

# SAUDI BOARD RESIDENCY TRAINING PROGRAM ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS

#### **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). Up to 10% unscored items can be added for pretesting purposes.
- 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 nontherapeutic, 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:

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%
Descriptio	Clear Fail	Borderline Fail	<b>Borderline Pass</b>	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:**

No.	Sections	Percentage
1	Orthopedics: Class II , III,Expansion ,Vertical and Transverse	25%
2	Superimposition And Treatment Rationale	10%
3	Anchorage and Extra-oral Force Treatment Rationale	10%
4	Tissue Reactions to Tooth Movement and Retention	8%
5	Speech, Swallowing, Respiratory , Soft tissue and Habits	5%
6	Orthognathic Surgery	20%
7	Interdisciplinary Treatment & Adult Orthodontics	22%
	Occlusion and Temporomandibular Joint Disorders	
	Total	100%

## Notes:

- Blueprint distributions of the examination may differ up to +/-5% in each section.
- Percentages and content are subject to change at any time. See the SCFHS website for the most up-to-date information.
- Research, Ethics, Professionalism, and Patient Safety are incorporated within various domains.

## Suggested References

## **Superimposition**

- 1. Doppel DM, Damon WM, Joondeph DR, Little RM. An investigation of maxillary superimposition techniques using metallic implants. Am J Orthod Dentofacial Orthop. 1994 Feb;105(2):161-8.
- 2. Nielsen IL. Maxillary superimposition: a comparison of three methods for cephalometric evaluation of growth and treatment change. Am J Orthod Dentofacial Orthop. 1989 May;95(5):422-31.
- 3. Nguyen, T., Cevidanes, L., Franchi, L., Ruellas, A., & Jackson, T. (2018). Three-dimensional mandibular regional superimposition in growing patients. American Journal of Orthodontics and Dentofacial Orthopedics, 153(5), 747-754.

#### Speech, Swallowing, Respiratory Function and Habits

- 1. Johnson NC, Sandy JR. Tooth position and speech—is there a relationship? The Angle Orthodontist. 1999 Aug;69(4):306-10.
- 2. Warren JJ, Bishara SE. Duration of nutritive and nonnutritive sucking behaviors and their effects on the dental arches in the primary dentition. Am J Orthod Dentofacial Orthop. 2002 Apr;121(4):347-56.
- 3. Proffit WR, Mason RM. Myofunctional therapy for tongue-thrusting: background and recommendations. The Journal of the American Dental Association. 1975 Feb 1:90(2):403-11.
- 4. Behrents RG, Shelgikar AV, Conley RS,Flores-Mir c, Hans M, Levine M, McNamara JA, Palomo JM, Pliska B, Stockstill JW, Wise J.Obstructive sleep apnea and orthodontics: an American Association of Orthodontists White Paper. American journal of orthodontics and dentofacial orthopedics. 2019 Jul1;156(1):13-28.
- Neelapu BC, Kharbanda OP, Sardana HK, Balachandran R, Sardana V, Kapoor P, Gupta A, Vasamsetti S. Craniofacial and upper airway morphology in adult obstructive sleep apnea patients: a systematic review and meta-analysis of cephalometric studies. Sleep medicine reviews. 2017 Feb 1;31:79-90.
- 6. Fiores-Mir C, Korayem M, Heo C, Witmans M, Major MP, Major PW. Craniofacial morphological characteristics in children with obstructive sleep apnea syndrome. Journal of the American Dental Association (JADA). 2013 Mar 1;144(3).

7. Aboudara C, Nielsen I, Huang JC, Maki K, Miller AJ, Hatcher D. Comparison of airway space with conventional lateral headfilms and 3-dimensional reconstruction from cone-beam computed tomography. Am J Orthod Dentofacial Orthop. 2009 Apr;135(4):468-79.

#### **Tissue Reactions to Tooth Movement**

- 1. Weltman B, Vig KW, Fields HW, Shanker S, Kaizar EE. Root resorption associated with orthodontic tooth movement: a systematic review. American journal of orthodontics and dentofacial orthopedics. 2010 Apr 1;137(4):462-76.
- 2. Bartzela T, Türp JC, Motschall E, Maltha JC. Medication effects on the rate of orthodontic tooth movement: a systematic literature review. American Journal of Orthodontics and Dentofacial Orthopedics. 2009 Jan 1;135(1):16-26
- 3. Zahrowski JJ. Bisphosphonate treatment: an orthodontic concern calling for a proactive approach. American Journal of Orthodontics and Dentofacial Orthopedics. 2007 Mar 1;131(3):311-20.
- 4. Bourguignon, C. et al. (2020) 'International Association of Dental Traumatology Guidelines for the management of traumatic dental injuries: 1. fractures and luxations', Dental Traumatology, 36(4), pp. 314–330. doi:10.1111/edt.12578.

