SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

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

Date30.7.19

From
DR.BALAJI SUBRAMANIYAN.R,
Professor and Head,
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: OCCLUSION

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **OCCLUSION** on 3.8.19_. We solicit your kind permission for the same.

Kind Regards

DR.BALAJI SUBRAMANIYAN

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR.JAYALAKSHMI

The HOD: DR.BALAJI SUBRAMANIYAN.R

The Expert: DR.AMUTHAVALLI.V

The committee has discussed about the course and is approved.

Dean | Subject Expert | HOD

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

Dr. V. AMUTHAVALLI, MDS.

Dr. BALASUBRAMANIAN, MDS.
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502

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]
[Affliated to Bharath University, Chennai - TN]

Circular

30.7.19

Sub: Organising Value-added Course: OCCLUSION 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**"_OCCLUSION ON 3.8.19"**. 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 1.8.19. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content and Registration form.

COURSE PROPOSAL

Course Title: OCCCLUSION

Course Objective: To enlighten students about significance of occlusion

Course Outcome: In depth knowledge regarding occlusion

Course Audience: MBBS STUDENTS

Course Coordinator: DR.BALAJI SUBRAMANIYAN

Course Faculties with Qualification and Designation:

1. **DR.AMUTHAVALLI.V M.D.S & ASSISTANT PROFESSOR**

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

SlNo	Date	Topic	Time	Hours
1.	3.8.19	Eruption sequence of deciduous teeth	4PM-7PM	3 hrs
2.	10.8.19	Eruption sequence of permanent teeth	4pm-7 pm	3hrs
3.	18.8.19	Ugly- duckling stage	5pm-8pm	3 hrs
4.	25.8.19	Overjet/Overbite	4pm-7pm	3hrs
5.	3.9.19	Deep bite/ open bite	5pm-8pm	3 hrs
6.	10.9.19	Bruxism	5pm-8pm	3 hrs
7.	18.9.19	Supra eruption of posteriors	4pm-7pm	3 hrs
8.	25.9.19	Impacted third molars	5pm-8pm	3 hrs
9.	3.10.19	Correlation of malocclusion	5pm-8pm	3 hrs
10.	15.10.19	Oral examination of teeth	4pm-7pm	3 hrs
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)

1.CYNTHIA PETERSON TEXT BOOK OF TMJ AND OCCLUSION

2. TANAKA TMJ DISORDERS

OCCLUSION

ABSTRACT

Occlusion and its relationship to the function of the stomatognathic system have been widely studied in dentistry since many decades. This series of articles describe about occlusion in the complete denture, fixed partial denture, and implants. Part I and II of this articles series describe concepts and philosophies of occlusion in complete denture. So far, available research has not concluded a superior tooth form or occlusal scheme to satisfy the requirements of completely edentulous patients with respect to comfort, mastication, phonetics, and esthetics. Since then, several balanced and nonbalanced articulation concepts were proposed in the literature. A balanced articulation appears to be most appropriate because of tooth contacts observed during nonfunctional activities of patients. This article discusses about evolution of different concepts of occlusion and occlusal schemes in complete denture occlusion.

Dentate status can affect diet, nutritional status, and general health. A complete maxillary denture can have an impact on taste and swallowing ability. Masticatory efficiency in complete denture wearers is approximately 80% lower than in people with natural dentition. Other factors that affect chewing ability include mobile teeth, bone resorption, reduced sensory perceptions, and motor impairment.

The early history of the first artificial tooth is obscure, but it is known that 100s of years ago, teeth were carved from stone, wood, ivory, and metal. Human teeth were also used in early dentures. Every time opposing teeth contact there is a resultant force. Although this force may vary in magnitude and direction, it must always be resisted by supporting tissues. Some dentists believe there should be cusps on the teeth and that they must be in complete harmony with the dynamics of temporomandibular joint function. Other dentists believed that the teeth should not have cusps. There are numerous concepts, techniques, and philosophies concerning complete denture occlusion.

OCCLUSION

INTRODUCTION

Occlusion is a factor that is common to all branches of dentistry. It is a term generally accepted to describe the contact relationship of the upper and lower teeth. Teeth whether natural or artificial are not immobile; so occlusion can never be considered a purely static relationship. Natural teeth move in their socket and change perceptibly from day to day. They move under load into their sockets and return to position when the load is removed. Artificial occlusion discloses even more apparent movement, since the teeth move as a group on a common base because of the nature of the supporting structures.

