


Get your Hands On this:

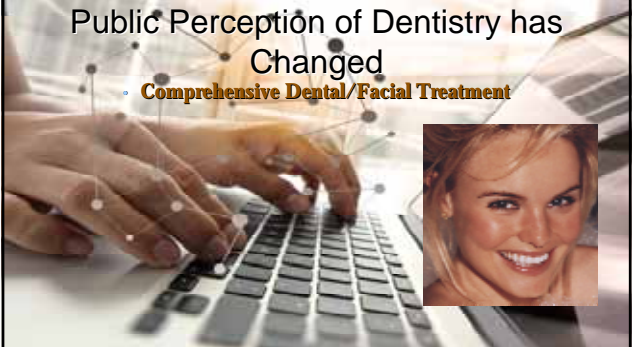
Digital Dental Photography Workshop

Daniel H Ward DDS



Public Perception of Dentistry has Changed

- Comprehensive Dental/Facial Treatment



VISUAL COMMUNICATION




Uses of Dental Photography


- Diagnostic
- Patient Communication
- Communication w/ Specialists
- Laboratory Communication
- Communication w/ Insurance Co
- Medical/Legal
- Self-Evaluation
- Lectures, Publications, Accreditation



Uses of Dental Photography




A Day at the Office




Diagnostic

Uses of Dental Photography





Chairside Smile Evaluation




Uses of Dental Photography

Diagnostic




Ineffective!

