental practitioner regarding the non-carious lesions prevention methods.

3.3. Ensure that all dental patients receive the same quality of management of non-carious lesions.

4. APPLICABILITY

4.1. DHA licensed general dental practitioners

5. RECOMMENDATION ONE: CLINICAL PRESENTATION AND DIFFERENTIAL DIAGNOSIS

5.1. Tooth wear may present as localized or generalized loss off tooth substance, depending on the number of teeth affected. Due to the multifactorial aetiology tooth wear can present in a variety of clinical appearances which includes:

5.2. Attrition

5.2.1. Initial presentation may involve localized occlusal cusp tips and the palatal surfaces of the maxillary/mandibular anterior teeth.

5.2.2. Flattening of incisal edges and cusp tips.

5.2.3. Reduced lower facial height and inter-occlusal space for restorations.

5.2.4. Exposure of the underlying dentin and hypersensitivity.

5.2.5. Changing the optical properties and colour of the teeth.

5.3. Erosion

5.3.1. In extrinsic erosion, tooth wear is often observed on the buccal cervical surfaces of the maxillary teeth and the occlusal surfaces of the mandibular posterior dentition.

5.3.2. In the cervical region, erosive wear tends to create broader dished-out shallow lesions in comparison to the sharply defined margins associated with abrasion.

5.3.3. In intrinsic erosion, tooth wear tends to present on the palatal surfaces of the maxillary dentition. The lingual surfaces and lower anterior teeth are often not affected due to the protective nature of the tongue covering them from exposure to the acid attack.

5.4. Abrasion

5.4.1. The tooth wear pattern will fit the shape of the object causing the wear.

5.4.2. In the cervical region, lesions have v-shaped sharply defined margins.

5.5. Abfraction

5.5.1. Abfraction lesions can present similarly to tooth brushing abrasion cavities, but tend to be more angular and undercut at the coronal aspect where enamel overhangs the defect.

5.5.2. The gingival recession especially in thin biotype commonly presented with the abfraction lesions.

5.5.3. Abfracton common teeth affected are the pre-molars which may present some grade of mobility and sensitivity.

6. RECOMMENDATION TWO: EXAMINATION

6.1. A detailed history of the chief complaint should be ascertained and documented. Alongside this, also record an accurate and up-to-date clinical assessment of the signs and symptoms and the location of the wear (generalized or localized) when creating a diagnosis.

6.2. The diagnosis of a patient presenting with tooth wear should include a description and coding of the type(s) of lesions observed, together with an account of the extent/location (localized, anterior/posterior or generalized) and severity (restricted to enamel only, into dentin or severely affecting the teeth involving the pulp) of the condition.

6.3. Extra-oral examination which includes an assessment of their temporomandibular joints and associated musculature.

6.4. Assessing the freeway space, by determining the patient's resting vertical dimension and occlusal vertical dimension.

6.5. Additional methods to measure tooth wear include using sequential photographs; periodic accurate study casts; sectional silicone index and radiographs.

7. RECOMMENDATION THREE: MANAGEMENT

7.1. Prevention and Management of Localized Lesion

7.1.1. Preventive and management of tooth wear needs early detection and includes any of the following:

a. Dietary advice

b. Medical referral

c. Oral hygiene instruction and correction of damaging habits

d. Fluoride application

e. Re-mineralizing solutions

f. Desensitizing agents

g. Occlusal splints.

7.1.2. Occlusal splints may be soft, bilaminar (hybrid) or hard and can be placed in either jaw. Hard acrylic splints are more effective in managing severe tooth wear, severe Temporomandibular Disorder (TMD) and establishing a reproducible retruded contact position in pre-restorative treatment.

7.1.3. Consider adhesive methods of repair first when treating tooth wear. Occlusal trauma causing weak structure at the cervical region “abfraction” should be sealed with flowable/resilient restorative materials such as flowable composite or bioactive resin material.

7.1.4. Composite restorations used to treat localized anterior tooth wear.

7.2. Management with fixed prosthesis

7.2.1. In severe wear cases and in teeth which have been heavily restored the prognosis may be poor. Referral to a prosthodontist is required to perform the required management.

