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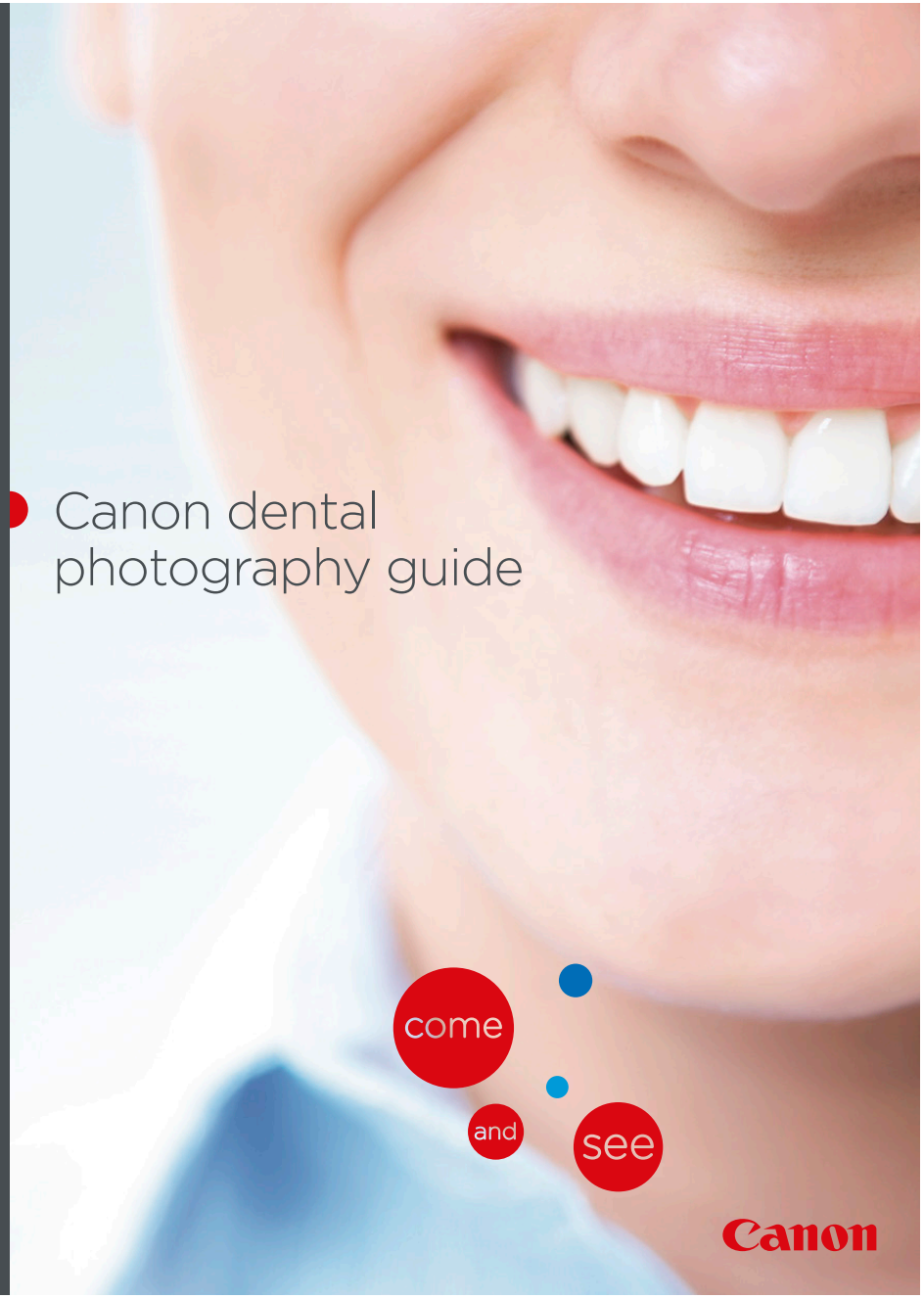


Canon dental photography guide

Index

Choosing a camera, lens and flash 2

Configuring and caring for your camera 3

Practical guide to dental photography 8

Problem solving tips 19

Choosing a camera, lens and flash

Dental photography is an essential part of modern dentistry – as well as an element of many advanced educational qualifications, where it's a great way to illustrate a dentist's skills and expertise.

