periapical pathoses. The sensitivity for the MPS was 63% (95% CI 59.2-68.0) for tooth-specific disease and the specificity was 92% (95% CI 92.2-94.5). The likelihood ratios (LR) were LR+ 9 and LR− −.39. The *P* value (McNemars $P \leq .0001$) was significant for MPS compared with FMS.

Discussion. The MPS is a good test with a fair to good reproducibility between examiners. However, prospective studies are needed for the MPS to be accepted and used in conjunction with a comprehensive clinical examination. This is also required to improve external validity of the MPS, because sensitivity was low. Consequently, the null hypothesis was rejected, because differences were statistically significant. The dental practitioner should consider selection criteria more often, because this would lower morbidity and mortality risk of operating room visits in this special care population group.

LICENSURE REQUIREMENTS FOR DENTAL TELERADIOLOGY IN THE U.S. *D. Tamimi, 3D Diagnostix, Orlando, Florida.*

Background. The question of the appropriate licensure requirements for the practice of teleradiology (i.e., reading images and writing a report from a remote site via the internet) has gone unanswered for some time.

Materials and methods. The dental boards of each state and territory in the United States were contacted with a letter requesting information on licensure requirements for the practice of teleradiology across state lines, followed up with a phone call when clarification was needed.

Results. Each state governs the practice of teledentistry differently. Few states do not require licensure in their state if the radiologist resides outside their geographic borders and interprets radiographs without being physically visited by the patient.

THE USE OF FLUOROSCOPY IN DENTISTRY: A SYSTEMATIC REVIEW. *D. Uzbelger-Feldman, J. Yang, and C. Susin, Kornberg School of Dentistry at Temple University, Philadelphia, Pennsylvania, and Federal University of Rio Grande do Sul Faculty of Dentistry, Brazil.*

Background. Dental fluoroscopy is the presentation of a continuous or dynamic radiographic image in dentistry. It was first described in 1896 by Williams H. Rollins. However, the dental fluoroscope was not used in dentistry routinely, because of the high level of radiation emitted by the early design. In 1953, image intensification and low mA settings were introduced. Since then, radiation exposure to patients has been considerably reduced, and many applications of dental fluoroscopy have been proposed.

Objectives. The purpose of the present systematic review was: 1) to describe the use of fluoroscopy in dentistry after the introduction of image intensification regarding its diagnostic value, research performance, clinical applications, and safety and future perspectives; and (2) to assign levels of evidence to those studies that fulfilled the systematic review inclusion criteria.

Materials and methods. A comprehensive search was conducted to identify studies on dental fluoroscopy published from 1950 to 2007. Two reviewers used Pubmed and Embase to retrieve abstracts and published papers. Combinations of the following medical subject headings were used: fluoroscopy, videofluoroscopy, videofluorography, videoradiography, cineradiography, cineradiographies, cinefluorography, cinefluorographies, photofluorography, radiocinematography, radiocinematographies, dental, and dentistry. No efforts were made to identify unpublished studies. Duplicate references were removed. Using this method, 129 abstracts were selected for review. Human, animal, and phantom/skull/mannequin studies were included. Studies that were not in English as well as those that used fluoroscopy without the use of image intensification were excluded. The selection of papers, decisions about eligibility, and data extraction were conducted independently by 3 reviewers: a endodontist, a periodontist, and an oral and maxillofacial radiologist. References retrieved from the search were screened, and the articles were classified by levels of evidence.

Results. Among the 129 reviewed articles, 76 did not fulfill the inclusion criteria. Among the 53 articles selected, 35 used dental fluoroscopy on human subjects only, 9 used animals, 6 used human subjects and a phantom, dry skull, or mannequin, 2 were performed on a phantom, dry skull, or mannequin only, and 1 did not use any subject. Among them, 17 were related to diagnostic value, 15 to research performance, 12 to clinical applications and 9 to safety. In addition, 13 were related to prosthodontics, 12 to orthodontics, 8 to radiology, 8 to oral biology, 5 to oral and maxillofacial surgery, 2 to endodontics, 2 to oral anatomy, 2 to pedodontics, and 1 to forensic dentistry. There were no disagreements during the inclusion of the studies in the review. Most of the studies reviewed were of low methodologic quality.