7.2.2. If the occlusion is to be corrected, careful planning is required. Mounted study casts are required to produce a diagnostic wax- up or wax try-in. An aesthetic composite or acrylic mock try-in can be tried in the patient's mouth for approval. Digital simulations are also possible.

7.2.3. Fixed adhesive or conventional repair with crowns are usually possible if there is at least 50% of the original tooth structure remaining. If more tooth tissue is missing, repair will be more difficult and may require crown lengthening surgery.

7.2.4. Interocclusal space creation for restorations is multi-disciplinary and can be generated in the following ways:

a. Tooth reduction
b. Orthodontic movement
c. Crown lengthening surgery (followed by further tooth reduction)
d. Increase in occlusal vertical dimension
e. Occlusal adjustment
f. Subapical osteotomy (only for severe malocclusions).

7.2.5. Indications for fixed management of tooth wear

a. Pain/discomfort

b. Aesthetic concern

c. Functional disturbance

d. Compromised structural integrity of tooth/teeth

e. Alveolar compensation with resulting lack of interocclusal space for restoration.

7.2.6. Contra-indications for fixed management of tooth wear

a. Worn teeth compromising periodontal disease and/or extensive caries

b. Non-restorable teeth

c. Vertical root fractures, horizontal/oblique fractures to bone crest, caries to bone crest, failed endodontics

d. Concurrent severe soft tissue defects

e. Worn dentitions with extensive edentulous spans or insufficient posterior support causing dental implants not considered.

7.3. Management with removable prosthesis

7.3.1. Removable management of tooth wear may be indicated in the following circumstances:

a. Severe wear

b. Multiple missing teeth and tooth wear

c. Soft tissue defects precluding fixed management

d. Long spans or distal extension

e. Primary disease or uncertainty with the prognosis of some teeth.

7.3.2. Referral to a prosthodontist is required to perform the required management.

7.3.3. If the occlusion is to be corrected, careful planning is required. Mounted study casts are required to produce a diagnostic wax- up or wax try-in. An aesthetic composite or acrylic mock try-in can be tried into the patient's mouth for approval. Digital simulations are also possible.

7.3.4. Planning follows conventional prosthodontic protocols of complete and partial dentures.

7.3.5. An increase in the occlusal vertical dimension (OVD) can often be guided by:

a. The former appearance

b. Mandibular rest position and assessment of the free-way space

c. Former crown height

d. Occlusal vertical dimension at the retruded contact position

e. Acceptance by the patient of using a provisional denture for 1–6 months as an intermediate phase.

7.3.6. A diagnostic or provisional appliance should make an assessment of:

a. Appearance

b. Lip support

c. Occlusion

d. Patient tolerance

e. Durability.

8. RECOMMENDATION FOUR: CONCLUSION AND RECOMMENDATIONS

8.1. Patients' attitude will dictate whether prevention or treatment is advised. They may be aware or unaware of their tooth wear. If it is of concern and they have symptoms (pain, poor function or poor appearance) they may request treatment. If possible, the dentist should advise prevention or minimal intervention treatment to prevent symptoms from occurring.

8.2. The exposure of dentin and presentation of thin or unsupported enamel should prompt a discussion with the patient about the tooth wear. The rate of tooth wear is likely to increase when dentin is exposed, so protection and prevention of further wear of dentin should be a priority.

8.3. In early or mild presentation of tooth wear, in the absence of symptoms, monitoring and prevention may be most appropriate.

8.4. If the occlusion is to be corrected, careful planning is required. The cases involving temporomandibular disorders "TMDs", the correction should be postponed till the condition is stabilized, by the use of intermediate stent for the duration of 1-3 months with sequential follow up and observing of the symptoms relived.

D. GUIDELINES FOR MANAGEMENT OF POST-OPERATIVE HYPERSENSITIVITY

1. BACKGROUND

A dental restoration is a treatment to restore the function, integrity and morphology of missing tooth structure resulting from caries or external trauma. Whether direct or indirect; restoring a tooth requires preparing the tooth for placement of restorative material(s). The process of preparation and/or placement of the restorative material may result in post-operative complications including dentin hypersensitivity.

