Department of Oral Biology & Genomic Studies

Oral Biology is a distinctively diverse scientific area, encompassing the disciplines of molecular biology and genetics, microbiology and immunology, biochemistry, biophysics, craniofacial system and their development. Because of the unique combination of dental hard and soft tissues and functions of the mouth and craniofacial complex, the field of oral biology blends fundamental scientific disciplines in unique and fascinating ways to meet the challenges of developing new and highly effective ways to manage, cure or prevent diseases and developmental defects. A service of Oral Biological Science (of Nitte University A.B. Shetty Dental College) not only complies with the core philosophy of the subject, also running operational research useful for community-in-need.

Department of Oral Biology is established at A.B. Shetty Memorial Institute of Dental Sciences (ABSMIDS), under Mangalore University of Karnataka state in the year 1998. This is first of its kind introduced and established in India. Until 2002 the department was running with its various activities under Rajiv Gandhi University of Health Sciences of Bangalore. During the period the department completed 15 research projects and established a unit for oral cancer screening and education, which has been documented in a published book and research.

Currently the Department of Oral Biology is running various important research projects and several intra-mural and extramural activities, of them research related to Fluoride, Cariology, Diabetes Mellitus are worth mentioning. But the main focus and the pivotal activity of the department is Oral Cancer Prevention and Control, and with this, the unit is rightly operating an extraordinary nicotine replacement therapy (NRT) services – comprising NRT clinical practice, training programme and tobacco related addiction researches, and this helping lives from pre-mature deaths and disabilities of tobacco menace. The Division of Oral and Maxillofacial Cancer is not only deals with primary prevention, ensures better tertiary care to provide Quality of Life (QoL) of cancer survivors as well. Moreover, number of projects related to educational development and action – oriented programmes are on-progress within the department of OBGS. Specifically the department focuses, cost-effective oral cancer screening, molecular interventions for prevention and control of oral-head-neck cancer and the oral cancer unit aims to identify unique Tumor Suppressor Genes (its deletions and mutations) which is associated mainly with smokeless tobacco (ST) habits — killing millions of Central and South East Asian population.

2
Department of Oral Biology & Genomic Studies

Our Vision

Oral health for better health

Our Mission

To develop oral and craniofacial health and research mainly for Indian population and largely for global under-served.

Our Values

Respect – we treat everyone in an open and courteous manner

Integrity – we behave fairly and honestly and are accountable for our actions

Teamwork – we work as a team and in partnership with our patients, our partners and the community

Excellence – we set best practice standards and are innovative in all that we do
### 2014–2015

#### Highlights

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>170</strong></td>
<td>We have carried out 170 Nicotine Replacement Therapy (NRT) counselling programme on 170 patients attending to the department of Oral Biology through entry of Oral Medicine and Radiology. The number of care takers has been increased significantly.</td>
</tr>
<tr>
<td></td>
<td>Increased participation of Dental Interns in the Department Activities</td>
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<tr>
<td></td>
<td>Advanced Dental Practice Learning modules for Dentists</td>
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<tr>
<td></td>
<td>15 interdepartmental research projects running in different areas of dentistry along with K.S.E.M.A Medical Hospital</td>
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<tr>
<td></td>
<td>5 PhD students in the Department of Oral Biology and Genomic Studies</td>
</tr>
<tr>
<td></td>
<td>2 Core Continuing Professional Development conducted</td>
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<tr>
<td></td>
<td>1 Work Group Meeting on Fluoride and Health</td>
</tr>
<tr>
<td></td>
<td>Development of Curriculum of Oral Biology for Undergraduates</td>
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<td>Division of Therapeutic Product and Device Development</td>
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Declaration

The head of Oral Biology and his team takes the responsibility to prepare the document - Annual Report of Operations for Department of Oral Biology & Genomic Studies for the year 2015.

Professor Chitta Chowdhury
Head of Department
Department of Oral Biology and Genomic Studies
A.B.Shetty Memorial Institute of Dental Sciences
Mangalore Deralakatte
India
Glossary

NRT – Nicotine Replacement Therapy
Year in review: Report from Head of Department

We set out to provide oral healthcare to more eligible people and, in 2014–2015, that was what we achieved.

The unit for Centre for Oral Disease, Prevention and Control at A.B. Shetty Memorial Institute of Dental Sciences, Mangalore Karnataka India has set an exclusive NRT clinical session for the patients having habit of tobacco smoking and chewing. 170 Patients so far has been concealed through this programme.

While our emphasis has been on seeing more patients than ever before, we have had a clear focus on improving the patient experience as well.

2014–2015 has been a year of significant change.

Teamwork making a difference

Oral Biology and Genomics department has a key role in leading and coordinating the provision of public oral health services in India, especially to disadvantaged and vulnerable communities.

We provide oral healthcare through the well-established institute A.B. Shetty Memorial Institute of Dental Sciences and various rural centres dental clinics located outskirts of the city.

We worked closely with all established dental institutions in India to help improve retention of the oral health workforce, particularly in rural India.

And this year we also introduced a series of continuing professional development (CPD) courses for dental students that will become an annual Innovations Workshop and hosted the first Public Oral Health Conference in Mangalore and Calcutta.
Changing how we do things, but still caring for the community

In the past year we saw more patients at Department of Oral Biology than ever before. A total of 170 patients accessed our NRT clinical services and other oral healthcare services.

While the focus was on providing care to eligible patients at Oral Biology we also introduced a major restructure to patient services.

As a result, we have improved how we do things at the hospital and plan to further improve patient satisfaction.

Our staff produced tools and resources that have received national recognition. We are in development of other resources and training programmes that can benefit professionals and the patients.

We listen to our patients

We listened and responded to what our patients said about our services. They asked for improved signage at the hospital to guide patients and visitors to our services and we are continuing to develop that into 2015–2016.

Multicultural excellence

ABSMIDS is visited by diverse group of people from Karnataka and Kerala, so do to the department of Oral Biology.
Developing the Oral health workforce

Case Study 1: Developing Oral Health Work Force

An intern at A.B. Shetty Memorial Institute of Dental Sciences, Community Health Centre, is learning new skills through the Dental Assistant up-skilling program. She now holds two separate certificate qualifications making her an invaluable asset to the clinical team. The programme is based on distinctive philosophy and strategy.

Case Study 2: Developing the Fluoride health workforce

Fluoride is endemic in many parts of the north-western and south-western part of Karnataka. We have developed a fluoride health workforce at Department of Oral Biology that works to develop policy and strategy to intervene the fluoride affected areas through research and clinical intervention.
Applied Research & Education

Our unit for Oral Health Research continues to focus on improving outcomes for the patients accessing public dental services through evidence-based research.

Oral Health Practice research unit has been involved in assessing the cost effectiveness of a minimal intervention dentistry approach in adolescents attending public dental clinics.

The Hall Technique is a painless method of treating tooth decay in young children (3–7 years). This approach uses stainless steel caps to seal tooth decay without using needles or drills.

The project studied the effectiveness of distributing toothbrushes, toothpaste and health promotion materials (through the Maternal and Child Health Service) on improving the oral health of young children in disadvantaged communities.

Department of Oral Biology also submitted the report on updating the evidence base on oral health promotion strategies to inform the development of the National Oral Health Promotion Plan. The team wrote five peer-reviewed journals and is continuing with a number of applied research and evaluation projects.

Improving the student experience

Developing a committed oral health workforce has required us to be innovative leaders and, in the past year, we have introduced more opportunities to improve student satisfaction.

Department of Oral Biology continued to support clinical placements of students at various units in the countries and abroad and at public dental agencies state-wide.

Department of Oral Biology also offers a Continuing Professional Development (CPD) program that is designed for staff wanting to enhance their skills and knowledge. These courses are offered free to all public oral health practitioners.
Research

Oral Biology is one of the diverse scientific areas in dentistry that tries to add new knowledge and finds the solution to the problem through research.

Department of Oral Biology and Genomic Studies at A.B. Shetty Memorial Institute of Dental Sciences Mangalore Karnataka India work both on intramural and extramural projects related to oral health and its impact on well-being.

Currently the Department of OBGS is running approximately 15 various important research projects and several intra- mural and extramural activities started previous year August 2014, of them research related to Fluoride, Cariology, Diabetes Mellitus, imaging, mineralized tissues and osteoporosis are worth mentioning.

But the main focus and the pivotal activity of the department is Oral Cancer Prevention and Control, and with this, the unit is rightly operating an extraordinary nicotine replacement therapy (NRT) services --comprising training programme and tobacco related addiction researches and this helping lives from pre-mature deaths and disabilities of tobacco menace.