Chairside Smile Evaluation



Uses of Dental Photography


Diagnostic



Golden Proportion RED Proportion


1:16 House Rule 78% width height ratio

Measurement of Tooth Dimensions




Uses of Dental Photography

Diagnostic




Pre-Planning Desired Results




Uses of Dental Photography

Patient Communication




Mouth Mirror is Ineffective




Uses of Dental Photography

Patient Communication




Allows them to see what you see



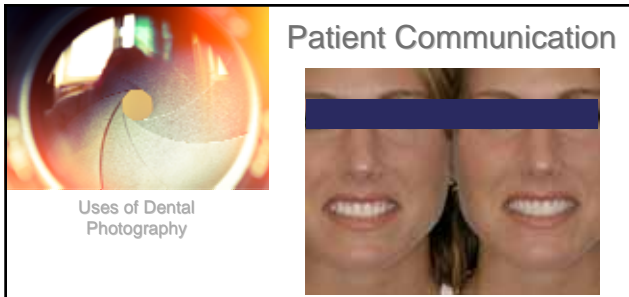
Uses of Dental Photography

Patient Communication



Chairside Patient Interaction

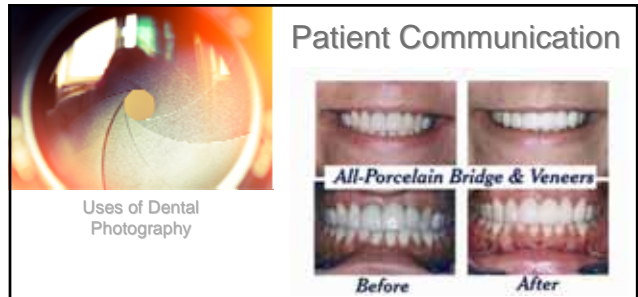
Patient Communication



Uses of Dental Photography

Imaged Full Face Smiles

Patient Communication



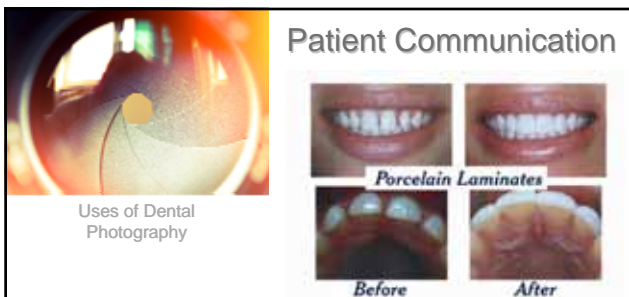
Uses of Dental Photography

All-Porcelain Bridge & Veneers

Before *After*

Before and After Pages

Patient Communication



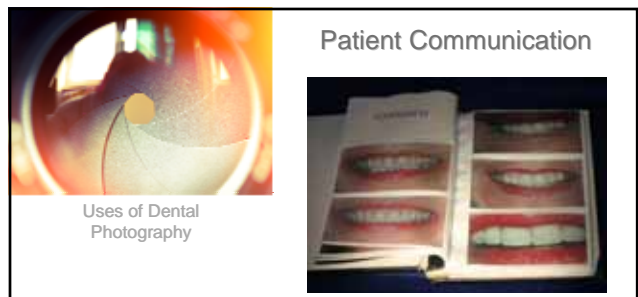
Uses of Dental Photography

Porcelain Laminates

Before *After*

Before and After Pages

Patient Communication



Uses of Dental Photography

Your Treatment Capabilities

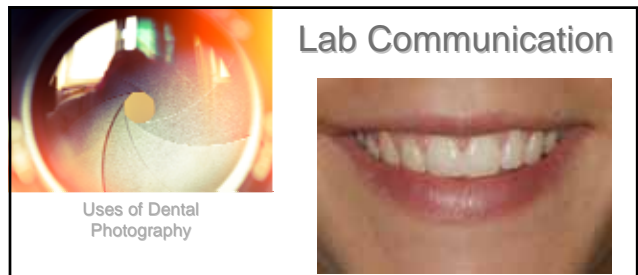
Lab Communication



Uses of Dental Photography

Adjacent teeth and tooth structure

Lab Communication



Uses of Dental Photography

Matching Single Central Incisor

Lab Communication



Uses of Dental Photography



Root Fracture

Lab Communication



Uses of Dental Photography





Paint Tints onto Shade Tab, Seal

Lab Communication



Uses of Dental Photography
Take Photos

E-Mail Photos to Lab
Mail Custom Shade Tab to Lab
Do NOT Mail Printed Pictures




Lab Communication




Uses of Dental Photography




First Visit SUCCESS!

Lab Communication




Uses of Dental Photography




Laminates with tryin paste

Porcelain Laminate Veneer Tryin

Lab Communication





Uses of Dental Photography



Non-bonded Composite

Place layered composite, email photo & send composite to lab



Specialist Communication

Uses of Dental Photography

Periodontists, Orthodontists, Endodontists, Oral Surgeons, Pathologists


Specialist Communication

Uses of Dental Photography

Oral Pathologists



Specialist Communication

Uses of Dental Photography

Oral Pathologists



Insurance Company Communication

Uses of Dental Photography

Fractured Porcelain invisible to radiographic inspection



Insurance Company Communication

Uses of Dental Photography


Necessary treatment invisible to radiographic examination

Insurance Company Communication





Uses of Dental Photography

Filing accident reports




Medical/Legal




Uses of Dental Photography

Documentation




Insurance Company Communication




Uses of Dental Photography

Filing accident reports



Self Evaluation



Uses of Dental Photography

Denture Tryins



Self Evaluation




Uses of Dental Photography

Learning from Every Case




Lectures




Uses of Dental Photography

Community Groups, Study Clubs, Conferences, Universities

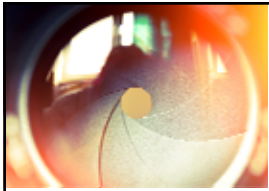


Publications



Uses of Dental Photography

Dentistry Today



Uses of Dental Photography

Accreditation

- ASDA
- AACD
- AAED

Aesthetic Organizations

Digital Photographic Principles



- 24-35mm—wide angle -"fish eye"
- 50mm—standard view
- 85-300—telephoto view—"flat image"
- Dental lens is 85-105mm telephoto macro



• 35mm View



• 105mm View






- Quantity of light that reaches the sensor



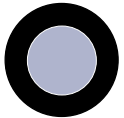
Exposure

- Aperture-Size of the lens opening
- Amount of time shutter is open
- Length of time that flash is illuminated



