

## Lesson Plan

**Course:** Radiology

**Topic:** Occlusal and Localization Techniques

**Audience:** Adult Learners (Senior Level Dental Hygiene Students)

**Time:** 50 minutes total

- Anticipatory set= 5 minutes
- Lesson content= 40 minutes
- Summary= 5 minutes

**Materials:** Computer, Projector, PowerPoint slides, Typodont, Occlusal Films (Size 4 and Size 2)

**Instructional Objectives:**

Upon completion of the lecture, the student should be able to:

1. Define the key terms associated with occlusal and localization techniques.
2. Describe the purpose of the occlusal examination.
3. List the uses of occlusal examination and the basic principles involved.
4. Describe the patient's equipment and equipment preparations that are necessary before using the occlusal technique.
5. State the recommended vertical angulations for the following maxillary occlusal projections: topographic, lateral (right or left) and pediatric.
6. State the recommended vertical angulations for the following mandibular occlusal projections: topographic, cross-sectional, and pediatric.
7. State the purpose of localization techniques and list their uses.
8. Describe the Buccal Object rule.
9. Describe the right-angle technique.

Reference:

Iannucci, Joen M, & Howerton, Laura J. (2016). Chapter 21: Occlusal and Localization Techniques. In *Dental Radiography* (5th ed., pp. 228–243). Elsevier.

LESSON CONTENT	NOTES – MEDIA – Q/A
<p><b>I. ANTICIPATORY SET</b></p> <p>A. <u>Introduction</u>: Dental radiographs are necessary tools allowing dental professionals to visualize structures that could not be seen during clinical examinations. In some situations, standard periapical or bitewing radiographs may not give complete information to evaluate large areas of the maxilla or mandible. Clinicians might get great help from occlusal radiography and localization techniques in identifying positions of teeth, foreign objects, and pathologic conditions within the jaws. For accurate diagnosis and treatment planning in dental practice it is vital to understand how and when to use these techniques.</p> <p>B. <u>Gain Attention/Motivate</u> Consider a patient coming with swelling on the floor of the mouth, and a salivary stone is suspected. A traditional periapical radiograph will not clearly show the exact location of obstruction. How will one determine if the object is located on the buccal or the lingual side?</p> <p>Radiographic localization techniques come with conclusion and allow professionals to accurately identify the position of objects within the jaws.</p> <p>C. <u>Activate Prior Knowledge</u> Before understanding these techniques, think of what you already know about dental radiography.</p> <ul style="list-style-type: none"> <li>• What are the commonly used radiographs in dentistry?</li> <li>• Does anyone know about the SLOB rule in Localization?</li> <li>• When does a periapical or bitewing radiograph not give enough information?</li> </ul> <p>These are the foundations that will help us understand occlusal and radiographic localization techniques.</p>	<p><b>PP Slide #1:</b> Title slide: Occlusal and Localization Technique</p> <p><b>PP Slide #2:</b> Occlusal Radiographs Image</p> <p><b>Q:</b> What is the purpose of dental radiographs?</p> <p><b>A:</b> To help visualize structures that cannot be seen during a clinical exam.</p> <p><b>Note:</b> This session will be Q&amp;A based, so your attention is very important.</p>

#### D. Establish Rationale

As future dental hygienists, you will come across patients who require additional radiographic views to diagnose conditions such as impacted teeth, fractures, foreign objects or salivary stones. Learning occlusal projections and localization techniques will help you in determining the exact location of objects and evaluating larger areas of the jaws.

This knowledge is important for patient safety, accurate diagnosis, and effective communication with the dental team.

#### E. Present Instructional Objectives

After today's lecture, you should be able to:

1. Define the key terms associated with occlusal and localization techniques.
2. Describe the purpose of the occlusal examination.
3. List the uses of occlusal examination and the basic principles involved.
4. Describe the patient's equipment and equipment preparations that are necessary before using the occlusal technique.
5. State the recommended vertical angulations for the following maxillary occlusal projections: topographic, lateral (right or left) and pediatric.
6. State the recommended vertical angulations for the following mandibular occlusal projections: topographic, cross-sectional, and pediatric.
7. State the purpose of localization techniques and list their uses.
8. Describe the Buccal Object rule.
9. Describe the right-angle technique.