Research Projects in Department of Oral Biology and Genomic Studies

<table>
<thead>
<tr>
<th>Projects</th>
<th>Collaborating Department</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft Lip/Palate and Quality of Life</td>
<td>Dr Ravi Department of Orthodontics</td>
<td>Target – 300 Cleft lip and palate cases</td>
</tr>
<tr>
<td></td>
<td>Dr Vikram Shetty Department of Oral and Maxillofacial Surgery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Nanda Kishore Department of Orthodontics</td>
<td>Until till date – 276</td>
</tr>
<tr>
<td>Candidal Load in Chronic Obstructive Pulmonary Disease (COPD) : ICMR Project</td>
<td>Dr Rajesh Department of Pulmonary Medicine</td>
<td>Target -100 COPD cases</td>
</tr>
<tr>
<td></td>
<td>Dr Giridhar Department of Pulmonary medicine</td>
<td>Control – 100 cases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>April to Oct 2015 – 109 cases</td>
</tr>
<tr>
<td>Nicotine Replacement Therapy (NRT)</td>
<td>Oral Medicine</td>
<td>N= 164</td>
</tr>
<tr>
<td>Nicotine Replacement Therapy (NRT)</td>
<td>Dr Giridhar Pulmonary Medicine</td>
<td>N= 50</td>
</tr>
<tr>
<td></td>
<td>Dr Rajeev</td>
<td>N= 46</td>
</tr>
<tr>
<td>Project Description</td>
<td>Department</td>
<td>Status</td>
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<td>--------------------------------------------------------------</td>
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<tr>
<td>Nicotine Replacement Therapy (NRT)</td>
<td>Department of Urology</td>
<td>N=29</td>
</tr>
<tr>
<td>Fluoride and Anaesthesia</td>
<td>Dr Bangera Department of Anaesthesia</td>
<td>Leaflet ready</td>
</tr>
<tr>
<td>Development of Artificial Saliva</td>
<td></td>
<td>Karnataka State Drug Control Board Approval pending</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In Vitro study is on going</td>
</tr>
<tr>
<td>Development of Atraumatic Restorative Treatment (ART)</td>
<td>Department of Pharmocology</td>
<td>Data generated and manuscript prepared and sent for proof reading</td>
</tr>
<tr>
<td>Solubility of Atraumatic restorative treatment material</td>
<td>Department of Pharmocology</td>
<td>Data generated and manuscript prepared and sent for proof reading</td>
</tr>
<tr>
<td>Development of Fluoride Mouth Rinses</td>
<td></td>
<td>Leaflet ready</td>
</tr>
<tr>
<td>Minimum Inhibitory Concentration (MIC) of Newly developed Atraumatic restorative Material (ART)</td>
<td>Department of Microbiology</td>
<td>Data is generated and testing on larger sample size</td>
</tr>
<tr>
<td>AMES Test</td>
<td>Department of Microbiology</td>
<td>Yet to start</td>
</tr>
<tr>
<td>Bone Density and Osteoporosis</td>
<td>Department of Orthopaedics</td>
<td>Ethical Approval has been taken from animal and Institutional ethical committee. DEXA Scan and a small animal bone density measuring software required (Funds Needed). Initial pilot study started with n=6 rat samples</td>
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<tr>
<td></td>
<td>Department of Pharmacology</td>
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<tr>
<td></td>
<td>Department of Medicine</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Fluoride in Water is analysed</td>
</tr>
<tr>
<td>Research Area</td>
<td>Description</td>
<td></td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td><strong>Recommended Daily Allowance of Fluoride (RDA)</strong></td>
<td>and data is published. Fluoride in food is analysed Fluoride in various drinks analysed</td>
<td></td>
</tr>
<tr>
<td><strong>Dental Anxiety and Oral health Perception</strong></td>
<td>Departments at different institutional dental settings Manuscript has been submitted to Appropriate Journal</td>
<td></td>
</tr>
<tr>
<td><strong>Denture and Quality of Life</strong></td>
<td>Data Collection completed. Analysis of data and manuscript preparation is in progress</td>
<td></td>
</tr>
<tr>
<td><strong>BRONJ and Oral Health and Panoramic Diagnosis of Osteoporosis</strong></td>
<td>Department of Orthopaedics</td>
<td></td>
</tr>
<tr>
<td><strong>Cone beam Computed Tomography (CBCT) influence on Oral and Maxillofacial Surgeons decisions and its impact in the management of third molars</strong></td>
<td>N= 100 Study in approval stage</td>
<td></td>
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</tbody>
</table>
Projects

Project 1
Title

Oral health status and related variables in Cleft Lip and Palate cases in India

Background

Cleft lip and palate cases have poor quality of life and affects social/psychological factors.

Objectives

To determine the QoL in Cleft lip and palate cases in south India

To determine psychological status of affected child and parent

Clinical Implication

This will help to come up with the policy to manage the cases of Cleft lip and palate and hence improving the Quality of Life (QoL) of the patients. It also helps to develop a strategy to intervene the psychological status of the child.

Project 2

Title

Candidal Load in Chronic Obstructive Pulmonary Disease (COPD): ICMR Project

Background

Chronic Obstructive Pulmonary Disease (COPD) is a class of lung disease characterized by airway obstruction, making it hard to breathe [1]. It is progressive in nature, with symptoms ranging from severe cough with sputum production, shortness of breath, wheezing and tightness of chest to name a few [2]. COPD is caused as a result of long-term exposure to chronic smoking that damage the lungs and airways. The global prevalence of physiologically defined COPD) in adults aged >40 years is approximately 9-10 per cent. In 2012, the Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis in adults had shown that the overall prevalence of chronic bronchitis in adults >35 years is 3.49 per cent [5, 6]. The most common of these irritants is tobacco smoke (including second-hand or passive smoking) [1]. Other lesser contributing factors like air pollution, primarily caused due to inadequate ventilation of cooking and heating fire, fuelled by coal, biomass etc.. Occupational Exposures are believed to be the cause of 10-20% of cases of COPD [1-4].

Inhalation therapy is most commonly employed and studies have shown that inhaled drugs used in the treatment of COPD have some adverse effects on the oral health based on their dosage, frequency, and duration of use. Several oral conditions such as xerostomia, dental caries, candidiasis, ulceration, gingivitis, periodontitis, dry mouth and taste changes have been associated with inhalation therapy [7].
As there has been increasing evidence that the drug regime used in the treatment of patients with COPD can have profound implications for clinical dental practice, manifested as dry mouth or oral candidiasis, periodontis and gastro-esophageal reflux, a study on COPD and candidal load in oral cavity will help to know the problem and possibly come with recommendation when dealing with COPD patients, in dental practice.

**Hypothesis**

COPD is prevalent in India due to the personal habits acquired mainly due to smoking over a prolonged period of time. It is seen that these patients have increased candida load due to the steroids, smoking etc. COPD patients will have more candida load compared to normal individuals and have more oral health problems.

**Clinical Implication**

The impact of this study will fill the gap in the information about the association between the COPD cases and oral conditions like dental caries, periodontal disease, gastro-esophageal reflux and more over the load of candida and risk of candidiasis in COPD patients. It also helps to come up with a recommendation for general dental practitioners and other health care professionals to assess the COPD patients effectively in the dental practice.

**References:**


2. NIH (2013) U.S Department Of Health and Human Services


8. SK Jindal “COPD: The Unrecognized Epidemic in India” FEBRUARY 2012•VOL. 60


Project 3

Title

Effect of Tobacco Consumption on Serum/Urine level of Fluoride in relation to renal function integrity after minimum alveolar concentration (MAC)

Background

Fluoride is present in anaesthetics in compound form and is strongly binds to the molecules of the isoflurane, sevoflurane and desflurane. When fluoride dissociates into the body from anaesthetics a large amount of fluoride is released (> 20ppm) which can affect the renal function and other systemic organs.

Objectives

To determine the fluoride release from different types of anaesthetics
To determine effect of Tobacco Consumption on Serum/Urine level of Fluoride

Clinical Implication

This study will come up with a conclusion about the amount of fluoride released from anaesthetics. This helps to draw a recommendation to pharmaceutical companies to take precaution.

Project 4

Title

Development of Artificial Saliva

Background

Saliva is a watery substance that secretes in the oral cavity by parotid, submandibular and sub-mental salivary gland and in small quantity by minor salivary gland. In composition it contains 99.5% water and 0.5% contains mucus, proteins, enzymes etc. Saliva has many functions in the oral cavity like it moistens and cleanses the mouth, helps to process food and prevents infection by controlling bacteria and fungi in the mouth.

Objectives

To develop artificial saliva fortified with fluoride
Clinical Implication

Current substitutes lack in the information about the biophysical criteria for example viscosity and surface tension and modifications are required to improve them. Hence, any new development of artificial saliva should adequately possess these properties for the better outcome of the product.

References


Hong-Seop, K. H. O. "Understanding of Xerostomia and Strategies for the Development of Artificial Saliva."


Development of Atraumatic Restorative Treatment (ART)

Background

Dental caries is a multifactorial disease which damages the tooth structure and results in the formation of cavity in the hard tissues such as enamel, dentine and cementum. The conventional protocol for treating dental caries is to excavate caries by using aerator and diamond or carbide burs and followed by the restoring it with amalgam, composites and glass ionomer restorative materials. Most of the patients avoid dental treatment because of pain and discomfort associated with conventional cavity preparation.

