

SAUDI BOARD RESIDENCY TRAINING PROGRAM

Orthodontics

Promotion Examination

Written Examination Format:

- A written examination shall consist of one paper with not less than 100 MCQs with a single best answer (one correct answer out of four options).
- The examination shall contain type K2 questions (interpretation, analysis, reasoning and decision making) and type K1 questions (recall and comprehension).
- The examination shall include basic concepts and clinical topics relevant to the specialty.
- Clinical presentation questions include history, clinical finding and patient approach. Diagnosis and investigation questions; include the possible diagnosis and diagnostic methods. Management questions; including treatment and clinical management, either therapeutic or non-therapeutic, and complications of management. Materials and Instruments questions; including material properties, usage, and selection of instruments and equipment used. Health maintenance questions; include health promotion, disease prevention, risk factors assessment, and prognosis.

Passing Score for Promotion Exam:

The trainee's performance is assessed in each of the evaluation formulas according to the following scoring system:

Score	Less than 50%	50% – 59.4%	60% - 69.4%	More than 70%
Description	Clear Fail	Borderline Fail	Borderline Pass	Clear Pass

1. To upgrade the trainee from a training level to the next level, She/he must obtain at least a **Borderline Pass** in each evaluation form.
2. The program director may recommend to the local supervision committee to request the promotion of the trainee who did not meet the previous promotion requirement according to the following:
 - A. In case that the trainee gets a **borderline Fail** result in **one** of the evaluation forms, the remaining evaluation forms must be passed with **Clear Pass** in at least **one** of them.
 - B. In case that the trainee gets a **borderline Fail** result in **two** of the evaluation forms to a maximum, provided they do not fall



under the same theme (Knowledge, Attitude, Skills). The remaining evaluation forms must be passed with **Clear Pass** in at least **two** of them.

- C. The promotion must be approved in this case by the scientific council for the specialization.

Blueprint Outlines

Training Level	Evaluation Item	Content	Relative Percentage	Passing Score
R2	Written Examination (120 MCQs, 2 hours) (40%)	Basic Science Topics:		50%
		1. Craniofacial Growth and Development	8%	
		2. Biomechanics	7%	
		3. Biomaterials	5%	
		Orthodontic Topics (R2-R5) *Group I, II, III, or IV (based on the group of literature reviewed during a specific year), <i>see below</i>	30%	
	Annual Report (60%)	Clinical Reports: a- Clinical-Evaluation b- Clinical Log Book	15%	50%
		Research: a- Literature review b- Presentation c- Book review d- Research	15%	50%
Log Book “Clinical Case Review “		20%	50%	
Structure Oral Exam		10%	50%	
Total			100%	60%



Training Level	Evaluation Item	Content	Relative Percentage	Passing Score
R3	Written Examination (120 MCQs, 2 hours) (40%)	Basic Science Topics		50%
		1- Occlusion & Craniofacial Dysfunction	12%	
		2- Behavioral science	8%	
		Orthodontic Topics (R2 & R3) *Group I or II (based on the group of literature reviewed during a specific year), <i>see below</i>	30%	
	Annual Report (60%)	Clinical Reports: a-Clinical-Evaluation b-Clinical Log Book	15%	50%
		Research: a- Lit. review b- Presentation c- Book review d- Research	20%	50%
		Log Book "Clinical Case Review "	0%	0%
Structured Oral Exam		25%	50%	
60%				

R4 R5 final	Annual Report	Clinical Reports: a- Clinical-Evaluation b- Clinical log Book	15%	50%	70%
		Research a-Literature review b-Presentation	15%	50%	
		Clinical case submission of finished cases	30%	50%	
		successful submission of required final 6 clinical cases with Structure Oral Exam	40%	50%	

Note:

- Blueprint distributions of the examination may differ up to +/-3% in each category.
- Percentages and content are subject to change at any time. See the SCFHS website for the most up-to-date information.



Suggested References:

Appendix II. COURSES REFERENCE LIST

ADVANCED ORAL AND MAXILLOFACIAL RADIOLOGY

Sc W, Pharoah MJ. 2009. Oral radiology: principles and interpretation. St Louis, Mo: Mosby Elsevier, Chapter 9-13.

