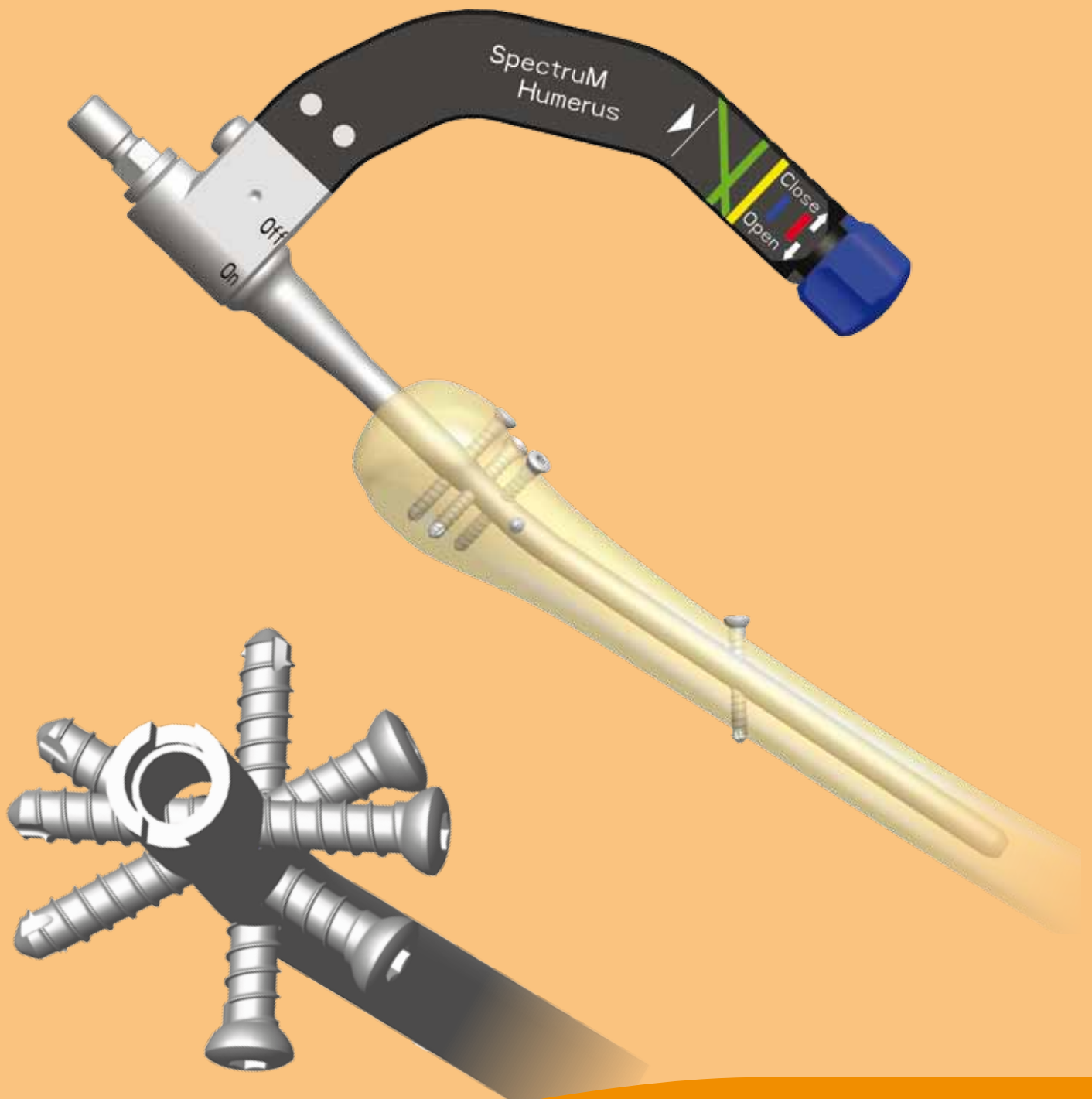


Humerus



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The following surgical description contains general outlines for intramedullary nailings performed on the humerus with SpectruM Humerus system. However, the operating surgeon shall adapt the content to the patient, fracture type and all other relevant factors that may have influence on the outcome of the surgery.

Therefore, Sanatmetal Ltd. strongly recommends participation on workshops and trainings prior to the initial operation.

1. Introduction	4	3.2.10 Distal locking II.	13
1.1 The implant	4	3.2.11 Distal locking III.	14
1.2 The instruments	4	3.2.12 Proximal locking	14-15
1.3 Indications	4	3.2.13 Removal of the targeting arm, closing the nail	15
2. Implant range	5	3.2.14 Implant removal	15
2.1 SpectruM Humerus nails	5	3.3 SpectruM Humerus FLEXIBLE nailing	16-21
2.2 End-cap	5	3.3.1 Patient positioning	16
2.3 Locking screw	5	3.3.2 Opening the intramedullary canal	16
		3.3.3 Determining the nail length	17
3. Surgical description	6-21	3.3.4 Assembly of the nail and the targeting arm	17
3.1 SpectruM Humerus PROXIMAL nailing	6-9	3.3.5 Insertion of the nail	18
3.1.1 Patient positioning	6	3.3.6 Distal locking	18-19
3.1.2 Opening the intramedullary canal	6	3.3.7 Proximal locking I.	19
3.1.3 Assembly of the nail and the targeting arm	6	3.3.8 Proximal locking II.	20
3.1.4 Insertion of the nail	7	3.3.9 Proximal locking III.	20
3.1.5 Proximal locking	7-8	3.3.10 Proximal locking IV.	20
3.1.6 Distal locking	9	3.3.11 Proximal locking V.	21
3.1.7 Removal of the targeting arm, closing the nail	9	3.3.12 Removal of the targeting arm, closing the nail	21
3.1.8 Implant removal	9	3.3.13 Implant removal	21
3.2 SpectruM Humerus RIGID nailing	10-15	4. Implant list	22-25
3.2.1 Patient positioning	10	4.1 SpectruM Humerus Rigid Nail	22
3.2.2 Opening the intramedullary canal	10	4.2 SpectruM Humerus Flexible Nail	23
3.2.3 Determining the nail length	10	4.3 SpectruM Humerus Proximal Nail	24
3.2.4 Assembly of the nail and the targeting arm	11	4.4 End caps	24
3.2.5 Insertion of the nail	12	4.5 Locking screws	25
3.2.6 Assembling the distal arm	12	5. Instrument list	26-28
3.2.7 Distal drilling	12	5.1 Filled up tray	26
3.2.8 Usage of the distal targeting device	13	5.2 Instruments	27-28
3.2.9 Distal locking I.	13		

The **SpectruM Humerus** implant and instrument system – similarly to all Sanatmetal intramedullary nailing systems – aims the reduction of the image intensifier usage time during operation as much as possible. This SpectruM Humerus system merge all the benefits of the previous successful systems. Accordingly, the harmful radiation level can be kept on the theoretical minimum during the operation with the SpectruM Humerus system.

1.1 | The implant

A SpectruM Humerus szeg

- Complete system for all humeral fractures



- Canullated nails
- Flexible and rigid nails – antegrade and retrograde insertion
- Short nail with 45° oblique distal locking hole for proximal humeral fractures



- Locking holes in several planes, 4pcs proximally, 3pcs distally – stable fixation in the bone



- Angle stabilised locking holes
- Special sagittal hole for accepting the manual targeting device
- Stainless steel, titanium, anodised titanium

Locking screws

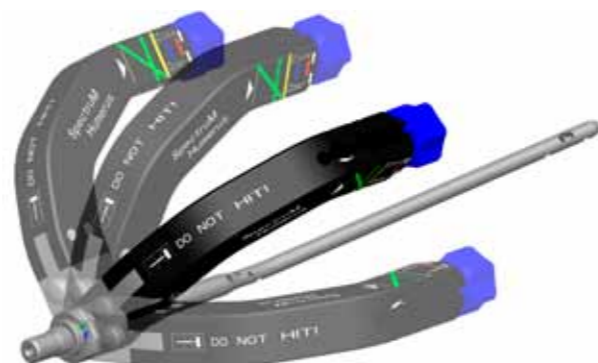
- 3,8mm diameter screws

1.2 | The instrumentarium

Well-organized instruments that guide the surgeon through the steps of operation, born from the melting of simplicity and minimal radiation load.

Features

- Mechanical distal targeting, lower quality image intensifier does not hinder accurate targeting.
- Rotatable colour coded proximal targeting arm for assembly-free targeting of the locking hole. (available in carbon)



- Manual distal targeting device for image intensifier free distal targeting.
- Soft tissue protectors and sleeves are protected against fallout.
- Antegrade and retrograde technique can be managed with the same set

1.3 | Indication

- Closed fractures of the humeral stem (2nd - 5th sections)
- Open fractures (grade 1 and 2) if penetration may go through healthy soft tissues.
- Present or possible fractures of the pathological bone structure
- Proximal humerus fractures
- Late bone recovery, pseudo-joints

2.1 | SpectruM Humerus nail



	Flexible	Rigid	Proximal
Diameter (mm)	6.5	6.5	
	7	7	
	8	8	8
			9
Length (mm)			140
			160
	180	180	
	195	195	
	210	210	
	225	225	
	240	240	
	255	255	
	270	270	
	285	285	
	300	300	
Rawmaterial	Stainless steel Titanium Anodised titanium	Stainless steel Titanium Anodised titanium	Stainless steel Titanium Anodised titanium

2.2 | End-cap



Length (mm)	0
	5
	10
	15
Rawmaterial	Stainless steel Titanium Anodised titanium

2.3 | Locking screw Ø=3,8 mm



Length (mm)	10 - 80
Rawmaterial	Stainless steel Titanium Anodised titanium

3 | Surgical description

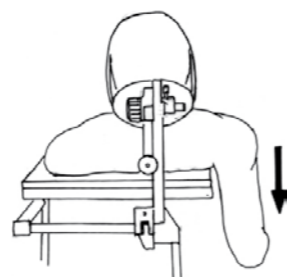
3.1 | *SpectruM* Humerus - Proximal nailing | Antegrad technique

INDICATION:

- subcapital fracture of humerus

3.1.1 | Patient positioning

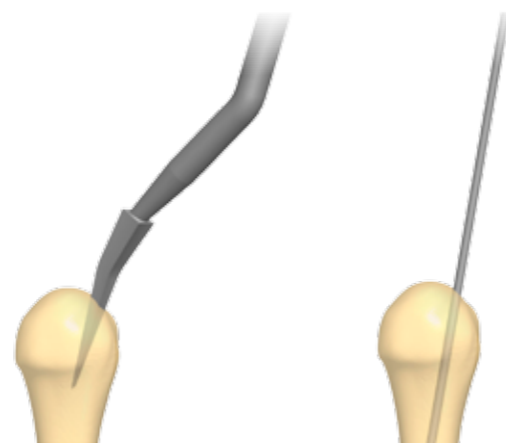
The arm of the semirecumbent patient is let to hang near the trunk thus its weight helps reduction. For the secure retaining of the arm during the aiming a radiolucent, mobile armrest is used. Preoperative reduction of the fracture is not needed; it is sufficient to perform it during the insertion of the guide rod or the nail.



