



**DJO Surgical
Orthopedic Summit
Snowbird, UT
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Nevada Hip & Knee
Center Of Excellence
& Research Institute



**Use of the Woodpecker
Pneumatic Broach with the CLP**

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1/9/09

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Cementless Stem Designs

- **Cylindrical (AML, Echelon)**
- **Anatomic (PCA, Image)**
- **Tapered**

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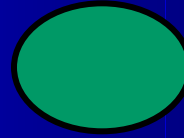
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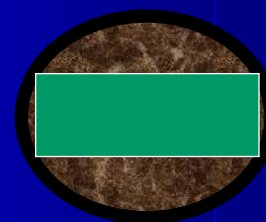
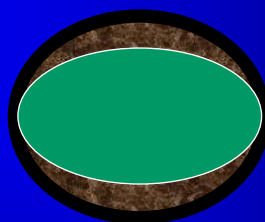
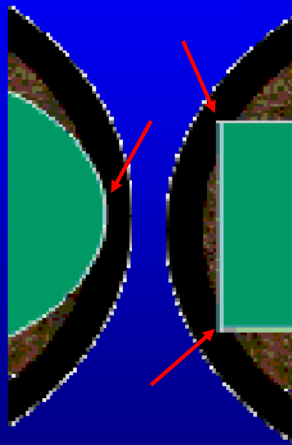


Tapered Stem Designs

- Canal filling (Mallory-Head, Synergy)
- Flat, Oval (Taperloc, Accolade)
- Flat, Rectangular (Zweymüller, CLP)

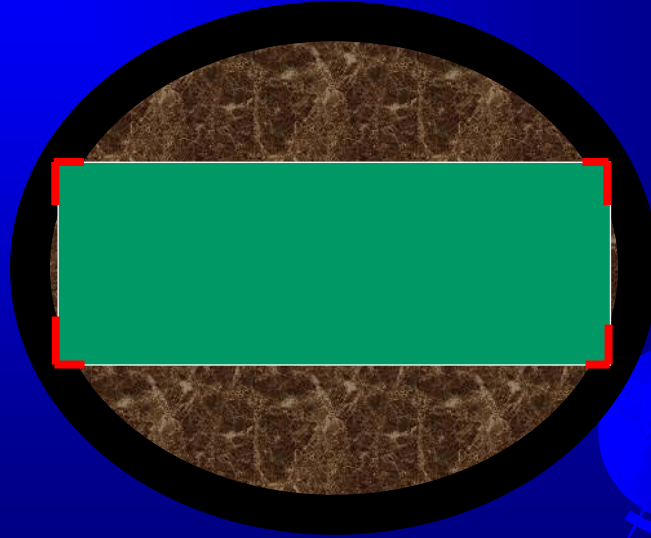


Primary Rotational Stability



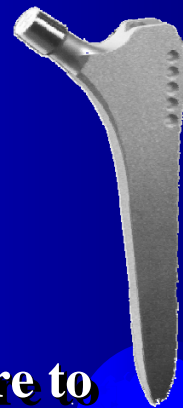
Good fit without fill gets stability from macro-interlock and interfacial friction between prosthesis & cortical bone

Corner-Cortical Interlock



Zweymüller Philosophy

- **Tapered AP and ML**
- **Rectangular**
- **Non-canal filling**
- **Grit-blast finish only**
- **Lateral metaphyseal flare to increase primary torsional stability**



Other Similar Designs Followed

- **CLP**
- **Platform**
- **Others**



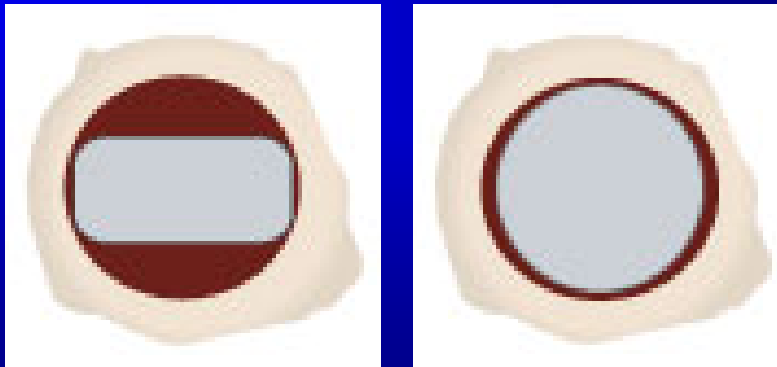
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CLP vs Cylindrical



