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Review Article

**TOOTH DECAY STAGES AND MANAGEMENT AMONG  
CHILDREN**<sup>1</sup>Abdulmajeed Ahmed Kashaf**Abstract:**

*Good general health also consists of good oral health. Raising the recognition and expertise concerning cavities as a whole can raise their understanding as well as abilities in oral health care. We conducted search using electronic biomedical databases such as; Medline, and Embase, for studies published up to November, 2018 with English language concerning the tooth decay stages and management among children. Oral health is an essential part of overall wellness. Dental decay has an intricate determination and also various etiological variables. Diet regimen and also bacteria in the dental plaque play a necessary role in the development of decays. Interventions in kids and teens are taken into consideration to be really efficient, because the condition has a dynamic development in a group or in the exact same topic at different periods of life. Difficulties in chewing, decreased appetite, loss of weight, sleep disturbances, behavioral changes and poorer academy efficiency are a few of the effects of a poverty-stricken oral health. Safety nets for cavities must be included in the individual's therapy strategy at any type of age, in order to maintain restorative therapy end results and also minimize future caries possibilities.*

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## INTRODUCTION:

Dental caries is among the most general avoidable problems which is identified as the primary root cause of oral ache and tooth loss. It is a significant public health dental disorder which hinders the achievement and also upkeep of oral wellness in all age groups [1]. WHO directed that the global concern of dental disease still lingers despite great developments in the dental health and wellness of population in numerous countries. WHO claimed that bad oral wellness might have an extensive result on general wellness along with lifestyle, and also a number of oral problems are related to chronic problems [2].

Dental caries refers to the local devastation of prone oral hard tissues by acidic by-products from the microbial fermentation of nutritional carbohydrates. It is a chronic disorder that proceeds slowly in a lot of the people, which arises from an ecological imbalance in the equilibrium between tooth minerals and also dental biofilms (plaque) [3]. The biofilm is identified by microbial activity, causing variations in plaque pH. This is an outcome of both microbial acid processing and buffering action from saliva as well as the surrounding tooth structure. The tooth surface area is as a result in a dynamic equilibrium with its surrounding setting. As the pH drops below a critical value, the demineralization of enamel, dentine or cementum takes place, while a gain of mineral (demineralization) occurs as the pH enhances [4]. The procedure of demineralization and also demineralization takes place regularly throughout the day. Gradually, this procedure brings about either decays lesions or the repair and also reversal of a lesion [5].

Key cavities can take place on various tooth surfaces. On an approximal surface area, the lesion starts and develops beneath the contact part in between teeth. Caries on an occlusal surface is additionally a localized phenomenon in pit and also fissure. On both occlusal as well as approximal surfaces, enamel caries is a three-dimensional subsurface demineralization that spreads along the enamel prisms. Second caries is a lesion situated at the margin of a dental restoration. It stands for a decays lesion beside the margin as well as there might be indications of demineralization (wall lesions) along the cavity wall which could be a consequence of microleakage. Nevertheless, scientific as well as microbiological researches show that this leak does not bring about active demineralization beneath the restoration [6].

Cavities may be characterized by the experience of ache, problem with eating, chewing, smiling and also

interaction because of missing, discolored or harmed teeth [2]. The microbial community of cavities is diverse and also has numerous facultative as well as obligatory-anaerobic microorganisms belonging to the category Actinomyces, Bifidobacterium, Eubacterium, Lactobacillus, Parvimonas and also Rothia [7]. It can also be caused by other microorganisms, consisting of participants of the mitis, anginosus and also salivarius teams of streptococci, Propionibacterium, Enterococcus faecalis, Scardovi, Prevotella, Selenomonas, Dialister, Fusobacterium, Pseudoramibacter, Veillonella, Atopobium, Granulicatella, Leptotrichia as well as Thiomonas [8]. Bacteroides, Prevotella, and also Porphyromonas varieties are prevalent on mucosal surface areas and get to very high focus in dental plaque, gingival gaps and also tonsillar crypts [8].

Good general health also consists of good oral health. Raising the recognition and expertise concerning cavities as a whole can raise their understanding as well as abilities in oral health care.