#### **Treatment Rationale**

- 1. Bishara SE, Khadivi P, Jakobsen JR. Changes in tooth size—arch length relationships from the deciduous to the permanent dentition: A longitudinal study. American Journal of Orthodontics and Dentofacial Orthopedics. 1995 Dec 1;108(6):607-13.
- 2. Robertsson S, Mohlin B. The congenitally missing upper lateral incisor. A retrospective study of orthodontic space closure versus restorative treatment. The European Journal of Orthodontics. 2000 Dec 1;22(6):697-710
- Kokich VG. Surgical and orthodontic management of impacted maxillary canines.
   American journal of orthodontics and dentofacial orthopedics. 2004 Sep 1;126(3):278-83.
- 4. Kokich VG, Kokich VO. Congenitally missing mandibular second premolars: clinical options. American Journal of Orthodontics and Dentofacial Orthopedics. 2006 Oct 1;130(4):437-44.



- 5. Stephens CK, Boley JC, Behrents RG, Alexander RG, Buschang PH. Long-term profile changes in extraction and nonextraction patients. American Journal of Orthodontics and Dentofacial Orthopedics. 2005 Oct 1;128(4):450-7.
- 6. Leonardi R, Annunziata A, Licciardello V, Barbato E. Soft tissue changes following the extraction of premolars in nongrowing patients with bimaxillary protrusion: a systematic review. The Angle Orthodontist. 2010 Jan;80(1):211-6.
- 7. Kokich VG, Shapiro PA. Lower incisor extraction in orthodontic treatment: four clinical reports. The Angle Orthodontist. 1984 Apr;54(2):139-53.
- Vilhjálmsson G, Zermeno JP, Proffit WR. Orthodontic treatment with removal of one mandibular incisor: Outcome data and the importance of extraction site preparation. American Journal of Orthodontics and Dentofacial Orthopedics. 2019 Oct 1;156(4):453-63
- 9. George SM, Campbell PM, Tadlock LP, Schneiderman E, Buschang PH. Keys to Class II correction: A comparison of 2 extraction protocols. American Journal of Orthodontics and Dentofacial Orthopedics. 2021 Mar 1;159(3):333-42.
- 10. Yezdani A, Nandhini N, Padmavati R. Serial extraction in orthodontics—A review. European Journal of Molecular & Clinical Medicine. 2020;7(2): 6432-6441.
- 11. O'Shaughnessy. Efficiency of serial extraction and late premolar extraction
- 12. cases treated with fixed appliances. AJODO 139(4):510-16. Apr 2011

## Anchorage: Lip Bumper, Implants, Extraoral Force and Miniscrews

- Hodge JJ, Nanda RS, Ghosh J, Smith D. Forces produced by lip bumpers on mandibular molars. American journal of orthodontics and dentofacial orthopedics. 1997 Jun 1;111(6):613-22.
- 2. Ludwig B, Glasl B, Bowman SJ, Wilmes B, Kinzinger GS, Lisson JA. Anatomical guidelines for miniscrew insertion: palatal sites. Journal of clinical orthodontics: JCO. 2011 Aug;45(8):433-67
- 3. Poggio PM, Incorvati C, Velo S, Carano A. "Safe zones": a guide for miniscrewpositioning in the maxillary and mandibular arch. Angle Orthod. 2006 Mar;76(2):191-7.
- 4. Chen Y, Kyung HM, Zhao WT, Yu WJ. Critical factors for the success of orthodontic minimplants: a systematic review. American Journal of Orthodontics and Dentofacial Orthopedics. 2009 Mar 1;135(3):284-91
- 5. Papageorgiou SN, Zogakis IP, Papadopoulos MA. Failure rates and associatedrisk factors of orthodontic miniscrew implants: a meta-analysis. Am J OrthodDentofacial Orthop. 2012 Nov;142(5):577-595.e7.