To overcome the limitations of conventional restorative treatment, the Atraumatic Restorative Treatment (ART) was developed around 1985 mainly for treating caries in children who are living in underserved areas, school, where resources and facilities in relation to dental care are limited. ART is a minimal intervention approach and is recommended by the World Health Organization. ART technique involves removing soft, dematerialized tooth tissue using only by hand instruments followed by restoration with an adhesive dental restorative material. Now this treatment is used all over the world which is cost effective treatment and can be handled by any primary health care settings [4, 5, 6].

Many materials are used as ART material for e.g. GIC. Glass ionomer cement has anti-cariogenic property due to its fluoride releasing capacity. There are numerous case studies about its use as an anti-cariogenic cement to arrest the caries in primary settings. Its fluoride release capacity is recommended by WHO especially for underserved community [8].

Fluoride release dental materials are effective in preventing secondary caries or caries on adjacent teeth [11,12,13]. Since the GIC is expensive, any additive with the ability to increase the antimicrobial effect of the dental materials without counteracting their physical and fluoride release properties would be great value.

Objectives

To develop atraumatic restorative material
To determine the physical properties of developed ART material
To determine the anti-cariogenic property
To determine the mechanical property
To determine the chemical properties
To determine the biocompatibility of the material

Clinical Implication
It will help to come up with the atraumatic restorative material fortified with fluoride. This can be used in children’s and community settings.

References

1. Atraumatic restorative treatment versus conventional restorative treatment for the management of dental caries; Mojtaba Dorri, Aubrey Sheiham, Valeria CC Marinho; Atraumatic restorative treatment versus conventional restorative treatment for the management of dental caries (Protocol); Copyright © 2009 The Cochrane Collaboration. Published by JohnWiley & Sons, Ltd.


3. Performance of Atraumatic Restorative Treatment (ART) depending on operator-experience: Rainer A. Jordan, MSc; Peter Gaengler, Prof. Dr. Dr.; Ljubisa Markovic, Dr.; Stefan Zimmer, Prof. Dr.; Department of Operative and Preventive Dentistry, Faculty of Dental Medicine, University of Witten/Herdecke, Journal of Public Health Dentistry . ISSN 0022-4006

4. The atraumatic restorative treatment (ART) approach for primary teeth: review of literature; Roger J Smales MDS, DDS, FDSRCS, FADM, FHKAM (Dental Surgery) Hak-Kong Yip BDS, PhD, MEd, MMEDSc, American Academy of Pediatric Dentistry

5. The atraumatic restorative treatment (ART) approach for primary teeth: review of literature; Roger J Smales MDS, DDS, FDSRCS, FADM, FHKAM (Dental Surgery) Hak-Kong Yip BDS, PhD, MEd, MMEDSc, American Academy of Pediatric Dentistry


Project 6

Title
Development of Fluoride Mouth Rinses

Background
Dental decay is one of the common oral diseases affects the population throughout the globe at a varied severity. If this ailment is not detected early and prevented appropriately, a loss of tooth may happen eventually, and that impacts on quality of life (QoL) and economy as well [1,2]. The prevalence of dental caries is more in non-fluoridated areas. Judicial use of fluoride helps decline the prevalence rate of dental caries and stop its sequel. Common means of fluoride delivery are fluoridated drinking water, fluoridated milk, salt, F-supplemented dentifrices, tablets, varnishes etc.

One of the fluoride delivery systems is Fluoride mouth rinse. Fluoride mouth rinse is a formulated concentration of Fluoride used for daily or weekly basis. And Sodium fluoride (NaF) is the superior solution comparing to other preparations. The strength of 0.05% NaF solution contains 230 ppm fluoride is recommended for daily use (once a day), on the other hand, 0.2% NaF is used once in a week or two weeks. The later contains 0.2% NaF ie. 900 ppm fluoride [2,3].

Objectives

Hypothesis

Supervised daily use of NaF has got better effect in preventing dental caries comparing to weekly or fort-nightly regimen [3].


2. Effect of mouthrinsing with a 0.2 per cent neutral NaF solution on the deciduous dentition of first to third grade school children Louis W. Ripa, DDS, MS Gary S. Leske, DDS, MS, MPH Andre Varma, MD, MS, The American Academy of Pedodontics/Vol. 6 No. 2.

Project 7

Title
Recommended Daily Allowance of Fluoride (RDA)

Background
In India due to the variations of the fluctuating fluoride content around the country it’s hard to get a RDA as people are unaware of how much fluoride is already found inside their water content. According to UNICEF state of ART report 1999 and FR/RDF data bank, 200 districts in 15 states of India are affected with dental, skeletal and/or non-skeletal Fluorosis due to high concentration of fluoride. The fluoride affected states are: Andhra Pradesh, Bihar, Delhi, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh. In Karnataka Tumkur, Kolar, Bellary, Bijapur and other places have been endemic. The extent of fluoride contamination in ground water varies from 1.0 to 48 mg/l.

It is essential to determine the total fluoride intake by an individual on daily basis. Hence the objective of this review is to identify the studies that have commented on

Objectives
To determine the recommended daily allowance for fluoride for daily intake for different age groups living in fluoride endemic, optimal and below optimal areas in India.

Project 8

Title
Effects of Fluoride in the therapy of Osteoporosis assessed by Optical Coherence Tomography
Background
Osteoporosis is a disease of bone, leading to an increased risk of fracture. In osteoporosis the bone mineral density (BMD) is reduced, micro-architecture of bone is disrupted, and the amount and variety of non-collagenous proteins in bone is altered. To assess the status of altered bone in osteoporosis, a non-invasive, simple and rapid investigation is a need (N Uryumova 2004). Therefore, development of a quick and non-invasive technique for detection and assessment of osteoporosis at early stages is one of the ways to support managing the diseases.

Objectives
This pilot study will help to know the determination of interdependence of Fluoride and Calcium at different concentrations in terms of pathogenesis of osteoporosis.

Hypothesis
This study will aim an objective for understanding of fluoride and Calcium from diets, which may have a role in maintenance of micro-architecture of bone. Fluoride is a highly reactive element. It has got distinct physiological properties like cariostatic effect and a stimulating effect in formation of bone (Merz 1981). Fluoride makes apatite crystals in bone stable and hence decrease the solubility of the apatite crystals. It also reduces the specific surface area in the bone crystals and increases the bone density, probably by an increased packing of bone crystals (Grynpas, M. D. (1990). Beneficial effects of fluoride in the treatment of osteoporosis are well documented (Heaney RP, 1994; Charles Y 1989; D.Theubad MD et al 1994; Zerwekh J E 1996; John A.K, 1993). Importantly, a Cochrane review by Hagueneauer D et al 2000 on Fluoride for treatment of postmenopausal osteoporosis concluded that Fluoride may not be the first choice of therapy, because the effect of fluoride in treatment of osteoporosis is adversely affected due to depletion of the level of Calcium. The fluoride endemic areas are badly affected with osteoporosis is not mainly due to high level of fluoride rather calcium level is depleted which affects bone severely (DS Bernstein et al 1966), But, we do not know the reason for this.

Clinical Implication
A novel imaging modality will help to determine the bone mineral content at earliest stages. It will help the therapeutic dose of fluoride in treating osteoporosis
**Background**
Removable dentures are basically used by the patients who are partially and fully dentate to improve the oral function and aesthetics. This practice has an impact on the overall oral health and general health of the patients with improved quality of life. In order to determine the information specifically regarding the factors that relate to the denture wearing and oral health related-quality of life (OHRQoL). The purpose of this study is to determine the association between the denture wearing and OHRQoL in elderly individuals in India.

**Objectives**
This study aimed to investigate the factors related to satisfaction and OHRQoL in elderly patient wearing removable partial dentures.

**Hypothesis**
The elderly population in India is growing at greater pace. It is expected that by 2021 140 million elderly people consists the total population i.e. 10 % increase in the elderly population compared to previous figures 6.7% in 1991 of total population in India [1]. It is been observed that the fertility rate has been decreased by 26.8% from 29.5 to 21.6. The scenario remained similar in the rural-urban sections as well [2]. Oral health is an important part to be healthy and its impact on general health is well reported [3-4]. Hence an oral health related quality of life (OHRQoL) in elderly population should be emphasized while delivery oral health cares.

**Clinical Implication**
This will help to develop a policy for elderly patients that help clinicians to make better clinical decision for elderly population

**References**

2. Estimates of birth Indicator in India


Project 10

Title

Effect on Oral health due to bisphosphonate therapy in Indian Population

Background

The most common complication in patients on bisphosphonate therapy is osteonecrosis of jaw (ONJ) which can occur after any surgical dental procedure and the risk for the development of osteonecrosis of jaw is higher in patients receiving intravenous bisphosphonate therapy than in patients receiving oral bisphosphonate therapy. Typical presentation is in the form of non-extraction socket, presence of exposed bone, gingival swelling or purulent discharge, when local debridement and antibiotics are ineffective. At present, there is no effective treatment for bisphosphonate induced osteonecrosis, so prevention is extremely important.

Objectives

The objective of this study is to determine the status of oral health in patients on bisphosphonate therapy and also to determine the prevalence of BRONJ in south Indian population.

