

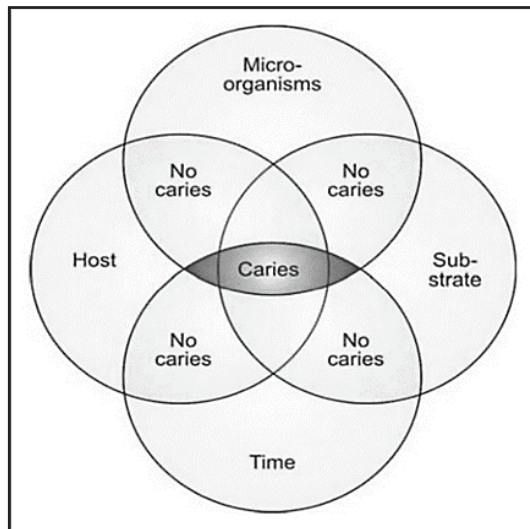
From Healer Restorer to Facial Therapist

Introduction

This paper will focus on the two major oral diseases, dental caries, and periodontal disease.

Dental caries

This is a multi-factorial disease. All factors must act concurrently for caries to occur (Fig. 1).



However, impact of each factor varies from person to person. For example, a frequent sugar consumer will be shown to have a large substrate and a longer time of exposure (Fig. 2).

On the other hand, a poor cleaner of teeth will have a large reservoir of micro-organisms in the mouth.

Fig. 1: Caries initiates when all the factors act concurrently (Keyes' concept).

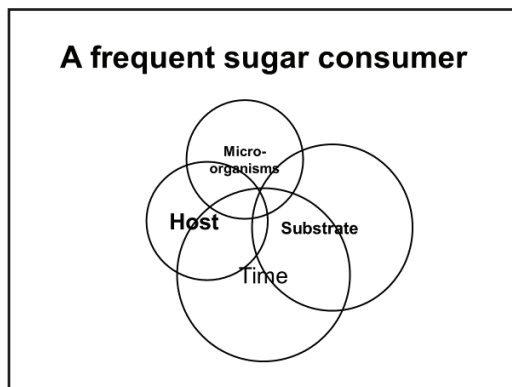


Fig. 2: Frequent sugar consumer

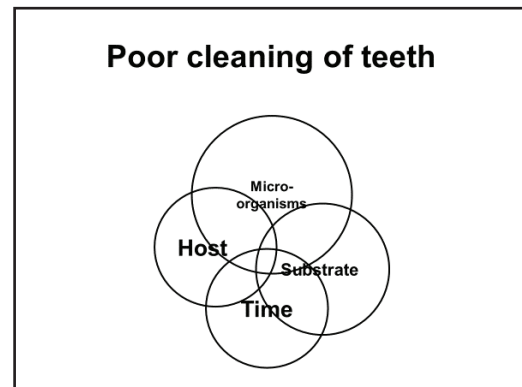


Fig.3: A poor cleaner of teeth

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Prevention of caries

Thus, to prevent caries, take the following measures: reduce amount of sugar in the diet; control oral microbial activity and strengthen teeth with fluoride.

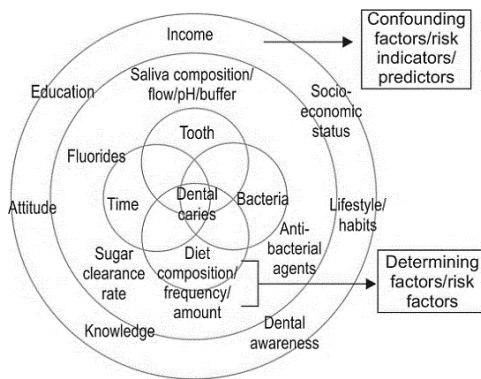


Fig. 4: Factors associated with dental caries.

However, this approach is too simplistic because there are many other factors, some determining factors and others confounding factors in operation. (Sathyanarayan and Vidyapeeth 2018) (Fig. 4).

Dynamics of factors

The dynamic relationship between primary factors, modifying factors and the behaviour of the biofilm i.e., plaque is shown in Fig. 5:

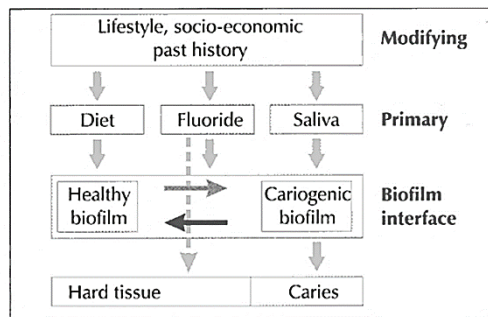


Fig. 5: Dynamic relationship between numerous factors

In other words:

- There is a continuous ionic exchange at the enamel / plaque / saliva interface.
- There is continuous enamel demineralisation and remineralisation.
- Depending on oral conditions, the balance can shift in either direction.
- These conditions are under an individual's control.
- Progress to cavitation is not inevitable.
- By identifying the risk factors and taking action, the balance can be tilted towards remineralisation.

