NEVO

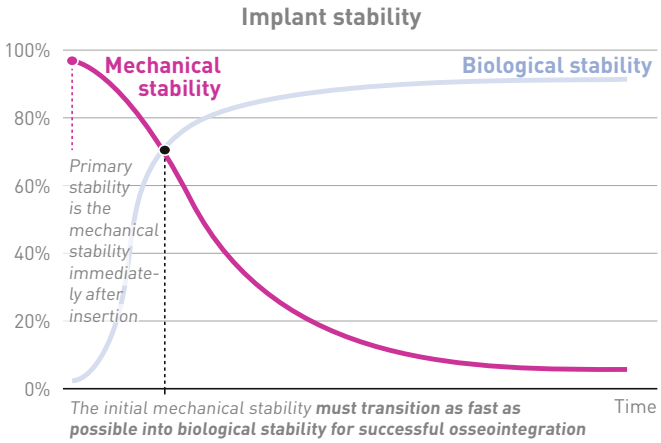
The Gentle Path to a Higher Primary Stability

NEVO features apically pronounced threads and a balanced cylindrical-tapered design for **enhanced primary stability.**

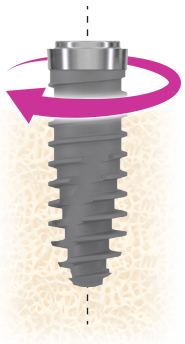
Its rapid healing technology with the conditioned INICELL® surface supports a **fast transition to biological stability.**

What is implant stability and why is it important?

- Implant stability, comprising primary stability and subsequent biological stability, is crucial for the long-term success of dental implants, ensuring they remain **secure and functional over time.**
- **Primary stability** is particularly important for immediate treatment protocols, where the implant must be stable enough to bear the load of a provisional restoration immediately after placement.

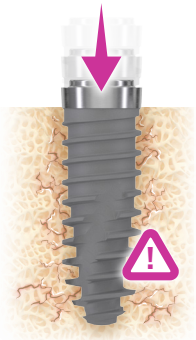


How can primary stability be determined?



Insertion Torque:
Rotational force required to insert the implant into the bone

- Measures resistance during insertion
- Influenced by bone quality, bone quantity, osteotomy, and implant design
- No clinical consensus on minimal insertion torque for successful implantation[1]



Load-Bearing Capacity:
Ultimate force before bone damage and compaction

- Determines immediate load-bearing capacity by applying occlusal compression up to bone failure
- Corresponds directly to primary stability[2]
- Can only be determined ex vivo

Insertion Torque indicates resistance during the implant insertion process, but not necessarily an objective measure of primary stability. Implant design and clinical experience influence primary stability assessment based on insertion torque.

Load-Bearing Capacity, indicated by ultimate force, serves as an objective measure of primary stability. However, it requires compression until collapse, so it cannot be determined in patients during implant placement.

Experimental set-up to test NEVO's primary stability[3]

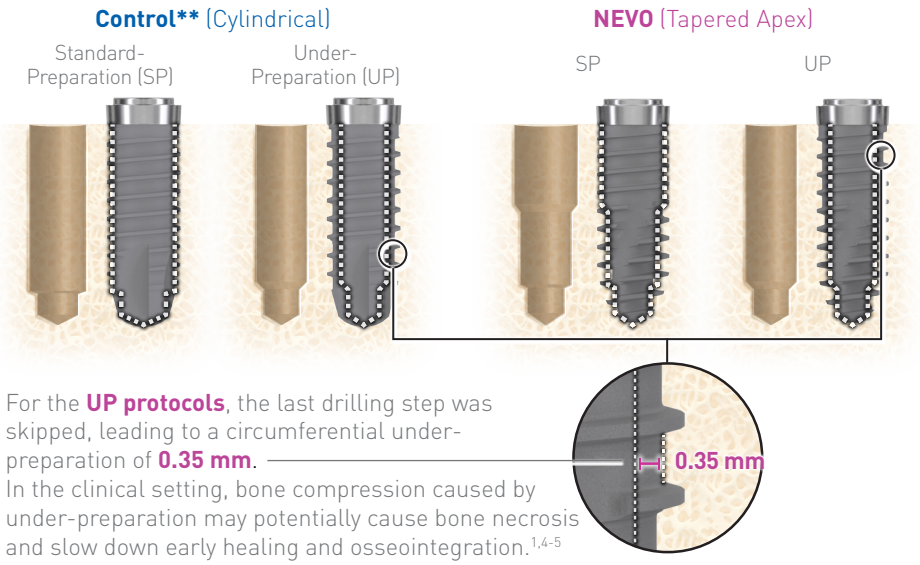
Experimental set-up:

1. **Implants** were inserted in bovine tibiae bone biopsies

2. **Mechanical tests** were performed to determine insertion torque and load-bearing capacity

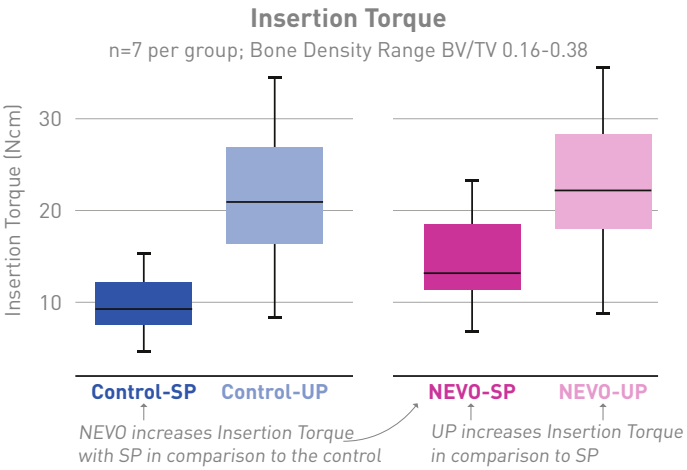
3. The bone samples were reconstructed from micro-CT images, converted into a micro-FE mesh and combined with the implants to a **simulation model***

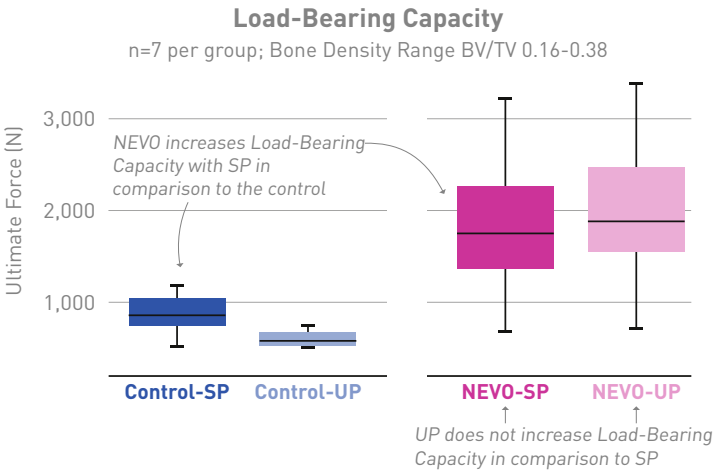
Experimental groups:



For the **UP protocols**, the last drilling step was skipped, leading to a circumferential under-preparation of **0.35 mm**.
In the clinical setting, bone compression caused by under-preparation may potentially cause bone necrosis and slow down early healing and osseointegration.[1,4-5]

Results: NEVO provides increased objective primary stability without the need for underpreparation[3]





Key Takeaways

✓ **NEVO** demonstrated an **increased Load-Bearing Capacity** and an **increased Insertion Torque** in comparison to a cylindrical control implant in low density bone, when prepared according to the manufacturer's drilling protocol (standard-preparation, no under-preparation).[3]

✓ Under-preparation did not increase Load-Bearing Capacity compared to standard preparation.[3] This means that **NEVO provides increased objective primary stability without the need for under-preparation**, resulting in optimal conditions for rapid osseointegration.[1,4-7]

BV/TV, bone volume to total volume; CT, computed tomography; FE, Finite Element; SP, standard-preparation; UP, under-preparation.

*A micro FE (Finite Element) analysis simulation provides a detailed assessment of stress and strain distribution, helping to predict the performance of dental implants under various loading conditions **ELEMENT implants from Thommen Medical were used as control.

1. Aldahlawi S et al, Clin Cosmet Investig Dent. 2018;10:203-9; 2. Vautrin A et al, J Mech Bhav Biomed Mater. 2024; 158:106688; 3. Patrik Wili & Prof. Philippe Zysset, Virtual Testing of the new Implant Designs Tapered A & I; ARTORG Center for Biomedical Engineering Research, Faculty of Medicine, University of Bern; unpublished data; 4. Cha JY et al. J Dent Res. 2015; 94:482-90; 5. Ikar M et al. Quintessence Int. 2020;51:142-150; 6. Duyck J et al. Clin Oral Implants Res. 2015;26:191-6; 7. Berglundh T et al. Clin Oral Implants Res.2003;14:251-62.

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