Canon offers a range of EOS cameras, lenses and specialist flashes that enable dentists and clinical staff to make consistent, accurate high quality pictures of patient's teeth.

Dental photography kit comprises:

Camera body

Canon offers a selection of EOS DSLR cameras to fit most budgets for dental photography.

Macro lens

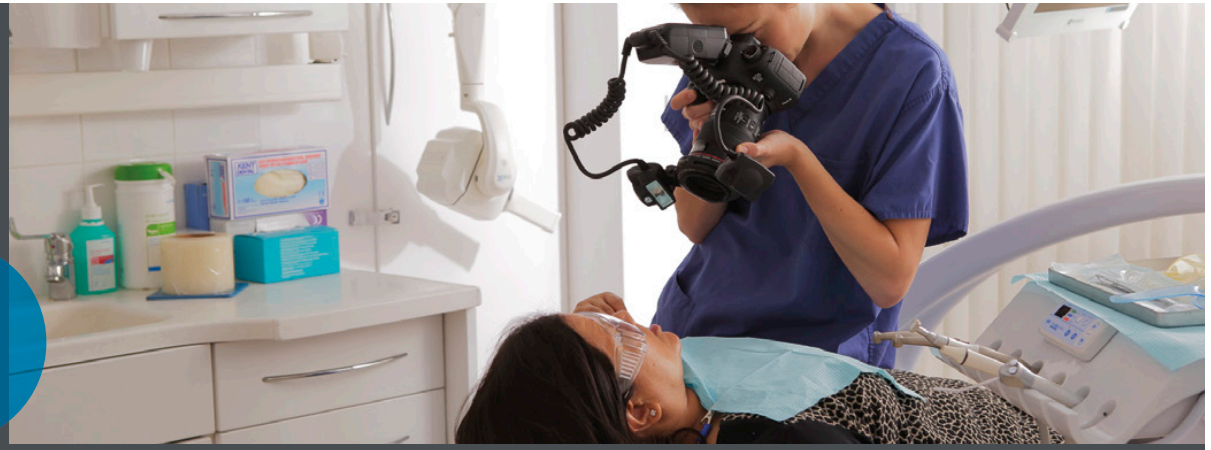
A macro lens has the ability to produce 1:1 life-size images. Canon's extensive range of interchangeable lenses includes a choice of macro lenses that are ideal for dental photography. Many standard intra-oral photographs are taken with 1:3 magnification and Canon macro lenses give a comfortable working distance of 0.5m for such photographs.

Macro flash

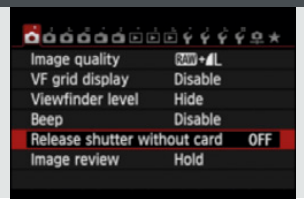
This specialist flash is called a Macro Ring Lite. It comprises two flash tubes that are positioned on the front of the macro lens just out of the picture. Using the macro flash eliminates the variable quality of ambient light and allows the camera to photograph all teeth in clear detail.

Configuring the camera

Before you start taking photographs, features on your new camera will need customisation via the camera menu system to optimise it for dental photography.



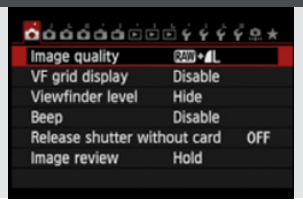
1. Memory cards



Almost all EOS cameras can use standard Secure Digital (SD) memory cards. 8GB or 16GB cards are an ideal option. SDHC, SDXC or cards marked with UHS-1 are also compatible with EOS cameras.

Cameras must be set to only take photos when a memory card is in the card slot. Press the MENU button and navigate to the menu option 'Release shutter without card' and set it to OFF.

2. Image files Raw + jPEG

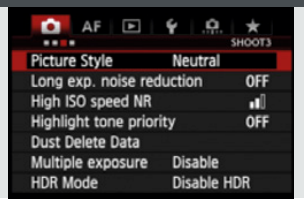


The camera should be configured to store both RAW and JPEG images on the memory card each time a picture is taken. JPEG images are easily used on all computer platforms and are compressed to reduce the storage space required.

