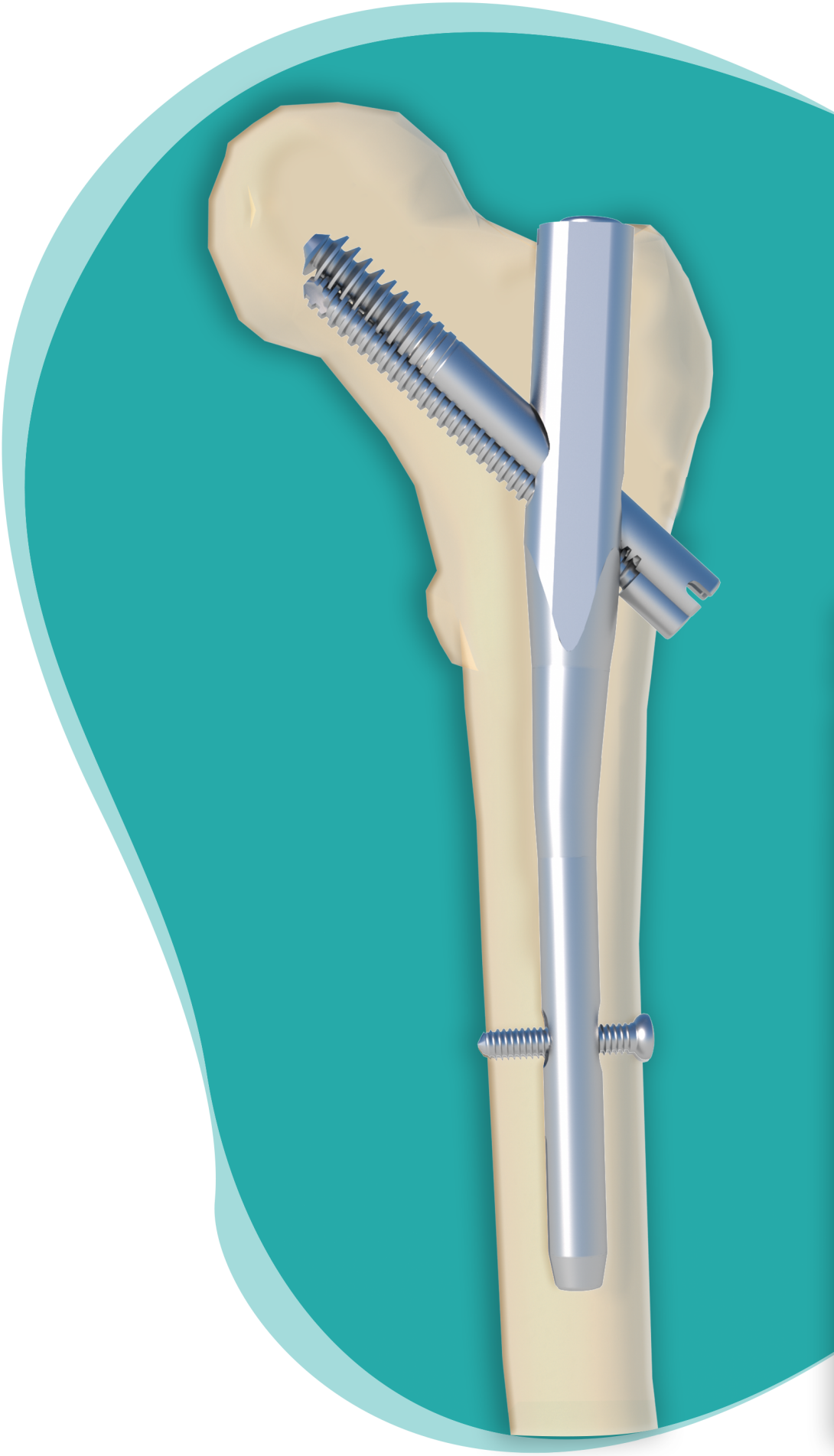
金属髓内固定系统
Metal Intramedullary Fixation System

股骨联合加压髓内钉

Combined compression intramedullary nail of femur



Fule 富乐
专注骨科事业

Why choose Fule?
Our strengths

- The company is a national high-techenterprise that integrates research and development,production,and sales of medical devices,with a fully intelligent processing equipment production line.
- The establishment of the Academician Expert Studio helps to enhance the R&D capabilities of Fule and further deepen the cooperation between industry, academia,and research; Approved postdoctoral research workstation.
- The hardware facilities are complete,the R&D team is excellent,and we work closely with clinical experts,obtaining more than 100 domestic and foreign patents.
- Based on the agent cooperation model,establish a nationwide sales and service network,supply products to nearly a thousand tertiary hospitals nationwide, and export to more than 20 overseas countries.

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Product advantages

Characteristic

The double nail mode of joint interlocking not only avoids the "Z effect" generated by traditional reconstruction nails, but also provides controllable sliding compression effect.

Main nail design

-Two types of neck shaft angles, 125 ° and 130 °, are designed to meet the diverse anatomical structures of the femoral neck.

- The cross-section of the proximal trapezoid is designed like a joint prosthesis handle, enhancing stability and mechanical advantages.

- Remote slotting design, dispersing stress.

- Remote selection of dynamic or static locking can meet clinical needs.

- Internally preset top wire enables one-step locking and interlocking of nails during surgery, reducing surgical steps.

Joint compression nail design

-Controllable linear compression allows the surgeon to see or touch a good reduction of the fracture during the surgical process, and the compression effect is more ideal than that of a single screw- Best stability, anti rotation, anti cutting;

