

Dynamic Navigation: Closing the gap between planning and execution

Computer-guided surgery is among the most exciting advancements made in digital dentistry throughout recent years. In this interview, Prof. Dr Ronald Jung¹ and Dr Marc Balmer², both working at the University of Zurich, talk about the current state of computer-guided implantology and the advantages of dynamic navigation in particular.

With the emergence of new digital technologies, novel treatment approaches have become available to clinicians—particularly in the field of implant dentistry. However, some implantologists are still sceptical of them. Why do you think that is? And what do you think is holding back more widespread utilisation of computer-guided-implantology right now?

For the utilisation of static or dynamic guidance, clinicians need to invest time to learn to use the new technology and protocols and adjust their workflow to create a streamlined process in their private practice. Clinically, static guides provide no tactile feedback, reduce access to drilling sites and delay time from scan to surgery. Dynamic navigation eliminates these disadvantages, yet it requires a higher initial purchase investment.

Let's talk about the use of computer-guided implantology. What types of cases are you going into thinking that you must have, or are probably going to

need surgical guidance? What are the advantages of dynamic navigation?

There are four major points: complex anatomy, high aesthetic demanding situation, flapless surgery and immediate loading. The big advantages are flexibility and visibility during surgery. Planning is simpler because no guide needs to be designed and fabricated. Treatment can be adapted any time during operation and the access to the operation field is unimpeded. Furthermore, a dynamic navigation system provides you with live feedback during the operation. In comparison with surgical guides, one could say that a static guide holds your hand, while a dynamic navigation system gives you more information during treatment. Moreover, with dynamic navigation there is increased safety and predictability because an accuracy check is always easily available.

Has it already proven itself in research and clinical practice? What results can it achieve compared with free-hand surgery?

Research in the field of dynamic guided implantology is ongoing. Some comparisons to free-hand and statically guided surgery, both *in vitro* and *in vivo* are already available. A recent JOMI publication showed that dynamic navigation is about two to three times more accurate than free-hand surgery, especially in angulation.

Fig. 1: Discussion of a patient scan before treatment. **Fig. 2:** Navident training tools ready for use.



Fig. 1



Fig. 2

What can clinicians do to better implement a digital workflow in implant treatment?

Clinicians should educate themselves about the latest technologies available and be ready to make an initial investment in training and be open to changing work habits. Newer developments in the field of dynamic navigation facilitate the process. The new generation of dynamic navigation systems require no preparations of stents or clips during 3D-imaging and no intraoral scans. In fact, the diagnostic scan can often be used for guidance as well. Also, with much simplified planning, the clinician can now easily and quickly plan the procedure themselves, rather than delegate it to technicians.

You also mentioned postgraduate studies. Clinicians need more exposure to dynamic navigation in order to gain more skills or to determine that they want to incorporate the technology into their workflow. Can you tell us about any programme that you have at the university?

All postgraduate students in our clinic are exposed and trained to multiple systems. This way, they can gain experience in static, as well as in dynamic navigation. They decide for themselves which systems fits better in their workflow.

You also mentioned being a “mentor clinician” for the programme. Does that mean you’re still available to clinicians who complete the programme, even after it’s over?

Yes, of course. We have an alumni programme and we stay in touch with all our former students on a professional and friendly basis.

Last question: How will dynamic navigation further change digital dentistry in the future?

Dynamic Navigation has an enormous potential for further developments. Beyond handpiece guidance, it can

be applied to other fields of dentistry, for example for root canal preparation and orthognathic surgery. In the longer term, it would enable the introduction into dentistry of other modern technologies such as virtual and augmented reality and robotics.

Editorial note: Watch a video recording in which Dr Balmer is teaching a postgraduate student using Navident via the QR Code below.

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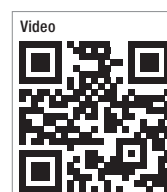


Fig. 3: Prof. Jung performing a TaP registration.