Project 11

Title
Cone beam Computed Tomography (CBCT) influence on Oral and Maxillofacial Surgeons decision and its impact on the management of third molars

Background

Cone beam computed tomography (CBCT) is used in the application of third molar imaging for further information that a 2D image can’t provide.

Objectives

To determine the if cone beam computed tomography determines the difficulty of extraction

To determine the impact of decision and outcome of oral and maxillofacial surgeon after CBCT of third molars

Hypothesis

Since it is a 3D imaging it has an impact of changing the decisions of oral surgeons in treating third molars and hence overall impact on the outcome.

Clinical Implication

This study will justify the influence of CBCT on Oral surgeon’s decision and its impact on outcome in preventing post-operative complications.
Nicotine Replacement Therapy

Nicotine replacement therapy is a treatment to help people stop smoking. It uses products that supply low doses of nicotine. These products do not contain many of the toxins found in smoke. The goal of therapy is to cut down on cravings for nicotine and ease the symptoms of nicotine withdrawal.

We have set up an exclusive unit for this purpose to help smokers and tobacco chewers to quit their habit. It is one of its kinds in India. This programme currently started at Nitte University followed by Swaroj Gupta cancer and research centre. We have developed educational leaflets, book publications and audio-visual educational tools to educate the Indian population.

This educational video helps stop tobacco habits (both smoking and chewing), and inform with updated facts on tobacco menace. The film explains about fatal consequences and the information about ill effect of tobacco, killing millions a year. The chewing tobacco, such as Pann, Gutkha and similar quid sachets in the market is one of the strong associated cause of mouth cancer (15-30% of all cancers) in India and regional countries, is our main concern today. We need to save lives from tobacco related pre-mature death and disabilities, especially an early detectable condition ie. mouth cancer and pre-cancer. Our initiative through this NRT clinic brings you a clipping to inform you on how artificial nicotine (as drug) helps quit tobacco addictions. You can avail NRT services (clinical, training and research) from the center mentioned. The Center is established by Professor Chitta Ranjan Chowdhury, and its clinical services cum awareness programme are run by an efficient team under his leading. The tobacco related addiction research (TRAR) is one of the distinctive functions of this unit is supported by Nitte University of Mangalore, India and is rightly linked with distinguished experts from home and abroad. NRT clinical services are extended by the founder in various parts of the country of them, Saroj Gupta Cancer Canter and Research institute, Thakurpupur, Calcutta is providing another comprehensive NRT services for primary prevention, and a better tertiary care to improve quality of life (QoL) of Oral & Head-neck cancer survivors.

The theme and contents of this educational film is given by Professor Chitta Ranjan Chowdhury, Head, and Department of Oral Biology & Genomic Studies and created by the Institute of Mass Media and Journalism of Nitte University [Professor Rakesh K, Head of the Institute (edited), Faculty Ramesh D.K (directed) and their team]. Chancellor Vinay Hegde of Nitte University is inspirational to
develop NRT services. Professor U.S Krishna Nayak, Principal of Nitte University Dental College, Professor N Sridhar Shetty, founding dean of the college is the advisory support of the unit.

Follow up Case

![Nicotine Replacement Therapy (NRT) A Followup case](image)

Academic Activities

### Undergraduates

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Description</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Candida Load in COPD patients project</td>
<td>IIInd Year Student working on ICMR project</td>
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<tr>
<td>--------------------------------------</td>
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</tr>
<tr>
<td>Curriculum of Oral Biology and Genomic Studies</td>
<td>Undergraduates</td>
</tr>
<tr>
<td>Lecture 1</td>
<td>Swellings and Tumour</td>
</tr>
<tr>
<td>Lecture 2</td>
<td>Dental Caries</td>
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<tr>
<td>Lecture 3</td>
<td>Oral Mucosa</td>
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<tr>
<td>Lecture 4</td>
<td>Periodontal Tissues and its pathology</td>
</tr>
<tr>
<td>Lecture 5</td>
<td>Periodontium and Host Response</td>
</tr>
<tr>
<td>Lecture 6</td>
<td>Salivary Glands, Saliva and Salivation</td>
</tr>
<tr>
<td>Lecture 7</td>
<td>MCQ's Assessment and Feedback</td>
</tr>
<tr>
<td>Students Feedback</td>
<td>Feedback in the form of survey regarding the course and teaching of the tutor by the 2nd year students.</td>
</tr>
</tbody>
</table>

**Interns**

<table>
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<tr>
<th><strong>INTERNS</strong></th>
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<tbody>
<tr>
<td><strong>Tasks</strong></td>
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<tr>
<td>Anxiety Survey</td>
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<tr>
<td>Clinical Discussion Session: BDJ Endodontics 1</td>
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<tr>
<td>BDJ Endodontics 2</td>
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<td>BDJ Endodontics 3</td>
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<td>BDJ Endodontics 4,5,6</td>
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<td>BDJ Endodontics 7,8,9</td>
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<tr>
<td>BDJ Endodontics 10</td>
</tr>
<tr>
<td>Literature Search</td>
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<tr>
<td>Scientific Paper Writing Training</td>
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</tbody>
</table>

**INTERNS ROUTINE TASKS INVOLVED IN DEPARTMENT OF ORAL BIOLOGY AND GENOMIC STUDIES**

**Protocol for handling patients:**

Please introduce yourself to the patient before you start taking patient details. Explain to the patient and in case child to a guardian about the purpose of coming to the oral biology and genomics department followed by a brief information how you will perform in layman language.
Do not miss or skip any of the patient’s demographics. Each component in the proforma for a specific project should be recorded succinctly. At the end of the session, please ask the patient, if he/she has any questions to ask.

**Timings**

9:00 – 10:00: Interactions: Plan, Progress and Discussion on paper.

10:00 – 1:00: Modular Study on Oral Biology and Advanced Clinical Dentistry/ NRT Clinic/ Data Entry

1:00 – 2:00: Lunch Break

2:00 – 3:30: Discussions on the projects, impact and Clinical outcomes. Modular sessions on Oral Biology and Advanced clinical dentistry

-----------------------------------------------------------------------------------------------------------------------------

**Quotas and Deadlines**

**NICOTINE REPLACEMENT THERAPY (NRT CLINIC)**

1. A monthly quota of 25 NRT and Tobacco counselling by each intern posted at the department of Oral Biology and genomic studies should compulsory completed.
2. A proper record of patients should be maintained.
3. Data entry into the excel sheet

**PROJECTS**

1. The participation in the ongoing projects in the department is actively anticipated

**DISCUSSIONS**

There will be discussions on the clinical cases and their management based on evidence based approach

**PUBLISHING PAPERS:**

Interns can get involve in publishing research, review, and case report papers in dental journals.

**Note:**

1. Assignments may be changed based on the ongoing and upcoming programmes.
2. Individual intern will be assessed based on work competency and outcome.
3. Regular and successful interns will be provided with certification/recommendation.
4. Leave will be granted 2 days, any absence will be covered up by extended duties.

**Nurses**

A total batch of 6 nursing students from the department of Psychiatrics, KSHEMA Hospital was posted in the department of oral biology and genomic studies. The students were given theoretical and hands on training on Nicotine Replacement Therapy (NRT). They were assessed at NRT clinical sessions.
<table>
<thead>
<tr>
<th>NURSES</th>
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<tr>
<td>Tasks</td>
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<tr>
<td>Description</td>
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<td>Batch 1</td>
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<td>Batch 5</td>
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<td>Batch 6</td>
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</table>

**Educational Development**

**MSc Oral Biology**

**Objectives:**

- DEVELOP CLINICAL COMPETENCY FOR GENERAL DENTAL/PRACTICE*
- DEVELOP SKILL THROUGH HANDS’ ON TRAINING FOR CLINICAL RESEARCH TECHNIQUES
- GET COMPETENCY FOR CLINICAL TRIAL, CLINICAL AUDITS, CLINICAL GOVERNANCE
- DEVELOP COMPETENCY FOR EVIDENCE-BASE MEDICINE & DENTISTRY
- DEVELOP COMPETENCY IN TEACHING & ASSESSMENT
- DEVELOP YOURSELF A COMPETENT WORKFORCE IN JOB MARKET (at home & abroad)

**Competency 1:** Way of examining a patient using updated assessment methods to evaluate oral and maxillofacial health, Oral diseases of Systemic origin and diseases for a diagnosis: Line of approach. (By Clinical Audits)

**Competency 2:** Formulate a comprehensive treatment plan based on diagnostic findings, then implement treatment in a safe, properly sequenced and timely manner, and cost-efficient services. (Clinical Governance)

**Competency 3:** Diagnose and manage hard and soft tissue lesions and diseases of the orofacial complex. (Clinical Audit)

**Competency 4:** Teaching-learning and Pedagogy in dental/medical teaching (through tutorials for example snowballing, PBL etc)

**Competency 5:** Utilizing the critical thinking process in assessing the technical and scientific information, and for identifying the requirements need for patients of Oral & Head-Neck Cancer. (Clinical audit)

**Competency 6:** Developing skill on modern investigative methods both for research and routine investigations.
Duration: 2 years

System: Semester System (Four Semesters of 2 years MSc Course)

Strategy: Work-based Learning. Aims to confirm job placement

Foreign Collaboration: University Faculties at Warwick University UK and Okayama University, Japan

Head of the Department & Course Director: Professor Chitta Ranjan Chowdhury, PhD (Japan), MPH (UK), FFDRCS (Ire), DND (DU), BDS(DU)

COURSE CONTENTS

SPECTROSCOPY: This MSc degree course focuses on essential techniques of routine laboratory techniques (Bio-medical – diagnostics), Basic Laboratory Techniques (such as ranging from preparation of molar solutions etc. to operating simple to advanced spectrophotometer (maintaining the temperature and asepsis for enzyme study), Atomic Absorption Spectrophotometer (AAS), Gas Liquid Spectrophotometer (GLC), High Performance Liquid Chromotography (HPLC), Mass Spectrophotometer (MS), Nuclear Magnetic Resonance (NMR).