In shifting the balance in favour of remineralization, note the following:

- Importance of early diagnosis and indications for arresting caries cannot be over-emphasised.
- Disease progression is preventable by relatively simple measures, tailor-made to each individual.
- Small lesions can re-mineralizable more readily.
- Re-mineralised lesions are more resistant to demineralisation.

Backer Dirks' study of carious lesions (1966)

A classic study on behaviour of carious lesions over seven years illustrates this well (Fig. 6):

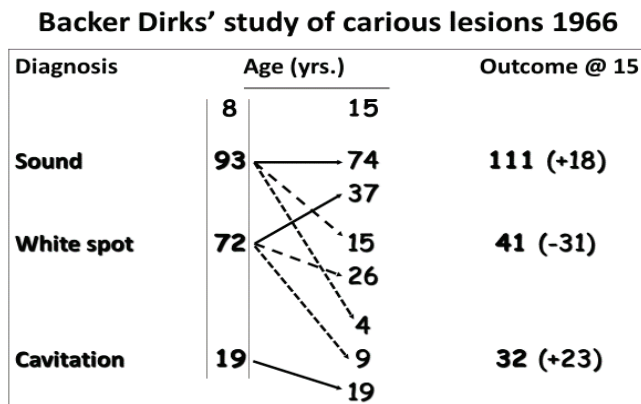


Fig. 6: Backer Dirks' study of the behaviour of carious lesions over time

At start of the study, there were 93 sound, 72 white spot and 19 cavitated lesions. Seven years later, the number of sound lesions had increased to 111. Obviously, 15 of the sound lesions had become white spot lesions but only 4 had progressed to cavitation. At the same time, the number of white spot lesions had decreased to 41 despite 15 sound lesions becoming white spot lesions. This was because 26 white spot.

lesions remained the same, 37 had become sound and only 9 had become cavitated. This study illustrates that progress to cavitation is not inevitable and that initial lesions can undergo remineralisation.

Assessment of caries risk

To assess caries risk, one must be *a detective with a systematic approach*: ask, listen, examine, investigate, and gather evidence. As the evidence is collated and reviewed, it is possible to identify whether a patient is at high or low risk of developing caries (Table 1):

High Risk	Low Risk
Medical & Social History	
Socially deprived	Middle class
Medically compromised	Regular
Irregular attendee	Healthy
Diet	
Frequent, cariogenic	Infrequent
Fluoride use	
Non-F area	F area
Non-F toothpaste	F t/paste
Plaque Control	
Infrequent, ineffective	Frequent
Clinical Evidence	
New lesions, many fillings	None
Extractions	Few, F seal

Table 1: Risk factors for caries

When it comes to caries, it is no longer a case of detecting, drilling, and filling cavities. There have been many advances in our understanding of this disease which should be managed by dealing with its aetiology. However, these factors affect each patient in a unique way, and it is the clinician's responsibility discover how and to deal with them accordingly. It is no longer a case of "one size fits all" approach to disease prevention and management. Repair of damage to tissues is only a part of disease management. This is a change from the past when repair was the focus of treatment.

Caries detection vs. caries diagnosis

There is confusion between *detection* and *diagnosis* of carious lesions. Detection is NOT diagnosis. Diagnosis is more than detecting cavities. Diagnosis of caries is finding out the underlying causes for the individual by applying the *expanded Keyes concept*. It means identifying the underlying risk factors. Therefore, before putting bur to teeth, clinicians must stop and think of the risk factors and how to manage them. This can be done by instituting a caries management programme.

Caries management programme

It is a plan or a strategy to deal with aetiology of the disease in partnership with the patient. A caries management programme will begin with the following: history, examination including special investigations, diet analysis and advice etc.

It is also important to get the patient involved in disease management. After all, many lifestyle factors such as diet, medications, and oral hygiene practices are under their control.

The question arises as to who can manage preventive care. Most preventive care can be delegated to the non-dentist members of the Dental Team. The role of the Dental Team will be discussed later.

