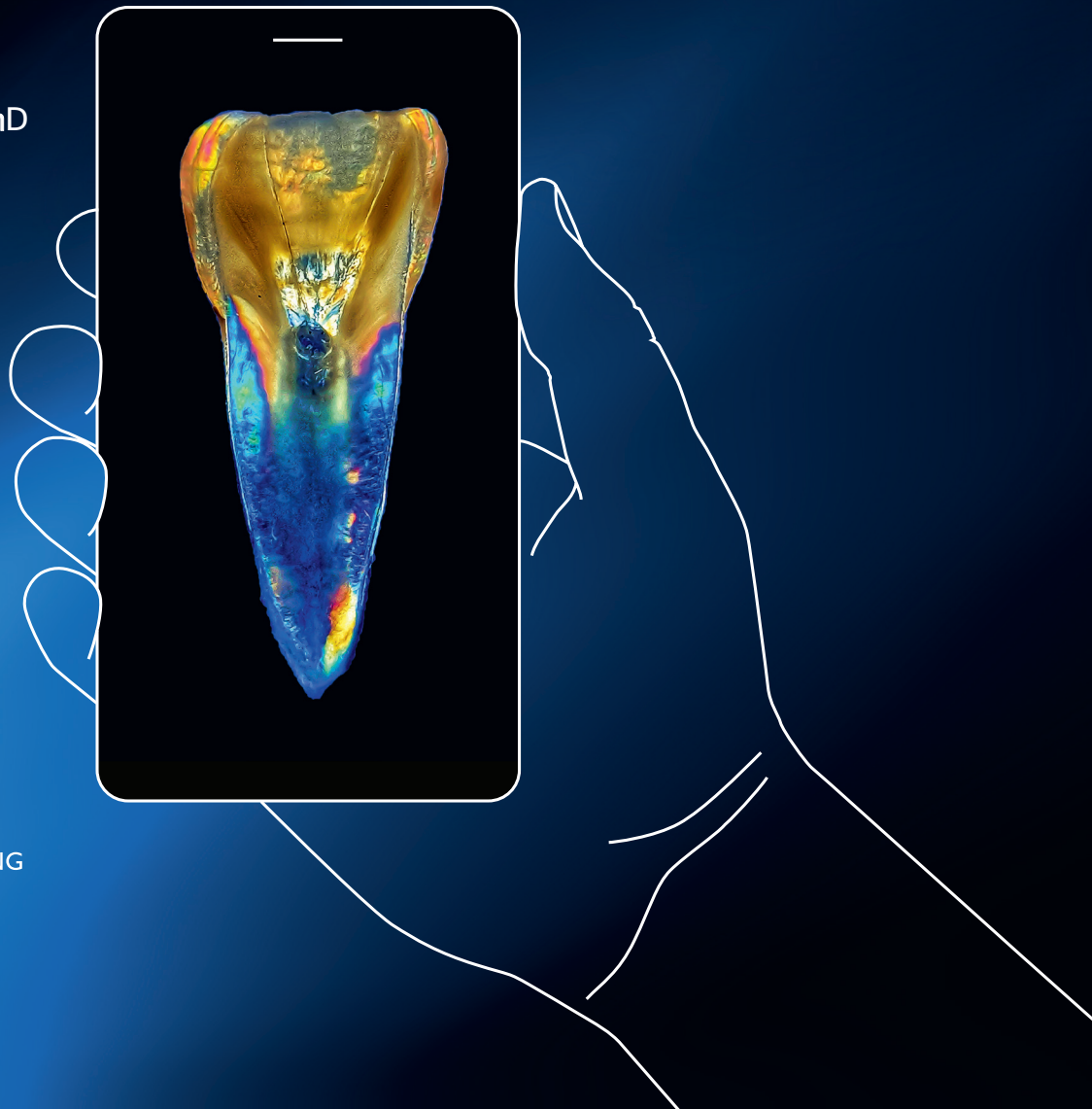


Protocols for  
**MOBILE DENTAL  
PHOTOGRAPHY**  
with Auxiliary Lighting

Louis Hardan, DDS, PhD



# Protocols for Mobile Dental Photography with Auxiliary Lighting

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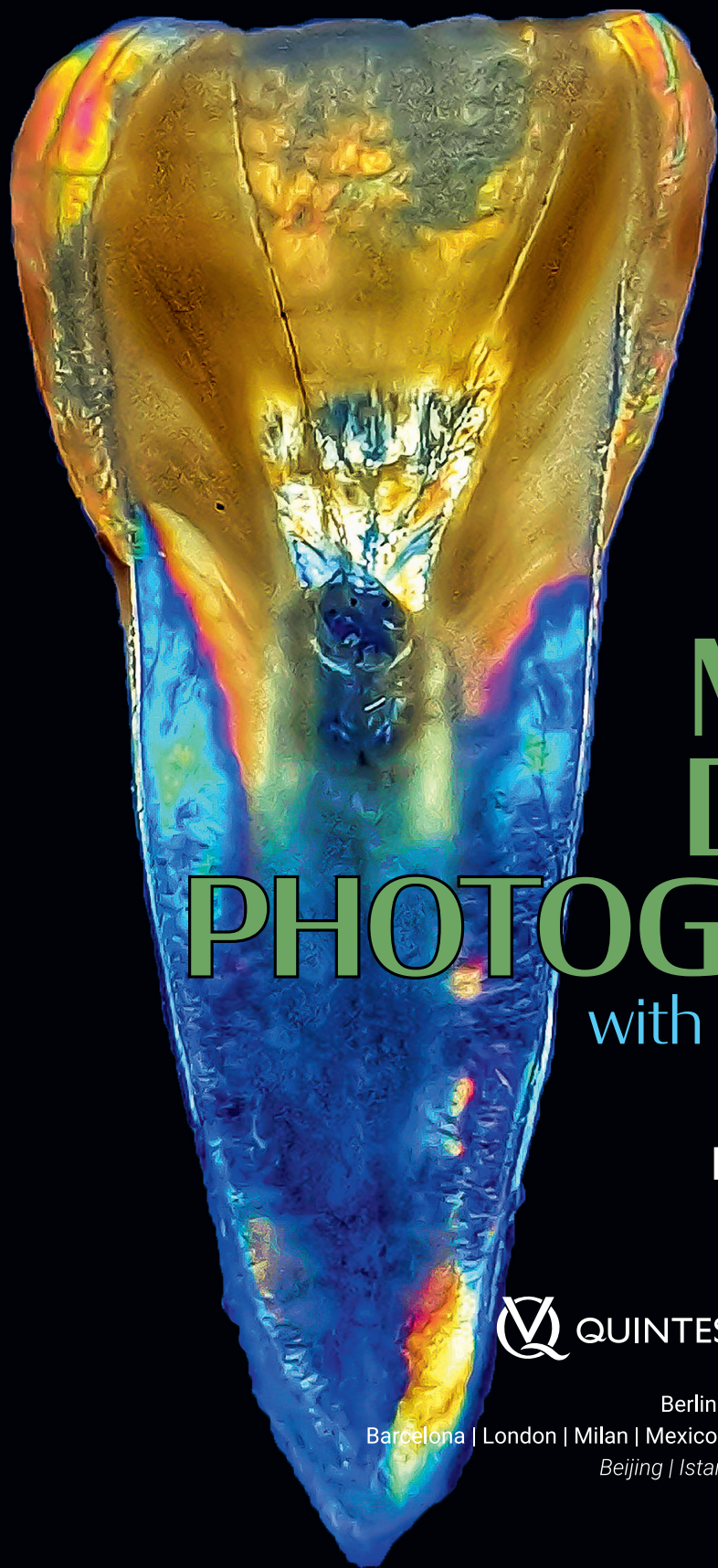
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# ABOUT THE AUTHOR

Louis Hardan, DDS, PhD, is a professor and the director of the master program in the Restorative and Esthetic Department at Saint Joseph University in Beirut, Lebanon. He received his dental degree in 1989 and continued his postdoctoral education at Saint Joseph University, where he obtained a certificate for basic science in 1993, completed his specialization in restorative and esthetic dentistry in 1995, and completed his PhD in oral biology and materials in 2009. Dr Hardan maintains a private practice in his hometown of Byblos, Lebanon, and he is the scientific director and an honorary and active international member of StyleItaliano. He is also the country chairperson for Lebanon of the European Society of Cosmetic Dentistry. Dr Hardan is the inventor of Smile Lite MDP (Smile Line), a device used to take high-quality dental photographs with a mobile phone, for which he won the Best of Class Technology Award in 2017, as well as Posterior Misura (LM instrument), an instrument for shaping direct posterior composites. He has many publications to his name in international journals and has given several international lectures and courses on esthetics, restorative dentistry, and mobile dental photography.