CLINICAL RESEARCH: The course units are designed for 1-4 phase Clinical Trial, Clinical Audits, Clinical Governance, Research Governance.

GENOMICS, INFORMATICS, BIOTECHNOLOGY: The Course Units includes the basics of Immunohistochemtisty, Biotechnology and an important part is the Genomic studies that comprises Bioinformatics and Genetics.

INTERNSHIP (WORK-PLACE BASED COMPETENCY): The candidates will need a 6 weeks internship (in the country and/or abroad) in a research/manufacturing laboratory where they will observe and learn the Quality Control (QC) of the lab and running the methods of relevance.

FURTHER SCOPES FOR PhD in JAPAN: Successful candidates with good standing, one published research in a journal more than 2 impact factor will have a scope for PhD at Japanese University with full fund support (tuition, travel and research grant).

Teaching Faculty: Efficient teaching faculties from home and abroad (UK and Japan).

AT THE END OF THE COURSE THE CANDIDATES ARE ABLE TO DEVELOP THE SKILL AND KNOWLEDGE ON THE FOLLOWING

Highlights on Hands-on Training [for the candidates of BDS qualification]

- Hand’s on training in biomedical routine tests in Hospital lab: They will be specially trained by knowing the principle and practice to running investigations for blood and other biological samples. Such as Full Blood Count, % Hb, CT, BT etc., also the basic microbiological techniques, along-with Bio-chemical investigations. So that they can run a diagnostic laboratory independently and can provide consultancy.

- Advanced Research Laboratory Techniques: They will be allowed to develop skill on basic to advanced spectrometric methods such as variable spectrophotometers, Atomic Absorption...
spectrophotometer (AAS), High Performance Spectrophotometer (HPLC), GLC, MS, NMR. The hands on training will be provided- so that they can operate the machines independently.

- **Biotechnology, Bio-informatics and Genomics:** The Candidates will learn the basics of Biotechnology attached with our extended laboratory. They will have appropriate learning on bioinformatics, genomics and genetics.

- **Running the Quality Control:** They will be able to perform the quality control of drug, medications and toxicity tests.

- **Animal Experimentation:** They will have all the essential techniques of animal experimentation including bio-chemical parameters from biological samples of animals

- **Research Governance, Clinical Research:** They will be able to understand how to proceed with a good research by ensuring all the directives of research Governance. They will be able to run Clinical Research (Clinical Trial, Clinical audits, Clinical Governance)

- **Epidemiology, Bio-statistics and Meta-analysis:** They will be competent enough to perform a meta-analysis, systemic review, writing grant applications and Cochrane Library Search Services

- **Publishing Paper in Overseas Journals:** They will be able to publish papers in relevant Journals in the UK, USA and Japan.

- **PhD studies at abroad:** They will be opted for higher studies leading to PhD degree with APL (accredited Prior Learning). With APL the MSc candidates will be exempted for course units in PhD taught programmes and that will reduce the duration of PhD course.

- **Stem-cell and Regenerative Medicine:** Corded bold stem cell collection, storing and dispersing. Basic techniques of Stem cell services and research.

- **Essential Clinical Learning for General Dental Practice:** Application of Orthodontics, Endodontics, Oral Surgery, implantology (CPD certified)

**Collaboration at Abroad:** Some of the course units will run in collaboration with the department of Medical Education of the University of Warwick School of Medicine & Postgraduate Dentistry, Coventry, UK; City of London Dental School, Harley Street London, UK; Global Child Dental Health Centre, King’s College London; Okayama University Dental School Japan, Nara Medical University, Japan, and Mississippi University for Women, USA.

**Job opportunities**

- **Dental/Medical Colleges:** where specially trained dental/medical researcher and teaching faculty is needed.

- **Pharmaceutical Industries:** Pharmacological research scientist and advisor for Quality Control

- **as an expert in Bio-technology and Bio-informatics (Instrumentation and techniques)**

  - As supportive stuff for Bio-statistics and Epidemiology
  - Quality Control Expert in Dental Industry: Dental Product development scientists and drug delivery system
  - Self-employment : Clinical Practice in General Dentistry
  - Providing consultancy services: Companies having R&D, Policy and Management Services

**Admission:** July 2014  (Extended until Sept for the Interns completing internship)

**Faculties:**
1 from Ortho, 1 from Prosthodontics/Implantology, 1 from restorative dentistry, Oral Radiology/Medicine, Pathology

For further information contact  : Professor Chitta Ranjan Chowdhury

Telephone (Office, direct) 0824 2204623   Mobile: 8861315150  Email. crc.ob.cod@gmail.com

Course Director    Chitta R. Chowdhury, PhD (Japan), MPH (UK), FFDRCS (Ire), DND (DU), BDS(DU)

Professor & Head, Department of Oral Biology & Genomic Studies, AB Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore, India-575018

Visiting Professor, Department of Educational Development School of Medicine and Post Graduate Dental Studies, The University of Warwick, Coventry, UK and Department of Oral Pathology, Osaka Dental University, Japan

Consulting Dean, Peoples University Community-based Medical & Dental School, Dhaka Consultant, Global Child Dental Health Task force, King’s College London, UK
Past President, Institute of Health Promotion & Education, UK

Email. crc.ob.cod@gmail.com         C.R.Chowdhury@warwick.ac.uk
Phone: +91 88 61325250 (India) +44 (0)7932704064 (UK)

AUTHOR: Oral Cancer Screening & Education: A Guideline Protocol

Tutorials

DEPARTMENT OF ORAL BIOLOGY & GENOMIC STUDIES
Education & Development
AB Shetty Memorial Institute of Dental Sciences
Nitte University

18th Nov 2015

Module/Topics
I. EBD. Managing Dental Problems based on Evidence based Dentistry (EBD): A Current Practice
II. MID. Minimally Invasive Dentistry (MID): Controlled Clinical Care and Prevention
III. PIHD. Patients Involvement for Health Development: Tutorial for Risk Group Patients of Oral Cancer and Pre-cancer.

Learning Objectives

- To differentiate traditional methods with modern methods of treating dental diseases
- To update students and make competent in problem solving based on evidence available in current practice
- Trend of minimally Invasive dentistry and its effectiveness
- How to educate risk group population of Oral cancer and Pre-cancer with evidences to reduce the risk of neoplasm.

Composition:

Small group Discussions (n=10 in a group)

PBL / LBL+PBL

<table>
<thead>
<tr>
<th>Takers:</th>
<th>3rd Year and Final Year BDS students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>15 days (spread over 3 months)</td>
</tr>
<tr>
<td>Starting date:</td>
<td>Last week of December</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module</th>
<th>Number</th>
<th>session</th>
<th>Student</th>
<th>Date</th>
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<tbody>
<tr>
<td>EBD</td>
<td>3</td>
<td></td>
<td>Final Year BDS</td>
<td>45 mins</td>
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<tr>
<td>MID</td>
<td>3</td>
<td></td>
<td>Final Year</td>
<td>45 mins</td>
</tr>
<tr>
<td>PIHD</td>
<td>3</td>
<td></td>
<td>3rd Yearr</td>
<td>45 mins</td>
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Resources/ Method of TL

Powerpoint
Blackboard

Internet-based (email Assignment): (100 words assignments from each module will be sent in email within 3 working days of the tutorial)

Outcome Assessment & Feedback

Feedback will be given in 5 days after receiving of assignments.

Lead: Dr. Shahanawaz K, Lecturer, Department of Oral Biology & Genomic Studies

Chief/validation: Professor Chitta R Chowdhury, Head
Continuing Professional Development
Medical Emergencies

Continuing Professional Development (CPD)

Topic
Managing Medical Emergencies in Dental practice: Real-Time Actions

½ Day Seminar Workshop [9:00 AM - 12:45 PM]
In association with Department of Oral Surgery, Oral Medicine and Anesthesiology of Nitte University

Date and Venue
Date: 13th August, Thursday 2015
Vimshathi Bhaban, 7th Floor of A.B. Shetty Memorial Institute of Dental Sciences

9:00 am : Registration
9:30 - 10 am : Welcome Address by

Chief Guest : Professor Raghuvir, Registrar, Yenepoya University

Guests of Honors : Professor Vathsala Head, Department of Oral Medicine & Radiology, A.J. Shetty Institute of Dental Sciences, Mangalore

Professor Junaid Ahmad, Head, Department of Oral Medicine & Radiology, MCOIDS, Mangalore

Dean of ABSMIDS : Professor U.S. Krishna Nayak

Founding Dean : Professor Sridhar Shetty

10:00 - 10:45 am : Working-paper and Recommendation, Professor Chitta Chowdhury
Convener

10:45 - 11:30 am : Key-note speech: Professor Anand Bangera, Head, Department of Anesthesiology and Critical Care, KS Hegde Medical Academy, Nitte University.

