ORTHOMEDICAL
GmbH · IMPLANTS

ORLOS II

HUMERAL ANTEROGRADE – AND RETROGRADE INTERLOCKING NAIL SYSTEM

HUMERAL NAILING
IMPLANTS AND OPERATING MANUAL

HUMERUS ANTEROGRADE AND RETROGRADE INTERLOCKING NAIL SYSTEM

SOLUTION WITHOUT COMPROMISE

IMPLANTS FOR LOCKING HUMERAL NAILING

System of implants:
Material: titanium alloy

Locking humeral nail, cannulated, diameter 7 - 8 - 9 mm,
cat.-no.:
from NA-34294-70180 to NA-34294-70310 (titanium alloy)
from NA-34294-80180 to NA-34294-80310 (titanium alloy)
from NA-34294-90180 to NA-34294-90310 (titanium alloy)

Locking screw, diameter 3,9 mm,
cat.-no.:
from LS-32200-39020 to LS-32200-39065 (titanium alloy)

End cup,
cat.-no.: LS-32400-07011 (titanium alloy)

Surgical set for locking humeral nailing,
cat.-no.: SET-94290-00000

IMPLANTS FOR LOCKING HUMERAL NAILING

Locking humeral nail, cannulated

Catalogue number			
L (mm)	**Ø 7 titanium alloy**	**Ø 8 titanium alloy**	**Ø 9 titanium alloy**
180	NA-34294-70180	NA-34294-80180	NA-34294-90180
205	NA-34294-70205	NA-34294-80205	NA-34294-90205
220	NA-34294-70220	NA-34294-80220	NA-34294-90220
230	NA-34294-70230	NA-34294-80230	NA-34294-90230
240	NA-34294-70240	NA-34294-80240	NA-34294-90240
250	NA-34294-70250	NA-34294-80250	NA-34294-90250
260	NA-34294-70260	NA-34294-80260	NA-34294-90260
270	NA-34294-70270	NA-34294-80270	NA-34294-90270
280	NA-34294-70280	NA-34294-80280	NA-34294-90280
295	NA-34294-70295	NA-34294-80295	NA-34294-90295
310	NA-34294-70310	NA-34294-80310	NA-34294-90310

Locking screw
Thread diameter: 3,9 mm
Core diameter: 3,2 mm
Pitch: 1,75 mm
Hex width: 2,5 mm

Catalogue number	
L (mm)	**titanium alloy**
20	LS-32200-39020
22	LS-32200-39022
24	LS-32200-39024
26	LS-32200-39026
28	LS-32200-39028
30	LS-32200-39030
32	LS-32200-39032
34	LS-32200-39034
35	LS-32200-39035
36	LS-32200-39036
38	LS-32200-39038
40	LS-32200-39040
42	LS-32200-39042

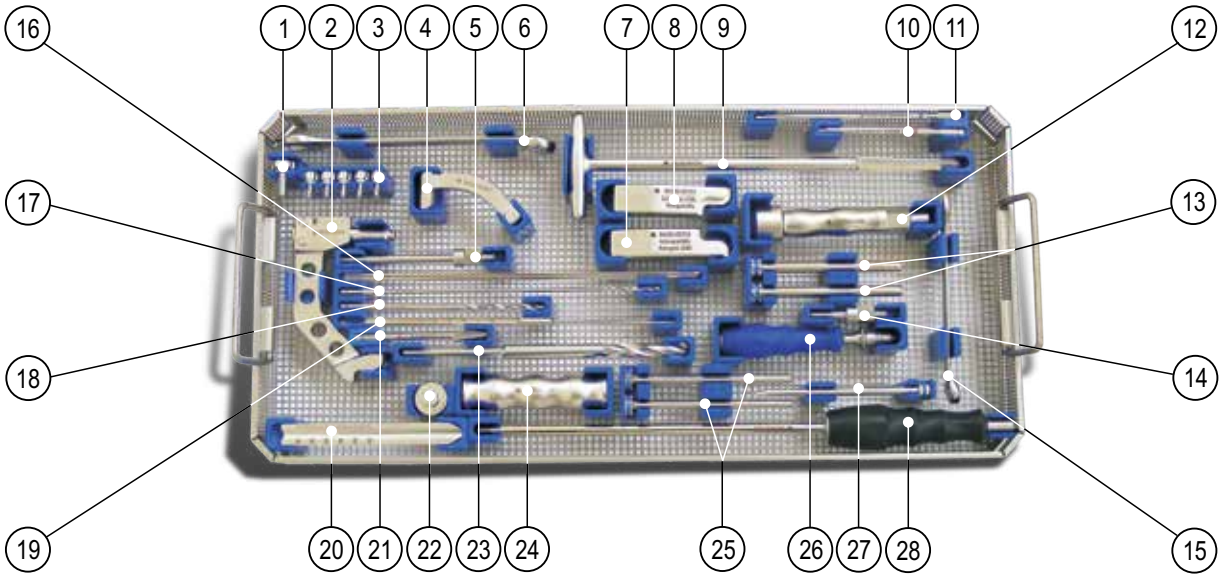
Catalogue number	
L (mm)	**titanium alloy**
44	LS-32200-39044
45	LS-32200-39045
46	LS-32200-39046
48	LS-32200-39048
50	LS-32200-39050
52	LS-32200-39052
54	LS-32200-39054
55	LS-32200-39055
56	LS-32200-39056
58	LS-32200-39058
60	LS-32200-39060
65	LS-32200-39065