Managing deep carious lesions

This is based on the current understanding of histology of deep carious lesions. There are two zones, Caries Infected Dentine CID, and Caries Affected Dentine CAD (Fig. 7).

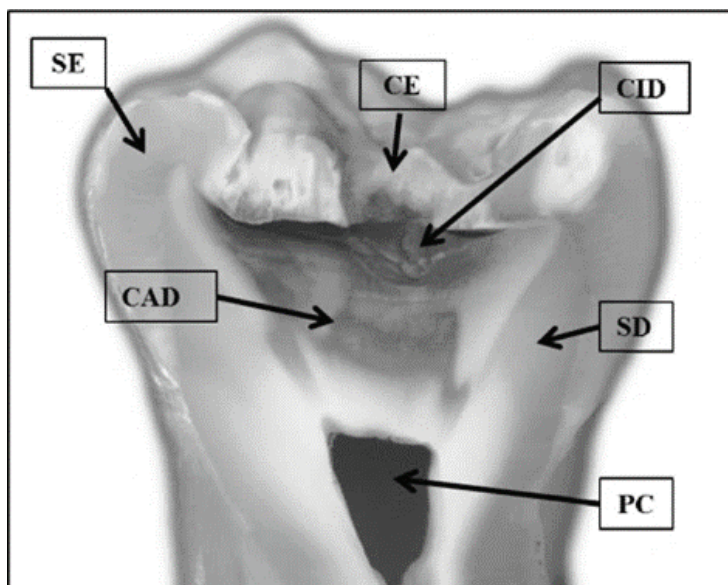


Fig. 7: Histology of a deep carious lesion

(Key: CID = Caries Infected Dentine; CAD = Caries Affected Dentine)

Stepwise caries removal

Based on this histology, Stepwise Caries Removal has been devised:

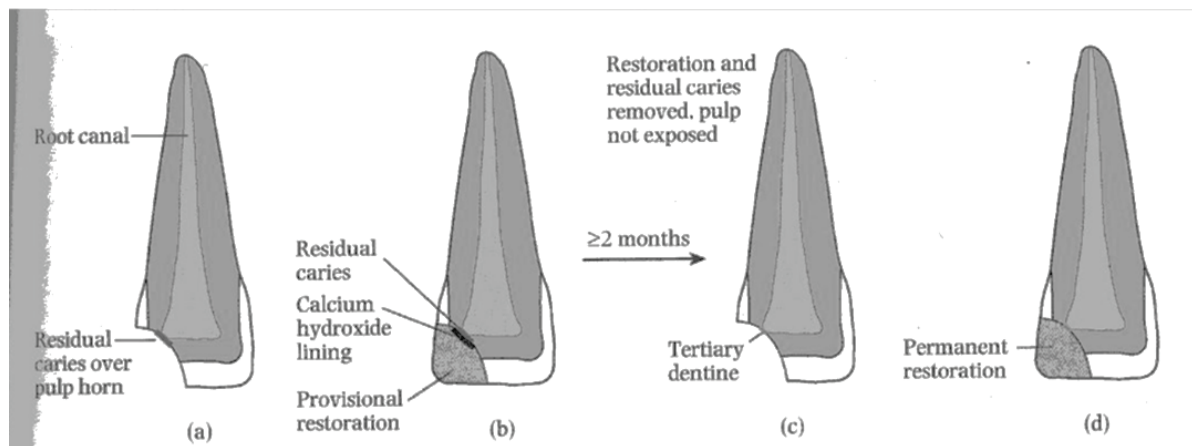


Fig. 8: Stepwise caries removal

There are two steps:

First: partial caries removal leaving soft carious dentine on pulpal floor to avoid pulp exposure and temporary restoration to seal the cavity. *Seal is the deal.*

Second: re-enter months later, check and remove any residual caries and place a definitive restoration. So, in summary: stepwise caries removal is to remove and seal, re-enter later to complete the caries removal and restore.

Selective caries removal

This is not negligent, careless, or lazy caries removal! It is the deliberate removal of only the soft, infected dentine using hand instruments thus avoiding a pulp exposure. Obviously, some traces of infected dentine will remain (Fig. 9). Then a restoration is placed to achieve a good seal so that nutrients cannot reach the remaining bacteria. The seal is critical so that without nutrients, the remaining bacteria will not survive for long. The pulp will remain healthy.

