

SYLLABUS  
ORT 620 - ORAL PHARYNGEAL FUNCTION, PART I  
Second-Year Graduate Orthodontics  
Course Director: Dr. E. Preston Hicks

**COURSE DESCRIPTION**

This course concerns the neuromuscular dimensions of oral-facial function. Specific topics covered include nasal airway and facial growth, speech development and interactions of diagnosis and management of patients with speech and swallowing deviations, nasal anatomy and function and relationships with referral of patients with suspected airway problems, relationship of muscle activity and dental arch development and stability issues, and applied muscle physiology as related to basic concepts of functional jaw orthopedics.

All material covered is based on assigned reading from the current literature which is discussed in seminar. Prerequisite: Second year standing in the graduate orthodontics program.

**COURSE OBJECTIVES**

Students will demonstrate understanding of the neuromuscular function of the face and oral cavity and the importance of these concepts to the diagnosis, treatment, and maintenance of orthodontic patients. They will understand the need for proper referral to speech and language pathologists, pediatricians, and otorhinolaryngologists.

**EVALUATION**

Performance will be based on student preparedness for seminar discussions. Consistent excellent seminar preparation and participation will earn an Honors grade. Acceptable performance will earn a Pass grade. Students are expected to abide by the College Honor Code standards.

**COURSE SCHEDULE  
ORT 620**

**DIRECTOR: DR. E. PRESTON HICKS  
ORT 620: ORAL PHARYNGEAL FUNCTION, PART I**

<b><u>SESSION</u></b>	<b><u>TOPIC</u></b>	<b><u>LECTURER</u></b>
1	The Functional Paradigm	Dr. Hicks
2	Functional Jaw Orthopedics	Dr. Hicks
3	Applied Concepts of Muscle Physiology and FJO	Dr. Hicks
4	Functional Jaw Orthopedics Clinical Appliances	Dr. Hicks
5	Mastication, Swallowing and Related Activity	Dr. Hicks
6	Managing the Vertical Dimension	Dr. Hicks
7	Muscle Activity & Malocclusion	Dr. Kluemper
8	Appl. Concepts to Changing Arch Forms	Dr. Kluemper
9	Guest Speaker: Dr. Ann Kummer	
10	Nasal Airway and Craniofacial Growth	Dr. Hicks
11	Anatomy of Nasal Airway and Diagnostics of Nasal Airway Impairment	Dr. Hicks

## COURSE OUTLINE AND READING ASSIGNMENTS

### SESSION 1: THE FUNCTIONAL PARADIGM

DR. HICKS

Carlson, David S. Growth modification from molecules to mandibles. In: Growth Modification: What Works, What Doesn't, and Why. Ed. James A McNamara, Jr.; Craniofacial Growth Series, Vol. 35, 1999, pp 17-61.

Frankel, R. Clinical implications of Roux's concept in orofacial orthopedics. In: The Enigma of the Vertical Dimension. Ed. James A McNamara, Jr. Craniofacial Growth Series, Vol 36, 2000, pp 21-40.

Tourne, Luc P.M. The long face syndrome and impairment of the nasopharyngeal airway. The Angle Orthodontist 60(3):167-176, 1990.

### SESSION 2: FUNCTIONAL JAW ORTHOPEDICS

DR. HICKS

DeVicenzo, J. P., Huffer, R. A., Winn, M. W. A study in human subjects using a device designed to mimic the protrusive functional appliances used previously in monkeys. AJODO 91:213-224, 1987.

Chapter 16, The Function Regulator (FR-2) of Frankel and Chapter 23, The Function Regulator (FR-3) of Frankel, In: Orthodontics and Dentofacial Orthopedics, Eds: McNamara, JA, Jr., Brudon, WL. (publisher Needham Press, Inc.) , 2001.

Frankel, Rolf. Lip seal training in the treatment of skeletal open bite. European Journal of Orthodontics 2:219-228, 1980.

### SESSION 3: APPLIED CONCEPTS OF MUSCLE PHYSIOLOGY AND FJO

DR. HICKS

**Dr. Garfinkle (please prepare written abstracts of the following articles for distribution)**

Ingervall, B., Bitsanis, E. Function of masticatory muscles during the initial phase of activator treatment. European Journal of Orthodontics 8:172-184, 1986.

Ingervall, Bengt and Thuer, Urs. Temporal muscle activity during the first year of Class II, Division 1 malocclusion treatment with an activator. AJODO 99:361-368, 1991.

Kiliaridis, S., Georgiakaki, I., Katsaros, C. Masseter muscle thickness and maxillary dental arch width. European Journal of Orthodontics 25:259-263, 2003.

**Dr. Hansen (please prepare written abstracts of the following articles for distribution)**

Auf der Maur, H. J. Electromyographic recordings of the lateral pterygoid muscle in activator treatment of Class II, Division 1 malocclusion cases. European Journal of Orthodontics 2:161-171, 1980.

Thuer, U., Ingervall, B. and Burgin, W. Does the mandible alter its functional position during activator treatment? AJODO 96:477-484, 1989.

Iwasaki, L., Baird, B., McCall, W.D., Nickel, J. Muscle and temporomandibular joint forces associated with chincup loading predicted by numerical modeling. AJODO 124: 530-540, 2003.