End cup for locking humeral nail

Catalogue number
titanium alloy
LS-32400-07011

SURGICAL INSTRUMENTS FOR LOCKING HUMERAL NAILING

Surgical set
Surgical set: Cat.no. SET-94290-00000
Tray for humeral nailing instrument set (SET-94290-00000): Cat.no. TRAY-94290-10000



SURGICAL INSTRUMENTS FOR LOCKING HUMERAL NAILING

POS.	Cat.-no.	DESCRIPTION	PCS
1.	INS-94290-00105	Fixing screw, M8	1
2.	INS-94290-00100	Proximal targeting arm	1
3.	INS-94290-00503	M5 screw for auxiliary arm and targeting shaft	5
4.	INS-94290-00500	Auxiliary targeting arm	1
5.	INS-94290-00400	Threaded stem, cannulated	1
6.	INS-99000-00009	Wrench, 17 mm	1
7.	INS-94290-00103	Targeting shaft, left (retrograde), right (anterograde)	1
8.	INS-94290-00104	Targeting shaft, left (anterograde), right (retrograde)	1
9.	INS-94290-00700	Reamer 10 mm, cannulated	1
10.	INS-99150-35106	Screw driver, quick coupling, 3,5 × 106 mm	1
11.	INS-99150-25150	Screw driver, quick coupling, 2,5 × 150 mm	1
12.	INS-94290-01600	Impactor, cannulated	1
13.	INS-94290-01400	Soft tissue protector, 8/6 mm	2
14.	INS-94290-00600	Threaded removal shaft	1
15.	INS-99000-00008	Wrench, 11 mm	1
16.	INS-15000-20250	Kirschner-wire, 2 × 250 mm	3
17.	INS-99010-32190	Spiral drill, quick coupling, 3,2 × 190 mm	1
18.	INS-99010-45145	Spiral drill, 4,5 × 145 mm	1
19.	INS-94290-01500	Screw length gauge	1
20.	INS-94290-01700	Length gauge	1
21.	INS-94290-01800	Bur	1
22.	INS-94290-01003	Removal - impactor bumper	1
23.	INS-99031-10200	Spiral drill, cannulated, 10/2,2 × 200 mm	1
24.	INS-94290-01100	Hammer	1
25.	INS-94290-01300	Drill sleeve 6/3.2 mm	2
26.	INS-99000-00012	Quick coupling handle	1
27.	INS-94290-01200	Pointer	1
28.	INS-94290-01000	Removal - impactor shaft	1

IMPLANTS FOR LOCKING HUMERAL NAILING

POS.	CAT.NO.	DESCRIPTION	PCS
1.	INS-94290-00105	Fixing screw M8	1

POS.	CAT.NO.	DESCRIPTION	PCS
2.	INS-94290-00100	Proximal targeting arm	1

POS.	CAT.NO.	DESCRIPTION	PCS
3.	INS-94290-00503	Screw for auxiliary arm and targeting shaft M5	1

POS.	CAT.NO.	DESCRIPTION	PCS
4.	INS-94290-00500	Auxiliary targeting arm	1

POS.	CAT.NO.	DESCRIPTION	PCS
5.	INS-94290-00400	Threaded stem, cannulated	1

POS.	CAT.NO.	DESCRIPTION	PCS
6.	INS-99000-00009	Wrench width 17 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
7.	INS-94290-00103	Targeting shaft left (retrograde), right(anterograde)	1

