Journal of Dental Reports

ISSN: 2583-2255
Ghanaati S, et al., 2025-J Dent Rep
Review Article

Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing

Shahram Ghanaati[1,2], Anja Heselich[1], Nadeem Karimbux[2] and Shibani Sahni[2]

Abstract

The use of autologous blood concentrates (ABC) has expanded significantly in dental regenerative procedures; however, standardized educational frameworks addressing their preparation, biological principles, and clinical application remain limited worldwide. At the same time, the Guided Open Wound Healing (GOWH) concept introduces innovative surgical approaches that rely on minimally invasive tissue management and the biologization of healing sites through solid and liquid blood concentrates.

To address the need for structured training in these emerging concepts, an international Maxi-Residency in Biological Dentistry, Biological Surgery, and Implantology was developed at Tufts University School of Dental Medicine (TUSDM). The program integrates foundational knowledge on GOWH, the Low-Speed Centrifugation Concept (LSCC), and venipuncture training with extensive hands-on exercises, case-based learning, and live-surgery observation. Its educational design promotes competency-based learning and facilitates the translation of evidence-based regenerative concepts into clinical practice. This article describes the structure, methodology, and pedagogical framework of the Maxi-Residency program and highlights its role in fostering global awareness and proficiency in the application of ABC in GOWH. Preliminary observations indicate successful implementation by participants, underscoring the growing importance of biologically driven surgical strategies in the future of oral wound healing and regenerative dentistry.

Keywords: Maxi-residency; Autologous blood concentrates; Biologization; Guided open wound healing; Continuous medical education; Covered socket residuum.

[1]Department for Oral, Cranio-Maxillofacial and Facial Plastic Surgery, Medical Center of the Johann Wolfgang Goethe University, Frankfurt, Germany

[2]Tufts University School of Dental Medicine, Boston, MA, USA

[*]**Corresponding Author:** Shahram Ghanaati, Department for Oral, Cranio-Maxillofacial and Facial Plastic Surgery, Medical Center of the Johann Wolfgang Goethe University, Frankfurt, Germany.

Receiving Date: 11-19-2025

Accepted Date: 12-03-2025

Published Date: 12-19-2025

Citation: Ghanaati S, Heselich A, Karimbux N, Sahni S. Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing. J Dent Rep. 2025;6(1):134-38.
DOI: https://doi.org/10.37191/Mapsci-2583-2255-6(1)-042

Introduction

Autologous blood concentrates (ABC) have become integral to modern regenerative dentistry, supported by extensive evidence demonstrating their ability to enhance wound healing and to promote predictable soft and hard tissue regeneration in the oral cavity. Despite their increasing use, there remains considerable variation in preparation systems, centrifugation protocols, and clinical application methods across different regions and dental practices [1]. These discrepancies highlight the need for standardized, evidence-based training programs that ensure safe and reproducible clinical outcomes. Moreover, key competencies such as venipuncture-necessary for the acquisition of whole blood and subsequent preparation of ABC-are rarely included in traditional dental curricula, leaving many clinicians without the foundational skills required for this biologically driven approach.

Simultaneously, the Guided Open Wound Healing (GOWH) [2] concept, developed by the lead author, has emerged as an innovative surgical paradigm emphasizing minimally invasive techniques, atraumatic tissue handling, and preservation of the natural anatomy of the alveolar ridge. By learning proper flap reflection techniques and thorough socket debridement following tooth extraction, the application of ABC in combination with indication-based bone substitute materials within the GOWH framework provides a predictable approach for ridge preservation, socket management, and implant site preparation. The integration of ABC into GOWH has shown significant potential to accelerate both soft and hard tissue healing and to improve clinical outcomes. Accordingly, participants learn to avoid unnecessary flap mobilization while allowing the wound to heal in a physiological and functional manner. Recognizing the need for a structured educational pathway that integrates these developments, the lead author developed the Maxi-Residency program in Biological Dentistry, Biological Surgery, and Implantology at Tufts University School of Dental Medicine (TUSDM). The program was designed for a global audience and combines theoretical content, practical skills training, and interactive learning methods [3,4]. The purpose of this article is to present the structure and educational approach of the program and to highlight its contribution to the global advancement of biologically oriented surgical techniques.

Problem

Although autologous blood concentrates (ABC) are increasingly used in dental regenerative procedures, preparation systems differ and a reproducible concept is needed. Additionally, venipuncture is not routinely taught in dental curricula, despite being essential for the safe and effective preparation of blood concentrates. Given the significant impact of ABC on soft-tissue healing, their integration enables innovative surgical strategies such as the Guided Open Wound Healing (GOWH) approach. This concept focuses on the biologization of bone substitute materials to establish a functional and aesthetic foundation for bone and soft-tissue regeneration following tooth extraction, combined with thorough debridement of all infected socket walls.