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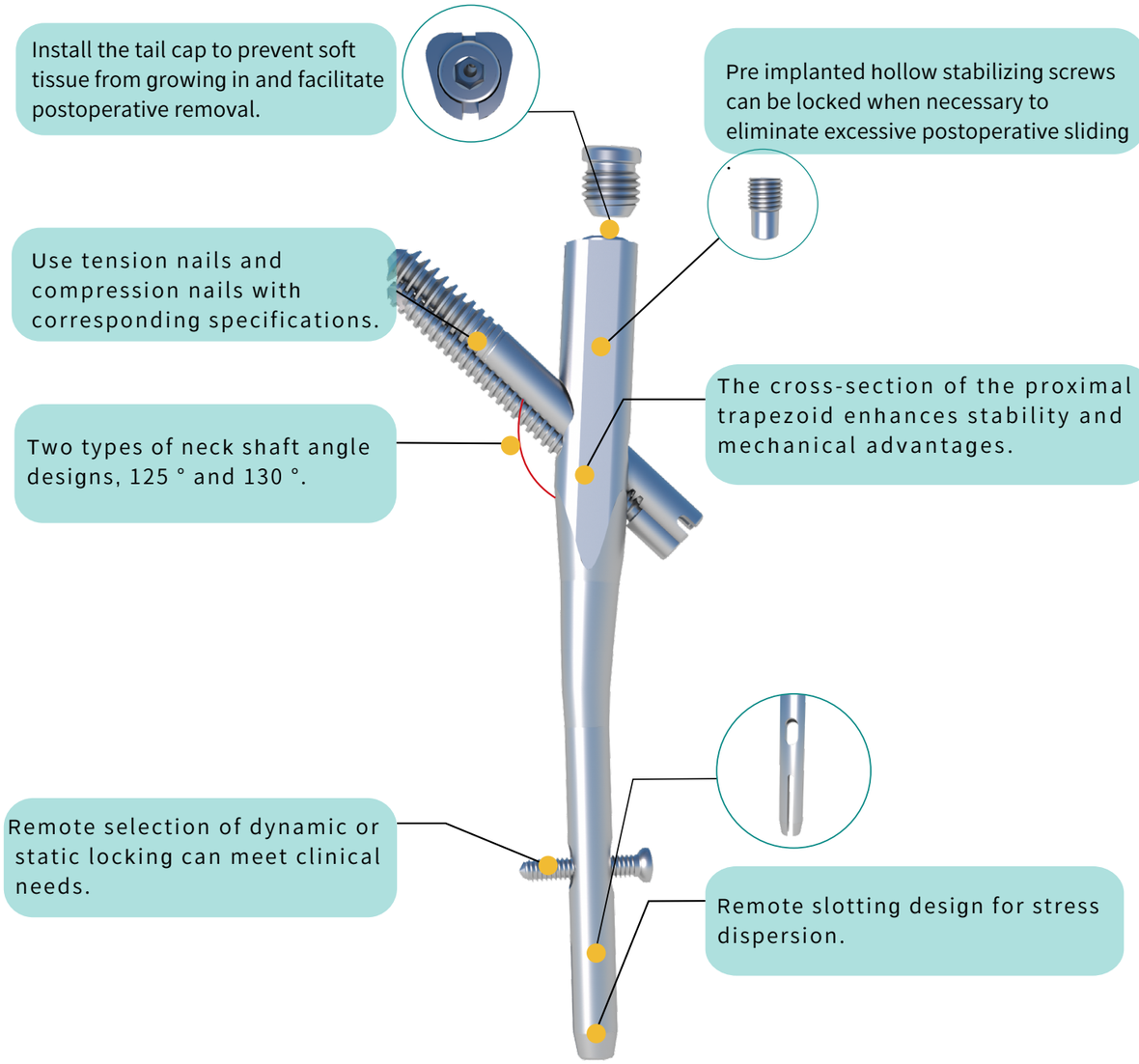
Product advantages



Indications for use

【Indications】

Intertrochanteric fractures (31-A1 and 31-A2);

Trachanteric fracture (31-A3);

High subtrochanteric fracture (32-A1);

【Contraindications】

Low subtrochanteric fracture;

Femoral shaft fracture;

Simple or combined fracture of the middle femoral neck.

Surgical procedures

【Step1】 Patient Position

- Place the patient in a supine or lateral position based on the surgeon's habits or type of fracture. Traction and fixation of the affected limb. Extend and lower the healthy limb or fix it on the bracket (Figure 1a).

Figure 1a

- The hip is adducted at 10 ° -15 ° to facilitate alignment with the medullary canal. Compare the healthy side to confirm the length and rotation of the affected limb. Ensure that the C-arm machine has sufficient visibility in both the forward and lateral positions (Figure 1b).

Figure 1b

Surgical procedures

【Step2】 Open and entry route

- Determine the specifications of the main nail (Figure 2a).
- Make a longitudinal incision at the proximal end of the greater trochanter and cut the fascia until the apex of the greater trochanter is felt.
- The insertion point should be slightly medial to the apex of the greater trochanter, so that the approach is at a 4 ° angle with the femoral axis in the upright position and in a straight line with the medullary cavity in the lateral position (Figure 2b).

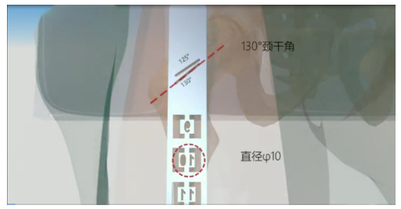


Figure 2a

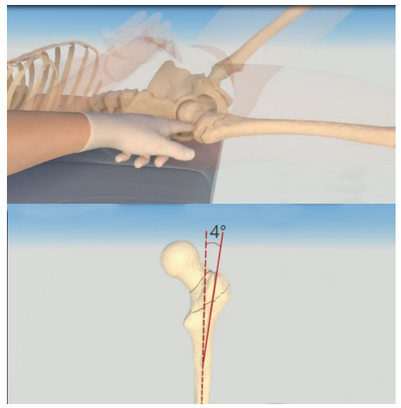


Figure 2b

Surgical procedures

【Step3】 Establish channels

- Attach the three piece set of entrance channel combination tools to the bone surface through the incision. Using specifications of Φ The 3.2x340 guide needle penetrates through the channel and drills into a large protrusion of about 2-3cm. Be careful not to drill too deep and establish incorrect channels, resulting in poor alignment and alignment (Figure 3a).

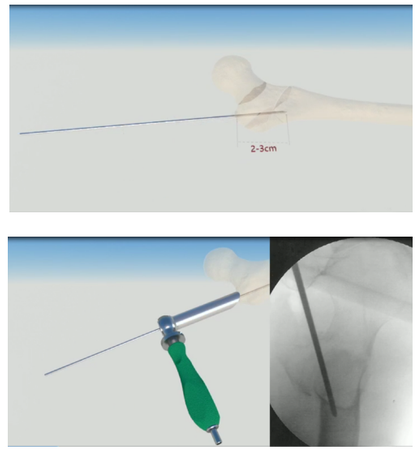


Figure 3a

Surgical procedures

【Step4】 Establish channels

- Confirm the correct position of the guide needle through positive and lateral fluoroscopy. If the position is not ideal, rotate the honeycomb guide to find the correct position and drill in another correct guide needle. Select Φ 3.2x400 guide pins to prevent cross interference during insertion (Figure 4a).