# FOREWORD

**“You should never judge a photographer by the type of film used, but only how he uses it.”**

**—Ernst Haas**

Since Professor Louis S. Hardan joined the StyleItaliano team, every day he has shown the curiosity and interest in simplified dentistry that is in our StyleItaliano DNA. One day he came to us and said, “Taking a good dental photo must be as easy and pleasant as taking a selfie.”

We were shocked by this, considering all the effort that goes into taking high-quality photographs in the clinic, all the devices and details required, all the money invested in making the communication better and better in our courses and lectures. But then he came with a smart prototype and showed us a series of photographs. They were breathtaking—in clarity, resolution, sharpness, and the way the light was managed.

And the device in question was his mobile. With some smart lighting of course.

We finally understood. He was thinking exactly of all the dentists and students who don’t take photographs because it is too complicated and expensive. He was thinking of an easy way to communicate with the dental technician. He was thinking of the assistants, always struggling with the professional camera. He was thinking of the easiest and best way to speak with the patient and create a positive relationship. All of this is the real philosophy and target of StyleItaliano.

We are proud of this work, proud to encourage every dentist to always document every case. This is the way to grow your skills and to share emotions with everyone around.

Although some may express cynicism at the use of smartphones in clinical photography, we would like to remind you of the initial quote by Ernst Haas: “You should never judge a photographer by the type of film used, but only how he uses it.” Smartphone cameras are evolving rapidly, and the photographs in this book are the best proof that it is not the type of camera that dictates the quality of a photograph—it’s how you use it.

Enjoy the book with passion and bright eyes!



**Walter Devoto & Angelo Putignano**  
Founders of StyleItaliano

01



# Introduction

Billions of photographs are taken worldwide each day, and most of them are captured with a smartphone.

The past is gone, we live in the present, and no one can predict the future. This is a reality that we cannot deny. Because our memories can be unclear and lack detail, to keep them alive we often try to capture moments with photographs and videos. Inventor Nicéphore Niépce is credited as the first to take a partially successful photograph in the early 19th century. This technology was slow to evolve, eventually picking up pace in the late 20th century with the introduction of pocket cameras, followed by the integration of cameras in mobile phones in recent years.

In 2011, only about 10% of the world's population used a smartphone. In 2018, that figure jumped to 36%, with an estimated 3.8 billion users in 2021. Because smartphones are relatively similar in design, utility, and performance, smartphone companies are shifting their attention to the quality of their products' cameras to give them the competitive advantage in the marketplace. After all, billions of photographs are taken worldwide each day, and most of them are captured with a smartphone. Improved optical zooming (10× or more), 360-degree video, and 3D imaging with depth sensing are the serious projects of the future for smartphone cameras, and there are plenty of other innovations on the horizon. This technology war between the dueling smartphone companies has spurred rapid evolution in the capabilities of smartphone cameras, leading even some professional photographers to start using their smartphones to take high-quality photographs with great definition.

We know that many dentists already use their smartphone cameras to document their cases and communicate with their laboratory because they do not have professional cameras, but a poorly taken photograph can compromise the quality of the dentistry delivered to the patient. Therefore, it is important to understand how to properly use a smartphone camera in the context of clinical photography. That is why we started the Mobile Dental Photography (MDP) project in 2012; we wanted to find a way to make documentation and communication easy and affordable to all dentists and laboratory technicians, including students. Even in hospitals, the trend of using smartphones and wireless technologies is increasing with the aim of providing high-quality, cost-effective, and altogether better health care.