In preparing a tooth for a restoration, a number of considerations will determine possible post-operative complications. The use of adhesive restorations is indicated in restoration of carious and non-carious lesions, inlays, onlays, and veneers as direct restorations.

With the wide use of the adhesive restorations, the main objective of this guideline is to help in understanding the different causative factors of post-operative hypersensitivity and addressing the proper preventive and management measures needed.

2. SCOPE

2.1. Management of post-operative hypersensitivity in direct resin composite restorations related to failures in diagnosis and indications for treatment and/or cavity preparation, the stages of hybridization of hard dental tissues, insertion of the material, and finishing and polishing the restoration.

2.2. Standardizing the treatment with direct composite restoration and the management of post-operative hypersensitivity.

3. PURPOSE

3.1. To increase the awareness among general dental practitioners regarding the causes and management of post-operative hypersensitivity.

3.2. To increase the awareness among general dental practitioner regarding how to avoid or minimize the occurrence of post-operative hypersensitivity.

3.3. Ensure that all dental patients receive the same quality of treatment with direct composite restorations.

4. APPLICABILITY

4.1. DHA licensed general dental practitioners

5. RECOMMENDATION ONE: SENSITIVITY IN RESIN COMPOSITE RESTORATIONS

5.1. Sensitivity is characterized as being a response given by the body to say that something is wrong and this response may be originated by an aggressive stimulus or in a spontaneous manner. The sensory potential of the pulp makes it capable of reaction with an immediate painful response, even when the stimulus is applied at a distance from the pulp tissue, such as in the superficial layers of dentin.

5.2. Pre-operative causes as follows:

5.2.1. Cracks and fractures- Cracked tooth syndrome.

5.2.2. Cervical dentinal exposure.

5.2.3. Pulp condition.

5.3. Operative causes as follows:

5.3.1. Abusive dental structure wear caused by inadequate cooling while cutting the tooth structure.

5.3.2. Incomplete carious tissue removal.

5.3.3. Negligence in protecting the dentin-pulp complex.

5.3.4. Inadequate isolation of the operative field.

5.3.5. Failure in dental tissue hybridization

5.3.6. Improper handling of restorative material.

5.4. Post-operative causes as follows:

5.4.1. Excessive finishing and polishing of the restoration

5.4.2. Occlusal interference

5.4.3. Cervical dentin exposure.

6. **RECOMMENDATION TWO:** CLINICAL STEPS

6.1. Proper examination of teeth including analysis of the pulp condition and the choice of restorative material.

6.2. Perform adequate isolation using rubber dam.

6.3. Follow the rules of preparation including bevelling and preserving of coronal enamel after complete removal of caries, for better bond strength.

6.4. Apply acid etching with adequate timing followed by proper bonding following the manufacturer instructions.

6.5. Use of gradual and careful light activation techniques and care with maintaining the wavelength emitted by the light source.

6.6. Insert the resin in small increments and the use of a base of materials with a low modulus of elasticity.

6.7. Perform proper finishing and polishing after minimal adjustment of occlusion.

7. **RECOMMENDATION THREE:** SPECIAL CONSIDERATIONS

7.1. Several causes of sensitivity result from errors in technique before, during and after placement of the restoration.

7.2. The dynamics of a poorly conducted restoration, with improper occlusal contacts may also trigger post-operative dentinal sensitivity.

7.3. Some cases performed using the same restorative materials and/or treated with the same technique and under similar clinical conditions may show sensitivity depending on the remaining dentinal bridge to the pulp.

7.4. Occlusal trauma causing weak structure at the cervical region “abfraction phenomenon” should be sealed with flowable/resilient restorative materials such as flowable composite or bioactive resin material.

7.5. It is essential for professionals to have full understanding of how complex the adhesive restorative technique is, so that they obtain adequate aesthetics and seal the cavity, thereby guaranteeing the success of the restorative treatment, without complaints of pain from their patients.