- 6. Bondemark L, Karlsson I. Extraoral vs intraoral appliance for distal movement of maxillary first molars: a randomized controlled trial. The Angle Orthodontist. 2005 Sep;75(5):699-706.
- 7. Brosh T, Portal S, Sarne O, Vardimon AD. Unequal outer and inner bow configurations: comparing 2 asymmetric headgear systems. American journal of orthodontics and dentofacial orthopedics. 2005 Jul 1;128(1):68-75.
- 8. Vaughn GA, Mason B, Moon HB, Turley PK. The effects of maxillary protraction therapy with or without rapid palatal expansion: a prospective, randomized clinical trial. Am J Orthod Dentofacial Orthop. 2005 Sep;128(3):299-309
- 9. Papageorgiou SN, Kutschera E, Memmert S, Gölz L, Jäger A, Bourauel C, Eliades T. Effectiveness of early orthopaedic treatment with headgear: a systematic review and meta-analysis. European Journal of Orthodontics. 2017 Apr1;39(2):176-87.
- 10. Bilbo EE, Marshall SD, Southard KA, Allareddy V, Holton N, Thames AM, OtsbyMS, Southard TE. Long-term skeletal effects of high-pull headgear followed by fixed appliances for the treatment of Class II malocclusions. The Angle Orthodontist. 2018 Sep;88(5):530-7

#### **Orthopedics and Class II Treatment**

- 1. Patel HP, Moseley HC, Noar JH. Cephalometric determinants of successful functional appliance therapy. The Angle Orthodontist. 2002 Oct;72(5):410-7.
- 2. Baccetti T, Franchi L, McNamara JAJr. Thecervical vertebral maturation (CVM) method for the assessment of optimal treatment timing in dentofacial orthopedics. *Semin Orthod.* 2005;11:119–129.
- 3. Tulloch JC, Proffit WR, Phillips C. Outcomes in a 2-phase randomized clinical trial of early Class II treatment. American Journal of Orthodontics and Dentofacial Orthopedics. 2004 Jun 1;125(6):657-67.
- 4. Burkhardt DR, McNamara Jr JA, Baccetti T. Maxillary molar distalization or mandibular enhancement: a cephalometric comparison of comprehensive orthodontic treatment including the pendulum and the Herbst appliances. American Journal of Orthodontics and Dentofacial Orthopedics. 2003 Feb 1;123(2):108-16.



- 5. Janson G, Leon-Salazar V, Leon-Salazar R, Janson M, de Freitas MR. Long-termstability of Class II malocclusion treated with 2-and 4-premolar extraction protocols. American Journal of Orthodontics and Dentofacial Orthopedics. 2009 Aug 1;136(2):154-e1.
- 6. Cozza P, Baccetti T, Franchi L, De Toffol L, McNamara Jr JA. Mandibular changesproduced by functional appliances in Class II malocclusion: a systematic review. American Journal of Orthodontics and Dentofacial Orthopedics. 2006 May 1;129(5):599-e1.
- 7. O'Brien K, Wright J, Conboy F, Sanjie Y, Mandall N, Chadwick S, Connolly I, CookP, Birnie D, Hammond M, Harradine N. Effectiveness of early orthodontic treatment with the Twinblock appliance: a multicenter, randomized, controlled trial. Part 1: dental and skeletal effects. American journal of orthodontics and dentofacial orthopedics. 2003 Sep 1:124(3):234-43.
- 8. Siara-Olds NJ, Pangrazio-Kulbersh V, Berger J, Bayirli B. Long-term dentoskeletal changes with the Bionator, Herbst, Twin Block, and MARA functional appliances. The Angle Orthodontist. 2010 Jan;80(1):18-29.
- 9. Cacciatore G, Ghislanzoni LT, Alvetro L, Giuntini V, Franchi L. Treatment and posttreatment effects induced by the Forsus appliance: a controlled clinical study. The Angle Orthodontist. 2014 Nov;84(6):1010-7.

#### **Soft Tissue**

- 1. Sarver DM. The importance of incisor positioning in the esthetic smile: the smile arc. American Journal of Orthodontics and Dentofacial Orthopedics. 2001 Aug 1;120(2):98-111.
- 2. Desai S, Upadhyay M, Nanda R. Dynamic smile analysis: changes with age. American Journal of Orthodontics and Dentofacial Orthopedics. 2009 Sep 1;136(3):310-e1.
- 3. Ker AJ, Chan R, Fields HW, Beck M, Rosenstiel S. Esthetics and smile characteristics from the layperson's perspective: a computer-based survey study. The Journal of the American Dental Association. 2008 Oct 1;139(10):1318-27.
- Arnett GW, Jelic JS, Kim J, Cummings DR, Beress A, Worley CM Jr, Chung B, Bergman R.
   Soft tissue cephalometric analysis: diagnosis and treatment planning of dentofacial deformity. Am J Orthod Dentofacial Orthop. 1999 Sep;116(3):239-53



