Auxein

ELASTIC NAILING SYSTEM

Surgical Technique

NEXT-LEVEL CARE

ABOUT US

Auxein Medical is an integrated, research based, orthopaedic implants & instruments manufacturing company, producing a wide range of quality, affordable generic implants, trusted by healthcare professionals and patients across geographies. It is the Company's constant endeavour to provide a wide basket of generic and our innovator products that exceed the highest expectations of customers in term of quality and safety. The company has world-class manufacturing unit established in India and serves customers in over 75 countries worldwide.

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75+
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Patients Cured

200+
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OUR ACHIEVEMENTS



OVER THE YEARS


HAAS
HAAS
POWER ON
POWER OFF
EMERGENCY STOP
HANDLE JOG
RESET
F1
F2
F3
F4
OVERRIDES
CYCLE START
STOP
REV
SPINDLE

At Auxein, it is our goal to provide the best in class quality and value to every individual. Consistency is a virtue we pursue with a passion. From the procurement of raw materials to the manufacturing of our range of 1200+ orthopaedic implant products, we employee world-class systems and technology at par with the highest standards of globally recognized evaluation systems. The Elastic Nailing System is part of our advanced orthopedic portfolio designed to support versatile fixation techniques in trauma and reconstructive procedures. Developed with input from global experts, the system provides reliable solutions for fixation of fractures, helping achieve stable fixation and accurate anatomical alignment.

ELASTIC NAILING SYSTEM

Elastic Nailing System

Introduction:

The Elastic Nailing System (ENS) is a minimally invasive intramedullary fixation technique primarily used for pediatric long bone fractures. It uses flexible titanium nails that are inserted into the medullary canal to stabilize fractures while preserving the biology of the bone and growth plates.



Core Concept:

Instead of rigid fixation, elastic nails work on the principle of balanced elastic stability. Two pre-bent nails are inserted from opposite sides of the bone, creating three-point fixation inside the medullary canal. This provides stability while allowing small micro movements that stimulate natural bone healing.

Common Indications:

Elastic nailing is widely used in children and adolescents for fractures such as:

- Femoral shaft fractures.
- Tibial shaft fractures.
- Humeral shaft fractures.
- Forearm fractures (radius and ulna).
- Selected clavicle fractures.

It is most effective in pediatric patients with open growth plates and diaphyseal fractures.

Key Features:

- Minimally invasive technique with small entry points.
- Flexible titanium nails that adapt to the natural curvature of the bone.
- Preserves periosteal blood supply and fracture hematoma.
- Growth plate friendly (does not disturb physes).

Principle of Stability:

- The stability of elastic nails comes from:

- Symmetrical nail insertion.
- Pre-bent nail shape.
- Three-point fixation inside the canal.
- Balanced opposing forces from two nails.
- This creates an internal splinting effect, maintaining alignment while allowing controlled elasticity.

Indications:

The Titanium Elastic nail is intended for xation of diaphyseal fractures with narrow canal including:

- Lower extremity fractures in pediatric and small-statured patients.
- Upper extremity fractures in all patients.



Nail measurement:

The Titanium Elastic Nails are available in Ø1.5mm, Ø2.0mm, Ø2.5mm, Ø3.0mm, Ø3.5mm & Ø4.0mm diameters. In order to determine the required nail diameter, measure the narrowest part of the medullary canal with ruler. The proper nail dia. should not be more than 40% of the width of the narrowest part of medullary canal. In order to prevent malalignment, the two nails of the same dia. will be used to provide the same bending forces and hence nullifying the two forces.

Femoral Nail Insertion:

This Surgical technique describes more commonly used retrograde femoral technique. For Femoral fractures only Ø3.0mm, Ø3.5mm & Ø4.0mm dia. nails are recommended to be used as per the patient anatomy.

Patient positioning:

Patient is positioned supine on a fracture table with traction boot. The C-arm is positioned on the lateral side of affected femur for AP and lateral views of leg from knee to hip in such a way to provide access to both lateral and medial aspects of the distal femur. Now reduce the fracture and observe it under the image intensifier in both AP and lateral views.

Nail contouring:

Either with hand or the plate bender, nail has to be contoured into an arch shape. This arch shape allows the nail to generate optimal resistance to malaligning forces. It is important to contour both the nail with same curvature for balanced forces.

