

# The evidence is in...

Enhanced Outcomes from Enhanced Stability

 **smith&nephew**  
**TRIGEN<sup>®</sup>**  
**INTERTAN<sup>®</sup>**  
Intertrochanteric Antegrade Nail

Supporting healthcare professionals



## Lower

risk of implant  
failure and  
non-union



## Reduced

postoperative  
pain



## Faster

time to  
fracture union



## Proven

high return  
to pre-fracture  
status



# How satisfied are you with current hip fracture outcomes?



Around **1 in 4** hip fracture patients over the age of 65 die within 12 months<sup>1</sup>



Around **6.6%** will require reoperation due to complications<sup>2</sup>

## And for those who survive:



**53%**



decline in mobility<sup>3</sup>

**51%**



decline in daily living activities<sup>3</sup>

**50%**



live with **reduced** ability to walk following fracture union<sup>1</sup>

**39%**



decline in self-reported health<sup>3</sup>

**29%**



decline in fine motor skills<sup>3</sup>

## Your patients can enjoy life after a hip fracture

The evidence is in! Based on data from more than two-dozen published studies, the TRIGEN® INTERTAN® Intertrochanteric Antegrade Nail allows patients to experience:



**Lower**  
risk of implant failure and non-union



**Reduced**  
postoperative pain



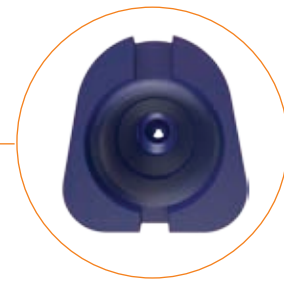
**Faster**  
time to fracture union



**Proven**  
high return to pre-fracture status

# Here's how it works

"Success rate of the operation partly depends on factors that the surgeon cannot influence. Surgeons should therefore be aware of the factors that they can manipulate with a positive outcome." – Brujin et al, 2012



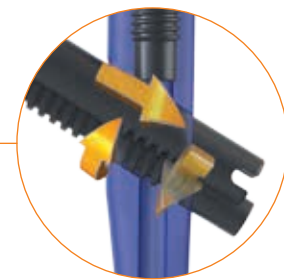
## Intertrochanteric rotational stability

The trapezoidal shape provides a pressfit in the metaphyseal region and positions more material on the lateral side of the nail where tensile/stretching forces tend to be greatest



## Maintain compression and eliminate Z-effect

Integrated Compression Screws thread together to generate push/pull forces that hold compression after instruments are removed and eliminate Z-effect



## Control rotation during reduction

A worm gear mechanism converts rotation to active compression while stabilizing the medial fragment



## Prevent periprosthetic fractures

A clothes pin distal tip is less rigid to decrease the stress riser and reduce the incidence of anterior thigh pain



## Eliminate medial migration

The head of the compression screw pushes medially against the nail and unloads stress forces off the lateral wall





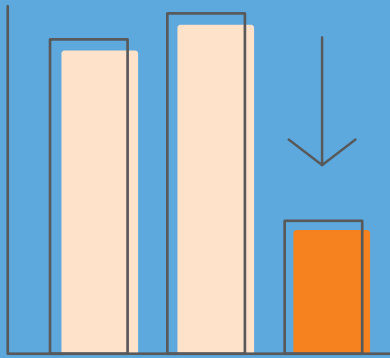
## Challenge Postoperative complications

Complication rates are still above 4% and can reach up to 16% in highly unstable fractures<sup>5</sup>



The TRIGEN<sup>®</sup>  
INTERTAN<sup>®</sup> Solution:

**Lower risk of  
implant failure and  
non-union**<sup>6,7,8,9,10,11,12,13,14,15</sup>

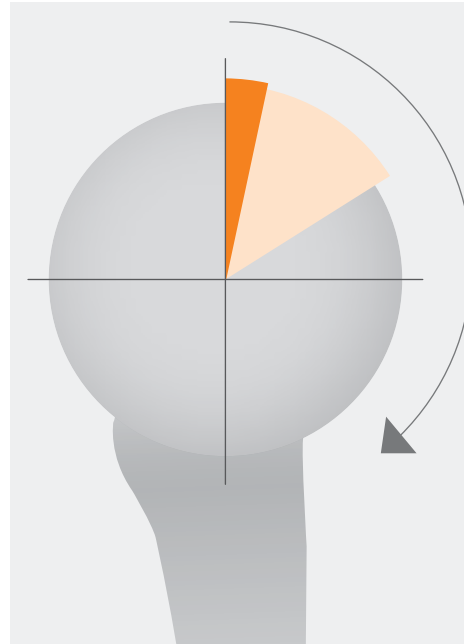


Statistically significant  
**69% reduction in  
implant related  
failures** ( $p=0.001$ )<sup>16</sup> versus  
comparator devices