RAW images store the image as unprocessed data, much like a picture on a roll of film before processing and have a high level of integrity if pictures are needed for evidential purposes.

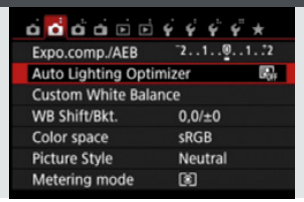
You will need an editing software package to review the RAW image. Patient confidentiality is assured since Canon cameras don't retain any images in their internal buffer memory.

3. Set neutral picture style



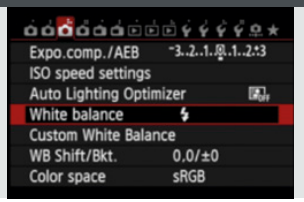
Picture styles determine how colours appear in the images captured by the camera. Neutral style is recommended for dental photography and should be selected from the Picture Style menu.

4. Deactivate Auto Lighting Optimizer



Auto Lighting Optimizer enhances images to brighten parts of the scene that the camera determines to be underexposed. For consistent results this automatic function should be deactivated.

5. Set the white balance to flash white balance

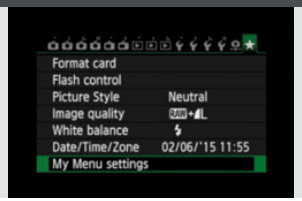


Since dental photos only use flash, set flash white balance to achieve consistent colour.

Dental Monitoring Ex. 2035
Page 3 of 12

6.

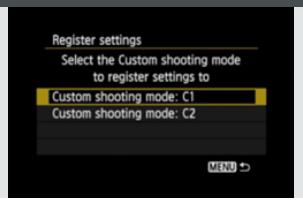
Use MyMenu to quickly access and review settings

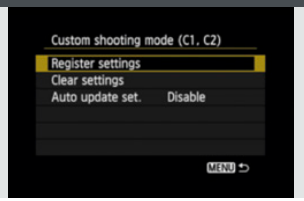


Canon's latest cameras have a green menu section known as My Menu, which can be configured for quick access or review of commonly used features and functions. Cameras can be set so that the My Menu screen is shown whenever the MENU button is pressed.

7.

Custom shooting modes





Advanced EOS cameras include one or more custom shooting modes. These offer a way to recall a preset camera configuration just by turning the camera mode dial. This ensures that consistent camera settings are always used.

If the Custom shooting modes are used, the Auto update setting must be disabled.

8.

Optical viewfinder dioptre correction

It is also important to configure the optical viewfinder before using the camera. Since each photographer has different eyesight, cameras include a dioptre correction that needs to be adjusted to suit each individual user.

- Set the lens to the minimum – closest focus – distance and aim the camera at a light coloured background
- Adjust the dioptre dial next to the viewfinder until the focus points – a series of squares across the image – are as sharp and clear as possible
- If the range of correction is insufficient, Canon has several dioptre correction lenses that will change the range of adjustment

9.

Manual exposure

Manual exposure mode is set on the camera by turning the mode dial to the M position. Then the shutter speed, aperture and ISO can be set. For consistent dental photography, the shutter speed is set to 1/200s and ISO 100 for all patients. The aperture value will need to be changed depending on the kind of photo being taken.

10.

Manual focus

Set the AF/MF switch on the lens to the MF position for manual focus. Then turn the lens' focus ring until the required magnification is visible in the window on the top of the lens. The majority of the intra-oral pictures can be taken with the lens at 1:3 if a camera with an APS-C size sensor is used, and at 1:2 using a full-frame camera.

11.

