

Department: Oral Pathology, Radiology, and Medicine

Course Title: Clinical Oral Radiology

Course Number: 86:161

Curriculum Level: III year (Junior)

Course Director: Dr. A. Ruprecht office: 335-7341
 home: 337-5044
 email: axel-ruprecht@uiowa.edu
 Website: ruprecht.radiology.uiowa.edu

Course Contributors: Dr. V. Allareddy
 Dr. T. Bamgbose
 Dr. R. Elvers
 Dr. S. Gonzalez
 Dr. J. Hellstein
 Dr. G. Kienzle
 Dr. J. Maxwell
 Dr. D. Sarasin
 Dr. R. Spieker
 Dr. S. Vincent
 Ms. R. Stanley
 Ms. S. Holte
 Ms. K. Ihns
 Ms. L. Krotz

Students seeking academic accommodations for disabilities should contact Dr. Ruprecht and/or the Associate Dean for Student Affairs.

I. COURSE DESCRIPTION

The emphasis in this course is the clinical application of the skills and knowledge acquired in freshman and sophomore courses. Students make and interpret radiographs of patients attending for diagnostic work-ups or other treatment in the College, as well as taking part in clinical radiologic conferences (CRCs).

Attendance during clinic hours, as well as assigned noon hour coverage is mandatory, as is adherence to the College of Dentistry clinic dress code. Any planned absences must be approved by the course director and coordinated with the Radiology Supervisor (Ms. Rosemary Stanley) at least 5 working days prior to the absence. Emergency absences must be reported to the Associate Dean for Student Affairs office as soon as possible. If deemed appropriate by the course director, a doctor's note explaining the reason for absence may be required. Failure to comply could result in a failing grade. (See Remediation below)

II. SYNOPSIS OF GOALS

The student will be able to:

1. make standard radiographs required in daily dental practice.
2. interpret standard radiographs required in daily dental practice. These may be analog (film-based) or digital.
3. demonstrate and utilize problem solving abilities by interpreting radiographs in CRCs that utilize and integrate knowledge previously acquired in various areas of the dental program up to that time.

III. COURSE OUTLINE

1. CRCs as per the schedule posted by the department, will be held with a member of the radiology teaching staff. Students take turns interpreting radiographs and discussing how the interpretations were derived. Students may be asked to defend those interpretations against alternative interpretations by classmates, and may be asked to suggest appropriate treatments (to show that the actual nature of the finding is understood).
2. Radiographs are made of patients, during the assigned half-day radiology rotations, and interpreted for review with one of the doctors in radiology.
3. Radiographs of patients made by staff members, other students or faculty may also be assigned for interpretation and review with one of the doctors in radiology.

IV. METHODOLOGY

Required Textbooks

Agur, A.M.R., Lee, M.J. Grant's Atlas of Anatomy, 10th ed. Lippincott, Williams & Wilkins, Baltimore, 1999.

White, S.C., Pharoah, M.J. Oral Radiology: Principles and Practice. 5 ed. Mosby, St. Louis, 2004.

Recommended Textbooks

Curry, T.S., Dowdey, J.E. and Murray, R.C. jr. Christensen's Physics of Diagnostic Radiology, current ed. Lea & Febiger, Philadelphia.

Selman, J. Fundamentals of X-Ray and Radium Physics, current ed. Charles C. Thomas, Springfield.

