Intramedullary Fixator. Using the Angular Stable Locking System (ASLS).

Angular stable locking concept for intramedullary nails
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**What is ASLS?**

The Angular Stable Locking System (ASLS) provides the ability to create a fixed-angle construct to an intramedullary nail. Therefore, it combines the advantages of angular stability and a minimally invasive approach. ASLS together with an intramedullary nail form the principle of the Intramedullary Fixator.

**How does ASLS work?**

The system consists of a screw with three outer diameters and a resorbable sleeve.

The resorbable sleeve is placed on the screw tip which has the smallest screw diameter and is pushed into the locking hole of the nail.

During screw advancement, the resorbable sleeve is expanded by the larger middle diameter. Radial expansion of the sleeve and its fixation in the nail creates the angular stability.

**ASLS – a milestone in nail development**

ASLS reduces the number of influencing variables in fracture treatment and improves conventional nailing by offering controlled stability throughout the procedure. ASLS represents a milestone in nail development: a truly locked construct offering angular stability to intramedullary nails.

**History of Nailing (Synthes/AO)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>Introduction of IM nailing technique by Gerhard Küntscher</td>
</tr>
<tr>
<td>1959/1960</td>
<td>AO (Standard) Nails</td>
</tr>
<tr>
<td>1969</td>
<td>First “locked” nail “Detensor” by Gerhard Küntscher</td>
</tr>
<tr>
<td>1987/1988</td>
<td>First “locked” nails by Synthes: AO Universal Femoral and Tibial Nails</td>
</tr>
<tr>
<td>1997</td>
<td>First cannulated nails: Cannulated Femoral Nail, Proximal Femoral Nail, Distal Femoral Nail</td>
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</table>
Where can I use ASLS?

ASLS is particularly indicated in cases where increased stability is needed, for example in fractures closer to the metaphyseal area or in poor quality bone.

ASLS can be used in combination with all Synthes cannulated titanium nails as an alternative to standard locking screws. It is especially suited for the use with the Expert Nailing System.

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Benefits of the Intramedullary Fixator according to AO Principles

### Stability

**Increased stability:** a stiff construct reduces the risk of secondary loss of reduction.²

![Graph showing increased stiffness with angular stable screws compared to conventional screws]

**Less fracture site movement:** mechanical properties of resorbable sleeve are maintained during initial 12 weeks of healing providing 80% less fracture site motion.³

**Fewer screws provide equal stability:** higher resistance to construct failure with angular stable locking proximally and distally.⁴

**Note:** certain fracture patterns may require more than two ASLS screws or ASLS screws in more than one plane to achieve optimal stability.

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³ Internal testing: RMS Rapport A08_06090_2, Performance Test for ASLS Resorbable, August 2008
Better hold: trend to superior stability of angular stable construct, especially in poor quality bone and in fractures closer to the metaphyseal area.5

Fracture gap angle at 500N is significantly smaller for angular stable construct in 6 out of 8 bone pairs. This effect is most prominent in low BMD (Bone Mass Density).

Relative stability: principle of relative stability and secondary bone healing remain valid.7

Controllable stability: degree of stability can be determined by surgeon (free choice between angular stable and conventional screws).6

The existence of callus shows that the principle of secondary bone healing with callus is also valid when using the angular stable locking system.

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7 X-rays: Prof. Höntzsch, BG Unfallklinik Tübingen, 2008/09
**Benefits of the Intramedullary Fixator according to AO Principles**

**Anatomic reduction**

**Reduced risk of secondary loss of reduction**

Conventional screws

Significant medial and lateral tilting of conventional construct during testing

Angular stable screws
(eperimental design)

Stable reduction

No lateral or medial tilting of angular stable construct during testing

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Preservation of blood supply

Minimally invasive approach:
ASLS combines the advantages of a minimally invasive intramedullary nailing approach with the advantages of angular stability.

Minimally invasive approach:

Early, active mobilization

Rehabilitation:
stable fixation, provided by ASLS, permits controlled, early, active rehabilitation that promotes optimal recovery.9

First clinical results ASLS, 2008/2009
10 First clinical results ASLS, 2008/2009

First clinical results show that the average time to full weight-bearing of 23 tibia fracture patients is significantly shorter when treated with ASLS (9.4 weeks)10 in contrast to conventional screws (12 weeks)11

Minimally invasive insertion of an Expert Tibial Nail
Intramedullary Fixator. Using the Angular Stable Locking System (ASLS).