DESIGN RATIONALE

ANGULAR STABLE LOCKING SYSTEM (ASLS)
DESIGN RATIONALE

NON-UNION DUE TO FRACTURE INSTABILITY AS A CLINICAL COMPLICATION

Intramedullary nailing remains the treatment of choice for most displaced tibial shaft fractures.\(^1\) Advances in surgical approaches and locking options have expanded indications to include more proximal and distal metaphyseal fractures.\(^1,2\) However, achieving mechanically stable fixation in metaphyseal fractures or poor bone quality can be challenging.\(^1,2\) As a result, there is up to a 15% occurrence of non-union in tibia shaft nailing procedures, with mechanical instability being a contributory factor.\(^1,4,5\)

ASLS IS DESIGNED TO IMPROVE CONSTRUCT STABILITY

The Angular Stable Locking System (ASLS) is an optional component of the DePuy Synthes nailing platform that provides fixed angle locking for fractures at risk of mechanical instability.

Compared to conventional locking, ASLS has:

- The potential to maintain stability while reducing the number of locking screws\(^5\)
- Improved stiffness and less interfragmentary movement\(^1\)
- Potential for earlier weight-bearing and improved bone healing\(^6\)

FEWER LOCKING SCREWS FOR EQUAL STABILITY

In a biomechanical study comparing the effect of 3 conventional locking screws vs. 2 ASLS screws in the distal tibia, the ASLS system provided equally stable fixation while reducing the number of locking screws.\(^5\)

Achieving a biomechanically stable construct with fewer locking screws could potentially reduce the risk of vascular and nerve damage during locking and/or removal, as well as reduce procedure time and costs.\(^5\)

*Bench test results may not be indicative of clinical performance
Seven biomechanical studies have published which report improvements in construct stability of ASLS compared to conventional locking.\textsuperscript{1,3,5-9}\textsuperscript{*} These improvements in stability may promote fracture healing, particularly in metaphyseal fractures or poor bone. Compared to conventional locking, ASLS had:

**UP TO 129% HIGHER CONSTRUCT STIFFNESS**
Based on static biomechanical loading\textsuperscript{*}.

**REDUCED INTERFRAGMENTARY MOVEMENT**
With up to 80% decrease in fracture site motion over a period of at least 3 months\textsuperscript{10}.

**LONGER FATIGUE LIFE**
Higher load and cycles to failure, with fewer broken screws\textsuperscript{9}.

An animal study comparing ASLS to conventional locking evaluated the affect of bone healing and mobilization.

**EARLIER WEIGHT-BEARING**
ASLS treated specimens had significantly higher maximum ground reaction forces, larger contact areas and longer contact times.

In addition, the animals were in full weight-bearing after 9 weeks, which may be indicative of reduced pain.\textsuperscript{6}

**IMPROVED BONE HEALING**
After 9 weeks, there was significantly less interfragmentary movement in all directions with the ASLS treated specimens.

In addition, the ASLS treated specimens had higher and more homogenous bone calcification.\textsuperscript{6}

*Histologic images provided courtesy of Prof. G.N. Duda of Charité–Universitätsmedizin Berlin Germany.

\textsuperscript{*}Bench test results may not be indicative of clinical performance.


Please also refer to the package insert(s) or other labeling associated with the devices identified in this brochure for additional safety information.

Not all products are currently available in all markets.

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