POS.	CAT.NO.	DESCRIPTION	PCS
8.	INS-94290-00104	Targeting shaft left (anterograde), right (retrograde)	1

POS.	CAT.NO.	DESCRIPTION	PCS
9.	INS-94290-00700	Reamer 10 mm, cannulated	1

POS.	CAT.NO.	DESCRIPTION	PCS
10.	INS-99150-35106	Screw driver, quick coupling 3,5 × 106 mm	1

SURGICAL INSTRUMENTS FOR LOCKING HUMERAL NAILING

POS.	CAT.NO.	DESCRIPTION	PCS
11.	INS-99150-25150	Screw driver, quick coupling 2,5 × 150 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
12.	INS-94290-01600	Impactor, cannulated 2,5 × 150 mm	1

POS.	CAT.NO.	CRIPTION	PCS
13.	INS-94290-01400	Soft tissue protector 8/6 mm	2

POS.	CAT.NO.	DESCRIPTION	PCS
14.	INS-94290-00600	Threaded removal shaft	1

POS.	CAT.NO.	DESCRIPTION	PCS
15.	INS-99000-00008	Wrench width 11 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
16.	INS-15000-20250	Kirschner-wire 2 × 250 mm	3

POS.	CAT.NO.	DESCRIPTION	PCS
17.	INS-99010-32190	Spiral drill, quick coupling 3,2 × 190 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
18.	INS-99010-45145	Spiral drill, 4,5 × 145 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
19.	INS-94290-01500	Screw length gauge	1

IMPLANTS FOR LOCKING HUMERAL NAILING

POS.	CAT.NO.	DESCRIPTION	PCS
20.	INS-94290-01700	Length gauge	1

POS.	CAT.NO.	DESCRIPTION	PCS
21.	INS-94290-01800	Bur	1

POS.	CAT.NO.	DESCRIPTION	PCS
22.	INS-94290-01003	Removal - impactor bumper	1

POS.	CAT.NO.	DESCRIPTION	PCS
23.	INS-99031-10200	Spiral drill, cannulated 10/2,2 × 200 mm	1

POS.	CAT.NO.	DESCRIPTION	PCS
24.	INS-94290-01100	Hammer	1

POS.	CAT.NO.	DESCRIPTION	PCS
25.	INS-94290-01300	Drill sleeve 6/3,2 mm	2

POS.	CAT.NO.	DESCRIPTION	PCS
26.	INS-99000-00012	Quick coupling handle	1

POS.	CAT.NO.	DESCRIPTION	PCS
27.	INS-94290-01200	Pointer	1

POS.	CAT.NO.	DESCRIPTION	PCS
28.	INS-94290-01000	Removal - impactor shaft	1

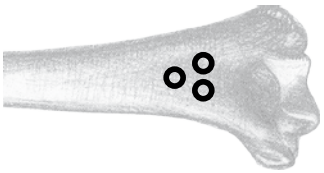
SURGICAL TECHNIQUE WITH RETROGRADE INSERTION

The Humerus Nail of Orto-Medical due to AO classification A, B and C types fit to all 3 subtypes for operation of fractures.
The correct placing of the nail depending on the direction of the insertion, do according to the medical prescriptions and the international literature.

1. For choosing the necessary implant with the help of Xray we define the appropriate sizes.

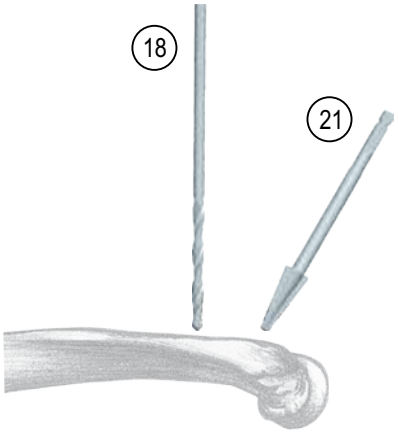
2. Knowing the length and diameter of the nail we assemble the prepared implant with the aimer.
(2 - a proximal targeting arm, 5 – threaded stem, 7, 8 - right-hand or left targeting shaft, 1 - a fixing screw).

