

## STATE OF THE ART



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**Dental photography: Why? What? How?****Part 1 Why? The role of dental photography in daily practice.**Oprea Bogdan<sup>1</sup><sup>1</sup> University Lucian Blaga Sibiu, Faculty of Medicine and Pharmacy, Sibiu, Romania**Abstract**

Digital Dental Photography (DDP) represents a must-have instrument for all dentists in their daily activities. Nowadays, DDP represents a tool that is no longer reserved for a select small number of dentists but is accessible to every practitioner. Although the number of dentists who use DDP daily is increasing, there is much hesitance, many questions, and resistance regarding the introduction of dental photography in daily practice.

This series of articles aims to demystify all the misconceptions related to the DDP and offer readers a transparent image of how DDP can become the most powerful tool for their offices. All the “mysterious” terms related to the DDP will be explained, and simple protocols that can be easily incorporated in any dental office in daily practice will be presented.

This article is the first in a five-part series dedicated to DDP.

Part 1 defines the role of DDP in daily practice covering the four significant indications: documentation, communication, education, and marketing.

**Keywords:** digital dental photography, initial consultation, intraoral photography, extraoral photography, education, communication.

**Introduction**

The indications of DDP are numerous and they cover all the fields of dentistry. However, DDP can play a significant role in the management and marketing of the dental office. The primary use of DDP in daily practice is linked to documentation, diagnosis, and communication. Three aspects must be covered to transform DDP into a “booster” of any practice: equipment, training, and daily implementation for each patient and treatment [1].

The most frequent reasons evoked by dentists who do not use photo documentation are: documentation is time-consuming, expensive equipment, long learning curve (too complicated), and lack of training [2-5].

Starting with this article, the author proposes to the readers a journey inside the fascinating world of digital dental photography with declared aims:

- To demonstrate the importance and benefits of incorporating the DDP in daily practice for each patient.
- To offer a clear and easy-to-understand vision about the fundamentals of DDP that will allow them to document each clinical case predictably.

- To explain how these photographs can be used during the initial consultation to facilitate communication with the patient regarding his dental status, treatment options, and risk of complications in the absence of the treatment. A successful presentation will increase the acceptance of the proposed plans, and DDP plays a significant role in this success.

There will be five parts in this series.

Part one of this series is dedicated to the question “WHY?”. Why do we need dental photography in our offices? The role and the place of dental photography in our daily practice.

Part two will answer the question “WHAT?”. What equipment do we need, and what settings do we need to know to be able to perform the dental photographic documentation with decent/ good/ excellent results?

Part three will continue with the question “WHAT?” What pictures do we need to take? The author will present an extended series of images organized by ergonomic and medical criteria. Another question that will receive answers in part three of the series: What the

ideal dental photography from technic and medical criteria looks like?

Part four will answer the question “HOW?” How to make these pictures in a standardized manner that will predict the results. A simplified protocol for intraoral and extraoral documentation will be presented, which can be performed with a basic kit in any busy dental office.

Part five will continue with the question “HOW?” How to:

- organize the images in a template (a link for downloading this template will be provided at the end of the fifth article)
- use the template to create a treatment plan
- present with success to the patient.

At the end of this series, the author hopes that all the mysteries and misconceptions regarding digital dental photography will be cleared and demystified. Most readers will understand how to transform dental photography into their most powerful tool during daily activity.

Why? The role of DDP in daily practice

The roles of dental photography are numerous, but they can be organized into four categories: Documentation-Communication-Education- Marketing [6,7].

Of course, we can describe other aspects in which dental photography can be used, but our focus will be on these four principal roles.

**DOCUMENTATION:** this is the primary purpose of DDP

- Initial status of the patient: a good set of pictures with the initial status of the patient is required at the beginning of the collaboration with every new patient. In this stage (initial consultation), DDP becomes a valuable instrument for examination, co-diagnosis, and treatment planning. Without hesitation, we can consider DDP a paraclinical examination with similar value as other investigations and tests. For all complex cases, it is recommended to avoid giving a final diagnosis, a treatment plan, and a financial statement at the end of the first meeting with the patient. The reasons are: many clinical aspects can be overlooked; there are clinical aspects that require an interdisciplinary approach, and we need the opinion of other specialists; there is always more than one option for the treatment plan. A complete set of pictures, together with other investigations (CBCT, 3D models), will allow the dentist to perform a “second examination” in the absence of the patient at a later date. In this way, there will be time to analyze the preoperative dental status, sometimes with colleagues of other specialties, to arrive at a final decision regarding the treatment plan (one or more options) to be presented to the patient (Figure1) [8-12].

