



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES



OSUDU, AGARAM VILLAGE, KUDAPAKKAM POST, PUDUCHERRY-605502.

Date: 29.12.2020

From

DR. BALAJI SUBRAMANIYAN. R  
ASSOCIATE PROFESSOR  
DEPARTMENT OF DENTISTRY  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,  
CHENNAI.

To

The Dean,  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,  
CHENNAI.

**Sub: Permission to conduct value-added course: *Oral manifestations of Diabetes Mellitus on 12.1.21.***

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: *Oral manifestation of Diabetes Mellitus* on 12.1.2021. We solicit your kind permission for the same.

Kind Regards

DR. BALAJI SUBRAMANIYAN. R

**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: DR. JAYAKUMAR

The HOD: DR. BALAJI SUBRAMANIYAN. R

The Expert: DR. BALAJI SUBRAMANIYAN. R

The committee has discussed about the course and is approved.

Dean  
**DEAN**

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
OSUDU, AGARAM VILLAGE,  
KODAPAKKAM POST,  
PUDUCHERRY - 605 502

Subject Expert

Dr. R. BALAJI SUBRAMANIYAN  
Associate Professor  
Department of Dentistry  
Sri Lakshmi Narayana  
Institute of Medical Sciences  
Osudu, Agaram, Puducherry.

HOD

Dr. R. BALAJI SUBRAMANIYAN  
Associate Professor  
Department of Dentistry  
Sri Lakshmi Narayana  
Institute of Medical Sciences  
Osudu, Agaram, Puducherry.



OFFICE OF THE DEAN

**Sri Lakshmi Narayana Institute of Medical Sciences**

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,  
PUDUCHERRY - 605 502.

[ Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME ( P-II ) dt. 11/07/2011 ]  
[ Affiliated to Bharath University, Chennai - TN ]

**Circular**

8.1.2021

**Sub: Organising Value-added Course: *Oral manifestations of Diabetes Mellitus* reg**

With reference to the above mentioned subject, it is to bring to your notice that SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES, **Bharath Institute of Higher Education and Research**, is organising "*Oral manifestations of Diabetes Mellitus*". The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 10.1.2021. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR, M.S., M.CH.,  
DIRECTOR / DEAN  
Sri Lakshmi Narayana Institute of Medical Sciences  
Osudu, Agaram Post, Pondicherry-605502.

Dean

Encl: Copy of Course content and Registration form.

# COURSE PROPOSAL

**Course Title:** *Oral manifestations of Diabetes Mellitus*

**Course Objective:** To create awareness among medical students about Oral manifestations of diabetes mellitus

**Course Outcome:** In depth knowledge in oral examination

**Course Audience:** MBBS STUDENTS

**Course Coordinator:** Dr. Jayakumar

**Course Faculties with Qualification and Designation:**

1. Dr. Balaji Subramaniyan. R M.D.S & associate professor

**Course Curriculum/Topics with schedule (Min of 30 hours)**

SINo	Date	Topic	Time	Hours
1.	12.1. 21	Sigificance of oral hygiene in dm patients	4PM-7PM	3 hrs
2.	22.1. 21	Oral manifestations in Diabetes melitus	4pm-7 pm	3hrs
3.	7.2. 21	Gingival abscess	5pm-8pm	3 hrs
4.	16.2. 21	Periodontal abscess	4pm-7pm	3hrs
5.	27.2. 21	Dento alveolar abscess	5pm-8pm	3 hrs
6.	6.3. 21	Patients care in type I diabetes	5pm-8pm	3 hrs
7.	12.3. 21	Patients awareness about oral hygiene in Dm pts	4pm-7pm	3 hrs
8.	21.3. 21	Halitosis	5pm-8pm	3 hrs
9.	26.3. 21	Oral examination of DM pts	5pm-8pm	3 hrs
10.	12.4. 21	Recurrent gingival inflammation	4pm-7pm	3 hrs
			Total Hours	30