We check fitting up, the punctuality of the borings, the anatomically correct position of the nail, the stiffness of the links.



3. Define the point of insertion.

4. Preparing countersink holes with 4.5 × 145 mm spiral drill (18).

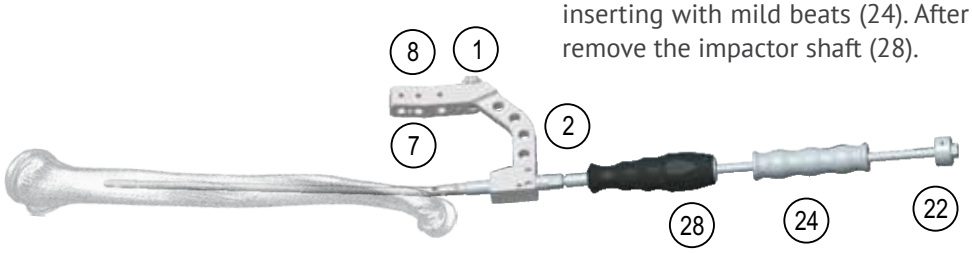


4a. Alternative technique
If the bone fracture requires, for effectiveness of the reposition we can choose either a leader-split. In this case we drill the penetration pont by Kirshner wire (16) we drive the wire in the necessary way of the intramedullary .The loose end of the wire with the help of the measuring strip (20) can identify the length of the nail.

5. With the Bur (21) we expand and fuse the countersink holes. With this we prepare the point of inserting the nail.

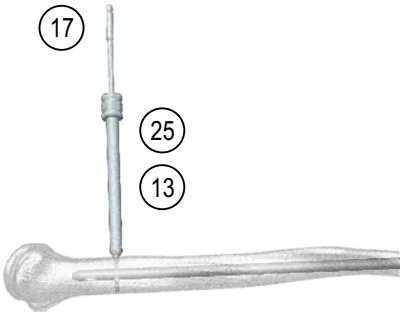
5a. Alternative technique:
We expand the penetration point - keeping the split (16)- by cannulated hand miller and / or cannulated spiral drill.

SURGICAL TECHNIQUE WITH RETROGRADE INSERTION



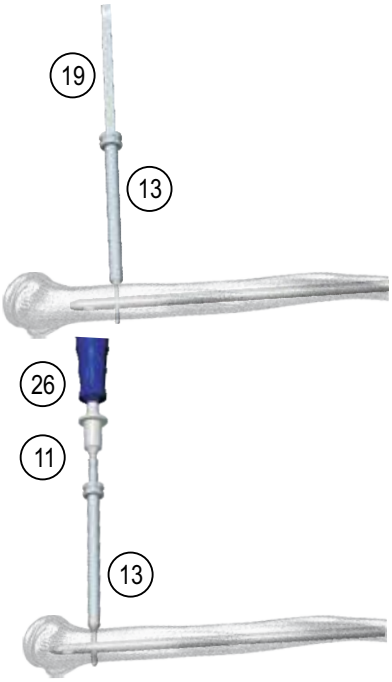
6. We insert the nail assembled with the targeting arm (2), (7-8), (1) and with the impactor shaft (28), (24) into the medullary canal.
We check the proper position with X-ray. If necessary we help the inserting with mild beats (24). After reaching the wished position we remove the impactor shaft (28).

6a. Alternative technique:
We fix to the cannulated impactor – which connect the nail and the targeting arm- the cannulated stem.The driving in of the nail takes place with the driving of the Kirschner. If necessary we can hammer slight the nail by the cannulated stem - we need to avoid any further damages and crack of the bone.



7. We carry out first the proximal locking, to which we look for the position of the locking borings with bi-directional X-ray control.
Using the soft tissue protector (13) and drill sleeve (25) with use of 3.2 × 190 mm spiral drill (17) we prepare a locking boring.

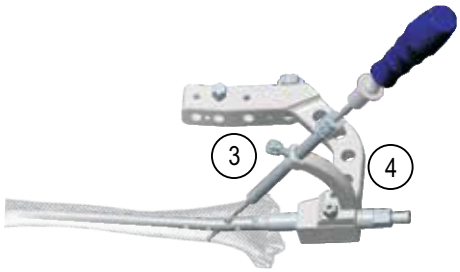
7a. Alternative technique:
If we used Kirshner leader split for driving in the nail, we need to remove it from the intramedullary before locking. Then remove the cannulated stem from impactor.



