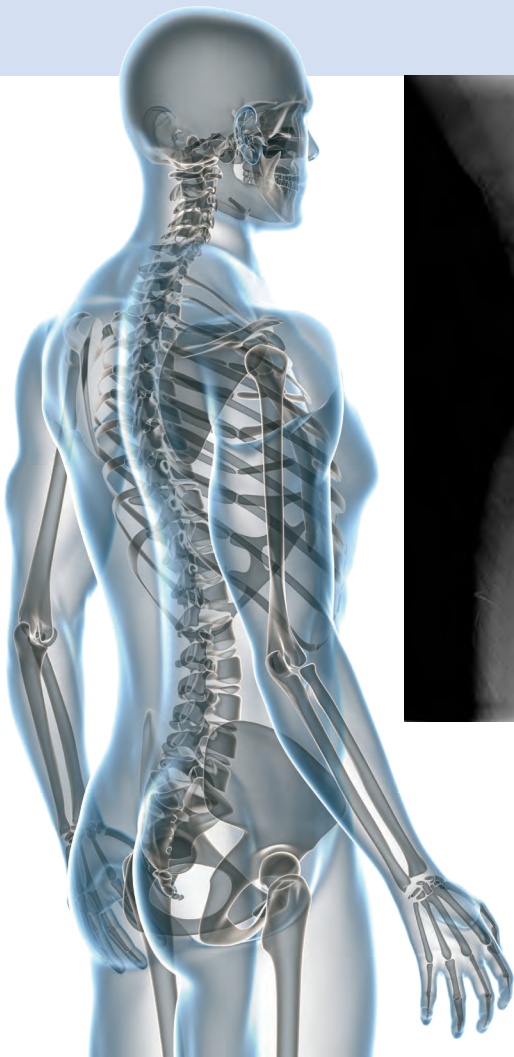


 **ORLOS**
Ortho-Medical "Tibia&Femoral Nail System, Titanium"



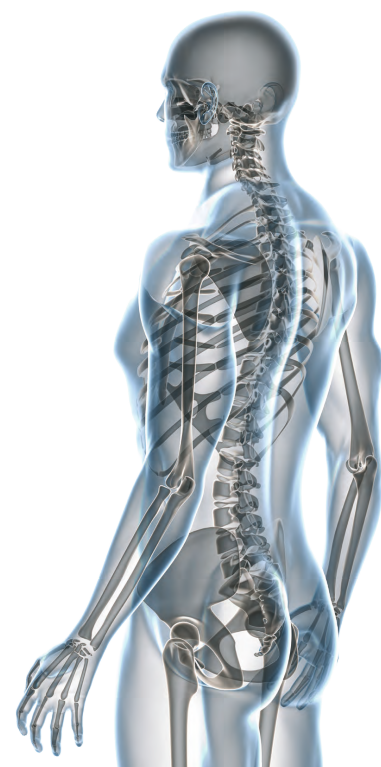
**ORLOS_II TIBIAL & FEMORAL
NAIL SYSTEM, TITANIUM**



Ortho-Medical "Tibia&Femoral Nail System, Titanium"

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GENERAL INFORMATION

Before using the product

Before every use you should carefully check the operability of the implants and the operating instruments. They should be free of damages. If there are any cracks, fractures, discolouration, deformation or any damages on the implants, which may be due to unsuitable storing, imperfect sterilization or preliminary inefficient treatment, the use of the implant is prohibited. The assembly, perfect fitting and operation of the implants and all the necessary instruments should be tested. Perfect fitting and operation, appropriate dimensions and positions should be checked in all cases.

Requirements towards the user

The set of tools and implants can only be applied by doctors with appropriate qualifications and special information and experience in the field of using implants. The doctor who performs the operation is responsible for choosing the correct indication, the type of the implants and the operation technology.

Contraindication

Implantation is not recommended if the patient's health condition makes it difficult to accept it or problems are expected during the recovery process e.g. decreased circulation, weak quality or quantity bone system, impossibility of rehabilitation due to the mental condition of the patient etc.

General warnings

Before the operation the patient should be informed about the possible disadvantages of the implant. By choosing the appropriate implant the type of the bone fracture, the weight and activity of the patient should be taken into consideration. The solidity of the implant is restricted, so it is necessary to avoid overloading it by overweight. The biomechanical loading of the implant should be minimized, as much as possible.

During the application of the implant the process of recovering is to be controlled. By repetitive loading or by protracted bone recovering the implants may be deformed, dislocated. This needs intervention in time. Repeated deformation of the implant should be avoided. The implants are only for one-time use, a re-implantation is prohibited. The type and the size of the implants should be defined according to the specific case. Before operation the user's manual of the implants should be studied carefully.

Applied materials

The applied materials are made of best quality, specially developed for medical implants with high, solidity, made of titanium alloys.

Caution: Combined use of products from other manufacturers are prohibited and may start damaging processes, which **ORTHOMEDICAL** can't take the responsibility for. Protection of the product, packaging, preparation for the use of implants without any production pollution for packaging will be preserved.

The storage should be in a clean and dry environment, avoiding extrem temperature and chemicals are recommended.

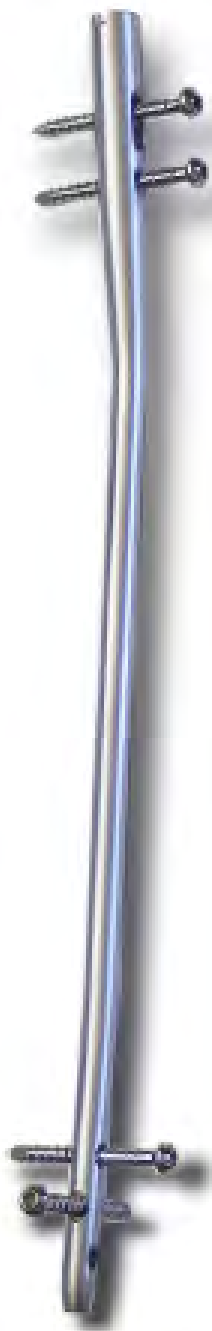
Sterilisation

Before use unpack the implant and sterilize due to the prescriptions. Avoid the touch by bare hand. The sterilisation of the instruments should be done together with the tray. The instructions of the producers should always be considered.

Interaction with medicines

An interaction of the implants with medicines is not known.

ORLOS TIBIAL NAILS



System of implants:

Tibial nail, cannulated:

Diameter: 8 mm, 9 mm, 10 mm, 11 mm, 12 mm, 13 mm

Length: from 270 mm to 420 mm

Material: titanium alloy

Recommended guide wire dimension: diameter 2.4mm x 900mm

Locking holes: on the side of lateral as well sagittal direction. The proximal locking as dynamic possible.

Locking screw: diameter 4.9 mm, length from 20 mm to 100 mm, titanium alloy

End cup, titanium alloy

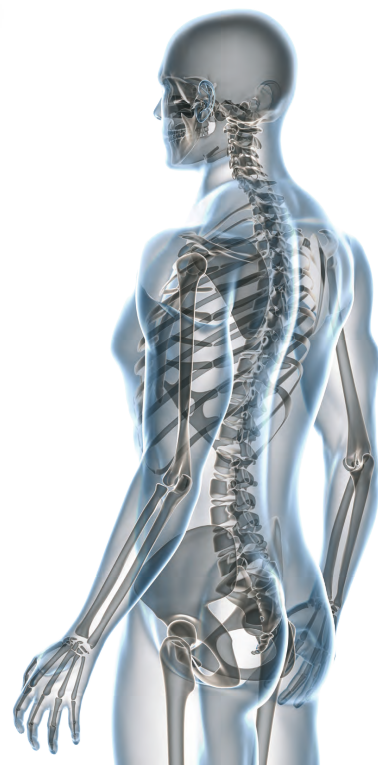


Anatomical fit, which ensures geometry.

For the locking of the proximal end you can choose either statical or dynamizing holes.



Either the lateral or sagittal direction is possible for distal locking.



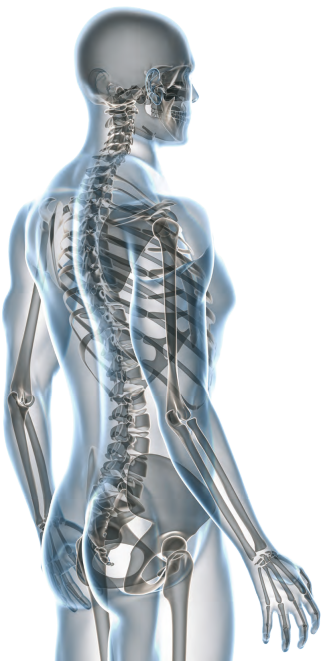
ORLOS TIBIAL NAILS

TIBIAL NAILS, CANNULATED

Diameter: 8 mm, 9 mm, 10 mm, 11 mm, 12 mm, 13 mm
Material: titanium alloy

	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
L (mm)	Ø 8 mm	Ø 9 mm	Ø 10 mm
	titanium alloy	titanium alloy	titanium alloy
270	NA-34010-08270	NA-34010-09270	NA-34010-10270
285	NA-34010-08285	NA-34010-09285	NA-34010-10285
300	NA-34010-08300	NA-34010-09300	NA-34010-10300
315	NA-34010-08315	NA-34010-09315	NA-34010-10315
330	NA-34010-08330	NA-34010-09330	NA-34010-10330
345	NA-34010-08345	NA-34010-09345	NA-34010-10345
360	NA-34010-08360	NA-34010-09360	NA-34010-10360
375	NA-34010-08375	NA-34010-09375	NA-34010-10375
390	NA-34010-08390	NA-34010-09390	NA-34010-10390
405	NA-34010-08405	NA-34010-09405	NA-34010-10405
420	NA-34010-08420	NA-34010-09420	NA-34010-10420

	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
L (mm)	Ø 11 mm	Ø 12 mm	Ø 13 mm
	titanium alloy	titanium alloy	titanium alloy
270	NA-34010-11270	NA-34010-12270	NA-34010-13270
285	NA-34010-11285	NA-34010-12285	NA-34010-13285
300	NA-34010-11300	NA-34010-12300	NA-34010-13300
315	NA-34010-11315	NA-34010-12315	NA-34010-13315
330	NA-34010-11330	NA-34010-12330	NA-34010-13330
345	NA-34010-11345	NA-34010-12345	NA-34010-13345
360	NA-34010-11360	NA-34010-12360	NA-34010-13360
375	NA-34010-11375	NA-34010-12375	NA-34010-13375
390	NA-34010-11390	NA-34010-12390	NA-34010-13390
405	NA-34010-11405	NA-34010-12405	NA-34010-13405
420	NA-34010-11420	NA-34010-12420	NA-34010-13420



END CUP SCREW FOR TIBIA NAILS

titanium alloy

CAT.NO. (REF.) LS-32400-08016



ORLOS FEMORAL NAILS

System of implants:

Femoral nail, cannulated:

Diameter: 9 mm, 10 mm, 11 mm, 12 mm, 13 mm

Length: from 300 mm to 480 mm

Material: stainless steel or titanium alloy

Recommended guide wire dimension: diameter 3.0mm x 900mm

Locking holes: on the side of lateral direction. Proximal locking with 6.5 mm as well 4.9 mm locking screws, proximal dynamisation.

Locking screw: diameter 4.9 mm, length from 20 mm to 100 mm, titanium alloy

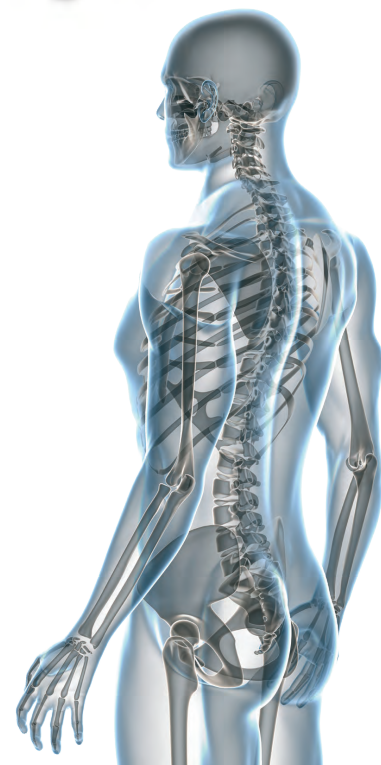
Locking screw: diameter 6.5 mm, length from 40 mm to 130 mm, titanium alloy

End cup, titanium alloy

The stem of the femoral nail is developed with anatomical bending.

