Alliance for a Cavity-Free Future Global Symposium 2016

The Fight for a Cavity-Free Future: ‘Joining up’ the evidence to make an achievable difference

Tuesday 2nd February 2016, AEEDC Dubai Conference- Hall E, 9:30-17:30

Speakers: Professor Nigel Pitts, Professor Paula Moynihan, Professor Tim Newton, Professor Dominick Zero, James Chauvin, Professor Svante Twetman, Professor Stefania Martignon

The Session opened at 09:30

Welcome by Dr Nasser Al Malik on behalf of AEEDC

Introduction by Professor Nigel Pitts

Introduction to the aim of the Symposium to ‘join up the evidence’

Outline of the future collaboration between ACFF and AEEDC, creating an annual Symposium to look at new caries topics to work towards achieving a Cavity-Free Future.

Introduction of the ACFF and the global declaration.

“Global collaborative action is needed to challenge global leaders and other stakeholders- including country and community leaders, health and dental health professionals, public policy and education communities, and the public- to learn the importance of caries as a disease continuum and to participate in action toward the delivery of comprehensive caries prevention and management that can positively influence the continuing problem of caries.”

ACFF initially focused on ensuring primary prevention methods in place, and then building a focus towards secondary prevention through the Chapters.

Presentation of a brief history of the ACFF including Goals and introduction to the 25 Chapters as well as looking at collaboration and the involvement of various organisations in ACFF activities.

Question Posed to General Assembly: Does our Current Approach to Caries Prevention and Control Strategies Integrate a Sufficiently Broad Range of Evidence?

Results: Yes- 42% No- 48.5% Don’t Know- 9.1%
Professor Paula Moynihan- Perspectives from Nutrition

Introduction
Overview of the role of diet in caries prevention. Sugar intake is increasing which has led to concerns over its contribution to obesity and other NCD's such as caries. Aim of the presentation is to have an insight into the role of sugar control as part of a multifaceted approach to caries prevention and control.

Exposition of 2015 WHO Sugar Guidelines
Free Sugar should represent less than 10% of calorie intake (strong recommendation) and further benefits could be seen if this figure halved to less than 5%.

Brief overview of dietary sugars and what classifies as ’Free Sugars’- All mono- and di-saccharides added by manufacturer, cook or consumer plus the sugars naturally present in honey and syrups, fruit juices and fruit juice concentrates

Overview of findings in data from Newcastle University WHO Centre Systematic Reviews
Sugar ingestion levels and dental caries
Positive correlation shown between sugar intake and caries levels in both adults and children.

In data regarding sugar consumption levels of below 10% there was still caries reported, although in significantly lower prevalence than in subjects with higher sugar consumption (0.5 compared with 1.4)

Frequency vs amount
There are very few studies looking at this relationship, but it is clear that frequency and amount tend to be correlated so efforts to reduce amounts should also reduce frequency and efforts to reduce frequency should also reduce amounts. At policy level, goals regarding amount are easier to use as a yardstick which can allow countries and populations to monitor intake and judge success levels. Chair side, adjustment of frequency is an important part of the education of patients.

Infant Feeding
4/7 studies within recent review showed that bottle fed children had a higher risk of developing dental caries, 3/7 showed no difference. The study concluded that breast feeding was more successful in protecting infants from dental caries, however noted the need for further studies due to insufficient controls.

Fluoride
Why worry about sugar when we have fluoride? Fluoride can help to reduce caries levels, but the root cause of decay is still there. Fluoride is a good mop, but it’s easier to switch off the taps.

Moving Forward
We need to think about supporting behaviour change not just by offering advice to the public, we need upstream approaches. Possible upstream approaches; Taxing high sugar foods, better labelling, changes in advertising, reformulation of recipes and food production methods, clear dietary advice.

Advice in getting patients to reduce sugar intake- understanding guidelines is key. Sugar cubes is a good reference point, or could be adjusted depending on the food being referenced.