8. Keeping the soft tissue protector we define the length of the proper locking screw. For this we fix the length gauge (19) into the opposite corticalis through the locking boring. The size shown on the soft tissue protector matches the length of the screw.

9. Installing the locking screws is to be done through the soft tissue protector (13). We put the steam of the screw driver 2,5 × 150 mm (11) into the quick coupling handle (26) and lock with the chosen screws.

SURGICAL TECHNIQUE WITH RETROGRADE INSERTION



10. The distal locking is to be done with the targeting device assembled to the nail. For the lateral locking we place a soft tissue protector (13) and a drill sleeve (25) into the hole of the targeting arm (7, 8). On the prepared boring with spiral drill 3,2 × 190mm (17) we do a length measuring like by the proximal locking and screw in the necessary locking screws.

If the direction of the fracture requires, we can do sagittal locking as well.In order to do it we have to use the auxiliary targeting arm (4) with a fixing screw (3). Preparing locking, the length measuring and locking is the same as previously described.

11. After finishing the locking we remove the targeting device (2),(7-8), (4) with the wrench (6), put an end cup into the nail and close the cut.

12. After the operation we check the reconstruction of the function of the shoulder. During the recovering process we control several times the process of the recovering. We control the position of the implants as needed but at least after 2 days and after 6 and 12 weeks with X-ray as well.

13. At appropriate stage of the bone-regeneration we can remove the medullary nail. At first we take out the locking screws then with removing the end cup we open the threaded link at the end of the nail.

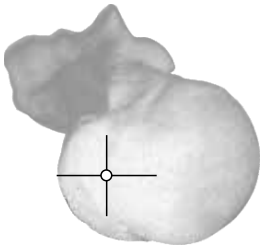
14. We screw the threaded removal shaft (14) into the end of the nail, than fix the removal shaft (28) on it. We place the hammer (24) and close the shaft with the removal bumper (22). We remove the nail with indulgent use of the hammer.

SURGICAL TECHNIQUE WITH ANTEROGRADE INSERTION

1. For choosing the necessary implant with the help of Xray we define the appropriate sizes.

2. Knowing the length and diameter of the nail we assemble the prepared implant with the aimer. (2 - a proximal targeting arm, 5 – threaded steam, 7, 8 - righthand or left targeting shaft, 1 - a fixing screw).

We check fitting up, the punctuality of the borings, the anatomically correct position of the nail, the stiffness of the links.



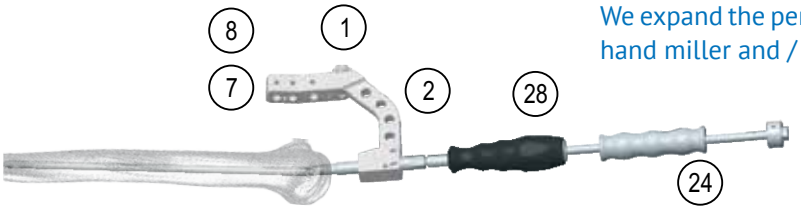
3. Draw aside the muscle fibres, then define the point of insertion. Open the medullary canal with 2 × 250 mm Kirschner wire (16).

4. While keeping the muscle fibres drawn aside using the correct position of the leader-spit (16) we enlarge the insertion point with the reamer (9) to the size of the nail. We remove both the spit (16) and the reamer (9).

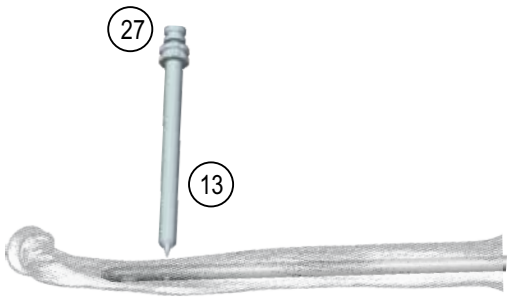
4a. Alternative technique:
If the bone fracture requires, for effectiveness of the reposition we can choose either a leader-split. In this case we drill the penetration pont by Kirshner wire (16) we drive the wire in the necessary way of the intramedullary .The loose end of the wire with the help of the measuring strip (20) can identify the length of the nail.

