Dental photography: This is what matters when choosing the right camera equipment!

Checklist

Dentist Blog
blog.ivoclarvivadent.com/dentist
Dental photography: This is what matters when choosing the right camera equipment!

I Selecting a camera for dental photography

First, you need to determine for what you want the pictures to use:
- to show them to others for informational purposes:
  ➤ the camera on your mobile phone will do
- to document clinical cases:
  ➤ a „better“ digital camera will be essential

Important points to consider when buying a camera:
- manual setting options
  ➤ e.g. aperture, exposure time, ISO sensitivity to light
  ➤ often already part of good-quality compact cameras
- range of accessories offered by the manufacturer
- auxiliaries available for the camera (e.g. lens filters, memory card reader)
- lens (see Section II)
  ➤ beside the camera, a main factor in dental photography
- white balance setting
- megapixel:
  ➤ at least 10 megapixels
  ➤ more pixels = more options for details = better photo-editing ability

Overview of cameras
Digital cameras are the most suitable type of cameras for dental photography. These cameras can be divided roughly into two main categories:

Compact cameras
- everything in one piece of equipment: housing, lens, flash cannot be replaced separately.
- most of them come with a full-auto program.
- choosing a camera with additional manual setting options is recommended.
- Many digital compact cameras are capable of macro photography and are therefore suitable for taking pictures of small objects (e.g. teeth and crowns).
  ➤ Caution should be used when using macro photography (the focus range will always be smaller).
  ➤ preferably with an optical zoom (avoid a digital zoom because of pixelation).
- Important: Flash adapter for external flash.
  ➤ if an additional ring flash is used.

Single-lens reflex cameras
- Housing, lens and flash are separate parts.
- The picture is transferred to the sensor via a mirror.
- Virtually limitless possibilities: The camera can be assembled individually to meet the specific needs of the user.
- Manual setting options are certain to be part of the camera.

Recommendation: Single-lens reflex cameras are the first choice cameras for dental photography.
Fixed focal length or zoom lens?
The better the lens is, the fewer problems with fuzziness, image noise and distortion will occur.
Lenses can be divided into two groups: lenses with a fixed focal length and zoom lenses.

Lenses with a fixed focal length
- cover a predetermined focal length.
- The frame is the product of the distance between the camera and the object being photographed.

Zoom lenses
- have variable focal lengths.
- This means that, within a certain range, the focal length can be adjusted to the object being photographed.
- Disadvantages:
  - Image quality and light transmission are usually not of a very good quality (unless you buy a very expensive camera).
  - Closest focus distance and light scattering are higher in zoom lenses than in fixed focal length lenses.

Both types of lenses are available in three versions:

1. Standard lens:
   - reproduces the object, surroundings and proportional relationships as seen by the human eye.

2. Macro lens (wide-angle lens):
   - enables extremely close-up pictures of the object to produce life-sized images with a reproduction ratio of 1:1 or higher.
   - Minimum focus distance and camera-to-object distance play an important part in macro photography.
   - With the camera being positioned only a few centimetres away, lighting the object is difficult.
   - Almost a must-have for intraoral photography in dentistry, in combination with a ring flash (see Section III).

3. Telephoto lens (long-focus lens):
   - brings distant objects closer, similar to binoculars.
   - provides an image with a perspective that appears „flatter“, „more compressed and „graphical“.
   - has a longer optically effective length than a standard lens.

Recommendation:
- Lenses with fixed focal lengths (due to sharpness and light sensitivity)
  - if you are aiming for precision
- Zoom lenses
  - if you are aiming for a fast and inexpensive way of taking pictures
Why use a flash?
If you would like to take a picture but the object is insufficiently lit, you may want to use a flash. The flash acts as a „surrogate“ light source.
• Learn first how to use a flash properly.
  ➤ Considered and controlled experimenting with the flash is indispensable.
  ➤ Attend a course on flash photography! Invest some time and money. It’s worth it.

Flash photography has its pros and cons. For your convenience we have compiled the most important ones for you.

### Advantages of flash photography
• independent source of light
• colour neutral
• short illumination times if light is poor
• directed light (ability to control the light source)
• ability to reduce contrast by using fill flash

### Disadvantages of flash photography
• necessity to adhere to synchronization times
• uneven in-depth illumination
• produces hard shadows and high contrasts

#### Flash types used in dental photography

1. **Detachable flashes:**
  ➤ for taking portrait pictures, picture stories, product pictures.
  ➤ especially for full pictures.
  ➤ mostly in combination with zoom lenses due to universal range of applications (TTL function).

2. **Ring flashes:**
  ➤ especially built flash units.
  ➤ One or several circular flashtubes are fitted to the front part of the lens.
  ➤ A sync cable connects the flash with the camera.
  ➤ Characteristic of the light produced by a ring flash: precise, frontal circular and therefore shadow-free illumination of the object without shadowing effect of the lens.
  ➤ Spatial expanse creates a soft light in contrast to the light of regular detachable flash units.
  ➤ particularly suitable for intraoral photography in dentistry.

3. **Twin flash units:**
  ➤ are attached at the sides of the lens and connected to the camera with a sync cable.
  ➤ in most cases consist of two individually mounted flashtubes that can be separately adjusted to illuminate the object.
  ➤ The output can normally be selected for each flash separately.
  ➤ in dentistry often used for lab photography because most components can be detached (e.g. Nikon R1C1).
  ➤ allows the light to be directed to some extent, depending on the possibilities and arrangement of the flash units:
    – horizontal arrangement of the flash units with equal power output, resulting in a wide-angle illumination, similar to ring flash units. This configuration is used for macro and portrait photography.
    – vertical arrangement of flash units. The output of the lower flash is reduced. The upper flash is used for mimicking the sun light. The lower flash (producing a lower output) is used to brighten up the shadows. This configuration is often used for taking macro pictures of small animals or insects, as it results in a natural image effect.

**Recommendation:** Ring and twin flashes are both ideally suited for dental photography. We strongly recommend you to attend a course on flash photography!
Shape your dental future
FROM THE MANUFACTURERS OF IPS E.MAX®: PROGRAMILL ONE

Connected to you
ivoclardigital.com