There are numerous concepts, techniques and philosophies concerning complete denture occlusion. Keeping abreast with the changes in this area is a challenging task. Some prosthodontists believe that there should be cusps on the artificial teeth and that they must be in harmony with the dynamics of mandibular functions. Other prosthodontists think that the artificial teeth should not have cusps because they create forces that are difficult to control.

THEORIES AND CONCEPTS OF OCCLUSION

Occlusion according to glossary of prosthodontic terms 8th ed, is defined as "the static relationship between the incising and masticating surfaces of the maxillary or mandibular teeth or teeth analogues."

Articulation is another terminology that deals with occlusion. It is the dynamic relationship or relationship in function of the maxillary and mandibular teeth.

Occlusion of natural and artificial teeth varies to a great extent. It is important for one to know about these differences in order to understand the need of balanced occlusion in a complete denture.

The first description of occlusal relationship of the teeth was made by Edward Angle in 1899. Occlusion became a topic of interest and much discussion in the early years of dentistry as the restorability and replacement of teeth became more feasible. The first significant concept developed to describe optimum functional occlusion was called balanced occlusion.

DEVELOPMENT AND MATURATION OF OCCLUSION:

The primary components of human dental occlusion are

(1) The dentition,

(2) The neuromuscular system, and

(3) The craniofacial structures.

The development and maturation of these components are interrelated so that growth, adaptation, and change actively participate in the development of an

adult occlusion. Dentition development is characterized by a period of dental alveolar and craniofacial adaptability, which is also a time when motor skills and neuromuscular learning are developing. Clinical treatment at this time may take advantage of such responsive adaptive mechanisms; for example, teeth can be guided into their correct alignment by orthodontic treatment.

In a healthy adult dentition, dental adaptive mechanisms are restricted to wear, extrusion, and drifting of teeth. Bony adaptations are essentially of a reparative nature and are slow in their operation. Protective reflexes are learned so one can avoid pain and inefficiency of the masticatory system. If and when an adult dentition begins to deteriorate, the prosthodontist resorts to fixed or removable prosthodontic therapy in attempts to maintain a functional occlusal equilibrium. This period is characterized by greatly diminished dental and reflex adaptation and by bone resorption.

Obviously, the presence of tooth loss and disease and the depletion of reparative processes pose a major prosthodontic problem. Finally, in the edentulous state, there are few natural adaptive mechanisms left. The prosthesis rests on tissues that will change progressively and irreversibly, and the artificial occlusion serves in an environment characterized by constant change that is mainly regressive.

The modern complete denture service is characterized by an integration of biological information with instrumentation, materials and clinical techniques. Orofacial and tongue muscles play an important role in retaining and stabilizing complete dentures. This is accomplished by arrangement of the artificial teeth to occupy a "neutral zone" in the edentulous mouth so the teeth will occupy a space determined by the functional balance of the orofacial and tongue musculature.

DIFFERENCES BETWEEN OCCLUSION IN ARTIFICIAL TEETH AND NATURAL TEETH

Artificial teeth

Artificial teeth function as a group and the occlusal loads are not individually managed.

- Malocclusions pose immediate drastic problems
- Non-vertical forces damage the supporting tissues
- Incising will lift the posterior part of the denture.
- Heavy mastication over the second molar can tilt or shift the denture base.
- Bilateral balance is mandatory to produce stability of the denture.
- There is no feedback and the denture rests in centric relation. Any prematurities in this position can shift the base. [1,5.]

Natural teeth

Natural teeth function independently and each individual tooth disperses the occlusal load.

- Malocclusion can be non problematic for a long time
- Non-vertical forces are well tolerated
- Incising does not affect the posterior teeth
- The second molar is the favored area for heavy mastication for better leverage and power.
- Bilateral balance is not necessary and usually considered a hindrance.
- Proprioceptive impulses give feedback to avoid occlusal prematurities. This helps the patient to have a habitual occlusion away from centric relation. [1,5.]

Requirements of artificial occlusion for tissue preservation

1. optimum orthopedically stable joint position
2. optimum functional tooth contacts
3. direction of force placed on the teeth
4. amount of force placed on the teeth
5. postural considerations and functional tooth contact. [9]

DETERMINANTS OF OCCLUSION

Fixed determinants of occlusion,

1. Angulation and curvature of the condylar guidances
2. Intercondylar distance
3. Hinge axis being closely related to centric relation (CR).
4. Mandibular lateral movements (defining the Bennett angle)
5. Bennett shift (or side shift) of the mandible.
6. Centric occlusion and rest position.