5. We insert the nail assembled with the targeting arm (2), (7-8), (1) and with the impactor shaft (28), and the hammer (24) into the medullary canal. In case of the right nail position the end of the nail must be in any case under the cartilage surface.
We check the proper position with X-ray. The image of the Kirschner wire led through the targeting arm helps to control the right position of the nail. After reaching wished position we remove the impactor shaft (28) and the hammer (24).

5a. Alternative technique
We expand the penetration point - keeping the split (16)- by cannulated hand miller and / or cannulated spiral drill.

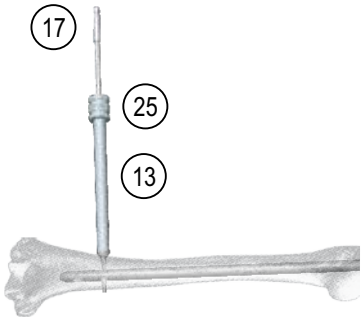


SURGICAL TECHNIQUE WITH ANTEROGRADE INSERTION



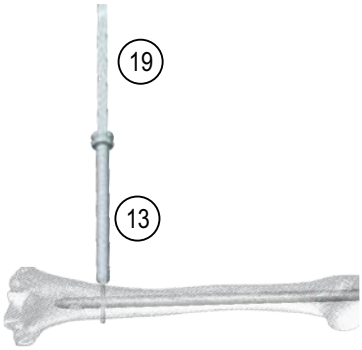
6. We begin locking on the distal end. We look for the position of the locking borings with bi-directional X-ray control. If necessary before drilling the lateral locking hole we can help through the soft tissue protector (13) with the use of pointer (27).

6a. Alternative technique:
We fix to the cannulated impactor – which connect the nail and the targeting arm- the cannulated stem.The driving in of the nail takes place with the driving of the Kirschner. If necessary we can hammer slight the nail by the cannulated stem - we need to avoid any further damages and crack of the bone.

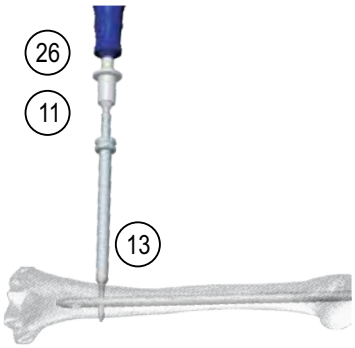


7. We carry out first the distal locking, to which we look for the position of the locking borings with bi-directional Xray control.
Using the soft tissue protector (13) and drill sleeve (25) with use of 3.2 × 190 mm spiral drill (17) we prepare a locking boring.

7a. Alternative technique:
If we used Kirshner leader split for driving in the nail, we need to remove it from the intramedullary before locking. Then remove the cannulated stem from impactor.

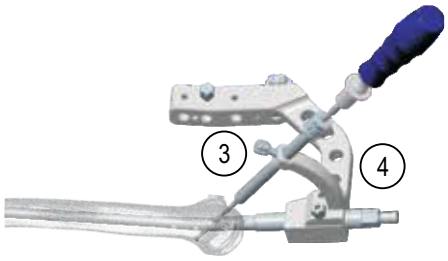


8. Keeping the soft tissue protector we define the length of the proper locking screw. For this we fix the length gauge (19) into the opposite corticalis through the locking boring. The size shown on the soft tissue protector matches to the length of the screw.



9. Installing of the locking screws is to be done through the soft tissue protector (13). We put the steam of the screw driver (11) into the quick coupling handle (26) and lock with the chosen screws.