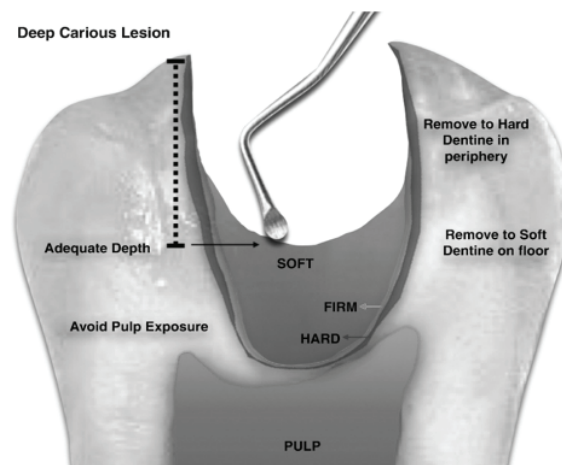


Fig. 9: Selective caries removal (Kher & Rao 2019)

Managing deep carious lesions: a summary

Table 2 summarises how to manage deep carious lesions.

Lesion depth*	Definition	Suggested treatment options
Shallow/moderate	Not reaching inner 1/3 or ¼ of dentine No risk of pulpal exposure	Selective caries removal to firm dentine Atraumatic restorative technique Non-restorative cavity control Fissure sealant
Deep	Reaching inner 1/3 or 1/4 of dentine Risk of pulp exposure	Selective caries removal to soft dentine Stepwise caries removal Atraumatic restorative technique

Table 2: How to manage deep carious lesions.

Periodontal disease

Over the last forty years, there had been multiple classifications of periodontal disease. There were many shortcomings in them as new evidence became known. The 1999 classification improved these shortcomings and was based on different clinical entities like necrotizing periodontitis, chronic periodontitis, aggressive periodontitis, and periodontitis as a secondary manifestation of systemic disease. The 2015 Task Force Report by the American Academy of Periodontology added other parameters and conditions such as radiographic bone loss in association with clinical attachment loss to the 1999 Classification of Periodontal Diseases. However, challenges in differentiating the aggressive periodontitis from chronic periodontitis and emergence of new scientific evidence such as peri-implant health and disease were the major rationale for the new classification of 2017.

One of the major changes in 2017 classification is the replacement of the Aggressive and Chronic Periodontitis terms with a single category “Periodontitis “. Thus, there is only one disease process with differing rates of extent, progression, and severity (Fig. 10).

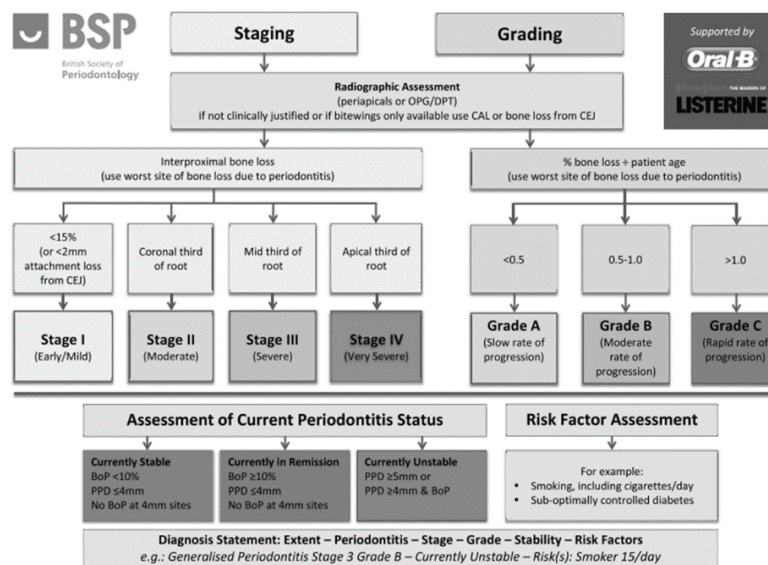


Fig. 10 Periodontal disease: staging & grading (British Society for Periodontology)

Given below is a brief description of the 2017 classification in which the disease is described and classified according to its severity and the rate of progression. Please note that signs and symptoms can overlap.

Codes 1-3 refer to gingivitis and Code 4 refers to periodontitis.

Staging refers to the severity of disease, mild, moderate, severe, very severe and the complexity of its management:

Stage I: Early stages of attachment loss.

Stage II: Established periodontitis.

Stage III: Significant damage to the attachment apparatus.

Stage IV: Significant damage to periodontal support leading to tooth loss and loss of masticatory function.

All stages of periodontitis need to be supplemented with information about the grade of the disease.