**REFERENCE BOOKS: (Minimum 2)**

**1. BURKET'S ORAL MEDICINE**

**2. GHOM'S ORAL MEDICINE**

# Oral Manifestations and Complications of Diabetes Mellitus

## Abstract

DIABETES MELLITUS IS A GROWING PUBLIC health concern and a common chronic metabolic disease worldwide. Diabetes mellitus represents a group of metabolic diseases that are characterised by hyperglycaemia due to a total or relative lack of insulin secretion and insulin resistance or both. The metabolic abnormalities involve carbohydrate, protein and fat metabolism. Diabetes mellitus affects all age groups, but is more common in adults. The World Health Organization (WHO) has recently declared it to be a pandemic. Its prevalence has increased dramatically over the past few decades and it is expected to triple in the next decade. Diabetes mellitus is considered a leading cause of death due to its microvascular and macrovascular complications. The most common types of diabetes are type 1 (also known as insulin dependent) and type 2 (also known as non-insulin-dependent). Type 2 is the more prevalent type. Countries with the highest rates of diabetes in the Eastern Mediterranean region and the Middle East are the United Arab Emirates, Saudi Arabia, Bahrain, Kuwait and Oman.<sup>9</sup> Oman is one of the countries that has a high prevalence of diabetes mellitus, especially type 2 diabetes, and its prevalence is expected to increase in the next twenty years.

Various inflammatory diseases and soft tissue pathologies in oral cavities are associated with diabetes mellitus; however, awareness of these complications is lacking worldwide. Periodontal diseases have been proposed as the sixth most prevalent complication of diabetes mellitus following the other diabetic complications. It has been reported as a more frequent oral complication of diabetes compared to other oral manifestations such as dry mouth and caries. Periodontitis is more frequent and severe in patients with diabetes with poor glycaemic control. Early identification and/or management of these oral manifestations may help in the early diagnosis of diabetes and in attaining better glycaemic control. Therefore, diabetic oral complications need to be identified and included in the ultimate care of diabetes in order to fight this chronic metabolic disease effectively.

## Oral Complications and Manifestations of Diabetes Mellitus

Several soft tissue abnormalities have been reported to be associated with diabetes mellitus in the oral cavity. These complications include periodontal diseases (periodontitis and gingivitis); salivary dysfunction leading to a reduction in salivary flow and changes in saliva composition, and taste dysfunction. Oral fungal and bacterial infections have also been reported in patients with diabetes. There are also reports of oral mucosa lesions in the form of stomatitis, geographic tongue, benign

migratory glossitis, fissured tongue, traumatic ulcer, lichen planus, lichenoid reaction and angular cheilitis. In addition, delayed mucosal wound healing, mucosal neuro-sensory disorders, dental caries and tooth loss has been reported in patients with diabetes. The prevalence and the chance of developing oral mucosal lesions were found to be higher in patients with diabetes compared to healthy controls.

## Periodontal Diseases

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### Pathophysiology of Periodontitis

Periodontitis is one of the most widespread diseases in the world affecting the oral cavity, and is highly prevalent in both developed and developing countries.<sup>28</sup> Periodontitis is a chronic inflammatory disorder affecting the gingivae and the periodontal tissue initiated by bacteria.<sup>29</sup> The micro-flora in the dental plaque that forms daily adjacent to the teeth causes this inflammatory process. Eventually, the toxins that are released by the microorganisms in the dental plaque will start the gingival inflammation as a result of failure to remove the dental plaque on a daily basis. A periodontal pocket is formed as a result of the progression of the gingival inflammation causing the gingivae to detach from the tooth surface. This periodontal pocket is filled with bacteria and its toxins. As the disease worsens, the pocket will get deeper carrying the dental plaque until it reaches the alveolar bone that will eventually be destroyed with the periodontal attachment. This process is very common and causes destruction of periodontal tissues, loss of alveolar bone and, finally, tooth loss. There are many factors contributing to this type of inflammation beside the presence of bacteria in dental plaque; a susceptible host is one of them