11:30 - 11:45 am : Tea break

11:45 - 12:45 pm : Scenario-based practice | CPR practice at Skill lab of KSHEMA | Certification

Registration fee: Free for faculties | Hands-on course takers (capacity 50): INR 100/-

Professor Chitta Chowdhury
Convener
Head, Oral Biology ABSMIDS

Professor Anand Bangera
Facilitator and Collaborator Head, Dept of Anesthesiology, KS Hegde Medical Academy

Professor U.S. Krishna Nayak
Principal & Dean, ABSMIDS
Nitte University

Organized by:
Education & Development Programme of the Department of Oral Biology & Genomic Studies AB Shetty Memorial Institute of Dental Sciences, Nitte University
# Seminar

## Fluoride and Health

**Continuing Professional Development (CPD) | Oral Biology Series 10**

**Fluoride and Health**

Facts on Source and Its Quantification for Dental Health and Wellness: A Measured Outcome for Karnataka

*Estimated values detected by F ion-selective electrode: Risk Assment for Population in Karnataka*

*In association with Centre for Advanced Dental and Stomatognathic Sciences (CADDS), Oral Medicine and Public Health Dentistry*

**Venue and Date:**

Vishnushree Bhavan (7th Floor ABSMIDS) 11th September, Friday, 2015

### Timetable

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
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<tbody>
<tr>
<td>9:00</td>
<td>Registration, Tea (Free for Faculties, and Non-course Takers)</td>
</tr>
<tr>
<td>9:30-10</td>
<td>Inaugural</td>
</tr>
<tr>
<td>Chief Guest: Professor B.H. Sipathi Rao, Principal Yenapoya Dental College</td>
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<tr>
<td>Dean of ABSMIDS: Professor US Krishna Nayak</td>
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<tr>
<td>Founding Dean: Professor N. Sridhar Shetty</td>
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<tr>
<td>10:00-10:30</td>
<td>[30mins]: Key-speech: Professor Prashanth Shenoy, Department of Oral Medicine and Radiology</td>
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<tr>
<td>10:30-10:45</td>
<td>[15 mins]: Professor Chitta Chowdhury: Directions and Dilemma on Fluoride in Karnataka</td>
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<tr>
<td>10:45-11:15</td>
<td>[30 mins]: Dr. Shahrawaz, K &amp; Professor Chitta Chowdhury (Facilitator)</td>
</tr>
<tr>
<td>Title: Environmental Distribution of Fluoride in Karnataka District and regional changes of concentration in terms of temperature and weather condition (Research Outcome Based)</td>
<td></td>
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<tr>
<td>11:15-11:45</td>
<td>[30 mins]: Ms. Diviya P &amp; Professor Chitta Chowdhury (Facilitator)</td>
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<tr>
<td>Topic: Set methods are validated to estimate fluoride from various sources (Biological and Non-biological Samples): [Fluoride Team, Department of Oral Biology]</td>
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</tbody>
</table>

### Hands-on with Certification

Fees 190 (Capacity 50)

- Bench work and preparations of samples before estimation by F electrode
- Detections of Fluoride by using ion-selective F electrode and calibration

### Organized by

- Education & Development,
- Oral Biology & Genetic Studies,
- AB Shetty Memorial Institute of Dental Sciences,
- Nitte University

Contact: Professor Chitta Chowdhury, Convenor
Email: cr.csk.cod@gmail.com.
Mobile: 08246131510

### Collaboration

- Prof(Dr) Sankas Bala
  - Department of Oral Medicine and Radiology
  - Shetty Memorial Institute of Dental Sciences

- Dr. Audby D Cruz
  - Department of Public Health Dentistry
  - Shetty Memorial Institute of Dental Sciences
Professor Chitta Chowdhury Head of Oral Biology and lead Fluoride team took the initiative to run another continuing professional development (CPD – 10th of Oral Biology) in Fluoride and Health.

The event highlighted the facts and fallacies on source of fluoride and their quantification for dental health and wellness in terms of geographic location of all the districts of Karnataka and temperature including rainfall status. It is the outcome of comprehensive Fluoride mapping out of all the districts of Karnataka. The result is based on original research conducted by the fluoride research division of the Department of Oral Biology and Genomic Studies, A.B.Shetty Memorial Institute of Dental Sciences, Deralakatte-Mangalore, India.

The event was conducted in association with Centre for Advanced Dento-facial and Stomatognathic Sciences (CADDS), Department of Oral Medicine and the Department of Public Health Dentistry of A.B.Shetty Memorial Institute of Dental Sciences (ABSMIDS).

Professor B.H. Sripathi Rao, Principal of Yenepoya Dental College was invited as chief guest and Professor Prashanth Shenoy of the same institute as key note speaker.

Professor Mithra Hegde Vice-Principal of AB Shetty Dental College gave the welcome address for the event and the dignitaries.

Chief Guest Professor Sripathi Rao spoke about the A.B. Shetty Memorial Institute of Dental Sciences reiterated – he has got a sort of fraternity with AB Shetty Dental College. He highlighted the history of fluoride and fluorosis. He emphasized the prevalence of fluorosis in our country and in Karnataka state in particular, and he rightly highlighted the importance of such interventional study Dr. Chowdhury and his team is performing rightly. He discussed on the issue of fluoride endemic areas in Karnataka and dental and skeletal ailments occurring due to high doses of fluoride consumed from the drinking essential to control.

Dr Prashant Shenoy, the Key note speaker spoke on the history and generic information on fluoride and fluorosis applicable to dentistry. He spoke on detail regarding underpinning issues of Fluoride chemistry – impacting on oral health and disease.

Professor Chitta Chowdhury, spoke on various aspects of fluoride and fluorosis. He explained the importance of research on fluoride and its clinical outcome and benefit to Indian Population. He encouraged students to consider taking up the research studies in fluoride that can benefit affected fluoride endemic areas both molecular and clinical research that can improve the way of control and prevention of the conditions in fluoride endemic areas of India. Importantly he expressed his concern about Pavagada Taluk of Tumkur District of Karnataka, the place he visited to analyse the situation with his team. Nitte University supported the initiative and Ramakrishna Mission Hospital in Pavagada and General Hospital joined their hands with Professor Chowdhury to tackling fluorosis menace. He appreciated the support he got from the Chief minister of Karnataka (letter is enclosed) for his work in fluoride and health. Organizing chair Dr Chitta Chowdhury likes to thank to Professor Rajendra Holla,
Head, Department of Pharmacology, KS Hegde Medical Academy (KSHEMA) and Professor Udaya Kiran, Head of Community Medicine of KSHEMA for their presence during the inaugural session of the event. They are the members of advisory board of Fluoride and Health.

Professor Chowdhury thanks to Professor U.S. Krishna Nayak, Principal, AB Shetty Memorial Institute of Dental Sciences for his full support and dynamic leadership. Dr Chowdhury spoke very high about Professor Subash Babu, who wholeheartedly supports this event with his team and he was really helpful, he spent the entire time of the event noting down the details of the event and guided. Dr. Chowdhury appreciates very much to Dr Subash Babu for his extraordinary supports, he does as ever.

Dr Shahnawaz Khijmatgar spoke on the fluoride status in drinking water from different districts of Karnataka. He presented the findings of the research that has been carried out at Fluoride Division of Oral Biology of A.B.Shetty Memorial Institute of Dental Sciences. The study was collaborated with couple of advisory researchers in the UK and Japan. He discussed recently published Cochrane review published in June 2015 on “Water fluoridation in drinking water” and discussed its findings and their current validity. He mentioned that the fluoride team work has been accepted for publication in the Perspectives in Public Health from the UK which has an impact factor of 1.40.

Mrs Divya Kumari, a research scholar in PhD degree programme at the Department of Oral Biology presented about the standard methodologies which are running in the Fluoride research laboratory of Oral Biology and Genomic Studies. Under the guidance of Professor Chowdhury, she herself was involved to set the different methods for estimate fluoride in drinking water, food sources, soft drinks, milk etc. by using fluoride ion selective electrode (ISE) UK.

Dr Shruthi Rao Postgraduate Dental Student at Department of Oral Medicine and Radiology conducted the entire session quite efficiently and amicably, the team is privileged to thank her very much. The event was concluded with vote of thanks.