INTEGRATED BASIC SCIENCE COURSE I

Embryology

- Barry Mitchell and Ram Sharma. Embryology: An Illustrated Colour Text, 2nd ed. Edinburgh: Churchill Livingstone, 2009. (ISBN: 0702032255)
- Keith L. Moore, T. V. N. Persaud, and Mark G. Torchia. The Developing Human: Clinically-Oriented Embryology, 9th ed. Philadelphia: Saunders, 2011. ISBN: 1437720021)
- http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1067&context=srhonors_theses

Anatomy

- Clinical Anatomy by Regions, Richard S. Snell, 9th edition, 2011, Lippincott Williams & Wilkins.
- Clinical Neuroanatomy, Richard's Snell, 7th edition, 2009, Lippincott Williams & Wilkins.
- Cunningham's Manual of Practical Anatomy: Volume III: Head, Neck and Brain (Oxford Medical Publications) - G. J. Romanes, 15 editions, 1986.
- Gray's Anatomy: The Anatomical Basis of Clinical Practice, Expert Consult - Online and Print, 40e - Susan Standring. Churchill Livingstone, 2008.
- Last's Anatomy: Regional and Applied - Chummy S. Sinnatamby. Churchill Livingstone, 2011.

Oral Pathology

- Oral and Maxillofacial Pathology, 3rd Edition, Saunders/Elsevier, St. Louis, MO 2009.
- Oral Pathology: Clinical Pathological Correlations, 6th Edition, Saunders/Elsevier, St. Louis, MO 2012.



- Color Atlas of Common Oral Diseases, 3rd Edition, Lippincott, Williams & Wilkins, Baltimore, MD, 2003.

INTEGRATED BASIC SCIENCE COURSE II

Oral Biology

1. Biological changes in PDL and bone during orthodontic treatment:

- Contemporary Orthodontics, William R. Profitt, 5th Edition
- Orban's Oral Histology and Embryology 13th Edition
- Ten Cate's Oral Histology 8th Edition

2. Histology of the Cementum and root resorption in Orthodontics

- Contemporary Orthodontics, William R. Profitt, 5th edition
- Current principles and techniques : Graber Vanarsdal : 3rd edition

3. Microanatomy and ultrastructure of the Gingiva and how it is affected during orthodontic treatment

- Carranza's Clinical Periodontology, 10th edition.
- Jan Lindhe, Clinical Periodontology and Implantology, 4th edition.
- Orban's Oral Histology, 12th edition

4. Anatomy and ultrastructure of salivary glands / physiology of salivary secretions.

- William G. Shafer., Maynard K. Hine, Barnet M. Levy. A Text Book of Oral Pathology. 4th edition.
- Stuart C. White, Michael J. Paroah. "Oral Radiology Principles and Interpretation". 5th Edition.
- Lee SJ, Kho HS, Lee SW, Yang WS. Experimental salivary pellicles on the surface of orthodontic materials. Am J Orthod Dentofacial Orthop. 2011;119(1):59-66.
- Agaoglu G, Arun T, Izgi B, Yarat A. Nickel and chromium levels in the saliva and serum of patients with fixed orthodontic appliances. Angle Orthod . 2014;71(5):375-9.

5. Age changes that occurs in the oral and dental tissues.

- Ten Cate's Oral Histology, 8th edition
- Orban's Oral Histology and Embryology, 13th edition
- Oral Anatomy, Histology and Embryology, 3rd edition
- Van Der Velden. Effect of Age on Periodontium. J Clin Periodont 1984; 11:281-294.
- Carranza's Clinical Periodontology 10th edition

6. Effects of drugs and systemic factors on orthodontic treatment

- Gameiro GH, Pereira-Neto JS, Magnani MB, Nouer DF. The influence of drugs and systemic factors on orthodontic tooth movement. J Clin Orthod. 2007 Feb;41(2):73-8.
- Kamatchi Diravidamani, Sathesh Kumar Sivalingam, and Vivek Agarwal. Drugs influencing orthodontic tooth movement: An overall review. J Pharm Bioallied Sci. 2012; 4(Suppl 2): S299–S303.
- Nezar Watted, Peter Proff, Borbély Péter, Abu-Hussein Muhamad. Influence of drugs on orthodontic tooth movement. J Res Med Dent Sci 2014; 2 (4): 1-8.