## 2.5x less varus

collapse when  
compared to the  
single screw<sup>17</sup>



## 84% less

initial rotation  
and varus  
collapse<sup>5</sup>

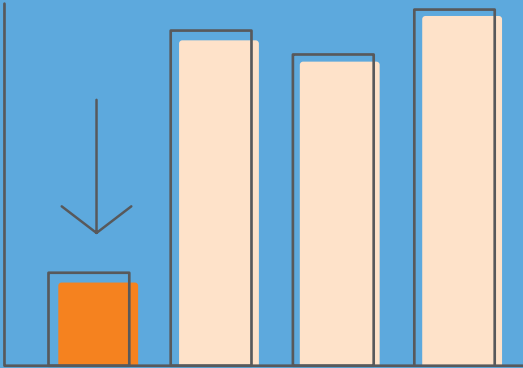
- Less varus collapse<sup>5,17,18</sup>
- Less peri-implant fractures<sup>13,19</sup>
- Effective in reducing the potential role of the tip of the short nail as a stress riser<sup>13</sup>

## Why INTERTAN?

The Integrated Compression Screws (ICS) of INTERTAN provide a second point of fixation in the femoral head, and allow for mechanical compression through the implant which is actively maintained after instrument removal. This combination creates strong interfragmentary friction and increases construct stability to resist complications such as rotation and varus collapse.



The TRIGEN® INTERTAN® Solution:  
**Lower risk of implant failure  
and non-union**<sup>6,7,8,9,10,11,12,13,14,15</sup>



Statistically  
significant **73%  
reduction in  
non-union**  
( $p=0.01$ )<sup>16</sup> versus  
comparator devices

“The integrated dual screw device offered significantly increased stability throughout the time interval that would be needed for fracture healing.”

– Santoni et al, 2016



**No non-unions** in  
radiographic analysis  
of the TRIGEN  
INTERTAN nail<sup>13,19,20</sup>



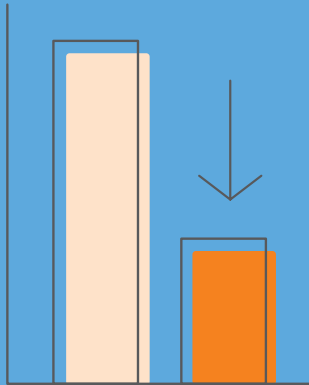
## Challenge pain management

Instability of the  
bone-implant construct >  
movement at the fracture  
site > pain<sup>11</sup>



The TRIGEN<sup>®</sup>  
INTERTAN<sup>®</sup> Solution:

**Reduced  
postoperative  
pain**<sup>9,10,11,13,14,15</sup>



Statistically significant  
**54% reduction in  
chronic hip and thigh  
pain** ( $p=0.003$ )<sup>16</sup> versus  
comparator devices

“When pain is not effectively managed, patients are not able to walk as they did before their injury, and they are more likely to have compromised pulmonary and cardiac function.” – Zanzzone et al, 2016

“Poorly managed postoperative pain is associated with delayed ambulation, pulmonary complications, and delayed transition to lower levels of care.”  
– Abou-Setta et al, 2011

Statistically significant  
improvement in postoperative  
pain and mobility<sup>19</sup>

“In our series, intertrochanteric fracture fixation using an INTERTAN nail lead to significantly shorter hospital stay, better functional outcomes, and less pain at 6 months.” – Berger-Groch et al, 2016



## Why INTERTAN?

With compression actively maintained postoperatively using the ICS screws, INTERTAN is designed to reduce unnatural movement of the hip at the fracture site. Patients with INTERTAN have been shown to experience less pain and therefore may feel more comfortable weight bearing on their implant postoperatively.