## METHODOLOGY:

We conducted search using electronic biomedical databases such as; Medline, and Embase, for studies published up to November, 2018 with English language concerning the tooth decay stages and management among children, Following MeSh terms were used in our search strategy: "tooth decay", "pediatrics oral health". more relevant studies were searched in the references list of included studies.

## DISCUSSION:

### • THE ICCMS™ CARIES STAGES

The International Caries Classification and Management System (ICCMS™) is a thorough series of clinical protocols that attend to all diagnostic, preventive and restorative decisions needed "to maintain tooth structure and also restore just when indicated," which is the mission adopted at the Temple University Caries Management Pathways workshop, in 2012 [9].

### Clinical stages of coronal caries

For pits and cracks, the decays categories are described as follows [9-11]:

**Sound surfaces** have no visible caries when viewed tidy and completely dry (ICDAS™ (International Caries Detection and Assessment System (ICDAS™) code 0) [10], [11]. Non-carious white or brownish marks on tooth surfaces need to be separated from

early caries lesions.

**Initial stage caries** is identified by the first visual change in enamel (seen only after extended air drying out or restricted to the confines of a pit or fissure) (ICDAS™ code 1) or a distinctive visual alteration in enamel (seen on a wet or dry surface area) that is within or wider than the confines of a pit or fissure (ICDAS™ codes 1 or 2).

**Moderate stage caries** is characterized visually by either localized enamel breakdown (without aesthetic indications of dentinal exposure) (ICDAS™ code 3) or an underlying dark darkness from dentin (ICDAS™ code 4). Enamel breakdown (ICDAS™ code 3) is commonly seen finest when the tooth is air dried out whilst watching from dentinal decays (ICDAS™ code 4) is frequently best seen with the tooth surface area moist.

**Extensive stage caries** is characterized by distinct cavitation revealing visible dentin. (ICDAS™ code 5 lesions show cavitation involving less than half the tooth surface area as well as ICDAS™ code 6 involves half of the tooth surface or even more).

#### The caries stages for approximal tooth surfaces

For approximal tooth surfaces, the caries categories are described as follows [9-11]:

**Sound surfaces** have no noticeable caries when seen tidy as well as dry (ICDAS™ code 0). Non-cariou white or brownish marks on tooth surface areas should be differentiated from early cavities lesions.

**Initial stage caries** is defined by the very first visual modification in enamel (seen just after extended air drying out) (ICDAS™ code 1) or an unique visual change in enamel (seen on a wet or dry surface) (ICDAS™ code 2). In occlusal surfaces, these lesions show up light or dark brown non-cavitated areas constrained to the pits to fissures. On smooth surfaces, these sores look like non-cavitated white demineralization bands that parallel the gingival margin.

**Moderate stage caries** is characterized aesthetically by either localized enamel breakdown (without aesthetic signs of dentinal exposure) (ICDAS™ code 3) or an underlying dark darkness from dentin (ICDAS™ code 4). These lesions are typically seen directly from the lingual or buccal instructions and also where there is a darkness this can be deemed discolored dentin visible through an evidently undamaged marginal ridge from the occlusal direction. Enamel breakdown (ICDAS™ code 3) is usually seen best when the tooth is air dried out,

whilst shadowing from dentinal cavities (ICDAS™ code 4) is frequently best seen with the tooth surface area wet.

**Extensive stage caries** is defined by distinct cavitation subjecting noticeable dentine. (ICDAS™ code 5 sores show cavitation including less than half the tooth surface and ICDAS™ code 6 lesions include a minimum of fifty percent of a tooth surface area).

#### Caries Stages for buccal-lingual smooth surfaces

For buccal-lingual smooth surfaces, the caries stages are described as follows [9-11] :

**Sound surface** areas have no noticeable caries when seen tidy and also completely dry (ICDAS™ code 0). Developing defects like enamel hypoplasias; fluorosis; tooth wear (attrition, abrasion as well as erosion), as well as external or innate stains should be recorded as sound in the lack of other indicators of decays sores.