Manual flash power

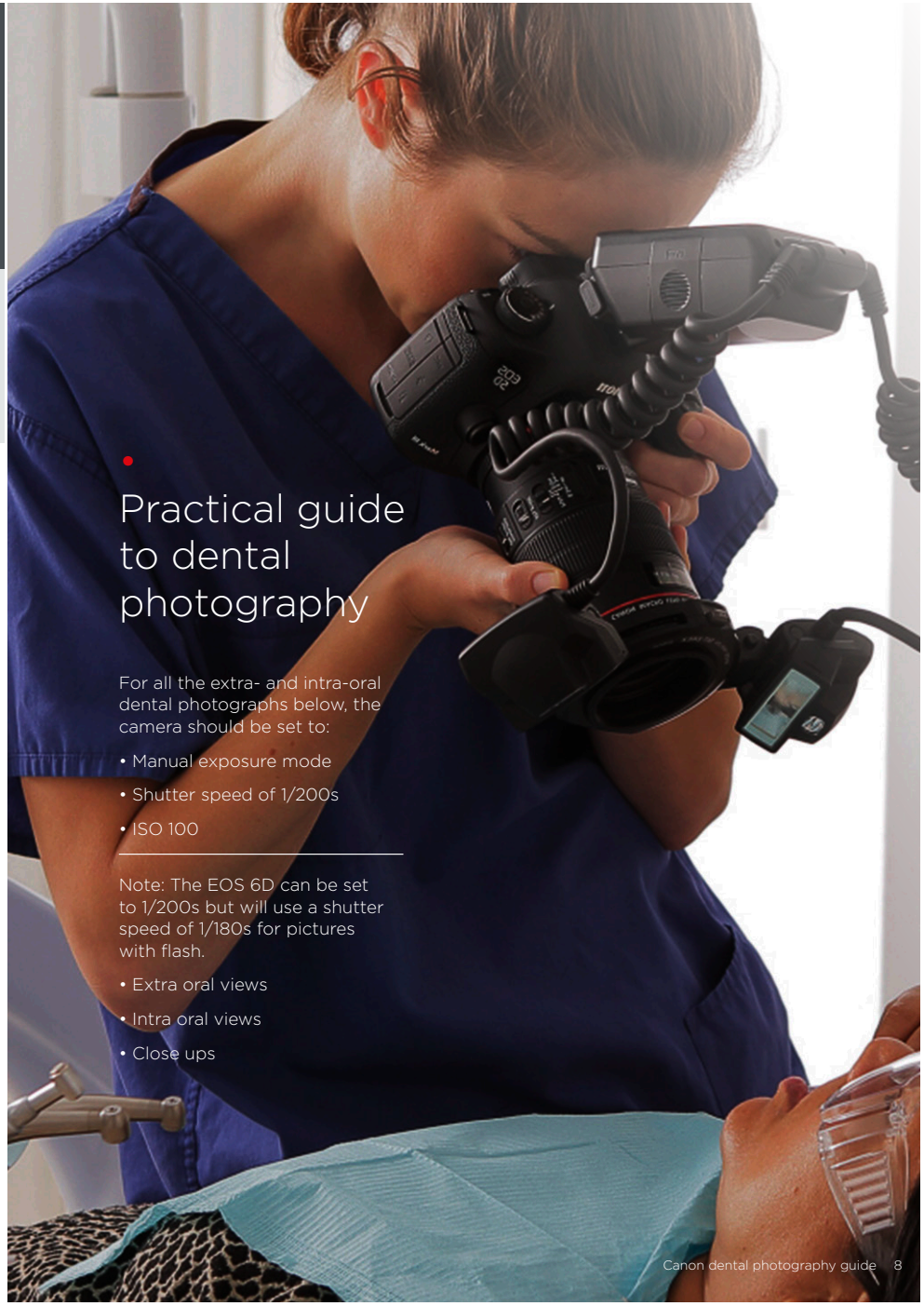
Set the flash to manual mode by pressing the MODE button on the flash until M is displayed. For cameras with an APS-C size sensor set the flash to 1/2 power, and for cameras with a full-frame sensor set the power to 1/4 power.

Flash power and flash mode can be set either on the flash itself or through the camera LCD menus if preferred.

12.

Camera care and cleaning

EOS cameras, lenses and flashes should not be sterilised. The camera can be kept clean with damp sterile wipes if necessary. Sterile gloves are not required when handling the camera.



Practical guide to dental photography

For all the extra- and intra-oral dental photographs below, the camera should be set to:

- Manual exposure mode
- Shutter speed of 1/200s
- ISO 100

Note: The EOS 6D can be set to 1/200s but will use a shutter speed of 1/180s for pictures with flash.