Note: It is highly advised not to create sharp bending as it could reduce the effectiveness of nail.

Creating Nail Entry point: An incision is made lateral or medial to the distal end of femur, starting 3cm above the physis and distally extending to 2.5cm. Hence the entry point of nail should be 2.5cm to 3cm proximal to the physis. There are two different options for creating an entry point as mentioned below:



Option I: With respect to nail size, select the next size drill bit. Insert the Double drill guide 4.5/3.2mm **(3767-4.5)** through the skin incision and advance it until it sits flush with the bone. Through the drill guide insert the selected drill bit. Verify the drill bit position under image intensifier.

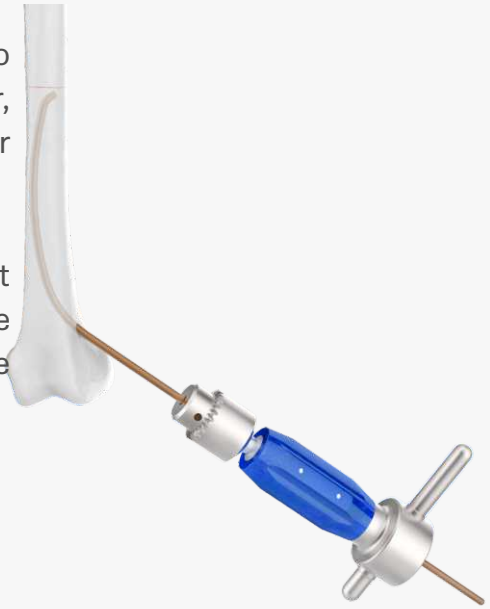
Now advance the drill bit and drill the near cortex. Slowly rotate the drill bit to 45° angle while rotating but not advancing in relative to the shaft axis. Continue drilling until it reaches the medullary canal.

Option II: The Awl **(3441-14)** could be used alternatively to open the cortex for providing access to the intramedullary canal. Similar to the drilling technique, rotate the awl along with its 45° motion as described in the adjoining figure. Advance the awl into the cortex at an upward angle. If using an end cap in order to ensure proper fitment of the end cap, the awl has to be inserted fully into the entry site before nail insertion along with providing a 180° rotation.



Nail insertion: Withdraw the drill bit and introduce the nail into the medullary canal through entry point. Under image intensi er, advance the nail such that the convex side slides along the far cortex in medullary canal.

Attach the Insertor to the nail keeping a nail length of about 150mm between the insertor and entry point and tighten the insertor using key for insertor **(3442-01)**. Now attach the Hammer guide **(7-027-01)** to the insertor.



Slide the Sliding Hammer **(3441-12)** into the hammer guide and with the repeated slight hammer blows advance the nail further up the medullary canal and observe it under the image intensifier. Continue with advancing the nail until it reaches to the level of fracture. Similarly open the femur from other end and insert the second nail up to the fracture.

Note: It is advised not to rotate the nail more than 180° during insertion.



Fracture Reduction: To provide reduction on either side of the fracture, the F-Tool for Reduction-Small **(3441-06)** is used. Firstly we need to assemble the F-tool with the Adjustable reductor. Attach the rst Adjustable reductor to the one end of the F-Tool. Continue with attaching the second adjustable reductor into the F-Tool such that the assembly ts across the leg. The third reductor will attached at the opposite end of the F-Tool.

To provide reduction, the assembly is placed on the leg at the level of fracture such that both the reductor provide the required force for reduction.



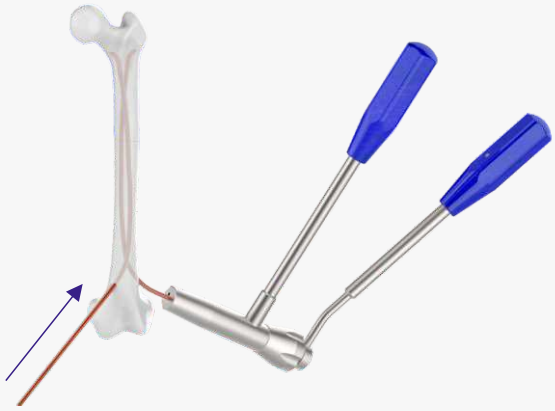
Once both the nail has reached the level of fracture verify under the image intensifier and advance the one which will effectively pull the proximal fragment in alignment. The nail has to be advanced only to a level such that the reduction is confirmed. Further advancing the nail may displace the proximal fragment making it more difficult to advance the other nail. Confirm the final nail position under image intensifier in both AP and lateral view.