8. **RECOMMENDATION FOUR:** RECOMMENDATIONS AND CONCLUSION

8.1. Making a good diagnosis before performing the restoration.

8.2. Analysing the initial health of the pulp and periapical region with proper radiographic examination.

8.3. Using new burs with abundant tooth structure/bur cooling.

8.4. Using adequate isolation to prevent contamination and improve the bond strength.

8.5. Avoiding dehydration of dentin through excessive drying.

8.6. Strictly following all the criteria indicated in the stages of hybridization, insertion, finishing, polishing and occlusal adjustment of the restoration.

8.7. Use proper light polymerizing appliances, with consideration of the dual/indirect polymerization to decrease the resin shrinkage.

E. GUIDELINES FOR TEETH WHITENING

1. BACKGROUND

Tooth whitening has become one of the most frequently requested dental procedures by the public. The public has come to demand whiter, more perfect smiles and in response. Many choices for tooth whitening have been made available.

These include home-based products such as toothpastes, gels, and films, as well as in-office based systems where products containing highly concentrated bleaching agents are applied under professional supervision.

Tooth whitening is any process that lightens the colour of a tooth. Whitening may be accomplished by physical removal of the stain or a chemical reaction to lighten the tooth colour.

Bleaching is defined here as the chemical degradation of the chromogens.

The active ingredient in most whitening products is Hydrogen Peroxide (H_2O_2) which is delivered as H_2O_2 or carbamide peroxide.

Carbamide peroxide is a stable complex that breaks down in contact with water to release H_2O_2. Because carbamide peroxide releases H_2O_2 the chemistry of most tooth whitening is that of H_2O_2.

A higher strength of bleaching agent is used (e.g. 30% to 50% H_2O_2) compared to homebased treatments (e.g. 10%to 22%carbamide oxide or 3% H_2O_2). Professional bleaching is the use of an activator or accelerant agent to provide power bleaching. Application of, light, laser, or a combination, is used to increase

the temperature of the bleaching agent in contact with the tooth surface. A systematic review of activators concluded that superiority of accelerant over non-activated bleaching therapies is still debatable.

The aim of professional bleaching is to obtain the greatest improvement in as few sessions and suitable for those who do not tolerate the use of trays.

2. SCOPE

2.1. To assist dental healthcare providers to facilitate successful teeth whitening service in dental clinics.

3. PURPOSE

3.1. To identify the right candidates for bleaching teeth.

3.2. To educate the identified candidates regarding the teeth whitening procedure.

3.3. To ensure safe and effective teeth whitening of patients.

4. APPLICABILITY

4.1. DHA Licensed Dental Healthcare Professionals.

5. **RECOMMENDATION ONE:** STAINS-CLASSIFICATIONS, CAUSES AND TREATMENT OPTIONS

5.1. Classification of staining:

5.1.1. Intrinsic

5.1.2. Extrinsic

5.1.3. Combination of both type

5.2. Causes of Staining:

5.2.1. **Intrinsic Staining**- Causes:

a. Medicines such as tetracycline

b. Fluorosis

c. Trauma

d. Systemic conditions (Erthyroblastosis foetalis, Jaundice, Amelogenesis Imperfecta).

e. Iatrogenic discolorations (Amalgam, Intra-canal medicaments).

f. Age.

g. Endodontic Treatments.

5.2.2. Treatment options:

a. Tooth bleaching procedures.

b. Restorative procedures such as crowns, veneers, or composite restorations.

c. Sometimes these treatments are combined for a more successful outcome.

5.2.3. **Extrinsic Staining**- Causes:

a. Direct:

I. Food that stain your teeth like Coffee, black tea, wine, berries, tomato sauce and brown soda.

II. Tobacco and betel leaf chewing.

III. Plaque and poor oral hygiene/chromogenic bacteria.

b. Indirect:

I. Polyvalent metal salts and cationic antiseptics (e.g. Chlorhexidine).

II. Copper salts in mouthwashes.

III. Potassium Permanganate in mouthwashes.

c. Others:

I. Aging.

5.2.4. Treatment options

a. Removal of surface, extrinsic stains and debris by scaling and polishing

b. Maintain good oral hygiene.

c. Smoothing of superficial enamel defects.

d. Tooth bleaching procedures.

e. Sometimes these treatments are combined for a more successful outcome.

