Impacts of Digital Dentistry Planning

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Norfolk, Va.

28 October 2021
1110 – 1210 (ET)

Presenter

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Navy Cmdr. James C. Lish, D.D.S., M.Sc.

- Graduated from University of Southern California Dental School in 2010
- Completed a one-year Advanced Education in General Dentistry program in 2011
- Completed a three-year Prosthodontics Training at Naval Postgraduate Dental School in 2016
- Currently stationed in Naval Station (NAVSTA) Norfolk serving as Prosthodontics Department Head and Associate Specialty Leader for Advanced Digital Dentistry

Disclosures

- Navy Cmdr. James Lish has no relevant financial or non-financial relationships to disclose relating to the content of this activity.
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Learning Objectives

At the conclusion of this activity, participants will be able to:

1. Compare the strengths of digital dentistry workflows to conventional processes.
2. Describe advances in digital surgical planning, and integrated restorative planning with hard and soft tissue volume.
3. Apply concepts of digital surgical planning to increased treatment predictability, decreased risk and patient morbidity, and increased treatment readiness.

A little about myself

(usc.com, n.d.) / (Photo credit: CDR Lish) / navaltoday.com

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(Photo credit: CDR Lish)

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People. Platforms. Performance. Power.

(Health.mil, n.d.)

Platforms: We focus on modernizing and maintaining our equipment sets, increasing speed, flexibility, and interoperability, while reducing fielding time and increasing survivability.

Performance: We leverage high reliability principles, appreciative inquiry, artificial intelligence, and partnerships at all levels across our organization.

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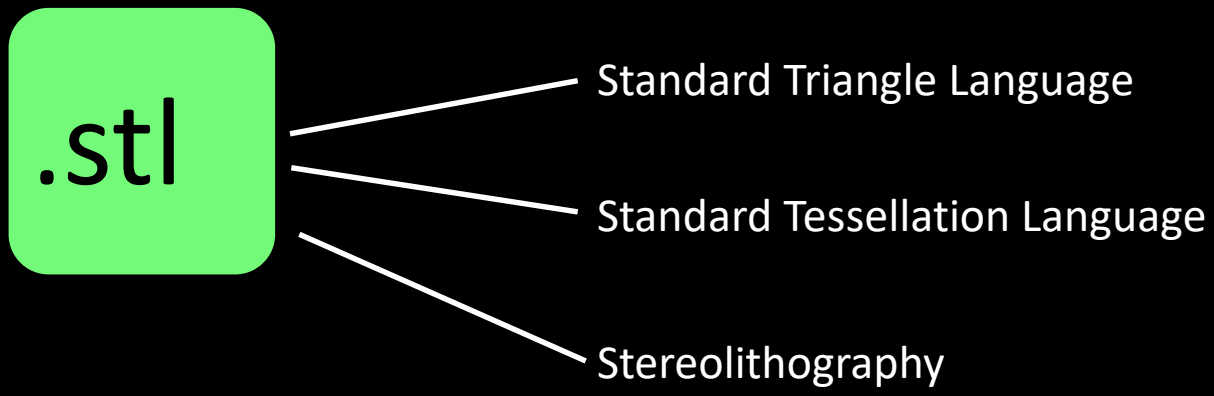
Introduction to 3D digitation of physical objects



Animation: media1

(Graphic Productions Dept, WRNMMC, n.d.)