Guidelines for Children- we need to know sugar cube levels for each food item. We need to not add sugar to baby food. Promotion of the use of whole fresh fruits not fruit juice- milk and water should be promoted to drink.

A lot of training is needed for all health professionals- nutritionists/GP should all know about oral health- let’s put the mouth back in the body. Dental health professionals should also be trained to provide dietary advice.

There needs to be much more action at policy level, sending strong messages- policies regarding tobacco have been successful in reducing consumption so sugar should be a focus. Nutrition is key and should be integrated with oral health advice in public health programmes, education and within dental offices in order to create lasting change.
**Professor Tim Newton- Perspectives from Education and Behaviour Change**

**Introduction**

Objectives of the session: To be able to outline a model of health related behaviour, identify targets for health related behaviour, define the components of the model, cite published evidence of the ability of the models to predict oral health related behaviours and identify possible targets for interventions to enhance oral health related behaviour.

**Behaviour at an Individual Level: Dentist to Patient Communication**

Targets for Behaviour change in Patients: daily tooth brushing with fluoride toothpaste; regular attendance at dentist; refrain from tobacco use; reduction in sugar consumption

Targets for Behaviour change in Dentists: shift to a broader perspective on caries including changes in practice in relation to recognition, management and follow up; increased focus on provision of preventive advice, including diet and oral health related behaviours; antibiotic prescribing; adoption of alternative workforce models, including delegated duties to other healthcare professionals.

**How do you provoke behaviour change?**

- **Capability (C):** Capacity to understand the advice being given- the person having the physical (e.g. strength) and psychological (e.g. knowledge) skills to perform the behaviour.
- **Opportunity (O):** Being in a position to, with the freedom to do something- the physical (e.g. access) and social environment (e.g. exposure to ideas) are supportive of the new behaviour
- **Motivation (M):** People need to want to change- referring to the person’s conscious (decision making) and automatic (emotional reaction/habit) processes

**How do we change Capability?**

- **Skills** (can be acquired from written information, observations made/demonstrations viewed, the latter of which is more likely to be effective despite being harder to implement)
- **Knowledge:** Understanding of terms, preconceived ideas that may differ from orthodox teaching. Messages given by clinicians are interpreted in terms of the patients understanding, which is often failing. They may then be reluctant to ask for clarification or further information. Patient recall of information from healthcare consultations differs from the recall of the delivering healthcare professional

**How can this be improved?** - Explore the patients understanding of their illness, and use this to explain the need for change.

Increasing recall: Use the primary effect. use specific rather than general statements, stress which information is important, repeat information, use shorter words and sentences, categorise information in an explicit manner, telephone and email reminders (proven to improve attendance), use written materials to support advice given.

Self-efficacy- people need to believe that they can do things and can change. This can be achieved through actual achievement (encourage small change to make them believe they can do a big one), vicarious experience, social persuasion and encouragement, physiological factors.

Studies have shown that planning when and where you will partake in an activity means you are more likely to do it-recording your activities and creating a plan of what you will do means better results.

**Top Tips:** Think more than simply giving knowledge. 2) Enhance self-efficacy through identifying previous success and creating small changes that accumulate. 3) Encourage Planning. 4) Use media to provide demonstrations

**Moving Forward- Tips for effective behaviour change**

- **Oral Hygiene-** target toothpaste choice (using free samples) and encourage persistence. COM on Flossing and Mouthwash use.
- **Dental Attendance-** Create Triggers (O) such as reminder texts, identify and tackle barriers through creative interventions (flexible payment plans/welcoming environments etc.), encourage patients to use reminders and diaries.
- **Smoking-** promote specialist cessation services and keep asking
- **Diet Change-** Identify common links between diet and goals, enhance belief in ability to change, encourage planning and use substitution where possible.
Introduction

We are looking at the role of dietary sugar in driving caries, how a theoretical understanding of the caries process can be applied to our clinical practice, actions and mechanisms of fluoride and optimisation of its use based on patient risk, and identifying necessary chances in practice towards providing evidence based care.

