

Impressions: avoiding distortion

Investing time in both the technical and non-technical aspects of impression taking will lead to an improvement in work, stress levels, relationships with patients and ultimately profit margins, says **Gary Jenkinson**

Impression distortion is easy to spot, right? If you answered yes, you would, in fact, be wrong.

Large or obvious impression distortions – as in Figure 1 – are easy to spot, and 99% of the time it is corrected by retaking the impression. However, small distortions can be difficult to see and account for the majority of remakes.

Even if you do spot these small distortions, it can be easy to fall into the trap of expecting a percentage of your work to end in being a remake or relying on your lab to get around the small distortions. Expecting a percentage of remakes is a short sighted view from both a business and a relationship perspective.

The business perspective

From a business perspective, expecting a percentage of your crown fits to go wrong means a loss in chair time. Chair time is the most precious commodity you have in the surgery and knowing how much this time is worth to you is imperative.

Knowing your surgery running costs is essential for you and your whole team – whether or not you are turning your chair time into a profit.

Typical running costs of surgeries

Gary Jenkinson is group technical manager of 1stDental laboratories. He is also a key opinion leader for Ivoclar UK. He manages 1stDentals' laboratory in Sheffield and has lectured and taught courses on many subjects.



Figure 1: Large or obvious impression distortions are easy to spot

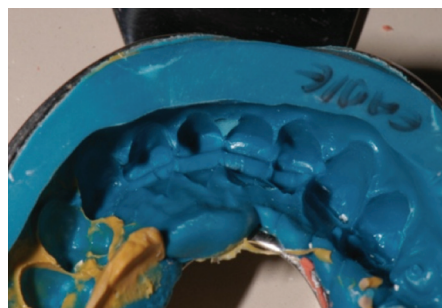


Figure 2: Impression material looks uneven, this is due to tray movement before setting



Figure 3: Achieving correct occlusal function with this model is very difficult. To prevent this, use an adequate amount of material and do not move the tray once it has been seated in the mouth

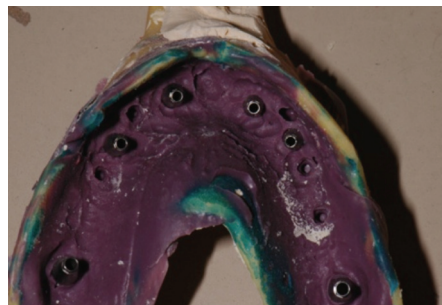


Figure 4: Using the correct amount of material in the tray is essential. This image shows that not enough material has been used as there are gaps and voids. The use of a rim lock or border lock tray would have caused a back flow of material, which may have prevented the shortage occurring

are anywhere from £350 to £700 an hour. Knowing how much a remake costs both you and your team is imperative, because for every crown that doesn't fit, it costs you three.

The first cost is the initial or original work you and all your team have completed, which did not fit. The second cost is the one to replace the first piece of work and the third is the work you could have been fitting if

you weren't fitting the second one.

This is also true for your lab – and as 80% of remakes are impression related (Adams, 2005), it is a huge cost for them that is mostly out of their control.

The relationship aspect

The relationship aspect is with your patients and your lab. The patient's

satisfaction and the consequence of referrals from them relies on their perception of a successful treatment.

If they get a crown that fits first time and looks first-class, they are more likely to recommend you to family, friends and colleagues. On the other hand, if they get a crown that looks first-class but takes two or even three visits to get it to fit, they are unlikely to recommend you to anyone. In fact, they will tell 10 people that you didn't know what you were doing and had to do it a couple of times!

Then we move onto how your lab team perceives you and how they feel about your relationship with them.

Historically, many clinicians have expected – or have been given – remakes for free. This is a mistake, as it will inevitably reinforce your behaviour.

Your behaviour may be that you no longer look too carefully at the impressions you send to the lab because there are, in your perception, no financial consequences to remaking your work.

If you are continually asking for remakes, you are no longer an attractive or viable business partner and the lab may discontinue its relationship with you.

Self-esteem is also a factor for all parties involved. For yourself, it is not good to have to explain to patients why this crown does not fit or for your members of staff to work in a surgery where patients are not happy. Your lab team will not feel good about themselves if they have to remake crowns again and again.

Prevention (non-technical)

The best way to prevent poor impressions from leaving your practice is to train yourself and your team, including your lab, to identify problems that may occur.

Make the assessment of impressions routine before temporisation. Make the culture of inspection one of identification of cause; it should never be one of blame.

While not exhaustive, this list includes most of the aspects that make an impression good:

- Uniform, homogeneous mix of material
- Tray is sufficiently filled with impression material
- Thoroughly applied tray adhesive
- Rigid, sturdy impression tray
- No voids or pulls on margin detail
- Detailed margins with no tears or rough surfaces
- No tray show-through of the impression material
- Good blend between heavy body and light body materials
- Strong bond between impression material and tray
- No tooth contact with the tray
- Complete information about the impression material used provided to the dental laboratory.

Recording remakes in a systematic way and finding the cause of them to prevent it happening again promotes and reinforces the correct and financially beneficial behaviour.