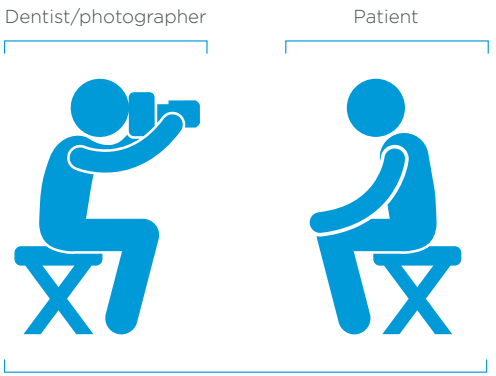
- Extra oral views
- Intra oral views
- Close ups

Extra oral views

Set up - positioning of photographer

For the portrait shots below, the camera should be positioned parallel to the patient at a constant distance of approximately 1.5m. This can be achieved by marking the positions on the floor for the patient and the photographer. A pair of height adjustable seats will allow the photographer and patient to be matched for height.

The camera aperture should be set to f/8. Autofocus can be used as manual focussing can be difficult when holding the camera in the portrait position. Autofocus is activated by moving the AF switch on the lens to the AF position.



Optimum positioning for extra oral views (1.5m distance)

Full-face smiling portrait

The point of focus should be on the bridge, not the tip of the nose.

Left and right portrait

The point of focus should be on the corner of the eye.

Improved portraits with additional flash - ADVANCED

An additional Speedlite flash can be used to take more flattering portrait pictures In this example an additional Speedlite 600EX-RT flash was used with a small light modifier called a softbox.

This combination provides softer lighting and a less obvious shadow around the whole of the face compared to pictures taken with the standard ringflash.

The additional flash can be controlled via the standard ringflash or using an additional flash controller the Speedlite Transmitter ST-E3-RT.

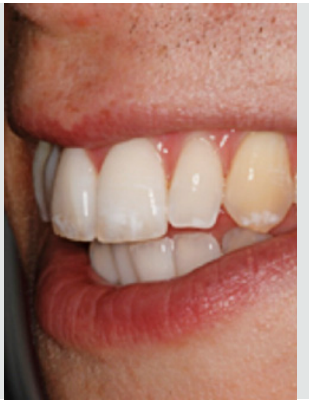
Intra oral views

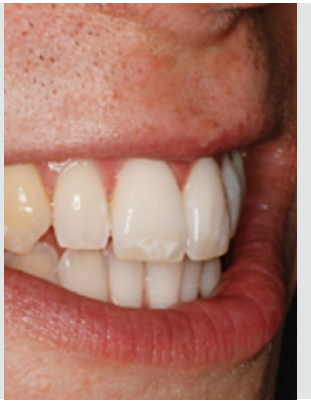
Intra oral views are typically taken whilst the patient is in the dental chair as this simplifies the positioning of the patient and photographer for some of the standard views. Make sure to keep the lens set to manual focus and follow the guidance for each view to set the focus distance and the aperture correctly. Using manual focus will ensure that photos taken at different stages of treatment can be easily compared to show progress.

Retracted teeth apart & eyes (Incisal/interpupillary line relationship)

- **Camera settings:** 1/200s, f/11, ISO 100
- **APS-C camera:** flash 1/2 power; lens set to distance of 1m
- **Full-frame camera;** flash 1/4 power; lens set to distance of 0.7m
- **Point of focus:** lateral incisor
- A pair of retractors should be used

Lateral smile left & right





- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power; lens set to 1:3 magnification
- **Full-frame camera:** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** lateral incisor
- The camera should be parallel to the tooth surface

Frontal smile anterior

- **Camera settings:** 1/200s, f/22, ISO 100,
- **APS-C camera:** flash 1/2 power; lens set to 1:3 magnification
- **Full-frame camera:** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** central incisors
- The camera should be parallel to the tooth surface

Retracted anterior in occlusion

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera:** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** lateral incisors.
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts

Dental Monitoring Ex. 2035
Page 7 of 12

Intra oral views

continued

Retracted right and left in occlusion

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera:** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** lateral incisors.
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts but release retraction on the contra-lateral side

Retracted anterior teeth parted

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** lateral incisors
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts

Retracted right and left in excursion

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** canines
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts but release retraction on the contra-lateral side

Retracted right and left teeth parted

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:2 magnification
- **Point of focus:** canines
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts but release retraction on the contra-lateral side

Dental Monitoring Ex. 2035
Page 8 of 12

Close-ups

Upper and lower incisors and canines

- **Camera settings:** 1/200s, f/29, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:2 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:1.5 magnification
- **Point of focus:** lateral incisors
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts
- A contraster is used behind the teeth to clearly show the shape

Right and left latera close-ups

- **Camera settings:** 1/200s, f/29, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:2 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:1.5 magnification
- **Point of focus:** lateral incisors
- The camera should be parallel to the tooth surface
- Operator inserts retractors, patient retracts
- A contraster is used behind the teeth to clearly show the shape

Dental Monitoring Ex. 2035
Page 9 of 12

Close-ups

continued

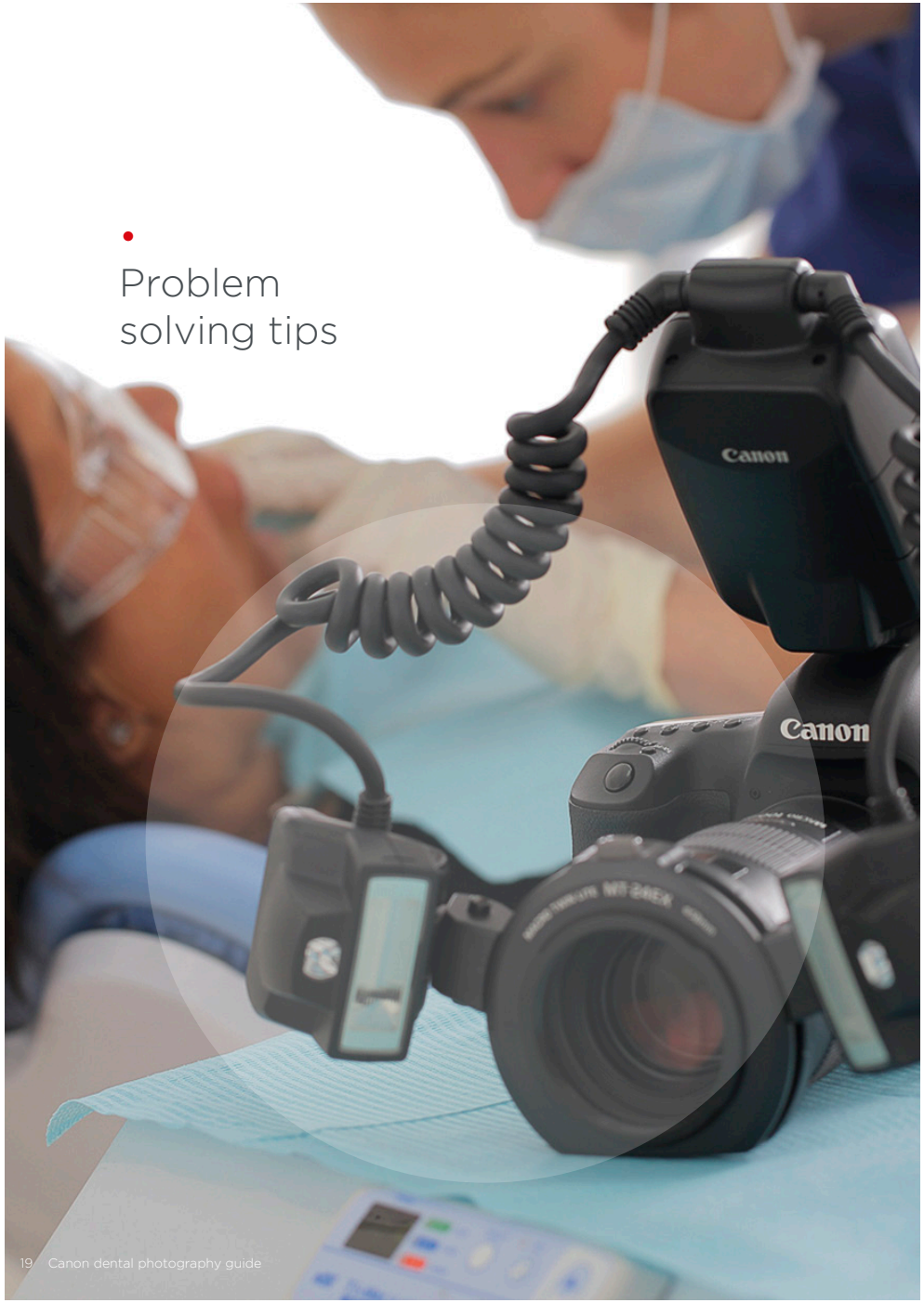
Full arch upper & lower occlusal view

- **Camera settings:** 1/200s, f/22, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:3 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:2 magnification
- An occlusal mirror is inserted/held by the operator or an assistant
- The camera should be at a shallow angle to the mirror
- **Point of focus:** centre of mirror
- Operator inserts retractors, patient retracts
- Mirror photos need to be rotated and flipped horizontally to show the correct view
- It may be easier for the operator if the patient is flat in the chair

Upper and lower right and left quadrants

- **Camera settings:** 1/200s, f/29, ISO 100
- **APS-C camera:** flash 1/2 power, lens set to 1:1.5 magnification
- **Full-frame camera;** flash 1/4 power, lens set to 1:1 magnification
- A buccal mirror is inserted/held by the operator or an assistant
- The camera should be at a shallow angle to the mirror
- **Point of focus:** centre of mirror
- Operator inserts retractors, patient retracts