Variable determinants of occlusion,

1. Anterior guidance
2. Occlusal plane
3. Curve of Spee
4. Curve of Wilson
5. Cusp height
6. Vertical overlapping (or trespassing)
7. Overjet and overbite

THEORIES

Monson's Spherical Theory of Occlusion:

G.S. Monson proposed this theory in **1918**, based on the observations of natural teeth and skulls. According to this theory, the anteroposterior and mesiodistal inclines of the artificial teeth should be arranged in harmony with a spherical surface. This theory of occlusion, showed that, the lower teeth moved over the surface of the upper teeth as over the surface of a sphere with a diameter of 8 inches (approximately 20 cm). The centre of the sphere was located in the region of glabella and the surface of the sphere passed through glenoid fossae concentric with the articulating eminences.

Monson felt that the condylar path and the occlusal plane form a curve. Bonwill said that the two condyles and the incisors formed an equilateral triangle with sides of 4 inches. Monson associated with **Bonwill's** triangle with his own observations and formulated his spherical theory.

TYPES OF BALANCED OCCLUSION

Occlusal balance or balanced occlusion can be classified as follows:

Unilateral balanced occlusion

· Bilateral balanced occlusion

· Protrusive balanced occlusion

· Lateral balanced occlusion.

Unilateral Balanced Occlusion

This is a type of occlusion seen on occlusal surfaces of teeth on one side when they occlude simultaneously with a smooth, uninterrupted glide. This is not followed during complete denture construction. It is more pertained to fixed partial dentures.

Bilateral Balanced Occlusion

This is a type of occlusion that is seen when simultaneous contact occurs on both sides in centric and eccentric positions. Bilateral balanced occlusion helps to distribute the occlusal load evenly across the arch and therefore helps to improve stability of the denture during centric, eccentric or parafunctional movements. This total concept of balanced complete denture occlusion must be considered in terms of the following:

The tooth size and position in relation to the ridge size and shape.

1. The extent of denture base coverage.
2. Occlusal balance with stable contacts at the retruded border position and in an area (long centric) anterior to it.
3. Right and left eccentric occlusal balance by simultaneous contacts at the limit of functional and parafunctional activity.
4. Intermediate occlusal balance for all positions between centric occlusion and all other functional or parafunctional excursions to the right, left, and protrusive. This balance is probably the most important, as it allows for smooth uninterrupted tooth contacts in the dynamics of daily mandibular movements.

The concepts of occlusal balance have generally been accepted and limited to the factors controlling the contacts of the teeth from centric to eccentric jaw positions. It is important that both aspects of balance, one due to tooth position and one due to tooth contact, complement one another for total denture base stability.

Importance of Bilateral Balanced Occlusion

Balanced occlusion is one of the most important factors that affect denture stability. Absence of occlusal balance will result in leverage of the denture during mandibular movement. Sheppard stated that, *"Enter bolus, Exit balance"*. According to this statement, the balancing contact is absent when food enters the oral cavity. This makes us think that balanced occlusion has no function during mastication; hence, it is not essential in a complete denture. But this is not true. Brewer reported the importance of balanced occlu,sion. He reported that on an average, a normal individual makes masticatory tooth contact only for 10 minutes in one full day compared to 4 hours of total tooth contact during other functions. So, for these 4 hours of tooth contact, balanced occlusion is important to maintain the stability of the denture. Hence, balanced occlusion is more critical during parafunctional movements.

Protrusive Balanced Occlusion

This type of balanced occlusion is present when mandible moves in a forward direction and the occlusal contacts are smooth and simultaneous anteriorly and posteriorly. There should be at least three points of contact in the occlusal plane. Two of these should be located posteriorly and one should be located in the anterior region. This is absent in natural dentition.

Factors of Protrusive Balance

1. The inclination of the condylar path on the, articulator. This inclination recorded on the patient represents the path of the condyle in protrusion

modified by the combined action of all of the tissues of the temporomandibular joint and the ridges covered by the recording bases.

2. The inclination of the incisal guidance chosen for the patient.
3. The inclination of the plane of occlusion set to physiologic factor.
4. The compensating curve set to harmonize with condylar path and the incisal guidance.
5. The control of cusp heights and tooth in clination of the posterior teeth.

Lateral Balanced Occlusion

In lateral balance, there will be a minimal simultaneous three point contact (one anterior, two posterior) present during lateral movement of the mandible.

Lateral balanced occlusion is absent in normal dentition. When a dentulous person with canine guided occlusion moves his mandible to the right, there will be canine guided disocclusion of all his teeth. That is, the canine will be the only tooth that contacts the opposing tooth. Even the canine of the opposite side will not have contact .