The proximal end of the femoral nail ensures statical or dynamical locking.

For the statical locking, 6.5 mm locking bone screws can be chosen too.



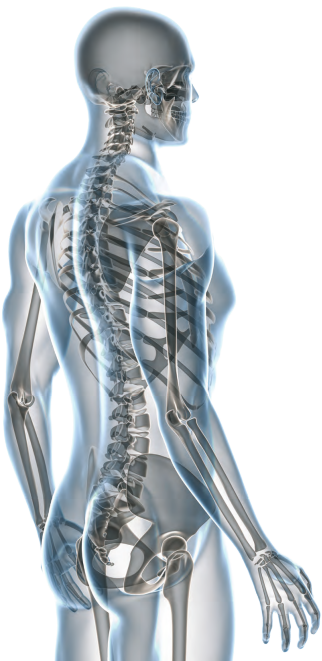
ORLOS FEMORAL NAILS

FEMORAL NAILS, CANNULATED

Diameter: 9 mm, 10 mm, 11 mm, 12 mm, 13 mm
Material: titanium alloy

	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
L (mm)	Ø 9 mm	Ø 10 mm	Ø 11 mm
	titanium alloy	titanium alloy	titanium alloy
300	NA-34240-09300	NA-34240-10300	NA-34240-11300
320	NA-34240-09320	NA-34240-10320	NA-34240-11320
340	NA-34240-09340	NA-34240-10340	NA-34240-11340
360	NA-34240-09360	NA-34240-10360	NA-34240-11360
380	NA-34240-09380	NA-34240-10380	NA-34240-11380
400	NA-34240-09400	NA-34240-10400	NA-34240-11400
420	NA-34240-09420	NA-34240-10420	NA-34240-11420
440	NA-34240-09440	NA-34240-10440	NA-34240-11440
460	NA-34240-09460	NA-34240-10460	NA-34240-11460
480	NA-34240-09480	NA-34240-10480	NA-34010-10480

	CAT.NO. (REF.)	CAT.NO. (REF.)	
L (mm)	Ø 12 mm	Ø 13 mm	
	titanium alloy	titanium alloy	
300	NA-34250-12300	NA-34250-13300	
320	NA-34250-12320	NA-34250-13320	
340	NA-34250-12340	NA-34250-13340	
360	NA-34250-12360	NA-34250-13360	
380	NA-34250-12380	NA-34250-13380	
400	NA-34250-12400	NA-34250-13400	
420	NA-34250-12420	NA-34250-13420	
440	NA-34250-12440	NA-34250-13440	
460	NA-34250-12460	NA-34250-13460	
480	NA-34250-12480	NA-34250-13480	



END CUP SCREW FOR FEMORALNAILS

titanium alloy

CAT.NO. (REF.) LS-32400-08011



ORLOS RETROGRADE FEMORAL NAILS

System of implants:

Retrograde femoral nail, cannulated:

Diameter: 9 mm, 10 mm, 11 mm, 12 mm, 13 mm

Length: 240 mm and 300 mm

Material: titanium alloy

Recommended guide wire dimension: diameter 3.0mm x 900mm

Locking holes: on the side of lateral direction. Distal locking with 6.5 mm as well 4.9 mm.

Proximal locking with 4.9 mm locking screws

Locking screw: diameter 4.9 mm, length from 20 mm to 100 mm, titanium alloy

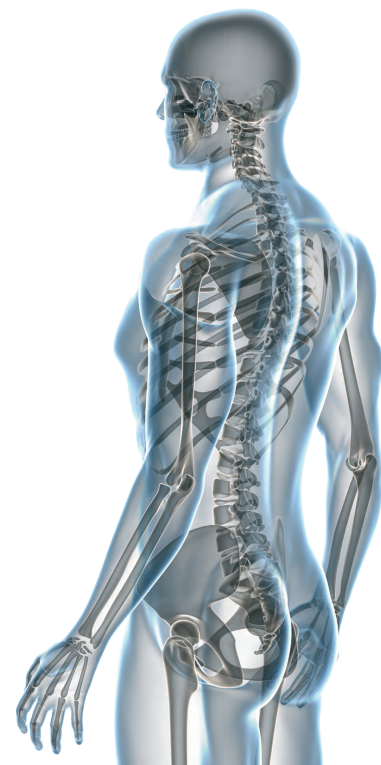
Locking screw: diameter 6.5 mm, length from 40 mm to 130 mm, titanium alloy

End cup, titanium alloy



The stem of the retrograde femoral nail is developed with anatomical bending.

For the statical locking of the distal end, 6,5 mm locking bone screws can be chosen too.



ORLOS RETROGRADE FEMORAL NAILS

RETROGRADE FEMORAL NAILS, SHORT, CANNULATED

Diameter: 9 mm, 10 mm, 11 mm, 12 mm, 13 mm
Material: titanium alloy

	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
L (mm)	Ø 9 mm	Ø 10 mm	Ø 11 mm
	titanium alloy	titanium alloy	titanium alloy
240	NA-34262-09240	NA-34262-10240	NA-34262-11240
300	NA-34262-09300	NA-34262-10300	NA-34262-11240

	CAT.NO. (REF.)	CAT.NO. (REF.)	
L (mm)	Ø 12 mm	Ø 13 mm	
	titanium alloy	titanium alloy	
240	NA-34262-12240	NA-34262-13240	
300	NA-34262-12300	NA-34262-13300	

END CUP SCREW FOR FEMORALNAILS

titanium alloy

CAT.NO. (REF.) LS-32400-08011



ORLOS LOCKING SCREW IMPLANTS

LOCKING SCREWS

Thread diameter: 4.9 mm
Core diameter: 4.2 mm
Pitch: 2.75 mm
Head diameter: 8.0 mm
Hex width: 3.5 mm



	CAT.NO. (REF.)		CAT.NO. (REF.)		CAT.NO. (REF.)
L (mm)	Ø 4.9 mm	L (mm)	Ø 4.9 mm	L (mm)	Ø 4.9 mm
	titanium alloy		titanium alloy		titanium alloy
20	LS-32200-49020	42	LS-32200-49042	64	LS-32200-49064
22	LS-32200-49022	44	LS-32200-49044	65	LS-32200-49065
24	LS-32200-49024	45	LS-32200-49045	66	LS-32200-49066
25	LS-32200-49025	46	LS-32200-49046	68	LS-32200-49068
26	LS-32200-49026	48	LS-32200-49048	70	LS-32200-49070
28	LS-32200-49028	50	LS-32200-49050	72	LS-32200-49072
30	LS-32200-49030	52	LS-32200-49052	75	LS-32200-49075
32	LS-32200-49032	54	LS-32200-49054	76	LS-32200-49076
34	LS-32200-49034	55	LS-32200-49055	78	LS-32200-49078
35	LS-32200-49035	56	LS-32200-49056	80	LS-32200-49080
36	LS-32200-49036	58	LS-32200-49058	85	LS-32200-49085
38	LS-32200-49038	60	LS-32200-49060	90	LS-32200-49090
40	LS-32200-49040	62	LS-32200-49062	100	LS-32200-49100

LOCKING SCREWS

Thread diameter: 6.5 mm
Core diameter: 4.4 mm
Pitch: 2.5 mm
Head diameter: 8.0 mm
Hex width: 3.5 mm



	CAT.NO. (REF.)		CAT.NO. (REF.)		
L (mm)	Ø 6.5 mm	L (mm)	Ø 6.5 mm		
	titanium alloy		titanium alloy		
40	LS-32201-65040	90	LS-32201-65090		
45	LS-32201-65045	95	LS-32201-65095		
50	LS-32201-65050	100	LS-32201-65100		
55	LS-32201-65055	105	LS-32201-65105		
60	LS-32201-65060	110	LS-32201-65110		
65	LS-32201-65065	115	LS-32201-65115		
70	LS-32201-65070	120	LS-32201-65120		
75	LS-32201-65075	125	LS-32201-65125		
80	LS-32201-65080	130	LS-32201-65130		
85	LS-32201-65085				

LOCKING SCREW AND END CUP SET: SET-011-0010-026 (NOT ILLUSTRATED)

CAT.NO.(REF.) TRAY-11-0010-026 FOR SCREW SET: CAT.NO.(REF.) SET-011-0010-0260

SET CONTENT: 4 PCS. 4.9MM LOCKING SCREWS, LENGTH 20MM UP TO 100MM

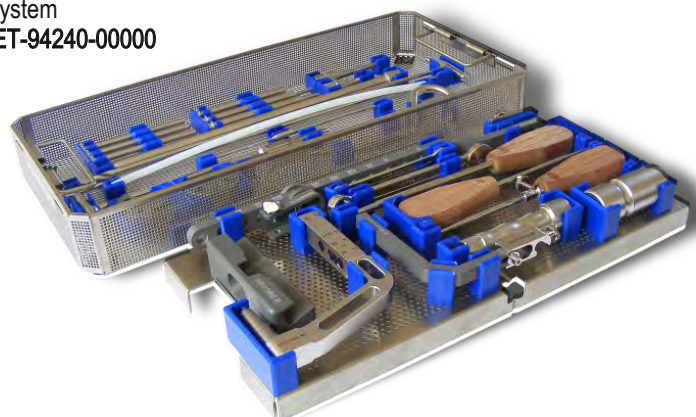
4 PCS. 6.5MM LOCKING SCREWS, LENGTH 40MM UP TO 120MM

4 PCS. END CUPS FEMOPRAL (MTT) / TIBIAL

ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENT SET

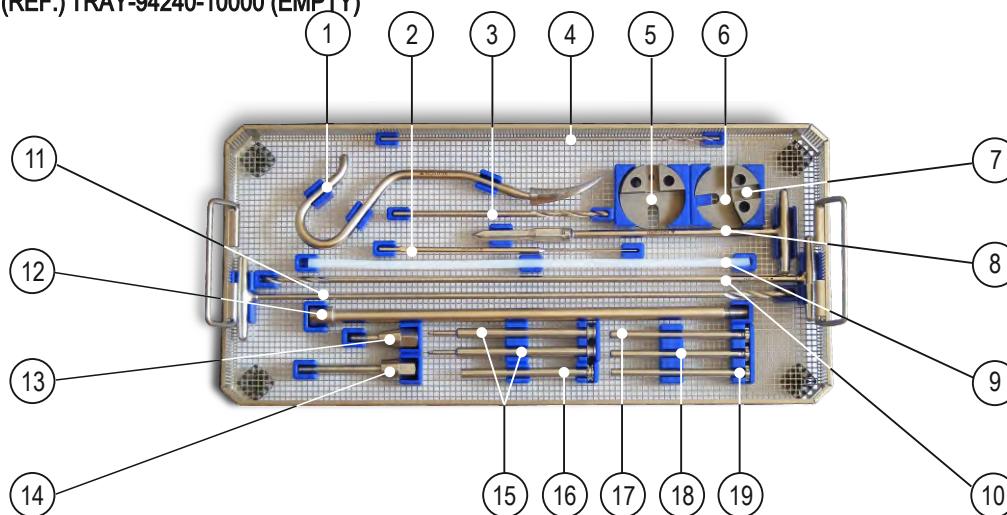
BASIC SURGICAL INSTRUMENT SET

Two Trays for Tibial-Femur -and retrograde Femoral Nailing System
Instrument Set, complete with Instruments: **CAT.NO.(REF.) SET-94240-00000**



TRAY I. FOR TIBIAL-FEMORAL -AND RETROGRADE FEMORAL NAILING SYSTEM

CAT.NO.(REF.) TRAY-94240-10000 (EMPTY)



POS.	CAT. NO. (REF.)	DESCRIPTION	PCS.
1.	INS-94240-00300	Awl	1
2.	INS-94240-01500	Length gauge	1
3.	INS-99010-60195	Spiral drill, Ø6.0 mm × L.195 mm	1
4.	INS-99010-42310	Spiral drill, Ø4.2 × L.310 mm	1
5.	INS-94240-00206	Femoral guide	1
6.	INS-94240-00205	Tibial guide	1
7.	INS-94240-01800	Screw, M6	1
8.	INS-94240-00400	Reamer, Ø14 mm	1
9.	INS-99000-00007	Teflon tube Ø8 mm / Ø6 mm × L.400 mm	1
10.	INS-94241-54240	Drill with T-handle, Ø6.0 × L.500 mm	1
11.	INS-94241-94240	Drill with T-handle, Ø8.0 × L.500 mm	1
12.	INS-94240-00500	Hammer shaft, cannulated	1
13.	INS-94240-00700	Threaded removal shaft	1
14.	INS-94240-00600	Threaded stem, cannulated	1
15.	INS-94240-02400	Hexagonal distal guide, Ø10 mm / Ø4.8 mm	2
16.	INS-94240-01100	Soft tissue protector, Ø10 mm / Ø8.1 mm	1
17.	INS-94240-00900	Drill sleeve, Ø8.0 mm / Ø3.6 mm	1
18.	INS-94240-01000	Drill sleeve, Ø8.0 mm / Ø4.2 mm	1
19.	INS-94240-00800	Drill sleeve, Ø8.0 mm / Ø6.1 mm	1

ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENTS



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
1.	INS-94240-00300	Curved awl	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
2.	INS-94240-01500	Length gauge for locking screws	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
3.	INS-99010-60195	Spiral drill, Ø6.0 mm × L.195 mm	1



POS.	CAT.NO.(REF.)	DESCRPITION	PCS.
4.	INS-99010-42310	Spiral drill, Ø4.2 mm × L.310 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
5.	INS-94240-00206	Femoral guide	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
6.-7.	INS-94240-00205	Tibial guide with M6 screw Cat.No.(REF.) INS-94240-01800)	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
8.	INS-94240-00400	Reamer with T-handle, Ø14 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
9.	INS-99000-00007	Teflon tube, Ø8 mm / Ø6.0 mm × L.400 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
10.	INS-94241-54240	Drill with T-handle, Ø6.0 mm × L.500 mm	1

ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENTS

POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
11.	INS-94241-94240	Drill with T-handle, Ø8 mm × L.500 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
12.	INS-94240-00500	Hammer shaft, cannulated	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
13.	INS-94240-00700	Threaded removal shaft	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
14.	INS-94240-00600	Threaded stem, cannulated	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
15.	INS-94240-02400	Hexagonal distal guide, Ø10 mm / Ø4.8 mm	2



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
16.	INS-94240-01100	Soft tissue protector sleeve, Ø10 mm / Ø8.1 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
17.	INS-94240-00900	Drill sleeve, Ø8.0 mm / Ø3.6 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
18.	INS-94240-01000	Drill sleeve, Ø8.0 mm / Ø4.2 mm	1



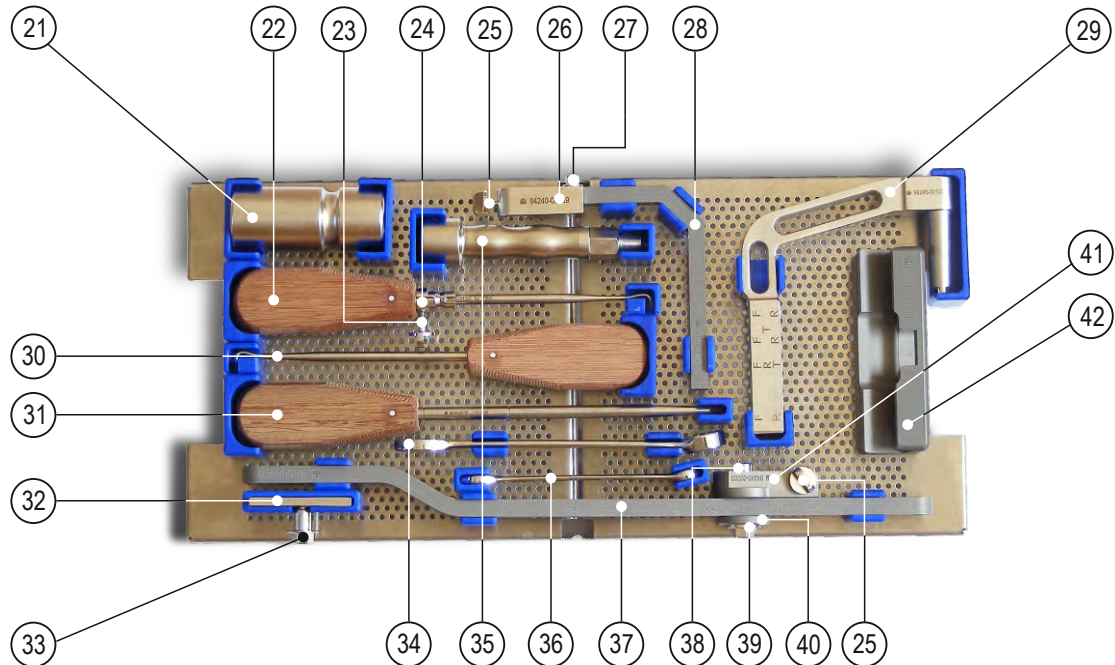
POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
19.	INS-94240-00800	Drill sleeve, Ø8.0 mm / Ø6.1 mm	1



ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENT SET

TRAY II. FOR TIBIAL-FEMORAL -AND RETROGRADE FEMORAL NAILING SYSTEM

CAT.NO.(REF.) TRAY- 94240-20000 (EMPTY)



POS.	CAT. NO. (REF.)	DESCRIPTION	PCS.
21.	INS-94240-01400	Hammer	1
22.	INS-94240-01300	Hook for tibial nail, 3 mm	1
23.	INS-94240-02200	Screw, M4	1
24.	INS-94240-00210	Holder ring for hook	1
25.	INS-94240-02300	Screw, M5	2
26.	INS-94240-00209	Holder	1
27.	INS-94240-01700	Screw for sagittal arm, M5	1
28.	INS-94240-00208	Sagittal arm	1
29.	INS-94240-00100	Proximal aiming arm	1
30.	INS-94240-01200	Hook for femoral nail, 3.5 mm	1
31.	INS-94240-02700	Screwdriver, 3.5 mm	1
32.	INS-94240-00207	Threaded fixing sheet	1
33.	INS-94240-01900	Screw, M8	1
34.	INS-99000-00009	Wrench, 17 mm	1
35.	INS-94240-00503	Hammer shaft block	1
36.	INS-99000-00008	Wrench, 11 mm	1
37.	INS-94240-00201	Distal aiming arm	1
38.	INS-94240-00202	Rail guiding shaft	1
39.	INS-94240-02000	Nut, M7	1
40.	INS-94240-00204	Washer	1
41.	INS-94240-00203	Rail holding sheet	1
42.	INS-94240-01600	Holder for aiming arm, previously on the tray mounted	1

ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENTS

POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
21.	INS-94240-01400	HAMMER	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
22.	INS-94240-01300	Hook for tibial nail, 3 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
23.	INS-94240-02200	Screw, M4	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
24.	INS-94240-00210	Holder ring for hook	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
25.	INS-94240-02300	Screw, M5	2



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
26.	INS-94240-00209	Holder	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
27.	INS-94240-01700	Screw for sagittal arm, M5	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
28.	INS-94240-00208	Sagittal arm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
29.	INS-94240-00100	Proximal aiming arm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
30.	INS-94240-01200	Hook for femoral nail, 3.5mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
31.	INS-94240-02700	Screwdriver, 3.5mm	1



ORLOS TIBIAL & FEMORAL NAIL BASIC SURGICAL INSTRUMENTS



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
32.	INS-94240-00207	Threaded fixing sheet	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
33.	INS-94240-01900	Screw, M8	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
34.	INS-99000-00009	Wrench, 17mm	1

POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
35.	INS-94240-00503	Hammer shaft block	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
36.	INS-99000-00008	Wrench, 11mm	1

POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
37.	INS-94240-00201	Distal aiming arm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
38.	INS-94240-00202	Rail guiding shaft	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
39.	INS-94240-02000	Nut, M7	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
40.	INS-94240-00204	Washer	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
41.	INS-94240-00203	Rail holding sheet	1



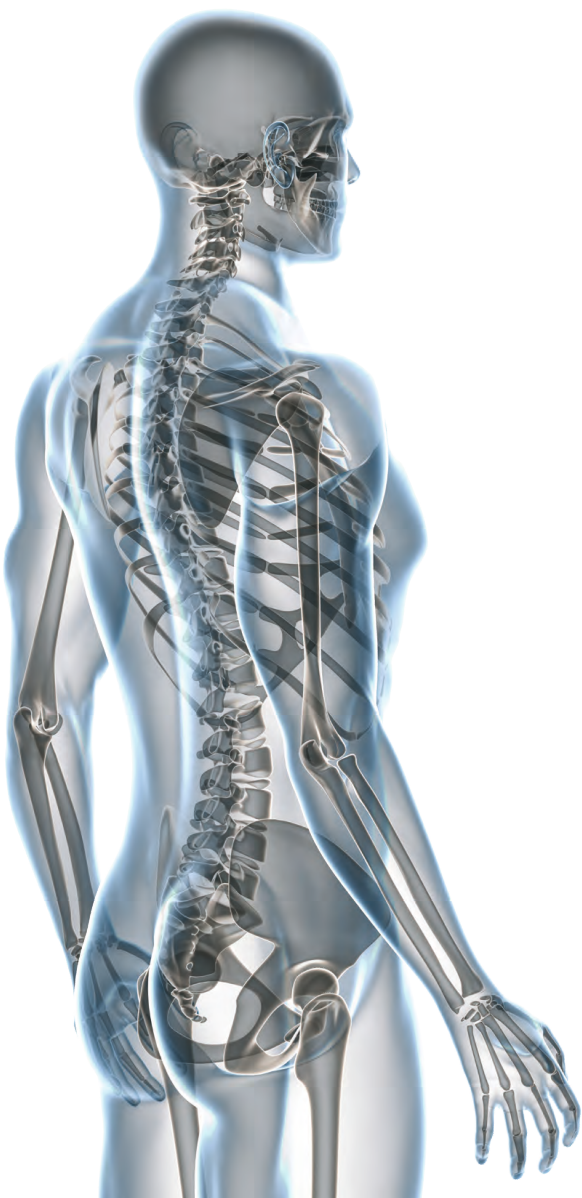
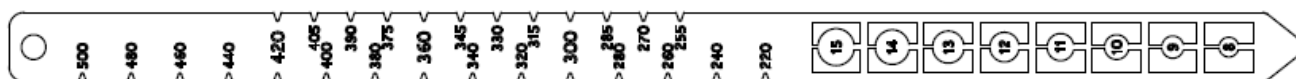
ORLOS TIBIAL & FEMORAL NAIL GUIDE WIRES

INFORMATION! NAIL GUIDE WIRE ARE NOT INCLUDED IN THE BASIC SURGICAL INSTRUMENT SET

CAT.NO.(REF.) 95-651.01 GUIDE ROD FOR IM NAIL DIA. 2.4MM X LENGTH 900MM

CAT.NO.(REF.) 95-651.02 GUIDE ROD FOR IM NAIL DIA. 3.0MM X LENGTH 900MM

CAT.NO.(REF.) 95-632.00 NAIL LENGTH GAUGE (NOT INCLUDED IN THE BASIC SURGICAL SET)



SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

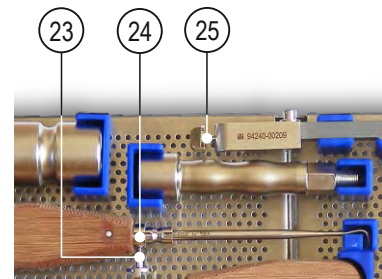
1 Preoperative planning

On preoperative X-rays measure the length of the uninjured limb to determine the proper nail length, diameter can be estimated by measuring the width of the intramedullary canal.

During measurement consider that X-rays are usually 10% magnified.

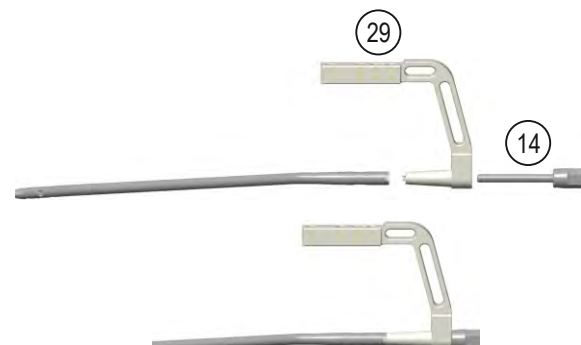


Numbers in brackets after instrument names refer to the list number in the instrument tray.



2 Assembling of the aiming arm with the nail

The tongue on the proximal aiming arm (29) match with the notch on the nail. The cannulated threaded stem (14) is placed through the aiming arm and must be tightened with the 11 mm wrench (36).