Aperture

- The size of the opening is referred to as *f* stop
- The larger the *f* stop, the smaller the opening


*f*4



Aperture

- The larger the *f* stop, the greater the depth of field

Aperture

- The smaller the *f* stop, the shallower the depth of field



*f*2

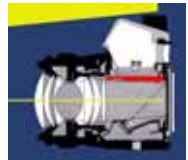
Aperture




*f*32
*f*2

Flash

- In flash photography length of exposure is determined by the amount of time the flash is illuminated
- Shutter opens before flash is on and closes after flash turns off





- Digital TTL metering uses a pre-flash to determine appropriate time for flash
- Shutter opens
- Flash illuminates
- Flash turns off
- Shutter closes



- Proper Tooth Exposure
- Camera attempts to balance light for all pictures
 - May need to overexpose +0.5-1.5 *f* stops to compensate for white teeth



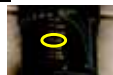
- Ring flash gives more even distribution of light-used for intra-oral views
- Point flash away from lens eliminates red eye and is more 3 dimensional-used for full face views



- Dual-point flash best for facial view of anterior teeth



- Magnification refers to the ratio of image size to object size
- 1:2 means object size is double the size of the image



- Magnification refers to the ratio of image size to object size
- 1:1 means object size is the same size as the image



Standardized Magnification

- Most currently available sensors are smaller than 35mm film and magnify image by approximately 1.5



Standardized Magnification

- Standard 35mm film is 24mm x 36mm



*1:2 magnification
(0.4m away)*

Standardized Magnification

- Digital sensors are smaller than film size



*1:2 magnification
(0.4m away)*

Standardized Magnification

- Resulting image is magnified approximately 1.5 X



*1:2 magnification
(0.4m away)*

Standardized Magnification

- Standard 35mm film Viewfinder



*1:2 magnification
(0.4m away)*



Standardized Magnification

- Standard Digital SLR Viewfinder



*1:2 magnification
(0.4m away)*



Standardized Magnification

- Standard Digital SLR Viewfinder



**1:3 magnification
(0.5m away)**

Standardized Magnification

Full Face Horizontal 1:10 (1:15 digital)	Full Smile View 1:2 (1:3 digital)	Frontal Closeup View 1:1 (1:1.5 digital)
		

Multiply magnification X 1.5

Choosing & Buying a Dental Camera

- Intra-Oral Cameras
- Modified Consumer Fixed Lens
- Dental Designed Fixed Lens
- Single Lens Reflex (SLR)
 - Lens
 - Flash
- Accessories
- Sources

Intra-Oral Cameras



- "Fish-eye" perspective
- Blurred & Faded
- Sheath fogs image
- Great for Hygiene Room

Smart Phones???



- Disinfection
- Distortion
- HIPPA Compliance

Modified-Consumer Fixed Lens



Canon G-16

- Relatively Inexpensive
- Limited Versatility
- Difficult for Intra-Oral
- Great for Full Face & Smile

Dental Designed Fixed Lens



Shofu Eye Special C-IV

- Programmed Dental Modes
- Standardized Magnifications
- Lightweight
- Excellent Full Face & Smile
- Perfect for Staff

Dental Designed Fixed Lens



Shofu Eye Special C-IV

- On-Screen Touch Controls
- Auto Focus & Zoom
- Standardizes Views
- Dual-Point Flash
- Takes Picture when in Range

Shofu Eye Special C-IV



Select Mode

Shofu Eye Special C-IV



Viewfinder

- Shows Mode
- Displays Ideal Distance
- Indicates Magnification
- View Alignment Guide Lines

Single Lens Reflex (SLR)



- Best Image Quality
- Most Versatility
- Image Standardization
- Heavier
- Requires Dedicated Operator

Single Lens Reflex (SLR)



- Use Viewfinder to Align & Focus
- Do Not Recommend Live View
- Review Screen after Exposure

Nikon (SLR)