Drive the second nail in the femur using combination of insertor **(3441-03)**, Hammer guide **(7-027-01)** & Sliding Hammer **(3441-11)**. Continue with advancing of the rst nail to a level just below the proximal physis followed by advancing of the second nail to the same level.

Shortening the nail: Once the nail is in its nal position mark it at the cutoff point which has to be 10mm-20mm outside the femoral cortex. Remove the nail outside the incision mark far enough to provide access to the cutoff point.

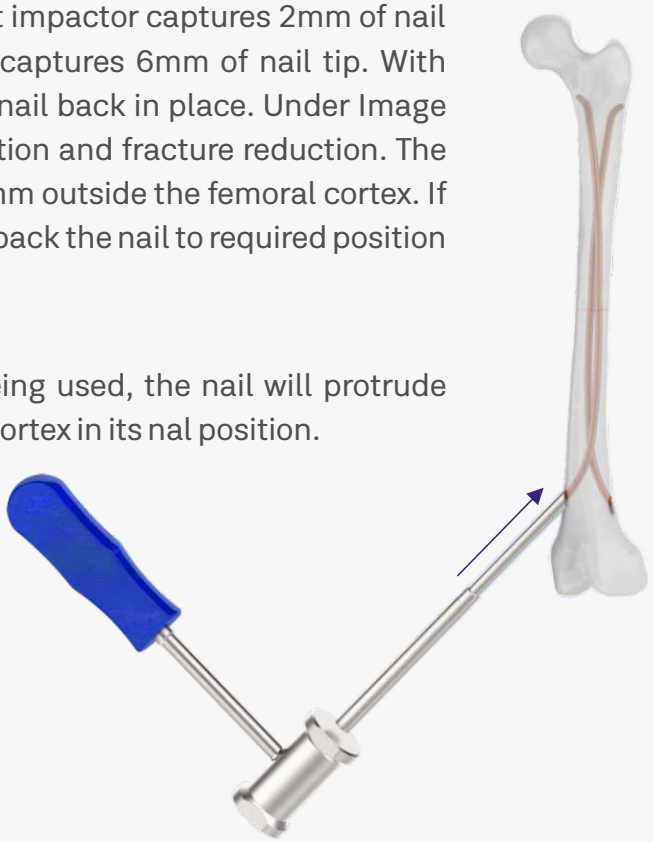
Note: In case where end cap is used, the cutoff point will be only 10mm outside the femoral cortex.

The combination of Cutter **(1243.00)** & Rotatable wrench **(3441-18)** will be used for cutting the nail. Using Rotatable wrench rotate the cutter bolt to an open position. Pass the nail through the appropriate hole as mentioned in the adjoining figure. Place both the Cutter handle and the rotatable wrench handle and rotate them in opposite direction to cut the nail.