Recommended Other Reading

- ADA and FDA. The Selection of Patients for Dental Radiographic Examinations 2004. http://ada.org/prof/resources/topics/topics_radiography_examinations.pdf
- Hardman, P.K. Tilman, M.F. and Taylor, T.S. Radiographic solution contamination. Oral Surg, Oral Med, Oral Pathol 63:733-737, June 1987.
- Hardison, J.D., Rafferty-Parker, D., Mitchell, R.J. and Bean, L.R. Radiolucent halos associated with radiopaque composite resin restorations. JADA 118:595-597, 1989.
- Kodak. Successful Intraoral Radiography, Eastman Kodak Co., Rochester.
- Kodak. Successful Panoramic Radiography, Eastman Kodak Co., Rochester.
- Kodak. Quality Assurance in Dental Radiography, Eastman Kodak Co., Rochester.
- Langland, O.E. and Sippy, F.H. Anatomic Structures as Visualized on the Orthopantomogram. Oral Surg, Oral Med, Oral Pathol 26:475-484, 1968.
- MacDonald, J.C., Reid, J.A. and Berthoty, D. Drywall construction as a dental radiation barrier. Oral Surg, Oral Med, Oral Pathol 55:319-326, March 1983.
- Marx, R.E. and Johnson, R.P. Studies in the osteoradionecrosis and their clinical significance. Oral Surg, Oral Med, Oral Pathol 64:379-390, October, 1987.
- Reid, J.A. and MacDonald, J.C. Use and workload factors in dental radiation-protection design. Oral Surg, Oral Med, Oral Pathol 57:219-224, February, 1984.
- Ruprecht, A. Radiologic Anatomy. University of Iowa, Iowa City, 1987.
- Ruprecht, A. [Oral and Maxillofacial Radiology Policy, Procedures and Information Manual](http://ruprecht.radiology.uiowa.edu) <http://ruprecht.radiology.uiowa.edu>

Recommended Other Study (Available from radiology staff or the web.)

- Ruprecht, A. The Paralleling Technique (videotape self study material)
- Ruprecht, A. Occlusal Projections (slide-book self study material)
- Ruprecht, A. Anatomy of the Maxilla (<http://ruprecht.radiology.uiowa.edu> – online autotutorials)
- Ruprecht, A. Anatomy of the Mandible (<http://ruprecht.radiology.uiowa.edu> – online autotutorials)
- Ruprecht, A. Anatomy on Pantomographs (<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

Glass, B.J., mod. Ruprecht, A. A Practical Panoramic Primer (slide-book self study material)

Ruprecht, A. Radiologic Interpretation of Caries
(<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

Ruprecht, A. Radiologic Interpretation of Periodontal Disease
(<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

Ruprecht, A. Variations in Size Shape and Number of Teeth
(<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

Ruprecht, A. Boning Up for Boards (<http://ruprecht.radiology.uiowa.edu> – online lectures)

Ruprecht, A. Find the Caries (<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

Ruprecht, A. Interactive OMR Review Questions
(<http://ruprecht.radiology.uiowa.edu> – online autotutorials)

V. PRE-REQUISITES AND/OR CO-REQUISITES

A. Pre-requisites

Gross Anatomy 60:101

Fundamentals of Oral Radiology 86:120

Basic Oral Surgery 87:130

Oral Pathology 86:135

Introduction to Clinical Oral Radiology 86:145

B. Co-requisites

Clinical Oral Diagnosis 86:160

VI. BEHAVIORAL OBJECTIVES

1. The student will be able to make a CMS.
2. The student will be able to make a pantomograph.
3. The student will be able to make the various occlusal radiographs

4. The student will be able to interpret the radiographs s/he makes, at the level of ability expected of a competent dental general practitioner.

VII. MEASUREMENT AND EVALUATION

Clinical performance	40%
(Interpretation	30%)
(Deportment	10%)
Final examination	60%

The student must receive a minimum overall mark of 70%, and complete all radiology reports by one week after the date of the radiographs (or sooner if so directed) and all clinical assignments by one week after the end of the rotation in order to pass the course.

Grading is 90+ = A; 80-89 = B; 70-79 = C; <70 = F. +/- is not used.

Remediation

A student who does not attend all the preclinical and clinical sessions for valid reasons (sudden illness or similar problem for the student or a member of her/his family, or who has previously arranged, with approval of the course director, to be absent for a valid reason) can arrange to have a make-up sessions for missed preclinical procedures, provided such make-up sessions are arranged as soon as possible after the problem, and are completed prior to the end of the semester, unless there is a valid reason for an extension being granted. All decisions in this regard are made by the course director, and that decision will be final.