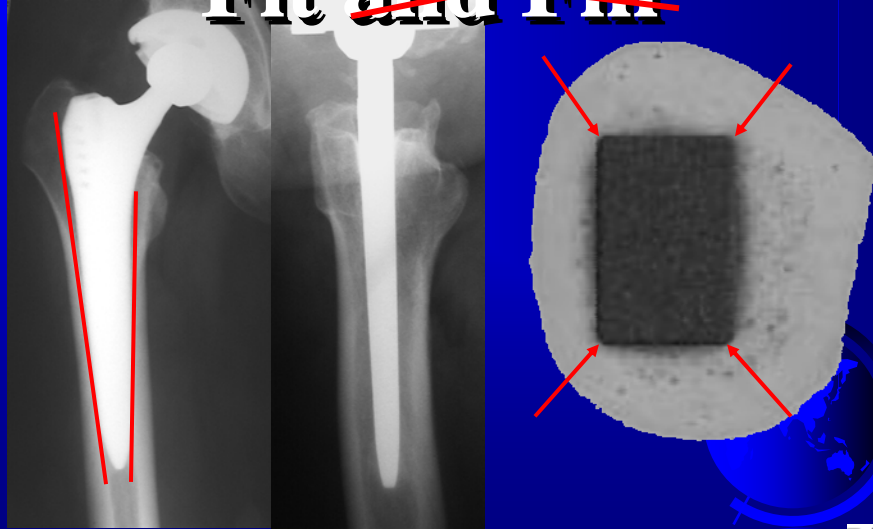
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Primary Stability ~~Fit and Fill~~



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Advantages of Flat, Rectangular, Tapered Stem

The Journal of Arthroplasty Vol. 20 No. 4 Suppl. 2 2005

The Tapered Press Fit Total Hip Arthroplasty

A European Alternative

Todd V. Swanson, MD

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My Experience

- **1000 Consecutive Primary THA's**
 - **905 Zweymüller stems**
- **93% osteoarthritics**
- **Dorr bone types**
 - **A: 442**
 - **B: 474**
 - **C: 84**
- **Mean age = 63.3 yrs (23-95)**
- **Most inserted with pneumatic broach (Woodpecker) preparation**

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“Woodpecker” Pneumatic Broach

- **Manufactured by IMT (Switzerland)**
- **Distributed by Minnesota Bramstedt Surgical Inc., St. Paul, MN**
- **Adapters available to most broaches**



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Theory of Operation

- **10mm linear excursion**
- **Frequency 70Hz (70 strokes/min)**
- **Forward stroke cuts, backward stroke clears bone chips**
- **Axial force <1.0 Newton/stroke (0.22 pounds)**



Advantages

- **Ease of use (no swinging mallet)**
- **Multiple short, quick strokes rather than large heavy strokes reduce risk of fracture**
- **Facilitates accurate broaching to minimize gaps between prosthesis and bone**



Settings

- Operates at 87-120 PSI
- Low impact setting useful for osteoporotic bone



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Technique

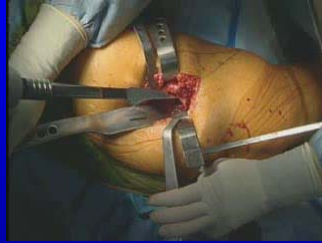
- Begin with small broach
- Increase broach size incrementally until resistance encountered
- Broach in straight line
- Exert only moderate pressure (let Woodpecker do the work)
- With CLP, can seat implant 5-10mm lower after initial resistance if necessary to avoid leg length inequality

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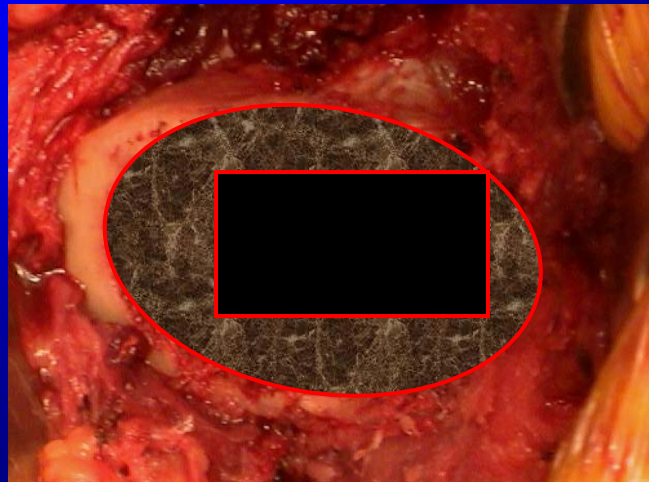
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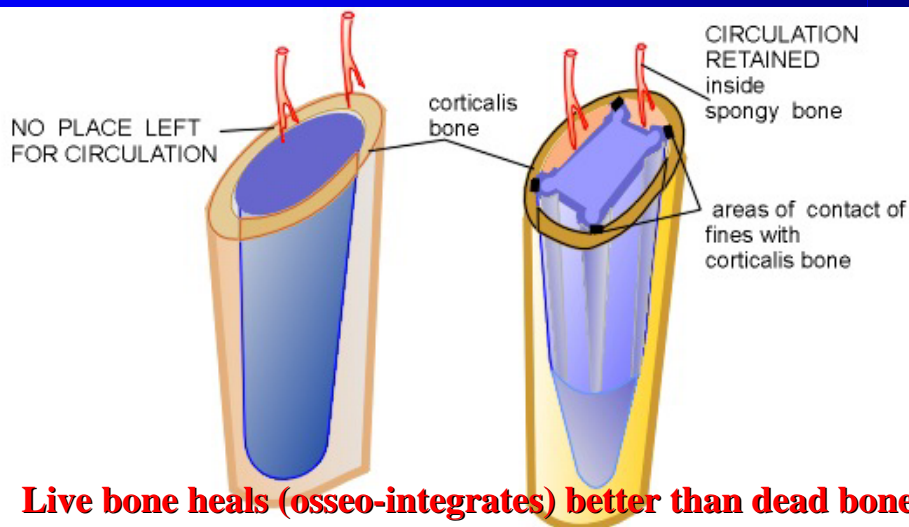
Provides Precise Cancellous Bone Compaction