6. RECOMMENDATION TWO: TYPES OF BLEACHING APPLICATIONS FOR VITAL AND NON VITAL TEETH

3.1. Vital Teeth:

3.1.1. Three bleaching approaches exist for vital bleaching of vital teeth:

a. Dentist supervised night guard bleaching.

b. In-office or power bleaching.

c. Mass market-bleaching products.

3.1.2. Custom made trays bleaching typically uses a relatively low level of whitening agent applied to the teeth via a custom fabricated trays and is worn at night for at least 2 weeks. In-office bleaching generally uses relatively high levels of whitening agents.

3.1.3. Mass-market products typically contain low levels of whitening agent (e.g. 3–6% H_2O_2) that are self-applied to the teeth via gum shields, strips or paint- on product formats and typically require twice per day application for up to 2 weeks.

3.2. Non-vital teeth:

3.2.1. Three approaches for non-vital bleaching are thermocatalytic, in-office, walking.

7. **RECOMMENDATION THREE:** INDICATIONS AND CONTRAINDICATIOS FOR BLEACHING

7.1. Indications:

7.1.1. Extrinsic stains.

7.1.2. Vital/non-vital teeth.

7.1.3. To improve quality of life.

7.2. Contraindications:

7.2.1. Pregnant or lactating women.

7.2.2. Visible recession and exposed roots.

7.2.3. Known allergies to any of the ingredients of the bleaching kit.

7.2.4. Persons under the age of 18 years.

7.2.5. Discolouration due to intrinsic staining.

7.2.6. Hypoplastic or severely undermined enamel.

7.2.7. Deep micro cracks.

7.2.8. Sensitive teeth.

7.2.9. Opaque white spots.

7.2.10. Extensive and/or defective restorations, (restoration margin).

7.2.11. Carious Teeth.

7.2.12. Persons with gingivitis and other periodontal diseases or defective restorations should take particular care in using tooth-whitening products.

7.2.13. Conditions such as pre-existing oral tissue injury or concurrent use of tobacco and/or alcohol may exacerbate the toxic effects of H_2O_2.

7.2.14. Patient who is photosensitive or using photosensitive medications and use of whitening procedures that incorporates a light or laser during treatment.

7.3. Outcome of Treatment:

7.3.1. Undertaking bleaching for the contraindications can have outcome such as hypersensitivity, toxicity, and exacerbation of underlying conditions, weakened enamel and tooth structure and burns.

8. RECOMMENDATION FOUR: BLEACHING ACTION AND MECHANISM

8.1. Most commonly used peroxide compounds are: H_2O_2, sodium perborate and Carbamide peroxide. Carbamide peroxide is a stable complex that breaks down in contact with water to release H_2O_2 (10% carbamide peroxide break down to 3% H_2O_2 and 7% Urea).

8.2. The colour of the teeth is influenced by a combination of intrinsic colour and the extrinsic stains that may form on the tooth surface. Intrinsic tooth colour is associated with the light scattering and adsorption properties of the enamel and dentine, the properties of dentine playing a major role in determining the overall tooth colour.

8.3. Extrinsic stains tend to form in areas of the teeth that are less accessible to tooth brushing and the abrasive action of a toothpaste and is often promoted by smoking, dietary intake of tannin-rich foods and the use of certain cationic agents such as chlorhexidine, or metal salts such as tin and iron.

8.4. How the intervention might work- The bleaching action of H_2O_2 is not fully understood however; the underlying chemical theory suggests two possible explanations.

8.4.1. H_2O_2 breaks down into two components, forming a free-radical molecule (HO_2) with high oxidative power, which would break-up macromolecular stains (It is assumed that the whitening effects are primarily due to degradation of high molecular weight, complex organic molecules that reflect a specific wavelength of light and is responsible for the colour of the stain. The resulting degradation products are of lower molecular weights and are less complex molecules that reflect less light and result in a reduction or elimination of the discolouration).