- Mirror photos need to be rotated and flipped horizontally to show the correct view
- It may be easier for the operator if the patient is flat in the chair

Dental Monitoring Ex. 2035
Page 10 of 12



Problem solving tips

Image too bright or too dark

If the captured image appears too bright;

- Flash power level is set too high
- Aperture value is not set correctly for the photo being taken
- The camera is too close to the teeth

If the captured image appears too dark;

- Flash power level is set too low
- Aperture value is not set correctly for the photo being taken
- The camera is too far from the teeth

Check flash power level

The flash power setting is not normally changed once set on the flash. For cameras with APS-C size sensors check that the flash is set to Manual mode – M is displayed in the top right corner of the flash unit LCD, and that the power level is set to 1/2 (for APS-C cameras) or 1/4 (for full-frame cameras).

Adjust aperture

The aperture value controls the amount of light recorded in the picture. Smaller numbers like f/8 allow more light in, bigger numbers like f/22 let less light in. For most extra oral and intra oral pictures the aperture should be set to f/22. For close-up and quadrant views the aperture should be set to f/29. For full-face and portrait views the aperture value should be f/8.

Check magnification settings

Since manual focus is set on the lens, there is a possibility that the focus ring has changed the magnification and the subject focussing distance. Check the magnification settings required for the view being photographed. If the camera is too far away from the patient the picture will be too dark. If the camera is too close the picture will be too bright.

Image not correctly in focus

AF

Extra-oral views

It is possible that the different posture of individual patients will require small adjustment of the focus; the lens can be set to autofocus mode for these pictures. Sliding the switch on the side of the lens barrel to the AF position activates autofocus.

Close up and intra- oral views

If the close-up and intra-oral views are incorrectly focussed make sure that the camera viewfinder dioptre correction is set to the optimum for the photographer.

There is a tendency for photographers to focus on the closest part of the teeth, which causes the teeth further away to be out of the zone of sharpness. Check after each shot, by zooming in and panning the image on the camera's LCD, that the focus is sharp on the specified teeth, often the lateral incisors or canines, as there is a zone of sharpness in front of the point of focus and a bigger zone behind the point of focus.

Occlusal and buccal mirrors may mist up in some cases. Warming the mirrors before inserting them in to the patient's mouth helps alleviate this. Use air to remove small amounts of condensation if necessary before taking the image.

This guide was prepared with
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