02



# Why Document?

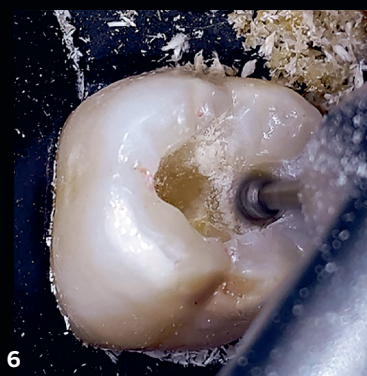
The primary reason to document in dentistry is to record with precision the actual oral situation or procedure performed, and as part of this process dental photography can be employed for diagnostic, clinical, and medicolegal purposes.

**P**atients' dental records comprise documents concerning the history of their dental conditions, clinical examinations, diagnoses, and treatments. The primary reason to document in dentistry is to record with precision the actual oral situation or procedure performed, and as part of this process dental photography can be employed for diagnostic, clinical, and medicolegal purposes.

High-quality photographs are required to obtain more information from the images, allowing their use in multiple fields of dentistry. Photography can be used for treatment planning, documentation and self-evaluation, communication with the patient and laboratory technician, tracking the evolution of treatment, as well as for publishing, lecturing, and marketing; it can also be used for artistic, insurance, or legal purposes.

## Treatment Planning

From the patient's first visit to the dental clinic, dental photography can prove its worth as a diagnostic and evaluative tool. A complete set of oral photographs is essential to create a thorough treatment plan. It can be a very useful implement for the analysis of facial profiles, for the evaluation of prosthetic rehabilitation, for the detection of caries or enamel defects, and for the assessment of gingival health and periodontal pocket or ridge morphology prior to implant placement. Moreover, photographs can be sent to external specialists for a second opinion without need for patient consultation, facilitating better diagnosis and optimized treatment planning. For esthetic cases, photographs can be used to build a smile design so the patient can see the final outcome via a virtual mockup on screen that can be printed and transferred to the mouth with bis-acryl material (Figs 1 and 2). Many smile design softwares are evolving to be used on smartphones as an app or on a website where you can upload photographs directly from the image gallery.



**FIGS 1 & 2** The patient can see his final smile design before beginning treatment. The photographs serve to build this smile, and if the patient approves the design, the dentist can begin the treatment in a guided way.

**FIGS 3 & 4** Before and 4 weeks after restoration of the first molar (and 1 year after restoration of the second molar). Examination of these photographs allows better assessment of the work performed than direct examination in the mouth and exposes any problems that can be corrected in the future.

**FIGS 5 & 6** Patients should know that sometimes a small black line on a tooth can hide a big carious lesion and that they should consult a dentist when they see such a lesion on their teeth. This information can be very empowering for patients who want to be in control of their dental health.

## Documentation and Self-Evaluation

For many years documentation in dental records relied on handwritten notes, radiographs, study models, and clinical photographs. Today most of this documentation is digitized for accessibility purposes. Photographs constitute a very effective archiving tool, providing improved documentation of clinical conditions over time and facilitating observation and monitoring.

Photographs also allow a more precise assessment of the completed work and the procedures followed, enabling effective self-evaluation. Details imperceptible to the human eye without magnification all of a sudden become clear. Moreover, the practitioner can easily examine and compare different procedures for different patients to determine which led to a better outcome, potentially improving future treatment planning.

With the evolution of smartphone cameras, accessibility is further enhanced because every dentist has a phone in his or her pocket that is designed to be user friendly. Photographs taken on a smartphone can be organized into folders by case and later evaluated on a larger screen to evaluate the quality of the work in hopes of improving it in future cases (Figs 3 and 4).

## Communication with the Patient and the Dental Technician

Effective communication between the practitioner and the patient is crucial for the success of any dental treatment, and a photograph is the simplest way to communicate dental information to patients. Images leave an impression on the patient and give him or her the sufficient confidence to move forward with treatment. Sometimes it is only by seeing photographs of their teeth that patients really understand their current dental situation and the treatment planning that the dentist proposes. This is especially true for patients who have sought dental advice elsewhere with negative experiences.