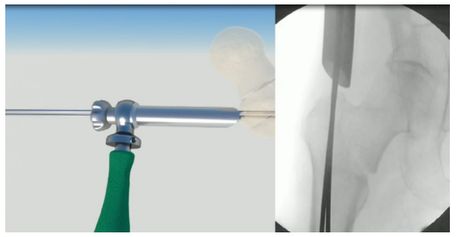
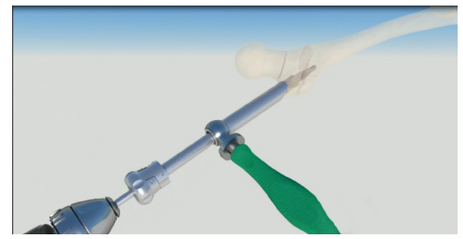


Figure 4a

Surgical procedures

【Step5】 Proximal medullary dilation

- After the guide pin is in place, remove the shorter guide pin and honeycomb guide with poor position.



- Connect the 12.5mm inlet drill to the 17mm hollow drill, drill along the guide needle and sheath into a large protrusion of 1-2cm, confirm the angle, and continue drilling to the depth limit. Remove the 12.5mm inlet drill and guide needle (Figure 5a).

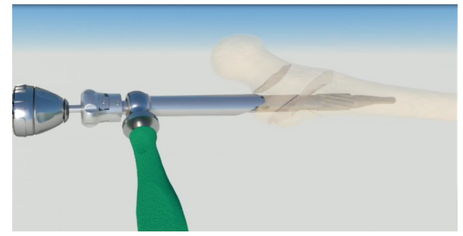


Figure 5a

Surgical procedures

【Step6】 Fracture reduction (cadre fracture) and medullary expansion

- Insert the bone lever into the medullary cavity for fracture reduction.
- After inserting the ball head guide along the bone lever, withdraw the bone lever (Figure 6a).
- Connect the medullary cavity soft drill and the medullary cavity knife head, and expand the medullary cavity along the ball head guide needle (Figure 6b).

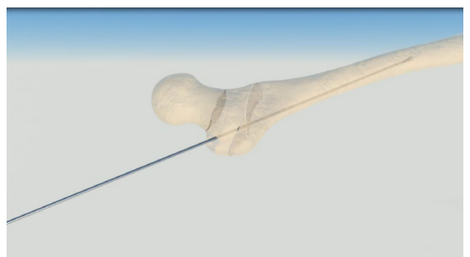
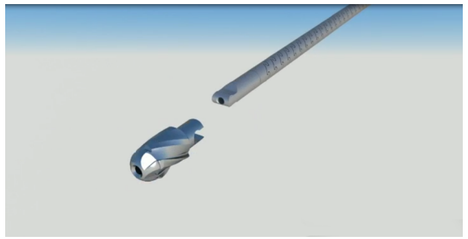


Figure 6a



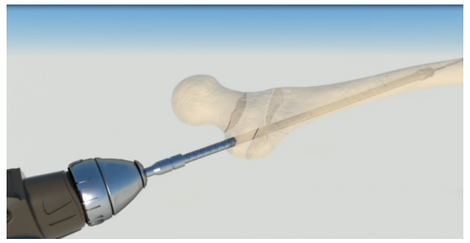


Figure 6b

Surgical procedures

【Step7】 Inserting the main nail

- Connect the handle to the main nail and use a bolt wrench to tighten the bolt into the main nail (Figure 7a).
- Install the guide block corresponding to the neck angle, and simulate the installation of the guide sleeve and tension nail drill bit. Confirm that the installation is correct and the built-in tightening wire will not hinder the passage of the drill bit and tension nail (Figure 7b).

Figure 7a

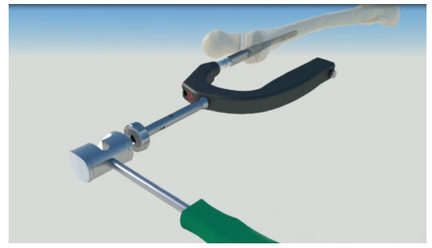


Figure 7b

Surgical procedures

【Step8】 Inserting the main nail

- After confirming the accuracy, remove the guide block and other instruments, insert the main nail into the medullary cavity along the channel, and ensure that the final angle of the main nail is consistent with the anterior inclination angle of the femur (Figure 8a).

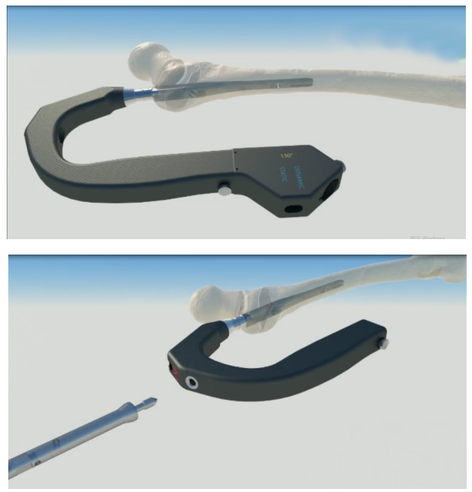


Figure 8a

Surgical procedures

【Step9】 Opening of tension nail

- Insert the guide block corresponding to the neck shaft angle, and insert the guide sleeve. Make all openings on the skin at the corresponding position, and place the guide sleeve in and against the bone cortex (the guide sleeve does not need to be against the bone cortex, but the inner sleeve must be in contact with the bone) (Figure 9a).

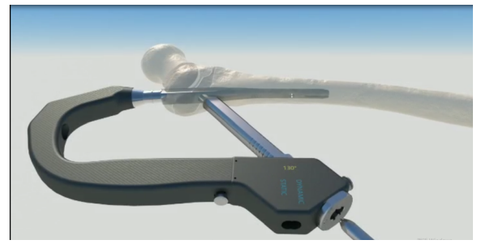


Figure 9a

Surgical procedures

【Step10】 Opening of tension nail

- Install the 4.0 guide drill sleeve and use a 4mm drill bit to drill through the bone cortex (Figure 10a). After removal, install the 3.2mm concave guide needle sleeve (Figure 10b).