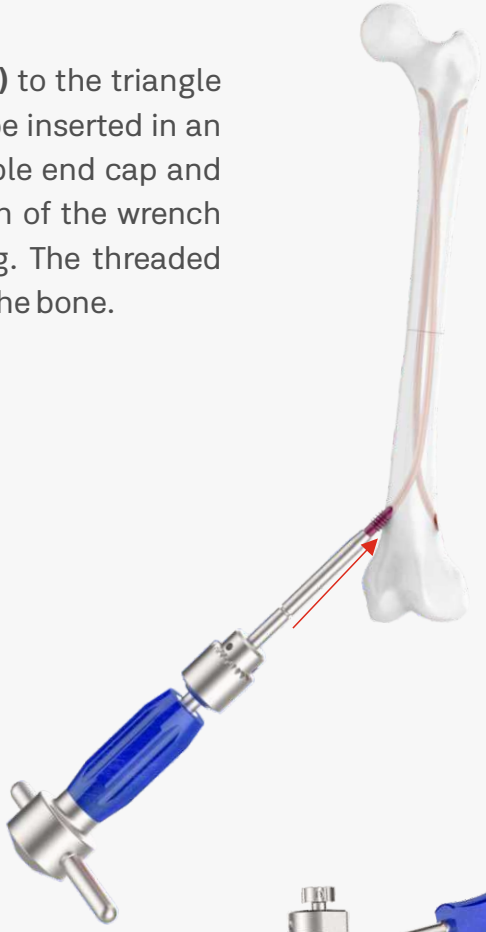


Reinsert the nail back using the combination of Impactor, Straight **(3441-01)** or Impactor, Beeveled **(3441-02)** and the Hammer **(3441-11).** The straight impactor captures 2mm of nail tip while the beveled impactor captures 6mm of nail tip. With slight hammer blows insert the nail back in place. Under Image intensi er confirm final nail position and fracture reduction. The nail should protrude 10mm-20mm outside the femoral cortex. If the nail is over inserted retrieive back the nail to required position using Plier **(3441-10).**

Note: In case the end cap is being used, the nail will protrude only 10mm outside the femoral cortex in its nal position.



End cap insertion: Attach the Insertor **(3441-03)** to the triangle wrench for end cap **(3441-15).** The end cap will be inserted in an oblique orientation in the bone. Select the suitable end cap and place it over the nail. With the clockwise rotation of the wrench tight the end cap into the bone for final seating. The threaded portion of the end cap must be fully inserted in to the bone.



Implant Removal: Make a skin incision and dissect to expose the end cap. Attach the Insertor **(3441-03)** to the triangle wrench for end cap **(3441-15).** Remove any bone overgrowth and with the help of triangle wrench remove the end cap by rotating it in anti-clockwise direction.

Hold the exposed end of nail using plier **(3441-10).** Screw in the Hammer guide **(7-027-01)** into the plier. Slide the sliding hammer **(3441-12)** into the hammer guide and with light blows remove the nail from the bone.



TIBIA NAIL INSERTION

For Pediatric tibial fracture usually two nails are inserted with antegrade approach from lateral and medial side of the bone. The nail from Ø2.5mm to Ø4.0mm are used depending on the patient anatomy. The entry point for the same will be few centimeters distal to the physis at anterolateral and anteromedial location.

HUMERAL NAIL INSERTION

The Titanium elastic nail could also be used for fixation of humeral fractures in both adult as well as children. For this purpose nail diameters ranging between Ø2.5mm and Ø3.5mm are used for fixation depending on the patient anatomy. The nail could be inserted using both antegrade as well as retrograde technique. For retrograde technique, the entry point is posterolateral off the lateral supercondylar ridge where one hole is above another. Whereas for the antegrade technique, entry points are located on the lateral humerus at level with the attachment point of the deltoid muscle.

FOREARM NAIL INSERTION

Unlike other nail insertion techniques, in the forearm mostly single nail is sufficient for fracture reduction. The nail diameters normally range from Ø2.0mm to Ø3.0mm depending on the patient anatomy. The nail could be inserted using the antegrade or the retrograde approach. It is advised to follow the retrograde approach for nail placement in radius and the antegrade approach for nail placement in the ulna.

Titanium Elastic Nail



NON STERILE

Size	Length	Code
Ø1.5mm	440mm	412-1.5-044
Ø2.0mm	440mm	412-2.0-044
Ø2.5mm	440mm	412-2.5-044
Ø3.0mm	440mm	412-3.0-044
Ø3.5mm	440mm	412-3.5-044
Ø4.0mm	440mm	412-4.0-044

STERILE

Size	Length	Code
Ø1.5mm	440mm	412-1.5-044-S
Ø2.0mm	440mm	412-2.0-044-S
Ø2.5mm	440mm	412-2.5-044-S
Ø3.0mm	440mm	412-3.0-044-S
Ø3.5mm	440mm	412-3.5-044-S
Ø4.0mm	440mm	412-4.0-044-S

End Cap for Titanium Elastic Nail

NON STERILE

Size	Code
Ø3.0mm-4.0mm	412E-1C
Ø1.5mm-2.5mm	412E-2C



STERILE

Size	Code
Ø3.0mm-4.0mm	412E-1C-S
Ø1.5mm-2.5mm	412E-2C-S





INSTRUMENTS

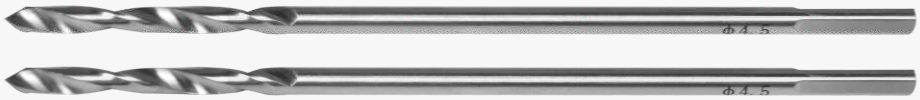
7-027-06 Drill Bit Plain Shank/Jacob Chuck End, Ø2.7mm x Length 115mm, for Elastic Nail