Patients often appreciate viewing photographs of their dental procedures to see exactly how their treatment was carried out. Patients can hence visualize things that they were only capable of imagining before, such as the presence and size of carious lesions (Figs 5 and 6) or the shape of pulp chambers during root canal treatment. Furthermore, by showing photographs of the clinical sequence of similar cases to the patient during the treatment plan presentation, he or she is better

able to understand the procedure and predict the result. This is often helpful in justifying the cost of treatment, especially in advanced cases.

Good communication should also exist between the dentist and the dental technician, especially in the domain of esthetic dentistry. Even the most detailed description written by the dentist cannot compare to the information communicated with a well-shot photograph. Photographs can help the technician visualize how and where his or her work will integrate in its environment. A large amount of information is transferred via photograph, such as the color, shape, alignment, personalization, translucency, opalescence, and halo effect of adjacent teeth.

In addition to other advanced techniques of communicating color information to the laboratory, the following three photographs are very useful:

1. A photograph of a shade guide positioned edge to edge with the natural tooth to show the difference between them (Fig 7).
2. A polarized version of the previous photograph to show the extension of the translucency and its location in the incisal edge, the presence of some details like white spots, and also the difference in color with the artificial shade guide (Fig 8).
3. A photograph showing the secondary and tertiary anatomy because esthetics are not only hue, chroma, and value but also anatomy (Fig 9).

## Evolution of the Treatment

Photographs are taken prior to any treatment to be used as a baseline indicating the primary situation and to be studied for treatment planning. However, follow-up photographs are just as essential to evaluate the progress of the treatment plan. Photographs can be taken on a regular basis throughout different phases of treatment. Thus, the evolution of the clinical situation and the treatment plan can be monitored according to a certain time interval. This is especially important in specialties like orthodontics, prosthodontics, restorative dentistry, and periodontics. Furthermore, photography allows clinicians to objectively assess any changes in color, shape, or integration of any materials used intraorally (Fig 10), which can aid future treatment planning.

**FIGS 7–9** The three photographs that should be sent to the dental technician: (1) anterior shot with edge-to-edge shade guide under diffused light; (2) polarized version of edge-to-edge shade guide; (3) shot taken with the light coming from the opposite side of the camera to show anatomical details of the teeth.

**FIG 10** Photographic documentation allows the dentist to see the evolution of the treatment and the behavior of dental materials over time. In this case, the fissure sealant on the first molar was performed 20 years prior to those of the other teeth.





## Lecturing and Publishing

Dental publishers and meeting organizers are very strict about their image criteria, so it is very important to take high-quality photographs if you are interested in preparing any lectures, posters, articles, or books.

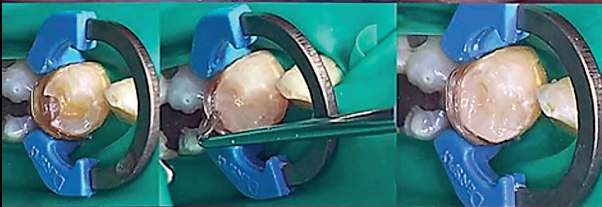
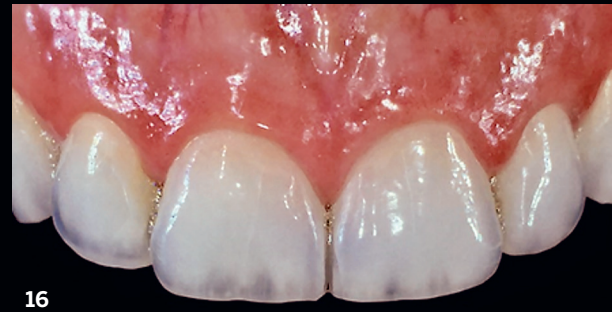
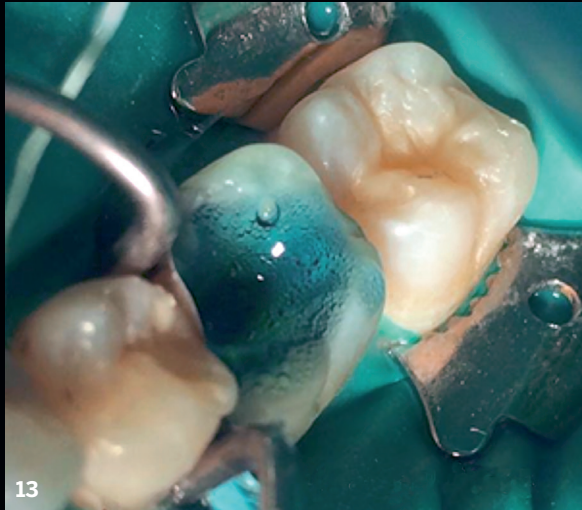
A successful dental lecture is based not only on the contents and the communication skills of the lecturer but also on the quality of the photographs and videos presented. Sought-after lecturers are known for their outstanding photographs (Figs 11 and 12). This is because dentists are visual learners and photographs allow the dental audience to have a clear and comprehensive idea of the topic presented. For example, in diagnosis, photographs make the identification of pathologic situations or lesions and the execution of their treatment easier, because a visual reference was already provided. Photographs or videos also portray the different stages of a procedure step by step, giving audience members a visual guideline that may help them in the future. Furthermore, dentists are able to see a clinical situation on a much bigger scale where details can be highlighted and studied.