- Drill in under perspective Φ The distance between the tip of the 3.2x340 threaded guide needle and the anterior medial cortex of the femoral head shall not be less than 5mm (Figure 10c).

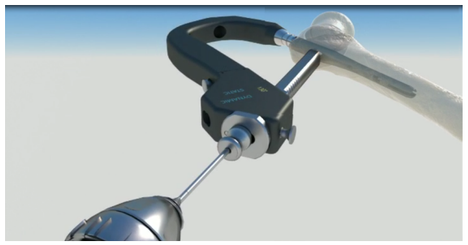


Figure 10a

Figure 10b

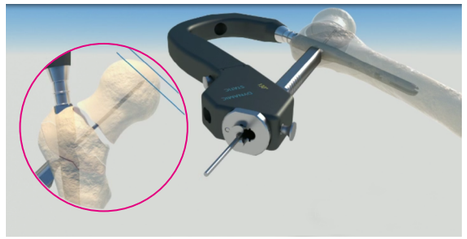
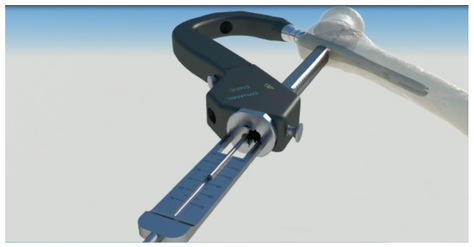


Figure 10c

Surgical procedures

【Step11】 Depth measurement to determine specifications

- Insert a depth gauge into the end of the 3. 2mm guide pin and read the value. When selecting the specification of the tension nail, if there is no fracture displacement gap, choose the corresponding specification of the tension nail.



- If compression is required, the displacement gap of the fracture should be subtracted. For example, if there is a 5mm displacement gap in the depth measurement of 95mm, a 90mm tension screw should be selected, and the corresponding 85mm compression screw should be selected (Figure 11a).

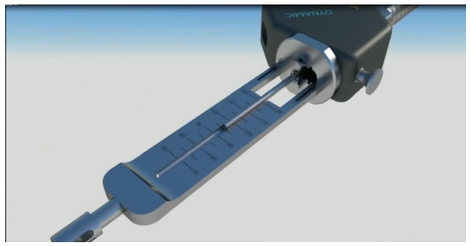


Figure 11a

Surgical procedures

【Step12】 Establish a pressurized screw path

- Use a 7mm pressure screw to drill along the guide sleeve to the depth limit position (Figure 12a).

- Use a 7mm pressure screw drill bit to drill into the femoral neck, paying attention to the depth scale and marking diagram of the drill bit (12b).

Figure 12a

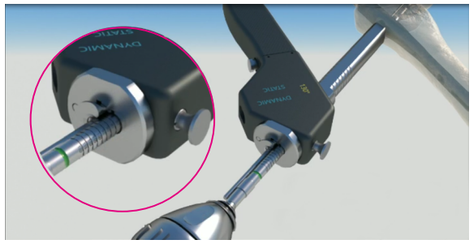


Figure 12b

Surgical procedures

【Step13】 Establish a pressurized screw path

- Insert anti rotation bolts, temporarily fix, stabilize the femoral head, and prevent subsequent operations from causing fracture displacement. If the insertion is not smooth, drilling can be done again (Figure 13a).

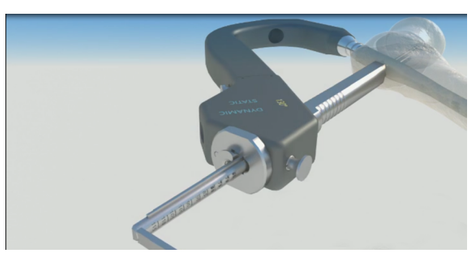


Figure 13a

Surgical procedures

【Step14】 Inserting tension screws

- Use a medullary cavity expansion drill to drill holes, pay attention to the depth markings on the drill bit, and the depth should be consistent with the measured depth. If necessary, a tap can be used to establish the nail path (Figure 14a).

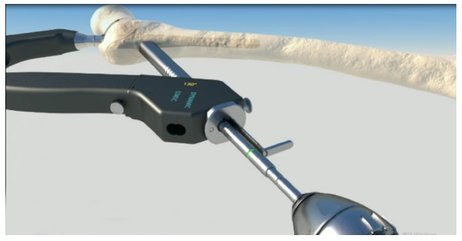


Figure 14a

- Connect the tension screw to the tension screw driver, screw it into the femoral head until it reaches the 0 mark position on the driver, and screw it into the femoral head until it reaches the 0 mark position on the driver (Figure 14b).

(If there is a fracture displacement gap that requires compression, continue to screw it in at an appropriate depth based on the distance between the gaps.)

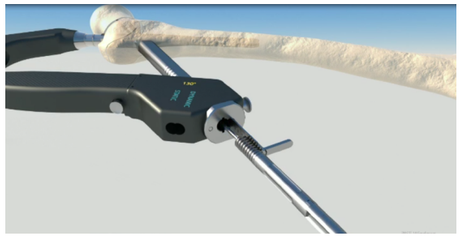


Figure 14b

- If the position is not ideal and you still want to move forward, you need to confirm whether the screw can move forward by another 3.1mm, because the screwdriver must rotate one circle, and the notch will punch towards the pressure screw (Figure 14c).

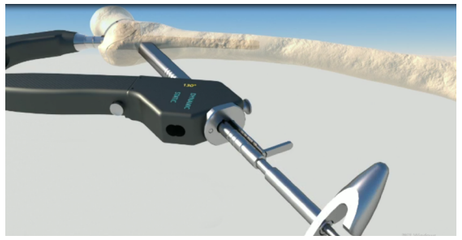


Figure 14c

Surgical procedures

【Step15】 Inserting compression screws

- After removing the anti rotation bolt (Figure 15a), screw in the pressure screw and observe the marked line on the pressure screw wrench, which is flush with the guide sleeve, indicating that the pressure screw has been implanted in place (Figure 15b).