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Figure 1. Series of “functional images” organized and prepared to analyze the occlusal functional aspects

- The treatment plan evolution stage by stage (restorative, orthodontic). The possibility to analyze different pictures at different moments of the treatment can give precious information to the dentists helping them to adjust the treatment approach according to the goals established at the beginning of the treatment. Also, these pictures can help the

dentist motivate the patient by showing the progress made (for example, long-period orthodontic cases, and complex periodontal treatments) (Figure 2) [9,13,14]. One of the effects of step-by-step photographic documentation of treatment is to create a collection of own images that will be used for educational and marketing purposes.



Figure 2. Before and after images during a severe erosion rehabilitation case

- The final result obtained at the end of the treatment. It is essential to have at least 4-6 pairs of pictures before and after, not only for marketing purposes but also for the

morale of the entire team which must learn to celebrate with the patient a successful end of treatment and motivate them for periodic check-ups. Also, these pictures can be used for marketing purposes (Figure 3).



Figure 3. Pictures taken at the end of the treatment

- The initial condition and its progress (evolution or remission). These are very

important, especially for soft tissue lesions [15].



- As a medico-legal document regarding the initial status and the treatment performed. The usefulness of a well-documented medical record in the case of possible disputes is significant. When the patient file is completed with pictures of the initial situation, the different treatment stages, and the final results, it will be much easier to demonstrate the initial oral situation of the patient and the quality of the treatments performed [8,11,16,17]. Ideally, all dental procedures must be documented, but it is also understandable that the standard practitioner, in her/ his practice, does not have time to document all the treatments performed daily. So, what must be documented for a legal purpose? Here are some suggestions:
- Surgical and esthetic treatments.
- All the treatment phases were performed on suspicious and reticent patients even if they agreed and signed the treatment plan.
- The patients with a problematic/ conflictual attitude.
- Comprehensive dentistry.
- Minimum two images with the initial situation and ending condition for each treatment we performed.

## COMMUNICATION

- With the patient: The value and communicative power of images have been known since ancient times. Whether or not we are aware of it, we all communicate much better through images. That is also valid in the case of the doctor-patient relationship. The use of DDP will help the patient understand their dental situation faster and better, and all the information regarding the causes and complications we want to explain to them. Using DDP, communication becomes much more effective. Of course, the dentist must improve her/ his verbal skills so that any patient can easily understand the explanations accompanying the presentation of the images. Without the presence of the DDPs, only the verbal explanation of the dental status and treatment proposals may confuse a patient unfamiliar with the medical language. When the dentist uses the patient's clinical images, many confusing terms become more evident, the impact is much more powerful, and confidence increases. Using a series of images presented in a specific order can help the dentist explain the logic behind the proposed treatment plan and the importance of following a specific sequence of treatment sessions (Figure 4) [8,9,18-20].



Figure 4. The use of DDP during the initial consultation

- With the members of the dental team: Modern dentistry and complex oral rehabilitation often require a multidisciplinary approach involving more than one dentist. Taking appropriate dental pictures and organizing them according to

an already agreed template will allow team members to collaborate to establish all the diagnoses and implicitly therapeutic solutions and the phasing during dental team meetings online or offline (Figure 5) [16,20-22].