7-027-04 Drill Bit Plain Shank/Jacob Chuck End, Ø3.2mm x Length 150mm, for Elastic Nail



7-027-05 Drill Bit Plain Shank/Jacob Chuck End, Ø4.5mm x Length 150mm, for Elastic Nail



3441-01 Impactor for Elastic Nail, Straight



3441-02 Impactor for Elastic Nail, Beveled



3441-03 Inserter for Elastic Nail



3441-04

Awl, Curved, Length 180mm for Clavicular Fractures



3441-06

F-Tool for Reduction - Small, for Elastic Nail



7-027-07

Adjustable Reductor for Elastic Nail



3441-10

Plier for Elastic Nail



7-027-08

Double Drill Guide Ø4.5/3.2mm for Elastic Nail



1243-000

Cutter for Elastic Nail



7-027-03

Rotatable Wrench (For Cutter), for Elastic Nail



3441-11

Hammer for Elastic Nail



3441-12

Sliding Hammer for Elastic Nail



3441-13

Pin Wrench, Φ4.5mm, for Elastic Nail



3441-14

Awl for Elastic Nail



7-027-09

Driver for End Cap, for Elastic Nail



7-027-01 Hammer Guide for Elastic Nail



7-027-10 Extraction Rod for Elastic Nail



7-027-02 Triangle Wrench for End Cap, Large, for Elastic Nail



3441-15 Triangle Wrench for End Cap, Small, for Elastic Nail



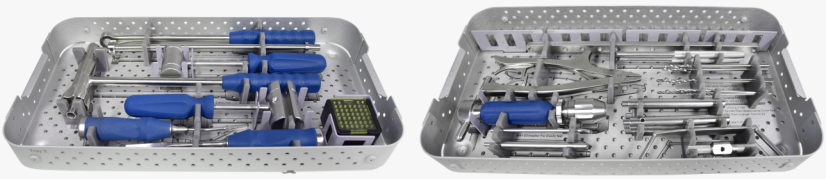
7-027-11 Pin Wrench



3442-02 Caddy for End Cap, for Elastic Nail



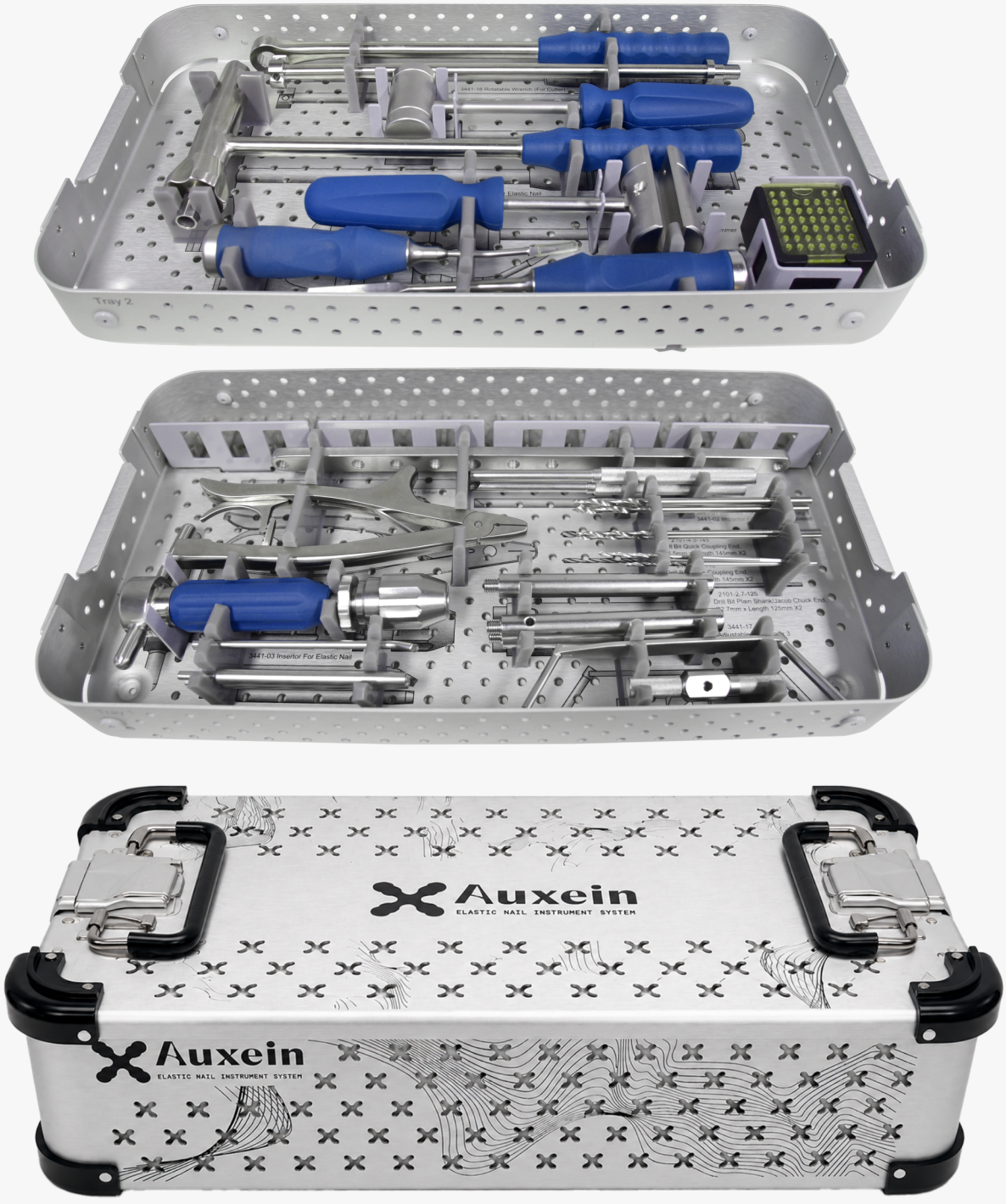
3442-03	Instrument Trays for Elastic Nailing Instrument Set



A10-028	Container For Elastic Nailing Instrument Set



5002-000	Elastic Nailing Instrument Set



ORDER INFORMATION

5002-000	Elastic Nailing Instrument Set