3.1.2 | Opening the intramedullary canal

The skin incision is performed in the upper third of the deltoid muscle, avoiding the damaging of the axillary nerve. Dividing the muscle fibres at the medial edge of the greater tubercle, on the border of the cartilage we cut the articular capsule and the rotator cuff, then trepanate the intramedullary canal.

The 2,2x600 mm guide spit is introduced under image intensifier control.

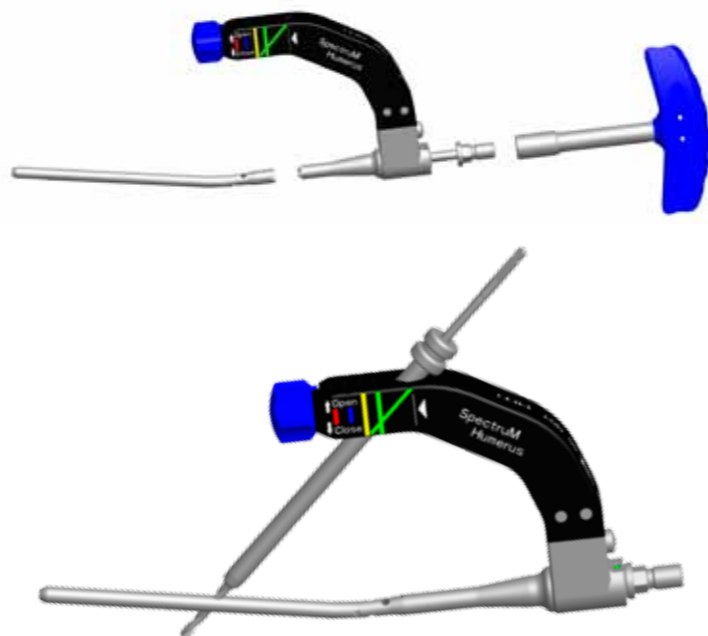


3.1.3 | Assembly of the nail and the targeting arm

Press the button and rotate the arm to position green. Fix the nail with the connecting screw to the targeting arm using the T-wrench.

ATTENTION

Checking the accuracy is strongly recommended before insertion. Put the green soft tissue protector into the green marked hole and tighten with the blue cap. Insert the 3.2mm drill sleeve into the soft tissue protector. Then push the 3.2mm drill-bit through the drill sleeve. In case of correct assembling the sleeve drive the drillbit into the proper locking hole. Do the same method in the other colour coded holes by rotating the proximal arm.

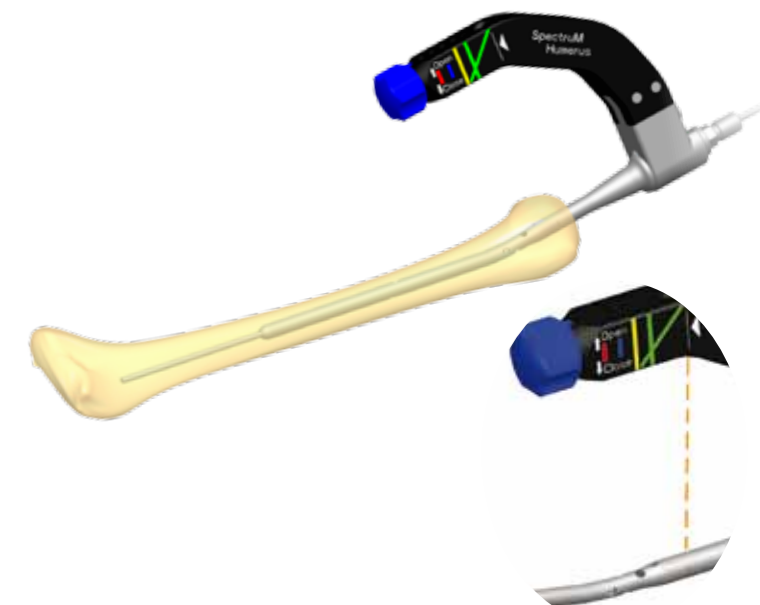


3.1.4 | Insertion of the nail

The nail is inserted into the intramedullary canal through the guide wire with rotating movements while the targeting arm is in green position. The nail is pushed by hand with the help of the targeting arm to the intramedullary canal. If the nail insertion meets difficulties, it is advisable to use the impactor and guide the nail with light mallet blows. The mark on the targeting device helps reaching the proper depth of the insertion and controlling the position of the nail, since it shows accurately the proximal end of the nail. Apply A-P and M-L image intensifier control when the nail passes the fracture zone and in the final position.

ATTENTION

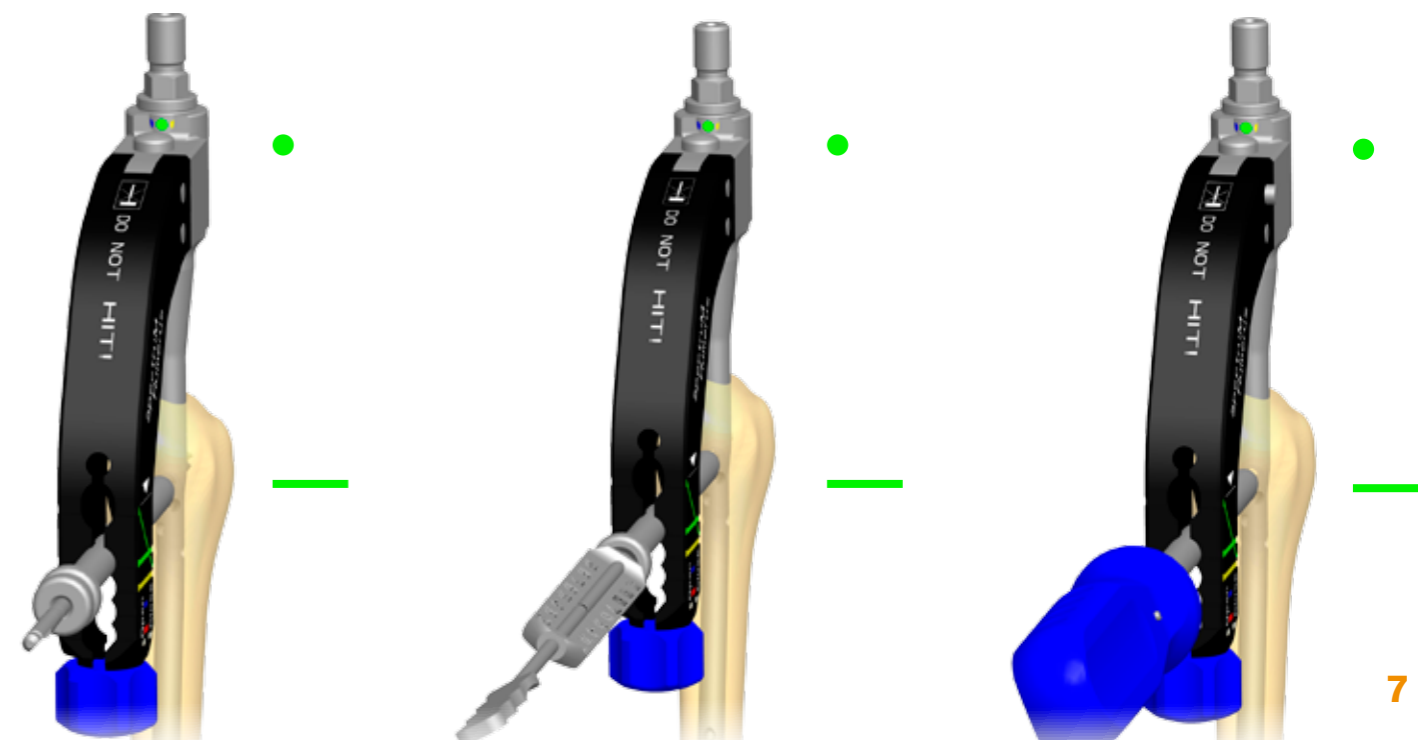
When placing the nail in the final position please pay attention to avoid nerves with the later inserted locking screws.



3.1.5 | Proximal locking

The number and position of proximal locking screws depend on the fracture type, the number and position of the fracture parts. Ensure that the proximal targeting arm is in the same colour marked position like the drill sleeve. First lock the perpendicular holes. Place the soft tissue protector and the drill sleeve into the same colour marked position of the targeting arm.

After marking and incision push them up to the bone surface. Apply the 3,2 mm drillbit then remove the drill sleeve. Measure the required screw length through the soft tissue protector, push the measurer up to the bone surface. The size is shown by the colour mark. Then drive in the appropriate 3,8 mm diameter screw.