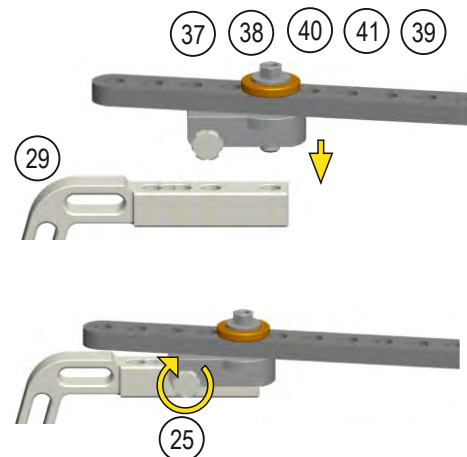


3 Assembling of the distal aiming rail with the proximal aiming arm

Steps 3-10 must be carried out only if you would like to use the distal aiming arm for distal interlocking instead of optical aiming with the image intensifier.

Attach the preassembled distal aiming rail (37, 38, 40, 41, 39) to the distal holes of the proximal aiming arm (29). Tighten the M5 screw (25) on the side of the distal aiming rail to secure the fixation.

You may use the holder for aiming arm (42) during distal aiming arm assembly.



SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING



4 Set the aiming rail according to the nail

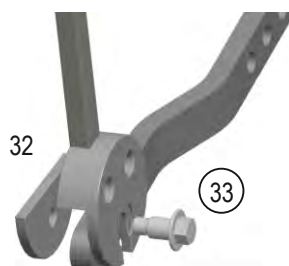
Loosen the M7 nut (39) on the distal aiming rail, and set the rail length according to the nail size.

Do not tighten the M7 nut!



5 Assembling of the sagittal arm

Connect the sagittal arm (28) to the femoral or tibial guide (6), tighten the M6 screw (7) with the 3.5 mm screwdriver (31).



6 Assembling of the sagittal arm with the aiming rail

Attach the sagittal arm to the aiming rail with the threaded fixing sheet (32) and the M8 screw (33).

Do not tighten the M8 screw!

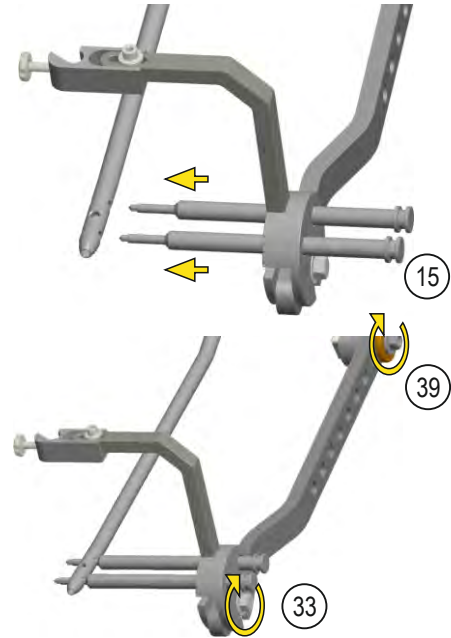


SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

7 Setting of the sagittal aiming arm

Stick the distal guides (15) into the holes on the femoral/tibial guide (6), and find the holes on the nail.

If the correct position is achieved tighten the M8 screw (33) with the 11 mm wrench (34) to fix the sagittal arm position and the M7 nut (39) to fix the distal aiming rail position.



8 Setting of the hook to the nail

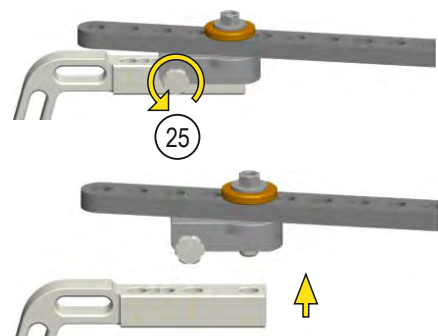
Put the holder ring (24, 23) on the hook for tibial nail (22).

Put the holder ring into the groove on the sagittal aiming arm, push the hook to the nail, and secure the holder ring position with the M4 screw (23).

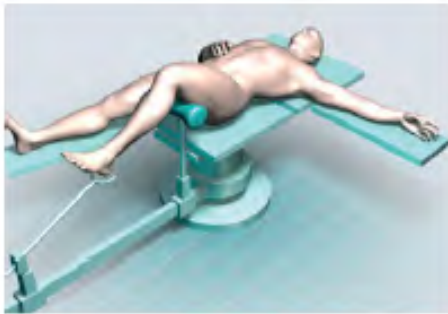


9 Remove of the distal aiming rail from the proximal aiming arm

Loosen the M5 screw (25) on the side of the distal aiming rail and remove the rail from the proximal aiming arm.



SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

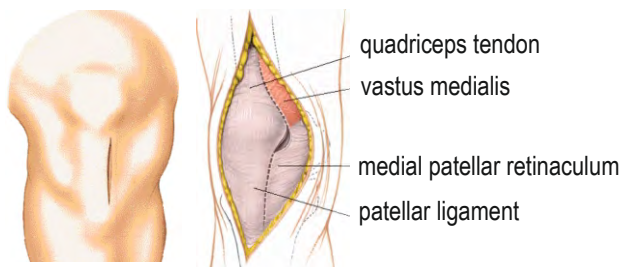


10 Patient positioning and reposition

The patient is placed in a supine position on a radiolucent table. The knee of the injured leg has to be able to flex at least 90°.

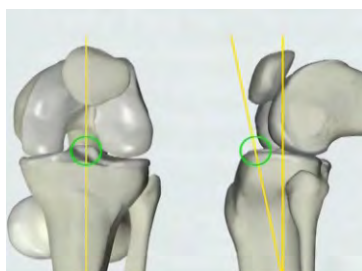
The image intensifier must be placed so that the tibia could be visualized in both a-p and lateral views. A leg holder is may be used to help for reduction and insertion of the nail. It must be placed under the lower thigh to avoid compression of neurovascular structures of the poplitear fossa.

The closed reduction is performed manually under image intensifier control using axial traction. The reduction can be temporarily fixed with reduction clamps.



11 Incision

Make a 5-cm long longitudinal transligamentous incision overlying the medial edge of the patella tendon.

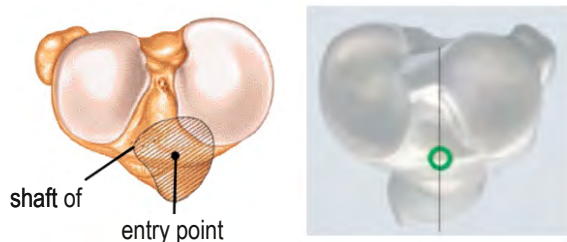


12 Determine of entry point

In a-p view the entry point is in line with the axis of the medullary canal and with the lateral tubercle of the intercondylar eminence.

In the lateral view the entry point is at the ventral edge of the tibial plateau and in line with the medullary canal.

Insert the guide wire 8-10 cm in the intramedullary canal of the tibia from the determined entry point. Its position must be checked with the image intensifier in a-p and lateral views.ay use the extraction device to support insertion.



SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

13 Opening of the intramedullary canal

The cannulated reamer (8) is inserted over the guide wire and the medullary canal is opened to a depth of 8-10 cm. The guide wire and the awl should not touch the posterior cortex.

Alternatively the awl (1) can be used for opening the medullary canal.

If necessary the medullary canal is enlarged to the desired diameter with a flexible reamer. Ream with 0.5 mm increments and ream 1 mm larger than the nail diameter. The reamer head is advanced with gentle back and forth movements, force must not be used.

Passage through the fracture zone and the correct position of the reaming rod are verified with the image intensifier.

14 Inserting of the nail

With the aiming arm (29) the nail can be introduced into the medullary canal. Slight rotational movements can help the insertion.

The passage of the nail through the fracture is monitored by the image intensifier in two planes to avoid malalignment.

In case of unstable fracture, reposition can be carried out in this step. The final position of the nail is verified in a-p and lateral views.

Never hit the aiming arm! In difficult cases you may use the extraction device (12, 21, 35) to support insertion.

15 Distal interlocking

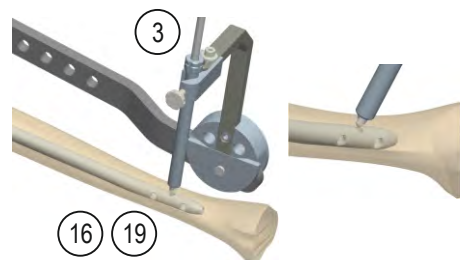
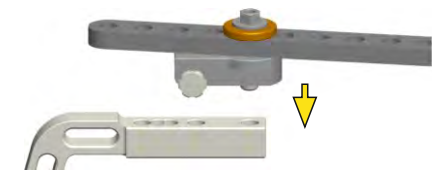
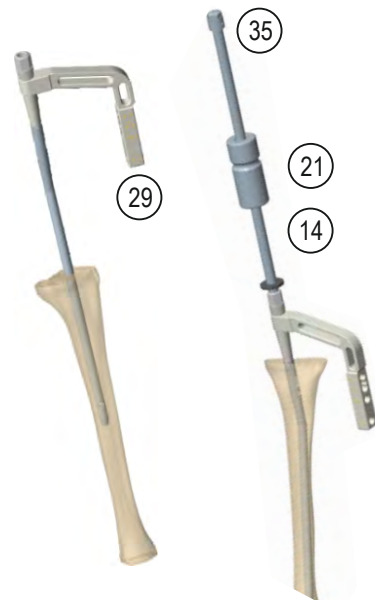
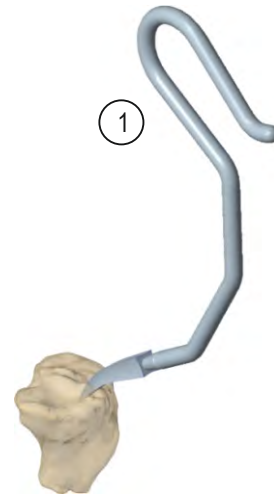
For distal interlocking you can use the distal aiming arm or optical aiming with the image intensifier. Use 4.9 mm screws for interlocking.

The nail is usually locked from the medial side.

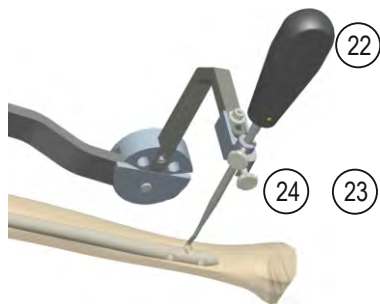
Mount the preassembled distal aiming arm to the proximal aiming arm (29) with the M5 screw (25).

Put the soft tissue protector (16) and 6 mm drill sleeve (19) into the groove of the sagittal aiming arm, incise the skin and drill through the anterior cortex of the tibia with the 6 mm drill (3).

Do not drill into the nail to protect the drill bit.



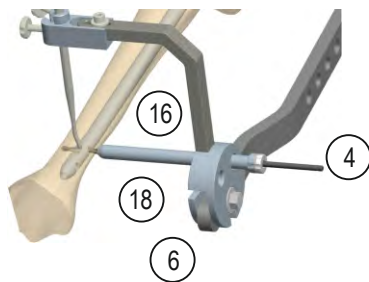
SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING



Put the tibial hook (22) into the drilled hole and hang it in the anterior cortex.

Hang the holder ring (24, 23) into the groove of the sagittal aiming arm.

If necessary loosen the M5 screw (25) to follow the deformation of the nail with the distal aiming arm.

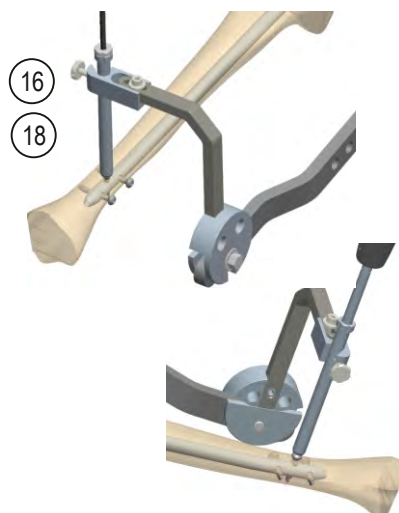


When the hook is in the anterior hole the lateral aiming holes are in a proper position.

