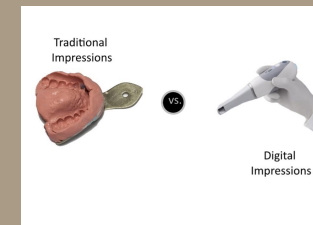


Conventional vs Digital Impressions

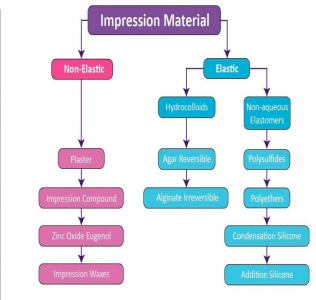
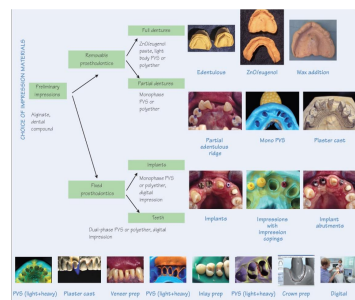
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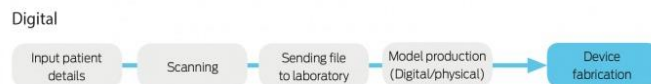


ABSTRACT

Summary: A dental impression is a negative replica of the hard and soft tissues of the oral cavity. Conventional impressions help make dental casts which are used for diagnostic and therapeutic purposes. Digital impression involves a 3D intraoral scanning, which is processed by the computer to generate a virtual replica of the tissues in the mouth. In modern dentistry, elastic impression materials like alginate, polyvinyl siloxanes, poly sulfides, addition and condensation silicones are used. Digital impressions can be a closed system like CEREC, that relies on one manufacturer and technology for CAD/CAM procedures or open systems like Trios and i70 that are compatible with many other technologies.



Digital vs conventional impression workflow comparison



COMPARISON

Digital Impression	Parameters	Conventional impression
<ul style="list-style-type: none"> Comfortable for patients 	Patient Comfort 	<ul style="list-style-type: none"> Gag reflex Tooth and periodontal Sensitivity Breathing difficulty Discomfort in the TMJ Anxiety
<ul style="list-style-type: none"> To date, the scientific literature considers the accuracy of optical impressions clinically satisfactory in the case of single-tooth restoration and fixed partial prostheses of up to 4-5 elements Do not appear to have the same accuracy as conventional impressions in the case of long-span restorations 	Accuracy 	<ul style="list-style-type: none"> Accuracy dependent on numerous items such as: water/powder ratio, Vacuum Versus Hand mixing, the type of dental stone and its compatibility with impression materials
<ul style="list-style-type: none"> High- However, According to a study published in 2019, In a practice with 2 patients for impressions per working day (500 per year), it would take 1.04 years to offset the purchase of the IOS; with 5 sets of impressions per day (1,250 per year), it would take 5 months, thus digital is more cost effective in the long run 	Cost 	<ul style="list-style-type: none"> Low initial cost Increased material cost with the number of impressions and retakes Considerable environmental cost
<ul style="list-style-type: none"> Less time Significant role in treatment planning via simulation in the aesthetic area. 	Efficiency 	<ul style="list-style-type: none"> More time- Time spent to select tray, adhesive setting, time for material setting, time spent to pour casts, time spent to send to the lab
<ul style="list-style-type: none"> You can erase and rescan the error and can take multiple scans 	Repeatability	<ul style="list-style-type: none"> The whole procedure must be repeated if there is an error
<ul style="list-style-type: none"> Digital Regional-arch deviation Bleeding Deep margins 	Storage Challenges 	<ul style="list-style-type: none"> Needs more physical space Lacerations over margin Sometimes hard to remove from mouth Distortion
<ul style="list-style-type: none"> 78% prefer Practitioner experience and skill can affect results 	Practitioner preference Technique sensitive	<ul style="list-style-type: none"> 48% prefer while 26% prefer both High technique sensitivity- Limited reproducibility for some high-precision impression materials

DISADVANTAGES OF EACH METHOD

- Lower accuracy especially in full arch situations
- Difficult to scan movable tissue
- Steep learning curve
- High initial cost
- Impression retakes
- Patient tolerance
- More labor intensive
- Longer process
- Impression material affects the quality

CONCLUSION

According to an article published in the Journal of Prosthodontics:

- A systematic review was done to evaluate the evidence of possible benefits and accuracy of digital impression techniques vs. conventional impression techniques- Digital impression accuracy was at the same level as conventional impression methods in fabrication of single unit crowns and short bridges.
- For fabrication of implant-supported crowns and FDPs, digital impression accuracy is clinically acceptable. In full-arch impressions, conventional impression methods resulted in better accuracy compared to digital impressions.
- Digital impression techniques are faster and can shorten the operation time, however, conventional impression technique is still recommended for full-arch impressions.
- With the advent of better technology, cameras and scanners, it is only a matter of time before digital impressions overtake conventional impression techniques.

REFERENCES