Code	Set Consisting Of	Units
7-027-06	Drill Bit Plain Shank/Jacob Chuck End, Ø2.7mm x Length 115mm, for Elastic Nail	2
7-027-04	Drill Bit Plain Shank/Jacob Chuck End, Ø3.2mm x Length 150mm, for Elastic Nail	2
7-027-05	Drill Bit Plain Shank/Jacob Chuck End, Ø4.5mm x Length 150mm, for Elastic Nail	2
3441-01	Impactor for Elastic Nail, Straight	1
3441-02	Impactor for Elastic Nail, Beveled	1
3441-03	Inserter for Elastic Nail	1
3441-04	Awl, Curved, Length 180mm for Clavicular Fractures	1
3441-06	F-Tool for Reduction - Small, for Elastic Nail	1
7-027-07	Adjustable Reductor for Elastic Nail	3
3441-10	Plier for Elastic Nail	1
7-027-08	Double Drill Guide Ø4.5/3.2mm for Elastic Nail	1
1243-000	Cutter for Elastic Nail	1
7-027-03	Rotatable Wrench (For Cutter), for Elastic Nail	1
3441-11	Hammer for Elastic Nail	1
3441-12	Sliding Hammer for Elastic Nail	1
3441-13	Pin Wrench, Φ4.5mm, for Elastic Nail	1
3441-14	Awl for Elastic Nail	1
7-027-09	Driver for End Cap, for Elastic Nail	1
7-027-01	Hammer Guide for Elastic Nail	1
7-027-10	Extraction Rod for Elastic Nail	1
7-027-11	Pin Wrench	1
7-027-02	Triangle Wrench for End Cap, Large, for Elastic Nail	1
3441-15	Triangle Wrench for End Cap, Small, for Elastic Nail	1
3442-02	Caddy for End Cap, for Elastic Nail	1
3442-03	Instrument Trays for Elastic Nailing Instrument Set	2
A10-028	Container For Elastic Nailing Instrument Set	1

ELASTIC NAILING SYSTEM

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