## Challenge Delayed healing

Insufficient stabilization > excessive motion of the fracture site > delayed healing



## The TRIGEN<sup>®</sup> INTERTAN<sup>®</sup> Solution:

**Faster time to  
fracture union**<sup>9,11,12,13,19,  
23,24,25,26,27,28,29</sup>

Nearly 3 week faster time  
to fracture union<sup>16</sup> versus  
comparator devices

TRIGEN INTERTAN

14.1 weeks

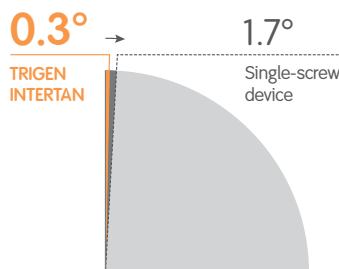
comparator

16.9 weeks

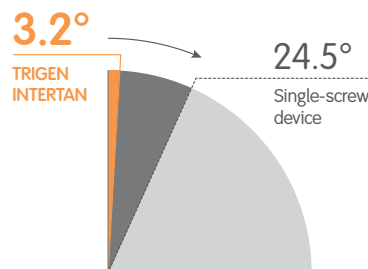
"Excess interfragmentary shear or rotational movements inhibit repair and can result in a significant delay to healing." – Gaston et al, 2007

"The INTERTAN nail can reduce healing time and is a good choice for elderly patients who need to walk bearing full weight in the early post-operative period." – Zhang et al, 2013

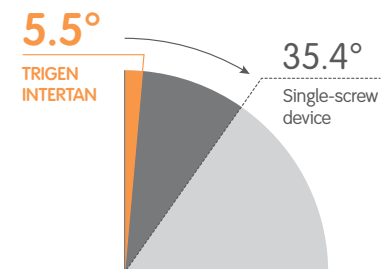
### Simulated gait



### Simulated chair rise



### Simulated chair rise



**5x greater**

initial rotational stability<sup>5</sup>

In a biomechanical simulated gait study comparing TRIGEN INTERTAN and Gamma3

**7x less**

femoral head rotation<sup>17</sup>

In a biomechanical simulated chair rise study comparing TRIGEN INTERTAN and Gamma3

**7x reduction**

in maximum femoral  
head rotation<sup>17</sup>

In a biomechanical simulated chair rise study at the end of 4x body weight loading or until failure

## Why INTERTAN?

By properly stabilizing the anatomy and maintaining an anatomical reduction, The INTERTAN ICS screws resist excessive motion in order to create a more stable healing environment. This provides the patient's biology a better chance to achieve an earlier and more successful union at the fracture site.



## Challenge Poor functional outcomes

Femoral neck shortening  
> decreases moment arm  
of abductors > reduced  
patient function<sup>31</sup>



The TRIGEN<sup>®</sup>  
INTERTAN<sup>®</sup> Solution:  
**Proven high  
return to  
pre-fracture  
status**<sup>6,13,19,23</sup>

Statistically significant **higher SF-36  
score** in favor of TRIGEN INTERTAN ( $p=0.002$ )<sup>16</sup>  
versus the comparator in one study<sup>6</sup>



**up to 93%** return to  
pre-fracture ambulatory status



"A large proportion of those patients  
who survive never recover to their  
prefracture level of function."  
– Abou-Setta et al, 2011

"Shortening of greater than 2cm is  
known to adversely affect locomotor  
function in otherwise active  
individuals." – Sanders et al, 2017

"Shortening of the femoral neck was  
the only significant variable predictive  
of a low SF-36 physical functioning  
score." – Zlowodzki et al, 2008



No uncontrolled collapse of the neck<sup>19</sup>

Less femoral neck shortening<sup>8,9,17</sup>

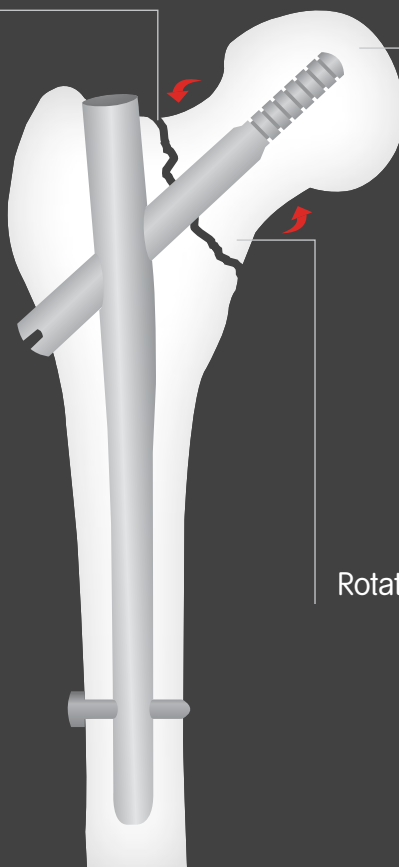
## Why INTERTAN?