Put the soft tissue protector (16) and 4.5 mm drill sleeve (18) in the lateral hole on the tibia guide (6), incise the skin and predrill with the 4.5 mm spiral drill (4) for both distal lateral interlocking screws.



Remove the drill guide, determine the length of interlocking screws with the length gauge (2) and screw in the proper interlocking screw through the soft tissue protector.



Remove the hook, put the soft tissue protector (16) with the 4.5 mm drill sleeve (18) into the groove of the sagittal aiming arm and drill through the nail and posterior cortex for the distal anterior interlocking screw.

Remove the drill guide, determine the length and screw in the proper interlocking screw through the soft tissue protector.

SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

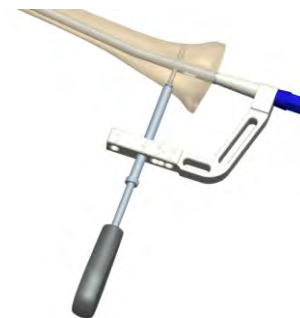
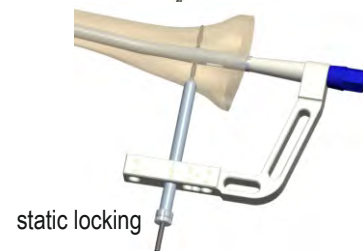
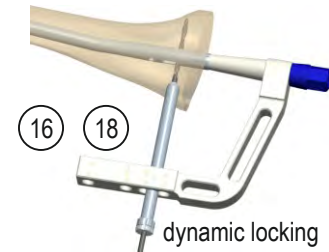
16 Proximal interlocking

There are two methods for locking: static and dynamic.

If the bone length and its rotation have to be maintained by the nail static locking must be carried out. If locking is for purely to ensure correct rotation of the tibia dynamic locking is appropriate.

Put soft tissue protector (16) with the inserted 4.5 mm drill sleeve (18) into the proper hole on the proximal aiming arm, incise the skin and predrill for proximal interlocking screw.

Remove the drill guide, determine the length and screw in the proper interlocking screw through the soft tissue protector.



17 Sealing

The end screw prevents tissue ingrowth into the proximal end of the nail and facilitates nail removal after successful healing of the fracture.

With the 3.5 mm screwdriver (31) screw in the end cap screw.



SURGICAL TECHNIQUE FOR ORLOS TIBIAL NAILING

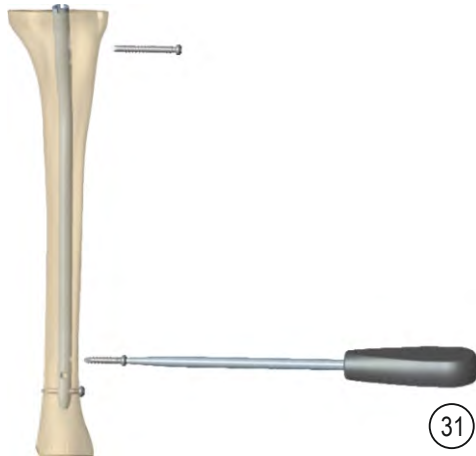
TIBIAL NAIL IMPLANT EXTRACTION

1 Removing of the cap screw



Remove the end cap screw with the 3.5 mm screwdriver (31).

2 Removing all except one interlocking screw



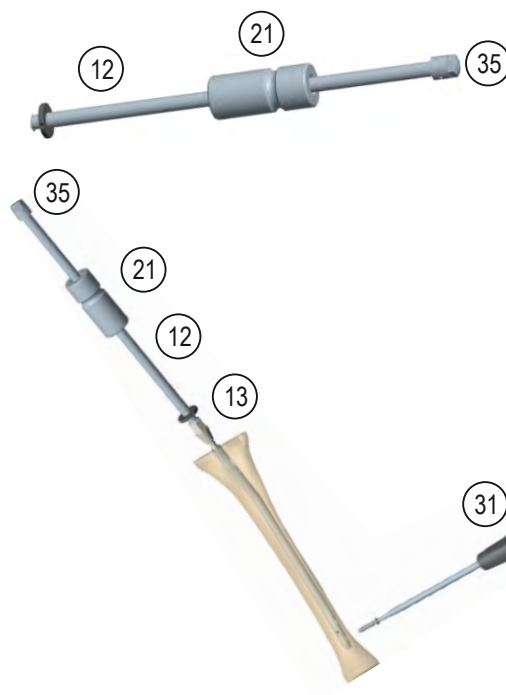
Remove the interlocking screws. One locking screw has to be left in the patient to prevent rotating or sliding away of the nail when the hammer guide is attached.

3 Connect the threaded removal shaft to the nail



Connect the threaded removal shaft (13) to the nail. You may insert a Kirschner wire into the cannulated nail in order to support insertion.

4 Assembly of the hammer

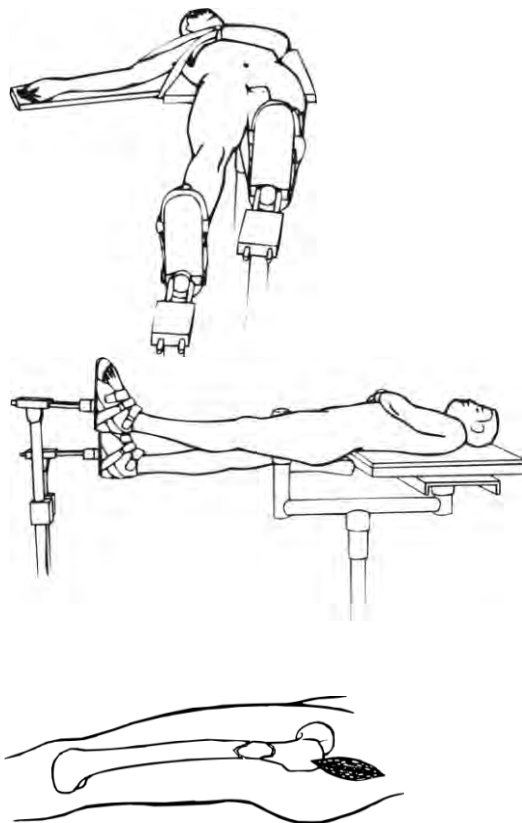
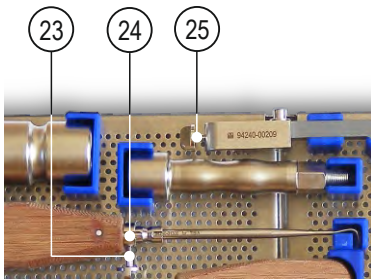


Put the slide hammer (21) over the cannulated hammer shaft (12), closing with the hammer shaft block (35).

5 Removing of the nail

Connect the assembled hammer to the threaded removal shaft (13) which is inserted in the nail. Before the removing of the nail do not forget to extract the last locking screw!

SURGICAL TECHNIQUE FOR ORLOS FEMORAL NAILING



Preoperative planning

On preoperative X-rays measure the length of the uninjured limb to determine the proper nail length, diameter can be estimated by measuring the width of the intramedullary canal.

During measurement consider that X-rays are usually 10% magnified.

Numbers in brackets after instrument names refer to the list number in the instrument tray.

2 Positioning of the patient

With the patient supine, abduct the unaffected limb while adducting the trunk and the affected extremity and flex the affected hip 15°.

Apply traction with a foot holder, and rotate the foot to obtain correct rotational alignment.

The image intensifier must be placed so that the femur could be visualized in both a-p and lateral view.

3 Incision

Make an approx. 5 cm long skin incision proximal to the greater trochanter.

Incise the fascia of the gluteus maximus, identify the subfascial plane, and palpate the greater trochanter.

SURGICAL TECHNIQUE FOR ORLOS FEMORAL NAILING

4 Opening of the medullary canal

Under image intensifier find the tip of the greater trochanter with the awl (1).

Ream the entry portal until the reamer sink into it.

If necessary the medullary canal is enlarged to the desired diameter with a flexible reamer.

Ream with 0.5 mm increments and ream 1 mm larger than the nail diameter. The reamer head is advanced with gentle back and forth movements, force must not be used.

Passage through the fracture zone and the correct position of the reaming rod are verified with the image intensifier.



5 Insertion of the nail

With the aiming arm (29) the nail can be introduced into the medullary canal. Slight rotational movements can help the insertion.

The passage of the nail through the fracture is monitored by the image intensifier in two planes to avoid malalignment. In case of unstable fracture, reposition can be carried out in this step.

The final position of the nail is verified in a-p and lateral views.

Never hit the aiming arm! In difficult cases you may use the extraction device to support insertion.

6 Distal interlocking

For distal interlocking you can use the distal aiming arm or optical aiming with the image intensifier. Use 4.9 mm screws for interlocking.

Mount the preassembled distal aiming arm to the proximal aiming arm (29) with the M5 screw (25).

Put the soft tissue protector (16) and 6 mm drill sleeve (19) into the groove of the sagittal aiming arm, incise the skin and drill through the anterior cortex of the femur with the 6 mm drill (3). Do not drill into the nail to protect the drill bit.

Put the femoral hook (30) into the drilled hole and hang it in the anterior cortex. Hang the holder ring (24, 23) into

the groove of the sagittal aiming arm. If necessary loosen the M5 screw (25) to follow the deformation of the nail with the distal aiming arm.

When the hook is in the anterior hole the lateral aiming holes are in a proper position. Put the soft tissue protector (16) and 4.5 mm drill sleeve (18) in the lateral hole on the femoral guide (5), incise the skin and predrill with the 4.5 mm spiral drill (4) for both distal lateral interlocking screws.

Remove the drill guide, determine the length of interlocking screws with the length gauge (2) and screw in the proper interlocking screw through the soft tissue protector.

SURGICAL TECHNIQUE FOR ORLOS FEMORAL NAILING



7 Proximal interlocking

There are two methods for locking: static and dynamic.

If the bone length and its rotation have to be maintained by the nail static locking must be carried out.

If locking is for purely to ensure correct rotation of the tibia dynamic locking is appropriate.

Put soft tissue protector (16) with the inserted 4.5 mm drill sleeve (18) into the proper hole on the proximal aiming arm, incise the skin and predrill for proximal interlocking screw.

Remove the drill guide, determine the length and screw in the proper interlocking screw through the soft tissue protector.

8 Sealing

The end screw prevents tissue ingrowth into the proximal end of the nail and facilitates nail removal after successful healing of the fracture.

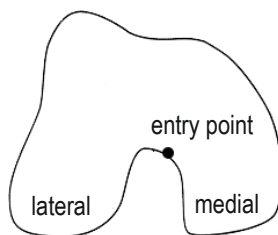
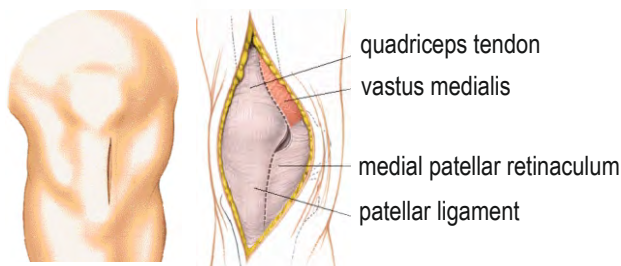
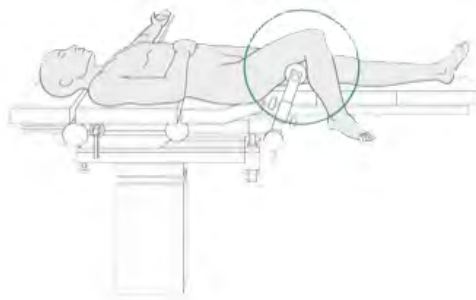
With the 3.5 mm screwdriver (31) screw in the end cap screw

FEMORAL NAIL IMPLANT EXTRACTION

9 Removing of the implants

Detailed description and pictures can be found on page 25.

SURGICAL TECHNIQUE FOR ORLOS RETROGRADE FEMORAL NAILING



Note

For standard nomenclature we use the same name for instruments; however at this approach the proximal part of the nail is at the distal part of the bone and vice versa.

1 Patient positioning and reposition

The patient is placed in a supine position on a radiolucent table, the knee of the injured leg is flexed at 70–90°.

The image intensifier must be placed so that the femur could be visualized in both a-p and lateral views.

2 Incision

For supracondylar or diaphyseal fractures either medial parapatellar or transligament approach is used.

For supradiacondylar fractures, which usually first require a screw fixation of the joint fracture, a medial parapatellar incision is appropriate.