### Periodontitis and Diabetes Mellitus

The link between diabetes mellitus and periodontal disease is not well recognised by the medical community. Periodontal disease has been reported with increased prevalence and severity in patients with type 1 and type 2 diabetes.<sup>30</sup> The mechanism by which hyperglycaemia can induce periodontal destruction is not yet fully understood. However, there are many theories which propose factors such as advanced glycation end products, changes in collagen status, and altered immune function that causes impaired polymorphonuclear leukocyte function which may facilitate bacterial persistence in the tissue and the accumulation of advanced glycation end products, which results from prolonged and chronic hyperglycaemia

Diabetes mellitus (DM) is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago. In 1936, the distinction between type 1 and type 2 DM was clearly made. Type 2 DM was first described as a component of metabolic syndrome in 1988. Type 2 DM (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycemia, insulin resistance, and relative insulin deficiency. Type 2 DM results from interaction between genetic, environmental and behavioral risk factors.

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. This review is based on a search of Medline, the Cochrane Database of Systemic Reviews, and citation lists of relevant publications. Subject heading and key words used include type 2 diabetes mellitus, prevalence, current diagnosis, and current treatment. Only articles in English were included.

Screening and diagnosis is still based on World Health Organization (WHO) and American Diabetes Association (ADA) criteria which include both clinical and laboratory parameters. No cure has yet been found for the disease; however, treatment modalities include lifestyle modifications, treatment of obesity, oral hypoglycemic agents, and insulin sensitizers like metformin, a biguanide that reduces insulin resistance, is still the recommended first line medication especially for obese patients. Other effective medications include non-sulfonylurea secretagogues, thiazolidinediones, alpha glucosidase inhibitors, and insulin. Recent research into the pathophysiology of type 2 DM has led to the introduction of new medications like glucagon-like peptide 1 analogues: dipeptidyl peptidase-IV inhibitors, inhibitors of the sodium-glucose cotransporter 2 and 11 $\beta$ -hydroxysteroid dehydrogenase 1, insulin-releasing glucokinase activators and pancreatic-G-protein-coupled fatty-acid-receptor agonists, glucagon-receptor antagonists, metabolic inhibitors of hepatic glucose output and quick-release bromocriptine. Inhaled insulin was licensed for use in 2006 but has been withdrawn from the market because of low patronage

and increased secretion of pro-inflammatory cytokines such as tumour necrosis factor- $\alpha$  and prostaglandin E-2.<sup>31,32</sup> The increase in collagenase activity together with the reduction in collagen synthesis will adversely influence collagen metabolism. This would result in compromised wound healing as well as periodontal tissue destruction. Recent studies indicate that periodontitis has a bidirectional effect on glycaemic control in patients with diabetes.<sup>33</sup> There is a cluster of research studies, which support the hypothesis of periodontitis occurring more frequently in patients with diabetes with poor glycaemic control.<sup>33–38</sup> In addition, there is enough evidence to support the hypothesis that poor periodontal conditions could worsen glycaemic control as well. Many studies report that diabetes is a risk factor for gingivitis and periodontitis and it is more severe with poor glycaemic control [Figure 2].<sup>39</sup> The risk of developing periodontitis in patients with diabetes has been reported to be three times higher than the general population.<sup>40</sup>

Numerous risk factors have been reported that make patients with diabetes more susceptible to periodontal disease, especially those with poor oral hygiene, poor metabolic control, longer duration of diabetes and who are smokers.<sup>41–43</sup> Smoking was identified in many studies as being a major preventable risk factor for periodontal disease and tooth loss in the general population and in patients with diabetes.<sup>44–48</sup> The dentist and the physician should play an important role in advising and supporting patients with diabetes regarding smoking cessation. The dentist should be engaged in counselling these patients and referring them to a specialist organisation which deals with smoking cessation.<sup>49</sup>

Several studies showed that the treatment of periodontal disease has an influence on glycaemic control in both type 1 and type 2. A recent meta-analysis of the efficacy of periodontal treatment on glycaemic control in patients with diabetes suggested that such treatment could lead to a significant reduction in HbA1c.<sup>50</sup> However, they also recommended that the results need to be viewed with caution due to a lack of strength and limitations in the designs of some of the studies included. Periodontitis and diabetes are related to each other therefore further larger studies are required to determine the effect of periodontal treatment on glycaemic control.