Grading refers to the rate of progression (percentage bone loss divided by patient's age):

Grade A: slow (<0.5% bone loss)

Grade B: moderate (0.5 – 1.0% bone loss) and

Grade C: rapid (>1.0% bone loss).

Then there is assessment of the current periodontal status and an assessment of risk factors such as smoking and diabetes. These will lead to a comprehensive diagnosis which will encompass the extent of the disease, stage, grade, degree of stability and the associated risk factors.

Those who are familiar with cancer diagnosis and classification will see similarities between those and the 2017 periodontal disease classification.

After diagnosis, there are agreed pathways for treatment with the emphasis on non-surgical therapy (Fig. 11). One must also be aware that some of the treatment can be delegated to non-dentist members of the Dental Team. Readers are advised to study published literature on the current classification and management of periodontal disease for a clear understanding.

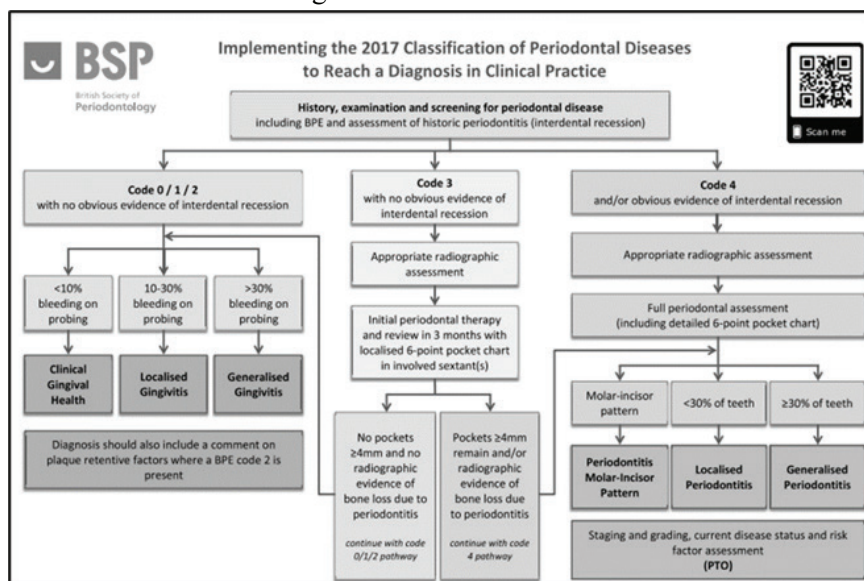


Fig. 11 Implementing 2017 classification of periodontal diseases (British Society for Periodontology)

Common risk factors

There are many common risk factors affecting both general health and oral health of an individual. These are shown in Fig. 12. For example, a bad diet can lead to obesity, cancer, heart disease and dental caries. Smoking can lead to cancer, heart disease and periodontal disease. Therefore, dealing with common risk factors will improve both general and oral health. One should not be managed in isolation of the other.

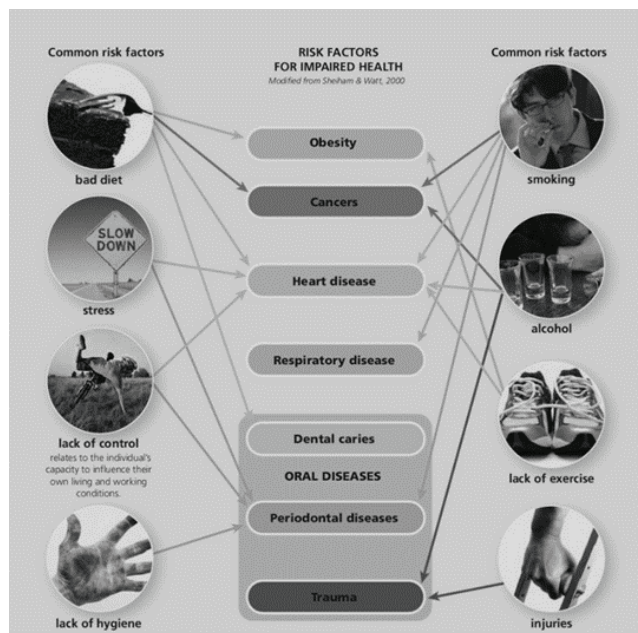


Fig. 12 Common risk factors (Oral Health Atlas 2015)

New mantra

New mantra is “*putting mouth back into the body.*” Also, with the realisation that oral health and general health are closely related, a more holistic approach to managing oral disease is being adopted. The common risk factors need to be dealt with in collaboration with the physicians. A change in lifestyle must be managed by the patient under guidance from the health professionals including the members of the Dental Team. These steps will go a long way in reducing or eliminating the common risk factors. The responsible clinicians, both dental and medical, will also find much satisfaction in this.