**Ground Reality**

The facts and fallacies on Fluoride and Health in Karnataka is a concern today likewise other states in India where fluorosis, and deficiencies at places are major public health issues as well. We highlight the facts based on our recent research outcome which has been accepted for publishing in well circulated Journal in the UK and other countries -- Perspective in Public Health -- IF 1.4. (Thomson Router Indices) We have completed fluoride mapping in all the districts of Karnataka and a disturbing situation we revealed in-terms of deficiency and excess level of fluoride in drinking water in identified localities are really a concern for the population of Karnataka. Secondly, many dentifrices, soft drinks
(highly acidic), mineral water, alcoholic beverages have got bizarre/confounding values (claimed/non-claimed in their level) comparing to WHO reports and others values elsewhere. Thanks to the members of the fluoride team of Department of Oral Biology and Genomics, who dedicatedly performed this intervention study for protection and promotion of health” “Say from Initiator Professor Chiita Chowdhury, Fluoride Team, 18th Sept., 2015, Nitte University, IndiaConference/Meetings

Meetings

Karnataka State Dental Council (KSDC) 2014

TITLE: RECOMMENDED DAILY ALLOWANCE (RDA) OF FLUORIDE FOR THE POPULATION LIVING IN KARNATAKA STATE.

Presenter: Sherin James, Intern and Researcher

Guide: Professor Chitta Chowdhury

Co-investigators: Dr. Shahnawaz K, Lecturer, Department of Oral Biology & Genomic Studies, ABSMIDS, Professor Edward Lynch, Head Warwick Dentistry

"Diviya Kumari P, PhD Researcher, Department of Oral Biology & Genomic Studies, Nitte University AB Shetty Institute of Dental Sciences, Mangalore, India.

1 Contact. Professor Chitta Chowdhury, Head, Department of Oral Biology, Lead, Fluoride Research Team. Professor at The University of Warwick, Coventry, UK. Email. C.R.Chowdhury@warwick.ac.uk

2 The University of Warwick, The Medical School, Head, Department of Dentistry, Coventry, UK.

ABSTRACT

POUPOSE: To determine the Recommended Daily Allowance (RDA) of Fluoride for the population of Karnataka of different age group. The study aims to estimate fluoride from drinking water, diets, cold drinks, mineral water, any beverages and external sources such as, fluoridated dentifrices, external application of Fluoride by dentists etc. This values is validated through the standard method used by National Institute of Nutrition (NIN), Hyderabad, India and Food and Drug Administration (FDA) of USA.

MATERIALS AND METHODS: Dietary Survey by Age-group: 24-hours re-call of dietary survey is used among different age groups of 5-7, 8-11, 12, 13-15, 16-25, 25-35, 36-45, 46-60 and above 60. Weekend diets history is also included to check any variation of the diet items from weekdays.

Fluoride estimation: Water samples (drinking water) were collected from all the districts of Karnataka, including various sources of fluorosis endemic areas of the state.
The estimation of fluoride from drinking water and dietary sources was performed by using Fluoride Ion selective electrode (ISE, UK) and convey diffusion dish for selected dietary samples are on progress.

An index was used for determination of adequate intake (AI) from all sources is set at 0.05 mg/kg/day.

Calibration is done using ion selective electrode by using a standard solution of 10 ppm, 100 ppm, 1000 ppm.

The collected data is compared and calculated with RDA of FDA-USA and elsewhere.

**RESULTS:** The Fluoride estimation was carried out from drinking water collected from all the districts of Karnataka states and a fluoride map has been developed by the Fluoride research team of the Department of Oral Biology & Genomic Studies. Fluoride was also estimated from twenty different but commonly consumed diets in Karnataka state. The concentration of fluoride lies within the 1.00 ppm in diet items and Fluoride concentration varies in drinking water ranging between 0.03 ppm and 4 ppm.

**CONCLUSION:**

So far the study has been carried out; none of the diet has got more than 2 ppm fluoride in them. But Fluoride concentration in drinking water varies; it is higher in fluorosis endemic areas. The conclusive RDA will be determined after comprehensive estimation of Fluoride from different sources including dentifrices, milk, salt external application etc. Also temperature and climatic conditions are taken into consideration for determination of RDA, because consumption of drinking water varies depending on the weather condition and temperature of the day. Usually during summer, people drink more water, that way the intake of fluoride is more during summer. Special attention has been given to determine the RDA of Fluoride in fluorosis endemic areas. The RDA study is in progress.
Outreach Programmes

Oral Cancer Awareness Programme 2014
Objective:
To know the knowledge and attitude of Oral Cancer among Mangalore residents

Methodology:
An initial pilot survey is conducted to know the Oral Cancer awareness at two selected sites. The KAP questionnaire form is used to know the knowledge and attitude of the patients coming to dept of oral medicine at A.B.SHETTY memorial institute of dental sciences, Mangalore Karnataka India and construction workers at construction site. The samples were selected randomly.

Results
TABLE 1: Beary’s Group

<table>
<thead>
<tr>
<th>Section I: Knowledge</th>
<th>Response</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Have you ever heard about Oral Cancer?</td>
<td>Yes</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>Q2 Do you know about the cause of Oral Cancer?</td>
<td>Yes</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>22</td>
</tr>
<tr>
<td>Q3 Where from whom did you hear about Oral Cancer?</td>
<td>Parents</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Doctor</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Dentists</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Radio</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>TV</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Newspaper</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>I Can’t remember</td>
<td>13</td>
</tr>
<tr>
<td>Q4 Does Oral Cancer kill many people in India?</td>
<td>Yes</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>10</td>
</tr>
<tr>
<td>Q5 Do you think, paan (Quid) chewing with tobacco may cause Oral Cancer?</td>
<td>Yes</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>13</td>
</tr>
<tr>
<td>Q6 Do you think paan chewing with tobacco is better than smoking?</td>
<td>Yes</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>16</td>
</tr>
<tr>
<td>Q7 Do you know any other bad effects of the tobacco habit?</td>
<td>Yes</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>33</td>
</tr>
<tr>
<td>Q9 Family history of Cancer?</td>
<td>Yes</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>6</td>
</tr>
</tbody>
</table>

Section II: Attitude

<p>| Q1 Do you want to quit the habit of chewing quid? | Yes | 13 |
| | No | 4 |
| | NO ANSWER | 1 |
| Q2 Which habit you prefer to give up? | CHEWING | 8 |
| | SMOKING | 11 |
| | BOTH | 4 |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Do you want our help to give up any of your habit?</td>
<td>YES</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>3</td>
</tr>
<tr>
<td>Q2 How do you feel when a person smokes near you?</td>
<td>FEEL NOTHING</td>
<td>5</td>
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<tr>
<td></td>
<td>BAD SMELL</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>FEEL LIKE SMOKING</td>
<td>3</td>
</tr>
<tr>
<td>Q3 Do you want to quit the habit of smoking?</td>
<td>YES</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>NO ANSWER</td>
<td>0</td>
</tr>
<tr>
<td>Section II: Attitude</td>
<td>Response</td>
<td>Results</td>
</tr>
<tr>
<td>Q4 Do you think a quid chewer looks good?</td>
<td>YES</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>NO ANSWER</td>
<td></td>
</tr>
<tr>
<td>Q5 Do you think the children should chew quid instead of smoking?</td>
<td>YES</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>NO ANSWER</td>
<td>4</td>
</tr>
<tr>
<td>Q6 Why do you chew quid/smoke?</td>
<td>ENJOY SMOKING</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PLEASURE</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>STRESS</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ADDICTION</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>FUN</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>HABIT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Table 2: Dental Hospital Section**

<table>
<thead>
<tr>
<th>Section I: Knowledge</th>
<th>Response</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Have you ever heard about Oral Cancer?</td>
<td>Yes</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td>Q2 Do you know about the cause of Oral Cancer?</td>
<td>Yes</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>21</td>
</tr>
<tr>
<td>Q3 Where from whom did you hear about Oral Cancer?</td>
<td>Parents</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Doctor</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Dentists</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TV</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Newspaper</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>I Can’t remember</td>
<td>8</td>
</tr>
<tr>
<td>Q4 Does Oral Cancer kill many people in India?</td>
<td>Yes</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>09</td>
</tr>
<tr>
<td>Q5 Do you think, paan (Quid) chewing with tobacco may cause Oral Cancer?</td>
<td>Yes</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>32</td>
</tr>
<tr>
<td>Q6 Do you think paan chewing with tobacco is better than smoking?</td>
<td>Yes</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td>41</td>
</tr>
<tr>
<td>Q7 Do you know any other bad</td>
<td>Yes</td>
<td>16</td>
</tr>
</tbody>
</table>
effects of the tobacco habit?  No  44

Q9  Family history of Cancer?  Yes  8  
      No  49
      I don’t know  8

Section II: Attitude
Q1  Do you want to quit the habit of chewing quid?  Yes  2  
      No  11  
      NO ANSWER  4

Q2  Which habit you prefer to give up?  CHEWING  0  
      SMOKING  12  
      BOTH  2  
      NONE  2  
      DIFFICULT TO DO SO  0

Q3  Do you want our help to give up any of your habit?  YES  3  
      NO  12

Q4  How do you feel when a person smokes near you?  NO ANSWER  9  
      FEEL NOTHING  12  
      BAD SMELL  16

Q5  Do you want to quit the habit of smoking?  FEEL LIKE SMOKING  0  
      YES  18  
      NO  6

Section II: Attitude
Q6  Do you think a quid chewer looks good?  YES  1  
      NO  12  
      NO ANSWER  9

Q7  Do you think the children should chew quid instead of smoking?  YES  2  
      NO  13  
      NO ANSWER  13

Q8  Why do you chew quid/smoke?  Mention the reason  ENJOY SMOKING  1  
      PLEASURE  1  
      STRESS  2  
      ADDICTION  2  
      FUN  3  
      HABIT  2

Discussion:

Section I: Knowledge

1. Have you ever heard about Oral Cancer?  
   When individuals are asked about the hearing of oral cancer, Overall out of 125 individuals 99 responded yes and 25 responded no to the question 1.

