เอกสารอ้างอิง

1. Nair M, Tyndall D, Ludlow J, May K. Tuned aperture computed tomography and detection of recurrent caries. *Caries Res* 1998; 32: 23-30.

2. Wenzel A. Current trends in radiographic caries imaging. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995; 80: 527-539.

3. Akdeniz B, Gröndahl H, Magnusson B. Accuracy of proximal caries depth measurements: comparison between limited cone beam computed tomography (LCBCT), storage phosphor and film radiography. *Caries Res* 2006; 40: 202– 207.

4. Tsuchida R, Araki K, Okano T. Evaluation of a limited cone-beam volumetric imaging system: comparison with film radiography in detecting incipient proximal caries. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007; 104: 412-416.

5. Haiter-Neto A, Wenzel A, Gotfredsen E. Diagnostic accuracy of cone beam computed tomography scans compared with intraoral image modalities for detection of caries lesions. Dentomaxillofac Radiol 2008; 37: 18-22.

6. Young S, Lee J, Hodges R, Chang T-L, Elashoff D, White S. A comparative study of high-resolution cone beam computed tomography and charge-coupled device sensors for detecting caries. *Dentomaxillofac Radiol* 2009; 37: 445-450.

7. ปรียพร ศรีมาวงษ์. โคนบีมคอมพิวเตดโทโมแกรมในทางทันตกรรม. *เชียงใหม่ทันตแพทยสาร* 2008; 58: 26-35.

8. Scarfe W, Farman A. Cone-beam computed tomography. In: White S and Pharoah M (ed). *Oral Radiology: Principles and Interpretation.* 6th ed. Missouri: Mosby, 2009, pp 225-243.

9. Scarfe W, Farman A, Sukovic P. Clinical application of cone-beam computed tomography in dental practice. *J Can Dent Assoc* 2006; 72: 75-80.

10. Baba R, Konno Y, Ueda K, Ikeda S. Comparison of flat-panel detector and image-intensifier detector for cone-beam CT. *Comput Med Imaging Graph* 2002; 26:153-158.

11. Ludlow J, Ivanovic M, Hill C. Comparative dosimetry of dental CBCT devices and 64-slice CT for oral and maxillofacial radiology. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008; 106: 106-114.

12. Danforth R, Dus I, Mah J. 3-D volume imaging for dentistry: a new dimension. *J Calif Dent Assoc* 2003; 31: 817-823.

13. Hashimoto K, Arai Y, Iwai K, Araki M, Kawashima S, Terakado M. A comparison of a new limited cone beam computed tomography machine for dental use with a multidetector row helical CT machine. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003; 95: 371-377.

14. Sukovic P, Brooks S, Clinthorne N. Initial performance measurements of the first clinical prototype of DentoCAT—a cone beam CT scanner for dentomaxillofacial imaging. *17th International Congress* 2003; series 1256: 1221-1223.

15. Araki K, Maki K, Seki K, Sakamaki K, Harata Y, Sakaino R, Okano T, Seo K. Characteristics of a newly developed dentomaxillofacial X-ray cone beam CT scanner (CB MercuRay^{TM}): system configuration and physical properties. *Dentomaxillofac Radiol* 2004; 33: 51-59.

16. วรรณาภรณ์ ชื่นชมพูนุท. Dental CT. เอกสารประกอบโครงการอบรมการศึกษาต่อเนื่องเชิงปฏิบัติการประจำปี 2552 เรื่อง ภาพรังสีเด็นตัลซีทีกับงานทันตกรรม (Dental CT and dental practices), จุฬาลงกรณ์มหาวิทยาลัย, 7 เมษายน 2552.

17. Ngan D, Kharbanda O, Geenty J, Darendeliler M. Comparison of radiation levels from computed tomography and conventional dental radiographs. *Aust Orthod J* 2003; 19: 67-75.

18. Gibbs S. Effective dose equivalent and effective dose: comparison for common projections in oral and maxillofacial radiology. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; 90: 538-545.