## Salivary and Taste Dysfunction

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### Salivary Dysfunction

Saliva has a major role in maintaining a healthy oral cavity. Saliva is produced by major salivary glands (parotid, sub-mandibular and sub-lingual) and numerous minor salivary glands distributed in the oral cavity. Salivary dysfunction has been reported in patients with diabetes.<sup>51,52</sup> A cross sectional epidemiological study was conducted in 2001 to look at the prevalence of hyposalivation and xerostomia (dry mouth) and to determine the relationship between salivary dysfunction and diabetes

complications. This study was conducted in type 1 diabetics and control subjects without diabetes. They found that symptoms of reduced salivary flow rate and xerostomia were more frequently reported by patients with diabetes than the controls, especially by those diabetics who had developed neuropathy.<sup>53</sup> Other studies conducted in type 2 diabetics also confirmed that xerostomia and hyposalivation were more prevalent in this group of patients.<sup>54</sup> It has been shown that poorly controlled type 2 diabetics have a lower stimulated parotid gland flow rate compared to well-controlled patients and patients without diabetes.<sup>55</sup> An increase in salivary pathogens was also reported in these patients.<sup>56</sup> Patients with diabetes usually complain of xerostomia and the need to drink very often (polydypsia and polyuria). The constant dryness of the mouth would irritate the oral soft tissues, which in turn will cause inflammation and pain. Patients with diabetes with xerostomia are more predisposed to periodontal infection and tooth decay. The cause of this is not yet fully understood in patients with diabetes, but may be related to polydypsia and polyuria or alteration in the basement membrane of the salivary glands. It is known that diabetes mellitus is associated with chronic complications such as neuropathy, micro-vascular abnormalities and endothelial dysfunction that lead to deterioration of microcirculation and this may play a role in reduction of the salivary flow rate and composition.<sup>57,58</sup> Sialosis is defined as asymptomatic, non-inflammatory, non-neoplastic, bilateral chronic diffuse swelling mainly affecting the parotid glands. Sialosis has been found to be more prevalent in patients with diabetes mellitus.<sup>59</sup>

### Taste Dysfunction

There are many factors that have been implicated in altered taste sensation in the oral cavity. Metabolic and endocrine diseases were proposed as causative factors for this disturbance; nevertheless, salivary dysfunction can contribute to altered taste sensation or elevation of detection thresholds.<sup>60, 61</sup> Taste dysfunction has been reported to occur more frequently in patients with poorly controlled diabetes compared to healthy controls.<sup>62</sup> Diabetic patients who suffer from neuropathy have a higher taste threshold. Taste disturbance has also been reported to lead to poor glycaemic control by inhibiting the ability to maintain a good diet.<sup>63</sup>

## Oral Infection

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### Fungal Infections

Oral candidosis is an opportunistic infection frequently caused by *Candida albicans* species. Many predisposing factors can lead to this infection; these include smoking, xerostomia and endocrine and metabolic diseases.<sup>64</sup> Other factors were also implicated such as old age, medications, Cushing's syndrome, malignancies, and the use of dentures.<sup>65</sup> Oral candidosis has been classified into primary and



secondary. Primary oral candidosis is subclassified into acute (pseudomembranous and erythematous), chronic (pseudomembranous, erythematous and hyperplastic) and candida associated lesions.

Pseudomembranous candidosis is also known as oral thrush. It is characterised by the presence of a creamy white patch which, when wiped, reveals underlying erythematous and bleeding oral mucosa. The soft palate is the most commonly affected area followed by the cheek, tongue and gingivae. It could be chronic in immuno-compromised patients.<sup>66</sup> Erythematous candidosis can present as acute or chronic infection. It is believed to result from the usage of steroid and broad spectrum antibiotics and mainly affects the tongue.<sup>66</sup> Hyperplastic candidosis is known as candidal leukoplakia. It appears as an irregular whitish raised plaque-like lesion commonly seen in the buccal mucous membrane near the commissures.