- 24 megapixel
- 1080p HD Video

Nikon D-7200 7500 \$2500-3500

Canon (SLR)



- 24 megapixel
- 1080p HD Video
- Built in wi-fi
- Easiest to setup-Value

Canon T7 T7i \$2300-2900

Canon (SLR)



- 32 megapixel
- 4k Video
- Built in wi-fi
- 2 Custom Modes
- Heavier

Canon 90-D \$2700-3000

Lens (SLR)



Sigma (85-105)



Sigma-Modified



Canon

Ring Flash (SLR)



Sigma EM 140
DG-Dual Point



Canon MR 14-
EX



Metz MS-1
Wireless Flash

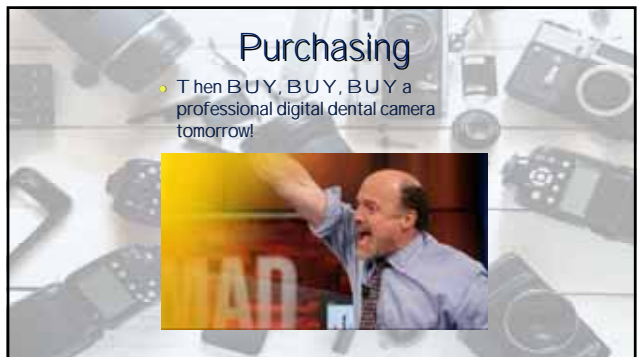
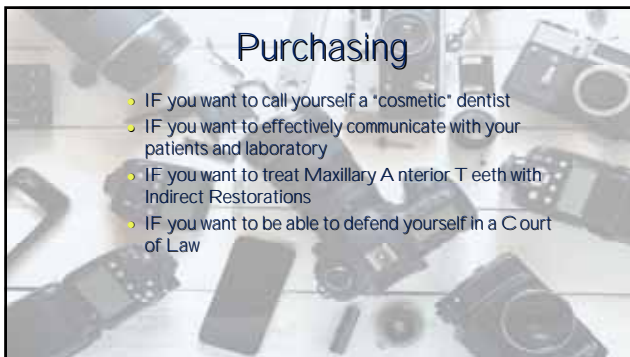
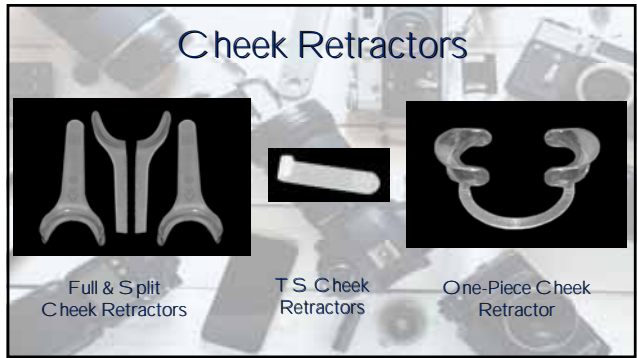
Dual-Point Flash (SLR)



Canon MT-24
EX



Nikon R1 Wireless



Downloading & Manipulating Images

- Direct Input
- Memory cards
- Dental Imaging Programs

Downloading & Manipulating Images

Direct Input



Downloading & Manipulating Images

Memory Cards



SD is predominant card

File Formats



- TIFF-large file (3-6 M)
 - preferred by some publishers & printers
 - also CMYK often preferred when printing
- JPEG-manageable file (1-3 M)
 - edited to 6" x 4" 125 dpi for email-300k
 - standard format-great for lectures

In-Office Dental Imaging Programs



- Smile Library-NOT RECOMMENDED!
- Independent Programs-Smile Designer Pro
- Scanner Modules-3-Shape
- Comprehensive-Digital Smile Design (DSD)
- Mainstream Imaging Programs

In-Office Dental Imaging Programs



Is this possible?