Caries - Diet is influenced by what is presented to us and how we’re ‘programmed’ to respond to food. This has been exploited by food manufacturers. Genes play a role (but no determination of which ones has been reached yet). Caries is now progressing slower in the post-fluoride era, so a more conservative approach is plausible.

Historically, caries was understood as a one way process, once initiated, treated by restoration or extraction. This is good for dentists, not so much for patients! We should be focussed on our failures as well as our successes.

Modern understanding of caries is that early stage caries can be prevented, or reversed through modification and protection.

Working hypotheses have evolved- caries is an infectious and transmissible disease; caries is a dietary carbohydrate-modified infectious disease; caries is an ecological shift in dental plaque; it is a biopsychosocial disease model; there is a genetic basis for increased caries risk; caries is a diet-mediated disease with free sugars being the primary factor.

Dental caries is the consequence of adaption by plaque bacteria to a low pH environment- the interaction between dietary sugars and dental biofilm lowers the pH level. Bacteria can become more pathogenic due to increased acid production and other reactions stimulated by the environment.

Diet influences pathogenicity of the biofilm, leading to shifts in the composition of the biofilm and changes in metabolic state. It also influences the thickness and structure of the biofilm and alters the diffusion properties. The concentration of the sugar is important in this process. Higher concentration leads to more violent penetration of biofilm. When biofilm thickens, the acids become more intensified and neutralising becomes an issue. There is some evidence to suggest that sucrose is more pathogenic than other forms of sugar. There are rises and falls over the course of a day in the mineral content of our teeth based on our sugar consumption. Type of Sugar - Frequency of Sugar – all contribute to progression of caries.

Preventive Intervention (fluoride) - what should we be doing? What problem are we trying to address?

Sub-clinical demineralisation, non-cavitated lesions, orthodontic white spot lesions.

We are more interested in the solutions for which we have higher levels of evidence than those for which there is less evidence.

Strategies:
- Modification or elimination of pathogenic bacteria – Cleaning, improving oral hygiene.
- Modification or elimination of cariogenic diet- Dietary counselling, behaviour change.
- Increase in caries resistance- Fluoride, sealants, salivary stimulation, and remineralisation strategies.

In the absence of fluoride as a barrier, the critical pH level is higher for remineralisation, leaving more of a window for demineralisation. However even with fluoride, if the environment is highly cariogenic, demineralisation will still occur.

Topical Fluoride: range of agents, range of concentrations, range of delivery techniques (paste, gel, foam, varnish, water)

Evidence based on fluoride use is varied, some areas are yet to receive accepted systematic reviews to show effect. Others show positive effects in caries levels based on fluoride use

Fluoride works on the surfaces which we have not cleaned properly (areas with biofilm)

What can influence the effectiveness of fluoride? - How long is the biofilm exposed for? How much fluoride is introduced? Post-brushing behaviours can limit the amount of time fluoride is being effective on the biofilm. Brushing before bed is a huge factor in success of tooth brushing behaviour on minimising cavities.

Recommendations for fluoride use: Low Risk- Fluoridated toothpaste 2x a day; Medium Risk- Fluoridated toothpaste 3x a day and a fluoride rinse before bed; High Risk- Fluoridated toothpaste 3x a day, high concentration gel before bed and routine professional topical applications.

Fluoride is currently the most highly effective caries prevention strategy, but is limited by sugar consumption behaviours. We should optimise fluoride usage in populations and at risk groups, however it is not likely that we will be able to reduce the global burden greatly without strategies linked with limiting the consumption of dietary sugars.
James Chauvin - Perspectives from Public Health

Introduction

Public Health Core Competences - Disease and injury prevention; health promotion; health protection; surveillance; population health assessment; emergency preparedness; advocacy and communication; leadership and governance

WFPHA - Dedicated to promoting and protecting global health since 1967. 106 member associations, 85 NPHA. Now have more than 100 countries with a public-health association.