19. Quereshy F, Savell T, Palomo J. Applications of cone beam computed tomography in the practice of oral and maxillofacial surgery. *J Oral Maxillofac Surg* 2008; 66: 791-796.

20. Marmulla R, Wörtche R, Mühling J, Hassfeld S. Geometric accuracy of the Newtom 9000 Cone Beam CT. *Dentomaxillofac Radiol* 2005; 34: 28-31.

21. Holberg C, Steinhuser S, Geis P, Rudzki-Janson1 I. Cone-beam computed tomography in orthodontics: benefits and limitations. *J Orofac Orthop* 2005; 66: 434–444.

22. Shintaku W, Venturin J, Azevedo B, Noujeim M. Applications of cone-beam computed tomography in fractures of the maxillofacial complex. *Dent Traumatol* 2009; 25: 358-366.

23. Hassan B, Metska M, Ozok A, Stelt P, Wesselink P. Detection of vertical root fractures in endodontically treated teeth by a cone beam computed tomography scan. *J Endod* 2009; 35: 719-722.

24. Misch K, Yi E, Sarment D. Accuracy of cone beam computed tomography for periodontal defect measurements. *J Periodontol* 2006; 77: 1261-1266.

25. Barrett J, Keat N. Artifacts in CT: Recognition and avoidance. *Radio Graphics* 2004; 24: 1679 - 1691.

26. AAPM Report No.39. Specification and acceptance testing of computed tomography scanner. American association of physicists in medicine by the American Institute of Physics; 1993: 34-37.

27. Seeram E. *Computed Tomography: Physical Principles, Clinical Applications, and Quality Control.* 3rd ed. St. Louis: Saunders; 2009: 208-210.

28. Lee R. Common image artifacts in cone beam CT. American association of dental maxillofacial radiographic technicians newsletter, 2008.

29. Nakata K, Naitoh M, Izumi M, Inamoto K, Ariji E, Nakamura H. Effectiveness of dental computed tomography in diagnostic imaging of periradicular lesion of each root of a multirooted tooth: a case report. *J Endod* 2006; 32: 583-587.

30. Guerrero M, Jacobs R, Loubele M, Schutyser F, Suetens P, van Steenberghe D. State-of-the-art on cone beam CT imaging for preoperative planning of implant placement. *Clin Oral Investig* 2006; 10: 1-7.

31. Mount G. Defining, classifying, and placing incipient caries lesions in perspective. *Dent Clin North Am* 2005; 49: 701–723.

32. Kidd E. Diagnosis of secondary caries. *J Dent Educ* 2001; 65: 997-999.

33. Mjor I, Toffenetti F. Secondary caries: a literature review with case reports. *Quintessence Int* 2000; 31: 165-179.

34. Yang J, Dutra V. Utility of radiology, laser fluorescence, and transillumination. *Dent Clin North Am* 2005; 49: 739–752.

35. de Vries H, Ruiken H, Konig K, et al. Radiographic versus clinical diagnosis of approximal carious lesions. *Caries Res* 1990; 24: 364–370.

36. Hintze H, Wenzel A. Clinically undetected dental caries assessed by bitewing screening in children with little caries experience. *Dentomaxillofac Radiol* 1994; 23: 19–23.

37. Nytun R, Raadal M, Espelid I. Diagnosis of dentin involvement in occlusal caries based on visual and radiographic examination of the teeth. *Scand J Dent Res* 1992; 100: 144–148.

38. Flaitz C, Hicks M, Silverstone L. Radiographic, histologic, and electronic comparison of occlusal caries: an in vitro study. *Pediatr Dent* 1986; 8: 24–28.

39. Skodje F, Espelid I, Kvile K, et al. The influence of radiographic exposure factors on the diagnosis of occlusal caries. *Dentomaxillofac Radiol* 1998; 27: 75–79.

40. Bloemendal E, de Vet H, Bouter L. The value of bitewing radiographs in epidemiological caries research: a systematic review of the literature. *J Dent* 2004; 32: 255–264.