Articles Related to Biology of Tooth Movement & Tissue Reaction

- Krishnan V, Davidovitch Z. Cellular, molecular, and tissue-level reactions to orthodontic force. Am J Orthod Dentofacial Orthop 129:469 e1-32, 2006
- Krishnan V, Davidovitch Z. On a path to unfolding the biological mechanisms of orthodontic tooth movement. J Dent Res 88:597-608, 2009.
- Meikle MC. The tissue, cellular, and molecular regulation of orthodontic tooth movement: 100 years after Carl Sandstedt. Eur J Orthod 28:221–240, 2006
- Iino S, Sakoda S, Ito G, Nishimori T, Ikeda T, Miyawaki S. Acceleration of orthodontic tooth movement by alveolar corticotomy in the dog. Am J Orthod Dentofacial Orthop 131:448 e1-8, 2007.



- Ren Y1, Maltha JC, Kuijpers-Jagtman AM. Optimum force magnitude for orthodontic tooth movement: a systematic literature review Angle Orthod. 2003 Feb;73(1):86-92..
- Kim SJ, Kang YG, Park JH, Kim EC, Park YG. Effects of low-intensity laser therapy on periodontal tissue remodeling during relapse and retention of orthodontically moved teeth. Lasers Med Sci. 2013 Jan;28(1):325-33. doi: 10.1007/s10103-012-1146-8. Epub 2012 Jul 20
- Proff P, Römer P. The molecular mechanism behind bone remodelling: a review. Clin Oral Investig 13:355-362, 2009
- Von Böhl M, Kuijpers-Jagtman AM. Hyalinization during orthodontic tooth movement: a systematic review on tissue reactions. Eur J Orthod 31:30-36, 2009

Genetics

1. Part 1:

- William R. Proffit. Contemporary Orthodontics, 5th edition
- Robert Moyers. Hand book of orthodontics
- Lee W. Graber, Robert L. Vanarsdall, Katherine W. L.Vig, Greg J. Huang. Current Principles and Techniques 6th edition, page 31-50.

2. Part 2:

- William R. Proffit. Contemporary Orthodontics, 5th edition
- Robert Moyers. Hand book of orthodontics
- Juan Daia, Bakr M. Rabie. Gene Therapy to Enhance Condylar Growth Using rAAV-VEGF. Angle Orthodontist 2008; 78(1): 89-93.
- Vagish Kumar L S. Gene Therapy: Principles and Applications in Dentistry. Research and Reviews: Journal of Dental Sciences 2014; 2(1): 5-12.
- N. Zhao, Y. Liu, H. Kanzaki, W. Liang, J. Ni J. Lin. Effects of local osteoprotegerin gene transfection on orthodontic root resorption during retention: an in vivo micro-CT analysis. Orthodontic and Craniofacial research 2012; 15:10-20.



- H. Kanzaki¹, M. Chiba, Takahashi, N. Haruyama, M. Nishimura, and H. Mitani. Local OPG gene transfer to periodontal tissue inhibits orthodontic tooth movement. *J Dent Res* 83(12):920-925, 2004.
- Nida Siddique , Hira Raza , Sehrish Ahmed , Zohaib Khurshid and Muhammad Sohail Zafar. Gene Therapy: A Paradigm Shift in Dentistry. *Genes* 2016, 7, 98; 1-12.
- ABM Rabie, J Dai and R Xu. Recombinant AAV-mediated VEGF gene therapy induces mandibular condylar growth. *Gene Therapy* (2007) 14, 972–980.

3. Part 3:

- H. Egusa et al. Stem cells in dentistry--part I: stem cell sources. *Journal of Prosthodontic Research*, 2012; 56: 151–165 & 229–248.