3 Determine of entry point

The entry point of the nail is in the axis of the medullary canal just below to the crest of the intercondylar notch, slightly on the medial side.

Under fluoroscopic control insert a Kirschner wire 10-15 cm into the medullary canal. In case of intraarticular type C fractures the condylar mass requires treatment first.

After reduction of the fracture it must be fixed with two cancellous bone screws ventrally to the medullary canal.

4 Opening of the medullary canal

Insert the cannulated 14 mm reamer (8) over the Kirschner wire to enlarge the entry portal.

Ream the distal femur until the reamer sink into it. If necessary the medullary canal is enlarged to the desired diameter with a flexible reamer. Ream with 0.5 mm increments and ream 1 mm larger than the nail diameter. The reamer head is advanced with gentle back and forth movements, force must not be used. Passage through the fracture zone and the correct position of the reaming rod are verified with the image intensifier.

SURGICAL TECHNIQUE FOR ORLOS RETROGRADE FEMORAL NAILING

5 Insertion of the nail

With the aiming arm (29) the nail can be introduced into the medullary canal. Slight rotational movements can help the insertion.

The passage of the nail through the fracture is monitored by the image intensifier in two planes to avoid malalignment. In case of unstable fracture, reposition can be carried out in this step.

The final position of the nail is verified in a-p and lateral views, the end of the nail should be 2-5 mm beyond the knee articular cartilage.

Never hit the aiming arm! In difficult cases you may use the extraction device to support insertion.

6 Distal interlocking

Distal interlocking is performed on the proximal part of the femur at this approach. For distal interlocking you can use the distal aiming arm or optical aiming with the image intensifier.

Use 4.9 mm screws for interlocking.

The nail is usually locked from the medial side.

Mount the preassembled distal aiming arm to the proximal aiming arm (29) with the M5 screw (25).

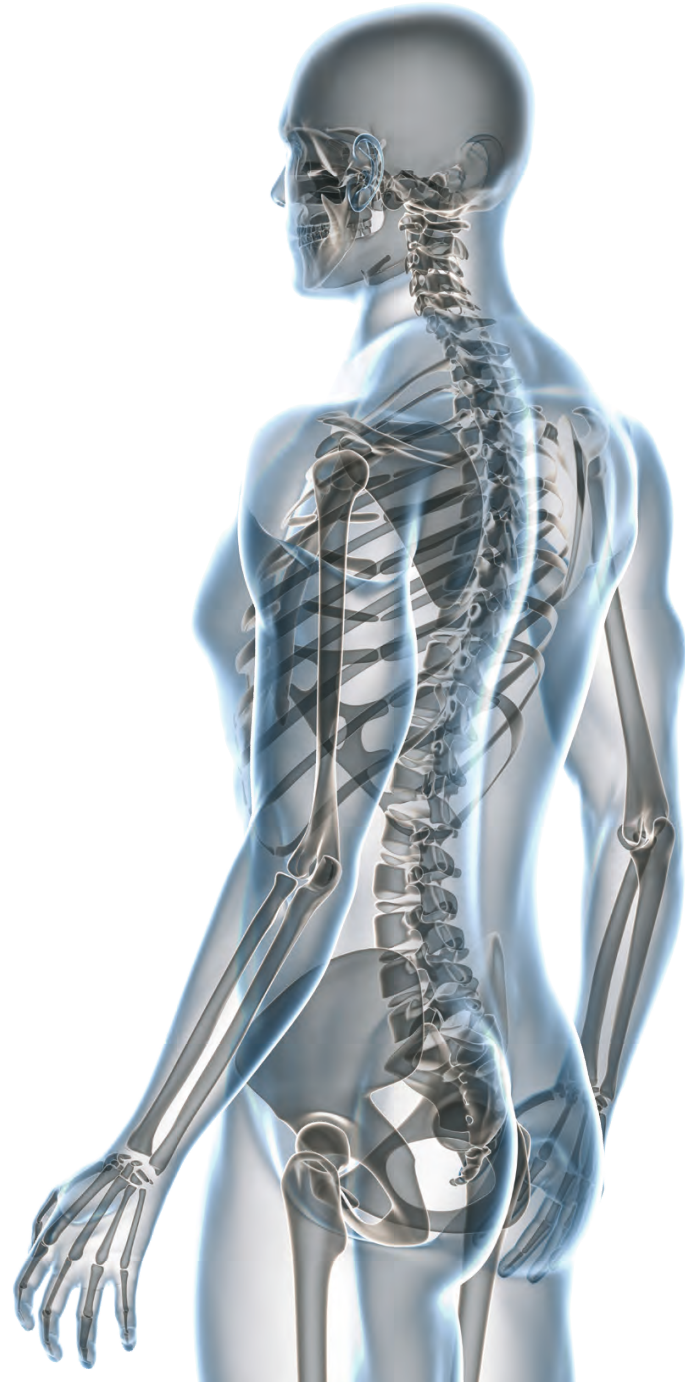
Put the soft tissue protector (16) and 6 mm drill sleeve (19) into the groove of the sagittal aiming arm, incise the skin and drill through the anterior cortex of the femur with the 6 mm drill (3).
Do not drill into the nail to protect the drill bit.

Put the femoral hook (30) into the drilled hole and hang it in the anterior cortex. Hang the holder ring (24, 23) into the groove of the sagittal aiming arm.

If necessary loosen the M5 screw (25) to follow the deformation of the nail with the distal aiming arm.

When the hook is in the anterior hole the lateral aiming holes are in a proper position. Put the soft tissue protector (16) and 4.5 mm drill sleeve (18) in the lateral hole on the femoral guide (5), incise the skin and predrill with the 4.5 mm spiral drill (4) for both distal lateral interlocking screws.

Remove the drill guide, determine the length of interlocking screws with the length gauge (2) and screw in the proper interlocking screw through the soft tissue protector.



SURGICAL TECHNIQUE FOR ORLOS RETROGRADE FEMORAL NAILING

7 Proximal interlocking

Put soft tissue protector (16) with the inserted 4.5 mm drill sleeve (18) into the proper hole on the proximal aiming arm, incise the skin and predrill for proximal interlocking screws.

Remove the drill guide, determine the length and screw in the proper interlocking screw through the soft tissue protector.

8 Sealing

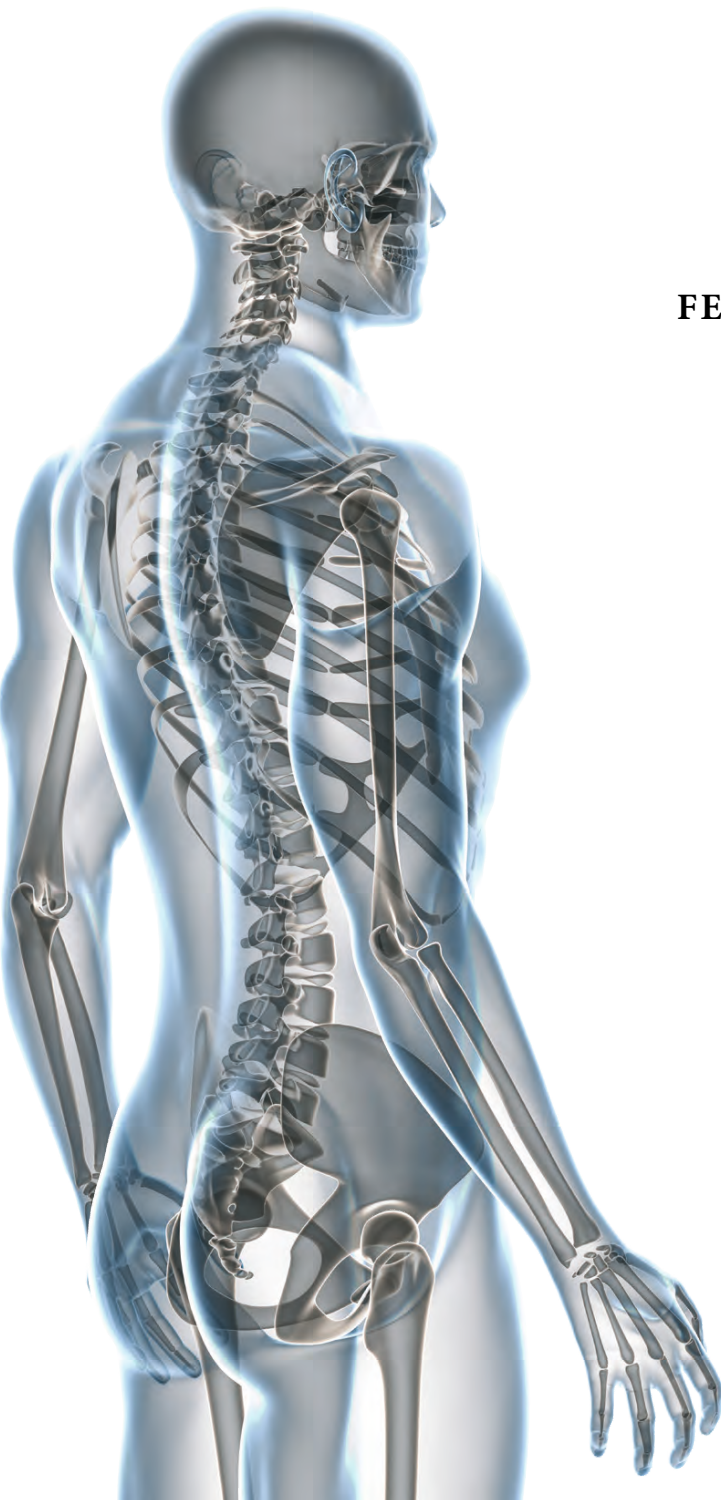
The end screw prevents tissue ingrowth into the proximal end of the nail and facilitates nail removal after successful healing of the fracture.

With the 3.5 mm screwdriver (31) screw in the end cap screw

FEMORAL NAIL IMPLANT EXTRACTION

9 Removing of the implants

Detailed description and pictures can be found on page 25.



ORLOS TIBIAL NAILS

System of implants:

Multilocking tibial treatment nail (MTT), cannulated:

Diameter: 8 mm, 9 mm, 10 mm, 11 mm, 12 mm = proximal diameter 12mm

Diameter: 13 mm = proximal diameter 13 mm

Length: from 270 mm to 420 mm

Material: titanium alloy

Recommended guide wire dimension: diameter 2.4mm x 900mm

Locking holes: on the side of lateral as well sagittal direction. The proximal locking as dynamic possible.
Locking screw: diameter 4.9 mm, length from 20 mm to 100 mm, titanium alloy

End cup, titanium alloy



Proximal end of the MTT nail with anatomical fit, which ensures the geometry

The four fixing direction of the proximal end extend the applicability of the MTT nail. On request rigid or dynamical osteosyntheses can be created by the energizing slot.



Distal end of the MTT nail

On the distal end we can use four lockig planes: AP direction, locking from the two lateral diractions and and one antero-lateral fixing. The fixation of ditsal fractures can be done by the locking holes, which following directly to the end of the nail.