41. Summitt J, Robbins J, Hilton T, Schwartz R. *Fundamentals of Operative Dentistry: a Contemporary Approach*. 3rd ed. Quintessence Publishing Co Inc: Illinois, 2006, pp 91.

42. Kidd E. Diagnosis of secondary caries. Proceedings of the 1st Annual Indiana Conference. Bloomington: Indiana University, 1996: 156-162.

43. Imperiano M, Khoury H, Pontual M, Montes M, Silveira M. Comparative radiopacity of four low-viscosity composites. *Braz J Oral Sci* 2007; 6: 1278 – 1282.

44. International Organization for Standardization. ISO 4049: 2000. *Dentistry - Polymer-Based Filling, Restorative and Luting Materials*. 3rd ed. Geneva, Switzerland: International Organization for Standardization; 2000.

45. Devito K, Ortega A, Haiter-Neto F. Radiopacity of calcium hydroxide cement compared with human tooth structure. *J Appl Oral Sci* 2004; 12: 290-293.

46. Nielsen L-L, Hoernoe M, Wenzel A. Radiographic detection of cavitation in approximal surfaces of primary teeth using a digital storage phosphor system and conventional film, and the relationship between cavitation and radiographic lesion depth: an in vitro study. *Int J Paediatr Dent* 1996; 6: 167-172.

47. Nummikoski P, Martinez T, Matteson S, McDavid W, Dove S. Digital subtraction radiography in artificial recurrent caries detection *Dentomaxillofac Radiol* 1992; 21: 59-64.

48. Wenzel A. Matters to consider when implementing direct digital radiography in the dental office. *Int J Comput Dent* 1999; 4: 269-290.

49. Wenzel A. Digital imaging for dental caries. *Dent Clinic North Am* 2000; 44: 319-338.

50. Wenzel A. Bitewing and digital bitewing radiography for detection of caries lesions. *J Dent Res* 2004; 83: C72-C75.

51. Kayipmaz S, Sezgin O, Saricaoglu S, Can G. An invitro comparison of diagnostic abilities of conventional radiography, storage phosphor, and cone beam computed tomography to determine occlusal and approximal caries. *Eur J Radiol* (in press).

52. Qu X, Li G, Zhang Z, Ma X. Detection accuracy of in vitro approximal caries by cone beam computed tomography images. *Eur J Radiol* (in press).

53. Zhang Z, Qu X, Li G, Zhang Z, Ma X. The detection accuracies for proximal caries by cone-beam computerized tomography, film, and phosphor plates. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010; 111: 103 – 108.

54. Kamburoglu K, Murat S, Pehlivan S, Cebeci A, Paksoy C. Occlusal caries detection by using a cone-beam CT with different voxel resolutions and a digital intraoral sensor. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010; 109: e63-e69.

55. Katsumata A, Hirukawa A, Noujeim M, Okumura S, Naitoh M, Fujishita M, et al. Image artifact in dental cone-beam CT. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006; 101: 652-657.

56. Draenert F, Coppenrath E, Herzog P, Muller S, Mueller-Lisse U. Beam hardening artefacts occur in dental implant scans with the NewTom cone beam CT but not with the dental 4-row multidetector CT. *Dentomaxillofac Radiol* 2007; 36: 198–203.

57. Odlum O. A method of eliminating streak artifacts from metallic dental restorations in CTs of head and neck cancer patients. *Spec Care Dentistry* 2001; 21:72-74.

58. Lund H, Grondahl K, Gro ndahl H. Cone beam computed tomography for assessment of root length and marginal bone level during orthodontic treatment. *Angle Orthod* 2010; 80: 466-473.

59. Kang B, Farman A, Scarfe W, Goldsmith L. Mechanical defects in dental enamel vs. natural dental caries: observer differentiation using Ektaspeed Plus film. *Caries Res* 1996; 30: 156-162.

60. Matteson S, Phillips C, Kantor M, Leinedecker T. The effect of lesion size, restorative material, and film speed on the detection of recurrent caries. *Oral Surg Oral Med Oral Pathol* 1989; 68: 232-237.