3 | Surgical description

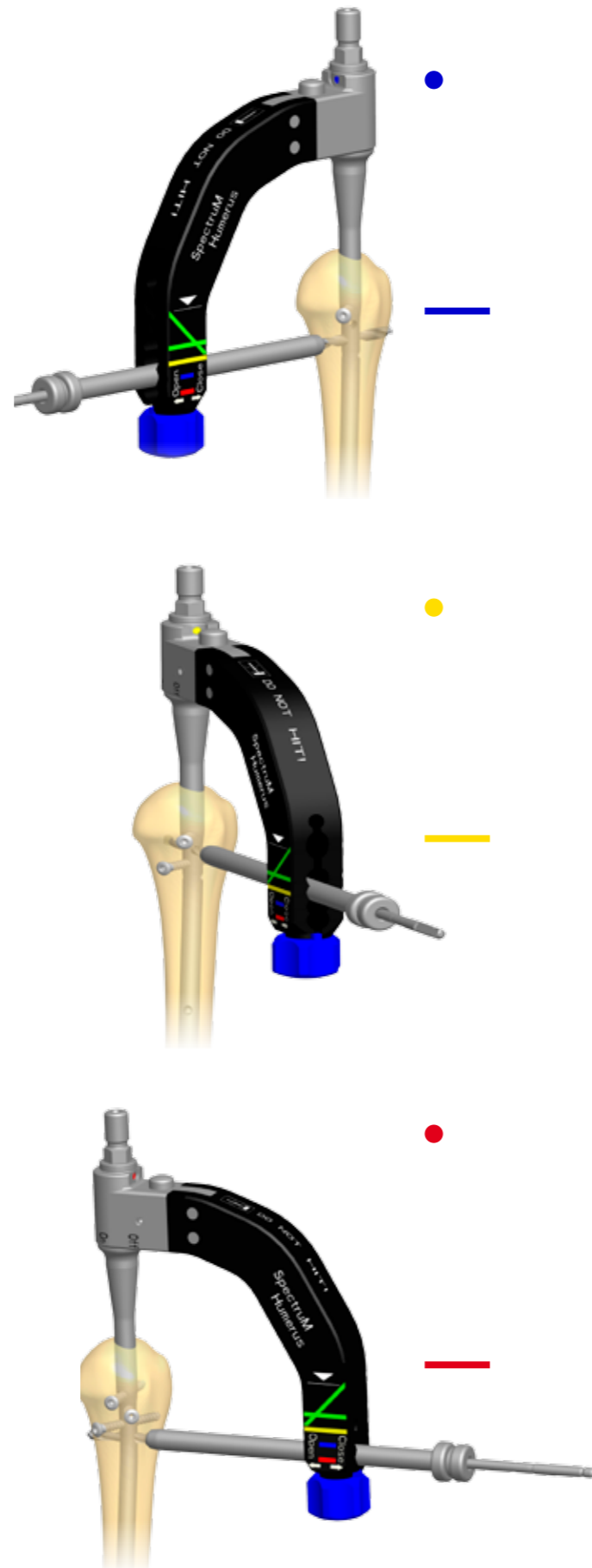
3.1 | *SpectruM* Humerus - Proximal nailing | Antegrad technique

Push the rotating button of the aiming device and rotate the arm until you see another colour under the button. Release the button, the arm fixes. Put the soft tissue protector into the new colour marked position and perform the locking according to the previous process.

Four perpendicular locking screws are inserted at the upper end of the nail in four different directions (marked by green, yellow, blue and red colour).

ATTENTION

Pay attention to the nervus axillaris in each locking position. Prepare the secure insertion of the sleeve near the supposed place of the nerve.

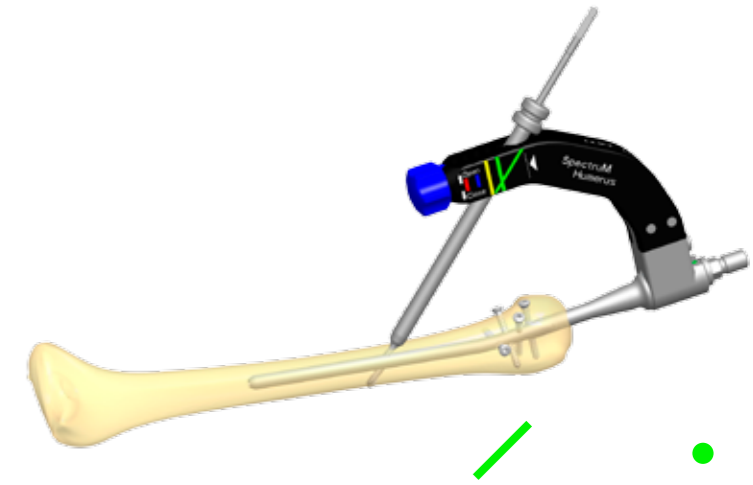


3.1.6 | Distal locking

In case of short nails, the lower, distal locking is done by the proximal targeting arm. For locking the 45° oblique green hole, rotate the targeting arm to the green position and put the drill sleeve into the 45° oblique green hole. Perform locking according to the previous process. Start drilling carefully to avoid slipping of the drilltip on the corticalis. In case the hole nears to the supposed place of the nervus radialis, prepare the insertion to the bone surface of the sleeve watchfully.

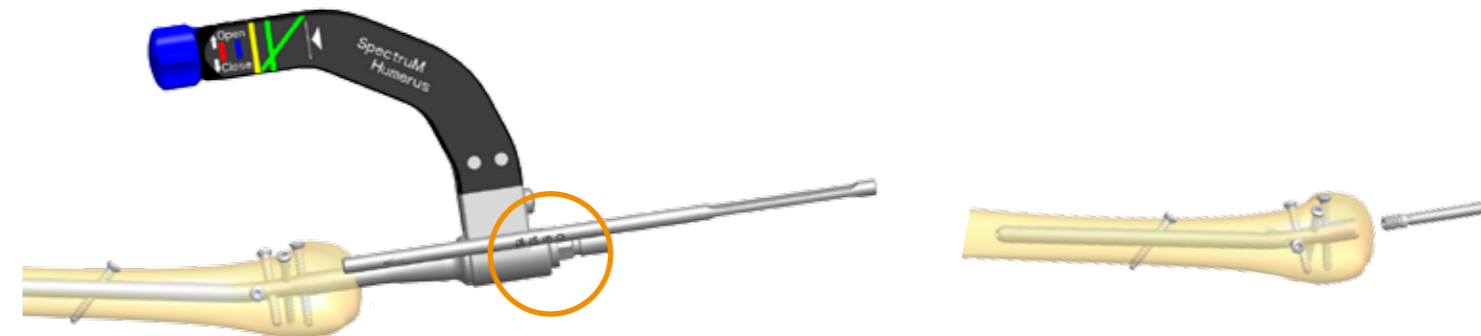
ATTENTION

Pay attention to the nervus radialis during inserting the sleeve to the bone.



3.1.7 | Removal of the targeting arm, closing the nail

Measure the proper length of the end cap. Remove the proximal targeting arm and close the end of the nail with the chosen end cap.



3.1.8 | Implant removal

If end-cap was used remove that first. Drive the nail removal pin. Take the locking screws out. Connect the implant impactor stem and the implant

impactor (optionally available) to the removal pin and carefully hammer the nail out of the bone.



3 | Surgical description

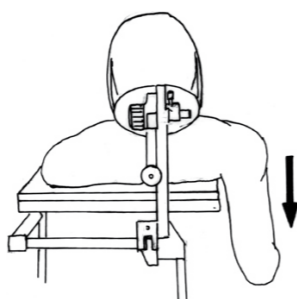
3.2 | *SpectruM* Humerus - Rigid nailing | Antegrad technique

INDICATIONS:

- diaphyseal fractures of humeral bone
- transverse and short oblique fractures of the middle third

3.2.1 | Patient positioning

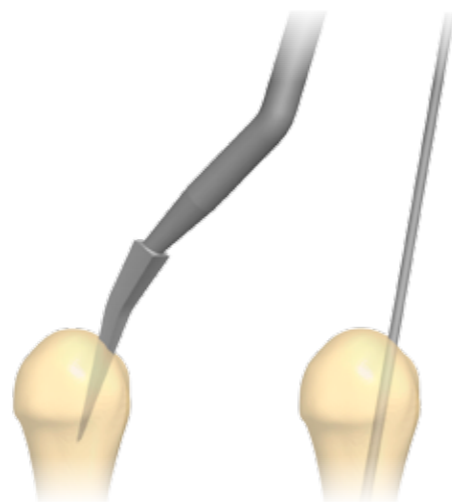
The arm of the semirecumbent patient is let to hang near the trunk thus its weight helps reduction. For the secure retaining of the arm during the aiming a radiolucent, mobile armrest is used. Preoperative reduction of the fracture is not needed; it is sufficient to perform it during the insertion of the guide rod or the nail.



3.2.2 | Opening the intramedullary canal

The skin incision is performed in the upper third of the deltoid muscle, avoiding the damaging of the axillary nerve. Dividing the muscle fibres at the medial edge of the greater tubercle, on the border of the cartilage we cut the articular capsule and the rotator cuff, then trepanate the intramedullary canal.

The 2,2x600 mm guide spit is introduced under image intensifier control.



3.2.3 | Determining the nail length

Drive the guide rod (600 x 2,2 mm) through the fracture with the help of an image intensifier. Measure the length of the guide wire part outside of the humerus with a measuring rod. Subtract this value from the 600 mm length of the guide wire. The result must be rounded off to the next humerus nail size.