**Dr. Long (please prepare written abstracts of the following articles for distribution)**

Carels, C., van Steenburghe, D. Changes in neuromuscular reflexes in the masseter muscles during functional jaw orthopedic treatment in children. AJODO 90:410-419, 1986.

Carels, C., van Steenburghe, D. Posterior periodontal loading plays a key role in the suppression of a short latency excitatory reflex in the masseter muscle in children being treated with the Bionator. European Journal of Orthodontics 8:84-90, 1986.

Pirttiniemi, P., Kantomaa, T., Tuominen, M., Salo, L. Articular disc and eminence modeling after experimental relocation of the glenoid fossa in growing rabbits. Journal of Dental Research 73: 536-543, 1994.

**SESSION 4: FUNCTIONAL JAW ORTHOPEDICS. CLINICAL APPLIANCES DR. HICKS**

Turley, PK: Modification of midfacial growth with maxillary protraction/expansion in Class III malocclusion. In: Growth Modification: What Works, What Doesn't, and Why. Ed. James A McNamara, Jr.; Craniofacial Growth Series, Vol. 35, 1999, pp. 105-121.

Chapter 15. The twin block appliance, Chapter 17. The Herbst appliance, and Chapter 18. The Bionator. In: Orthodontics and Dentofacial Orthopedics, Eds: McNamara, JA, Jr., Brudon, WL. (publisher Needham Press, Inc.) , 2001.

**SESSION 5: MASTICATION, SWALLOWING, AND RELATED ACTIVITY DR. HICKS**

Miller, AJ. Chapter 4. Mandibular Rest Position, Chapter 5. Mandibular Muscle Function and Recruitment, Chapter 6. Mastication and Deglutition, and Chapter 10. Craniomandibular Muscle Function and Morphology. In: Craniomandibular Muscles: Their role in function and form. CRC Press 1991.

**SESSION 6: MANAGING THE VERTICAL DIMENSION DR. HICKS**

The following articles are all found in **The Enigma of the Vertical Dimension.** Ed. James A McNamara, Jr. Craniofacial Growth Series, Vol 36, 2000.

**All read:**

Proffit, WR. The Development of Vertical Dentofacial Problems: Concepts from recent human studies. pp 1-20.

Nanda, SK. Characteristics of the Long Face Syndrome, pp 127-146.

Brankovan, M, Woodside, DG, and Rossouw. Overclosure and its relationship to facial morphology, occlusion, orthodontic diagnosis, and treatment planning: a review, pp 147-174.

**NOTE:** Each student is free to select two (2) other articles from this volume that relate to managing the vertical dimension. Prepare written abstracts of the articles you select for distribution.

**SESSION 7: MUSCLE ACTIVITY AND MALOCCLUSION DR. KLUEMPER**

Proffit WR, Knight JM. Tongue pressures and tooth stability after anterior maxillary osteotomy. *J Oral Surgery* 35:798-801, 1977. **Garfinkle**

Rossouw PE. Terminology: Semantics of Postorthodontic Treatment Changes in the Dentition. *Seminars in Orthodontics* 5(3):138-141, September 1999. **Long**

BeGole EA, Sadowsky C. Methodologies for Evaluating Long-Term Stability of Dental Relationships After Orthodontic Treatment. *Seminars in Orthodontics* 5(3):142-150, September 1999. **Hansen**

Proffit WR. Equilibrium theory revisited: Factors influencing position of the teeth. *The Angle Orthodontist* 48:175-186,1978. **Garfinkle**

McNulty EC, Lear CSC, Moorreas CFA. Variability in lip adaptation to changes in incisor position. *J Dent Res* 47:537-547, 1968. **Long**

**SESSION 8: APPL. CONCEPTS TO CHANGING ARCH FORMS DR. KLUEMPER**

Articles will be distributed.

**SESSION 9: GUEST SPEAKER, DR. ANN KUMMER**

**SESSION 10: NASAL AIRWAY AND CRANIOFACIAL GROWTH DR. HICKS**

Harvold EP, Tomer BS, Vargervik K, Chierici G.: Primate experiments on oral respiration. *Am J Orthod* 1981; 79:359-372.

Solow B, Kreiborg S.: Soft-tissue stretching: a possible control factor in craniofacial morphogenesis. Scand J Dent Res 1977; 85:505-507.

Woodside DG, Linder-Aronson S, Lundstrom A, McWilliam J.: Mandibular and maxillary growth after changed mode of breathin. Am J Orthod Dentofac Orthop 1991;100:1-18.

Behlfelt K, Linder-Aronson S, McWilliam J, Neander P, Laage-Hellman J.: Cranio-facial morphology in children with and without enlarged tonsils. Eur J Orthod. 1990;12(3):233-43.

Vig PS, Sarver DM, Hall DJ, Warren DW: Quantitative evaluation of nasal airflow in relation to facial morphology. Am J Orthod 1981;79:263-272.

**SESSION 11: ANATOMY OF NASAL AIRWAY AND DIAGNOSTICS OF NASAL AIRWAY IMPAIRMENT** **DR. HICKS**

Principato JL.: Upper airway obstruction and craniofacial morphology. Otolaryngol Head Neck Surg 1991 Jun;104:881-90.

Vig KWL.: Nasal obstruction and facial growth: The strength of evidence for clinical assumptions.