Candida associated lesions include denture induced stomatitis, angular cheilitis and median rhomboid glossitis which have mixed bacterial and fungal etiology. Denture induced stomatitis is mainly seen in full denture wearers in the underlying surface of the upper denture. Angular cheilitis is seen in the lip commissures as an erythematous crusting lesion. The lesion has been reported to occur in diabetics with poor glycaemic control. Median rhomboid glossitis is seen on the dorsal surface of the tongue as a depopulated erythematous diamond-shaped patch at the midline.

The incidence of fungal infections in patients with diabetes mellitus has been recognised for many years.<sup>67</sup> Candidal infection is reported to be more prevalent in patients with diabetes especially in those patients who smoke, wear dentures, have poor glycaemic control and use steroids and broad spectrum antibiotics.<sup>68</sup> In addition, salivary dysfunction in patients with diabetes can also contribute to higher carriage of fungi in this group of patients. It is clear from these studies that both local and systemic predisposing factors might increase candidal carriage rate and hence increase the risk of oral candidal infection in patients with diabetes.

### **Bacterial Infections**

Patients with diabetes are more susceptible to developing oral bacterial infections. They are well known to have an impaired defense mechanism hence considered to be immuno-compromised. Diabetics with diabetic complications and poor metabolic control are more prone to spreading and recurrent bacterial infection. Several studies have reported that patients with diabetes are more prone to deep neck bacterial infection compared to patient without diabetes.<sup>72,73</sup> A four-year prospective study by Rao *et al.* investigated the severity of maxillofacial space infection of odontogenic origin, the type of micro-organism, the sensitivity of the micro-organisms to antibiotics, and the length of hospital stay of patients with diabetes compared with patients without diabetes. They concluded that the spread of the bacterial infection to the submandibular space was more common in patients and controls and that the second commonest area was the buccal

space. *Streptococcus* species was more commonly isolated in both groups. Patients with diabetes were found to stay longer in hospital due to more severe infection and required more time to control their blood glucose levels.<sup>74</sup>

### Poor Oral Wound Healing

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Poor soft tissue regeneration and delayed osseous healing in patients with diabetes are known complications during oral surgery. Therefore, the management and treatment of patients with diabetes undergoing oral surgery is more complex. It was reported that delayed vascularisation, reduced blood flow, a decline in innate immunity, decreased growth factor production, and psychological stress may be involved in the protracted wound healing of the oral cavity mucosa in patients with diabetes.<sup>75</sup>

### Non-Candidal Oral Soft Tissue Lesion

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Oral lesions that are not caused by candidal infection have been reported to occur in patients with diabetes such as fissured tongue, irritation fibroma and traumatic ulcer. These lesions were more prevalent in diabetes compared to the controls.<sup>27</sup> Altered or delayed wound healing may play a role in traumatic ulcer.

### Oral Mucosal Disease

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Both lichen planus and recurrent aphthous stomatitis have been reported to occur in patients with diabetes.<sup>76,77</sup> Oral lichen planus (OLP) is a skin disorder that produces lesions in the mouth. OLP is reported to occur more frequently in patients with type 1 diabetes compared to type 2 diabetes.<sup>76</sup> The reason for this is that type 1 diabetes is considered an autoimmune disease, and OLP has been reported to have an underlying autoimmune mechanism. Patients with diabetes are subjected to a prolonged state of chronic immune suppression especially in type 1 diabetes. In addition, acute hyperglycaemia causes alteration in the immune responsiveness in diabetes mellitus. Atrophic-erosive oral lesions are more common in patients with diabetes with OLP.<sup>77</sup>

### Neuro-Sensory Oral Disorder

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Oral dysesthesia or burning mouth syndrome (BMS) is a painful condition affecting the oral cavity (palate, tongue, throat and gingivae).<sup>78,79</sup> Other abnormal oral sensations may co-exist with the burning mouth sensation such as tingling,

numbness, dryness or sore mouth at the same time. The exact cause of BMS is unknown, but it has been attributed to several conditions such as dry mouth, menopause, candidal infection, diabetes mellitus, cancer therapy, psychological problems and acid reflux. BMS is classified into two types: primary idiopathic, and secondary as a result of a systemic process; secondary BMS has been reported to occur with diabetes mellitus. It could adversely affect the ability to maintain good oral hygiene in patients with diabetes. Diabetic neuropathy could be the underlying cause of BMS in patients with diabetes. The nerve damage in diabetic neuropathy has been reported to show an increase in the Langerhans cells that are associated with immune disturbance.<sup>80, 81</sup> Therefore, it is crucial to screen patients who have symptoms of BMS for diabetes mellitus.