3.2.4 | Assembly of the nail and the targeting arm

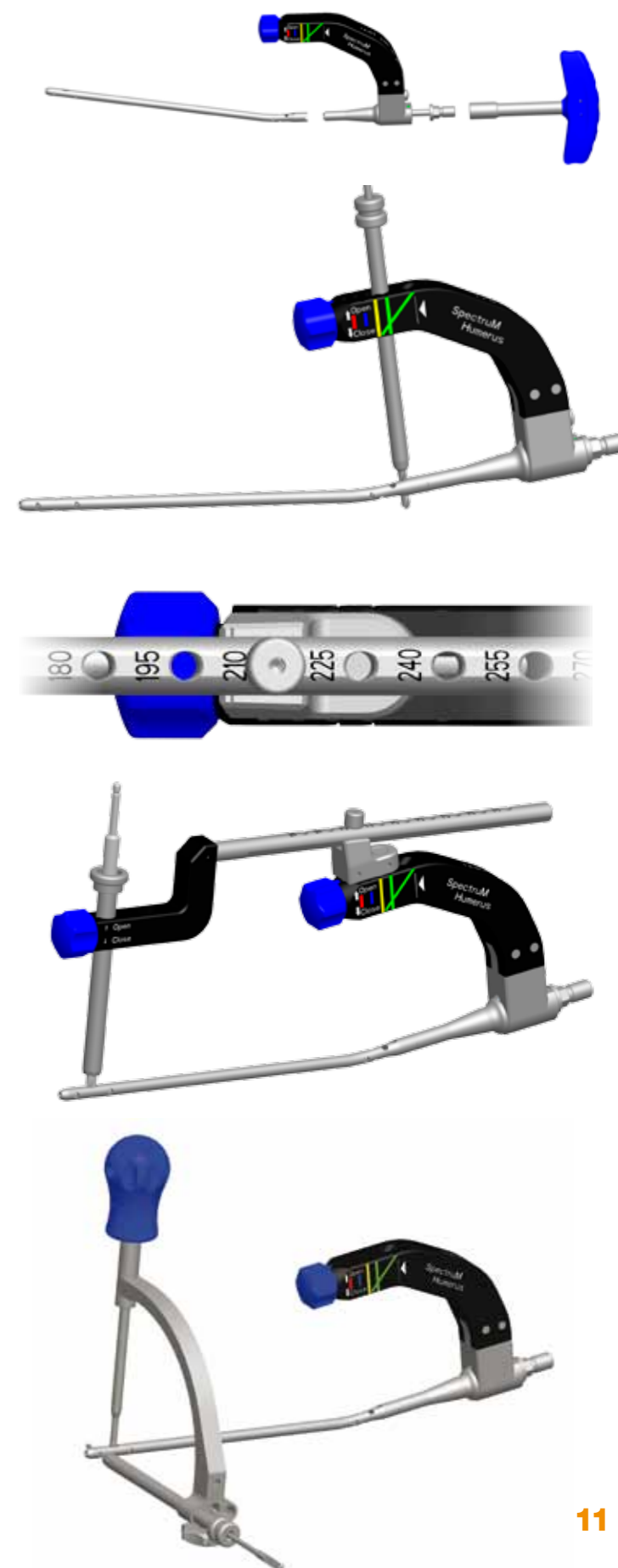
Press the button and rotate the arm to position green. Fix the nail with the connecting screw to the targeting arm using the T-wrench.

ATTENTION

Checking the accuracy is strongly recommended before insertion. Put the green soft tissue protector into the green marked hole and tighten with the blue cap. Insert the 3.2mm drill sleeve into the soft tissue protector. Then push the 3.2mm drill-bit through the drill sleeve. In case of correct assembling the sleeve drive the drillbit into the proper locking hole. Do the same method in the other colour coded holes by rotating the proximal arm.

Set the distal targeting arm according to the length of the selected nail. The fixing screw is always tightened by the 2,5 mm screwdriver. Mount the distal arm to the proximal and fix with the blue fixing knob. The soft tissue protector placed into the hole of the distal targeting arm shall be above the sagittal distal hole of the nail. After control the distal arm is removed.

Click the distal aiming device into the special hole of the nail. Put the soft tissue protector and the drill sleeve into the device and insert the 3,2 mm drillbit. In case of correct assembling the sleeve drives the drillbit into the proper locking hole. After this check remove the distal targeting device.



3 | Surgical description

3.2 | *SpectruM* Humerus - Rigid nailing | Antegrad technique

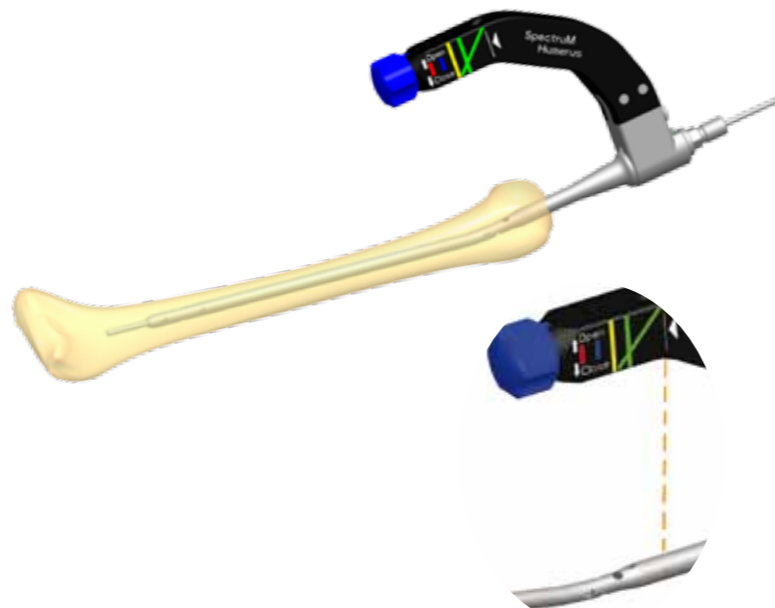
3.2.5 | Insertion of the nail

The nail is inserted into the intramedullary canal through the guide wire with rotating movements while the targeting arm is in green position. The nail is pushed by hand with the help of the targeting arm to the intramedullary canal.

If the nail insertion meets difficulties, it is advisable to use the impactor and guide the nail with light mallet blows.

The mark on the targeting device helps reaching the proper depth of the insertion and controlling the position of the nail, since it shows accurately the proximal end of the nail. Apply A-P and M-L image intensifier control when the nail passes the fracture zone and in the final position.

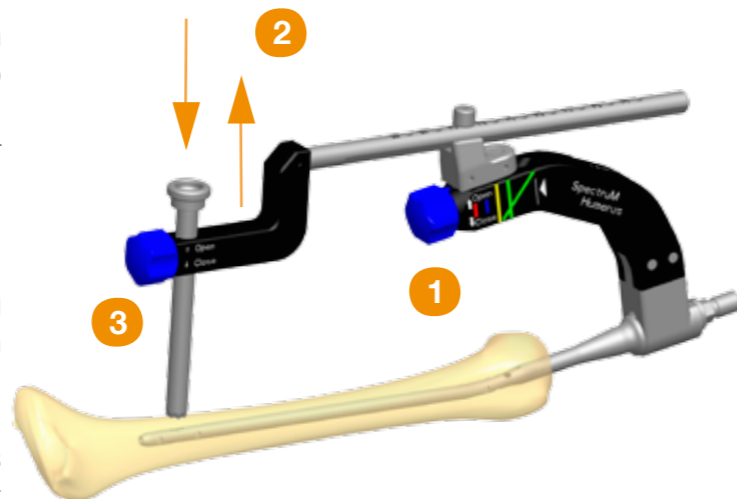
ATTENTION: When placing the nail in the final position please pay attention to avoid nerves with the later inserted locking screws.



3.2.6 | Assembling the distal arm

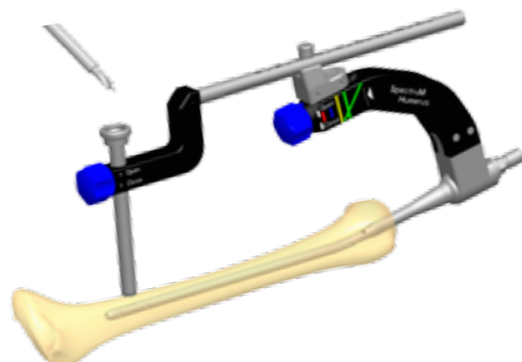
Put the already set length distal targeting arm on the proximal targeting arm, fix it with the blue cap and put the forked soft tissue protector in the hole. After skin incision push the soft tissue protector on the bone so that all claws fix well on the bone. During insertion of the soft tissue protector mind the avoiding of the nervus radialis. Lift the distal arm away from the bone and fix it with the tightening cap. This way we can add tension and the arm presses the soft tissue protector to the bone.

ATTENTION: Please pay attention to the nervus radialis during the insertion of the forked soft tissue protector.



3.2.7 | Distal drilling

After skin incision drill the closer cortical through the soft tissue protector with the 5,5 mm drillbit. Drill carefully. Stop drilling after the drillbit passed the cortical and reached the nail. Remove the distal arm.



3.2.8 | Usage of the distal targeting device

Put the manual targeting device into the monocortical hole in the bone then click it into the special hole of the nail. (In optimal case the rotation of the device is not possible) After skin incision put the soft tissue protector and the drill sleeve into the manual targeting device, push them to the bone surface. Fix the tissue protector and perform drilling. Keep the distal targeting device well fixed for the period of drilling.

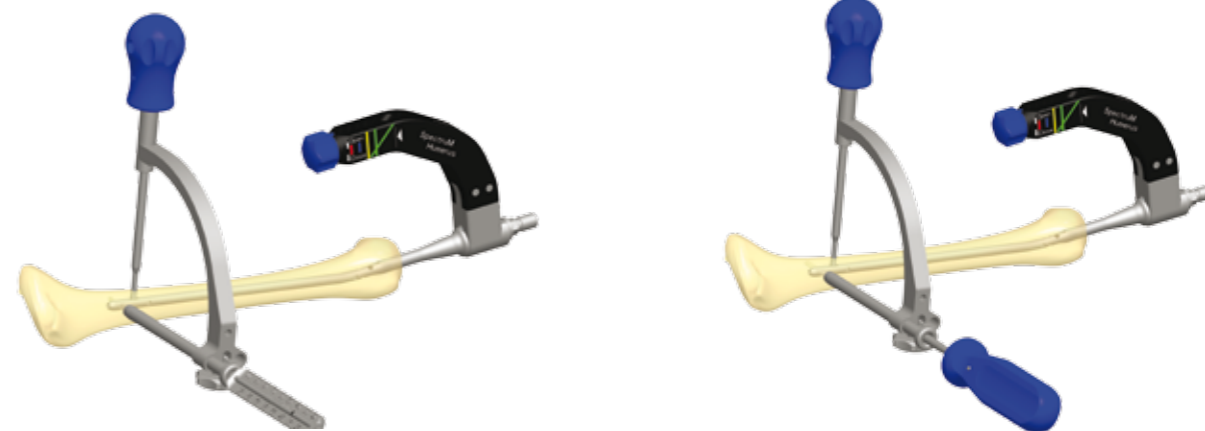
ATTENTION: Pay attention to avoid the nervus radialis.



