

# Focus<sub>on</sub> Photography

## Excellence in Dental Photography

by Anna Kataoka, MS, MBA



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### Abstract

This article discusses the basic components of successful clinical photography, including the camera equipment, accessories, adherence to procedures and protocols, and involving the dental team by delegating the tasks of clinical photography. The Journal of the American Academy of Cosmetic Orthodontics is planning to publish more on this subject, with topics ranging from orthodontic photo guides recommended for clear aligners, to the application of clinical photography in marketing and intercommunication with patients and the dental team.

### Relevance of dental photography

The application of digital photography has permeated every aspect of modern dentistry. In fact, it would be difficult to imagine today's dental practice without the use of photography. It is simple and fast, and its uses include case documentation; treatment planning; and patient, peer, and lab intercommunication, collaboration, and education.

The main objective of dental photography is documentation of dental treatment, through images demonstrating the patient's record, the treatment plan, and progress of the results. Clinical photography offers an instant look at the patient's case which can be effortlessly reviewed, monitored, and compared with the patient's other records. Other applications of dental photography include:

- **Patient education and communication:** Visual aids help educate patients on diagnosis and proposed treatment, ultimately resulting in better understanding of a proposed treatment plan, higher case acceptance, and improved practice productivity.
- **Peer-to-peer collaboration and referrals:** Images introduce an entirely new dimension when referring patients to other specialists. Clinical photographs, in particular, play a pivotal role in consultations regarding new patients, facilitating effective communication with both the patient and the referred specialist.
- **Laboratory communication:** Although a stone model accurately renders the details of a tooth's shape and position, it provides no details on a tooth's gingival character, shade, color, or translucency. A shade guide may help characterize the color, but it does not have the ability to portray the complexity of the tooth structure as comprehensively as an image. Photographs, on the other hand, effectively convey visual information about hue, chroma, and value of a restoration, leaving little room for misinterpretation of the desired outcome.
- **Patient record management and insurance verification:** Dental charting, radiographs, and the proper description of a patient's clinical condition are required by insurance providers before benefits can be disbursed. Although useful in recording the state of the mouth, radiographs and charting do not provide information about the tissue. Digital photographs of a patient's condition can support a recommended treatment plan and expedite authorization of an insurance claim.
- **Legal documentation:** A malpractice lawsuit is every dentist's nightmare. In certain cases, clinicians may find themselves involved in consulting on, or even rectifying, a negligent treatment. Proper photo documentation may support the case of a mistreated patient or, conversely, defend a falsely accused colleague.



**Figure 1:** Shofu EyeSpecial C-II digital dental camera includes the Isolate Shade mode, which grays out the gingival tissue for optimal shade matching.

- **Marketing dentistry with photography:** Marketing can take many forms. A patient's before-and-after photographs are powerful tools to motivate, excite and persuade. Besides their invaluable visual appeal in an office portfolio or gallery, they also provide the most cost-effective way to increase patient acceptance and promote a dental practice.
- **Professional instruction and research:** Narrative alone is often inadequate in conveying concepts. On the other hand, instructional photographs depicting the tools and protocols of specific procedures can help improve practice efficiency. In addition, photographic series can be employed to describe a clinical condition or to communicate ideas and concepts with other clinicians in lectures, presentations, trade publications, and professional certification.
- **Self-education, work ethic and personal improvement:** Clinical photography is the backbone of honest self-assessment. A practitioner can use comparative

images to objectively evaluate and improve the quality of care provided, ultimately setting a path to becoming a better clinician.

### General guidelines

The progress of health care technologies and the ubiquity of information technology have made patients better informed about the aspects of dental care. Today, patients' written consent is a legal obligation, as well as an ethical principle which represents patients' right to take part in clinical decisions concerning their treatment. Therefore, it is a necessity to obtain informed consent before using patients' images for clinical, marketing, or educational purposes (in lectures and the like, as well as in professional print and online publications).

A variety of available practice management software solutions have built-in consent templates; some even provide an option to create customized forms using on-screen step-by-step instructions. Similarly, trade literature, popular dental periodicals, and online resources may supply information useful in finding appropriate forms.

### Photographic equipment

In the last decade, dental photographic equipment has undergone a tremendous transformation. With a score of cameras available to dental professionals today, two types are the most prevalent: point-and-shoot cameras and single-lens reflex (SLR) cameras. Despite their deficiencies, which can be mitigated with ancillary equipment, accessories, carefully arranged surrounds, and standardized procedures, both types can deliver satisfactory solutions.

The rule of thumb is to invest in a camera capable of capturing images with accurate human color, full tonal range, and adequate depth of field, and providing the ability to produce close-up images with good light control. Whatever hardware they use, practitioners can increase efficiency and reduce chair time by developing excellent skills in using mirrors and retractors, as well as knowledge of how to photograph with consistency and predictability.

### Wireless images for clinical photography with a smartphone, tablet, computer or TV

With the proliferation of smartphones and tablets, clinicians now have the ability to interconnect a dental camera with other communication devices and systems in the operatory and laboratory. A photograph, captured with a digital camera that is equipped with a Wi-Fi card, will instantly appear on connected office devices, such as computer monitors, laptops, or tablets, turning a dental office or a laboratory into an efficient communication hub.