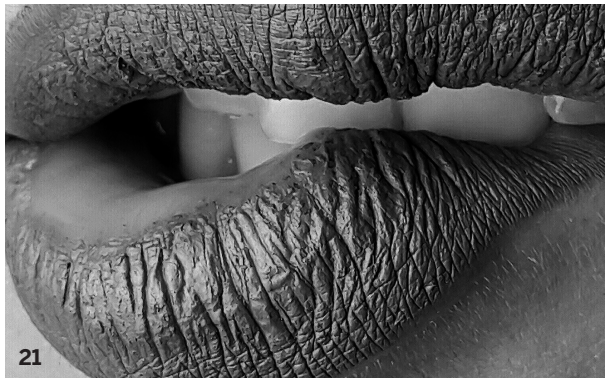
Concerning scientific studies and publications, photographic documentation is a huge asset. It gives the opportunity of remote scoring and enables multiple scorers to evaluate images for scientific purposes. Dental clinicians can compare cases or evaluate a given case over time. In this context, dental photography is an adaptable, reliable, and reproducible recording technique that enables longitudinal studies.

Documentation is mandatory in postgraduate programs at universities, so dental students must start learning how to document with photography in their undergraduate career. They must learn how to frame a shot, how to manage light, and how to “make a picture” (Figs 13 to 18). Once these basics are mastered, it will be easier to upgrade

**FIGS 11 & 12** When lecturing on big screens, high-quality photographs are a must.

**FIGS 13–18** Undergraduate students are able to take good photographs with their smartphones without the use of professional cameras, which is especially useful when they cannot afford one. They only need to be taught how to play with the light and how to frame the shot.





**FIGS 21 & 22** Artistic photographs are sometimes difficult to capture, but they are popular and demanded by many patients. Artistic shots of lips, teeth, prosthodontic elements, and more can be achieved by playing with the light and the position of the camera. These images can be used on social media, in lectures, or as decoration in the dental clinic.

Photographs used in marketing can be “before and after” photographs or a sequence of photographs showing the different steps of a treatment. Digital marketing like this results in high visibility and targets a large base of potential patients. High-quality photographs are mandatory; otherwise, the advertisement will be a failure, even if the dental treatment and esthetic result were perfect.

## Artistic Photographs

Artistic photographs such as those presented in Figs 21 and 22 can form a special and personalized ambiance in dental clinics when they are used for decorative purposes. Furthermore, artistic photographs are primed for marketing via social media. While images like this require established photographic skills, they garner attention and generally encourage potential patients to seek more information about the clinician.