3.2.9 | Distal locking I.

Remove the drill sleeve and measure length through the tissue protector. Select the locking screw accordingly. Drive in the screw with 2,5 mm screwdriver.

The length of the screw is verifiable on the scale of the measuring rod. Drive in the screw with 2,5 mm screwdriver.



3.2.10 | Distal locking II.

After first locking leave the manual targeting device in position and repeat drilling, length gauging and screw insertion in the other hole. Then remove the manual targeting device.



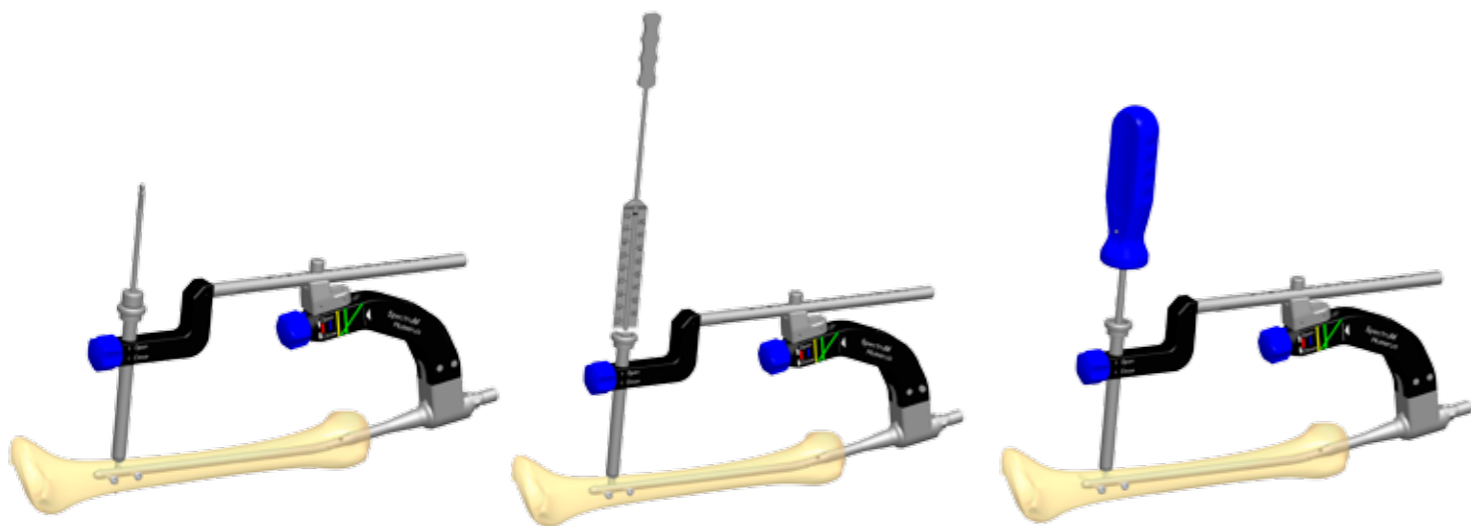
3 | Surgical description

3.2 | *SpectruM* Humerus - Rigid nailing | Antegrad technique

3.2.11 | Distal locking III.

For sagittal locking mount the distal arm onto the proximal arm. Drill, measure length and insert screw in the usual manner.

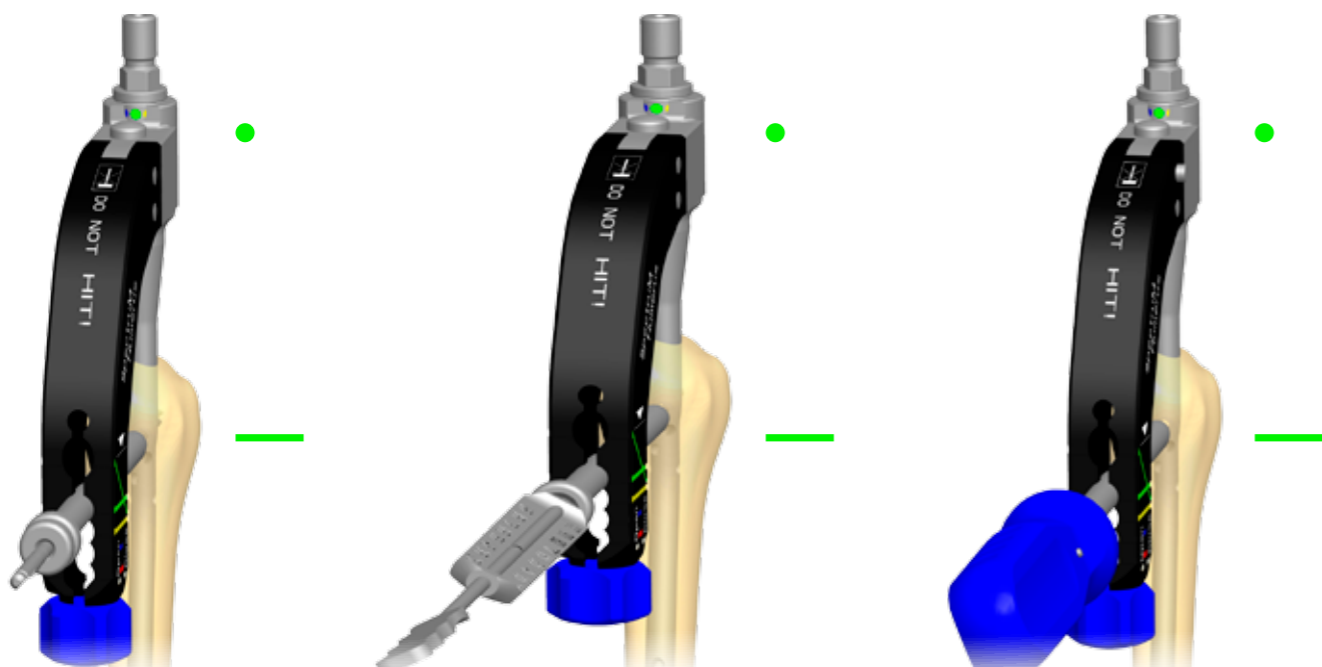
When inserting the screw be careful since the screw holds only in the farther cortical wall of the bone. Remove the distal targeting arm after locking.



3.2.12 | Proximal locking

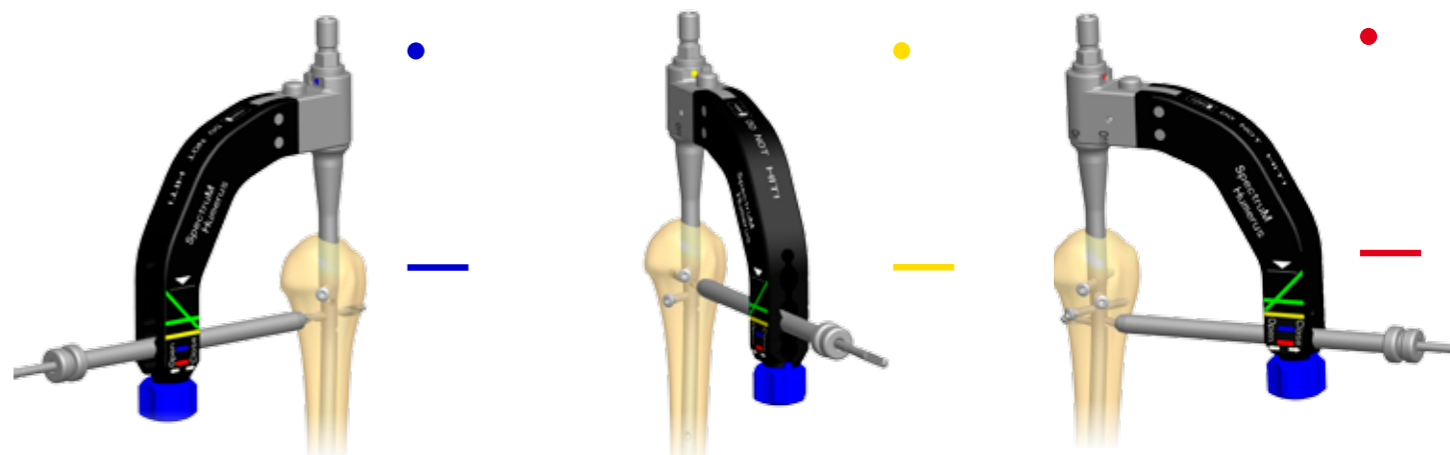
The number and position of proximal locking screws depend on the fracture type, the number and position of the fracture parts. Ensure that the proximal targeting arm is in the same colour marked position like the drill sleeve. First lock the perpendicular holes. Place the soft tissue protector and the drill sleeve into the same colour marked position of the targeting arm.

After marking and incision push them up to the bone surface. Apply the 3.2mm drillbit then remove the drill sleeve. Measure the required screw length through the soft tissue protector. The size is shown by the colour mark. Then drive in the appropriate 3,8 mm diameter screw.



Push the rotating button of the aiming device and rotate the arm until you see another colour under the button. Release the button, the arm fixes. Put the soft tissue protector into the new colour marked position and perform the locking according to the previous process.

Four perpendicular locking screws are inserted at the upper end of the nail in four different directions (marked by green, yellow, blue and red colour).



ATTENTION

Pay attention to the nervus axillaris in each locking position. Prepare the secure insertion of the sleeve near the supposed place of the nerve.

3.2.13 | Removal of the targeting arm, closing the nail

Measure the proper length of the end cap. Remove the proximal targeting arm and close the

end of the nail with the chosen end cap.



3.2.14 | Implant removal

If end-cap was used remove that first. Drive in the nail removal pin. Take the locking screws out. Connect the implant impactor stem and the implant

impactor (optionally available) to the removal pin and carefully hammer the nail out of the bone.