'Flexure in plastic trays, pressure points due to thin plastic and ill fitting or wrongly sized trays will cause distortion in your impressions.'

Remember: record, review and improve.

Assessing the causes of remakes and the number that are caused by poor impressions is essential.

Recording the number of remakes and their cause is what will force you to question and improve your impression taking techniques. It will make your surgery time happier, relaxed and more profitable.

Identifying an impression distortion

To identify if it is an impression distortion, you will need the original impression, the original model and the original restoration, as well as the new model and new restoration.

Before the patient arrives for the second fit appointment, try the following procedure. Take the original restoration and place it gently on the original model. Identify if it fits onto the original model – does it fit to the margins? Are the interproximal contacts heavy or correct? If all of these aspects are correct then the lab has constructed the restoration to the blueprint you provided.

Next, take the new restoration and gently place it onto the new model and again check all aspects of the fit. If both impressions are a true and accurate representation of the mouth then both crowns should be interchangeable between both models.

Take the old restoration and try it onto the new model, if it doesn't seat then the probable cause is impression distortion. If it does seat then the likely cause is lab based. Both situations should be investigated. And remember that you are looking for cause not blame!

Prevention (technical)

Flexure

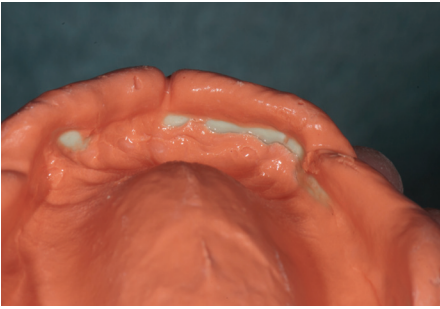
Flexure in plastic trays, pressure points due to thin plastic and ill fitting or wrongly sized trays will cause distortion in your impressions. Tray selection for both size and type is crucial.

A correctly sized and pre-checked rim/border lock tray is difficult to beat.

The presence of the rim on rim/border lock trays causes a back flow of the material in the tray, which increases pressure in the areas that you need.

Premeasure the tray size to ensure correct choice of tray.

Clinical excellence



Figures 5a and 5b: The alginate impression looks fantastic until on further inspection you can see that the soft tissue has encroached onto the custom tray, which will lead to inaccuracy in reproduction and can be avoided by careful positioning of the arch in the tray

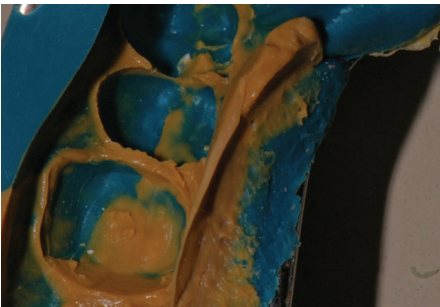


Figure 6: Good detail on the margin of the preparation

Shrinkage

Shrinkage can be caused by not using an adhesive on the tray walls. This needs to be correctly applied and allowed to dry.

If an adhesive is not used, it may allow the impression material to pull from the walls of the tray on setting, on removal from the jaw or it may also mean that the impression can only be accurately poured once as multiple stone castings causes great stress on this aspect of the impression. The material will set and shrink microscopically towards the greatest mass.

Injection technique

When using wash injection techniques, keep the nozzle below the

material; this prevents air being introduced into the margin areas.

Working times

Observe all manufacturers' mixing and setting times – they are there for a reason and it is usually prudent to extend the setting time by one minute to ensure full setting.

This feels like a lifetime but taking the correct amount of time to take the impression can actually result in saving you time.

Expect an impression from start to finish to take you at least 15 minutes. If you add retraction cord placement or the use of Expasyl to this then it can easily be over 25 minutes.

Movement

Slowly, firmly and confidently place the tray into the mouth and, once in the correct position, do not move it. It can cause facial or lingual pulls.

Quality of impression materials

Use adequate amounts of high quality impression material that have been manufactured with strict controls to ensure a consistent product and result.

Accurate alginate impressions

used for opposing dentition, study models and diagnostic work must also have the same care and attention to detail that all your impressions must have.

One of the most common faults with opposing impressions is not including all of the arch or adequate soft tissue detail. It will help your lab greatly if both of these aspects are strictly adhered to.

Conclusion

Impression distortion is not just a technical problem requiring only a technical solution.

As with most things, if you want better results then you need to invest more in the solution and this means slowing down in order to improve quality and consistency of our work and investing our most precious possession, 'time'.

Investing this time in both the technical and non-technical aspects of impression taking will lead to an improvement in our work, our stress levels, our relationships with patients and, ultimately, our profit margins. Everyone wins! [PD](#)

References

Adams DC (2005) Impression distortion... only a technical problem? A doctor/technician liaison's perspective *Dent Today* 24: 66-70

'One of the most common faults with opposing impressions is not including all of the arch or adequate soft tissue detail. It will help your lab greatly if both of these aspects are strictly adhered to.'



Comments to Private Dentistry



@ThePDmag