.stl

Standard Triangle Language

Standard Tessellation Language

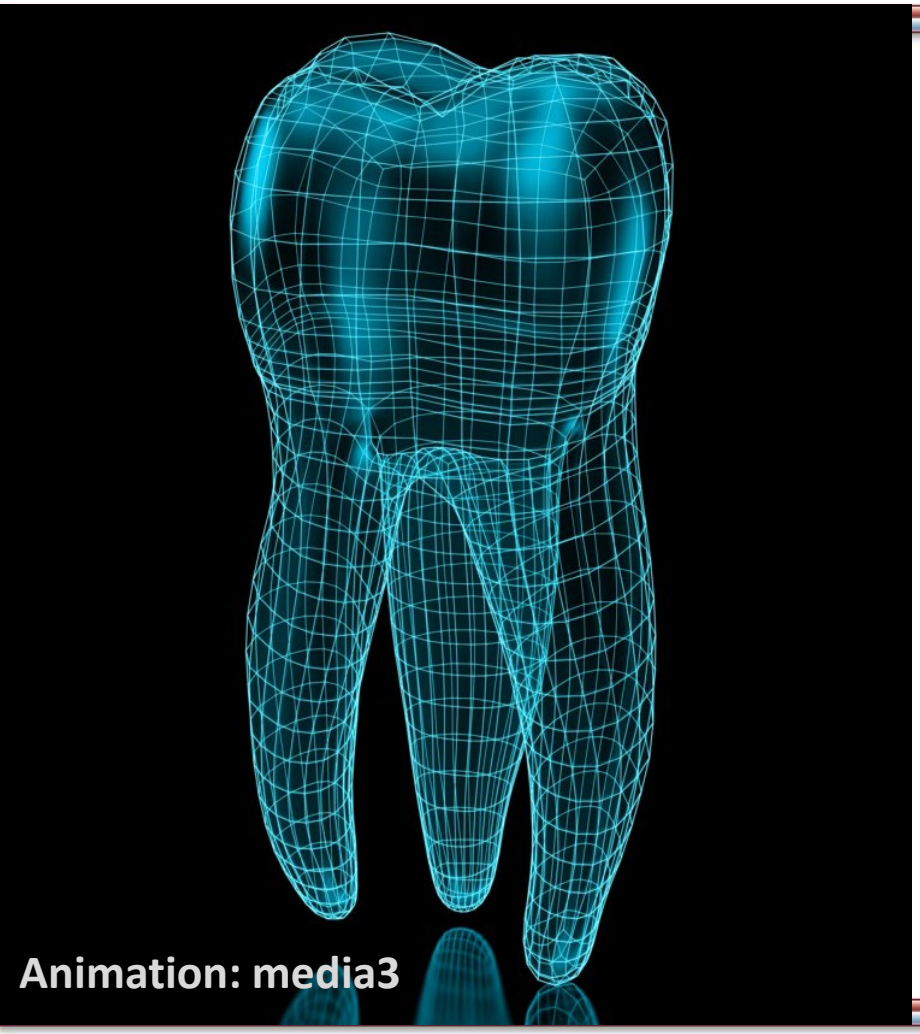
Stereolithography

Defense Health Agency

Animation: media2

(Photo credit: CDR Lish)

Digital V.S. Conventional Processes



(Video credit: CDR Lish)

Predictable, high quality

Faster prototyping

Vastly superior treatment planning

Mistake?… Re-mill!

Less experience capital needed

Force Multiplication

(Adobe Stock, n.d.)

(Alamy.com, n.d.)

Superior. Surgical. Planning.

Defense Health Agency

Are we changing this process now?