### Dental Caries and Tooth Loss

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It is well known that patients with diabetes are susceptible to oral infections that lead to tooth decay and loss.<sup>82</sup> Salivary secretion dysfunction, periodontal and sensory disorders could increase the likelihood of developing new and recurrent dental caries and tooth loss [Figure 3]. The relationship between diabetes and development of dental caries is still unclear. It is well-known that the cleansing and buffering capacity of the saliva is diminished in patients with diabetes mellitus resulting in increased incidence of dental caries, especially in those patients who suffer from xerostomia.

#### Conclusion:

Diabetes mellitus is a chronic, non-communicable and endemic disease. Type 2 compared to type 1 diabetes mellitus is more prevalent worldwide and increasing, especially in Oman. Oral manifestations and complications in patients with diabetes mellitus have been recognised and reported recently as a major complication of diabetes mellitus. There is increasing evidence that chronic oral complications in patients with diabetes adversely affect blood glucose control. Prevention and management of oral complications, especially periodontal disease, in patients with diabetes is important due to their possible adverse effect on glycaemic control. Promotion of a healthy oral cavity in patients with diabetes is paramount. Epidemiological and research data on this problem in Omani patients with diabetes should be expanded by further studies.

There are several clinical implications from this review. These include: 1) a lack of awareness of oral complications among both diabetics and health providers; 2) an understanding of the way diabetes affects oral health is necessary for both clinicians and patients, therefore research in this field should be encouraged; 3) the need for

regular follow-up of patients with diabetes mellitus by both dentist and physicians; 4) the major role that dentists should play in recognising the signs and symptoms of diabetes and their oral complications; 5) advice and counselling for diabetic smokers regarding smoking cessation, and 6) vigorous treatment of oral infection either bacterial or fungal in these patients, especially if they have poor glycaemic control.

[Go to:](#)

## References

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Annexure 2

**Bharath Institute of Higher Education and Research**

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES


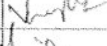
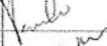

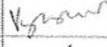
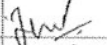
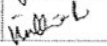
Participant list of Value added course: *Oral manifestations of Diabetes Mellitus* on **12.1.2021**

Sl.No	Reg.No	Name of the candidate
1	U13MB287	VELMURUGANE. E
2	U13MB288	VENKADESH.V.S
3	U13MB289	VENNILA.T
4	U13MB290	VIGNESH. V
5	U13MB291	VIGNESHWARAN.M
6	U13MB292	VIKRAMAN.J
7	U13MB293	VINITHA.R

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: *Oral manifestations of Diabetes Mellitus*

Sl.No	Reg.No	Name of the candidate	Signature
1	U13MB287	VELMURUGANE. E	
2	U13MB288	VENKADESH.V.S	
3	U13MB289	VENNILA.T	
4	U13MB290	VIGNESH. V	
5	U13MB291	VIGNESHWARAN.M	
6	U13MB292	VIKRAMAN.J	
7	U13MB293	VINITHA.R	



**SRI LAKSHMI NARAYANA INSTITUTE OF HIGHER EDUCATION  
AND RESEARCH**

**Oral manifestations and complications of Diabetes Mellitus  
and DI-2**

**QUESTIONS**

**Course Code: DI-2**

**I. ANSWER ALL THE QUESTIONS**

1. Gingival/periodontal abscess?
2. Mucosal changes associated with diabetes?
3. Oral candidiasis?
4. Halitosis?
5. Oral hygiene status of diabetes mellitus?