### Surrounds and background

A consistent background should be present behind each patient for pre-, mid-, and post-treatment photographic sessions. For routine photographing in a clinical setting, it is worth the effort to devise a system with a standardized



**Figure 2:** depth-of-field range of Nikon D100 (top) and Shofu EyeSpecial C-II (bottom).

background that can be used in any room without disrupting the office traffic. The ability to take professional pictures at any time, simply and conveniently, without disrupting the work flow is also an advantage in a high-volume practice. Nothing looks worse than equipment and furniture in the background of clinical images.

Professional medical photographers often use a nonreflective dark background, preferably duvetyne, a velvet-like cloth used in theatrical staging for light control. However, with little effort, behind the door of each treatment suite, one can mount a simple picture frame on tracks, to allow the frame to be raised or lowered to accommodate patients of any height, or even patients in wheelchairs. Another option is to utilize a widely available nonglare bulletin board which can be swiftly affixed with sticky tape, Velcro or bulldog clips.

### Infection control

Dental photography requires strict adherence to infection control protocols. All photographic equipment, including the body of the camera, lens, flash, tripod, and cable releases, should be draped with films, barriers, or disposable covers. Cheek and lip retractors should be either autoclaved or cold-sterilized, depending on the manufacturer's instructions. Intraoral mirrors and contrastors should be cleaned and disinfected carefully with a mild surface disinfectant to avoid smearing and damaging of their delicate coating. To avoid



**Figure 3:** a series of retracted images captured for the orthodontic series: Right Buccal, Frontal, and Left Buccal.

scratching, mirrors should never be placed on or near metal instruments. Sanitary sheaths and plastic barriers that cannot be sterilized in an autoclave must be disposed of in accordance with OSHA standards.

### Dental mirrors

Manufactured in an assortment of sizes for both adults and children, intraoral mirrors are excellent for capturing reflected images when working in regions which are difficult to access. Generally, occlusal mirrors should be used for maxillary and mandibular occlusal images, while buccal mirrors should be utilized when photographing quadrants, or buccal or lingual areas.

Although metal mirrors are more durable and less expensive, and can be sterilized in an autoclave, optically they are inferior to glass mirrors because the polished metal tends to reflect less light than the glass mirrors, and it seems to slightly distort the images. Conversely, glass mirrors, specifically rhodium-coated ones, tend to be more fragile and expensive, but produce more brilliant mirror images than metal mirrors, and are therefore a recommended option.

### Retractors and contrastors

Available in clear plastic and metal, retractors are used to pull back the lips and the labial and buccal mucosa. Retractors can be either single- or double-ended. Single-ended retractors



**Figure 4:** a series of orthodontic face images, repose (left), smile (middle), and profile (right), photographed against a nonreflective, dark background.

have longer, tapered handles, while double-ended retractors provide both a small and a large curvature, allowing for more adaptability and maneuvering.

Their fragile nature notwithstanding, clear plastic retractors are preferred because they offer a slightly better outcome than their metal equivalent, are non-distracting, and look more esthetic in photographs. Metal retractors made of wire, with a larger or smaller curvature at either end, are also in common use. However, the challenge with these retractors is their inability to properly hold the center of the lips.

The important point for dental photography is to retract the cheeks and lips away from the teeth, and photograph the teeth with no cheeks, lips, or retractors present in the images.

To facilitate improved placement of retractors, lubricant may be applied to the lips to prevent their chapping. For quality dental photography, I recommend using the largest set of retractors that the patient can comfortably tolerate. If possible, air-dry the teeth as well, to minimize the presence of saliva and to better reproduce the gingival characterization.

An anterior contrastor can be used in anterior photographs to obscure the inside of the mouth and to make the images more presentable for patients, or as visual aids in lectures and publications. The contrastors can also effectively aid in depicting incisal translucency and the complexity of hue, chroma and value.

### Getting the shots done

Before attempting to capture clinical images, the practitioner should sterilize both the camera and ancillary equipment, and make sure they are supplied with charged batteries and appropriate memory cards. A tray with retractors, contrastor, dental mirrors, moisture control (e.g., lukewarm water), isolation materials, lip lubricant, and other accessories of choice should be ready for single-patient use.

Explain the purpose of the photographic session, and obtain the patient's written consent. The next step is the preparation of the space and background and the appropriate positioning of the patient. Arrange the area in such a way that the background office equipment and furniture are not visible in photographs. The patient should be clean of debris, including blood, excess saliva, lipstick on teeth, remnant cement, and glove powder.

Carefully position the camera and patient according to the type of photographs to be captured, to avoid the errors associated with canting or with taking the images at angles that are too high or too low. Use the interpupillary line and the midline to help orient the camera.

### Standardization

It may be challenging for today's busy practice to standardize clinical photography when so many images are taken by different people, in different rooms, using different cameras and lenses, under different lighting, and from different distances or angles to the patient. Still, when comparing photographs to demonstrate the treatment progress, ideally, the only variable component should be the patient. Everything else—the background, positioning, perspective, lighting, color, magnification, and contrast—should remain constant.

Although standardization in clinical photography requires effort, planning, and a systematic approach to procedures and protocols, the ability to capture high-quality dental photographs each and every time will invariably increase practice productivity and profitability.

### Including the team in dental photography tasks

Although some clinicians may prefer to take dental photographs themselves, delegating this task to another member of the dental team, such as a dental assistant, hygienist, or dental technician, may be worth considering. Firstly, the clinician's unique expertise may be better utilized in performing dental work that cannot be assigned to adjuncts. Secondly, allowing the staff to acquire a new skill is motivational and may be helpful in transforming a daunting task into a rewarding assignment for the entire dental team.

### Disclosure

The author is an employee of Shofu Dental Corporation. ■

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