**Initial stage caries** is characterized by the initial aesthetic change in enamel (seen just after prolonged air drying out) (ICDAS™ code 1) or an unique aesthetic modification in enamel (seen on a wet or dry surface area) (ICDAS™ code as well as 2). Initial active stage lesions on free smooth surfaces lie close (in touch or within 1 mm) to the gingival margin or beside orthodontic or prosthetic attachments on a tooth surface.

**Moderate stage caries** is characterized visually by either localized enamel breakdown (without visual signs of dentinal direct exposure) (ICDAS™ code 3) or an underlying dark shadow from dentin (ICDAS™ code 4). Enamel breakdown (ICDAS™ code 3) is typically seen finest when the tooth is air dried out, whilst shadowing from dentinal cavities (ICDAS™ code 4) is usually best seen with the tooth surface wet.

**Extensive stage caries** is defined by distinct cavitation subjecting visible dentin. (ICDAS™ code 5 sores display cavitation including less than half the tooth surface and also ICDAS™ code 6 entails fifty percent of the tooth surface or more).

#### Root Caries Stages and Activity Assessment

ICCMS™ additionally organizes root decays lesions. The staging of origin cavities is based in evaluation of presence of cavitation as well as activity of the lesions. Once again, the emphasis gets on prevention, control, as well as conservative management of lesions.

Root surfaces are classified as follows [9-11]:

**Code 0.** The origin surface area does not exhibit any type of unusual discoloration that identifies it from the surrounding or adjacent origin areas, neither does it show a surface defect either at the cemento-enamel joint or wholly on the root surface. The root surface area has a natural physiological contour, or the root surface area may display a guaranteed loss of surface connection or physiological shape that is not regular with the cavities process. This loss of surface area integrity normally is related to dietary influences or practices such as abrasion or erosion. These problems typically take place on the face (labial) surface. These areas typically are smooth, glossy and hard. Abrasion is identified by a plainly specified outline with a sharp boundary, whereas disintegration has a much more diffuse border. Neither condition reveals discoloration.

**Code 1(initial).** There is a clearly demarcated part on the origin surface or at the cemento-enamel junction

(CEJ) that is discolored (light/dark brownish, black) yet there does no cavitation (loss of physiological shape < 0.5 mm) exist.

**Code 2 (Moderate/Extensive lesion).** There is a clearly demarcated area on the origin surface area or at the cemento-enamel junction (CEJ) that is discolored (light/dark brown, black) and there is cavitation (loss of anatomical contour < 0.5 mm-2 mm (Moderate), > 2mm (Extensive)) existing.

**Root caries activity.** The attributes of the base of the discolored area on the origin surface can be used to determine whether or not the root decays sore is active or not. These characteristics consist of texture (smooth, rough), appearance (shiny or glossy, matte or non-glossy), spot in a plaque-stagnation area, as well as assumption of structure on mild probing (soft, tough, difficult). Active origin cavities lesions are generally located within 1 mm of the crest of the gingival margin.