NAME- VIGNESH.V

ROLL NO:- U17MB290

① 263  
Oral manifestations, significance / manifestations of metabolic milieu?

The oral manifestations and complications related to DM (dry mouth, xerostomia) tooth decay (necrosis), paronychia, gingivitis / periodontitis, oral candidiasis burning mouth (glossodynia) altered taste, xerophthalmia, vitreous floaters / blurred vision.

- metabolic disorder —
- no specific oral lesions associated with diabetes. However there are a number of problems by presence of hyperglycemia.

- ② — Microangiopathy
- altered cell metabolism
  - increased  $Ca^{++}$
  - increased collagen breakdown.

## Schrey gland

- Keratin
- Tenderness
- may cause scaly eruption of parotid glands.

## Dialy acid

- Increased prevalence of acne & dandruff
- Hypo-glycemic state shows a positive correlation with dialy acid.

## Scabies

- Reason - mite *Sarcoptes scabiei*

Delayed healing of wound

Dufoils

Nanophthia

My rule mite effect





# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research  
(Deemed to be University under section 3 of the UGC Act 1956)



## CERTIFICATE OF MERIT

This is to certify that VELMURUGANE. E has actively participated in the Value Added Course on *Oral manifestations of Diabetes Mellitus and* held during JAN 2021 – APR 2021 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Balaji Subramaniyan. R  
RESOURCE PERSON

Dr. Jayakumar  
COORDINATOR

### Student Feedback Form

Course Name: ORAL MANIFESTATIONS OF DIABETIC MILLETUS

Subject Code: DI - 2

Name of Student: VENKATEJH Roll No.: U13MB288

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations			✓		
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective			✓		
6	Instructors encourage interaction and were helpful			✓		
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4	5

\* Rating: 5 - Outstanding; 4 - Excellent; 3 - Good; 2 - Satisfactory; 1 - Not-Satisfactory

Suggestions if any:

  
Signature

## COURSE COMPLETION

Date 10.4.2021

From  
DR. BALAJI,  
DEPARTMENT OF DENTISTRY,  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,  
CHENNAI.

Through Proper Channel

To  
THE DEAN,  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,  
CHENNAI.

**Sub: Completion of value-added course: *Oral manifestations of Diabetes Mellitus***

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: *Oral manifestations of Diabetes Mellitus* on 10.4.2021. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