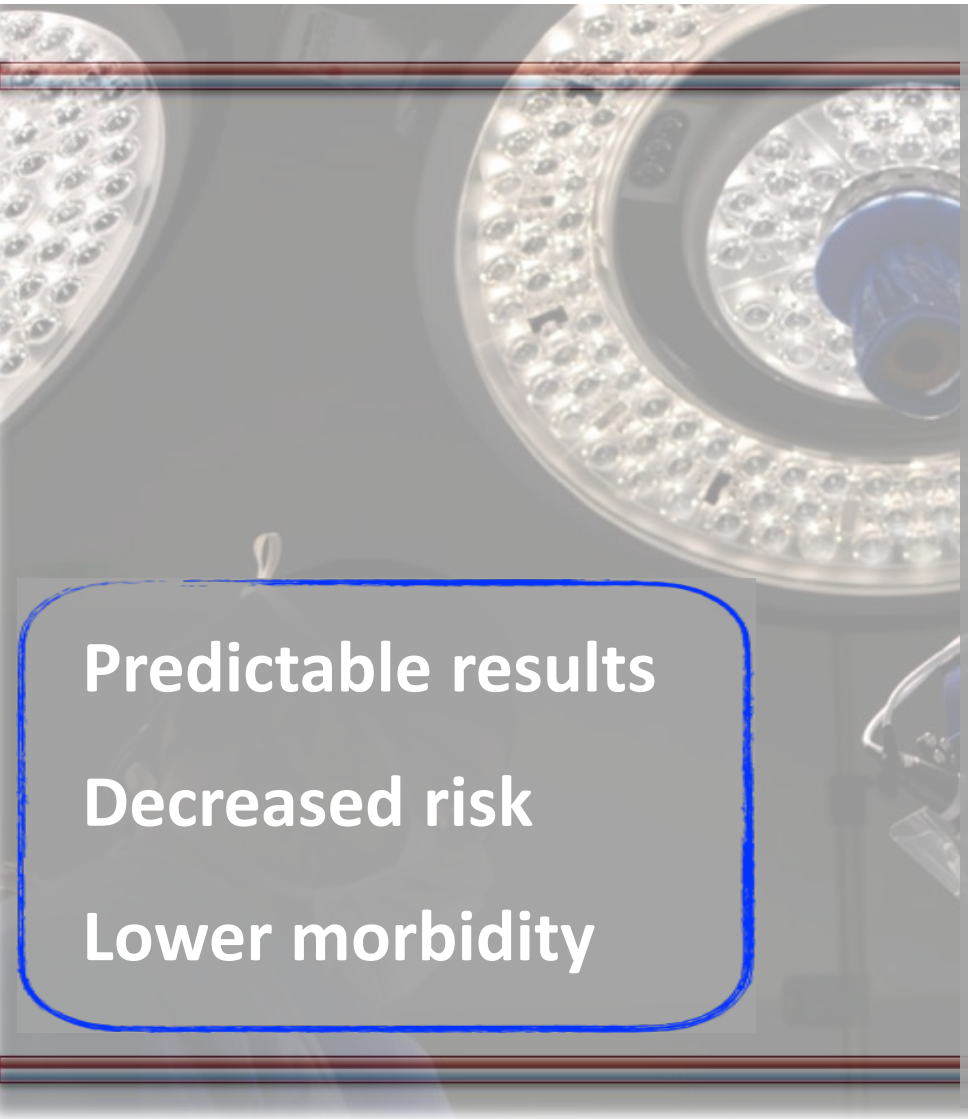
Predictable results

Decreased risk

Lower morbidity

1. Kola MZ, Shah AH, et al: Surgical templates for dental implant positioning; current knowledge and clinical perspectives. Niger J Surg 21(1):1 – 5, 2015
2. Sarment, DP, Sukovic, P, et al Accuracy of implant placement with a stereolithographic surgical guide. Int J Oral Maxillofac Implants. Inter J Oral Maxillofacial Implants 28 M18(4):571 – 577, 2003
3. Greenberg A: Digital technologies for dental implant treatment planning and guided surgery. Oral Maxillofacial Surg Clin N Am 27:319 – 340, 2015
4. Nickenig HJ, Eitner S, et al: Possibilities and limitations of implant placement by virtual planning data and surgical guide templates. International Journal of Computerized Dentistry 15(1): 9 – 21, 2012
5. Arisan V, Karabuda CZ, et al Implant positioning errors in freehand and computer-aided placement methods: a single blind clinical comparative study. Inter J Oral Maxillofacial Implants 28(1):190 – 204, 2013

Superior. Surgical. Planning.



Predictable results

Decreased risk

Lower morbidity

Computer-aided Design (CAD) Guided
vs
Conventional Model Based Guided

- Conventional guides are less accurate
- Digital guides reduce surgical time
- Provide superior prosthetic outcomes

Superior. Surgical. Planning.

Digital Workflow Treatment

(Photo credit: CDR Lish)