Challenges facing Sri Lanka

It is appropriate now to consider the situation in Sri Lanka. There are many challenges to be addressed. Please note that these observations are based on data from the several sources which are not the most recent. These have been subjected to limited and selective interpretation.

Who delivers oral health care?

Table 3 gives oral health care personnel in the state sector. There are estimated to be a few hundred dentists working in the private sector.

Dental surgeons	1596
Consultants	108
Dental therapists	369
Dental laboratory technicians	42
	2018 data

Table 3: OHC personnel in the state sector

Given below is a summary of many challenges facing Sri Lanka. It is not an exhaustive list.

- There are many oral health inequalities.
- The number of dentists is inadequate with uneven distribution across the country.
- There seems to be an increase in patient attendances.
- Caries prevalence and severity among children are decreasing but there is an increase among the elders.
- Extractions remain high especially in under-served areas.
- Many of the decayed teeth in the young are left untreated: consequently, in 35 – 44-year-olds, more teeth are missing.
- Tooth loss and their replacement are still significant challenges.
- Older population needs care but does not seem to seek it. The decayed teeth have been lost and not replaced.
- Oral health related behaviours among seniors are less desirable than among the young.
- Elders have fewer teeth according to other data. This is in keeping with data presented above.
- There is a lot of unmet need.

The above is a formidable list. All the stakeholders need to work together to address these challenges.

Era of cosmetic dentistry

Now we are living in an era where life-style issues such as physical fitness and appearance have gained prominence. There are several drivers for this: one is that more people are keeping more teeth to old age. Then there is the impact of Bollywood and Hollywood on the lives of ordinary people. Take for example a rising demand for skin lightening! Most want a beautiful body. They want to look good, smart, and young irrespective of age. Older persons wish to rediscover lost youth. They wish to have a beautiful body with a beautiful smile. These are leading to growth of cosmetic surgery, growth of cosmetic dentistry and a blurring of boundaries between the two.

One must recognise that having beautiful smiles with beautiful teeth are in line with current definition of oral health (FDI WDC 2016):

“To reflect its multifaceted nature and importance, oral health is now defined, amongst other things, as including the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex.”

Thus, it is not just teeth, gums, and jaws anymore. The role of the Dental Team is expanding with the dentists performing complex procedures and delegating routine tasks to the rest of the Team. Dentists are venturing into managing general health problems e.g., obstructive sleep apnoea. Dentists are undertaking more cosmetic work. Some treatments provided by dentists are going beyond traditional Cosmetic Dentistry with growing links between Cosmetic Dentistry and Facial Aesthetics. Facial Aesthetics is becoming big business. Thus, the dentists have become the new beauty makers! Here is a list of procedures undertaken: botoxology, labio-plasty, oral lifts, peels and pinnaplasty, palpebral rejuvenation,



Fig. 13: A recent publication

skin rejuvenation and total facial rejuvenation. This list is by no means exhaustive.

To provide new treatments, dentists need to acquire new skills. Thus, there are many new courses available. There is an International Academy of Facial Aesthetics IAFA.

A cynic might state that this is a case of new wines in old bottles! So now we have dentists, oral physicians, specialists such as endodontists, oral & maxillo-facial surgeons, paedodontists, orthodontists, restorative dentists, cosmetic maxillo-facial surgeons, botoxologists and facial aesthetists!

Moral question

When there is much oral disease and unmet needs and demands, is it right to move away from being a healer and a restorer to being a beauty therapist? How does one balance conflicting demands? After all, the dentists have plenty of restorative and rehabilitative work to do. One solution is to delegate simpler tasks to other members of the Dental Team. One must also recognize that the pattern of oral disease has changed over the decades. In the past, most treatments were of mid-range complexity. There were some simple and some complex treatment needs at either end of the scale (Fig. 14). Currently, most treatments needs tend to belong to either simple or complex categories (Fig. 15). The current disease patterns lend themselves to their management by the Dental Team with dentists delivering complex treatments and the other members of the Dental Team delivering simple **treatments**.