Factors of Lateral Balance

1. The inclination of the condylar path on the balancing side.
2. The inclination of the incisal guidance and cuspid lift.
3. The inclination of-the plane of occlusion on the balancing side and working side.
4. The compensating, curve on the balancing side and working side.
5. The buccal cusp heights or inclination of the teeth on the balancing side.
6. The lingual cusp heights or inclination on the working side.
7. The Bennett side shift on the working side.

The relationship of tooth molds to balanced occlusion:

Specific tooth molds have been suggested to provide the needed tooth contacts for this concept. The classical example of bilateral balanced articulation dates back to 1914, when **Gysi introduced the 33-degree cusp form** arranged according to the movements of the articulator. These teeth arranged in a balanced occlusal concept were meant to enhance stability and direct the contact forces toward the ridges.

Annexure- II

VALUE ADDED COURSE

OCCLUSION

DI-11

List of Students Enrolled AUG 2019 – OCT 2019

MBBS Student		
Sl. No	**Name of the Student**	**Roll No**
1	THEEPTHI .T	U16MB389
2	UDDIP DATTA RAY	U16MB390
3	VASIPALLI SUJITHA	U16MB391
4	VENKAT SRI RANGAN.P.B	U16MB392
5	VENKATACHALAPATHY .G	U16MB393
6	VIDHY ADHARAN.S	U16MB394
7	VIGNESH .D	U16MB395

Dr. Amuthavalli. V

RESOURCE PERSON

Dr. Jayalakshmi

COORDINATOR

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: **OCCLUSION**

Sl.No	Reg.No	Name of the candidate	Signature
1	U16MB389	THEEPTHI .T	
2	U16MB390	UDDIP DATTA RAY	
3	U16MB391	VASIPALLI SUJITHA	
4	U16MB392	VENKAT SRI RANGAN.P.B	
5	U16MB393	VENKATACHALAPATHY .G	
6	U16MB394	VIDHY ADHARAN.S	
7	U16MB395	VIGNESH .D	

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

OCCLUSION

QUESTIONS

Course Code: DI-11

ANSWER ALL THE QUESTIONS

1.Eruption of permanent teeth seqeuale?

2. Position of tongue?

3. Muscles of mastication?

4. Path of closure?

5. Role of TMJ in Occlusion?

NAME: V JOTHESH S
ROLLNO: U16MB395

33/50

Occlusion

Definition:

Contact relationship of the upper and lower teeth during various activities of the mandible (mastication, swallowing, and speech)

Overjet: Horizontal relation of the upper teeth to the lower teeth in centric occlusion.

Overbite: Vertical relation of the upper teeth to the lower teeth in centric occlusion

Importance:

- prevent soft tissue biting
- Guide the mandible through various lateral movement

Leeway Space:

The erupting premolars are smaller in mesiodistal dimension than the primary molars.

- The difference in sizes between the premolars and primary molars as well as the deciduous canines called Leeway space.

Curve of Spee.

- Sagittal planes.
- Incisal Ridges of the anterior teeth and the Cusps of the posterior teeth follow a curve which end at the anterior surface of the condyle.

Curve of wilson:

- coronal plane

The Occlusal surfaces of posterior teeth confom to a curved plane.

- The Crowns of mandibular posterior teeth must incline to the lingual while the crowns of the maxillary posterior teeth must incline toward the buccal.

- Deeper posteriorly that of the premolar. - molars Inclination is greater than the premolar.

Bonwill triangle:

- Describe the mandible and found that the mandibular dental arch adapts itself to an equilateral triangle of 4 inches length.

Angle's Classification:

- Class I
- Class II
- Class III

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 VIDHYADHARAN.S has actively participated in the Value Added Course on OCCLUSION held during AUG 2019 – OCT 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Amuthavalli.V
RESOURCE PERSON

Dr. Jayalakshmi
COORDINATOR

Student Feedback Form

Course Name: OCCLUSION

Subject Code: DT – 11

Name of Student: VIGNESH. D Roll No.: V16MB395

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

Date: 16.7.19

COURSE COMPLETION

Date 17.10.19

From
DR.BALAJI SUBRAMANIYAN.R
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: OCCLUSION

Dear Sir

With reference to the subject mentioned above, the department has conducted the value-added course titled: **OCCLUSION** on 15.10.19. 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.BALAJI SUBRAMANIYAN.R

Professor-HOD Dental
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam

Encl: Certificates

Photographs