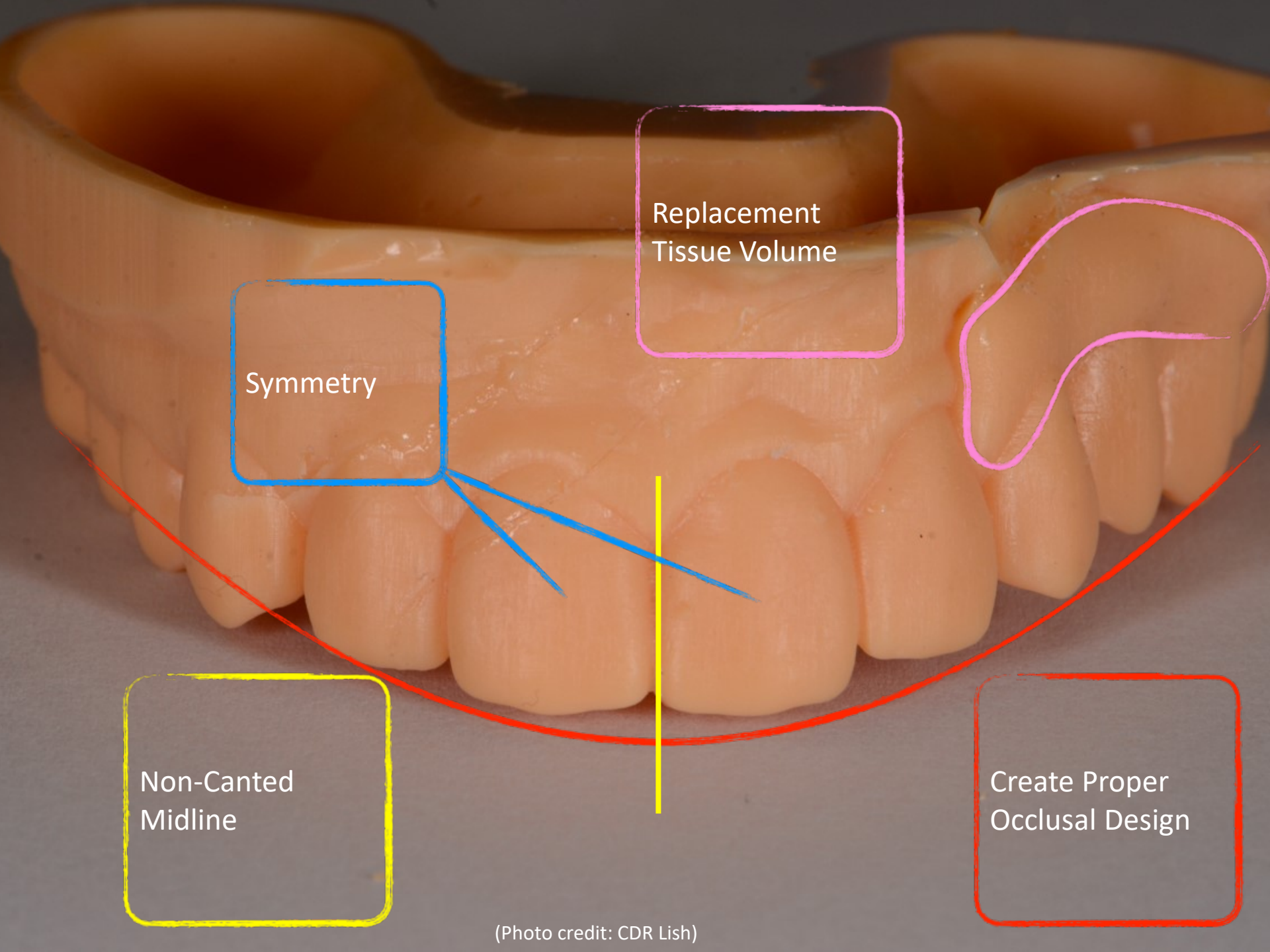
Digital Workflow Treatment

(Photo credit: CDR Lish)

Digital Prototyping

Animation: media4

(Photo credit: CDR Lish)



(Photo credit: CDR Lish)

