

► **TECHNOLOGY**

# The Art of Making A Good Impression

*Getting it right the first time saves time, money and aggravation.*

By Randy Morgan

**B**asic to the hearing health-care industry is the art of making a good impression. Whether the final product will be a hearing instrument, hearing protection device, communications mold, assistive listening device or swim mold, that product will only be as good as the impression from which it is made. Everyone loses when the initial impression is lacking in quality and accuracy. The customer gets angry, the lab is frustrated and the dispenser's cash flow is affected. It costs time and money for all parties involved; thus, a quick review of the basics of a good impression can be of benefit to everyone.

Over the years, I have had the opportunity to look at nearly three million impressions of the human ear. Experience has given me a pretty good idea of what qualifies as proper impression technique. While there are advocates of different approaches, each with merit, I base the proper technique on what is required to pass the scrutiny of any earmold laboratory or hearing aid manufacturer technician, and on what will result in

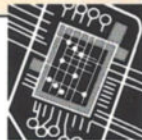
the best fit, comfort and effectiveness for your customer (not to mention fewer headaches for you).

This article will pick up the impression process just after the patient's ear has been thoroughly examined and determined to be acceptable for the process. At that point, a canal block should be placed in the ear canal prior to the mixing of any material. This block should be made of cotton or foam. Both are readily available in a variety of sizes. Size is most critical in selection of the block. Material makes little difference.

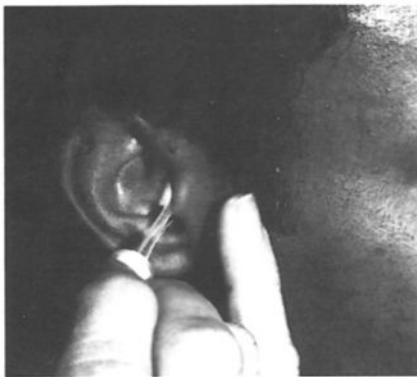
**Common Pitfall #1:** The purpose of the block is to provide an end point to determine the ear canal length of the impression, and, of course, to prevent impression material from coming in contact with the tympanic membrane. An undersized block will allow impression material to flow past the block or push the block too deep, creating an uncomfortable situation for both impression taker and patient. An oversized block will either abnormally expand the ear canal or be too large to place as deep in the ear canal as desirable.

There are no readily available gauges for measuring, so each patient presents a new challenge. Do not be afraid to try several different blocks before selecting the proper size. Also, do not assume both ears require the same size. Before placing the canal block in the ear canal, be certain the thread is firmly attached to the block in case the block doesn't adhere to the cured impression material, and

Making an ear impression is a matter of perfecting a few basic steps and avoiding common "bad habits." The end result is to make a good impression on clients/patients. That way, everyone wins.



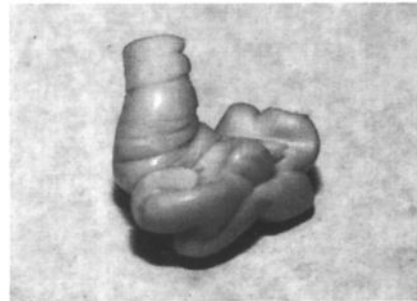
*Randy Morgan is president of Westone Labs., Inc., Colorado Springs, CO. After processing about three million earmolds, he and his firm have seen just about everything that can be done to an ear impression.*



**Fig. 1.** Brace the little finger against the side of the head.



**Fig. 2.** Gently begin to move out of the ear canal, but do not allow the tip of the syringe to come out of the material



**Fig. 3.** A steady release of material from the syringe coordinated with the movement of the syringe tip will prevent wrinkles, worms, voids or other imperfections.

remains in the ear after the impression is removed.

Use an illuminated oto light to aid in placing the block to the proper depth. Note how the little finger is braced against the side of the head (Fig. 1). This provides a steady hand for block placement and protects against inadvertent patient/rigid probe tip interaction (a sudden head jerk caused by a cough, tickle, discomfort, etc.). Place the tip of the oto light in the center of the block that has been placed at the entrance of the ear canal. Gently guide the block into place, at least beyond the second bend. For some custom ear products, such as the popular musicians earplugs, the impression must extend fully to the bony portion of the canal.

**Common Pitfall #2:** Never, never scrimp on canal length! It is easy to casually insert the block and shoot the impression quickly, but this almost always results in doing it over—an embarrassing situation for you and an inconvenience for your patient. An impression received by the laboratory that is actually too long for the canal portion of the requested style of earmold or hearing instrument is cause for celebration. The lab can reduce the length easily, but never can they accurately extend the length.