3 | Surgical description

3.3 | *SpectruM* Humerus - Flexible nailing | Retrograde technique

INDICATIONS:

- diaphyseal fractures of humeral bone
- transverse and short oblique fractures of the middle third

3.3.1 | Patient positioning

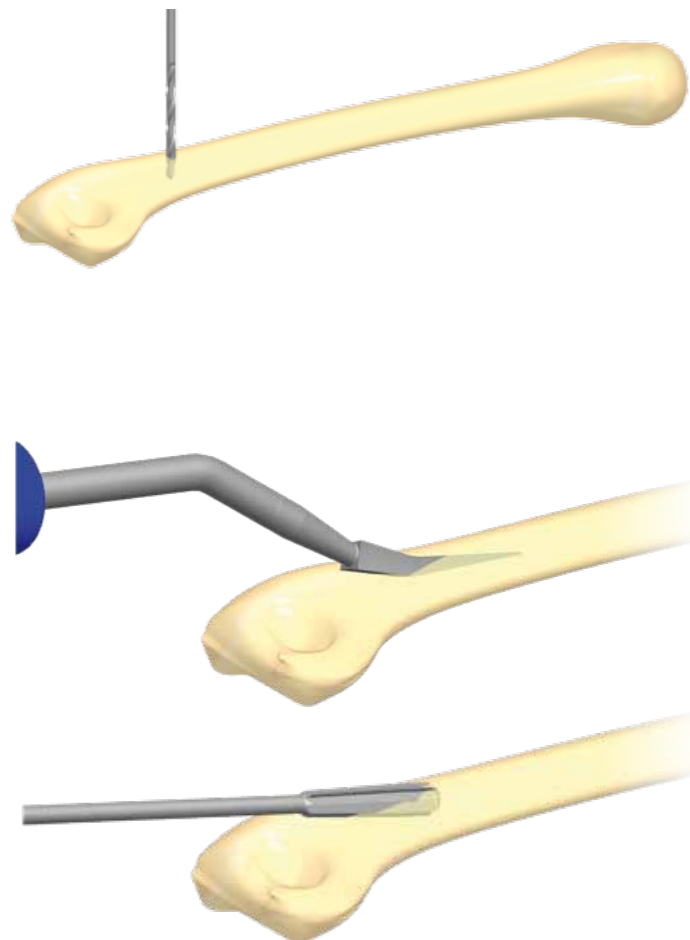
In the supine position, the patient's arm is positioned on the arm-table in 45° abducted with flexed elbow and proned hand position. The elbow is supported by 2 folded bed-sheets.

3.3.2 | Incision and opening the intramedullary canal

Before incision the covered reposition of the fracture is controlled by the image intensifier. A 6-8 cm long skin incision is made proximal from the top of the olecranon, then fascial incision is made.

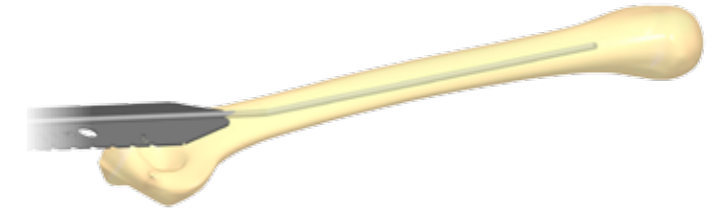
After separating the triceps-fibres, the intramedullary canal is opened with a 3,2mm drill perpendicularly, at a distance of 2,5 cm from the edge of fossa olecrani cranialisa. It is recommended to drill some holes (in an area of 1x2,5 cm) upper from the posterior proximal edge of fossa olecrani. The holes are broadened with a 4.5 mm drillbit and united.

The resulted window, must be symmetric according to the bone axis, is broadened with a 9 mm reamer, the edges are finished. Perform broadening until the nail end can be easily inserted through the bone window, otherwise iatrogenic fracture can occur.



3.3.3 | Determining the nail length

Drive the guide rod (2,2x600 mm) through the fracture with the help of an image intensifier. Measure the length of the guide wire part outside of the humerus with a measuring rod. Subtract this value from the 600 mm length of the guide wire. The result must be rounded off to the next humerus nail size.



3.3.4 | Assembly of the nail and the targeting arm

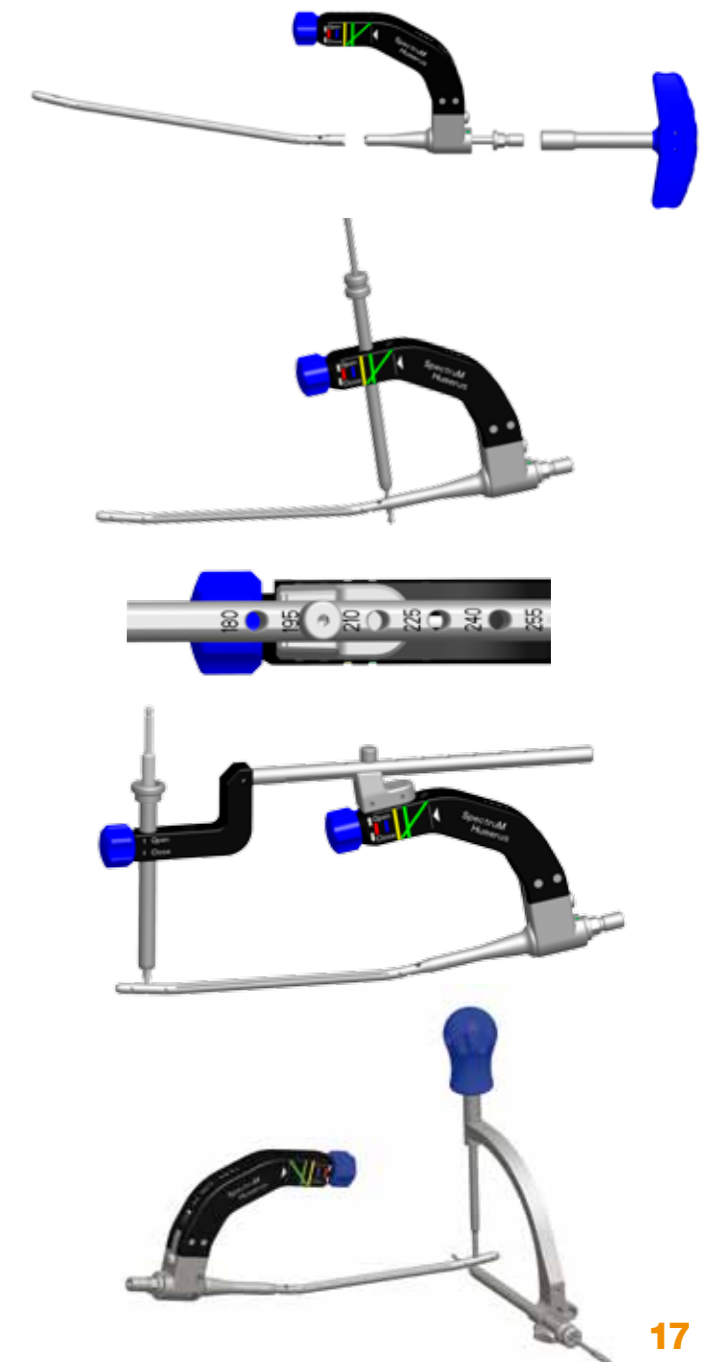
Press the button and rotate the arm to position green. Fix the nail with the connecting screw to the targeting arm using the T-wrench.

ATTENTION

Checking the accuracy is strongly recommended before insertion. Put the green soft tissue protector into the green marked hole and tighten with the blue cap. Screw the 3.2mm drill sleeve into the soft tissue protector. Then push the 3.2mm drill-bit through the drill sleeve. In case of correct assembling the sleeve drives the drillbit into the proper locking hole. Do the same method in the other colour coded holes by rotating the proximal arm.

Set the distal targeting arm according to the length of the selected nail. The fixing screw is always tightened by the 2,5 mm screwdriver. Mount the distal arm to the proximal and fix with the blue fixing knob. The soft tissue protector placed into the hole of the distal targetin arm shall be above the sagittal distal hole of the nail. After control the distal arm is removed.

Click the distal aiming device into the special hole of the nail. Put the soft tissue protector and the drill sleeve into the device and insert the 3,2 mm drill-bit. In case of correct assembling the sleeve drives the drillbit into the proper locking hole. After this check remove the distal targeting device.



3 | Surgical description

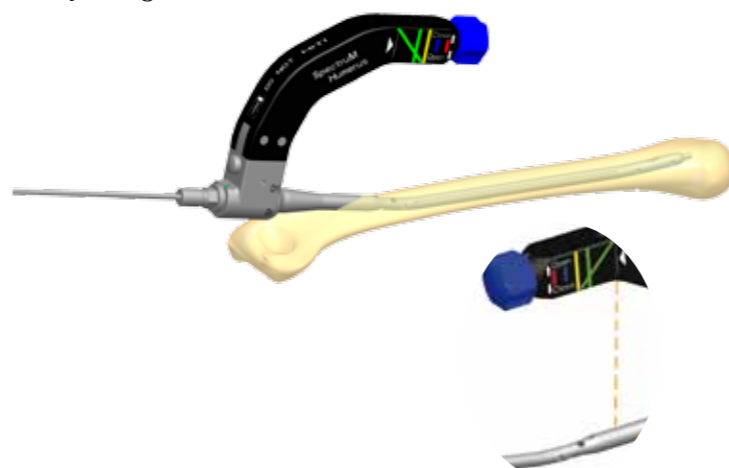
3.3 | *SpectruM* Humerus - Flexible nailing | Retrograde technique

3.3.5 | Insertion of the nail

The nail is pushed by hand into the intramedullary canal through the guide wire while the targeting arm is in green position. If the nail insertion meets difficulties, it is advisable to use the impactor and guide the nail with light mallet blows. The mark on the targeting device helps reaching the proper depth of the insertion and controlling the position of the nail, since it shows accurately the proximal end of the nail. Apply A-P and M-L image intensifier control when the nail passes the fracture zone and in the final position. When placing the nail in the final position please pay attention to avoid nerves with the locking screws.