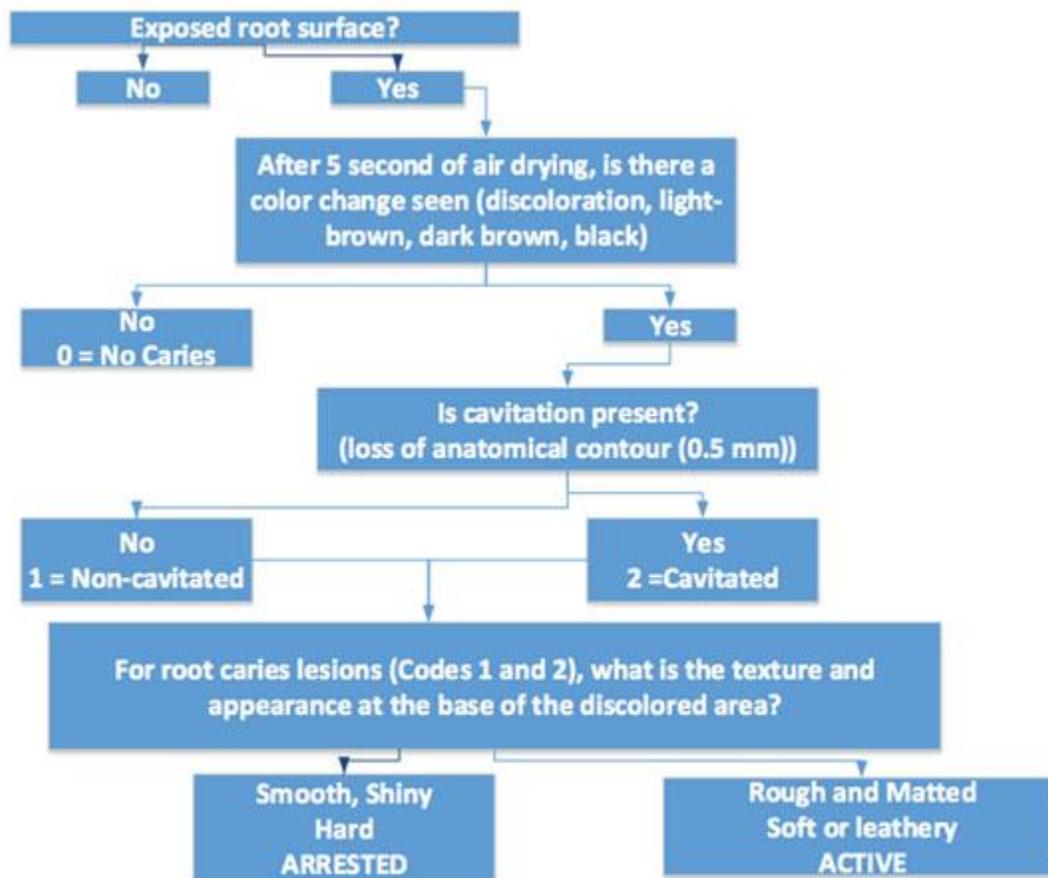


Figure 1. Root Caries Staging and Activity Analysis [9].

**DENTAL DECAY MANAGEMENT:**

Presently, treatment of dental caries is reevaluated. Modern methods of detection and early diagnosis allow the individualization of medical stages that can benefit from remineralization, if dental ecosystem parameters modifications in a favorable way. To attain this, the therapy of tooth decays should be approached in an alternative way, placed in a sequence that lay stress on precautionary methods and individual active involvement [10].

Modern management of dental decay uses of the following algorithm [10]:

- detection and dimensional valuation of caries (decay type, associated histopathological changes);
- monitoring the lesion, determine whether restoration or remineralization treatment will be performed;
- assessing individual carious risk;
- diagnostic/prognostic/therapeutic measures - lesion treatment using methods belonging to restorative or preventive dentistry;
- periodical follow up, monitoring .

Many researches have shown that an essential factor in the positive or unfavorable comments of

preventive measures is stood for by the social context [11]. Commonly patients are not informed on dental pathology, forget routine dental examination, attend the dental office just in case of an emergency and also embrace a diet regimen abundant in sugars and also fats [11].

The first examination dentist-patient is critical to develop sufficient interaction, the basis of reliable treatment. The information provided by the medical professional to the youngster as well as parents should be tailored to their enlightening and cultural context. What might seem like a "waste of time" in the initial treatment session is actually a real assessment of our profession, due to the fact that in the absence of preventive perspectives, the lasting prognosis of oral restorations is unfavorable and also might be a failing [12]. Sufficient oral health needs a cumulative initiative of everybody included: medical team, kid, family, as well as teachers, and also if we consider the diversification of those associated with this process we can understand why it is so challenging to move on efficient programs for tooth decays avoidance as well as therapy [13].

These recommendations cannot be implemented essentially; they must be adjusted to the client's cavities risk, which might develop gradually as well as must be evaluated in the control session [12], [11].

**Table 1.** Restorative versus preventive approach in dental decay management in children and adolescents [11],[12].

RESTORATIVE MODEL	PREVENTIVE MODEL
Treatment of all active carious lesions	Diagnosis of active and inactive carious lesions
Restorative treatment goal is to arrest caries progression	Remineralization-for non cavitary lesions limited to enamel
Decay treatment-cavity preparation and restoration	First treatment objective -remineralized incipient lesions. Restorations are made only if preventive approach failed
Extensive restorations - all dental tissues considered demineralized and infected will be eliminated	Minimally invasive restorations - for demineralized tissues the first therapeutic approach will be remineralization

The goal of therapy is to preserve tooth structures and stop additional destruction of the tooth. Most importantly, whether the carious lesion is cavitated or noncavitated dictates the administration.