Solution

The Maxi-Residency in Biological Dentistry, Biological Surgery, and Implantology at Tufts University School of Dental Medicine

Citation: Ghanaati S, Heselich A, Karimbux N, Sahni S. Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing. J Dent Rep. 2025;6(1):134-38.
DOI: https://doi.org/10.37191/Mapsci-2583-2255-6(1)-042

(TUSDM) was conceived to address these educational gaps and to provide an evidence-based, clinically focused curriculum designed for a global community of dental professionals.

Foundational Principles of GOWH

The residency curriculum teaches key anatomical and functional principles required for GOWH, including:

1. The alveolar ridge separates the floor of the mouth from the cheek and contains the sockets of the teeth.
2. Attached gingiva exists only at the buccal and lingual aspects of the ridge.
3. Creating flaps to close the occlusal part of the ridge requires soft tissue mobilization, potentially altering the anatomy and functionality of the adjacent oral mucosa and associated musculature.
4. Avoiding covered socket residuum (CSR) in former extraction sites provides the optimal foundation for successful implant therapy
5. Correct performance of venipuncture prevents infection, vein damage, hematoma formation, and unnecessary pain, while providing clinically relevant insights into patients' health conditions.
6. Application of solid and liquid blood concentrates alone or in combination with bone substitutes significantly enhances wound healing and tissue regeneration.
7. The Low-Speed Centrifugation Concept (LSCC) allows reproducible preparation of ABC regardless of centrifuge brand by defining gravitational force parameters.

Clinical Objectives and Training Structure

Participants were trained to perform procedures based on GOWH, including:

1. Alveolar ridge preservation following atraumatic extraction and prevention of CSR [5]
2. Alveolar ridge augmentation and soft tissue management
3. Immediate and delayed implant placement
4. Competency development was reinforced through:
5. A six-month curriculum consisting of 10 modules
6. 60 hours of lectures and 40 hours of hands-on training
7. Multiple pedagogical strategies (lecture, active learning, flipped classroom, 3D animations, videos, photo documentation)
8. Hands-on practice using models and sheep jaws
9. Case presentations from participants' own practices, followed by structured feedback
10. Observation and group discussion of live surgeries.

Participants presented 6-12 clinical cases over the course of the program, with continuous refinement of surgical techniques and application of ABC. The final module included observation of an in-house live surgery performed at Department for Oral, Cranio-Maxillofacial and Facial Plastic Surgery, Medical Center

Citation: Ghanaati S, Heselich A, Karimbux N, Sahni S. Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing. J Dent Rep. 2025;6(1):134-38.
DOI: https://doi.org/10.37191/Mapsci-2583-2255-6(1)-042

of the Johann Wolfgang Goethe University, Frankfurt in Germany, reviewing all aspects of ABC application and GOWH.

Conclusions

The design and pedagogical framework of the Maxi-Residency contributed to the successful implementation of a novel, biologically oriented surgical concept. Participants gained proficiency in venipuncture, ABC preparation, and the full range of dento-alveolar surgical procedures guided by GOWH. A planned survey will evaluate the long-term integration of these concepts into participants' clinical practices and further elucidate the global impact of this educational initiative.