61. Eli I, Weiss E, Tzohar A, Littner M, Gelernter I, Kaffe I. Interpretation of bitewing radiographs. Part 1. Evaluation of the presence of approximal lesions. *J Dent* 1996; 24: 379-383.

62. Carvalho F, Fucio S, Sinhoreti M, Correr-Sobrinho L, Puppin-Rontani R. Confocal laser scanning microscopic analysis of the depth of dentin caries-like lesions in primary and permanent teeth. *Braz Dent J* 2008; 19: 139–144.

63. Marquezan M, Correa F, Sanabe M, Filho L, Hebling J, Guedes-Pinto A, Mendes F. Artificial methods of dentine caries induction: A hardness and morphological comparative study. *Arch Oral Biol* 2009; 54: 1111-1117.

64. Grossman E, Matejka J. Histological features of artificial secondary caries adjacent to amalgam restorations. *J Oral Rehabil* 1999; 26: 737-744.

65. Clarkson B, Wefel J, Miller I. A model for producing caries-like lesions in enamel and dentin using oral bacteria in vitro. *J Dent Res* 1984; 63: 1186–1189.

66. Zoellner A, Diemer B, Weber H, Stassinakis A, Gaengler P. Histologic and radiographic assessment of caries-like lesions localized at the crown margin. *J Prosthet Dent* 2002; 88: 54-59.

67. Espelid I, Tveit A, Erickson R, Keck S, Glasspoole E. Radiopacity of restorations and detection of secondary caries. *Dent Mater* 1991; 7: 114-117.

68. Anbiaee N, Mohassel A, Imanimoghaddam M, Moazzami S. A comparison of the accuracy of digital and conventional radiography in the diagnosis of recurrent caries. *J Contemp Dent Pract* 2010; 11: E025-032.

69. Espelid I, Tveit A. Diagnosis of secondary caries and crevices adjacent to amalgam. *Int Dental J* 1991; 41: 359–364.

70. Sanders M, Hoyjberg C, Chu C, Leggitt V, Kim J. Common orthodontic appliances cause artifacts that degrade the diagnostic quality of CBCT Images. *J Calif Dent Assoc* 2007; 35: 850-857.

71. Nair M, Tyndall D, Ludlow J, May K, Ye F. The effects of restorative material and location on the detection of simulated recurrent caries. A comparison of dental film, direct digital radiography and tuned aperture computed tomography. *Dentomaxillofac Radiol* 1998; 27: 80-84.

72. Chindasombatjaroen J, Uchiyama Y, Kakimoto N, Murakami S, Furukawa S. Quantitative analysis of metallic artifacts on CT images: The effect of quantity, type, angle, and position of metal materials. Proceedings of the 7th Asian Congress of Oral and Maxillofacial Radiology; Nara, Japan; 2008: 91.

73. SEDENTEXCT Project. Radiation protection: cone beam CT for dental and maxillofacial radiology. Provisional guidelines. May 2009. Available from: http://www.sedentexct.eu/content/provisional-guidelines-cbct-dental-and-maxillofacial-radiology.

ประวัติผู้เขียน

ชื่อ - สกุล	นาย อานนท์ จารุอัคระ
วัน เดือน ปี เกิด	30 ตุลาคม 2525
ประวัติการศึกษา	สำเร็จการศึกษามัธยมศึกษาตอนปลาย โรงเรียนปรินส์รอยแยลส์ วิทยาลัย ปีการศึกษา 2542 สำเร็จการศึกษาปริญญาทันตแพทยศาสตรบัณฑิต มหาวิทยาลัย นเรศวร ปีการศึกษา 2551
ประวัติการทำงาน	พ.ศ. 2551 – ปัจจุบัน พนักงานมหาวิทยาลัย (พนักงานวิชาการ) ตำแหน่งอาจารย์ภาควิชาชีววิทยาช่องปากและวิทยาการ วินิจฉัยโรคช่องปาก คณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่
ทุนการศึกษา	ได้รับทุนอุดหนุนคณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ ปี 2552