Camera Recommendation for Dental Photography
October 2016

Introduction

The digital camera is a necessary tool in every dental practice. The type of digital camera system necessary will depend on the work being done and the output being produced. A Digital Single Lens Reflex, or DSLR, camera system is required for high quality close-up macro photography.

A Ring Flash or Ring and Point Flash combination mounted on the front of the lens is required for any intra-oral photography.

The lens required is dependent on the views necessary:

- 90mm, 100mm or 105mm macro lens → extreme close-up, up to 2 teeth
- 85mm macro lens → up to a quadrant
- 60mm macro lens → no smaller than a full mouth

While all these lenses allow you to focus on very small areas, it also means that the working distance between the lens and the subject is very short. This means that using lenses with a shorter focal length, can result in the lens and the flash touching the cheek of the patient, if you try to get an extreme close up view.

Restorative Dentists, Cosmetic Dentists, Prosthodontists and Periodontists, need this type of camera system, because of the extreme close up views, colour accuracy and definition that must be documented for this type of dentistry. Orthodontists can use a 60mm macro lens, because they typically document only the full mouth.

Mirrorless DSLR Systems:

These cameras are currently only useful for hobby photography. While the small size of the camera is very appealing, and close up views can be obtained with some of the lenses, the problem comes when lighting the objects. I have not found a flash for these cameras that will allow for a well-lit intra-oral photograph without shadows. Hopefully this will change in the future.

All cameras require a very specific set-up for clinical dentistry photography. The proper exposure set-up and flash calibration will only be provided through photography courses or through purchases from Dental Photography suppliers. Contact Bauer Seminars, Carestream Dental, Dine Corp, Henrys Commercial Division, PhotoMed and Norman Cameras. If you are purchasing equipment through a regular camera store, make sure that you get the camera set-up, tested and calibrated with your lens and flash selection before you buy.
Canon Camera Body Recommendations:

The **Canon EOS 1300D (Rebel T6)** and **Canon EOS 1200D (Rebel T5)** are the first choice as a DSLR system. They are a substantially smaller and lighter SLR camera compared to other models and offer easy exposure calibration and consistent results.

Other Canon camera recommendations are: **Canon EOS 100D (Rebel SL1)**, **Canon EOS T5i, T6s or T6i (more expensive option)** or **Canon Rebel T3 or T3i**, and **T4i (discontinued models)**.

(Please note: The grip on the T5i is smaller and can be hard to hold if you have large hands however, any upgrades to a higher end model will add a significant amount of weight to the system so it’s important to find out what works best for you.)

Canon Lens recommendations:

1. **Canon EF 100mm f/2.8 Macro USM Macro lens** (approx. $600)

   Please note: You do NOT need the Canon EF 100mm F2.8 “L IS” USM Macro lens with the VR function which costs over US$1000. Vibration reduction is only required if you take photographs in low light and without flash. This model is also heavier than the earlier model USM Macro lens.

2. **Canon EF-S 60mm f/2.8 Macro USM Lens** - Less expensive and lighter than the 100mm macro lens, however this lens will only work well for close ups no closer than a full mouth view. Closest recommended view is only the full mouth due to the short working distance. The flash will touch the patient’s cheek if close ups of posterior teeth are required. This short working distance will result in slightly barrel shaped, distorted images on both facial and intra oral views.
Canon Flash Systems:

Canon Ring Lite MR 14EX II or the previous model, Canon Ring Lite MR-14EX – These Canon flash systems are totally integrated and are, in my opinion, the easiest system to calibrate and standardize for dental photography. Don’t try to save money by purchasing a cheap ring flash or ring light. It is always very difficult to calibrate, and it is quite often impossible to get consistent exposures with a sufficient depth of field.

Canon MT-24EX Twin Light Macro Flash – Excellent quality images can be obtained with this flash system, however, it is too cumbersome and time consuming to use. Not recommended for a fast paced workflow.