PP Slide #3: Objectives

LESSON CONTENT	NOTES – MEDIA – Q/A
<p><b>I. Key Terms Associated with Occlusal techniques</b></p> <p>A. Surface: Chewing surface of posterior teeth</p> <p>B. Examination: Inspect large areas on one image of</p> <ol style="list-style-type: none"> <li>1. Mandible</li> <li>2. maxillary</li> </ol> <p>C. Technique: Method used to expose receptors</p> <p>D. Receptor: Patient “occludes” or bite</p> <ol style="list-style-type: none"> <li>1. Sizes <ol style="list-style-type: none"> <li>a. 4: largest, used in adults</li> <li>b. 2: used in kids</li> </ol> </li> </ol> <p><b>II. Purpose of Occlusal examination</b></p> <p>A. To locate</p> <ol style="list-style-type: none"> <li>1. Retained Roots</li> <li>2. Teeth <ol style="list-style-type: none"> <li>a. Supernumerary</li> <li>b. Impacted</li> <li>c. Unerupted</li> </ol> </li> <li>3. Foreign bodies</li> <li>4. Salivary stones</li> <li>5. Extent of lesions <ol style="list-style-type: none"> <li>a. Cysts</li> <li>b. Tumors</li> <li>c. Malignancies</li> </ol> </li> </ol> <p>B. To evaluate</p> <ol style="list-style-type: none"> <li>1. Boundaries of maxillary sinus</li> <li>2. Fractures</li> <li>3. Patients who cannot open their mouth</li> <li>4. Area of cleft palate</li> <li>5. Change in Size or shape of the jaw</li> </ol> <p><b>III. Uses of occlusal examination and basic principles involved</b></p> <p>A. Used in/when:</p> <ol style="list-style-type: none"> <li>1. Conjunction with PA or BW</li> <li>2. To visualize large areas of the maxilla or mandible</li> <li>3. Area of interest is larger than a PA receptor</li> <li>4. Placement of the receptor is too difficult</li> </ol> <p>B. Basic Principles</p> <ol style="list-style-type: none"> <li>1. Receptor placed with the tube side facing</li> </ol>	<p><b>PP Slide #4: Terminology</b></p> <p><b>Q:</b> What does the term occlusion refer to?</p> <p><b>A:</b> The chewing surface of the teeth.</p> <p><b>Note:</b> Show two different types of occlusal film sizes and then pass it around the class so students can observe</p> <p><b>Q:</b> What is one important step before taking an occlusal radiograph?</p> <p><b>A:</b> Explain the procedure to the patient</p> <p><b>PP Slide #5: Purpose of Occlusal Examination</b></p> <p><b>PP Slide #6: Purpose of Occlusal Examination Continued</b></p> <p><b>PP Slide #7: Uses of Occlusal Technique</b></p> <p><b>PP Slide #8: Basic Principles of Occlusal Technique</b></p>

2. White side facing the arch
3. Digital sensors must face the arch
  - a. Flat non-wired
  - b. Non-battery side
4. Placed in the mouth between the occlusal
5. Inform patient to "Gently" bite

#### IV. Patient and equipment preparations

1. Infection control protocol
2. Explain procedure
3. Adjust the chair
  - a. Upright position
  - b. Comfortable working height
4. Maxillary occlusal exposure
  - a. Arch parallel to the floor
  - b. Midsagittal plane perpendicular to the floor
5. Mandibular occlusal exposure
  - a. Pt's head reclined
  - b. Occlusal plane perpendicular to the floor
6. Lead apron with thyroid collar
7. Set exposure control factors
  - a. Kilovoltage
  - b. Milliamperage
  - c. Time
8. PID used
  - a. Short- 8 inches
  - b. Long- 16 inches

#### V. Maxillary Occlusal Projections

- A. Topographic: used to examine
  1. Palate
  2. Maxillary anterior teeth
- B. Lateral (right or left): used to examine
  1. Palatal roots of molars
  2. Foreign bodies
  3. lesions in the posterior teeth
- C. Pediatric: used to examine
  1. Anterior teeth
  2. Children 5 years or younger

#### VI. Mandibular Occlusal Projections

- A. Topographic: used to examine
  1. Anterior Teeth

**Q:** While taking occlusal radiographs, how should the patient bite on the receptor?

**A:** Gently

**Note:** Show them how to place the film on typodont. Position the wide part of the film across the teeth, leaving about 1/4<sup>th</sup> of the borders on both sides. Then pass it around in the class so students can observe.

**PP Slide #9:** Patient and Equipment Preparations

**Q:** Would we obtain a clear image if a patient has a retainer, dentures or chewing gum?

**A:** No.

**Note:** A short PID is used to expose the mandibular area and a long PID is used to expose the maxillary area.

**PP Slide #10:** Differentiate between Occlusal projections

**PP Slide #11:** Identify the projections

**Note:** Image 1-Topographic mandibular, Image 2-Cross-sectional mandibular occlusal projection

**PP Slide #12:** Identify the projections

**NOTE:** Image 1-Topographic maxillary, Image 2-lateral right maxillary occlusal projection

B. Cross-sectional: used to examine

1. Buccal
2. Lingual
3. Locate
  - a. Foreign bodies
  - b. Salivary stones

C. Pediatric: used to examine

1. Anterior teeth
2. Children 5 years or younger

### VII. Vertical Angulations of the Occlusal Projections (degrees)

A. Maxillary

1. Topographic: +65
2. Lateral (right or left): +60
3. Pediatric: +60

B. Mandibular

1. Topographic: -55
2. Cross-sectional: 90
3. Mandibular pediatric: -55

### VIII. Purpose of localization techniques and their uses

A. Purpose

1. To obtain three-dimensional information

B. Uses: To locate

1. Foreign bodies
2. Impacted teeth
3. Retained roots
4. Salivary tones
5. Jaw fractures
6. Broken needles
7. Broken instruments
8. Dental restorative materials

