

Patient compliance is one of O&P clinicians' biggest challenges. Within the field of prosthetics, the problem is less severe. To begin with, prosthetic patients are just more likely to use their prosthesis. After all, a prosthesis replaces what was lost instead of adding something to drag around. Secondly, since prostheses are laminated with carbon fiber and resin, a talented technician can easily apply an image or design under the final lamination. A photo of a loved one, a favorite fabric design or a team logo can greatly increase compliance.

Most modern-day orthoses, on the other hand, are made with thermoformable plastic. Sterile, non-pigmented plastic draws attention to its sheer, stark ugliness. Pigmented plastics mitigate the problem, but stocking several colors in at least three thicknesses makes inventory a real nightmare and ties up lots of cash. Even then, patients only have solid colors to choose from.

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Recently, some manufacturers have begun to offer transfers that can put a pattern onto the plastic. Both Fillauer and Friddles offer some excellent pattern prints, and Positive Image Orthotics has licensed cartoon images as well as NHL and NFL team logos.

These pattern transfers have helped mostly children, for whom cosmesis is most important. Young classmates can be very cruel when you look different, but a cool transfer image can make things easier.

More mature patients are pretty much out of luck. With the exception of team logos, adults don't have very

many options. Basic black, while less noticeable, doesn't match what adult patients can get from their prosthetist. If you bring in a bit of interesting fabric or a photo of your sweetheart, it can be made part of your artificial limb. If only there was a way to have the same level of cosmesis in a brace...

Do it yourself

Many orthotic technicians have tried to make pattern transfers in their own labs with varying degrees of success. Those who have tried T-shirt transfer paper bought at the local office supply store have been disappointed. The reason is quite

simple: Cotton accepts transfers differently from plastic because the two are different materials.

T-shirt transfer paper uses dry toner or ink to print onto a polymer coated paper. The paper is then ironed onto the cloth and leaves the substrate behind in the cloth. When this ink is applied onto hot plastic, however, the result is more like a surface decal. The patterns crack, peel and otherwise don't stick well to plastic.

Sublimation

In order to transfer ink onto plastic so that it won't peel or crack off

Making Braces Beautiful

By Steve Hill

we need to use a process called "sublimation." Sublimation is the scientific term for a process where solids (in this case dyes) are converted into a gas without first becoming liquid. Dry ice goes through sublimation and becomes a gas rather than melting into a liquid.

Sublimation printing uses a dye instead of a dry toner or ink, along with special paper. With heat, the ink on the paper turns into a gas that is able to penetrate the plastic surface.

You can use sublimation to apply custom images to your thermoformed plastics. It's easy to do. All you'll need is some sublimation ink (dye) and sublimation paper. Neither is very expensive; the one caveat is that sublimation ink cartridges are only made for certain inkjet printers. If you don't mind investing in a new printer, that shouldn't be a problem.

Scan the image into your computer, adjust the color balance as needed and print the image onto your sublimation paper. Then heat the plastic to molding temperature. Apply the paper, ink side down, and rub for about ten seconds. Remove the paper and the transfer should be on.

Tips and techniques

Here are a few tips I've learned from some expert technicians to achieve a superior result when using any type of transfer paper.

Prepare the transfer paper by folding the corners back about an inch. Be sure to fold the corners back so the ink side faces down and the tabs are

large enough for you to grab them with your fingers. That way, you won't have to try and pry up a corner when it's time to remove the transfer.

If you really want colors to pop, try leaving the transfer on a little longer and rubbing a little harder. As long as you don't rub too long or too hard, you won't mess up the paper or plastic. Experiment with some scrap pieces of transfer paper and plastic to see what results you get.


Put the plastic back into the oven for an extra thirty seconds once the transfer is complete. First, this brings the plastic back up to optimal forming temperature. It tends to cool down a bit while you're busy rubbing it with inky paper. Second, pulling transfer paper off usually leaves the surface bumpy. Reheating flattens it out again.

Measure carefully to properly align images. Setting a single image, such as a

cartoon character or team logo, at the apex of an adult-sized AFO is easy. Simply measure from the top of the vacuum forming vise to where you want the image. Then measure down the same amount from the top of the plastic sheet and apply the image aligned with the center. When applying an image to a pediatric orthosis, you'll have to measure much more carefully.

If applying multiple images, especially on KAFOs, you will want to make a template of the whole design out of paper and have several technicians help hold the template in place above the cast. Place the images correctly according to the marks you've made on the template. Rub all the images a sufficient amount of time before carefully removing them from the plastic. Obviously, the more images there are, and the more complicated the brace design, the more help you'll need.

Finally, don't stretch the plastic at all when using a pattern transfer that covers the total area of the brace. You can stretch a single image pull so long as you aren't stretching right at the image, but stretching total area pattern transfers at all will ruin the overall effect.

Try to keep any stretching to a minimum no matter what kind of transfer you're using, though. 'Cause if you stretch Speedy Gonzales longways he looks more like Wile E. Coyote. 



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