#### Orthopedics and Class III Treatment

- 1. Ghiz MA, Ngan P, Gunel E. Cephalometric variables to predict future success of early orthopedic Class III treatment. American Journal of Orthodontics and Dentofacial Orthopedics. 2005 Mar 1;127(3):301-6.
- 2. Iwasaki H, Ishikawa H, Chowdhury L, Nakamura S, Iida J. Properties of the ANB angle and the Wits appraisal in the skeletal estimation of Angle's Class III patients. The European Journal of Orthodontics. 2002 Oct 1;24(5):477-83.
- 3. Foersch M, Jacobs C, Wriedt S, Hechtner M, Wehrbein H. Effectiveness of maxillary protraction using facemask with or without maxillary expansion: a systematic review and meta-analysis. Clinical Oral Investigations. 2015 Jul;19(6):1181-92
- 4. Liu W, Zhou Y, Wang X, Liu D, Zhou S. Effect of maxillary protraction with alternating rapid palatal expansion and constriction vs expansion alone in maxillary retrusive patients: a single-center, randomized controlled trial. American Journal of Orthodontics and Dentofacial Orthopedics. 2015 Oct 1;148(4):641-51.

#### **Orthopedics Expansion**

- 1. Baccetti T, Franchi L, Cameron CG, McNamara Jr JA. Treatment timing for rapid maxillary expansion. The Angle Orthodontist. 2001 Oct;71(5):343-50.
- 2. Ghoneima A, Abdel-Fattah E, Hartsfield J, El-Bedwehi A, Kamel A, Kula K. Effects of rapid maxillary expansion on the cranial and circummaxillary sutures. American Journal of Orthodontics and Dentofacial Orthopedics. 2011 Oct 1;140(4):510-9.
- 3. Lagravere MO, Major PW, Flores-Mir C. Long-term dental arch changes after rapid maxillary expansion treatment: a systematic review. The Angle Orthodontist. 2005 Mar;75(2):155-6.
- 4. Garib DG, Henriques JF, Janson G, Freitas MR, Coelho RA. Rapid maxillary expansion—tooth tissue-borne versus tooth-borne expanders: a computed tomography evaluation of dentoskeletal effects. Angle Orthod. 2005 Jul;75(4):548-57
- 5. Marshall SD, Southard KA, Southard TE. Early Transverse Treatment. Semin Orthod 11(3):130-139, 2005.



- 6. Mucedero, M., Fusaroli, D., Franchi, L., Pavoni, C., Cozza, P., & Lione, R. (2018). Long-term evaluation of rapid maxillary expansion and bite- block therapy in open bite growing subjects: A controlled clinical study. The Angle Orthodontis
- 7. Handelman CS, Wang L, BeGole EA, Haas AJ. Nonsurgical rapid maxillary expansion in adults: report on 47 cases using the Haas expander. The Angle Orthodontist. 2000 Apr;70(2):129-44.
- 8. Marchetti C, Pironi M, Bianchi A, Musci A. Surgically assisted rapid palatal expansionvs. segmental Le Fort I osteotomy: transverse stability over a 2-year period. Journal of Cranio-Maxillofacial Surgery. 2009 Mar 1;37(2):74-8.
- 9. Wilmes B, Tarraf N, Drescher D. Treatment of maxillary transversal deficiency by using a mini-implant-borne rapid maxillary expander and aligners in combination. American Journal of Orthodontics and Dentofacial Orthopedics. 2021 Jul 1;160(1):147-54.
- 10. Garrett BJ, Caruso JM, Rungcharassaeng K, Farrage JR, Kim JS, Taylor GD. Skeletal effects to the maxilla after rapid maxillary expansion assessed with cone-beam computed tomography. Am J Orthod Dentofacial Orthop. 2008 Jul;134(1):8-9.
- 11. Pinto, A. S., Buschang, P. H., Throckmorton, G. S., & Chen, P. (2001). Morphological and positional asymmetries of young children with functional unilateral posterior crossbite.

  American Journal of Orthodontics and Dentofacial Orthopedics, 120(5), 513-520.

## **Vertical and Transverse Dimensions**

- 1. Khosravi R, Cohanim B, Hujoel P, Daher S, Neal M, Liu W, Huang G. Management of overbite with the Invisalign appliance. American journal of orthodontics and dentofacial orthopedics. 2017 Apr 1;151(4):691-9.
- 2. Sankey WL, Buschang PH, English J, Owen III AH. Early treatment of vertical skeletal dysplasia: the hyperdivergent phenotype. American Journal of Orthodontics and Dentofacial Orthopedics. 2000 Sep 1;118(3):317-27.
- 3. Al-Buraiki, Sadowsky, Schneider. The effectiveness and long-term stability of overbite correction with incisor intrusion mechanics. AJODO 2005 Jan;127(1)47-55.
- 4. Greenlee GM, Huang GJ, Chen SS, Chen J, Koepsell T, Hujoel P. Stability of treatmentfor anterior open-bite malocclusion: a meta-analysis. Am J Orthod Dentofacial Orthop. 2011 Feb:139(2):154-69. Review.
- 5. Vaden JL, Pearson LE. Diagnosis of the vertical dimension. Semin Orthod 8(3):120-129, 2002.