03

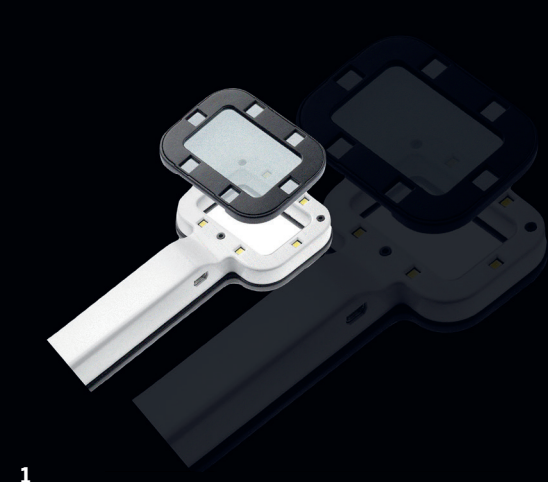




**FIG 11** With DSLR cameras, the user needs to change the settings many times before landing on a good photograph, because the final result can be seen only after the flash is turned on. Sometimes the user is not even able to attain the desired results.



**FIG 12** With MDP, the user can see the final result before taking the photograph because the light is continuous. The process is fast, and we can even take nice photographs of fidgety children.



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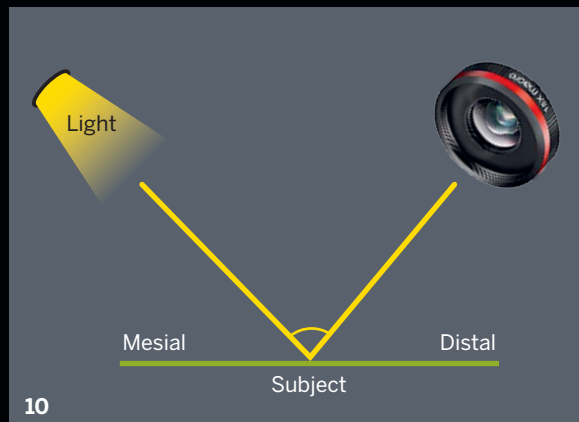
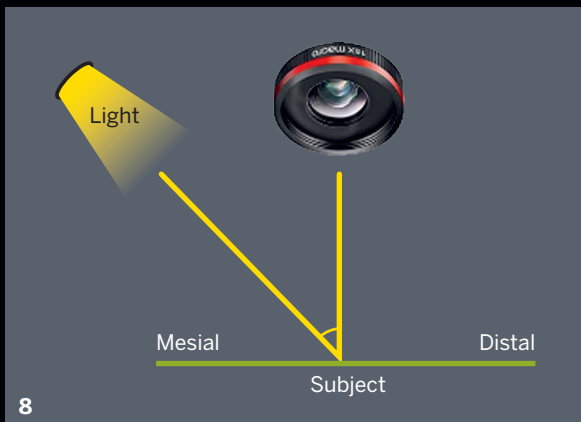
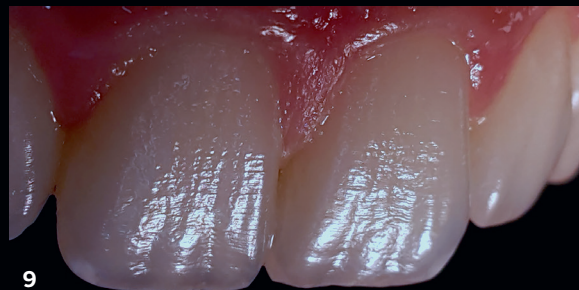
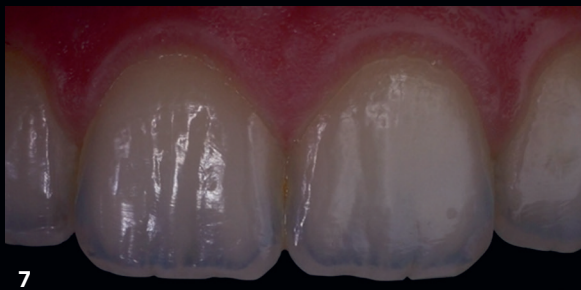
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4



**FIGS 7 & 8** To show the structure of the enamel, the light must be coming from an angle opposite to that of the camera. In this photograph, the diffused light is coming from one side and the camera is parallel to the teeth on the other side. Compare this to Fig 6, where the secondary anatomy is not visible.

**FIGS 9–11** In this photograph, the hard light is coming from opposite the camera, and the camera is oblique to the buccal surface of the central incisors.