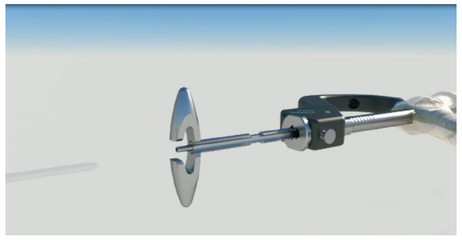


Figure 15a

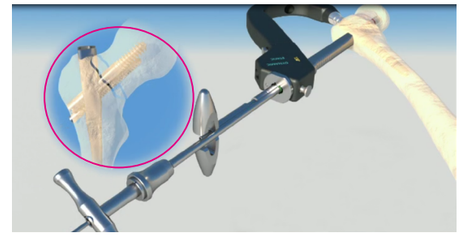


Figure 15b

Surgical procedures

【Step16】 Compression

- Continue to rotate the compression screw wrench to apply axial compression to the fracture end until resistance is felt or the fracture line disappears (Figure 16a).

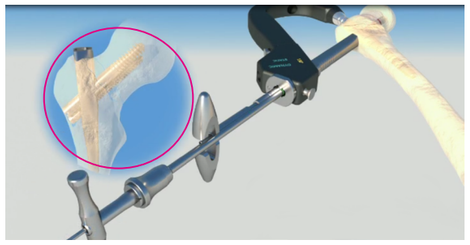


Figure 16a

- Remove two wrenches and guide sleeves (Figure 16b).

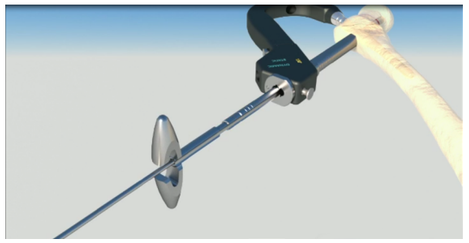


Figure 16b

Surgical procedures

【Step17】 Lock the preset tightening thread

- Use a universal wrench to lock the pre-set tightening screw inside the main nail, locking the tension screw system (Figure 17a).

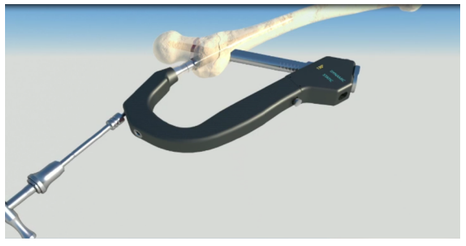


Figure 17a

Surgical procedures

【Step18】 Remote lock

- Install the sheath, guide drill, and locating cone into the aiming frame (Figure 18a).

Figure 18a

- Use a 4mm drill bit to drive along the guide drill and penetrate the contralateral cortical bone (Figure 18b), and use a depth gauge to determine the specifications of the interlocking nail.

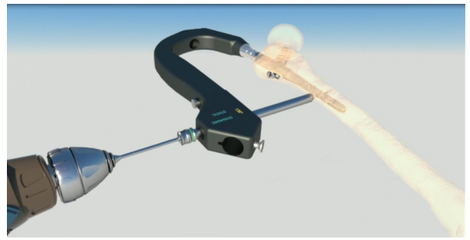


Figure 18b

- Use a locking screwdriver to insert the screw (Figure 18c).

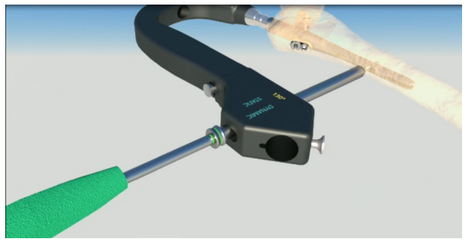


Figure 18c

Surgical procedures

【Step19】 Install the tail cap

- Remove the aiming frame (Figure 19a) and use a tail cap wrench to screw the tail cap into the main nail (Figure 19b).

Figure 19a

- Suture the wound and complete the surgery (Figure 19c).

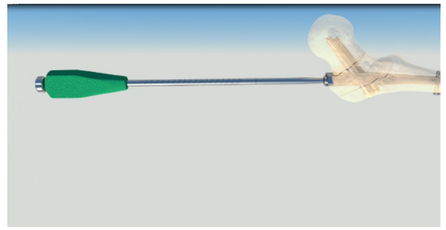


Figure 19b

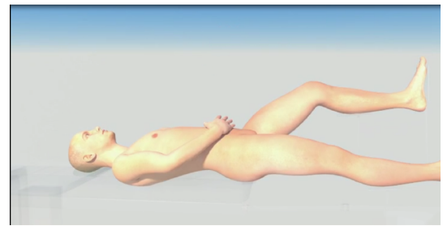


Figure 19c

Product information

【Intramedullary nail VI】

Code	Specifications	Neck shaft angle	Code	Specifications	Neck shaft angle	Code	Specifications	Neck shaft angle
9109009180	ф9x180	125	9107010240	ф10x240	125	9108010220	ф10x220	130
9109009200	ф9x200	125	9107011180	ф11x180	125	9108010240	ф10x240	130
9109009220	ф9x220	125	9107011200	ф11x200	125	9108011180	ф11x180	130
9109009240	ф9x240	125	9107011220	ф11x220	125	9108011200	ф11x200	130
9110009180	ф9x180	130	9107011240	ф11x240	125	9108011220	ф11x220	130
9110009200	ф9x200	130	9107012180	ф12x180	125	9108011240	ф11x240	130
9110009220	ф9x220	130	9107012200	ф12x200	125	9108012180	ф12x180	130
9110009240	ф9x240	130	9107012220	ф12x220	125	9108012200	ф12x200	130
9107010180	ф10x180	125	9107012240	ф12x240	125	9108012220	ф12x220	130
9107010200	ф10x200	125	9108010180	ф10x180	130	9108012240	ф12x240	130
9107010220	ф10x220	125	9108010200	ф10x200	130			

【Anti rotation compression nail I (combined tension screw)】

Code	Specifications	Code	Specifications	Code	Specifications
9111011070	70	9111011090	90	9111011110	110
9111011075	75	9111011095	95	9111011115	115
9111011080	80	9111011100	100		
9111011085	85	9111011105	105		

【Anti rotation compression nail I (combined tension screw)】

Code	Specifications	Code	Specifications	Code	Specifications
9112077065	65	9112077085	85	9112077105	105
9112077070	70	9112077090	90	9112077110	110
9112077075	75	9112077095	95		
9112077080	80	9112077100	100		

Product information

【Interlocking screw I】

Code	Specifications	Code	Specifications	Code	Specifications
9113011070	70	9113011090	90	9113011110	110
9113011075	75	9113011095	95	9113011115	115
9113011080	80	9113011100	100		
9113011085	85	9113011105	105		