Smile Libraries

In-Office Dental Imaging Programs



Smile Design Pro

In-Office Dental Imaging Programs



3-Shape Imaging Module

In-Office Dental Imaging Programs



Digital Smile Design

Imaging Programs

- Photos
- Photoshop Elements
- Corel Draw
- Photoshop

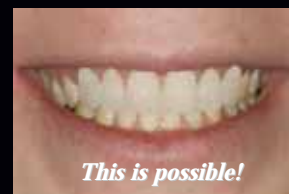


USES



- Imaging
- Cropping & rotating images
- Adjusting light
- Adjusting contrast & saturation
- Balancing Color
- Removing Red Eye & Imperfections
- Formatting image size

Imaging Programs



This is possible!

Proportion-based Imaging

Imaging Programs



RED Proportion-based Imaging

Imaging Programs

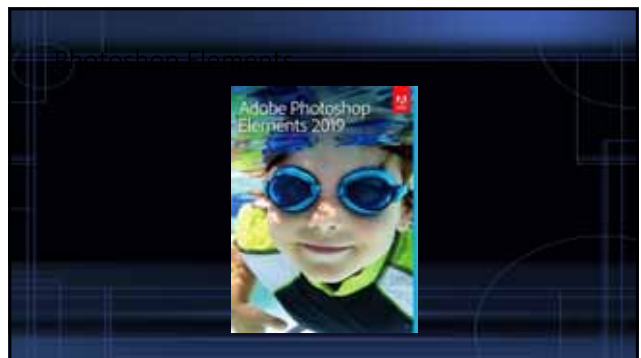


RED Proportion Smile Design

Imaging Programs



RED Proportion Imaged Smile



Quick Fix Mode/Smart Fix

Before



After



Downloading & Manipulating Images

Outsourced Imaging



• **Pre-op Photo**

• **Template***

• **Imaged Photo***

*Valley Dental Arts

Taking Standardized Dental Views

***AACD Required Views**

SLR Camera Setup

- ISO 200
- Flash Sync speed 1/200 second
- Aperture Priority (Av setting)
- Over exposure override +0.5-1.5 f/stops
- Manual focus
- TTL flash



Specialty Dental Camera Setup

No Setup Needed




Shofu Eye Special
C-III

Taking Standardized Dental Views

Simplified Views

Exposure Steps

1. Turn Camera and flash on
2. Set f stop
3. Set magnification
4. Position patient
5. Move to Focus and SHOOT



Single Lens Reflex Camera

Exposure Preparation


- Most have 30 second automatic shutoff
- Set flash to TTL




Step 1-Turn Camera & Flash On

Exposure Preparation

- f 8 or 11 for full face
- f 22 or 32 for all others



Step 2-Set the Aperture

Exposure Preparation


- Manual focus
- Pre-set magnification



Step 3-Set the Magnification

Exposure Preparation


- Lean patient in chair
- Stand over patient



Step 4-Position the Patient

Exposure Preparation

- Move camera to focus
- SHOOT!



Step 5-Focus and Shoot

Exposure Preparation

1. Turn on Camera
2. Select Mode
3. Select Magnification
4. Position the Patient
5. Align and Shoot!



Shofu Eye Special
C-III

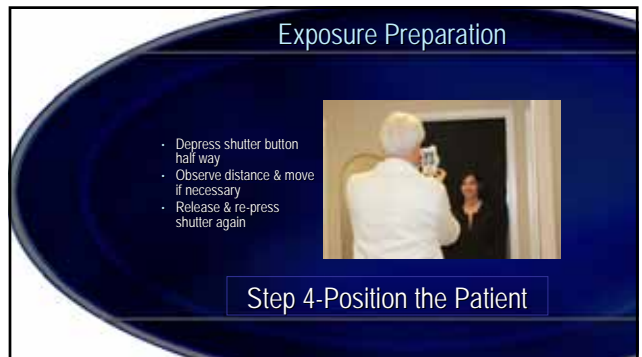
Specialty Dental Camera

Exposure Preparation

- Turn Switch to ON
- Remove lens cover




Step 1-Turn Camera On




Exposure Preparation

- Align and center subject
- SHOOT!