A student who fails to achieve a passing grade may, if approved by the course director, be granted a supplemental examination and/or remedial clinical activities, whichever is appropriate. The decision will be partially based upon the course director's evaluation of the student's knowledge base, and whether a review of material by the student should allow her/him to adequately understand the material. Passing such an examination or clinical sessions will result in a grade of C regardless of the mark achieved. Failure will require the student to repeat the course and achieve a passing grade. A supplemental examination is not a right, nor is it automatic. Students should not plan their studies upon such a contingency.

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: 20 CMS

Referring Dr.: John Smith

Date of Report: July 20, 2004

Teeth Present

1																
32	31	30	29	28	27	26	25	24	23	22	21			19	18	
																17

Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

		D					D						M(R)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	M													M	
	D													O	
														D	

Periodontal Assessment

The generalized horizontal bone level is 1-2 mm apical to the CEJ.

There is evidence of vertical bone loss of 19M.

There is no evidence of furcation involvement.

The generalized root form is tapering and the root length is within the range of normal.

C:R = 2:3

The proximity of the roots is within the range of normal.

Overhanging margins: 19MD, 30M.

There is mesial drifting and tipping of 19 and 18.

The width of the periodontal ligament space is within the range of normal.

Open contacts: 23//22//21.

The portrayed borders of the maxillary sinuses are draped over the roots of 1, 2, 3, 13, 14 and 15, and superior to the roots of 4 and 12.

Calculus:

27 26 25	24 23 22	14
----------	----------	----

Periapical/Parapical/Periodental Findings

R = rarefying osteitis; S = sclerosing osteitis; H = hypercementosis;
P = periapical cemento-osseous dysplasia; A = alveolo-osseous induction effect;
E = enostosis; X = external resorption, O = Other (q.v.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	O	O											E		

Other

There is a radiopaque mass situated between the mandibular right first and second molar. The radiopacity is that of metal. The appearance is consistent with a metallic foreign body, probably an amalgam fragment.

The portrayed borders of the maxillary sinuses appear to be intact. There is a radiopaque, dome-shaped mass located on the floor of the right maxillary sinus. The appearance is consistent with a mucous retention pseudocyst.

The generalized bone pattern is within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

Y. Mee
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: OC-100™, 4 BWs

Referring Dr.: John Hancock

Date of Report: July 20, 2004

Teeth Present

1																
32	31	30	29	28	27	26	25	24	23	22	21			19	18	
																17

Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

		D												M(R)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	
	M															M
	D															O
																D

Periodontal Assessment

The generalized horizontal bone level is 1 mm apical to the CEJ.

There is evidence of vertical bone loss of 19M.

There is no evidence of furcation involvement.

The generalized root form is tapering and the root length is within the range of normal.

C:R = 2:3

The proximity of the roots is within the range of normal.

No overhanging margins are evident.

There is mesial drifting and tipping of 19 and 18.

The width of the periodontal ligament space is within the range of normal.

Open contacts: 23//22//21.

The portrayed borders of the maxillary sinuses are draped over the roots of 1, 2, 3, 13, 14, 15 and 16, and superior to the roots of 4 and 12.

Calculus:

27	14
----	----

Periapical/Parapical/Periodental Findings

R = rarefying osteitis; S = sclerosing osteitis; H = hypercementosis;
P = periapical cemento-osseous dysplasia; A = alveolo-osseous induction effect;
E = enostosis; X= external resorption , O = Other (q.v.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	O	O											E		

Other

There is a radiopaque mass situated between the mandibular right first and second molar. The radiopacity is that of metal. The appearance is consistent with a metallic foreign body, probably an amalgam fragment.

The portrayed borders of the maxillary sinuses appear to be intact; there is no evidence of antral pathosis.

The generalized bone pattern and jaw morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

I.M. Overworked
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: OP-10™

Referring Dr.: Francis Marion

Date of Report: July 20, 2004

Teeth Present

1																
32	31	30	29	28	27	26	25	24	23	22	21			19	18	
																17

Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

			D													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	
																M

Periodontal Assessment

The generalized horizontal bone level is 1-2 mm apical to the CEJ.