ATTENTION

At insertion it is important that the targeting arm must face to the posterior surface of the humerus. Only axial strength is allowed, avoid rotational movements. In the final position of the nail rotation may be given.

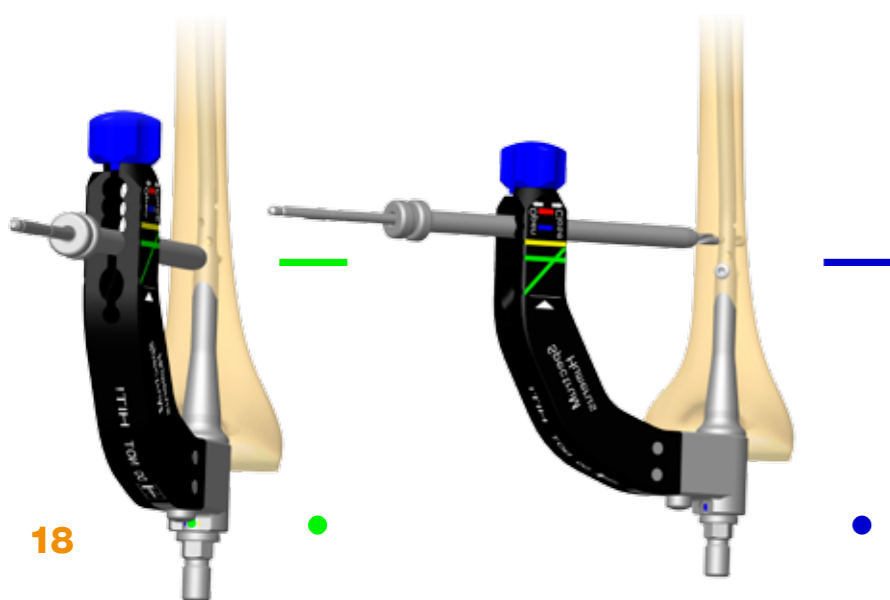


3.3.6 | Distal locking | according to the body

The number and position of the necessary locking screws depend on the fracture type. Ensure that the proximal targeting arm is in green position. First lock the perpendicular green hole. Place the forked soft tissue protector and the drill sleeve into the perpendicular green hole of the targeting arm. After incision push them to the bone surface and fix with the fixing knob. Drill with the 3.2mm drillbit then remove the drill sleeve.

Measure the required screw length through the soft tissue protector, the size is shown by the color mark. Drive in the appropriate 3,8mm diameter screw, then remove the soft tissue protector.

Push the button and rotate the arm to the right until you see blue colour under the button. Release the button, the arm fixes. Perform the locking according to the previous process.

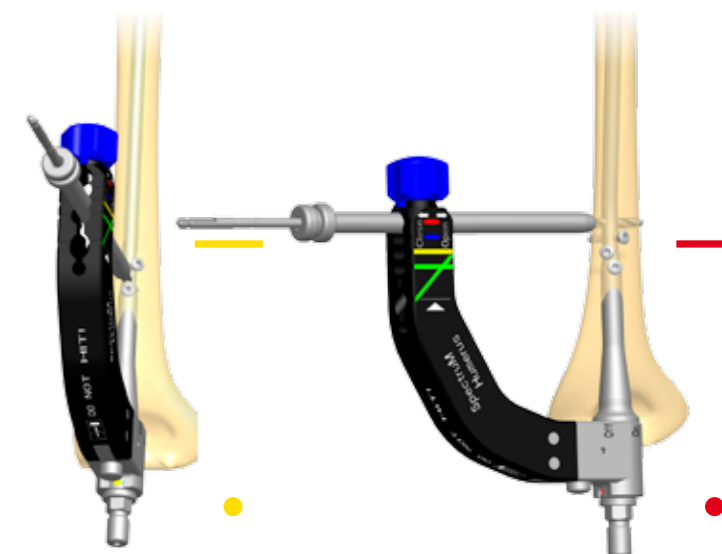


Proceed with the yellow coded hole. Rotate the arm to the left until you see yellow colour under the button. Perform the locking according to the previous process.

Finally lock the red coded hole. Rotate the arm to lateral until you see red colour under the button. Perform the locking according to the previous process.

ATTENTION

Pay attention to avoid the nervus radialis.



3.3.7 | Proximal locking I. | (according to the body)

Proximal locking is performed by free hand with the help of an image intensifier. Put the already set length distal arm on the proximal arm and put the forked soft tissue protector in the hole. Perform the skin incision where the soft tissue protector sign. Separate the muscles after incision.

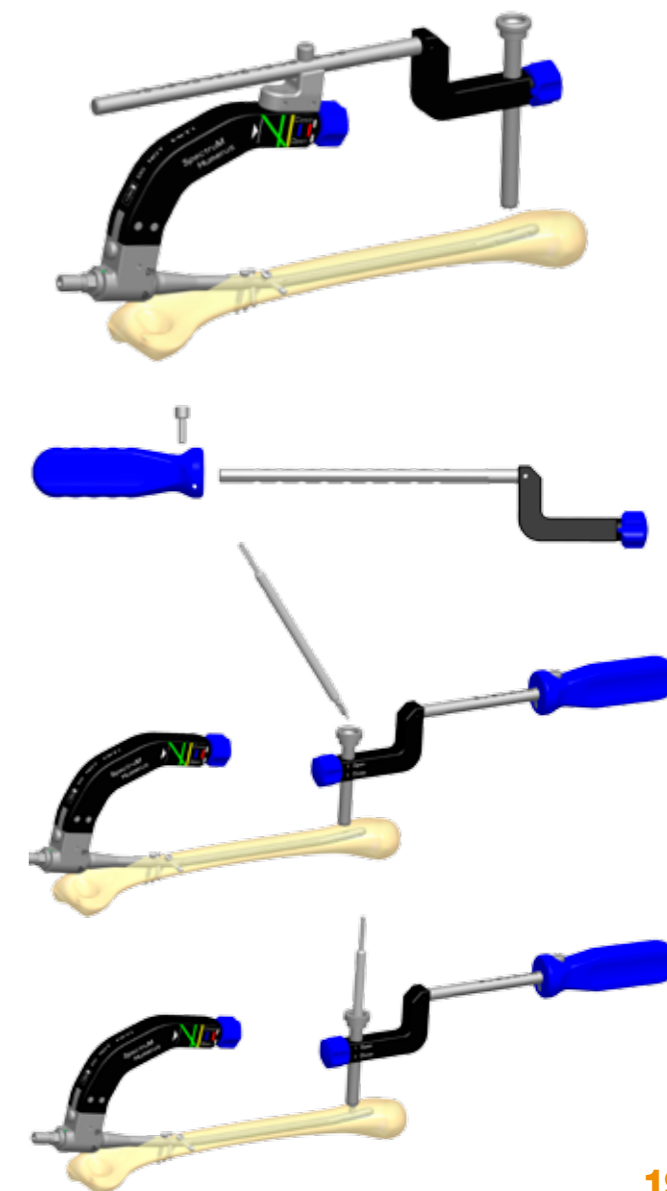
Remove the distal targeting arm, assemble it with the free hand targeting device hilt and fix them with the fixing screw.

Put the assembled device with the soft tissue protector on the bone and under image intensifier position it until the hole in the nail shows a full circle.

ATTENTION

Pay attention to avoid the nervus axilliaris.

Drill the closer cortical through the soft tissue protector with the 5,5 mm drillbit. Drill carefully. Stop drilling after the drillbit passed the cortical and reached the nail. Remove the distal arm.



3 | Surgical description

3.3 | *SpectruM* Humerus - Flexible nailing | Retrograde technique

3.3.8 | Proximal locking II.

Put the manual targeting device into the monocortical hole in the bone then click it into the special hole of the nail. (In optimal case, rotation of the device is not possible.) After skin incision put the tissue protector and the drill sleeve into the manual targeting device, push them to the bone surface. Fix the tissue protector and perform drilling. Keep the distal targeting device well fixed for the period of drilling.



3.3.9 | Proximal locking III.

Remove the drill sleeve and measure length through the tissue protector. Select the locking screw accordingly. Check screw length on the scale of the measuring rod. Drive in the screw with 2,5 mm screwdriver through the soft tissue protector. Repeat these steps at the other hole as well.



3.3.10 | Proximal locking IV.

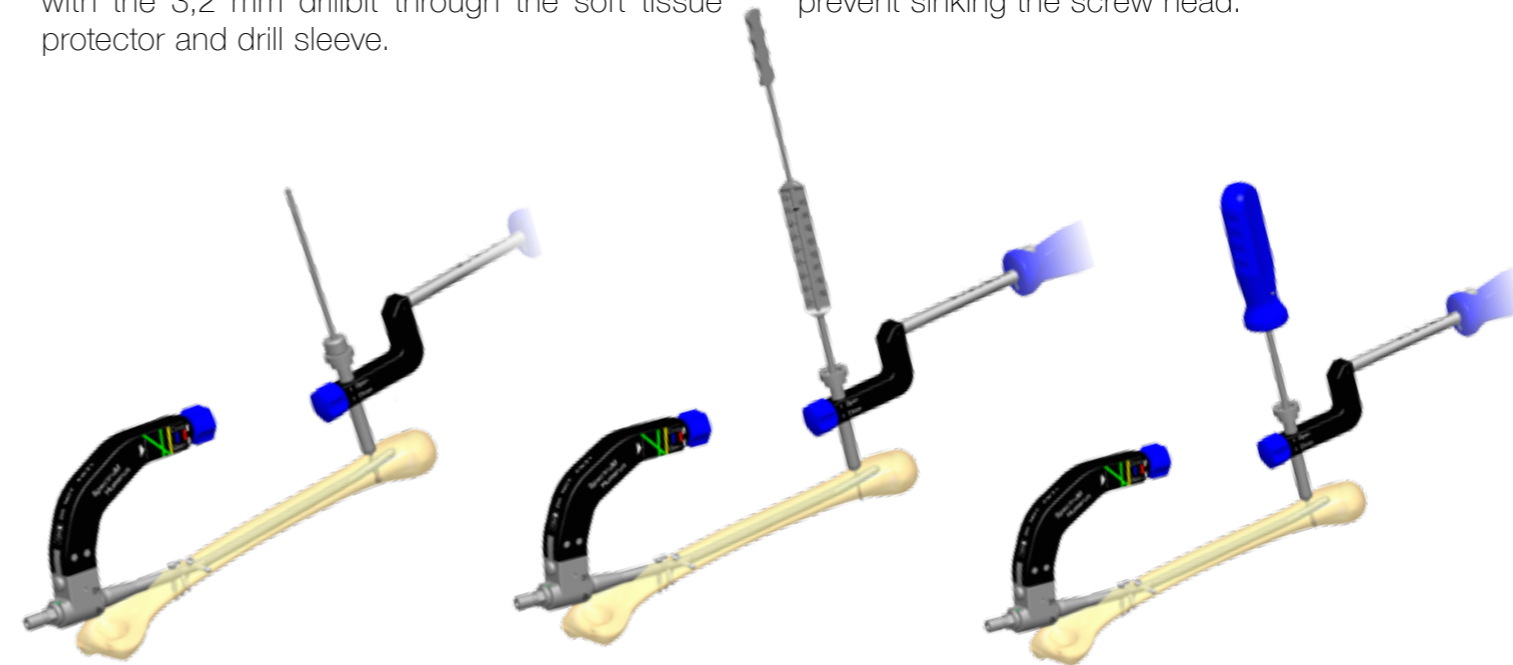
Repeat the steps (3.3.8-3.3.9) at the other hole as well.