RESEARCH METHODOLOGY & SCIENTIFIC WRITING INTEGRATED COURSE

Articles Related to Evidence-Based Orthodontic Practice

- Delière M, Yan-Vergnes W, Hamel O, Marchal-Sixou C, Vergnes JN. Cochrane systematic reviews in orthodontics. *Int Orthod* 8:278-292, 2010
- Lempesi E1, Koletsi D2, Fleming PS3, Pandis N4. The reporting quality of randomized controlled trials in orthodontics *J Evid Based Dent Pract*. 2014 Jun;14(2):46-52. doi: 10.1016/j.jebdp.2013.12.001. Epub 2014 Apr 18.

EDUCATIONAL METHODS

- Tyler, I., Rowlands, M. and Spasoff, R., 2009. An environmental scan of best practices in public health undergraduate medical education: strengths, weaknesses and applicability of teaching methods. *J Assoc Faculties Med Can*, 5, pp.2-14.
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teaching episode. Medical journal of Australia, 180(12), p.643.

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- Lake, F.R. and Hamdorf, J.M., 2004. Teaching on the run tips 5: teaching a skill. Medical journal of Australia, 181(6), p.327.
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- Spencer, J., 2003. ABC of learning and teaching in medicine: Learning and teaching in the clinical environment. BMJ: British Medical Journal, 326(7389), p.591.

BEHAVIORAL SCIENCES

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- Mostofsky, D.I. and Fortune, F., 2013. *Behavioral dentistry*. John Wiley & Sons.
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- Ackerman, M. B., McRae, M.S., Longley, W.H. Microsensor
- Technology to help monitor removable appliance wear. American Journal of Orthodontics and Dentofacial Orthopedics, 135, 549-551, 2009.
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- Machen, D. E. The uncooperative patient: Terminating orthodontic care. American Journal of Orthodontics and Dentofacial Orthopedics, 97(6), 528-529, 1990.
- Ramsay, D.S., Soma, M., and Sarason, I.G. Enhancing patient adherence: The role of technology and its application to orthodontics. In: J.A. McNamara, Jr. and C.A. Trotman (Eds.), Creating the Compliant Patient.



Volume 33, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, 1997.

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- Becker, A. and Shapira, J. Orthodontics for the handicapped child. European Journal of Orthodontics, 18, 262-266, 1985.
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PRACTICE MANAGEMENT

Robbins, S.P. and Coulter, M., 2007. **Principles of management**. Fourth Edition, Tehran: Office of Cultural Studies.

ORTHODONTIC TECHNIQUES INTEGRATED COURSE

Wire Bending

- Manual
- Proffit WR, Fields Jr HW, Sarver DM. **Contemporary orthodontics**, 5th Edition. Elsevier Health Sciences; 2006 Dec 8.
- Singh, G., 2015. **Textbook of Orthodontics**. JP Medical Ltd.



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Typodont

- Manual
- Proffit WR, Fields Jr HW, Sarver DM. Contemporary orthodontics, 5th Edition. Elsevier Health Sciences; 2006 Dec 8.
- Bishara, S.E., 2001. Textbook of orthodontics. WB Saunders.
- Graber, Thomas M., and Brainerd F. Swain. Current orthodontic concepts and techniques. WB Saunders Company, 1975.

Laboratory Fabricated Appliances

- Manual
- Proffit WR, Fields Jr HW, Sarver DM. Contemporary orthodontics, 5th Edition. Elsevier Health Sciences; 2006 Dec 8.
- Graber, Thomas M., and Brainerd F. Swain. Current orthodontic concepts and techniques. WB Saunders Company, 1975.
- McNamara, J.A., Brudon, W.L. and Kokich, V.G., 2001. Orthodontics and dentofacial orthopedics. Needham Press.

CEPHALOMETRIC ANALYSIS

- Jacobson, A., Jacobson, R.L. and Rushton, V.E., 2007. Radiographic Cephalometry: From Basics to 3-D Imaging, (Book/CD-ROM set) (Vol. 2006).