Step 5-Align and Shoot

Full Face View 1:10



Full Face View 1:10

- $f11$
- Face Mode



Step 2-Select f stop/Mode

Full Face View 1:10


- 1:15 digital
- Full face (far left) setting



Step 3-Select Magnification

Full Face View 1:10

- Use background
- 6" in front of background
- Careful focusing
- *Auto-focus w reference pt



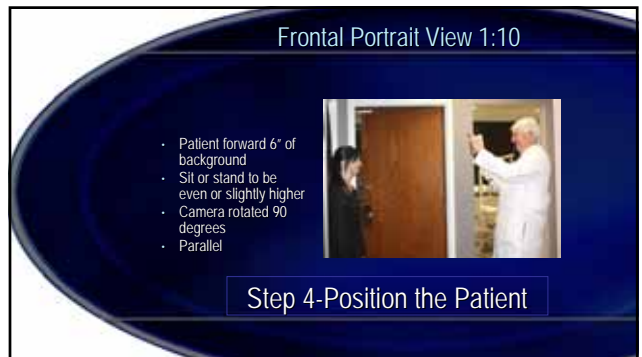
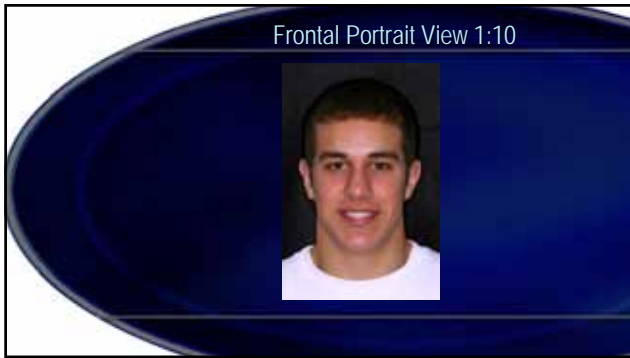
Step 4-Position the Patient

Full Face View 1:10

- Centered w Interpupillary line
- Inferior border below chin
- Centered with vertical midline




Step 5-Align and Shoot



Frontal Portrait View 1:10

- Parallel to Interpupillary line
- Inferior border at clavicle
- Centered with vertical midline



Step 5-Align and Shoot

Full Smile View 1:2



Full Smile View 1:2

- f* 32
- Standard Mode



Step 2-Select *f* stop/Mode

Full Smile View 1:2


- 1:3 digital
- 1/2 setting



Step 3-Select Magnification

Full Smile View 1:2

- Patient seated in chair
- Tilt back
- Stand over Patient



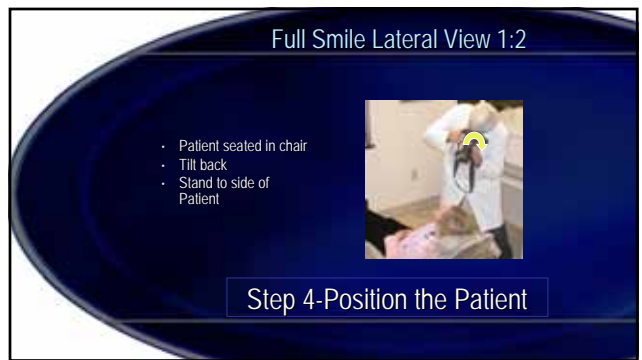
Step 4-Position the Patient

Full Smile View 1:2

- Parallel to incisal plane
- Centered with contact between central incisors




Step 5-Align and Shoot



Frontal Retracted View 1:2

- f_{32}
- Standard Mode



Step 2-Select $f_{stop}/Mode$

Frontal Retracted View 1:2

- 1:3 digital
- 1/2 setting



Step 3-Select Magnification

Frontal Retracted View 1:2


- Gently place cheek retractors



Step 4-Position the Patient

Frontal Retracted View 1:2

- Parallel to incisal plane
- Centered between central incisors
- Centered with incisal plane