- 6. Turley PK. Orthodontic management of the short face patient. Semin Orthod 2(2):138-153, 1996.
- 7. Thomas J Cangialosi, Skeletal Morphologic features of anterior open bite. Am J Orthod Dentofacial Orthop 1984; 85:28-36.
- 8. Budi Kusnoto and BernardJ. Schneider. Control of the Vertical Dimension. Semin Orthod 2000:6:33-42
- 9. Lagravere MO, Major PW, Flores-Mir C. Long-term dental arch changes after rapid maxillary expansion treatment: a systematic review. Angle Orthod 75(2):155-161, 2005.
- 10. Ghoneima A, Abdel-Fattah E, Hartsfield J, et al: Effects of rapid maxillary expansion on the cranial and circummaxillary sutures. American Journal of Orthodontics and Dentofacial Orthopedics 140(4):510-519, October 2011.
- 11. Suri L, Taneja P. Surgically assisted rapid palatal expansion: a literature review. Am J Orthod Dentofacial Orthop. 2008 Feb;133(2):290-302.

#### Retention and Relapse

- 1. Zachrisson BU. Important aspects of long term stability. J Clin Orthod. 1997;31:562-83.
- 2. Little RM. Stability and relapse of dental arch alignment. British journal of orthodontics. 1990 Aug;17(3):235-41
- 3. Freitas KM, Massaro C, Miranda F, de Freitas MR, Janson G, Garib D. Occlusal changes in orthodontically treated subjects 40 years after treatment and comparison with untreated control subjects. American Journal of Orthodontics and Dentofacial Orthopedics. 2021 Nov 1;160(5):671-85
- 4. Al-Moghrabi D, Littlewood SJ, Fleming PS. Orthodontic retention protocols: An evidence-based overview. British Dental Journal. 2021 Jun;230(11):770-6.

#### Interdisciplinary Treatment & Adult Orthodontics

- 1. Adult Orthodontics. Birte Melsen. 2012, 1st Edition, Wiley- Blackwell, Hoboken. ISBN: 978-1405136198.
- 2. Chapter 19: Special Considerations in Treatment for Adults: ContemporaryOrthodontics. William R. Proffit, Henry W. Fields Jr., Brent E. Larson ,David M. Sarver. 2019, 6th Edition, Mosby Inc., Saint Louis. ISBN 978-0-323-54387-3.
- 3. Hamilton RS, Gutmann JL. Endodontic-orthodontic relationships: a review of integrated treatment planning challenges. Int Endod J 32(5):343-360, 1999.



- 4. Kokich VG, Spear FM. Guidelines for managing the orthodontic- restorative patients. Semin Orthod 3(1):3-20, 1997.
- 5. Mathews DP, Kokich VG. Managing treatment for the orthodontic patient with periodontal problems. Semin Orthod 3(1):21-38, 1997

## Orthognathic Surgery

- 1. Profitt WR, White RP, Sarver DM. Contemporary Treatment of DentofacialDeformities.
- 2. Chapter 20: Combined Surgical and Orthodontic Treatment: ContemporaryOrthodontics. William R. Proffit, Henry W. Fields Jr., David M. Sarver. 2019, 6th Edition, Mosby Inc., Saint Louis. ISBN: 978-0-323-54387-3.
- 3. Sabri R. Orthodontic objectives in orthognathic surgery: state of the art today. World J Orthod 7(2):177-191, 2006.
- 4. Bailey LJ, Cevidanes LH, Proffit WR. Stability and predictability of orthognathic surgery. Am J Orthod Dentofacial Orthop 126(3):273-277, 2004.
- 5. Larry M. Wolford, Spiro C. Karras, and Pushkar Mehra, Considerations for orthognathic surgery during growth, Part 1: Mandibular deformities. Am J Orthod Dentofacial Orthop 2001;119:95-101

## Occlusion and Temporomandibular Disorders

 Okeson JP: Management of Temporomandibular Disorders and Occlusion, ed8, Elsevier, 2019.

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