Survey - Oral health sits at the bottom of all health concerns within the public health agenda across all associations. Europe views it as least important out of surveyed areas. Amongst those concerned for oral health, caries ranks as one of the higher level concerns within oral public health.

Why oral health is not considered more important

Not considered to be life threatening; little understanding of links between oral health and chronic disease; Lack of data on oral health issues; lack of national oral health strategy; treated as a treatment issue rather than focus on prevention; little understanding about non-health determinants of oral health and social/economic consequences of poor oral health; Weak links between dental health and public health.

What is being done to resolve this?

WFPHA has been involved in raising the issue of oral health - creation of working groups, EADPH involvement, passing resolutions relating to oral health/oral cancer children’s oral health, endorsement of Advanced Dental Public Health Leadership Programme. Some issues with implementing change, despite resolutions

Individuals largely influenced by personal and community wide as well as political/economic/environmental/commercial factors.

Example: Parts of the oral health system in Canada are not covered by public funding. 62.6% of Canadians have private insurance. 17.3% say they have avoided care, and 16.5% have declined recommended dental care because of the cost. 2.26 million school days and 4.15 million work days are lost annually due to dental treatment or resulting sick days. Immigrants are 5 times more likely to have poor oral health. Those on low income, and those whose jobs do not include dental plans are less likely to have dental insurance. Tooth decay is the most prevalent chronic disease of childhood- approx. 60% of children aged 6-19 have experienced decay. 53.4% of children enter school without decay, this percentage is significantly lower when looking at Inuit/First Nations Children.

Families on lowest income have highest rate of dental avoidance and use an emergency pattern of visitation. A high percentage of elderly people do not have dental insurance. Those with a post-secondary education of any level have slightly lower rates of missing teeth or DMFT than those who did not complete school.

Even when there is no cost barrier, some groups still present high prevalence of tooth decay. Indigenous people are covered by public funding but dental care is inaccessible to a high percentage. Where safe water is not available, and the price of milk is high, sweetened beverages become the drink of necessity- therefore the consumer market affects oral health.

The single greatest risk factor is poverty. Other contributing factors include household crowding, family size and nutrition habits as well as other health behaviours, parenting practices, and tobacco and alcohol exposure

Moving Forward: Proposed simple steps

Oral health inequalities are caused by the conditions of daily living, political, social and physical environments of modern societies, which in turn dictate the choices and options open to individuals.

Focus solely on the individual fails to address the underlying cause of oral disease. Building healthy public policies, creating supportive environments, strengthening community action and refocusing services to achieve oral health improvement.

We should be pushing for access to preventive dental services for all ages, tackling the commercial, economic, political and social determinants and cultivating a culture of oral public health within society whilst developing oral public health leadership.

What can we do?- Develop publicly funded oral health as a component of national policies; advocate for better evidence informed data on commercial and economic determinants to challenge the food and beverage/ tobacco and alcohol industries; include social determinants within dental health training curricula; community based oral disease prevention initiatives; recruitment of dental health professionals within public health associations; closer collaboration between PHA’s, ACFF Chapters and National PH organisations.
Introduction

Evidence-based dentistry can be regarded as a triad with three key elements: best available scientific evidence; clinician’s knowledge, skill, experience and education; patient’s expectations, demand and the economy.

Triad example: Toothbrush choice.

Science: Powered toothbrushes are significantly better for removing plaque and reducing gingivitis; Clinical: Differences are small and the clinical significance is unknown; Patient: I don’t want to spend much money on my oral health.

Practicing evidence-based dentistry does not provide you with absolute guidelines - the treatment highest level of evidence may not be the most effective course in every situation. Evidence-based dentistry is an informed dialogue, not an instruction manual.

Advice for Clinicians

Systematic Reviews can provide us with the best available data, however it is impossible for any one clinician to keep up to date with all scientific papers published. GRADE system is an eye-catching simple way to assess quality of evidence to study.