### Materials Debate

Which is the best impression material: traditional powder and liquid or the many silicone materials on the market? Which is most cost efficient? Easiest to use? The most professional?

Unfortunately, there is no

simple answer. Each material has its advantages and drawbacks. Without a doubt, an impression taken with silicone retains a highly accurate dimensional stability from ear to laboratory. Very little deviation will result from the ear to the finished product.

**Common Pitfall #3:** As stable as silicone is, it is capable of expanding the ear sufficiently to create an ill-fitting earmold or hearing instrument. This can happen even when the material flows easily through the syringe, giving the dispenser a false sense of a good impression. Traditional powder and liquid mix is capable of a beautiful, extremely accurate impression with no distortion of the ear, if mixed in the proper proportions and syringed into the ear in a timely manner.

That's a substantial "if." Your supplier should provide specific information on mixing the powder and liquid you use. If the mixture and/or timing is off, several things can happen, none of which are desirable. It is possible to stretch the impression when removing it from the ear if it has an improper mix ratio or if it is not fully cured. Stretching can also occur if there is a bulbous portion that resists easy removal from the ear canal.

If the powder/liquid ratio is too dry, the material will be very difficult to push through the syringe, often distorting or not properly filling the ear, leaving voids. This is often evidenced by the pronounced red and white coloring of the fingers

on the business end of the syringe.

Too much liquid makes the impression very susceptible to melting. This melting may be so pronounced as to be humorous, or slight only to the point of irritation. Either way, the patient leaves without a satisfactory fitting.

**Common Pitfall #4:** It costs well under a dollar an ear for impression material. It costs much more than that to end up with an unsatisfactory first-time fitting. The cost of a few canal blocks thrown away in the selection process, or the slight additional cost of a high quality impression material (pre-measured if it is powder and liquid) is worth the 10-15 cents extra it takes to have all the components for a quality impression...and to have a happy customer.

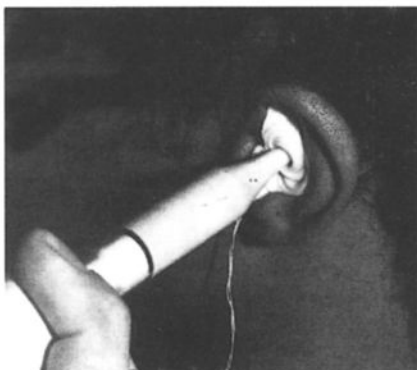
### Making The Impression

O.K., the right-sized canal block has been placed at the proper depth in the ear canal and the impression material is mixed according to the manufacturer's instructions. Place the material into the syringe barrel, assemble, and depress the plunger to bring the material to the tip of the syringe. When first entering the ear with the syringe tip, it is a good idea (unless the patient objects) to gently pull up and back on the pinna to straighten the auditory canal. This will maximize penetration and minimize the distance the impression material must travel before it begins to retreat from the canal.





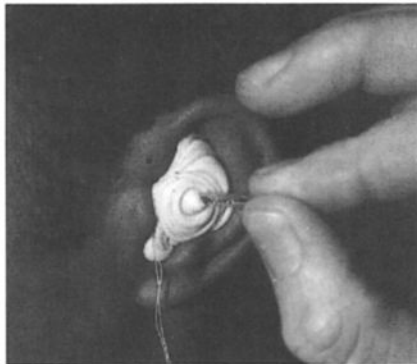
**Fig. 4.** Tilt the syringe barrel down so that the material can flow up into the helix lock.



**Fig. 5.** It should appear as if the tip of the syringe is moving around a 1/4" round fluid blob just by being in the center of it.



**Fig. 6.** The bowl area bulk gives the laboratory the reference points they need to create the earmold.



**Fig. 7.** If the indentation disappears when pressure is released, the impression is ready for removal.



**Fig. 8.** First release the helix lock area.

As soon as the material begins to flow from the syringe, release the ear. Assuming the material has been mixed to the proper consistency (see *Common Pitfall #3*), it will now begin to flow deep into the ear canal, come to rest against the canal block, and finally reverse direction and attempt to push back beyond the syringe tip. This is good. At the moment the material begins to creep back past the tip (Fig. 2), gently begin to move out of the ear canal with the tip of the

syringe. Take your time, both in dispensing material and retreating from the ear canal. A smooth, steady release of material from the syringe coordinated with the movement of the syringe tip will prevent wrinkles, worms, voids or other imperfections (Fig. 3).