Third Party Flash Systems for Canon:

Yongnuo – These Ring Lite units are produced in the same style as the Canon Ring Lite and at about one quarter of the cost. The light output might vary from exposure to exposure as the flash ages, but a solid option for a good price. Mostly available through online orders or special/mail order.
**Pentax (Ricoh) Systems:**

**Pentax K-50** – Lightweight and affordable, this Pentax body also can be ordered in your choice of colour. A clean, white look is great for an office, and something bright and playful would be great in a children’s clinic. Used with the Pentax 100mm macro lens and the Pentax AF 160FC Macro Ring-light (now discontinued) and you have a dedicated system, not unlike Canon, that is more affordable. However, because the Ring Flash is now discontinued it may only be available through sites such as ebay.com

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**DSLR’s:**

Basically all DSLR camera bodies will produce great results. You can obtain excellent clinical views from entrance level DSLR’s because they still have enough function settings for superior dental images. Higher end models will also offer amazing results but is much heavier which can be an issue for dental photography.

**Recommended Nikon DSLR’s:**

Some other excellent camera models are the **Nikon D3400, D5500, D3300, D5300,** and the **D7100.** (Please note: Nikon no longer manufactures its own Ring-light. Read on for lighting alternatives)
Nikon Lens Recommendations:

1. Nikon 85 mm macro lens - very light but is not capable of achieving extreme close-ups.
2. Nikon 105mm macro lens - excellent quality, versatile but is very heavy.

Recommended Lens Alternatives:

The Tamron 90mm or Sigma 105mm macro lens are some alternatives that can be considered. They are available for both the Canon and Nikon systems and typically are less expensive than the Canon and Nikon lenses.

Please note: any 60mm macro lenses should be used with CAUTION. The short working distance will result in a distorted “barrel shaped” image for both the facial and intra-oral views. Closest recommended view is no smaller than a full mouth, due to the short working distance.

Please note: the 18-55mm lens (that often comes with a purchase of a camera body kit) should NOT BE USED. While this lens is ok for hobby photography, it is not appropriate for dental photography. The smallest image that can be captured using this lens is a full mouth set at 55 mm. The short working distance results in barrel shaped distortion for both the facial and the intra oral views.

Other Recommended Flash Systems:

Dine- Mini MacroDual Ring/Point or Ring flash from www.dinecorp.com The Dine Ring flashes work well with Nikon cameras using the Nikon 85mm macro lens or the Tamron 90mm lens. This flash is a Nikon product, so the exposure integration with the Nikon camera is excellent. Exposure set up instructions are supplied by Dine Corporation and the technical support system is excellent.

The Sigma EM-140 DG Macro Ring Flash works well with recent camera models, but it is very difficult to calibrate the exposure settings when used with older model cameras. If you are experiencing inconsistent exposure results, contact the distributor as your flash may require re-programming. (You will need to provide them with the make and model of your camera.)
Nikon has discontinued their ring flash and replaced it with the Nikon R1 macro flashes which are attached at the front of the lens. The downside of this system is that the positioning of the flashes require a lot of attention to detail to get good photographs and is therefore very cumbersome and heavy to use by a dental team in a fast paced practice. The extended flash brackets make it even more awkward to handle. Also they require Lithium batteries for the two flash units, making this a very expensive operating system.

Metz Mecablitz 15 MS-1 wireless macro flash – a decent alternative, however achieving a consistent colour correction proves to be difficult. It also requires an extensive exposure calibration as the images appear very flat.

Warning: Low cost Ring flashes and Ring lights such as the Bower SFDS2C Ring Flash or the Amaran Halo LED light cannot be used for dental photography when used with a DSLR camera system because of the low level light output. Exposure tests must be done at f-32 or f-22 for an intra-oral view to get maximum depth of field, and thus ensuring sharp focus for all teeth in the intra-oral image.
Current “Point and Shoot” Recommendations

When using a ‘Point and Shoot’ camera for dental photography please note:
Very good images can be obtained, however the views cannot be 100% standardized. This is because the camera will obtain focus no matter what the distance from the camera to the subject is. Also, colour rendition is not going to be consistent due to the differing lighting conditions of the room.

Olympus TG-4 Current recommendation for 2016 or the previous model, TG-3 (now discontinued)
Both the TG-4 and TG-3 have a similar look, build and lens. These cameras have a powerful macro setting and a flash placement that will prevent excessive shadows. The LED ring-flash that is sold as an accessory is not necessary as it doesn’t provide the type of illumination needed to improve the inter-oral photos.

Recommended discontinued “Point and Shoot” cameras.
- Canon Powershot G16 (Must have a Canon ring flash with adapter ring to achieve shadow free images.)
- Canon Powershot G12 (With the correct exposure and zoom setting this camera will provide distortion free and shadow-less images, without an additional flash system.)