There is no evidence of vertical bone loss.

There is no evidence of furcation involvement

The generalized root form is tapering and the root length is within the range of normal.

C:R = 2:3

The proximity of the roots is within the range of normal.

No overhanging margins are evident.

There is mesial drifting and tipping of 19 and 18.

The width of the periodontal ligament space is within the range of normal.

No open contacts evident.

The portrayed borders of the maxillary sinuses are draped over the roots of 1, 2, 3, 13, 14, 15 and 16, and superior to the roots of 4 and 12.

**Periapical/Parapical/
Periodental Findings**

R = rarefying osteitis; S = sclerosing osteitis; H = hypercementosis;
P = periapical cemento-osseous dysplasia; A = alveolo-osseous induction effect;
E = enostosis; X = external resorption , O = Other (q.v.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	O	O											E		

Other

There is a radiopaque mass situated between the mandibular right first and second molar. The radiopacity is that of metal. The appearance is consistent with a metallic foreign body, probably an amalgam fragment.

The portrayed borders of the maxillary sinuses appear to be intact; there is no evidence of antral pathosis.

The generalized bone pattern and jaw morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

Lettmee Brybeyu
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: 4 BWs

Referring Dr.: Patrick Henry

Date of Report: July 20, 2004

Teeth Present

1															
	2	3	4	5	6?										
32	31	30	29	28	27?										
															17

Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

		D												M(R)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	
	M															
	D															
														M		
														O		
														D		

Periodontal

The generalized horizontal bone level is 1-2 mm apical to the CEJ.

There is evidence of vertical bone loss of 19M.

There is no evidence of furcation involvement.

No overhanging margins are evident.

There is mesial drifting and tipping of 19 and 18.

Open contacts: 23//22//21.

Calculus: $\frac{27}{22} \quad 14$

Other

The generalized bone pattern is within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

R.U. Kydding
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: 1 periapical

Referring Dr.: Patrick Henry

Date of Report: July 20, 2004

Teeth Present



Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

													M(R)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Periodontal Assessment

The generalized horizontal bone level is 1-2 mm apical to the CEJ.

There is no evidence of vertical bone loss.

There is no evidence of furcation involvement

The generalized root form is tapering and the root length is within the range of normal.

C:R = 2:3

The proximity of the roots is within the range of normal.

No overhanging margins are evident.

The width of the periodontal ligament space is within the range of normal.

No open contacts evident.

The portrayed borders of the maxillary sinuses are draped over the roots of 13, 14 and 15.

Calculus: _____ | _____ 14

Other

The portrayed border of the left maxillary sinus appears to be intact; there is no evidence of antral pathosis.

The generalized bone pattern is within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

Sofar Sogood
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 27

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: 20 CMS

Referring Dr.: John Smith

Lateral cephalometric skull

Date of Report: July 20, 2004

Teeth Present

1																	
32	31	30	29	28	27	26	25	24	23	22	21			19	18		
																	17

Caries: G = Gross; M = Mesial; O = Occlusal/Incisal; D = Distal; F = Facial; L = Lingual/Palatal
(i) = Incipient; (R) = recurrent

		D					D						M(R)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	M													M	
	D													O	
														D	

Periodontal Assessment

The generalized horizontal bone level is 1-2 mm apical to the CEJ.

There is evidence of vertical bone loss of 19M.

There is no evidence of furcation involvement.

The generalized root form is tapering and the root length is within the range of normal.

C:R = 2:3

The proximity of the roots is within the range of normal.

No overhanging margins are evident.

There is mesial drifting and tipping of 19 and 18.

The width of the periodontal ligament space is within the range of normal.

Open contacts: 23//22//21.

The portrayed borders of the maxillary sinuses are draped over the roots of 1, 2, 3, 13, 14, 15 and 16, and superior to the roots of 4 and 12.

