American Dental Association
Technical Report No. 1029

Guide to Digital Dental Photography and Imaging

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AMERICAN DENTAL ASSOCIATION TECHNICAL REPORT NO. 1029 FOR A GUIDE TO DIGITAL DENTAL PHOTOGRAPHY AND IMAGING

The Council on Dental Practice of the American Dental Association has approved American Dental Association Technical Report No. 1029 for a Guide to Digital Dental Photography and Imaging. Working Groups of the ADA Standards Committee on Dental Informatics (SCDI) formulate this and other technical reports and specifications for the application of information technology and other electronic technologies to dentistry's clinical and administrative operations. The ADA SCDI has representation from appropriate interests in the United States in the standardization of information technology and other electronic technologies used in dental practice. Approval of ADA Technical Report No. 1029 was confirmed by the ADA SCDI on April 12, 2004.

The ADA SCDI thanks Scott D. Benjamin, Advanced Integration & Mentoring, Inc., Hancock, NY, as chairman of Working Group 12.4 for Digital Photography for leading the development effort.

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FOREWORD

(This foreword does not form a part of the Dental Association Technical Report No. 1029 for a Guide to Digital Dental Photography and Imaging).

In 1992, there was interest in the standardization of clinical information systems related to electronic technology in the dental environment. After evaluating current informatics activities, a Task Group of the ANSI Accredited Standards Committee MD156 (ASC MD156) was created by the ADA to initiate the development of technical reports, guidelines, and standards on electronic technologies used in dental practice. In 1999, the ADA established the ADA Standards Committee on Dental Informatics (SCDI). The ADA SCDI is currently the group that reviews and approves proposed American National Standards (ANSI approved) and technical reports developed by the standards committee's working groups. The ADA became an ANSI accredited standards organization in 2000.

The scope of the ADA SCDI is:

"To promote patient care and oral health through the application of information technology to dentistry's clinical and administrative operations; to develop standards, specifications, technical reports, and guidelines for: components of a computerized dental clinical workstation; electronic technologies used in dental practice; and interoperability standards for different software and hardware products which provide a seamless information exchange throughout all facets of healthcare."

This technical report was prepared by SCDI Working Group 12.4 for Digital Photography. The SCDI Working Group 12.4 chairman is Scott D. Benjamin. SCDI Working Group 12.4 prepared this report at the request of SCDI Subcommittee 12 for Informatic Component Interoperability in Dentistry (Brent Dove, Chairman).

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INTRODUCTION

Although in its infancy in dentistry, digital photography, digital imaging and its management is exploding at an extraordinary rate. At present, the use of digital photography in dentistry has no set nomenclature, procedure codes, standards or continuity. The focus of this Technical Report is to provide basic information on the use of digital photography in dentistry and to facilitate the appropriate selection of the necessary equipment. This report further seeks to foster the interoperability of digital images and the information contained therein, thereby helping concerned parties to achieve consistent communication. The information provided will address the digital imaging needs of the various dental specialties, the general dental practitioner, other health care providers, the patient and any interested third parties such as insurance carriers, prosthetic and pathology laboratories. These discussions take into consideration interoperability requirements to insure proper identification, exporting and importing of the image and database management of the image.

To capture a quality digital image is not enough— the image has to have proper and standardized labeling of what it contains (the structures that are visible in the image) and the necessary DICOM descriptors of what, how and when it was captured. Tables 1, 2, 3 gives the practitioner suggested views for the dentition, soft tissues and extraoral, respectively. These tables include details of the structures expected to be contained within the images in the primary view; the relationship (angles) of the camera to the structures; and the occlusal relationship in the image so that images can be compared to subsequent images of the same region, even if captured with different cameras by different clinicians. These tables will be expanded in the future to include the appropriate DICOM descriptors. The establishment of consistent procedural nomenclature for the image needs to be established to make images truly exportable from database to database.

Digital dental photography requires the combined knowledge and understanding of the terminology of dentistry, computer technology and photography. Appendix A is a comprehensive glossary of dental digital photography terminology for use as a reference to help users obtain an understanding and consistent use of some of the most common photography terms and definitions associated with digital photography and camera use in dentistry. The definitions of most of the technical terms contained within the text of this document can be located within this glossary. The glossary's terminology and definitions are further intended to be consistent with a master glossary of terms developed for the overall field of dental informatics.

DIGITAL PHOTOGRAPHY

Digital photography means that the images are stored in a computerized file format often referred to as a digital image file. A digital image file comprises any computer file format that contains a graphical image instead of text or program data. Photographs and documents that have been scanned along with digital camera photographs end up as digital image files. There are basically two types of digital images—a bitmapped image and a vector based image.

A 'bitmapped' image contains information for placement of each and every pixel in the image. JPEG, PNG, GIF, TIFF and BMP are probably the most common type bitmapped digital image. JPEG, GIF and TIFF are readable in both PC and Mac format computers. All digital cameras and scanners produce