Look at Cochrane database - very quick to do whilst in clinic. Cochrane SR grade the quality of evidence presented but issue no treatment recommendations based on the evidence.

There are two gaps:
    Gap between the strength of the evidence and what is offered in daily practice
    Gap between the dentist’s stated treatment intentions/plan and what they actually do

There is a disparity in agreement between published evidence recommendations and everyday clinical practice - an average of 62% of recommendations are commonly accepted amongst practitioners for their clinic work.

What would drive dentists towards prevention?

Education on the benefits along with preventive training, coupled with fairer pay reward where treatment costs pay salaries.

ICCMS™ - This is a simple way to educate practitioners as to the options surrounding early caries detection and prevention.

Early detection of caries is not as complicated as dentists think. Moderate evidence suggests that visual inspection of dry, clean teeth can be enough to accurately assess the presence of caries in 62% of cases.

Adding radiographs to the diagnostic procedure is a highly accurate way to detect cavitated proximal lesions, and are also suitable to detect dentine caries with only a limited risk for false positive diagnosis.

When detecting secondary caries lesions there is not a huge amount of evidence to draw from.

Root caries detection - there is no systematic review available. This should be done via visual and radiographic detection, and also tactile detection if great care is taken.

Widely recognised visual scoring systems present significantly better accuracy than studies that develop their own scoring criteria. If all dentists were to utilise the same scoring and classification system this would allow more accurate diagnosis.

Without detecting initial stage caries, 30% of non-cavitated lesions which may require treatment are being overlooked.

As dental professionals we need to balance the risk assessment side with other contributing factors for the patient.

Should patients with highest risk of developing caries get higher levels of preventive treatment? When using risk assessment protocol more dentists end up providing preventive treatment.

Moving Forward

Money and communications effort should go to methods with highest levels of evidence (fluoride toothpaste/varnish/gel) - despite very clear evidence for fluoridated toothpaste, not everyone uses it to the optimum recommendations.

Clinicians must recognise the new paradigm in caries management based on early detection, risk assessment and medical management. Detect-Assess-Do should be a key philosophy utilised throughout treatment plans.

Adopt evidence of efficacy for both primary and secondary prevention; Embrace the emerging micro-invasive methods to arrest dentine caries; Networking, education, training and practice-based research drive dentists towards prevention and tissue-preserving approaches. The demand of stakeholders and patients will fuel this translation.
Professor Stefania Martignon - Perspectives from Integrated Caries Prevention and Management

Introduction

We are looking at how to work towards preventing new lesions appearing, preventing existing lesions from advancing, preserving tooth structure with non-operative care initially and conservative operative care at more extensive levels, and providing a structure for risk and recall intervals with periodic monitoring and reviewing.

ICDAS- International Caries Detection and Assessment System/ICCMS™ (Caries Management System)

The management plan should be: appropriate- personalised- preventively based- risk adjusted- tooth preserving.

The plan aims to provide a comprehensive set of evidence based clinical protocols in history taking, clinical examination, risk assessment and personalised care planning, in order to enable long term improved outcomes.

Identifying caries lesions and activity- Classification

Initial diagnosis can be made visually, and can be coupled with radiographic scoring. This should give you an assessment of the lesion type and activity level. ICDAS records lesions from 0 (sound) to 6, and as active or inactive lesions. A simpler 0 to 3 coding is available for those who prefer it.

To assess likelihood of progression, we need to analyse both individual risk status and current caries activity status (no active lesions, initial stage active lesions, moderate or extensive stage active lesions).

This will give us an ICCMS™ Progression likelihood of low, medium or high, which influences the course of action taken for the patient.

Treatment Plan- Management

The ICCMS™ Guide offers advice on homecare and clinical interventions required to minimise risk of caries progression at the patient level.

Homecare- tooth brushing recommendations and general behaviour modification etc.

Clinical Intervention- motivational engagement, dietary assessment, professional cleaning, sealing, risk based recall visits etc.