8.4.2. Peroxide opens the carbon-ring of pigments, transforming them into chains, which would give an appearance lighter in colour. When a photochemical accelerator like light or laser is used, the rate of formation of hydroxyl radicals increases. Carbamide

peroxide has a different chemical mechanism with other intermediary molecules, however, the final free-radical molecule is the same either H_2O_2 or carbamide peroxide final products diffuse into the tooth through the organic matrix of enamel and dentin, due to their low molecular weight, reaching the internal portion of the tooth within minutes. As soon as chromogenic agents are transformed by the action of treatment into colourless molecules, the bleaching process reaches a plateau and no extra benefit can be obtained through further administration. The amount of peroxide that could penetrate the pulp is:

a. 10% Carbamide peroxide: 3.5 ug after 15 min, 3.6 ug after 25 min,

b. 35% H_2O_2 gel, 10.4 ug after 15 min.

c. H_2O_2 level that inhibit pulp enzyme activation is 50,000 ug.

9. **RECOMMENDATION FIVE:** CLINICAL PROCESS OF LIGHT ACCELERATED BLEACHING

9.1. Dentist will assess patient's teeth to identify the cause prior to treatment to see if he/she is an ideal candidate for tooth whitening procedures, discolouration may be due to one or a combination of factors.

9.2. After patient education about advantages, side effects, and follow up, he/she can choose whether to go for professional in-office whitening, if patient would like to do, the dentist will provide referral.

9.3. Patient preparation:

9.3.1. The Dental Healthcare Professionals must undertake a comprehensive patient assessment.

9.3.2. Inspect colour of teeth, shape of teeth, and presence of spaces, sensitivity (spontaneous sensitivity, induced sensitivity), surrounding tissues and its health. Radiographs may be necessary to aid in screening and diagnosis of diseases or conditions that may manifest as tooth discolouration, such as pulp necrosis.

9.3.3. A scaling procedure is indicated 1-2 weeks prior to the bleaching procedure Appropriate PPE must be used during the procedure (protection for patient also includes light protective eye wear).

9.3.4. After examining the patient the current tooth colour should be determined using a shade guide and documented and demonstrated to the client.

9.3.5. If a single tooth is being whitened, all other teeth must be covered in moistened gauze.

9.3.6. Apply any recommended protector material for the lips and surrounding soft tissue as recommended by the manufacturer.

9.3.7. Apply desensitizing agent if any.

9.3.8. Isolate soft tissue with the resin-based light curable barrier (or as per the manufacturer's instructions).

9.3.9. Apply the whitening gel on clean, air dried teeth as per the manufacturer's instructions.

9.3.10. Expose to the light source for the time as stated by the manufacturer's instructions.

9.3.11. The sessions of light activation is done until the desired shade is reached.

9.3.12. The procedure may be done in multiple sittings to abate sensitivity. Any related accessories such as retractors and remaining material should be brought back by the Client.

9.3.13. Apply post de-sensitizing agent (either fluoride or that provided by the manufacturer).

9.3.14. Results may vary on various factors such as: activation time, presence of restorations and use of equipment according to manufacturer's instructions.

9.3.15. At any time observe the patient for any untoward signs (allergic reactions, hypersensitivity, etc.). Appropriate care must be

undertaken in such cases. Client may be appointed again for another session; the office treatment can result in significant whitening after only one treatment visit but may require multiple treatment appointments for optimum whitening.

9.3.16. Client may be recommended to “touch-up” their teeth using home whitening kits.

9.3.17. Ensure complete documentation of the process.

9.3.18. Follow Manufacturer’s Instructions.

9.4. Patient education:

9.4.1. Think of whatever will stain your T-shirt will stain your teeth.

9.4.2. Clients should be informed not to consume any coloured foods or drinks after treatment for a time as recommended by the manufacturer’s instructions of the bleaching kit.

9.4.3. Foods to avoid– grapes, tomatoes, cherries, raspberries, mustard, spaghetti, sauce, blue berries, dark stews, dark soups, dark chocolates, slushes If you do eat any of these in the first couple of days after whitening treatment– brush your teeth and rinse your mouth immediately after eating.

9.4.4. Your teeth can absorb the colour for up to 3 days after whitening procedure.

9.4.5. Teeth and gums will most likely become sensitive after treatment which is normal. It will reduce and then subside with time.