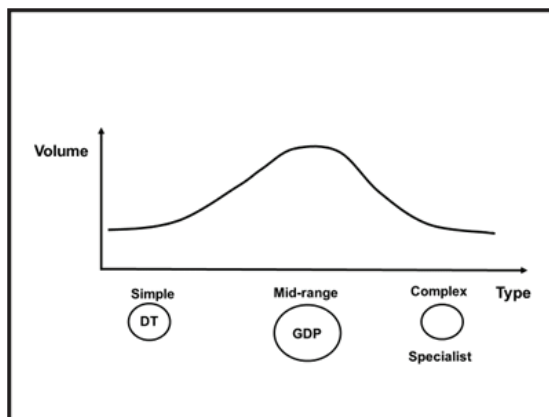


Fig. 14: Barmes' Hat showing treatment needs yesterday (named after late Dr. David Barmes, legendary Head of WHO Oral Health Unit)

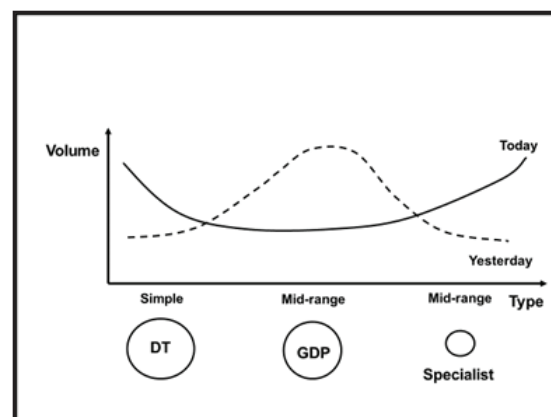


Fig. 15: Barmes' Hat showing treatment needs today: it is flattened!

Who should manage?

The above analysis can be explored further in relation to dental caries. The "Iceberg of dental caries" (Fig. 16) shows the range and extent of dental caries affecting individuals and their teeth. This can be used as a basis for determining who should do what when it comes managing dental caries as a Team effort. As can be seen from the diagram, there is a substantial amount of preventive care that can be managed by the non-dentist

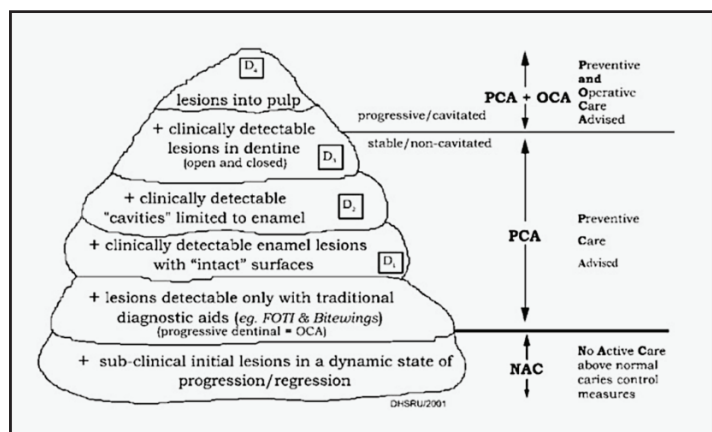


Fig. 16: Iceberg of dental caries (Pitts 2004)

members of the Dental Team.

The same principle can be applied to the management of the other major dental disease, periodontal disease.

Dental Team lends itself to managing a range of activities as can be seen from Figs. 17 and 18. While dentists undertake more complex and challenging treatments, preventive and simple oral care can be delegated to the other members of the Dental Team. The scope of practice of the Dental Team has also expanded in recent times to include some orthodontic (e.g. bonding and debonding of brackets) and prosthodontic procedures (e.g. impression taking). However, it is for Sri Lanka to decide on the most appropriate composition and the respective skills mix of the Dental Team. It is not for others to dictate that.

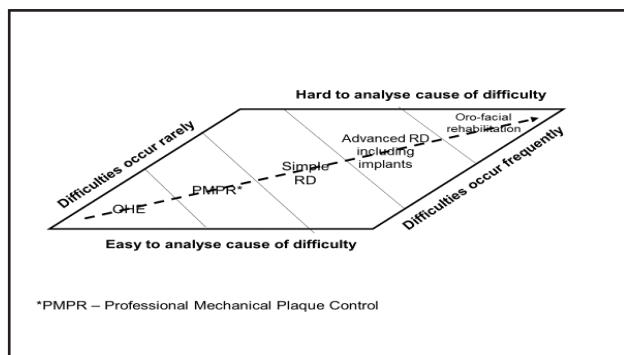


Fig. 17: Range of dental care. Dentists' preference for more complex work will continue to grow (Adapted from Allred & Hobdell 1986)

