# Becoming More Efficient Through Automating Check Socket Fabrication

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**For decades, CAD (Computer Aided Manufacturing) has been supporting prosthetists who prefer to design digitally rather than in plaster. The CAD/CAM Society is an active subgroup of the Academy. CAD systems are used to design devices and CAM systems are used to provide instructions for a machine to automatically fabricate those devices as designed.**

Automation of the creation of a carved mold uses a process known as subtractive manufacturing or more commonly referred to as carving. Contemporary carvers have become quite fast and sophisticated. Some of the most advanced carvers can create a mold from a foam block in minutes without the need for plaster. However, once the mold is created, the fabrication process transitions back to a manual fabrication process.

## Additive Manufacturing Pushes Automation Beyond the Mold

Advances in additive manufacturing have enabled practices to go "beyond the mold" and adopt an automated check socket fabrication process. At first, implementing additive manufacturing for check socket fabrication was complex and tedious; success was only within reach of the tinkering early adopters with plenty of patience.

Today, pre-integrated, turnkey solutions bring additive manufacturing for check socket fabrication within reach of all practices. These pre-integrated solutions take the risk out of implementing additive manufacturing while accelerating the time to value. No more expensive machines sitting around gathering dust due to complexity of setup and use. Solution level training makes additive manufacturing accessible to all. Solution level support means practices have a partner dedicated to their success.

## The Need for Efficiencies

With current business pressures of declining revenues and increasing costs, the benefits of using additive manufacturing for check socket fabrication have become too big to ignore. The biggest benefit is efficiency. Once proficient with CAD systems, the design time for check sockets can be reduced from hours to minutes. Perhaps more dramatic is the efficiency in fabrication where the design can be "sliced" then sent to the printer with the click of a few buttons, kicking off an automated check socket fabrication process. Though the duration of 3D printing, a check socket may take longer than all the steps required to pull a traditional check socket, the level of effort is up to 90% less.

Like most devices created with any manual process, the primary driver of cost is labor. By creating efficiencies in the design and fabrication processes, much of the labor costs required to fabricate a check socket can be saved. When a second check socket is necessary to fit a patient whose first check socket required drastic adjustments, such as volumetric scaling, the savings can be even

greater. Driving efficiencies can streamline the time from initial consult to provider reimbursement.

## Desire to Improve Patient Experience and Provide Better Care

By finding efficiencies in the check socket fabrication process, providers can streamline the overall fitting process to deliver prosthetics to patients sooner. There is growing evidence that fitting patient sooner benefits patient outcomes. Some of these patient benefits have been documented in the Impact Study[1]. This is especially true for a patient's initial prosthetic when their rehabilitation is heavily impacted by delays in the fitting process.

Check sockets that are fabricated using additive manufacturing have wall thicknesses that are uniform, unlike a pulled check socket which will have variances in wall thickness inherent in the pulling process. Digital design and measurement tools make it possible to create better fitting check sockets, improving the overall likelihood that the patient will wear the prosthetic as intended, getting the most benefit possible.

## Summary

Automating check socket fabrication can be accomplished using proven processes that are documented to be repeatable and scalable, driving efficiencies. Streamlined design and fabrication processes benefit patient outcomes by reducing the wait time to receive the prosthetic, often resulting in better fitting devices. Additive manufacturing to automate check sockets is becoming mainstream due to pre-integrated solutions that simplify implementation.

[1] Published in the American Journal of Physical Medicine and Rehabilitation, the IMPACT study found a 25 percent reduction in total healthcare costs associated with earlier prosthetic care.

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