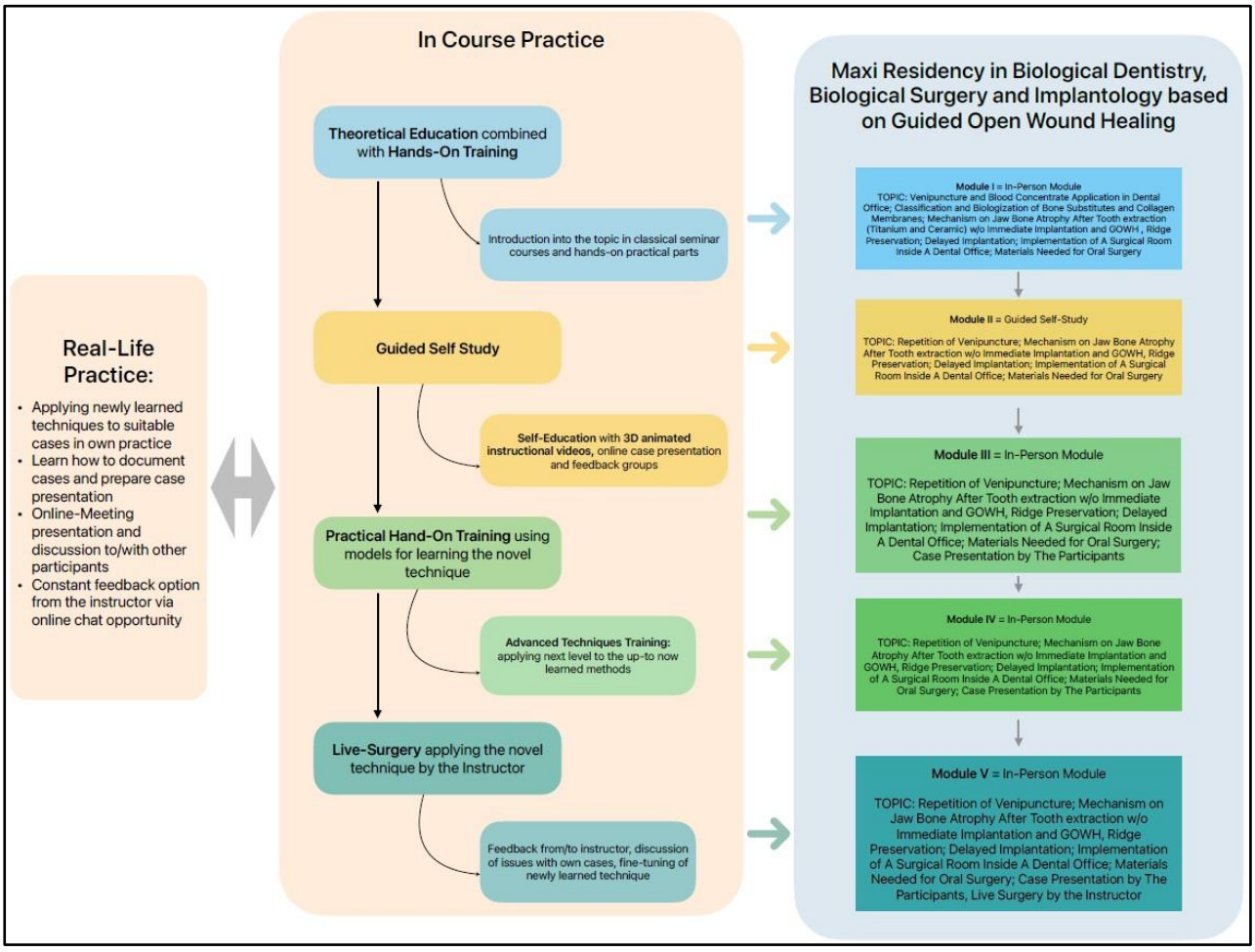

Figure 1: Educational concept of Maxi-Residency. Workflow of modules with integrated theoretical teaching, hands-on training, and self-implementation of the participants.

References

1. Choukroun J, Ghanaati S. Introducing the Low-speed Centrifugation Concept. Platelet Rich Fibrin in Regenerative Dentistry: Biological Background and Clinical Indications: Biological Background and Clinical Indications. 2017:33-46.
2. Ghanaati S, Śmieszek-Wilczewska J, Al-Maawi S, Neff P, Zadeh HH, Sader R, et al. Solid PRF Serves as Basis for Guided Open Wound Healing of the Ridge After Tooth Extraction by Accelerating the Wound Healing Time Course-A Prospective Parallel Arm Randomized Controlled Single Blind Trial. Bioengineering. 2022;9(11):661. PubMed | CrossRef

Citation: Ghanaati S, Heselich A, Karimbux N, Sahni S. Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing. J Dent Rep. 2025;6(1):134-38.
DOI: https://doi.org/10.37191/Mapsci-2583-2255-6(1)-042

3. Bosse HM, Mohr J, Buss B, Krautter M, Weyrich P, Herzog W, et al. The Benefit of Repetitive Skills Training and Frequency of Expert Feedback in the Early Acquisition of Procedural Skills. BMC Med Educ. 2015;15(1):22. PubMed | CrossRef
4. Kooloos JG, Bergman EM, Scheffers MA, Schepens-Franke AN, Vorstenbosch MA. The Effect of Passive and Active Education Methods Applied in Repetition Activities on the Retention of Anatomical Knowledge. Anat Sci Educ. 2020;13(4):458-66. PubMed | CrossRef
5. Ghanaati S, Kamolov A, Bouquot J, Sader R, Heselich A, Al-Maawi S. Covered Socket Residuum (CSR) in Former Third Molar Sockets Despite Platelet-Rich Fibrin: A Prospective Randomized Controlled Split-Mouth Clinical Study. Bioengineering. 2025;12(11):1242. PubMed | CrossRef

Citation: Ghanaati S, Heselich A, Karimbux N, Sahni S. Raising Global Awareness by Implementing a New Methodology of Teaching and Learning to Meet the Future Needs of Autologous Blood Concentrates Application in Guided Open Wound Healing. J Dent Rep. 2025;6(1):134-38.
DOI: https://doi.org/10.37191/Mapsci-2583-2255-6(1)-042