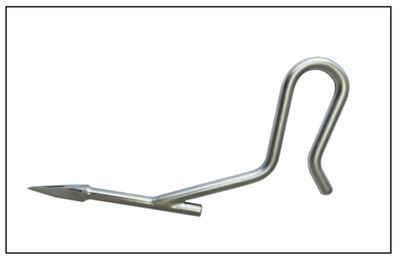
【UHC Hollow screw】

Code	Specifications	Remarks	Code	Specifications	Remarks
3146035013	尾帽 0	ф3.5x13	3146035023	尾帽 10	ф3.5x23
3146035018	尾帽 5	ф3.5x18	3146035028	尾帽 15	ф3.5x28

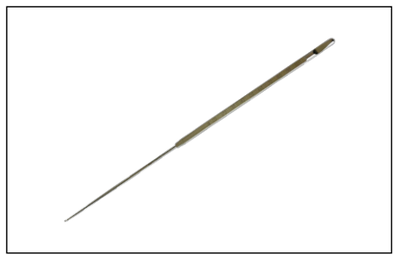
【Titanium bone screws】

Code	Specifications	Code	Specifications	Code	Specifications
3529050026	ф5.0x26	3529050038	ф5.0x38	3529050050	ф5.0x50
3529050028	ф5.0x28	3529050040	ф5.0x40	3529050052	ф5.0x52
3529050030	ф5.0x30	3529050042	ф5.0x42	3529050054	ф5.0x54
3529050032	ф5.0x32	3529050044	ф5.0x44	3529050056	ф5.0x56
3529050034	ф5.0x34	3529050046	ф5.0x46	3529050058	ф5.0x58
3529050036	ф5.0x36	3529050048	ф5.0x48	3529050060	ф5.0x60

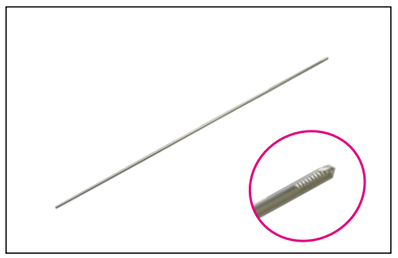
Tool information



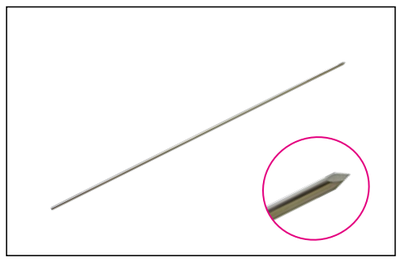
● 425-020
Open cone



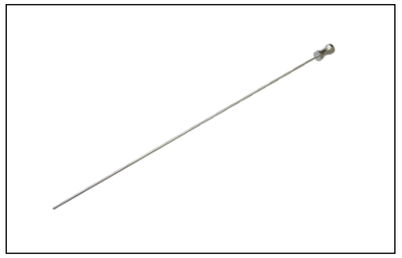
● 425-030
Sounder (II)



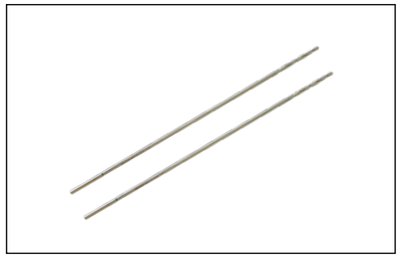
● 425-040
Bone positioning needle (threaded) Φ 3.2 × 400



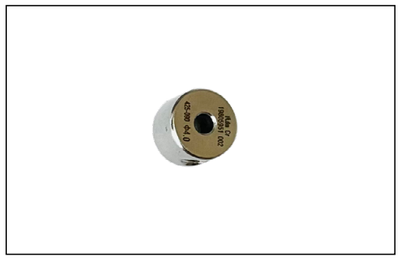
● 425-050
Bone positioning needle (light rod) Φ 3.2 × 400



● 425-070
Bone guided needle (cleaning I)



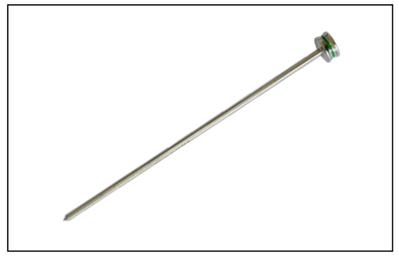
● 425-080
Orthopedic drill bits



● 425-090
Orthopedic locator (limiter I)

● 425-100
Orthopedic wrench (hexagonal II)

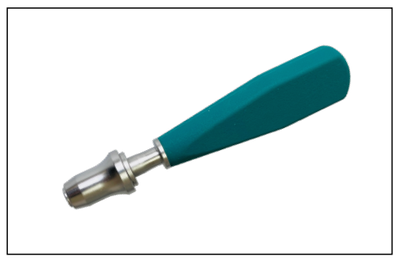
Tool information



● 425-110
Bone cone (positioning rod)

● 425-120
Sheath (II)

● 425-130
Sheath （I）



● 425-191
Quick fit handle (straight type)

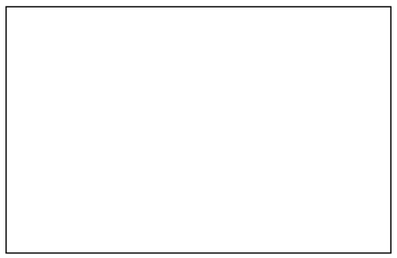
● 425-210
Quick installation handle (T-type I)

● 425-361
Bone Hammer (I)

● 414-470
Orthopedic wrench (open end)

● 425-451
Orthopedic wrench (handle locking I)

Tool information

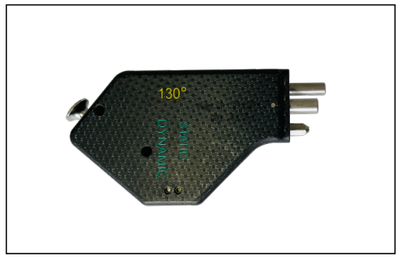


●2070086
Orthopedic wrench (hexagonal quick change)

● 414-790
Orthopedic wrench (hexagonal universal joint)