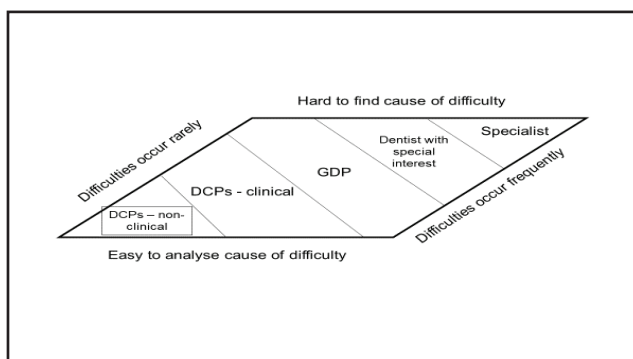


Fig. 18: Most preventive care can be delegated to the other members of the Dental Team

Some home truths

The breadth of dentistry makes it possible to provide care by a range of dental professionals working in primary, secondary and tertiary care utilizing a range of skills, techniques, and materials. For Sri Lanka, this means dentists, dental therapists, dental hygienists, and specialists working as a Team led by the dentist. The dentist will be responsible for diagnosis and treatment planning and delegation of appropriate work to the other members of the Dental Team. The Dental Team members will be required to work on a prescription provided by the dentist and under the supervision of the dentist. The supervision must be direct, not remote. In other words, the Dental Team must work under the same roof. Many patients requiring preventive dental care can be managed by dental therapists and hygienists. In the meantime, the dentist can undertake more complex and challenging work.

The aim of a modern health service must be to:

Do the right thing, at the right time, for the right patient, in the right place with the right staff.

(Adapted from NHS England 2012).

Concluding remarks

Oral diseases have not gone away. With better understanding of the disease process, the diseases can be managed with less destructive approaches by adopting a therapeutic approach. At the same time, the dentist's

role is expanding to encompass more challenging oro-facial aesthetic treatments.

In Sri Lanka, there are unmet needs and demands compounded by inadequate workforce and other issues. The expanding role of the dentist poses a moral dilemma given the unmet needs and demands of the general population.

The Dental Team

One solution to meeting the basic oral health needs and demands of the population and indulging in oro-facial aesthetic care is to work as a Dental Team. While the dentist can deliver a range of dental treatments including the most advanced, other members of the Team can deliver the balance of care. The Dental Team must be led by the dentist, the clinician who has received the most extensive education and training. It is therefore logical that the dentist will be the diagnostician, care planner and the leader/supervisor. Other members of the Team will work to a prescription provided by the dentist and under direct - not remote - supervision. Only Team member exempt from direct supervision will be the dental technicians. They too will continue to work to a prescription provided by the dentist as is the practice now.

Introduction of a Dental Team where dentist is not the only (operating) clinician is not new to Sri Lanka. Dental therapists have been working in Sri Lanka for decades. Except that their role has been limited to working in school dental clinics providing care to school children and divorced from the General Dental Services. The time has come to reorganise the oral health care services so that dental therapists and hygienists can also work in the General Dental Services, not independently but under supervision as described previously. Dental therapists and hygienists should be permitted to work in the private sector too but only under the direct supervision of a dentist. Thus, the Dental Team will be able to deliver the full range of oral health care from the simple to the most complex in an efficient and cost-effective manner.

The way forward

However, such a reorganisation of Dental Services cannot be done overnight. Firstly, there must be legislation enabling the education, training, and employment of the non-dentist members (e.g. hygienists and therapists) of the Dental Team. Although dental therapists operate in Sri Lanka, they can only treat school children. Therefore, their scope of practice and training need to be expanded to include treating adults. Then there are other concerns. For example, the legislative framework must be strengthened to prevent malpractice and other issues such as Team members expected to work under supervision trying to work independently. Team members must also be prevented from attempting to operate beyond their skills set. This will apply to dentists too. For example, a dentist wishing to undertake implant treatment and oro-facial cosmetic therapies must undergo appropriate training first to ensure high professional standards and patient safety and welfare. Dentists must also learn to lead the Dental Team effectively. They must not view the other operating members of the Team as potential threats. Leaders must guide their Team to deliver high quality oral health care.

Only an enlightened, a progressive and a visionary leadership can guide the dentists to expand their scope of practice to include more complex and rewarding treatments such as oro-facial aesthetics while meeting the basic oral health care needs of the general population. Thus, dentists can aspire to be at the apex of an expanded “dental work force pyramid” in the same way the medical colleagues have established, enhanced, and consolidated their position at the apex of the “medical work force pyramid.”

Dental profession in Sri Lanka needs to reflect on these, reach a consensus on the way forward and act without delay so that it does not fall behind in adopting international best practice.

Acknowledgements

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