9.4.6. Do not drink very cold or hot liquids, as these extreme temperatures will cause your teeth to expand and contract, and permit the stains to penetrate.

9.4.7. To avoid to chew or smoke tobacco for 48 hours to 1 week.

9.4.8. The DHCP should also educate the client on teeth whitening including expected side effects before, during and after the treatment in order for him/her to make an informed decision.

9.4.9. Restorative materials cannot be whitened and there it is recommended that teeth be whitened prior to restorations. Restorations may need to change after the bleaching treatment.

9.4.10. Clients should also be informed that after a certain saturation point, there may not be further changes on the shade of the teeth. Furthermore, each tooth may respond differently to the bleaching material.

9.4.11. Teeth with a yellow or brown tint are more likely to respond better to whitening treatment.

9.4.12. The step-by step process of the treatment must be clearly explained to the client prior and during the procedure. The

provided shade card may be used for a more visual understanding of the current and desired shade by both the client and the dental professional.

10. RECOMMENDATION SIX: SIDE EFFECTS OF VITAL BLEACHING

10.1. Tooth Sensitivity:

10.1.1. The sensitivity is usually mild to moderate and transient due to temperature changes often occurs during the early stages of treatment and usually persists for 2 or 3 days. Active approach on managing hypersensitivity include fluoride, potassium nitrate may be included as desensitizing agent.

10.2. Enamel Damage:

10.2.1. Most studies show little or no morphological changes on the bleached surface.

10.2.2. Uptake of bleach and transport to dental pulp:

a. In a study of Slezak et al. (2002) the pulp penetration was studied with 6.5% H2O2 and 9% H2O2 paint-on gel.

b. It was claimed that pulpal penetration over two-30 minutes applications of peroxide under in vitro conditions produced a level of approximately 1000 times lower than the amount of peroxide required to inhibit pulpalenzymes.

c. The levels were also well below concentrations shown to result in no damage to the pulp tissue.

d. It has been found that vital tooth bleaching produces histological evidence of minor inflammation of superficial layers of pulp adjacent to the pulp-dentin junction.

e. The minor inflammatory response of the pulp to the introduction of bleaching seems to be concurrent with the pain response expressed by consumers having increased hypersensitivity.

10.3. Soft Tissue Irritation:

10.3.1. The tissue generally appears white immediately after it has come into contact with whitening product, usually mild to moderate occurring either immediately and last for a few days with bleaching gels. Most kits come with gingival protectors.

10.3.2. Meticulous application of these protectors prior to the whitening product is crucial to reduce the chances of gingival irritation and achieve the desired result.

10.3.3. The tray rather than the tooth whitening materials may cause the mucosal irritation. Special attention should be given to provide adequate gingival protection.

10.4. Restorations:

10.4.1. Bleaches do not significantly damage restorations, although restoring teeth should be avoided immediately after bleaching due to a transient reduction in bond strength, which quickly returns to normal.

11. RECOMMENDATION SEVEN: GENERAL INFORMATION ON VITAL BLEACHING

11.1. Teeth whitening is not permanent. People who expose their teeth to foods and beverages that cause staining may see the whiteness start to fade in as little as one month. Those who avoid foods and beverages that stain may be able to wait one year or longer before another whitening, treatment or touch-up is needed.

11.2. Fillings, crowns, and other restorations:

11.2.1. Tooth-coloured fillings and resin composite materials used in dental restorations (crowns, veneers, bonding, bridges) will not show change in shade following bleaching. Therefore, using a whitening agent on teeth that contain restorations will result in uneven colour/shade.

11.3. Unrealistic expectations:

11.3.1. Individuals who expect their teeth to be a new "blinding white" may be disappointed with their results. Smokers need to be

aware that their results will be limited unless they refrain from continued smoking, particularly during the bleaching process.

11.4. Darkly stained teeth:

11.4.1. Yellowish teeth respond well to bleaching, brownish-coloured teeth respond less well and greyish-hue or purple-stained teeth may not respond to bleaching at all.

11.4.2. Teeth become dehydrated during the whitening/bleaching procedure, which at the time may look whiter. This may not be the final shade of the tooth when it re-hydrated.