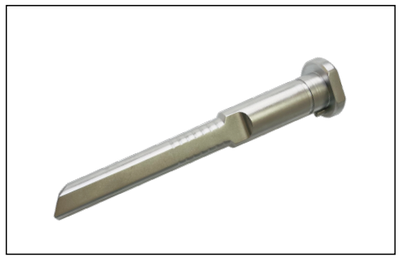
●432-050
Orthopedic positioning frame (handle V)

● 432-060
Orthopedic positioning frame (proximal IV) 120°

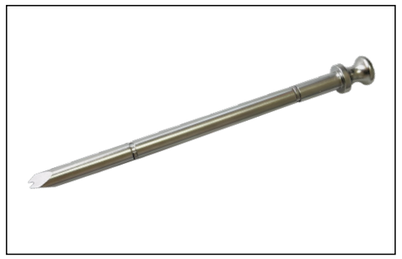


●432-070
Orthopedic positioning frame (proximal IV) 130°

● 432-080
Orthopedic positioning frame (distal IV)



● 432-090
Femoral medullary cavity alignment handle sleeve (II)



● 432-100
Sheath(Ⅷ)

Tool information

● 432-110
Guide drill （Ⅱ）

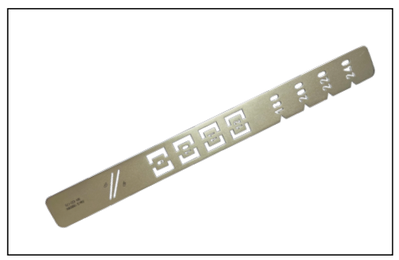
● 432-120
Orthopedic drilling sight (porous II)

● 432-130
Guide drill (handle)

● 432-140
Orthopedic drill bit (soft drill)

● 432-150
Medullary cavity enlargement drill （Ⅱ）Φ16

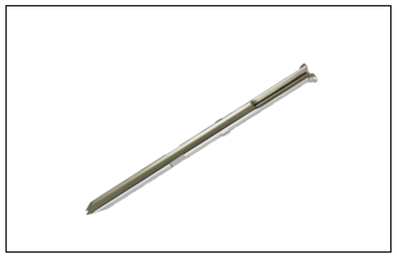
● 432-160
Medullary cavity enlargement drill （Ⅱ）Φ17



● 432-170
Template (Development)

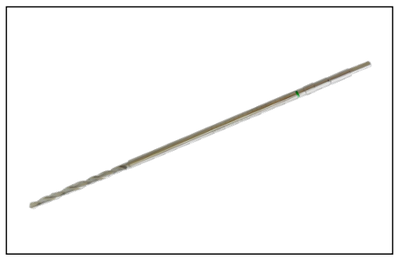
●432-180
Quick connecting rod (handle)

Tool information

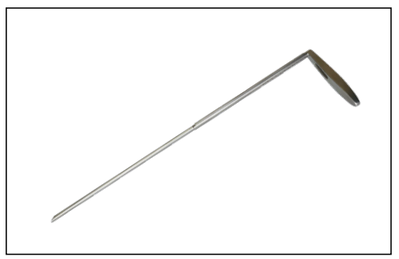


● 432-200
Sheath （IV）

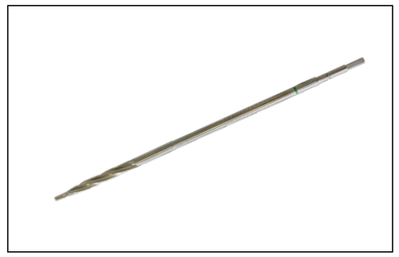
● 432-210
Orthopedic drill bit (pressure opening)



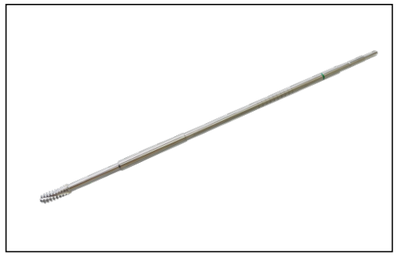
● 432-220
Orthopedic drill bit (pressurized)



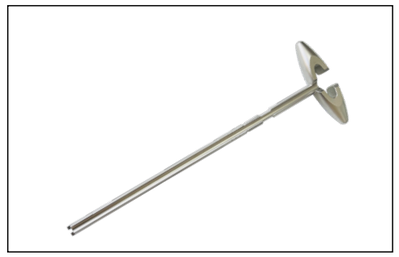
● 432-230
Orthopedic locator (anti rotation)



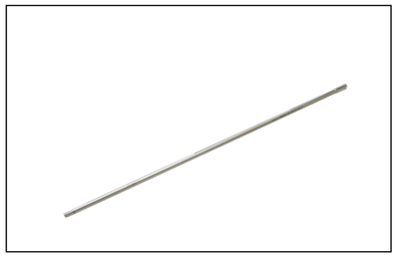
● 432-240
Orthopedic drill bit (limited hollow)



● 432-250
Tap



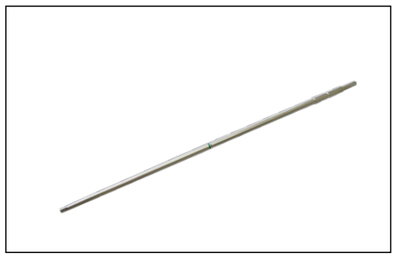
● 432-260
Orthopedic wrench (tension screw)



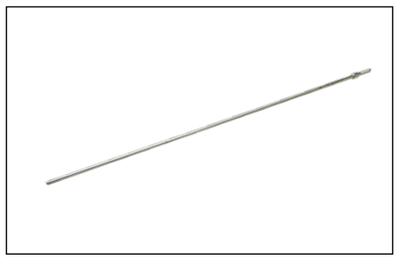
● 432-270
Orthopedic wrench (tension screw holding rod)

Tool information

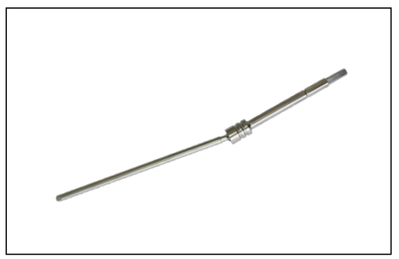
● 432-280
Orthopedic locator (II)