2. Do you know about the cause of Oral Cancer?  
   The 81 respondents said yes about if they have the knowledge of oral cancer and 43 responded no.

3. Where from whom did you hear about Oral Cancer?  
   Parents/Friends/Doctor/Dentist/Radio/TV/Newspaper/I can’t remember  
   2  4  2  1  61  18  21
The most common source of awareness about oral cancer acquired from the TV followed by newspapers, friends and parents.

4. **Does Oral Cancer kill many people in India?**
   When asked if oral cancer kills many people in India, 66 replied yes and 20 no and 19 I don’t know.

5. **Do you think, paan (Quid) chewing with tobacco may cause Oral Cancer?**
   When asked about, if they know paan (Quid) chewing with tobacco may cause Oral Cancer, 66 replied yes and 13 no and I don’t know 45.

6. **Do you think paan chewing with tobacco is better than smoking?**
   22 of the individuals think that paan chewing with tobacco is better than smoking compared to 40 who said No and 57 I don’t know.

7. **Do you know any other bad effects of the tobacco habit?**
   When asked about if they know any other bad effects of tobacco habit 29 of them replied yes and 77 no.

8. **Family history of Cancer?**
   13 of them had family history of Cancer, 86 of then didn’t had and 14 of them didn’t know the answer,

   **Section II: Attitude**

1. **Do you want to quit the habit of chewing quid?**
   15 of them wanted to quit the chewing habit and 15 of them said no. 5 had no answer

2. **Which habit you prefer to give up?** Chewing/Smoking/Both/None/Difficult to do so
   8 23 6 2 1
   23 of them said they want quit the habit of smoking first and later 8 people want to quit the habit of chewing followed by the 6 want to quit both at same time.

1. **Do you want our help to give up any of your habit?**
   25 answered yes, when they if they need help to quit their habit and 15 answered no and 9 had no answer.

2. **How do you feel when a person smokes near you?**
   17 feel nothing if someone smokes near them and 45 of them feel it is bad smell and don’t feel good.

3. **Do you want to quit the habit of smoking?**
   37 responded if they want to quit the habit of smoking and 13 answered no and 4 had no answer.

4. **Do you think a quid chewer looks good?**
   9 of them think that people with quid chewer looks good followed by 47 answered and 9 didn’t had any answer.

5. **Do you think the children should chew quid instead of smoking?**
   16 people think that the children should chew quid instead of smoking followed by 45 people said no. 17 didn’t know the answer.
Q8: Why do you chew quid/smoke? Mention the reason

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENJOY SMOKING</td>
<td>11</td>
</tr>
<tr>
<td>PLEASURE</td>
<td>7</td>
</tr>
<tr>
<td>STRESS</td>
<td>4</td>
</tr>
<tr>
<td>ADDICTION</td>
<td>4</td>
</tr>
<tr>
<td>FUN</td>
<td>6</td>
</tr>
<tr>
<td>HABIT</td>
<td>6</td>
</tr>
</tbody>
</table>

The most common reason for quid chewing and smoking is because most of the individuals replied they enjoy smoking, followed by pleasure.

**Conclusion:**

There is sound knowledge among the individuals about the oral cancer, and think that chewing tobacco and smoking have harmful effects and in long term causes oral cancer. The individuals still consume smokeless tobacco and smoke, they do it because they it for enjoyment, to get pleasure and stress.

**Figure:** KAP and NRT programme at Beary’s Turning Point
Nicotine Replacement Therapy (NRT)

Nicotine replacement therapy most widely used pharmacotherapy for treating tobacco addiction. NRT replaces nicotine from tobacco, reducing nicotine withdrawal symptoms and the urge to smoke which makes it easier to quit smoking. NRT is a way of getting nicotine into the bloodstream without smoking. There are nicotine gums, patches, inhalers etc. These help to manage the withdrawal symptoms of nicotine.

In a Recent programme for oral cancer awareness 2014 conducted between 7-21 November 2014, 83 patients have undergone NRT counseling and are in follow up.
Situational Analysis of fluoride endemic Areas: Pavagada Taluk, Tumkur District 2014

As per road-map and declaration of Experts’ Work-group meeting (held on 26 August 2014), the Fluoride Research team of the Department of Oral Biology and Genomic Studies of Nitte University proceeded for an intervention.

For this Professor Chitta Chowdhury and his task force visited Pavagada during 16-18th Sept 2014 in order to tackle Fluorosis (both skeletal and dental).

He and his team conducted oral health survey especially to estimate a disfiguring dental health problem i.e., dental Fluorosis is prevailing among the students of high school and pre-university colleges in urban, peri-urban and rural areas of the Pavagada Taluk. The team aimed to understand the underpinning issues of dental fluorosis and that may be considered as an indicator of systemic fluorosis such as musculo- skeletal Fluorosis, and complication in renal (kidney) system including hormonal impairment.

Professor Chowdhury designed a protocol to understand the knowledge of the students regarding ill effect of excessive fluoride in their drinking water. For this three schools were selected to identify sampled population that represents the entire student population of the same age-group and socio-economic background of the Pavagada taluk.

**Fluorosis status:**
Among the groups (who are from relatively well-off families) only less than one percent students are free from Dental Fluorosis. Therefore, almost each of students has developed dental fluorosis, although all of them drink de-fluoridated water claimed by the students. Again the students in a government school in a urban locality (of middle class or lower middle class background) are equally affected with dental Fluorosis with less amount of serity, but all of the students in Pre-University College located in Peri-urban locality is affected with Fluorosis. However Both the boys and girls are equally affected.

**Caries Status:**
80% of the students of that age group 9-15 yrs are free from caries. Therefore, 20% children needs filling in their teeth. Again both the boys and girls are equally affected.

**Awareness about Fluorosis and the knowledge status:**
Out of 100 students 84 students do not have knowledge about ill effects of excess fluoride in drinking water. However we have educated them with the necessary information. It would improve their knowledge. No difference of knowledge/awareness between the boys and girls was evident.

**Remedy/treatment:**
Fluorosis: Treatment with bleaching or/and restoration in severe cases is recommended.

**Urge from the Fluorosis affected students.**
Students to write a petition addressing to Chief Minister of Karnataka, and a copy to health minister and team fluoride. They need immediate attention for treatment of dental fluorosis, and its prevention as well.
Oral Biology and Genomic Studies Laboratory Facilities

Fluoride Analysis

pH Meter
Title: Fluoride levels in drinking water in Karnataka, India: A study for further intervention regarding fluoride-related health and disease implications


Objectives:

1. To estimate the concentration of fluoride in drinking water in different districts of the state of Karnataka.
2. To investigate the variation of fluoride concentration in drinking water from different sources, and its relation to daily temperature and rainfall status in the regional districts.
3. To develop an updated fluoride concentration intensity of the state of Karnataka.

Materials and Methods:

Aqueous standard solutions of 10, 100 and 1,000ppm fluoride (F) were prepared with analytical grade NaF and a buffer; TISAB II was incorporated in both calibration standard and analyte solutions in order to remove the potentially interfering effects of trace metal ions. The analysis was performed using anion-selective electrode (ISE). Mean determination readings for each sample were recorded.

Results:

The fluoride concentration in drinking water in Karnataka state was found to be highest in the North-western zone (1.77 ppm), and lowest in the South-western zone (0.29 ppm).

Conclusion:

The southern part of Karnataka has low levels of fluoride in its drinking water, and may require fluoridation in order to mitigate for dental caries and further ailments related to fluoride deficiency. In contrast, the districts in the North-western region of this region have contrastingly high levels of fluoride, an observation which has been linked to dental and skeletal fluorosis. This highlights the major requirement for interventional actions in order to ensure maintenance the normal range of fluoride concentrations (0.8 – 1.5 ppm) in Karnataka’s drinking water.
## Grant Applications

<table>
<thead>
<tr>
<th>Project</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICMR – Oral Cancer Screening and Control</td>
<td></td>
</tr>
<tr>
<td>Candida and COPD - ICMR</td>
<td></td>
</tr>
<tr>
<td>Recommended Daily Allowance (RDA)</td>
<td>Approved</td>
</tr>
<tr>
<td>Atraumatic Restorative Material (ART)</td>
<td>Approved</td>
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<td>Cotidinine &amp; Tobacco</td>
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