Utilizing the ICS screws for controlled active compression, rather than relying on weight bearing and uncontrolled sliding, helps resist shortening of the femoral neck which can improve patient function. By restoring the patient's natural anatomic measurements and preserving limb length, INTERTAN results in highly successful postoperative ambulatory outcomes.

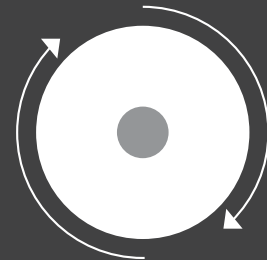
Inadequate  
compression

## Single Screw

"Because the screw is rotationally unstable within the bone when using a single lag screw, flexion-extension of the limb results in loosening of the bone-screw interface, with the screw secondarily cutting out" – Zhang et al, 2013



Single Pivot Point

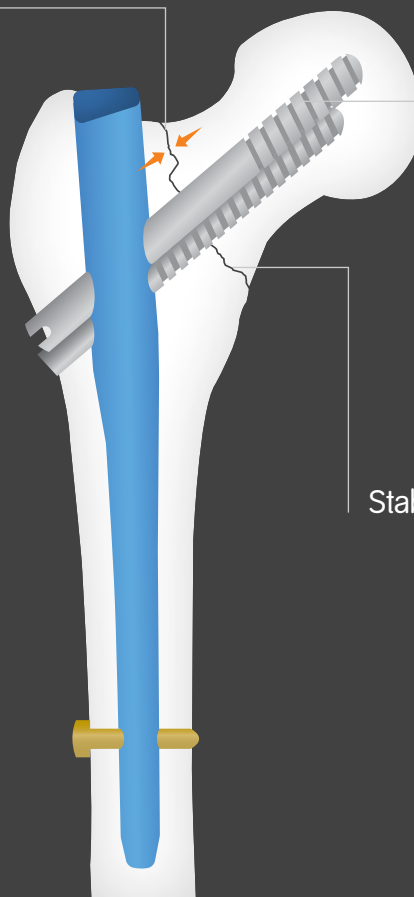


Rotational Instability

Compression  
Maintained

## Integrated Compression Screws

"With the more recent identification that rotational instability contributes to malunion and implant-bone construct failure, the use of an integrated-slide implant should be considered to provide added rotational stability in unstable fracture patterns." – Baldwin et al, 2016



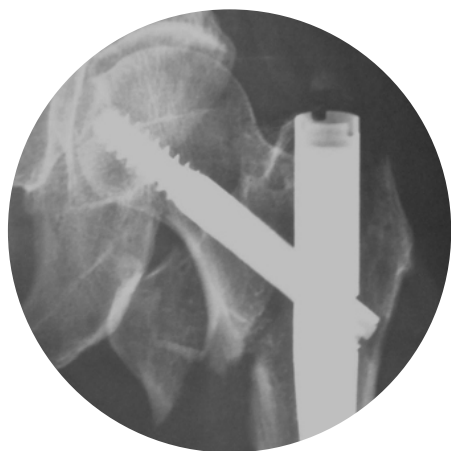
Two Points of Fixation



Stable Fracture Site

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There is a lack of definitive evidence identifying the superiority of a helical blade or lag screw implant<sup>33</sup>



“The use of the INTERTAN system may be an improvement in surgery compared to Gamma 3...In our department, we have standardized the use of INTERTAN nail for the treatment of intertrochanteric fractures.” - Su et al, 2016

“The results of our study show that the incidence of femoral shaft fractures, rotational loss of reduction, varus collapse of the head/neck, [...] cut-out, and femoral neck shortening were decreased in group IT comparing with group PFNA-II.”  
– Yu et al, 2016

“INTERTAN is superior to DHS in internal fixation stability, thus better applies in cases of osteoporosis and unstable fractures.”  
– Wang et al, 2014



## Economic Impact:

In the changing economic landscape of healthcare, better patient outcomes mean better outcomes for hospitals. When considering the costs involved in treating a patient with a hip fracture, the benefits of the TRIGEN® INTERTAN® system – **lower risk of implant failure and non-union, reduced postoperative pain, faster time to fracture union, and a proven high return to pre-fracture status** – can help you achieve better outcomes more efficiently.



“The priority remains improving functional outcomes and reducing complications. If, as a profession, we are to rise to the challenge of the ageing population, more is going to be needed for less.”

–Ollivere et al, 2017



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Supporting healthcare professionals for over 150 years

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