Step 5-Align and Shoot

Lateral Retracted View 1:2



Lateral Retracted View 1:2

- f_{32}
- Standard Mode



Step 2-Select $f_{stop}/Mode$

Lateral Retracted View 1:2


- 1:3 digital
- 1/2 setting



Step 3-Select Magnification

Lateral Retracted View 1:2

- 2 full retractors-1 firm
1 loose-pulling upward



Step 4-Position the Patient

Lateral Retracted View 1:1

- Parallel to incisal plane
- Parallel to frontal plane of lateral incisor
- Centered w lateral incisor



Step 5-Align and Shoot

Max Ant Frontal View 1:1



Max Ant Frontal View 1:1

- *f*.32
- Standard Mode



Step 2-Select *f*stop/Mode

Max Ant Frontal View 1:1


- 1:1.5 digital
- 1.0 setting



Step 3-Select Magnification

Max Ant Frontal View 1:1

- Gently place cheek retractors
- Black background optional



Step 4-Position the Patient

Max Ant Frontal View 1:1

- Parallel to incisal plane
- Centered with contact between central incisors



Step 5-Align and Shoot

Max Ant Lateral View 1:1



Max Ant Lateral View 1:1

- *f*.32
- Standard Mode



Step 2-Select *f* stop/Mode

Max Ant Lateral View 1:1


- 1:1.5 digital
- 1.0 setting



Step 3-Select Magnification

Max Ant Lateral View 1:1

- 2 full retractors-1 firm
- 1 loose-pulling upward



Step 4-Position the Patient


Max Ant Lateral View 1:1

- Parallel to incisal plane
- Parallel to frontal plane of lateral incisor
- Centered w lateral incisor



Step 5-Align and Shoot

Mirrored Occlusal Views



Maxillary Mandibular

Mirrored Occlusal Views

- f32
- Mirror Mode



Step 2-Select f stop/Mode

Mirrored Occlusal Views


- 1:3 digital
- 1/2 setting



Step 3-Select Magnification

Maxillary Mirrored Occlusal Views


- Patient tilted 60 degrees in chair
- Stand over Patient
- Cheek Retractors (full or split)
- Occlusal Mirror



Step 4-Position the Patient

Maxillary Mirrored Occlusal Views

- Tilt mirror and camera to include Incisors & 2nd molars
- Blow air on mirror or pre-warm in water
- Do not show nose!
- Centered



Step 5-Align and Shoot

Mandibular Mirrored Occlusal Views

- Patient tilted 20 degrees in chair
- Stand over Patient
- Cheek Retractors (full or split)
- Occlusal Mirror



Step 4-Position the Patient

Mandibular Mirrored Occlusal Views

- Tilt mirror and camera to include Incisors & 2nd molars
- Blow air on mirror or pre-warm in water
- Tongue behind mirror
- Centered



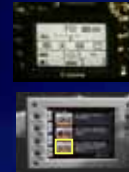
Step 5-Align and Shoot

Mirrored Buccal View



Mirrored Buccal View

- $f.32$
- Mirror Mode



Step 2-Select f stop/Mode

Mirrored Buccal View

- 1:2.25 digital
- 1/1.5 setting



Step 3-Select Magnification

Mirrored Buccal View

- Full Retractor on photographer side
- Mirror holding out cheek
- Blowing air on mirror



Step 4-Position the Patient

Mirrored Buccal View

- Adjust mirror angle
- Back to first or second molar
- Do not pivot on gingiva, pull out cheek



Step 5-Align and Shoot

Mirrored Closeup View



Mirrored Closeup View

- *f*32
- Mirror Mode



Step 2-Select *f* stop/Mode

Mirrored Closeup View


- 1:1.5 digital
- 1:1 setting



Step 3-Select Magnification

Mirrored Closeup View

- Patient tilted in chair
- Hold camera & mirror
- Assistant dries mirror



Step 4-Position the Patient

Mirrored Closeup View

- Centered w tooth
- May use disposable mouth mirror



Step 5-Align and Shoot