Discussion. Fluoroscopy with image intensification has been a useful tool in dentistry for over 50 years and has diagnostic, research, clinical, and safety applications. Its main drawback has been the size and image resolution of the device. However, with advances in imaging devices, fluoroscopy can be revolutionized; its usefulness could be increased in the near future by developing the technology to allow continuous or dynamic radiographic images for dental use, and more research is recommended to demonstrate this further.

STABILITY OF VERTICAL HEIGHT MEASUREMENTS ON DIGITAL PANORAMIC RADIOGRAPHS USING POSTERIOR MANDIBULAR IMPLANTS AS REFERENCE OBJECTS. *L. Vasquez, N. Gaydarov, Y.N. Al Din, R. Nedir, M. Bischof, U.C. Belser, and J.-P. Bernard, University of Geneva School of Dental Medicine and Swiss Dental Clinics Group.*

Background. Panoramic radiographs have been used as standard examination tools for implant treatment planning and have been reported to give the best radiographic survey, impart a low radiation dose, and appear sufficient to evaluate available bone height before inserting posterior mandibular implants. Image distortion in rotational panoramic radiography has been well described.

Objective. The present study aimed to control the stability of vertical height measurement on digital panoramic radiographs using implants in the posterior segment of the mandible as radiopaque reference objects.

Materials and methods. The study included 11 implants inserted in the premolar region and 15 implants in the molar region of 18 partially edentulous patients (mean age 66.65 years). Panoramic radiographs were taken with a digital panoramic unit. The proprietary measurement software (Kodak 8000C; Eastman Kodak Company, Rochester, NY), calibrated with a 5-mm-diameter metal ball and a mouse-driven caliper, was used for vertical linear measurements. Twenty-six 10-mm-long standard Strau-

Table II. Vertical measurements of implants using panoramic radiography

Observer/ measurement	*Global implant length, mm*	*Premolar implant length, mm*	*Molar implant length, mm*	*Global DR*	*Premolar DR*	*Molar DR*
A1	13.6-14.5 (mean 14.08)	13.8-14.5 (mean 14.03)	13.6-14.4 (mean 14.11 mm)	0.95-1.01 (mean 0.98)	0.96-1.01 (mean 0.98)	0.95-1.00 (mean 0.98)
A2	13.4-14.5 (mean 14.01)	13.5-14.3 (mean 13.92)	13.4-14.5 (mean 14.08)	0.93-1.01 (mean 0.97)	0.94-1.00 (mean 0.98)	0.93-1.01 (mean 0.98)
B1	13.5-14.3 (mean 14.01)	13.8-14.2 (mean 14.02)	13.5-14.3 (mean 14.01)	0.94-1.00 (mean 0.97)	0.95-0.99 (mean 0.99)	0.94-1.00 (mean 0.97)
B2	13.5-14.3 (mean 14.01)	13.5-14.3 (mean 13.99)	13.8-14.1 (mean 14.01)	0.94-1.00 (mean 0.97)	0.94-1.00 (mean 0.97)	0.94-1.00 (mean 0.97)
Global mean	14.27			0.97		

DR, Distortion ratio.

mann (Basel, Switzerland) implants were measured from the implant's apex to the top of the small healing cap, giving a total length of 14.3 mm. Measurements were taken twice (measurements 1 and 2) with an interval of 1 week by 2 independent observers (A and B). The stability of the measures was analyzed, and the distortion ratio (DR; radiologic implant length/real implant length) was calculated.

Results. The radiologic implant length with corresponding calculated DR for each series of measurements are shown in Table II.

Conclusions. A good stability in vertical measurements was noted in the 2 implant groups. The mean measured implant length was 14.3 mm (maximum variability 1.1 mm) with an identical variability for molar and premolar segments. The mean vertical DR was 0.97, unrelated to the localization. The vertical measurement stability using a software-based calibrated measurement tool confirms the safe use of digital panoramic radiography for preoperative implant length evaluation, including in mandibular premolar and molar segments, as long as the width dimension is considered to be known.