Articles Related to Cephalometric Analysis & Superimposition



- Nielsen IL. Maxillary superimposition: A comparison of three methods for cephalometric evaluation of growth and treatment change. Am J Orthod Dentofacial Orthop 95:422-431, 1989.
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- The Angle Orthodontist Aug 2003, Vol. 73, No. 4 (August 2003) pp. 374-380
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ORTHODONTIC DIAGNOSIS & TREATMENT PLANNING

- Proffit WR, Fields Jr HW, Sarver DM. Contemporary orthodontics, 5th Edition. Elsevier Health Sciences.
- Graber, Thomas M., and Brainerd F. Swain. Current orthodontic concepts and techniques. WB Saunders Company, 1975.

Articles Related to Etiology of Malocclusion

- Xue F, Wong RW, Rabie AB. Genes, genetics, and Class III malocclusion. Orthod Craniofac Res 13:69-74, 2010
- Cassidy SE1, Jackson SR2, Turpin DL3, Ramsay DS4, Spiekerman C5, Huang GJ6.



- Classification and treatment of Class II subdivision malocclusions. Am J Orthod Dentofacial Orthop. 2014 Apr;145(4):443-51. doi: 10.1016/j.ajodo.2013.12.017.
- Ib Leth Nielsen. Vertical malocclusions: etiology, development, diagnosis and some aspects of treatment. The Angle Orthodontist Dec 1991, Vol. 61, No. 4 (December 1991) pp. 247-260
- Richard A. Smith. The Etiology of Angle Class II Division I Malocclusion, The Angle Orthodontist Jan 1939, Vol. 9, No. 1 (January 1939) pp. 15-19
- David Normando, Marco A. O. Almeida and Cátia C. A. Quintão. Dental crowding,.The Angle Orthodontist Jan 2013, Vol. 83, No. 1 (January 2013) pp. 10
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Articles Related to Diagnostic Procedures & Case Analysis

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- Endo T, Uchikura K, Ishida K, Shundo I, Sakaeda K, Shimooka S. Thresholds for clinically significant tooth-size discrepancy. Angle Orthod 79:740-746, 2009
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ORTHODONTIC BIOMATERIALS

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Articles Related to Orthodontic Materials

- Eliades T. Orthodontic materials research and applications: part 1. Current status and projected future developments in bonding and adhesives. Am J Orthod Dentofacial Orthop 130:445-451, 2006.
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CRANIOFACIAL GROWTH AND DEVELOPMENT

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- Tiziano Baccetti, Lorenzo Franchi, James A. McNamara
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ADVANCED ORTHODONTIC SEMINARS

See Appendix III

Note:

This list is intended for use as a study aid only. SCFHS does not intend the list to imply endorsement of these specific references, nor are the exam questions necessarily taken solely from these sources.

Example Questions

EXAMPLE OF K1 QUESTIONS

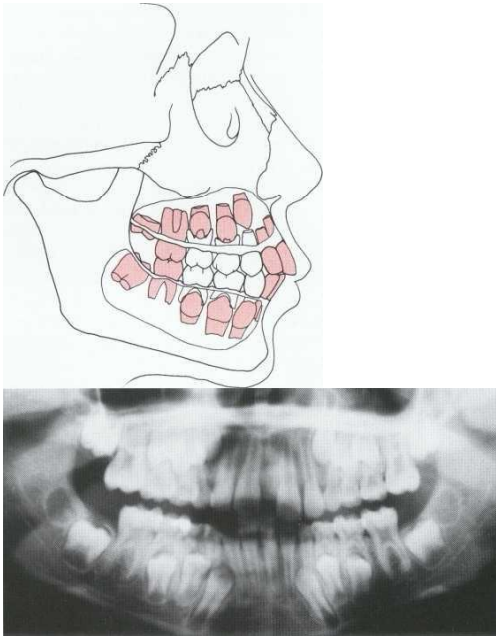
Question 1

Which of the following part of the brain is located in the posterior cranial fossa?

- A. Pons
- B. Spinal cord
- C. The cerebellum
- D. Medulla oblongata

EXAMPLE OF K2 QUESTIONS

Question 1



A young boy came to the clinic with his parents seeking the right time for orthodontic treatment, on examination patient is in the mixed dentition stage, a panoramic view is taken for him illustrated (see images).

What is the most appropriate dental age for him?

- A. Dental age 8
- B. Dental age 9
- C. Dental age 10
- D. Dental age 11