KEY PERFORMANCE INDICATORS (KPIs)

1. Patient Happiness: Overall Assessment	
DHA Pillar	Patient Happiness
Indicator Name	Overall Assessment
Measure Type	Outcome
Data Source	Survey data
Measure Description	People who had a very favorable overall assessment of the facility during measurement period
Measure Denominator	All survey respondents who meet inclusion criteria
Measure Numerator	Survey respondent whose overall assessment of the facility was very high - patients with the highest possible score (scale has 2-7 options) or the two highest options (scale has 8+ options)
Measure Inclusion Criteria	Total number of valid responses to surveys that ask a patient to give their overall assessment of a facility
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

2. Patient Happiness: Recommendation to Others	
DHA Pillar	Patient Happiness
Indicator Name	Recommendation to Others
Measure Type	Outcome
Data Source	Survey data
Measure Description	Percentage of patients who were very likely to recommend the facility to other people during measurement period
Measure Denominator	All survey respondents who meet inclusion criteria
Measure Numerator	Survey respondent whose recommendation was very high - patients with the highest possible score (scale has 2-7 options) or the two highest options (scale has 8+ options)
Measure Inclusion Criteria	Total number of valid responses to surveys that ask whether the patient would recommend the facility to others
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

3. Patient Happiness: Doctors Made Sure Patient Understood All Information	
DHA Pillar	Patient Happiness
Indicator Name	Doctors Made Sure Patient Understood All Information
Measure Type	Outcome
Data Source	Survey data
Measure Description	Percentage of patients who answered favorably ('yes') that doctors made sure he/she understood all information
Measure Denominator	All survey respondents who met inclusion criteria
Measure Numerator	Survey respondent indicated 'yes,' doctors made sure that the patient understood all information
Measure Inclusion Criteria	Valid response to the survey question ('yes' or 'no')
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

4. Patient Safety: Rate of Medication Error	
DHA Pillar	Patient Safety
Indicator Name	Rate of Medication Error
Measure Type	Outcome
Data Source	Internal facility records, reports, or survey data
Measure Description	Rate of prescriptions per 100,000 with a dispensing error during measurement period
Measure Denominator	Number of medication prescriptions during measurement period
Measure Numerator	Number of prescriptions in which a medication error occurs (e.g. dispensing error, prescribing error, administering and preparing error, patient compliance error, vaccine error, administering a medicine for a known allergy patient, dose-related adverse drug reaction)
Measure Inclusion Criteria	All filled prescriptions
Measure Exclusion Criteria	Unsafe condition and near miss incident, adverse drug reactions
Source	TEC required measures http://apps.who.int/iris/bitstream/10665/252274/1/9789241511643-eng.pdf
International Benchmark	2.28 Per 100,000 (in the U.S.) Source: https://www.nationwidechildrens.org/newsroom/news-releases/2017/07/study-finds-rate-of-medication-errors-resulting-in-serious-medical-outcomes-rising . One medication error occurs for every five doses given in US hospitals and 1-2% of patients admitted to US hospitals are harmed by medication errors. Source: http://stateclaims.ie/wp-content/uploads/2017/11/Medication-Incidents-Report-2016.pdf
Higher is Better	No
Risk Adjust This Measure	No

5. Patient Safety: Rate of Medical Error	
DHA Pillar	Patient Safety
Indicator Name	Rate of Medical Error
Measure Type	Outcome
Data Source	Internal facility records, reports, or survey data
Measure Description	Rate of medical errors (errors in diagnosis, medication, surgery, equipment use, lab findings interpretation) per 100,000 patients in measurement period
Measure Denominator	All qualifying patients in measurement period
Measure Numerator	Medical errors as defined through proven reports (e-medical systems) during measurement period
Measure Inclusion Criteria	All patients with at least one medical encounter in measurement year
Measure Exclusion Criteria	None
Source	TEC required measures http://apps.who.int/iris/bitstream/10665/252274/1/9789241511643-eng.pdf
International Benchmark	To be discussed with DHA
Higher is Better	No
Risk Adjust This Measure	No

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