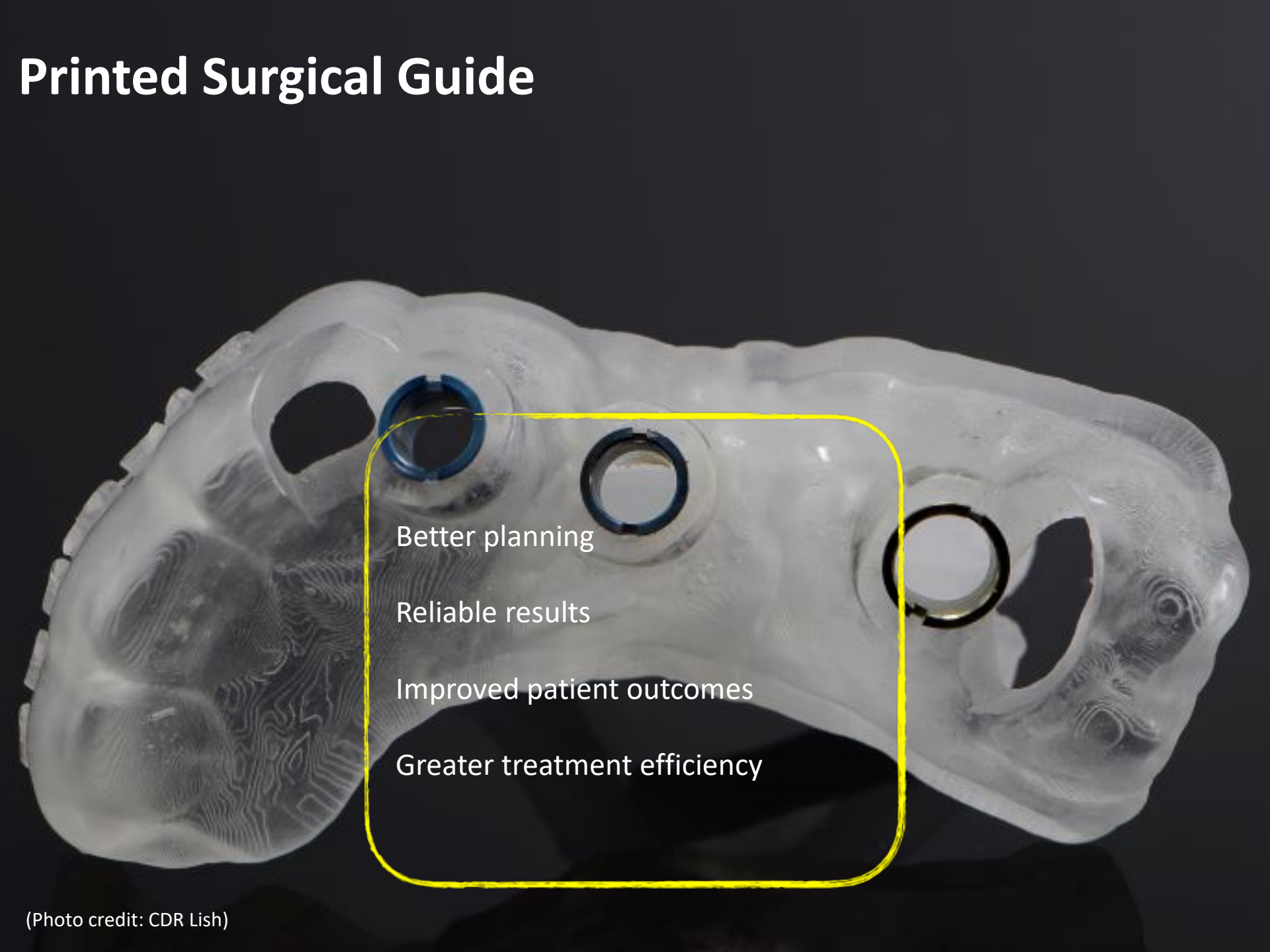
(Photo credit: CDR Lish)