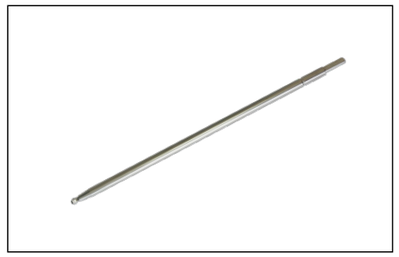
● 432-290
Orthopedic wrench (compression screw)



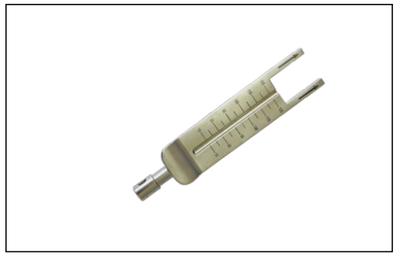
● 432-300
Orthopedic wrench (pressure screw holding rod)



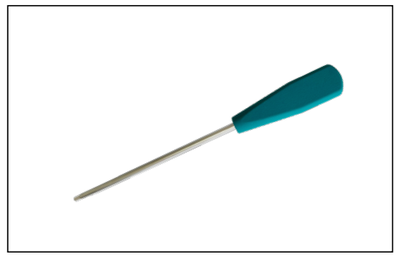
● 432-320
Orthopedic wrench (universal)



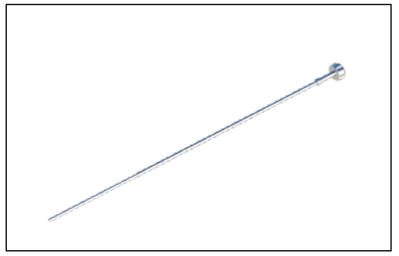
● 432-330
Orthopedic wrench (hexagonal universal quick change)



● 432-360
Sounder (IV)



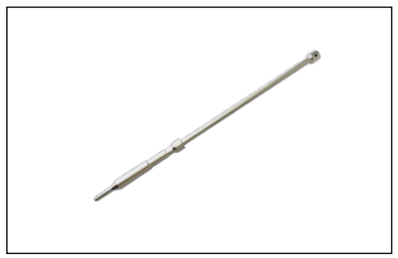
● 2070136
Orthopedic wrench (universal tail cap)



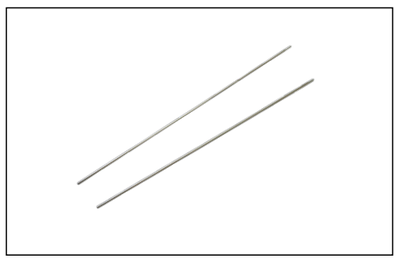
● 2070137
Orthopedic wrench (tension screw holding rod)

Tool information

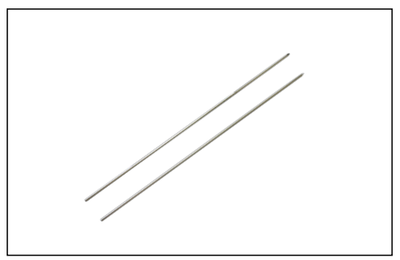
● 2070082
Driver (I)



● 2070083
Nail extractor (I)

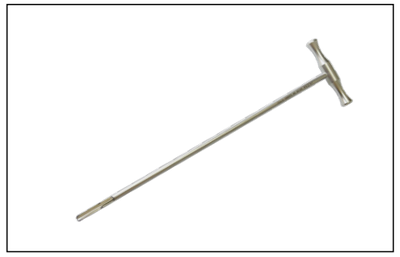


● 2070128
Bone positioning needle (threaded) Φ3.2×340

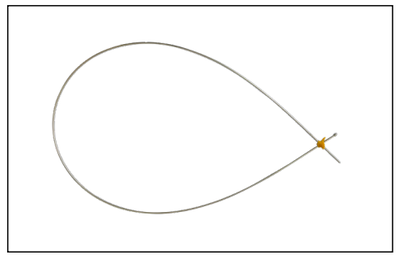


● 2070129
Bone positioning needle (light rod) Φ3.2×340

● 432-030
Flexible pulp expander (bidirectional II)



● 432-020
Bone pry

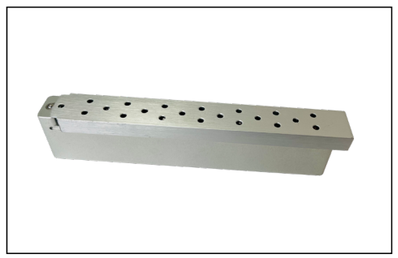


● 432-010
Bone guide needle (ball head)

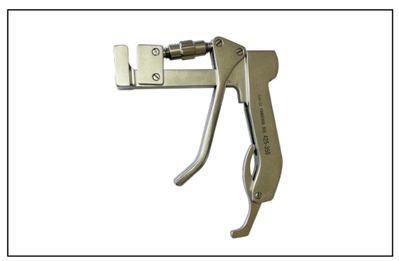
● 425-510
Marrow cavity reamer (I)

Tool information

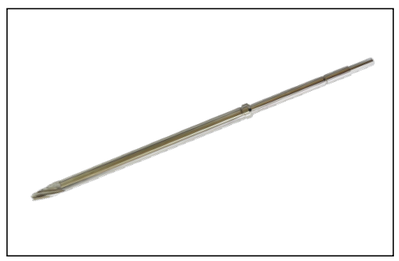
● 425-511~519
Marrow cavity reamer (II)



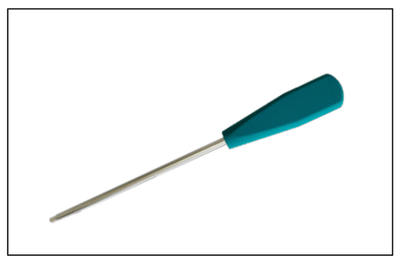
● 2070134
Medullary cavity reamer box



● 425-350
Puller (needle guide I)

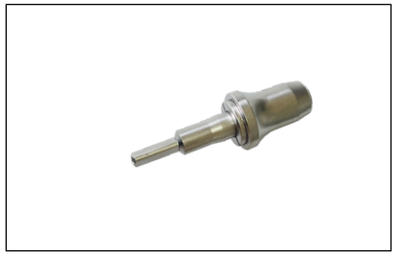


● 432-040
Bone Reamer (I)



● 2070145
Orthopedic wrench (handle locking I)

● 2070141
Quick connecting rod (pressurized)



● 432-190
Adapter（II）Φ8