3.3.11 | Proximal locking V.

Remove the manual aiming device and put back the free hand targeting device on the sagittal hole. Drill through the ventral wall of the cortical hole. Drill with the 3,2 mm drillbit through the soft tissue protector and drill sleeve.

After length measurement introduce the screw. Mind that the screw will hold only in the farther cortical. Do not tighten with excessive force to prevent sinking the screw head.



3.3.12 | Removal of the targeting arm, closing the nail

Remove the proximal targeting arm and close the end of the nail with the chosen end cap.



3.3.13 | Implant removal

If end-cap was used remove that first. Drive in the nail removal pin, then take the locking screws out. Connect the implant introducer stem and the implant introducer (optionally available) to the removal pin and carefully hammer the nail out of the bone.



4 | Implant list

4.1 | *SpectruM* Humerus nail-Rigid | Catalogue number



Steel

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	253226180	253227180	253228180
L = 195mm	253226195	253227195	253228195
L = 210mm	253226210	253227210	253228210
L = 225mm	253226225	253227225	253228225
L = 240mm	253226240	253227240	253228240
L = 255mm	253226255	253227255	253228255
L = 270mm	253226270	253227270	253228270
L = 285mm	253226285	253227285	253228285
L = 300mm	253226300	253227300	253228300

Titanium

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	293226180	293227180	293228180
L = 195mm	293226195	293227195	293228195
L = 210mm	293226210	293227210	293228210
L = 225mm	293226225	293227225	293228225
L = 240mm	293226240	293227240	293228240
L = 255mm	293226255	293227255	293228255
L = 270mm	293226270	293227270	293228270
L = 285mm	293226285	293227285	293228285
L = 300mm	293226300	293227300	293228300

Anodized titanium

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	393226180	393227180	393228180
L = 195mm	393226195	393227195	393228195
L = 210mm	393226210	393227210	393228210
L = 225mm	393226225	393227225	393228225
L = 240mm	393226240	393227240	393228240
L = 255mm	393226255	393227255	393228255
L = 270mm	393226270	393227270	393228270
L = 285mm	393226285	393227285	393228285
L = 300mm	393226300	393227300	393228300

4.2 | *SpectruM* Humerus nail-Flexible | Catalogue number



Steel

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	253236180	253237180	253238180
L = 195mm	253236195	253237195	253238195
L = 210mm	253236210	253237210	253238210
L = 225mm	253236225	253237225	253238225
L = 240mm	253236240	253237240	253238240
L = 255mm	253236255	253237255	253238255
L = 270mm	253236270	253237270	253238270
L = 285mm	253236285	253237285	253238285
L = 300mm	253236300	253237300	253238300

Titanium

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	293236180	293237180	293238180
L = 195mm	293236195	293237195	293238195
L = 210mm	293236210	293237210	293238210
L = 225mm	293236225	293237225	293238225
L = 240mm	293236240	293237240	293238240
L = 255mm	293236255	293237255	293238255
L = 270mm	293236270	293237270	293238270
L = 285mm	293236285	293237285	293238285
L = 300mm	293236300	293237300	293238300

Anodized titanium

	d = 6.5mm	d = 7mm	d = 8mm
L = 180mm	393236180	393237180	393238180
L = 195mm	393236195	393237195	393238195
L = 210mm	393236210	393237210	393238210
L = 225mm	393236225	393237225	393238225
L = 240mm	393236240	393237240	393238240
L = 255mm	393236255	393237255	393238255
L = 270mm	393236270	393237270	393238270
L = 285mm	393236285	393237285	393238285

4 | Implant list

4.3 | *SpectruM* Humerus nail-Proximal | Catalogue number



Steel

	d = 8mm	d = 9mm
L = 140mm	253218140	253219140
L = 160mm	253218160	253219160

Titanium

	d = 8mm	d = 9mm
L = 140mm	293218140	293219160
L = 160mm	293218160	293219170

Anodized titanium

	d = 8mm	d = 9mm
L = 140mm	393218140	393219160
L = 160mm	393218160	393219170

4.4 | End-cap | Catalogue number



Steel

Titanium

Anodized titanium

	Steel	Titanium	Anodized titanium
	253400001	293400001	393400001
L = 5mm	253400002	293400002	393400002
L = 10mm	253400003	293400003	393400003
L = 15mm	253400004	293400004	393400004

4.5 | Locking bone screw | Catalogue number Ø=3.8mm



Steel

Titanium

Anodized titanium

	Steel	Titanium	Anodized titanium
L = 10mm	932138010	922138010	364138010
L = 12mm	932138012	922138012	364138012
L = 14mm	932138014	922138014	364138014
L = 16mm	932138016	922138016	364138016
L = 18mm	932138018	922138018	364138018
L = 20mm	932138020	922138020	364138020
L = 22mm	932138022	922138022	364138022
L = 24mm	932138024	922138024	364138024
L = 26mm	932138026	922138026	364138026
L = 28mm	932138028	922138028	364138028
L = 30mm	932138030	922138030	364138030
L = 32mm	932138032	922138032	364138032
L = 34mm	932138034	922138034	364138034
L = 36mm	932138036	922138036	364138036
L = 38mm	932138038	922138038	364138038
L = 40mm	932138040	922138040	364138040
L = 42mm	932138042	922138042	364138042
L = 44mm	932138044	922138044	364138044
L = 46mm	932138046	922138046	364138046
L = 48mm	932138048	922138048	364138048
L = 50mm	932138050	922138050	364138050
L = 52mm	932138052	922138052	364138052
L = 54mm	932138054	922138054	364138054
L = 55mm	932138055	922138055	364138055
L = 56mm	932138056	922138056	364138056
L = 58mm	932138058	922138058	364138058
L = 60mm	932138060	922138060	364138060
L = 62mm	932138062	922138062	364138062
L = 64mm	932138064	922138064	364138064
L = 65mm	932138065	922138065	364138065
L = 66mm	932138066	922138066	364138066
L = 68mm	932138068	922138068	364138068
L = 70mm	932138070	922138070	364138070
L = 72mm	932138072	922138072	364138072
L = 74mm	932138074	922138074	364138074
L = 76mm	932138076	922138076	364138076
L = 78mm	932138078	922138078	364138078
L = 80mm	932138080	922138080	364138080

5 | Instrument list

5.1 | Filled up tray



Instruments

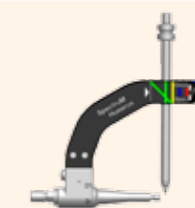
Description	Size	Quantity	Cat. n°
Proximal targeting arm		1	253920011
Distal targeting arm		1	253920002
Distal targeting device		1	253920003
Spiral drill	5,5 mm	1	253920004
Depth gauge for locking screw		1	253920005
Awl	8 mm	1	210510005
Fraise		1	253910006
Measuring rod	500 mm	1	939999072
Impactor		1	188560000
Guiding rod	2,2x600 mm	1	939999100
Spiral drill with quick-connecting end	3,2x310mm	1	939532310
Screwdriver for collet	2.5 mm Long	1	210710025
T-wrench		1	253920006
Linear gauge for end-cap		1	253920007
Distal target arm accessory		1	253920008
Tray		1	253820001
Filled up tray			257820000

Optional tray

Impactor for intramedullary nail			939999083
Collet	6 mm	1	210750625

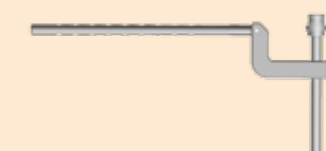
5.2 | Instruments

Proximal targeting arm
 *fixing screw
 *round ended soft tissue protector
 *drill sleeve
 *trocar



257920011

Distal targeting arm
 *forked soft tissue protector
 *drill sleeve



257920002

Distal targeting device



257920003

Spiral drill (Ø=5.5 mm)



257920004

Depth gauge for locking screw



253920005

Awl



210510005

Fraise



253910006

Measuring rod



939999072

Product family

■ TRAUMATOLOGY

- 1.1. Intramedullary nails
 - 1.1.1. **Humerus nails**
 - 1.1.2. Ulna-radius nails
 - 1.1.3. Trochanteric nails
 - 1.1.4. Femur nails
 - 1.1.5. Tibia nail
 - 1.1.6. Fibula nail
 - 1.1.7. Sanat PIN
- 1.2. Plates
- 1.3. Screws
- 1.4. Fixateur externe
- 1.5. Other

■ ORTHOPEDICS

■ DENTAL

■ SPINE

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