ORLOS TIBIAL NAILS

MULTILOCKING TIBIAL TREATMENT NAILS (MTT), CANNULATED

Diameter: 8 mm, 9 mm, 10 mm, 11 mm, 12 mm, 13 mm
Material: titanium alloy

L (mm)	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
	Ø 8 mm	Ø 9 mm	Ø 10 mm
	titanium alloy	titanium alloy	titanium alloy
270	NA-34040-08270	NA-34040-09270	NA-34040-10270
285	NA-34040-08285	NA-34040-09285	NA-34040-10285
300	NA-34040-08300	NA-34040-09300	NA-34040-10300
315	NA-34040-08315	NA-34040-09315	NA-34040-10315
330	NA-34040-08330	NA-34040-09330	NA-34040-10330
345	NA-34040-08345	NA-34040-09345	NA-34040-10345
360	NA-34040-08360	NA-34040-09360	NA-34040-10360
375	NA-34040-08375	NA-34040-09375	NA-34040-10375
390	NA-34040-08390	NA-34040-09390	NA-34040-10390
405	NA-34040-08405	NA-34040-09405	NA-34040-10405
420	NA-34040-08420	NA-34040-09420	NA-34040-10420

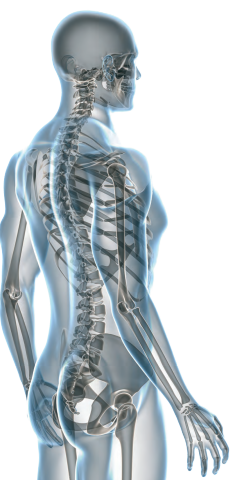
L (mm)	CAT.NO. (REF.)	CAT.NO. (REF.)	CAT.NO. (REF.)
	Ø 11 mm	Ø 12 mm	Ø 13 mm
	titanium alloy	titanium alloy	titanium alloy
270	NA-34040-11270	NA-34040-12270	NA-34040-13270
285	NA-34040-11285	NA-34040-12285	NA-34040-13285
300	NA-34040-11300	NA-34040-12300	NA-34040-13300
315	NA-34040-11315	NA-34040-12315	NA-34040-13315
330	NA-34040-11330	NA-34040-12330	NA-34040-13330
345	NA-34040-11345	NA-34040-12345	NA-34040-13345
360	NA-34040-11360	NA-34040-12360	NA-34040-13360
375	NA-34040-11375	NA-34040-12375	NA-34040-13375
390	NA-34040-11390	NA-34040-12390	NA-34040-13390
405	NA-34040-11405	NA-34040-12405	NA-34040-13405
420	NA-34040-11420	NA-34040-12420	NA-34040-13420



END CUP SCREW FOR MULTILOCKING TIBIAL TREATMENT NAILS (MTT)

titanium alloy

CAT.NO. (REF.) LS-32400-08011



ORLOS LOCKING SCREW IMPLANTS

LOCKING SCREWS

Thread diameter: 4.9 mm
Core diameter: 4.2 mm
Pitch: 2.75 mm
Head diameter: 8.0 mm
Hex width: 3.5 mm



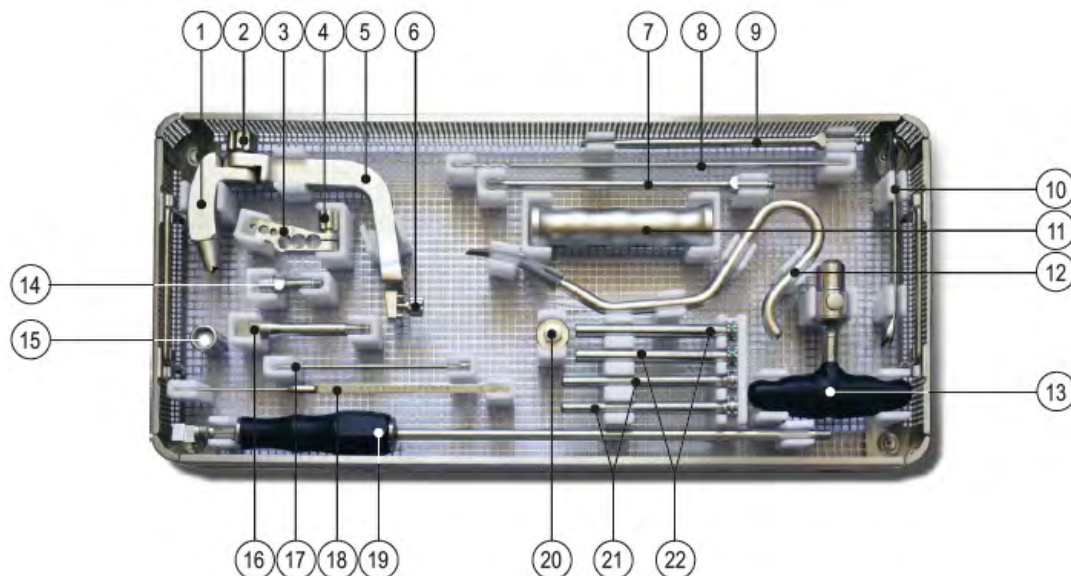
	CAT.NO. (REF.)		CAT.NO. (REF.)		CAT.NO. (REF.)	
L (mm)	Ø 4.9 mm	L (mm)	Ø 4.9 mm	L (mm)	Ø 4.9 mm	L (mm)
	titanium alloy		titanium alloy		titanium alloy	
20	LS-32200-49020	42	LS-32200-49042	64	LS-32200-49064	
22	LS-32200-49022	44	LS-32200-49044	65	LS-32200-49065	
24	LS-32200-49024	45	LS-32200-49045	66	LS-32200-49066	
25	LS-32200-49025	46	LS-32200-49046	68	LS-32200-49068	
26	LS-32200-49026	48	LS-32200-49048	70	LS-32200-49070	
28	LS-32200-49028	50	LS-32200-49050	72	LS-32200-49072	
30	LS-32200-49030	52	LS-32200-49052	75	LS-32200-49075	
32	LS-32200-49032	54	LS-32200-49054	76	LS-32200-49076	
34	LS-32200-49034	55	LS-32200-49055	78	LS-32200-49078	
35	LS-32200-49035	56	LS-32200-49056	80	LS-32200-49080	
36	LS-32200-49036	58	LS-32200-49058	85	LS-32200-49085	
38	LS-32200-49038	60	LS-32200-49060	90	LS-32200-49090	
40	LS-32200-49040	62	LS-32200-49062	100	LS-32200-49100	



ORLOS MTT BASIC SURGICAL INSTRUMENT SET

BASIC SURGICAL INSTRUMENT SET

Tray for Multilocking Tibial Treatment (MTT) Nailing Instrument Set, complete with Instruments:
 CAT.NO.(REF.) SET-94030-00000



TRAY FOR MULTILOCKING TIBIAL TREATMENT (MTT),NAILING INSTRUMENT SET

CAT.NO.(REF.)TRAY-94030-10000 (EMPTY)

POS.	CAT. NO.(REF.)	DESCRIPTION	PCS.
1.	INS-94030-00100	Nail holder aiming device	1
2.	INS-94030-00400	Aiming arm clamp screw	1
3.	INS-94030-00300	Aiming arm attachment	1
4.	INS-94030-00500	Screw for clamping of the sleeve	1
5.	INS-94030-00200	Aiming arm	1
6.	INS-94030-00600	Aiming arm attachment clamp screw	1
7.	INS-94030-01300	Screw driver, quick coupling, 3.5 × 200 mm	1
8.	INS-99010-40280	Spiral drill with three faceted chuck, 4 × 280 mm	1
9.	INS-94030-00800	Wrench with round end, quick coupling, 8 mm	1
10.	INS-99000-00004	Wrench, 12 mm	1
11.	INS-94500-01100	Slide hammer	1
12.	INS-94010-00500	Awl	1
13.	INS-99000-00006	T-wrench with quick coupling, cannulated	1
14.	INS-94030-00700	Nail clamping device	1
15.	INS-94500-01004	Fixation sleeve for removal device	1
16.	INS-94030-01400	Attachment for hammer guide	1
17.	INS-94030-01100	Pointer	1
18.	INS-94030-01200	Length gauge	1
19.	INS-94500-01000	Hammer guide shaft	1
20.	INS-94500-02501	Bumper for hammer guide	1
21.	INS-94030-01000	Drill guide sleeve, 8/4.2 mm	2
22.	INS-94030-00900	Soft tissue protector, 10/8.2 mm	2

ORLOS MTT BASIC SURGICAL INSTRUMENTS



POS.	CAT. NO.(REF.)	DESCRIPTION	PCS.
1.	INS-94030-00100	Nail holder aiming device	1



POS.	CAT. NO.(REF.)	DESCRIPTION	PCS.
2.	INS-94030-00400	Aiming arm clamp screw	1



POS.	CAT. NO.(REF.)	DESCRIPTION	PCS.
3.	INS-94030-00300	Aiming arm attachment	1



POS.	CAT. NO.(REF.)	DESCRIPTION	PCS.
4.	INS-94030-00500	Screw for clamping of the sleeve	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
5.	INS-94030-00200	Aiming arm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
6.	INS-94030-00600	Aiming arm attachment clamp screw	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
7.	INS-94030-01300	Screw driver, quick coupling, 3.5 x 200 mm	1

ORLOS MTT BASIC SURGICAL INSTRUMENTS

POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
8.	INS-99010-40280	Spiral drill with three faceted chuck 4 × 280 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
9.	INS-94030-00800	Wrench with round end, quick coupling 8 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
10.	INS-99000-00004	Wrench 12 mm	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
11.	INS-94500-01100	Slide hammer	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
12.	INS-94010-00500	Awl	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
13.	INS-99000-00006	T-wrench with quick coupling, cannulated	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
14.	INS-94030-00700	Nail clamping device	1



ORLOS MTT BASIC SURGICAL INSTRUMENTS



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
15.	INS-94500-01004	Fixation sleeve for removal device	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
16.	INS-94030-01400	Attachment for hammer guide	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
17.	INS-94030-01100	Pointer	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
18.	INS-94030-01200	Length gauge	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
19.	INS-94500-01000	Hammer guide shaft	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
20.	INS-94500-02501	Bumper for hammer guide	1



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
21.	INS-94030-01000	Drill guide sleeve 8/4.2 mm	2



POS.	CAT.NO.(REF.)	DESCRIPTION	PCS.
22.	INS-94030-00900	Soft tissue protector 10/8.2 mm	2

SURGICAL TECHNIQUE FOR ORLOS MTT NAILING

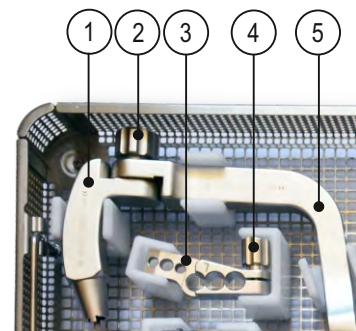
1 Preoperative planning

On preoperative X-rays measure the length of the uninjured limb to determine the proper nail length, diameter can be estimated by measuring the width of the intramedullary canal.

During measurement consider that X-rays are usually 10% magnified.



Numbers in brackets after instrument names refer to the list number in the instrument tray.



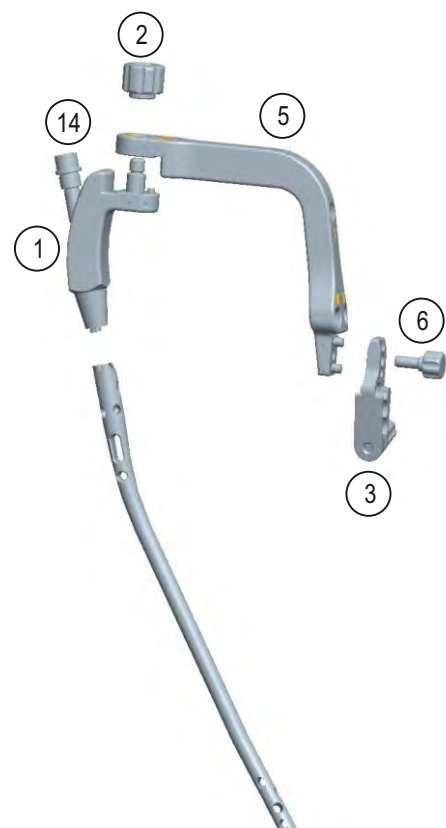
2 Assembling of the aiming arm with the nail

After determining the appropriate size we can choose the implant and with the help of the connection bit we can fix it with the nail holder aiming device. (1) The formation of the connection surfaces precludes the false assembly. We ensure the nail and the holder by nail clamping device. (14)

Before the operation please make sure that the aiming arm focuses on the location of the proximal locking holes.

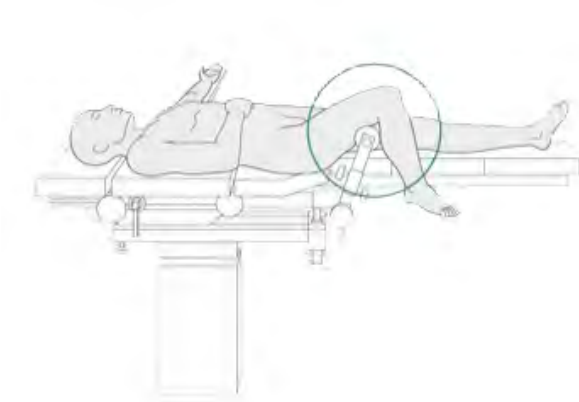
Install the aiming arm (5) to the pin of the nail holder aiming device (1) and turn it to the sagittal direction at the beginning. For finding the directions quickly, the markings on the nail holder aiming device (1) and on the aiming arm could be helpful. We can get the sagittal aiming position if the hole with „I” marking whole suits to the finger marked pin of the nail holder aiming device (1). We can ensure the set position with clamp screw (2). We can check the precision of the aiming device by leading the soft tissue protector (5), drill sleeve and drill into the appropriate hole through the aiming arm. The half loosening of the clamp screw (2) allows checking the precision of the remaining whole position (II and III marking) by turning over the aiming arm (5).