When the canal is filled, slowly begin to move up the rear of the concha bowl area. As the syringe tip approaches the anti-helix area, tilt the syringe barrel down so that the material can flow up into the helix lock (Fig. 4). Caution: this is an area that is easy to distort with too much pressure! When the material has completely filled the helix area, move slowly down the front edge of the ear, being sure to fill the anti-tragus area completely. Throughout the impressioning process, it should appear as if the tip of the syringe is moving around a 1/4" round fluid blob just by being in the center of it (Fig. 5). At this point, slowly move the imbedded tip of the syringe to just below the center of the ear and "unload" it as necessary to provide bulk in the outer

ear. Note that the bowl area will already be close to being filled from the previous movement up the rear of the bowl and down the front edge of the ear. This bulk gives the laboratory the reference points they need to create the earmold (Fig. 6). Keep in mind that excess bulk creates weight that can pull the impression from the ear during curing.

**Common Pitfall #5:** Don't feel that all the material from a single impression unit must be used. It is better to squirt the extra on a paper towel and discard it. If the amount used in the outer ear is "just right," it will support itself. As a bonus, impressions made in this fashion have a natural exterior surface that provides a flat area for shipping purposes.

Once the outer ear is properly filled, do not touch the ear! Don't support the tragus with one finger and push in on the canal with another. Don't smooth the outer surface to aid in shipping (see above). Don't try to create a tighter fit by pressing the material into the patient's ear. This all works against the laboratory and results in a bad fit. In other words, leave well enough alone.

Dispensers can, however, use their "bedside manner" to generate a better impression. Encourage the patient to act naturally. The old school required the patient to remain absolutely still while the impression material cured. While this is good technique for post-mortem fittings, a real live human being is going to be moving constantly. Encourage your patient to talk, turn their head in all directions, smile, chew, and move around so the impression will be as accurate and "real-world" as possible. The omission of this technique is usually evidenced when the patient comes in saying, "whenever I chew or smile, this thing whistles." Sound familiar?

Not convinced? Try this simple test. Put your little finger as deep into your ear canal as you safely can and chew. Feel it? The magnitude of the mandibular action varies from individual

*continued on page 24*

## Good Impression

continued from page 14

to individual. In many cases, impressions made with the patient being statue-still result in earmolds that work their way out of the ear with repeated jaw movement.

It typically takes seven to 10 minutes for impression material to cure. The easiest way to determine if the impression is properly cured is to indent the outer surface with an object like a paperclip or your fingernail. If the indentation remains, the impression is uncured. If the indentation disappears when pressure is released, the impression is ready for removal (Fig. 7). First release the helix lock area (Fig. 8). Then, with a forward and outward movement, gently pull the impression from the ear (Fig. 9).

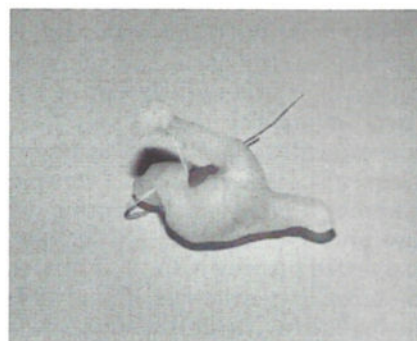
**Common Pitfall #6:** Don't use the thread attached to canal block to aid in removing the impression, as this can distort the cured



**Fig. 9.** With a forward and outward movement, gently pull the impression from the ear.

impression (Fig. 10). Examine the ear and remove any foreign matter remaining from the process. If the ear cannot be easily cleaned, refer the patient for appropriate medical treatment.

Allow cured impressions to air in an open container for at least 30 minutes. This helps in further curing and stability. Silicone impressions can be shipped loose in a shipping container, but this is disastrous with a powder and liquid impression. This is where a properly finished exterior sur-



**Fig. 10.** Using the attached thread to aid in removing the impression can distort the cured impression.



**Fig. 11.** Secure the impression to the center of the shipping box and insert order form so it doesn't touch the impression.

face is to your advantage (see **Common Pitfall #5**). Secure the impression to the center of the shipping box interior with a product like DUCO household cement, and insert the order form in a manner as to ensure that it does not come into contact with the impression (Fig. 11). This is a common cause of distorted impressions that arrive at the laboratory.

Assuming that a dispenser is using a quality material and working at the right speed, the result will be a great first impression. Remember, the technicians who create the earmolds, sound attenuators and hearing instruments for your patients may differ here and there on particular aspects of technique and preferred materials, but they all agree on one key point: the quality of their work depends upon the quality of the impression you provided. A few extra minutes spent on proper technique with quality materials will pay huge dividends in the long run.

Best of all, a good impression will be made on your patients. Everyone wins! ♦

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