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FROM SCAN TO SMILE

The Dental Assistant's Role in Digital Whitening Tray Fabrication

Abstract

Digital dentistry continues to reshape the delivery of patient care while creating new opportunities for Dental Assistants to expand their clinical responsibilities. Through advancements in intraoral scanning, cloud-based design software, and chairside additive manufacturing, Dental Assistants are increasingly participating in the fabrication of custom dental appliances. One example is the production of custom whitening trays utilizing the DMG DentaMile® digital workflow. This article reviews the complete process from patient documentation and digital scanning through appliance design, printing, washing, curing, and delivery. Emphasis is placed on the evolving role of the Dental Assistant as a contributor to digital workflows.

Learning Objectives

After reading this article, participants will be able to:

- ✓ Discuss the evolving role of the Dental Assistant within digital dentistry workflows.
- ✓ Describe the clinical steps involved in designing and fabricating a custom whitening tray using the DMG DentaMile® digital workflow.
- ✓ Explain the benefits of digital scanning, software-based design, and additive manufacturing in whitening tray fabrication.
- ✓ Identify opportunities for Dental Assistants to participate in digital appliance production, quality control, and patient education.

Clinical Significance

The integration of digital scanning and chairside 3D printing allows dental teams to fabricate highly customized whitening trays with improved

consistency and efficiency. Dental Assistants trained in digital workflows can contribute significantly to appliance fabrication, quality control, workflow management, and patient education. Understanding these technologies supports expanded team utilization while improving treatment efficiency and patient experiences.

From Traditional to Digital Workflows

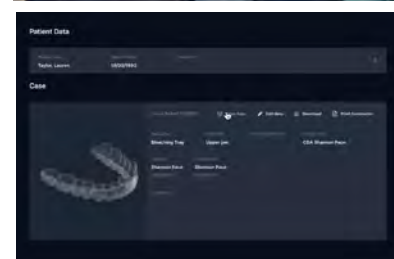
Custom whitening trays have long been a staple of cosmetic dentistry. Traditionally, fabrication required conventional impressions, model pouring, trimming, block-out procedures, vacuum-forming materials, and finishing techniques. While these methods remain effective, they are time-consuming and introduce opportunities for distortion and inconsistency. Using digital impressions and software-driven design, clinicians can now fabricate highly accurate whitening trays that are customized to each patient's anatomy. The result is improved adaptation, predictable gel placement, enhanced patient comfort, and greater manufacturing consistency. More importantly, many of these steps can be performed by trained Dental Assistants.

Digital Scanning and STL Generation

The workflow begins with an intraoral scan of the maxillary and mandibular arches using a digital scanner such as the iTero Element. The assistant captures detailed anatomy including:

- Facial surfaces
- Incisal edges
- Interproximal areas
- Gingival architecture
- Vestibular extensions

Once scanning is complete, the software generates STL files, which serve as the digital models used throughout the design process.



The Assistant's Role Begins

with Digital Documentation Every successful whitening case begins long before a tray is printed. The process starts with patient evaluation and documentation, areas where Dental Assistants have always played a critical role. Medical history reviews, whitening consultations, photography, shade analysis, and patient education remain essential components of treatment planning.

Capturing the Digital Impression

Once the patient has been evaluated, the next step involves digital scanning. Using an intraoral scanner, the Dental Assistant captures detailed digital impressions of the maxillary and mandibular arches. Unlike conventional impressions, digital scans eliminate patient discomfort associated with impression materials while providing immediate visualization of the dentition.

The resulting STL files serve as the foundation for appliance design. For many assistants, scanning represents their first introduction to digital dentistry. However, it quickly becomes apparent that scanning is far more than simply capturing teeth. Successful scans require attention to detail, understanding of anatomy, and an appreciation for how digital data will ultimately influence appliance fabrication.

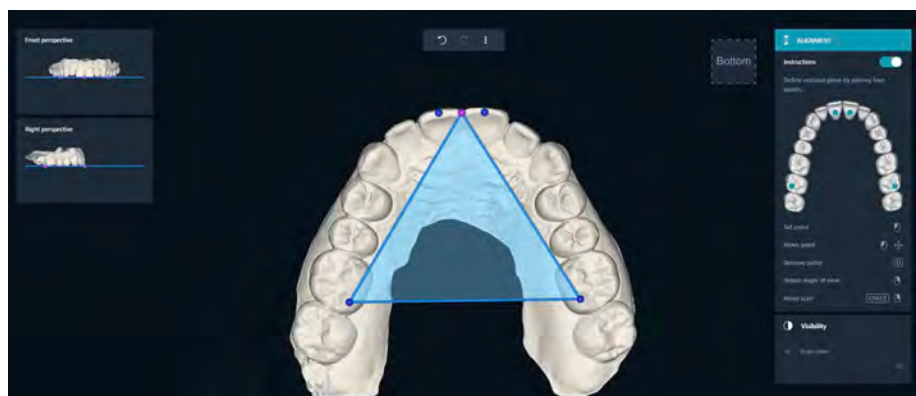
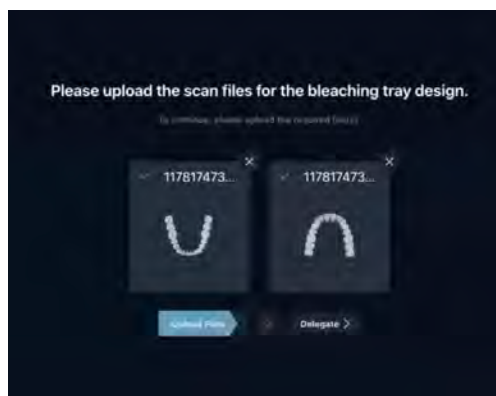
As more practices adopt digital workflows, scanning proficiency is becoming one of the most valuable skills a Dental Assistant can possess.