Cone Beam CT Digital Planning

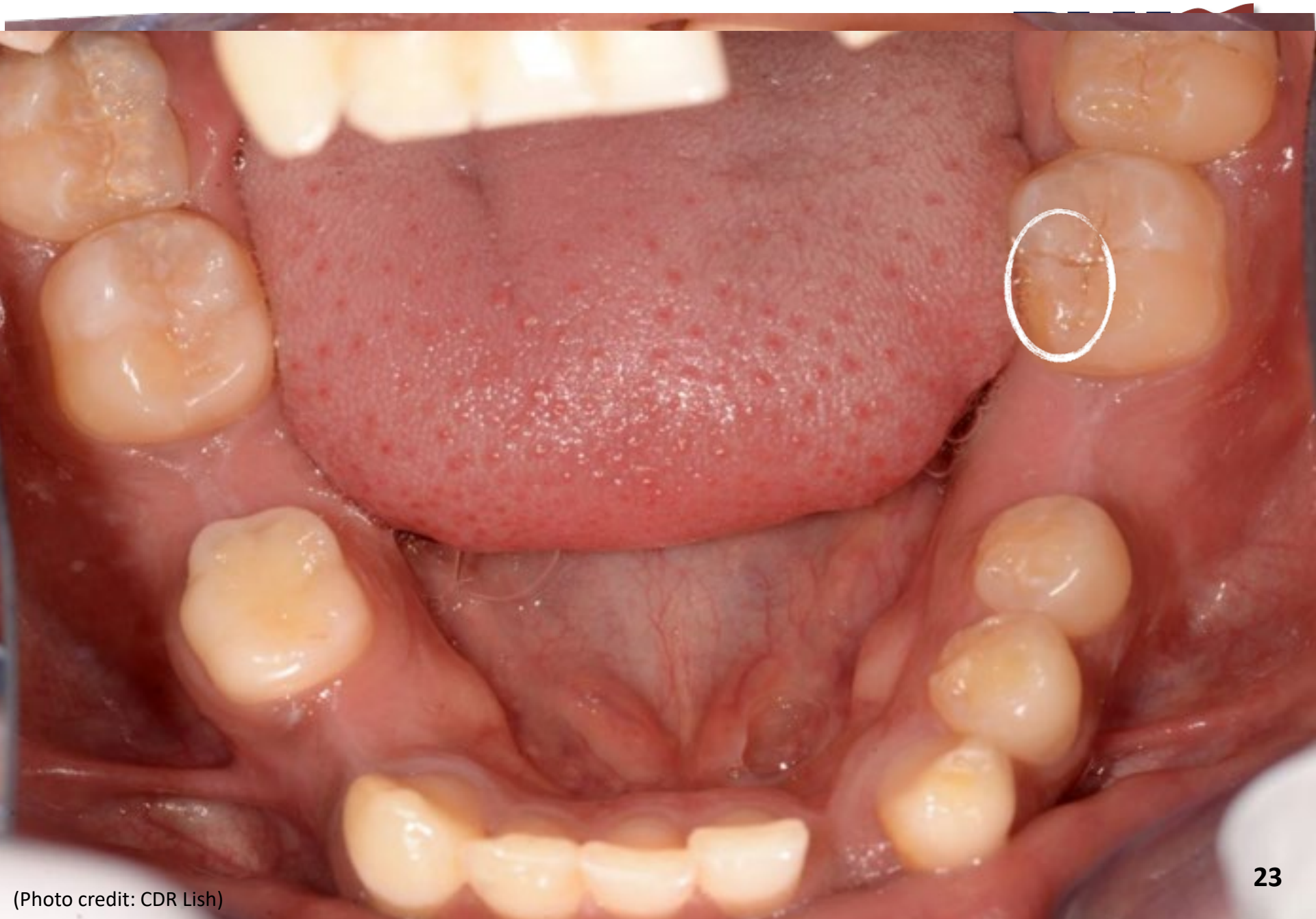
Animation: media5

(Photo credit: CDR Lish)

Printed Surgical Guide



(Photo credit: CDR Lish)