Cancellous Bone Compaction

- **Delays stress shielding**
- **Increases primary stability**
- **Maintains endosteal blood supply**

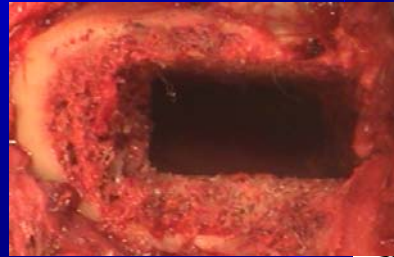
Preservation of blood supply



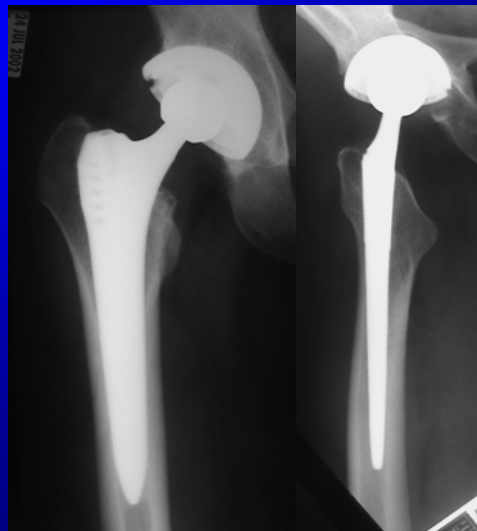
Live bone heals (osseo-integrates) better than dead bone

Simplicity of removal

- **Non-canal-filling stem allows for introduction of thin osteotomes**
- **Occasional extended trochanteric osteotomy needed due to excellent secondary fixation**
 - **Easily performed**
 - **Easily repaired**



Minimize Gaps



Reduction of Hoop Stresses

- **Bolland, JBJS-B, 2007**
 - **In vitro study of bone impaction using Woodpecker device compared to hand broaching**
 - **Hoop strains significantly reduced using Woodpecker device (13.2% vs 4.2%)**
 - **Bone impaction equal or better with Woodpecker device**



Revision THA

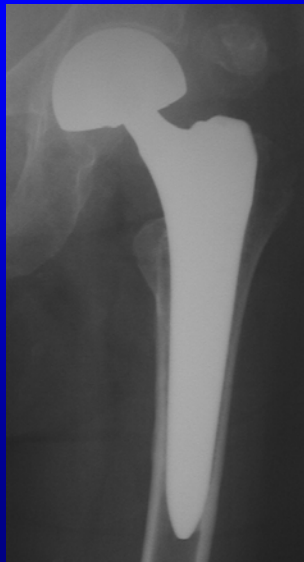
- **(Hourlier, Polyclinique de la Thierache, Wignehies, France-unpublished data)**
 - **62 revision THA's using long, Zweymuller stem**
 - **Mean f/u 4.8 years**
 - **All femora prepared using Woodpecker**
 - **No fractures**
 - **Mean subsidence 1mm**



My 1,000 Cases

- 43% Type A bone
- 48% Type B bone
- 9% Type C bone

8.6% Type C Bone



Fracture Rate

- **4 femoral shaft fractures/1000 cases (0.4%)**
 - **2 hand broaching**
 - **2 pneumatic broaching**
- **All in extremely osteoporotic bone**



Leg Lengths

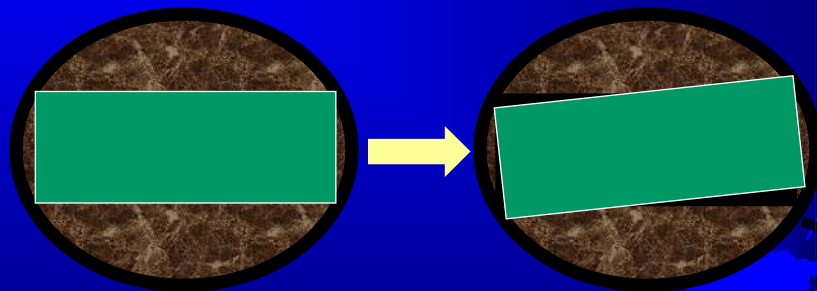
- **Within 7mm in 912 hips (91.2%)**
 - **Error likely related to method of leg length determination**
- **Stem subsidence <2mm in all**



Intra-op Adjustability

- **Sharp, cutting broaches allow intra-op changes**
 - **In prosthesis height**
 - Leg length
 - Soft tissue tension
 - **In prosthesis anteversion**

Anteversion Adjustability



Summary

- **Woodpecker pneumatic broach for preparation for CLP stem**
 - Safe
 - Simple
 - Reliable
 - Reproducible



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Thank-You!

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