(1) Pre-operative fullface photograph documenting smile presentation prior to whitening treatment.

Designing the Whitening Tray

Once scanning is complete, the digital models are imported into DentaMile® connect software. This is where many assistants begin to realize the true power of digital dentistry. Within the software environment, the assistant can review digital models, organize patient information, identify treatment areas, and participate in the appliance design process. Instead of relying on stone models and manual block-out techniques, tray design occurs entirely within a virtual environment. Treatment zones can be selected with precision. Tray margins can be adjusted digitally. Whitening reservoirs can be incorporated directly into the design. Every aspect of the appliance can be visualized before manufacturing begins. This level of control creates opportunities for consistency that are difficult to achieve using traditional methods.



The Importance of Reservoir Design

One of the most significant design features of a whitening tray is the reservoir. Reservoirs create controlled spaces that allow whitening gel to remain in contact with tooth structure during treatment. Historically, creating reservoirs required manual block-out procedures performed on stone models. Digital design has transformed this process. Within DentaMile® connect, reservoirs can be created virtually with exceptional accuracy.

The assistant can visualize the location, size, and shape of each reservoir before fabrication occurs. This digital approach improves consistency while reducing material waste and manufacturing variability. More importantly, it gives Dental Assistants direct involvement in appliance design decisions that can influence clinical outcomes.



Washing, Curing, and Quality Control

Printing is only one component of the manufacturing process. Following fabrication, whitening trays must undergo proper washing and curing procedures to ensure safety, accuracy, and long-term performance. The DentaMile® ecosystem simplifies these steps through dedicated post-processing equipment designed to create consistency throughout production. Once washing and curing are complete, the assistant performs a final quality assessment.

- ✓ Margins are evaluated
- ✓ Adaptation is inspected.
- ✓ Surface quality is reviewed.

The appliance is prepared for delivery. These quality-control procedures further reinforce the assistant's role as an integral part of the digital workflow.



From Virtual Design to Physical Appliance

Once the design has been finalized, the case proceeds to manufacturing. DentaMile Desk MC-5, the virtual design is transformed into a physical appliance through additive manufacturing technology. For many Dental Assistants, operating a dental 3D printer represents a remarkable departure from traditional responsibilities. The ability to move from digital scan to fabricated appliance within the practice environment provides a level of control and efficiency that was previously unavailable. Instead of shipping impressions to a laboratory and waiting days or weeks for appliance delivery, the assistant can oversee the entire process from start to finish. This capability improves scheduling flexibility, enhances patient convenience, and strengthens the assistant's role within the clinical team.



Delivering the Final Appliance

Perhaps the most rewarding moment occurs when the completed whitening tray is delivered to the patient. Because assistants often spend more time with patients than any other member of the dental team, they are uniquely positioned to provide education regarding tray use, whitening protocols, sensitivity management, and maintenance instructions. Patients frequently view assistants as trusted sources of information, making this educational component essential to treatment success. When patients achieve successful whitening outcomes, they often associate that success not only with the treatment itself but also with the guidance and support provided by the assistant throughout the process.



Elevating the Profession Through Technology

One of the most impressive aspects of the DentaMile® workflow is that it was designed with the entire dental team in mind. Rather than limiting digital manufacturing to laboratories or dentists, DMG has created a workflow that empowers assistants to become active participants in modern dentistry. Through scanning, design, printing, post-processing, quality control, and patient education, Dental Assistants are able to contribute at a level that would have been difficult to imagine only a decade ago.



Conclusion

Digital dentistry is not replacing Dental Assistants—it is elevating them.

The integration of scanning, design software, and chairside manufacturing has created new opportunities for assistants to participate directly in treatment delivery while expanding their clinical skill sets. DMG's DentaMile® workflow exemplifies this transformation by providing a practical, team-centered approach to digital appliance fabrication. As dentistry continues to evolve, Dental Assistants will play an increasingly important role in bridging technology and patient care. Through systems such as DentaMile®, assistants are no longer simply supporting treatment—they are helping create it. And that may be one of the most exciting developments in modern dentistry. This evolution benefits practices through improved efficiency. It benefits patients through enhanced care. Most importantly, it benefits Dental Assistants by creating meaningful opportunities for growth, leadership, and professional development.

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