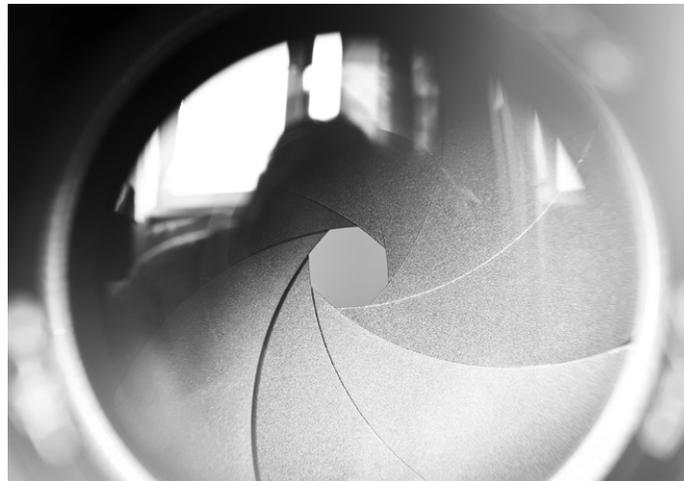# You've Got to See It to Believe It

Digital Dental Photography

By

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Uses of Dental Photography

Diagnostic

- Evaluation of *all* smile components
- Measurement of tooth dimensions
- Pre-Planning desired results
- Advanced cases

Patient Communication

- Mouth mirror is ineffective
- Allows them to see what we see
- Educates with facts
- Before & After Procedure pages
- Imaged full-face smiles
- *Your* treatment capabilities

Laboratory Communication

- Remaking and re-contouring crowns
- Adjacent teeth and tooth structure
- Relative color & texture
- Crown try-in color
- Porcelain laminate veneer try-in
- Depth & contour
- Abutments
- Multiple anterior crowns
- Porcelain laminate veneers

Communication with Specialists

- Periodontists, Orthodontists, Endodontists, Oral Surgeons, Pathologists
- Email with specialists

Communication with Insurance Co

- Necessary treatment invisible to radiographic examination
- Fractured porcelain invisible to radiographic examination
- Documentation
- Filing accident reports

Medical/Legal

Self Evaluation

- Denture tryins
- Learning from every case

Lectures, Publications, Accreditation

- ASDA
- AACD
- AAED

Digital Photographic Principles

Lens

- Focal length
- Shorter the focal length the wider the field of view
- 24-35mm–wide angle - "fisheye"
- 50mm-standard view
- 85-300-telephoto view- "flat image"
- Dental lens is 85-105mm telephoto macro

Exposure

- Quantity of light that reaches the sensor
- Size of the lens opening
- Length of time the shutter is open, or time flash is illuminated

Aperture

- Aperture is size of the opening of a lens
- Larger the f stop the smaller the diameter of the opening-greater depth of field
- Smaller the f stop the larger the diameter of the opening-easier focusing

Flash

- In flash photography length of exposure is determined by the amount of time the flash is illuminated
- Shutter in flash photography is set to be entirely open long enough to allow all of flash to reach sensor
- Digital TTL metering uses a pre-flash to pre-determine time for flash on
- Proper Tooth Exposure: Camera attempts to balance light for all pictures
- Need to overexpose +0.5-1.5 f stops to compensate for white teeth

- Ring flash gives more even distribution of light-used for intra-oral views
- Point flash away from lens eliminates red eye and is more 3 dimensional-used for full face views
- Dual point flash best for facial texture of anterior teeth

Standardized Magnification

- Magnification refers to the ratio of image size to object size
- 1:2 means object size is double the size of the image
- 1:1 means image on film is same as image
- Most digital sensors are smaller & magnify image by approximately 1.5
- Standard 35mm film is 24mm x 36mm
- Digital sensors are smaller than film size
- Resulting image is magnified approximately by 1.5x from same distance
- Moving back and using desired magnification x 1.5 gives same result
- 1:3 printed digital image is equivalent to 1:2 film image
- Multiply desired magnification by 1.5 for digital settings

Digital Dental Cameras

Smart Phones
- Disinfection
- Distortion
- HIPPA compliance

Modified-Consumer Fixed Lens
- Cheap
- Canon G-16

Dental Specialty
- Easy
- Ideal for staff
- Shofu Eye Special C-III
- On screen display
- Touch screen
- Takes photo when in proper range
- Standardized views-camera zooms in and out
- Multiple modes