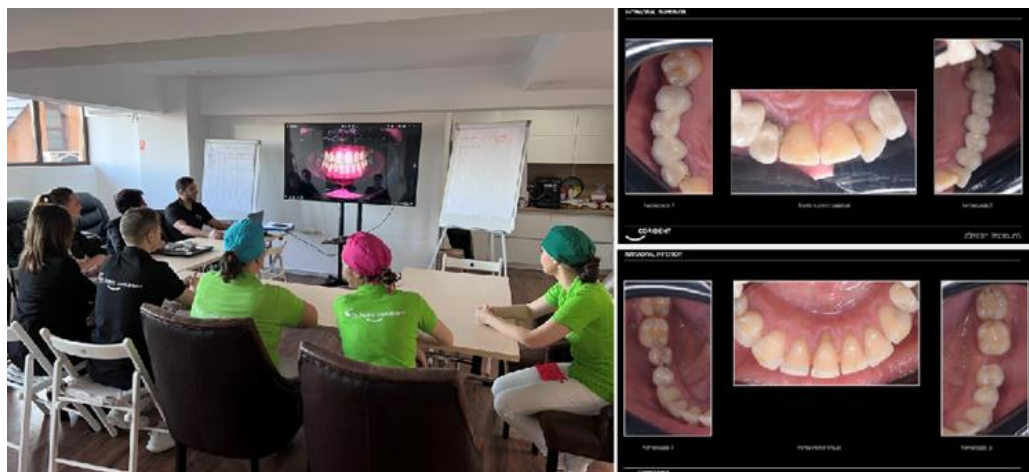


Figure 5. The use of DDP during the interdisciplinary meeting

- With the dental laboratory: Digital or analog, dental technicians work on a model without a face, lips, or soft tissue and depend totally on the information that the dentist provides to them. The photos taken by the doctor will provide the dental technician with important information related to the color, shape, texture, and size of teeth that will allow the technician to create restorations as appropriately as possible from a functional and esthetic point of view. A minimal set of pictures for

a dental technician must include: a portrait, semi-profile, and profile, each one in maximal intercuspation (MI), relaxed lips, smile, large smile; frontal teeth on black background, frontal teeth with polarised light, a picture with the shade guide in normal light and polarized light. This basic photographic information must be accompanied by a list of patient expectations and wishes. Also, the dentist must provide the dental technician with pictures of all try-in stages (Figures 6,7) [8,23-31].



Figure 6. Minimal photo portfolio for the communication with the dental laboratory



Figure 7. Images with prosthodontic restorations during try-in phases and the end of treatment

- With the referral colleagues: If we want to refer our patient to a specialist (for a second opinion or a specific treatment), attaching a picture of the lesion or preoperative status is extremely helpful. The specialist will have

more information to better understand the case and schedule the appointment accordingly. That goes both ways and is valid when other colleagues refer patients to us (Figure 8).

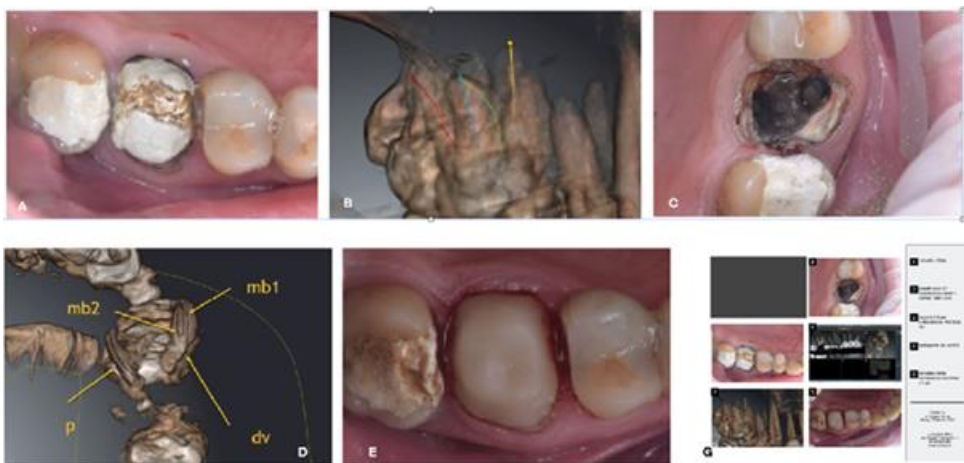


Figure 8. Example of photo portfolio used to create a medical report for the referral dentist. A: initial situation, B: 3D Xray showing an upper first molar with four canals, C: situation after removing the metallic post, D: 3D Xray control validating the quality of root canals obturation, E: clinical image with new ceramic post core, G: example of report created with the images

- Academic, publishing, and education: DDP is the mandatory way to document a clinical case that will be presented to the scientific community, colleagues, and students [8,10,18,32-37]. These are a few recommendations regarding the use of DDP in this field:
- use DDP to document “step by step” any procedures intended to be presented in the academic environment making possible the

illustration of a protocol from beginning to end.

- each periodic control must be well-documented (including DDP) to record the changes during the treatment and for long-term survey results.
- organize the pictures on the computer in a way that makes them easy to find according to the topic that must be illustrated.

- respect all the quality criteria for a DDP according to the academic recommendations.

## EDUCATION

- For the patient: by creating a practice portfolio with own solved clinical cases that can be used to:
  - show similar cases and how they are solved,
  - similar cases without treatment and how they evolved into complications.