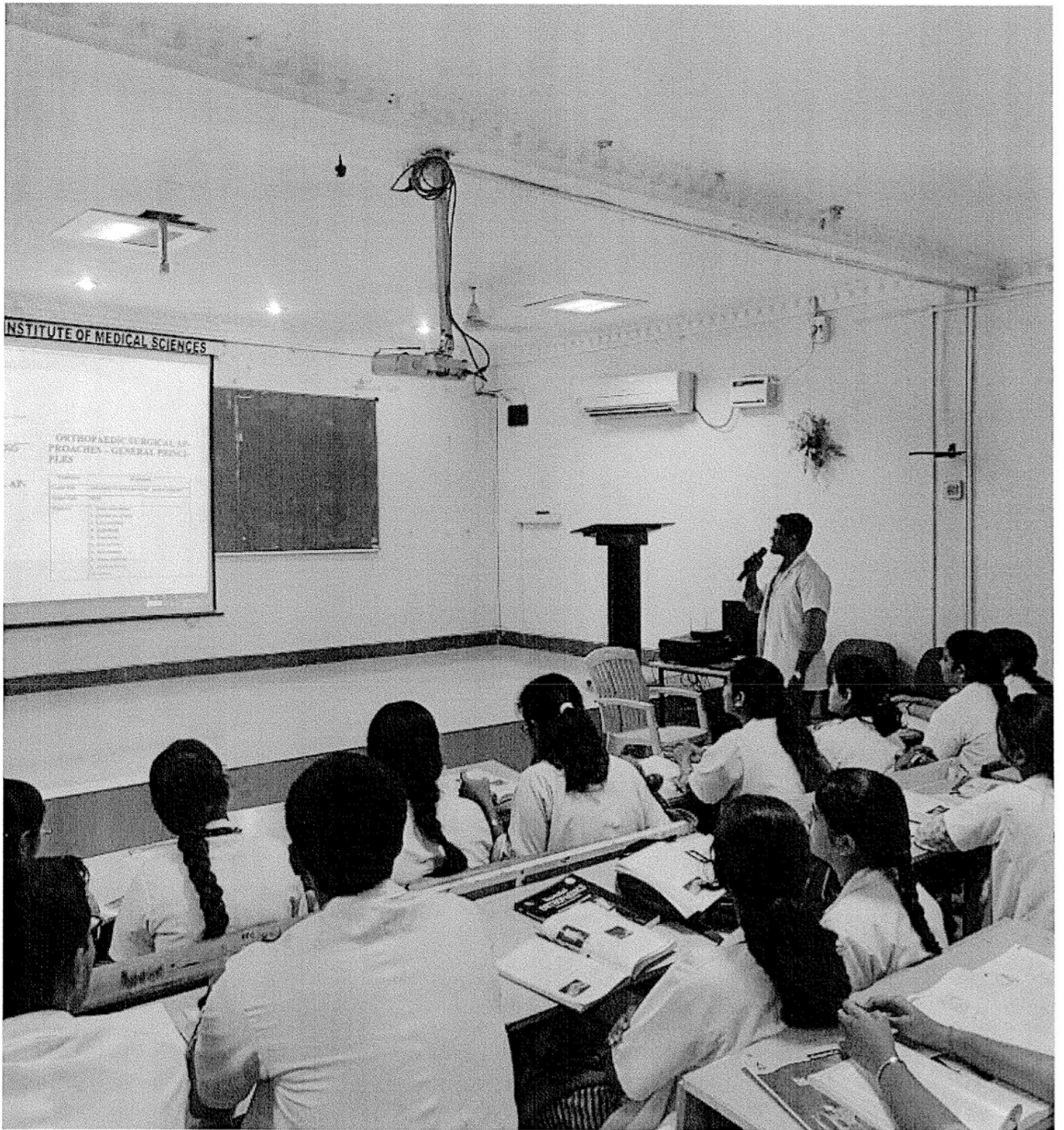
Kind Regards



Dr. R. BALAJI SUBRAMANIYAN  
DR. BALAJI SUBRAMANIYAN.R  
Department of Dentistry  
Sri Lakshmi Narayana  
Institute of Medical Sciences  
Osudu, Agaram, Puducherry.

**Encl: Certificates**

**Photographs**





## Sri Lakshmi Narayana Institute of Medical Sciences

Date 02/01/2021

From  
Dr.K.R.Jothikumar,  
Professor and Head,  
otorhinolaryngology,  
SLIMS  
Bharath Institute of Higher Education and Research,  
Puducherry.

To  
The Dean,  
SLIMS  
Bharath Institute of Higher Education and Research,  
Puducherry.

**Sub: Permission to conduct value-added course: : Audiological Care For Musicians reg.**

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Audiological Rehabilitation on Jan 2021 to June 2021 . We solicit your kind permission for the same.  
Kind Regards

Dr.K.R. Jothikumar

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### FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean:

The HOD:

The Expert:

The committee has discussed about the course and is approved.

Dean

(Sign&Seal)

**DEAN**  
Prof.K.BALAGURUNATHAN,M.S  
(General surgeon)  
SRI LAKSHMI NARAYANA  
INSTITUTE OF MEDICAL SCIENCES  
OSUDU PONDICHERRY

Dr. K. VENKATARAMANAN, MS.  
Reg. No: 72549  
Professor ENT  
Sri Lakshmi Narayana Institute of Medical Sciences  
Osudu, Kudapakkam, Puducherry-605 502.

**SUBJECT EXPERT**  
(Sign & Seal)

**Seal & Signature of the HOD**  
**PROFESSOR & HOD**  
**DEPARTMENT OF E.N.T**  
Sri Lakshmi Narayana Institute Of Medical Sciences  
PONDICHERRY - 605 502