The aiming of the fixing position of the lateral locking hole and the energizing slot is ensured by the attachment with the appropriate attachment (3). After tightening of the clamp screw (6) check this function of aiming arm too.



SURGICAL TECHNIQUE FOR ORLOS MTT NAILING

3 Patient positioning and reposition

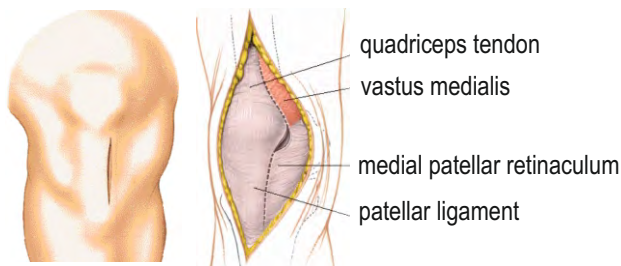


The patient is placed in a supine position on a radiolucent table. The knee of the injured leg has to be able to flex at least 90°.

The image intensifier must be placed so that the tibia could be visualized in both a-p and lateral views. A leg holder is may be used to help for reduction and insertion of the nail. It must be placed under the lower thigh to avoid compression of neurovascular structures of the poplitear fossa.

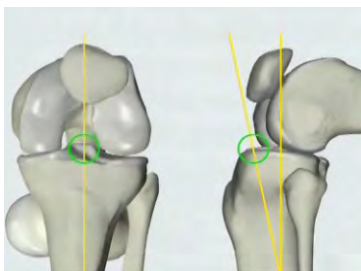
The closed reduction is performed manually under image intensifier control using axial traction. The reduction can be temporarily fixed with reduction clamps.

4 Incision



Make a 5-cm long longitudinal transligamentary incision overlying the medial edge of the patella tendon.

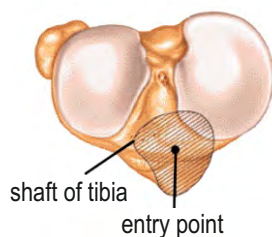
5 Determine of entry point



In a-p view the entry point is in line with the axis of the medullary canal and with the lateral tubercle of the intercondylar eminence.

In the lateral view the entry point is at the ventral edge of the tibial plateau and in line with the medullary canal.

Insert the guide wire 8-10 cm in the intramedullary canal of the tibia from the determined entry point. Its position must be checked with the image intensifier in a-p and lateral views.ay use the extraction device to support insertion.



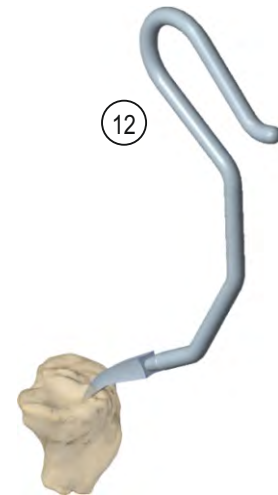
SURGICAL TECHNIQUE FOR ORLOS MTT NAILING

6 Opening of the intramedullary canal

The awl (12) can be used for opening the medullary canal.

If necessary the medullary canal is enlarged to the desired diameter with a flexible reamer. Ream with 0.5 mm increments and ream 1 mm larger than the nail diameter. The reamer head is advanced with gentle back and forth movements, force must not be used.

Passage through the fracture zone and the correct position of the reaming rod are verified with the image intensifier.



7 Leading the nail in

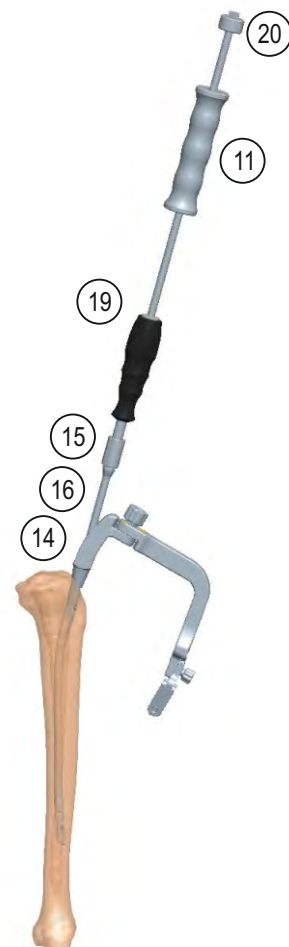
It can be done by the aiming arm. If necessary, we can gently use the slide hammer.

We fix to the nail clamping device (14) the attachment for hammer guide (16), which connects the hammer guide (19). The locking surfaces are kept together by the fixation sleeve for removal device (15).

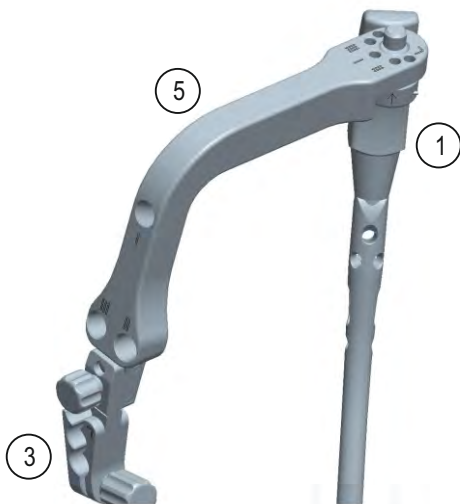
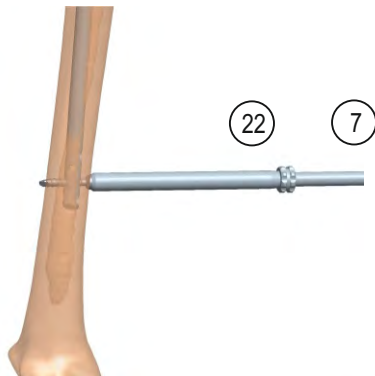
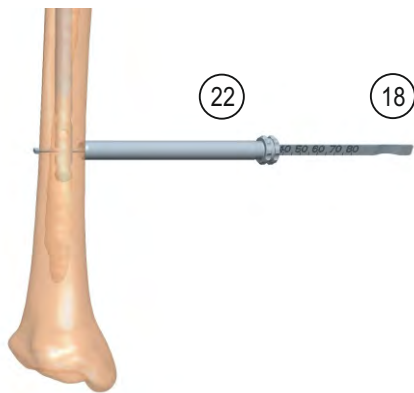
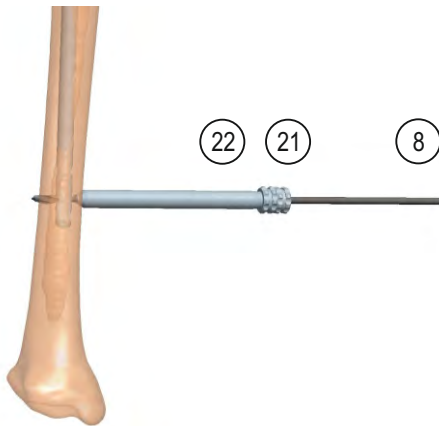
We install the slide hammer (11) to the stem, then we close the end by bumper for hammer guide. (20)

With gentle hits drive the nail to the required position.

Check on the image intensifier if the reposition is correct and the nail stands in the appropriate position.



SURGICAL TECHNIQUE FOR ORLOS MTT NAILING



8 Distal locking

First of all we make the distal locking. The distal end of the nail allows us for using four locking planes, so the different fracture cases can be fixed from optimal direction.

The distal holes are created by hand. The accurate drill axes are determined by the two way records of the X-ray image intensifier.

We create a core hole through both side of the cortocalis with the use of the soft tissue protector (22), the drill guide sleeve (21) and the 4x280mm spiral drill (8).

By keeping the soft tissue protector (22) we measure the length of the screw. We hang the length gauge (18) to the cortocalis which stands on the other side. We can read the value from the edge of the soft tissue protector, which shows directly the necessary screw length.

We build up the screw driver with the help of the T-wrench with quick coupling (13) and the screw driver, quick coupling (7), we drive the selected locking screw through the soft tissue protector (22).

9 The operational principle of the proximal aiming holes

The targeting of the proximal locking holes is possible by only one universal aiming arm. The aiming arm can be turned over and we need to fix to the direction which enables that the finger stands in one line (e.g.: the marking of the sagittal plane: "I") with marked hole for locking ("I" "II" or "III").

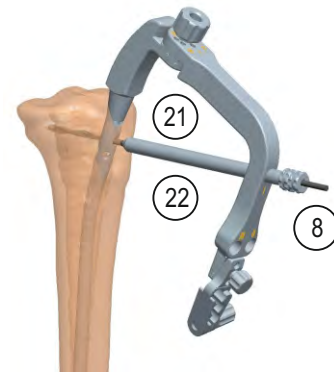
The MTT nail is universal, so we can use it for the left and right tibia as well. The location of the lateral proximal lockings is only possible by left and right aiming arm attachment (3). The marking is placed –avoiding the fibula- as the driving in of the locking screws need to be done from the medial.

SURGICAL TECHNIQUE FOR ORLOS MTT NAILING

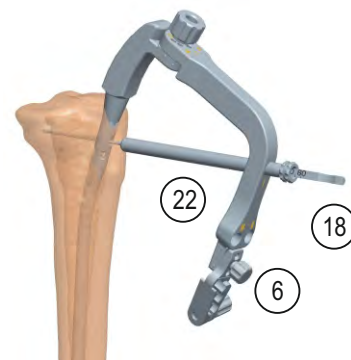
10 Perfection of the proximal locking

We can ensure the sagittal position of the aiming arm („I” marking) with the help of the clamp screw (2).

We lead soft tissue protector (22) and drill sleeve (21) to the aiming hole marked with „I”, we create a core hole by a spiral drill (8).

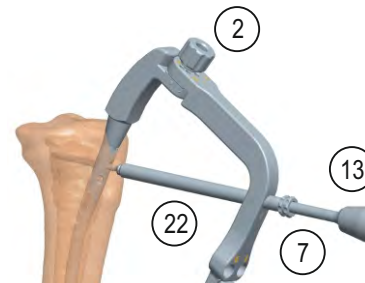


We drive the length gauge (18) through the soft tissue protector (22) to the prepared hole, we choose the screw length according to the read value.



With the help of the T wrench (13) and the screw driver (7) we make the locking.

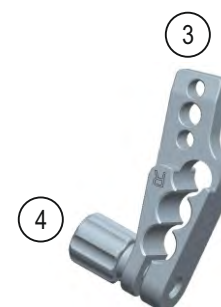
If necessary the aiming arm (5) could be turned to the anterolateral („II” marking) and anteromedial („I” marking) direction. After fixation we can drill the core hole and we can make the length measuring and locking.



The side locking can be done through the aiming arm attachment (3). Whether we use it for the right or left tibia we insert the attachment (5) according to the „L” or „R” sign to the aiming arm (5) and we can fix them by clamp screw (6).

If the setting of the aiming arm attachment (3) is right, it can be found at the medial position.

For the simple locking, we install soft tissue protector to the selected hole according to static and dynamical screw position. We can fix the soft tissue protector by screw for clamping of the sleeve (4). The locking can be done after core hole drilling and length measuring as before.



SURGICAL TECHNIQUE FOR ORLOS MTT NAILING

11 Finishing the operation and control

After the locking procedure we need to check once more the position of the implants.

We can remove the sleeves, and then we can remove the aiming device from the MTT nail with the loosening of the nail clamping device (14).

We can put the end cup at the end of the MTT nail, then we knots.

Examine the regeneration process several times during the healing. Check the position of the implants 24 hours, 7 days, 4-, 8- and 12 weeks after surgery.

The check needs to be done in each case by using two-way X-ray.



12 Removal of the MTT-implants

With the help of the screw driver (13), (7) remove the end cup from the proximal end.

We can remove all of the lockings and we can drive in the attachment for hammer guide (16) to the place of the end cup.

We can connect it to the hammer guide shaft (19), we can ensure the connection with the fixation sleeve for removal device (15).

We can install the hammer (11), close the end of the stem by bumper (20).

Then we can remove the free MTT nail, with gentle beats from the intramedullary.



NOTICE





ORTHO MEDICAL

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