**Noncavitated** lesions can be arrested as well as remineralization can accompany considerable modifications to the diet i.e, reduction in frequency

of refined sugars [16]. It can be treated with non-operative technique by tooth remineralization.

**Tooth remineralization.** Tooth remineralization is a procedure in which minerals are gone back to the molecular structure of the tooth itself.

Destroyed tooth structure does not completely

regrow, although remineralization of very small carious lesions may happen if dental hygiene is kept at optimum degree such as toothbrushing two times per day with fluoride toothpaste and also flossing, as well as regular application of topical fluoride. Such monitoring of a carious lesion is labelled "non-operative therapy" [15].

**Cavitated lesion**, especially if dentin is entailed, remineralization is a lot more challenging as well as an oral restoration is typically indicated. Such administration of a rancid lesion is labelled "personnel therapy".

**Dental restoration.** An oral restoration or dental filling is a procedure in which oral restorative component (including oral amalgam, composite resin, porcelain, and also gold) is used to recover the feature, honesty as well as morphology of missing out on tooth structure. Compound resin and porcelain can be made to match the color of a patient's natural teeth as well as are more regularly made use of [14]. Anesthetics, nitrous oxide ("laughing gas"), or various other prescription drugs might be needed in many cases to ease discomfort during or following treatment or to relieve anxiety throughout therapy [14].

**Tooth extraction.** The elimination of the decayed tooth is executed if the tooth is also much damaged from the decay procedure to properly restore the tooth [17].

**Fluoride Treatment.** Fluoride is a crucial and cost-efficient avoidance approach to reinforce tooth enamel and also protect against degeneration. The ADA suggests that high decays risk kids receive a full-mouth topical fluoride varnish application with reapplication consistently at three months periods [18]. A minimum of every six months is suggested for kids at moderate cavities danger, even if the child lives in a community that already receives the benefits of water fluoridation [17]. Suppliers need to repeat the advancing advantage of the fluoride varnish, even if it has actually been discussed previously in the visit [19]. Following the fluoride application, the caregiver must be advised not to enable brushing of the child's teeth or eating crunchy/sticky foods for the remainder of the day to take full advantage of the effect of the fluoride varnish. Fluoride have pre-eruptive as well as post-eruptive effects on decays avoidance [22].

**Oral hygiene. Personal** hygiene care contains appropriate brushing and flossing daily [14]. Proper cleaning as well as flossing is to remove as well as protect against the development of plaque or oral

biofilm. Specialist hygiene treatment includes normal dental evaluations as well as professional treatment (cleaning) [21].

### CONCLUSION:

Oral health is an essential part of overall wellness. Dental decay has an intricate determination and also various etiological variables. Diet regimen and also bacteria in the dental plaque play a necessary role in the development of decays. Interventions in kids and teens are taken into consideration to be really efficient, because the condition has a dynamic development in a group or in the exact same topic at different periods of life. Difficulties in chewing, decreased appetite, loss of weight, sleep disturbances, behavioral changes and poorer academy efficiency are a few of the effects of a poverty-stricken oral health. Safety nets for cavities must be included in the individual's therapy strategy at any type of age, in order to maintain restorative therapy end results and also minimize future caries possibilities. Preventative activities as brushing the teeth last point prior to sleeping enables fluoride concentration level to stay high throughout the entire night as salivary flow rates are reduced throughout sleeping. A tooth brush must be appropriate size for a kid and reach all tooth surface areas. A mix of flossing and brushing with fluoride toothpaste is extra efficient, especially if it kept an eye on by a grownup. The objective of treatment is to preserve structure of tooth as well as protect against further devastation of the tooth, also it ought to be individualized. In summary, prevention of a disease is often more budget friendly as well as reliable option than the therapy of an established problem.

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