Advice is also offered on management of the individual lesions, taking a non-operative approach, and also a tooth preserving operative care approach where required.

Non-Operative Care- Fluoride varnish/gel/toothpaste, sealing, mechanical biofilm removal

Tooth Preserving Operative Care- Restorations, Pulp preserving restorations/excavation, sealing, Hall technique/ART, extraction

Once treatment has been decided on, and the correct measures are in place to care for the patient in both prevention and management of existing lesions, the risk based recall interval can be decided.

The outcomes of the ICCMS™ System are:

    Health Maintenance- Establishing and maintaining long term oral health and well being
    Disease Control- Effectively managed active lesions, non-progression of inactive lesions, tooth structure preserved
    Patient-centred quality metrics- Patient satisfaction, risk based attendance and care pattern established, caries risk stabilisation, oral hygiene and dietary practices improved.

Moving Forward

Wider impacts of the ICCMS™ are a change in the philosophy of dental practitioners, schools, insurance systems and health systems, along with changes in national and international policy, based on research, to push towards the healthcare goals of organisations such as the WHO and FDI, and offer improved value within our health systems

Work is being done to synthesise the research and documents produced and many organisations are pushing to share this management system as a universal tool. E-learning has been created to make the tool more widely accessible and improve training levels. Integration of all disciplines discussed today is vital as they all impact parts of the management plan, and we need to work together to discover the best system for keeping people cavity free (that is with either sound surfaces or well controlled initial stage caries).
Closing Synthesis by Professor Nigel Pitts: Moving forwards towards a Cavity-Free Future with a focus on caries prevention and management

The Meeting discussed how best to move forward now that all participants had agreed that there is a need to integrate the various perspectives from the very different stakeholders into simple and deliverable actions.

There was support for the view that, around the world, all stakeholders should be aware that:

• The continuing ubiquitous global prevalence of dental caries - in terms of its clinical, psychological and economic burden - underlines the need to make an achievable difference and move more rapidly towards a Cavity-Free Society.

• There is a need to better understand the existing body of evidence regarding caries prevention and control, and also to determine how to integrate that evidence and identify a clear path towards a cavity-free future for all age groups and risk groups.

• There are a series of different and equally important stakeholders in the area of effective caries prevention and management; these include:
  
  - Nutrition
  - Education & Behaviour Change
  - Cariology
  - Public Health
  - Clinical Practice
  - ICCMS™ Caries Management

The work of these stakeholders needs to be integrated and then also combined with actions from other groups such as:

  - Health professionals
  - Patients
  - The public
  - Others

Conclusions

It was the conclusion of the meeting that this ‘puzzle’ needed to be joined up (see figure) and that the ACFF, both globally and locally, will take a role in facilitating this process.

Questions Posed to General Assembly

Does our Current Approach to Caries Prevention and Control Strategies Integrate a Sufficiently Broad Range of Evidence?

Results: Yes - 53.3%  No - 26.7%  Don’t Know - 20%

Have you learned new knowledge about dental caries and its control today?

Results: Yes - 86.7%  No - 13.3%  Don’t Know - 20%

The Session closed at 17:15

Participants:

Prof. Nigel Pitts - Chairman, Alliance for a Cavity-Free Future/Director, Innovation and Translation Centre, King’s College London Dental Institute, UK

Prof. Paula Moynihan - Director, Centre for Oral Health Research, Newcastle University, UK

Prof. Tim Newton - Professor of Psychology as applied to Dentistry, King’s College London Dental Institute, UK

Prof. Dominick Zero - Director, Oral Health Research Institute, Indiana University School of Dentistry, USA

James Chauvin - Immediate Past President, World Federation of Public Health Associations

Prof. Svante Twetman - Professor of Cariology, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark

Prof. Stefania Martignon - Senior Lecturer in Cariology, Technology and Methodology, King’s College London Dental Institute, UK/Universidad El Bosque, Bogota, Colombia