SURGICAL TECHNIQUE WITH ANTEROGRADE INSERTION



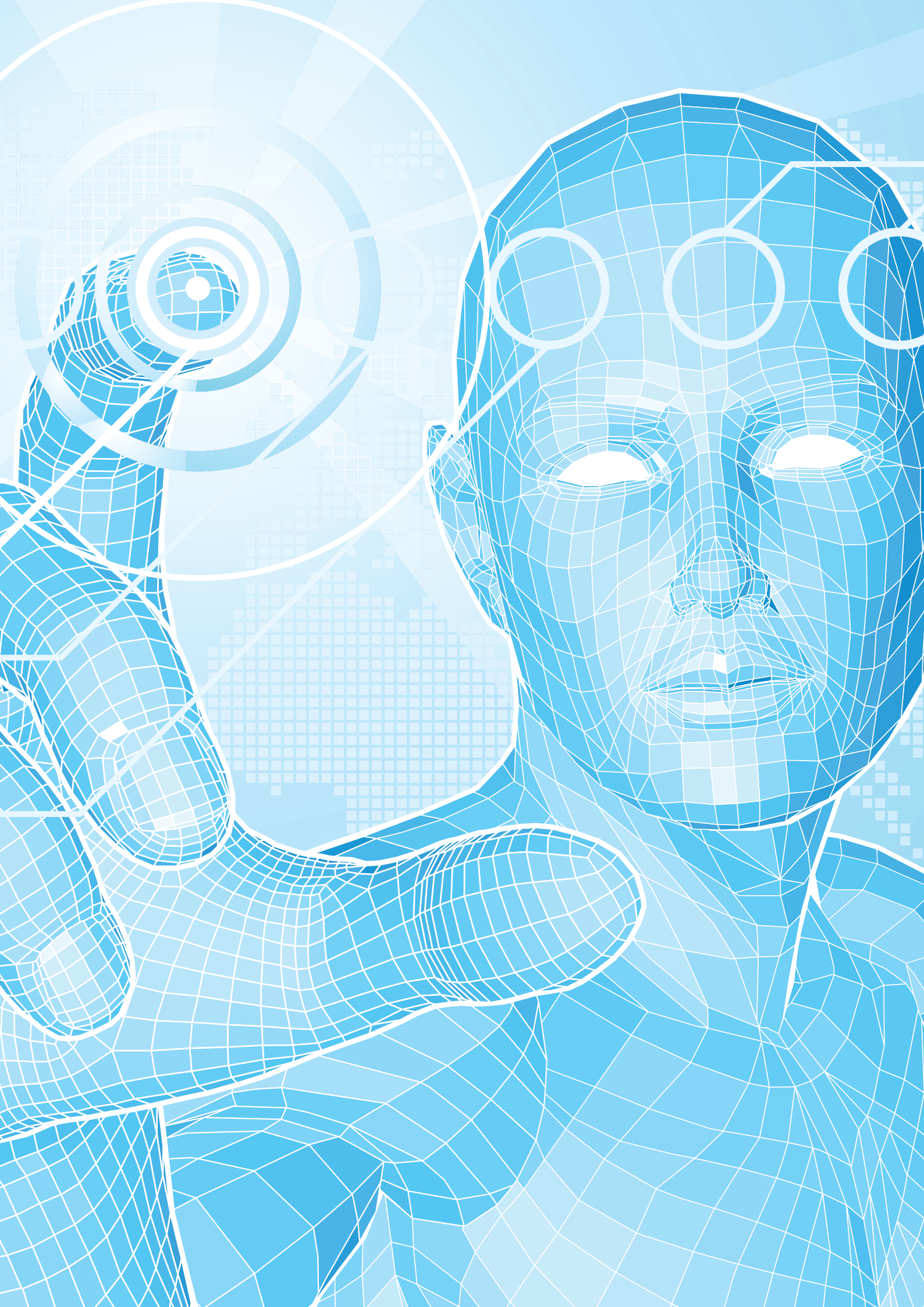
10. The distal locking is to be done with the targeting device assembled to the nail. For the lateral locking we place a soft tissue protector (13) and a drill sleeve (25) into the hole of the targeting arm (7, 8). On the prepared boring with spiral drill (17) we do a length measuring like by the proximal locking and screw in the necessary locking screws. If the direction of the fracture requires we can do sagittal locking as well. In order to do it we have to use the auxiliary targeting arm (4) with a fixing screw (3). The preparing locking, the length measuring and the locking is the same as previously described.

11. After finishing locking we remove the targeting device (2),(7-8), (4) with the wrench (15), put an end cup into the nail and close the cut.

12. After the operation we check the reconstruction of the function of the shoulder. During the recovering process we control several times the process of the recovering. We control the position of the implants as needed but at least after 2 days and after 6 and 12 weeks with X-ray as well.

13. At appropriate stage of the bone-regeneration we can remove the medullary nail. At first we take out the locking screws then with removing the end cup we open the threaded link at the end of the nail.

14. We screw the threaded removal shaft (14) into the end of the nail, than fix the removal shaft (28) on it. We place the hammer (24) and close the shaft with the removal bumper (22). We remove the nail with indulgent use of the hammer.



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Edition 2018|10 | Revision: 09.11.2018
Printed in Malaysia