Single Lens Reflex (SLR)
- Quality
- Nikon D-7200-24 MP 1080 p HD video
- Nikon D-7500-24 MP 1080- p HD video
- Canon T-7-24 MP 1080 p HD video-no wireless flash
- Canon T-7i-18 MP 1080- p HD video higher res screen
- Canon 90-D-32 MP metal case-dental fx programmable

Lens
- Sigma EX 105mm f 2.8 DG macro (w or w/o guide) (not manufactured)
- Tokina AT-X M-100 100mm f/2.8 macro
- Canon EF 100mm f 2.8 macro
- Nikon AF-S VR105mm f 2.8 macro

Flash
- Sigma EM 140-DG Dual Point Flash
- Metz MS-1 Wireless Dual Point Flash
- Canon MR14-EX-Ring
- Canon MT 24-EX -Twin Point Flash
- Canon 270-EX II Wireless Twin Point Flash
- Nikon R1 Wireless Twin Point Flash

Accessories
- Occlusal Mirror, Buccal Mirror, Combination Mirror
- Full & split cheek retractors
- TS retractors
- One-piece cheek retractors

Sources

- Internet: www.BHPhotoVideo.com (800-947-5525)
- Specialized dental camera companies
- Clinipix (866-254-6749)-Lester Dine (800-624-9103)-Photo-Med (800-998-7765)

Downloading & Manipulating Images

Direct Input

Memory card Input

- Memory Card reader
- Direct ports
- Eye Fi-SD card format (no longer manufactured)

- Newer cameras have wi fi output built in

File Formats

- RAW-(12-32M) ability to manipulate but traceable-AACD accreditation
- TIFF-(3-6M) preferred by some publishers/printers-may want CMYK also
- JPEG-(1-3M) standard format-edit to 6" x 4" 125 dpi for lecture and email-300k

Imaging Programs

- Photoshop Elements
- Paint Shop Pro
- Microsoft Digital Image Suite
- Photoshop

Dental Imaging Programs

- Smile Library-avoid total intra-oral transfer
- Proportion smile template
- RED proportion smile design
- Digital Smile Design (DSD)
- Outsourced imaging

Exposing a "Full Series" of Photographs

Exposure Preparation

- **STEP 1-Turn on camera and flash** (Av mode, ISO 200,TTL+0.5-1.5 *f* stop)
- **STEP 2-Set the aperture** (*f/8, f/11* full face *f/32* all others*)*
- **STEP 3-Set the magnification** (manual focus, pre-set magnification)
- **STEP 4-Position the patient** (place retractors & mirror if needed)
- **STEP 5-Move to focus and SHOOT**

Hands-On Photographic Protocol

200 ASA-speed
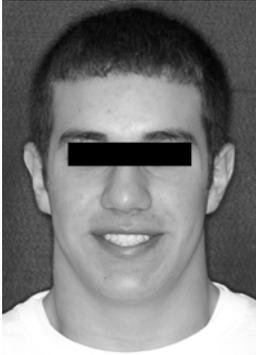TTL flash setting with Av-Aperture Priority +0.5-1.5 *f* stop
1/250 second-shutter speed
Manual focus-preset magnification
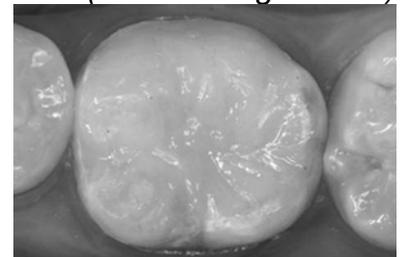
Full Face View 1:10
f/8 or f11
(1:15 digital SLR)

**Frontal Retracted
View 1:2** *f/22-32*
(1:3 digital SLR)

**Mirrored Closeup
View** *f/22-32*
(1:1-1:1.5 digital SLR)

Full Smile View 1:2
f/22-32
(1:3 digital SLR)

**Lateral Retracted
Views 1:2** *f/22-32*
(1:3 digital SLR)

Maxillary Occlusal View 1:2
f/22-32
(1:3 digital SLR)

**Full Smile Lateral
Views 1:2** *f/22-32*
(1:3 digital SLR)

**Maxillary Anterior Buccal
Views 2:3** *f/22-32*
(1:2.25 digital SLR)

**Mandibular Occlusal View
1:2** *f/22-32*
(1:3 digital SLR)