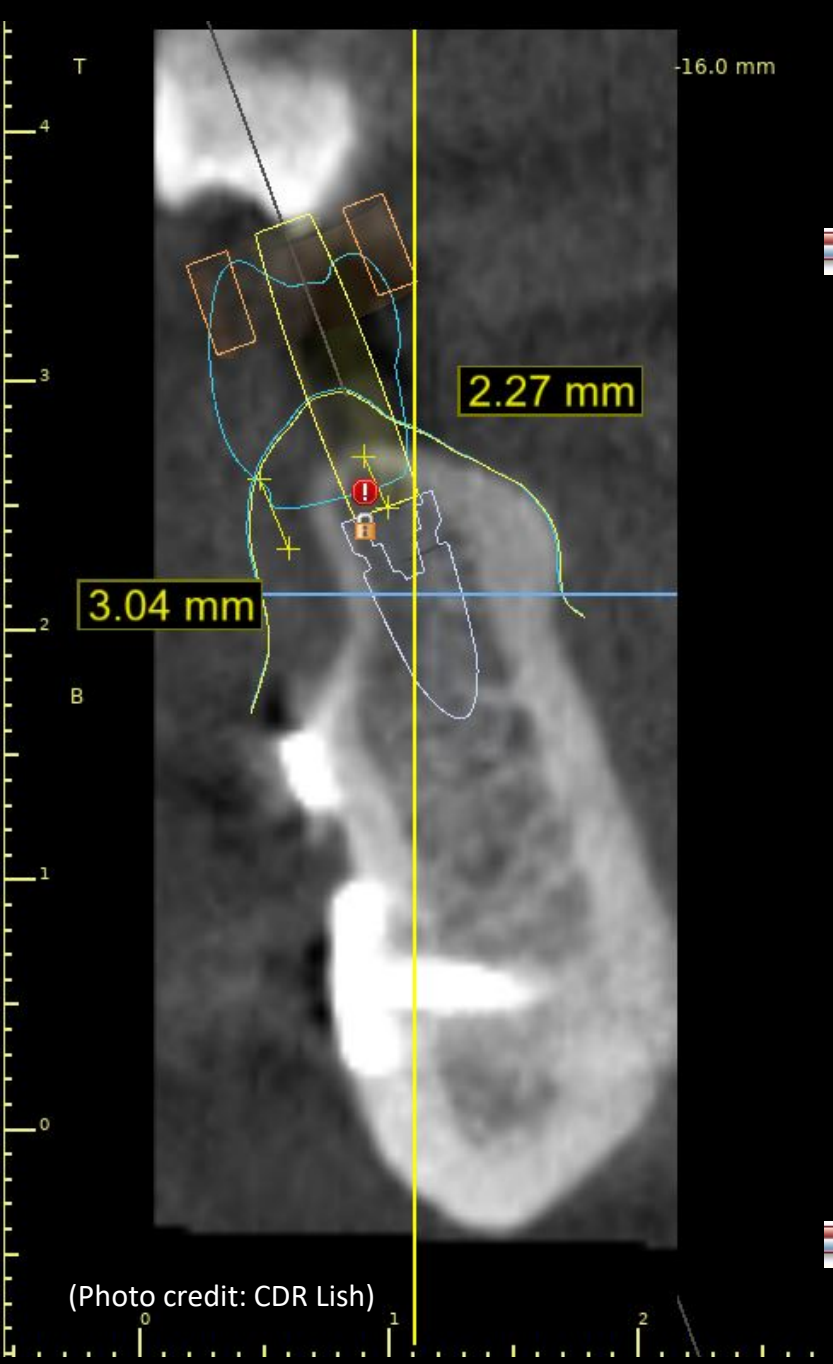


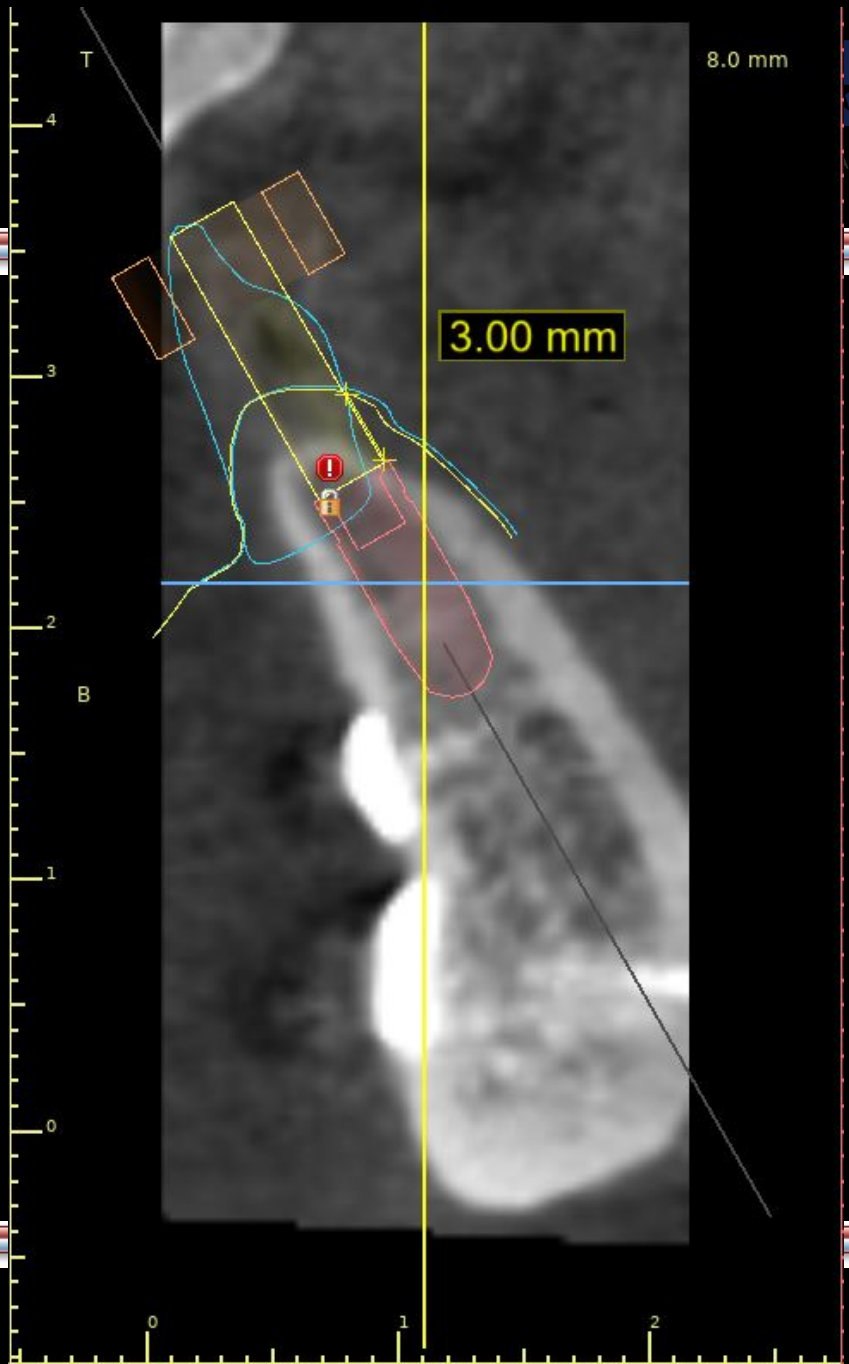
(Photo credit: CDR Lish)