Calculus:

27 26 25	24 23 22	14
----------	----------	----

Periapical/Parapical/Periodental Findings

R = rarefying osteitis; S = sclerosing osteitis; H = hypercementosis;
 P = periapical cemento-osseous dysplasia; A = alveolo-osseous induction effect;
 E = enostosis; X= external resorption , O = Other (q.v.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
	O	O											E		

Other

There is a radiopaque mass situated between the mandibular right first and second molar. The radiopacity is that of metal. The appearance is consistent with a metallic foreign body, probably an amalgam fragment.

The portrayed borders of the paranasal sinuses appear to be intact; there is no evidence of pathosis in these sinuses.

The airway appears patent.

Parts of the first through third cervical vertebrae are depicted. There is posterior ponticle formation on C-1. There is a normal width of prevertebral soft tissue.

The generalized bone pattern and jaw morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
 Professor & Director
 Oral & Maxillofacial Radiology

Iyam Neerlibroke
 Junior Dental Student
 Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Russell, William

Age: 10-3

Sex: M

Number: 4523

Date of Images: July 16, 2004

Type: OC-100™

Referring Dr.: John Smith

Lateral cephalometric skull

Date of Report: July 20, 2004

Teeth Present

1	2	4	6		11	13	15
	3	A	5	C	7	8	9
	30	28	27	26	25	24	23
32	31	29				22	18
						21	K
							19
							17

Orthodontic/Pediatric Assessment

The dental age and chronological age appear to coincide. The occlusal development is within the range of normal, except for the missing teeth noted above.

Other

The portrayed borders of the paranasal sinuses appear to be intact; there is no evidence of pathosis in these sinuses.

The airway appears patent, but there is evidence of marked adenoidal hyperplasia.

Parts of the first and second cervical vertebrae are depicted. No gross abnormalities are seen. There is a normal width of prevertebral soft tissue.

The generalized bone pattern and jaw morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

X. Sepshunal
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: <u>Reindeer</u> , Rudolph R.N.	Age: 10-3	Sex: M
Number: 4523		
Date of Images: July 16, 2004	Type: OC 100™	
Referring Dr.: S. Klause	Lateral cephalometric skull	
Date of Report: July 20, 2004	PA Hand/Wrist (Carpal Index)	

Teeth Present

1	2		4		6					11		13		15	
		3	A	5	C	7	8	9	10	H	12	J	14		
		30		28	27	26	25	24	23		21	K	19		
32	31		29							22				18	17

Orthodontic/Pediatric Assessment

The dental age, skeletal age and chronological age appear to coincide. The occlusal development is within the range of normal, except for the missing teeth noted above.

Other

The portrayed borders of the paranasal sinuses appear to be intact; there is no evidence of pathosis in these sinuses.

The airway appears patent, but there is evidence of marked adenoidal hyperplasia.

Parts of the first and second cervical vertebrae are depicted. No gross abnormalities are seen. There is a normal width of prevertebral soft tissue.

The generalized bone pattern, jaw, hand and wrist morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

Matt Finish
Junior Dental Student
Oral & Maxillofacial Radiology

Radiology Report

Oral and Maxillofacial Radiology
University of Iowa
College of Dentistry

Patient: Lateralis, Norma

Age: 12-5

Sex: F

Number: 9876

Date of Images: July 16, 2004

Type: Lateral Cephalometric Skull

Referring Dr.: John Adams

Date of Report: July 20, 2004

The portrayed borders of the paranasal sinuses appear to be intact; there is no evidence of pathosis in these sinuses.

The airway appears patent, but there is evidence of moderate adenoidal hyperplasia.

Portions of the first through third cervical vertebrae are depicted. No gross abnormalities are seen. There is a normal width of prevertebral soft tissue.

The generalized bone pattern and jaw morphology are within the range of normal.

A. Ruprecht, D.D.S., F.R.C.D.(C)
Professor & Director
Oral & Maxillofacial Radiology

Natalie Attyred
Junior Dental Student
Oral & Maxillofacial Radiology