C. Types:

1. Buccal object rule
2. Right-angle technique

### IX. Buccal-object rule

1. 2 radiographs at different angulations
2. 1 with proper angulation
3. 2<sup>nd</sup> change in direction of x-ray beam
4. Same direction, position lingual
5. Opposite direction, position buccal
6. SLOB rule

PP Slide #13: Identify the projections

Note: Image 1-pediatric mandibular occlusal projection, Image 2- pediatric maxillary occlusal projection

PP slide #14: Projections and Vertical Angulations

PP Slide #15: Localization Techniques

Q: Why is it important to locate a foreign object accurately?

A: For Proper diagnosis and treatment

PP Slide #16: Types of localization technique

PP Slide #17: Buccal Object Rule

Note: Play Slob rule videos  
<https://www.youtube.com/watch?v=CptXqX3BZwl>

Note: Please pay attention at the end of this video we will discuss whether the object moved distally or mesially

**X. Right-angle technique**

1. 1 PA receptor is exposed at 90 degrees
2. Position of the object
3. Superior-inferior
4. Anterior posterior
5. Occlusal receptor is used
6. To locate objects in mandible
7. Images are compared to find objects in 3-D

<https://www.youtube.com/watch?v=vLenLd4RrPI>

**Q:** What does SLOB stand for?

**A:** Same-lingual, Opposite-Buccal

**PP Slide:** #18,19,20,21 Examples of SLOB rule

**PP Slide:** #22 Right-Angle Technique

**PP Slide:** #23,24 Example of Right-Angle Technique

**PP Slide:** #25,26,27,28,29,30,31,32 Given images, apply the slob rule

LESSON CONTENT	NOTES – MEDIA – Q/A
<p><b>SUMMARY:</b>            Today we discussed the occlusal techniques and localization methods used in dental radiology. Occlusal techniques are important as they allow clinicians to examine larger areas of mandible or maxilla and guide in identifying conditions such as impacted teeth, foreign objects, fractures and salivary stones. We also reviewed different types of maxillary and mandibular occlusal projections along with their recommended vertical angulations.</p> <p>Additionally, explore certain localization techniques, like the buccal object rule (SLOB rule), and the right-angle technique that helps in determining the 3-D position of objects within the oral cavity. Knowledge of these techniques allows dental professionals to gain more accurate diagnostic information and improve patient care.</p>	<p>PP Slide #33: Summary</p> <p>Note: Thank the learners for their attention and participation.</p> <p>Q: What stood out to you most from today's lectures?</p> <p>A: Responses will vary. Identify and clarify any misconceptions.</p>

## Test Items

**Objective #1: Describe the patient's equipment and equipment preparations that are necessary before using the occlusal technique.**

**Test Item #1:** What is the most important thing to consider when preparing the patient and equipment for an occlusal examination?

- a. Following infection control protocols
- b. Explaining the procedure to the patient
- c. Adjusting the chair properly
- d. All of the above

**Objective #2: List uses of occlusal examination.**

**Test Item #2:** Which of the following is the use of occlusal radiography?

- a. Locating salivary stones and foreign objects
- b. Detecting only gingival inflammation
- c. Evaluating only enamel thickness
- d. Measuring blood pressure

**Objective #3: Describe buccal object rule.**

**Test Item #3:** According to the buccal object rule (SLOB), if an object moves in the opposite direction of the tube shift, where is it located?

- a. Lingual
- b. Occlusal
- c. Buccal
- d. Distal

**Objective #4: State vertical angulations for maxillary and mandibular projections.**

**Test Item #4:** State two recommended vertical angulations for occlusal projections.

**Objective #5. State purpose of localization techniques.**

**Test Item #5:** What is the purpose of localization techniques used in dental radiography?

**Correct Answer Key:**

1. D

2. A

3. C

4. Maxillary topographic: +65°, Maxillary lateral: +60°, Mandibular topographic: -55°, Mandibular cross-sectional: 90°

5. To obtain three-dimensional information and accurately determine the position of objects such as impacted teeth, foreign bodies, or salivary stones within the jaws.