Digital Prototyping

Animation: media7

(Photo credit: CDR Lish)





(Photo credit: CDR Lish)

Creating pre-surgical restorative parts

Animation: media8a

(Photo credit: CDR Lish)

Creating pre-surgical restorative parts

Defense Health Agency

Animation: media8b

(Photo credit: CDR Lish)

IMPACTS OF DIGITAL DENTISTRY PLANNING

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Key Takeaways

- Digital planning offers unmatched predictability and quality.
- Digital processes are both highly efficient and require less experience capital.
- Navy Area Dental Lab study showed average 60% efficiency compared to conventional processes.
- Digital surgical planning and guided surgery leads to more efficient surgery, less patient morbidity risk, higher quality patient outcomes, and increased readiness conversion for surgical procedures.
- Digital planning also leads to 30% less appointments for restorative procedures following guided surgery.

Questions?

References

Arısan, V., Karabuda, C. Z., Mumcu, E., & Özdemir, T. (2013). Implant Positioning Errors in Freehand and Computer-Aided Placement Methods: A Single-Blind Clinical Comparative Study. *The International Journal of Oral & Maxillofacial Implants*, *28*(1), 190–204. https://doi.org/10.11607/jomi.2691

Greenberg, A. M. (2015). Digital Technologies for Dental Implant Treatment Planning and Guided Surgery. *Oral and Maxillofacial Surgery Clinics of North America, 27*(2), 319–340. https://doi.org/10.1016/j.coms.2015.01.010

Kola, M., Shah, A., Khalil, H., Harby, N., Rabah, A., Sabra, S., & Raghav, D. (2017). Surgical Templates for Dental Implant Positioning; Current Knowledge and Clinical Perspectives. *Al-Azhar Dental Journal for Girls*, *4*(3), 215–222. https://doi.org/10.21608/adjg.2017.5261

Nickenig, H. J , Eitner, S., et al. (2012). Possibilities and limitations of implant placement by virtual planning data and surgical guide templates. *International Journal of Computerized Dentistry 15*(1): 9 – 21. https://pubmed.ncbi.nlm.nih.gov/22930944/

Sarment, D. P., Sukovic, P., & Clinthorne, N. (2003). Accuracy of implant placement with a stereolithographic surgical guide. *The International journal of oral & maxillofacial implants*, *18*(4), 571–577. https://pubmed.ncbi.nlm.nih.gov/12939011/

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   b. Complete the Evaluation
   c. Take the Posttest
5. After completing the posttest at 80% or above, your certificate will be available for print or download.
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