We must be aware of our educational role as dentists in patient relationships. Patients come from different social backgrounds, they have different educational and even intellectual levels, and most of them do not benefit from any education in the field of dental health. We cannot expect to talk and obtain a real understanding of the clinical situation and treatment plan from the patient. When the patient can see their images or images with similar situations and these images are accompanied by verbal or written explanations, the level of understanding rises, and the decision regarding the chosen treatment is much easier and faster [12,14,38-40].

- Self-learning by analyzing the pictures of the procedures performed with good and not-so-good aspects. During the author's lectures or workshops, the participants are encouraged to take pictures of their work and view them on a large screen. The DDP is a merciless teacher who will reveal any mistake, allowing the dentist to correct it. In other cases, the DDP will confirm the success of the treatment, validating a specific protocol, technique, or material used. Taking dental photos step by step during the treatments that are performed will allow the dentist to:
  - self-evaluate her/ his work and discover, possibly, specific errors not noticed during the treatment
  - to assess, afterward, if a particular approach or solution was favorable [41, 42].
  - team training: the pictures with the successful and the failed treatments are the best study materials during the team training. The DDP and other investigations (CBCT and 3D models)

are invaluable tools to validate/improve/ change the protocols.

## MARKETING

DDP plays a significant role in all aspects related to the marketing of the dental office. Whether we speak about internal or external, offline or online marketing, DDP is the element that gives power to the words. We can use DDP:

- Offline – for printed materials for the reception area or to be handed to the patients.
- Online – for the website and social media.

Regarding the use of pictures for the marketing materials (offline or online) it is important to mention that it is recommended to use pictures of practice patients instead of pictures that can be bought from online platforms. The images of a genuinely beautiful smile taken in the dental office, together with pictures of the dental team and real patients smiling, will improve the reputation of the dental office and will create a climate of confidence inside and outside the dental team.

We must obtain written consent from each new patient for taking and using DDP. There are numerous models of standard release forms. The form must contain a clear and explicit statement of the intended use of the pictures and must be signed by the patient before taking any DDP. This form must be kept in the file of the patient. Most of the patients understand and agree to photo documentation as a medical investigation. However, many of them are reluctant if their images are used for marketing purposes, and many patients specify that they do not want to appear in social media posts [43, 44].

## Conclusions

The technological evolution over the last 10-15 years has increased the quality of the images that dentists can obtain for their DDP documentation using digital cameras and specific accessories.

From a financial point of view, a basic kit for DDP is now accessible to any dentist interested in introducing the DDP in his daily practice.



From a learning point of view, nowadays, there are many training solutions (online or offline).

Regarding the use of DDP as a co-diagnostic instrument:

DDP presents some absolutely indisputable advantages when we use it as a co-diagnostic tool, advantages that cannot be overlooked:

- It is non-invasive;
- It is fast and easy for the patient; DDP documentation will not be time-consuming if a protocol is followed and all the team members know it and respect it (Figure 9);



Figure 9. Photo documentation for initial consultation. Fast, easy, painless

- The quality of the information (exposure, composition) can be controlled instantly;
- Provides details and information that can sometimes escape a regular first clinical examination;
- Due to the high resolution, these images allow the observation of the finest details

using the zoom in tool. The quality of the details obtained from an image is equal to or, sometimes, better than the one offered by a microscope (much more expensive and not available on a large scale in each dental office) (Figure 10);



Figure 10. DDP are easy to check for quality criteria

- Allows the examination time to be extended indefinitely. Creating a comprehensive treatment plan, fully responding to the

esthetic and functional needs of the patient, must rely not only on a thorough clinical and para-clinical examination but also on a



stage of reflection upon the collected information in order to provide an accurate diagnosis. DDP, together with the other test and investigations, offers dentists extra time (in the absence of the patient) for this reflection stage. The time we have with the patient on the dental chair is limited, and

often, many aspects can be missed or overlooked. Having a set of original images will allow the dentist to examine them later on the computer and observe details that might have escaped during the clinical examination (Figure 11).



Figure 11. DDP allows a later examination without the need for the patient to be present

Due to its numerous indications, dental photography represents one of the most critical “instruments” we can add to our daily practice.

Dental photography can boost real and long-term professional and financial growth for dentists and their offices through correct and day-to-day use.

Probably the essential use of photography is that of a co-diagnostic and communication tool during the first consultation. However, this is a vast subject so we will dedicate it to part five of this article series.

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