

DLP - Dorso-Lumbar Polyaxial Screw System

Surgical Technique



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“Movement is Life”



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The **DLP - Dorso-Lumbar Polyaxial** Screw System has been designed to address the pathologies of the thoracolumbar spine.



The **DLP** System contains a wide range of polyaxial and monoaxial screws, rods and transverse connection, providing multiple options for construct.

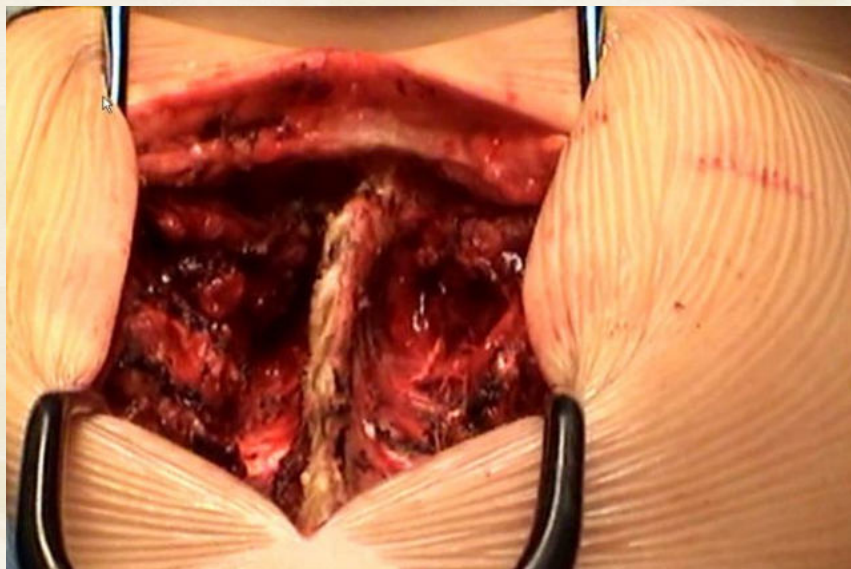
Monoaxial screws		Polyaxial screws		Rods	
101-0205-0430	4,0mm x 30 mm	101-0204-0425	4,0 mm x 25 mm	101-0300-0045	45 mm
101-0205-0435	4,0mm x 35 mm	101-0204-0430	4,0 mm x 30 mm	101-0300-0055	55 mm
101-0205-0440	4,0mm x 40 mm	101-0204-0435	4,0 mm x 35 mm	101-0300-0065	65 mm
101-0205-0445	4,0mm x 45 mm	101-0204-0440	4,0 mm x 40 mm	101-0300-0075	75 mm
101-0205-0535	5,0mm x 35 mm	101-0204-0445	4,0 mm x 45 mm	101-0300-0085	85 mm
101-0205-0540	5,0mm x 40 mm	101-0204-0530	5,0 mm x 30 mm	101-0300-0095	95 mm
101-0205-0545	5,0mm x 45 mm	101-0204-0535	5,0 mm x 35 mm	101-0300-0105	105 mm
101-0205-0550	5,0mm x 50 mm	101-0204-0540	5,0 mm x 40 mm	101-0300-0115	115 mm
101-0205-0555	5,0mm x 55 mm	101-0204-0545	5,0 mm x 45 mm	101-0300-0125	125 mm
101-0205-0635	6,0mm x 35 mm	101-0204-0550	5,0 mm x 50 mm	101-0300-0135	135 mm
101-0205-0640	6,0mm x 40 mm	101-0204-0555	6,0 mm x 35 mm	101-0300-0145	145 mm
101-0205-0645	6,0mm x 45 mm	101-0204-0640	6,0 mm x 40 mm	101-0300-0155	155 mm
101-0205-0650	6,0mm x 50 mm	101-0204-0645	6,0 mm x 45 mm	101-0300-0165	165 mm
101-0205-0655	6,0mm x 55 mm	101-0204-0650	6,0 mm x 50 mm	101-0300-0175	175 mm
		101-0204-0655	6,0 mm x 55 mm	101-0300-0185	185 mm
		101-0204-0660	6,0 mm x 60 mm	101-0300-0195	195 mm
		101-0204-0665	6,0 mm x 65 mm	101-0300-0205	205 mm
		101-0204-0670	6,0 mm x 70 mm	101-0300-0225	225 mm
		101-0204-0735	7,0 mm x 35 mm	101-0300-0255	255 mm
		101-0204-0740	7,0 mm x 40 mm		
		101-0204-0745	7,0 mm x 45 mm	Transverse Rods	
		101-0204-0750	7,0 mm x 50 mm	101-0307-0040	40 mm
		101-0204-0755	7,0 mm x 55 mm	101-0307-0060	60 mm
		101-0204-0760	7,0 mm x 60 mm	101-0307-0080	80 mm
		101-0204-0765	7,0 mm x 65 mm		
		101-0204-0770	7,0 mm x 70 mm	Transverse Rod Connector	
		101-0204-0840	8,0 mm x 40 mm	101-0407-0000	
		101-0204-0845	8,0 mm x 45 mm		
		101-0204-0850	8,0 mm x 50 mm		
		101-0204-0855	8,0 mm x 55 mm		
		101-0204-0860	8,0 mm x 60 mm		
		101-0204-0865	8,0 mm x 65 mm		
		101-0204-0870	8,0 mm x 70 mm		
		101-0204-0875	8,0 mm x 75 mm		
		101-0204-0880	8,0 mm x 80 mm	Locking Screw	
				101-0602-0000	

Patient positioning, exposure

The patient is usually positioned prone on an appropriate spinal table, as is customary for the surgeon.



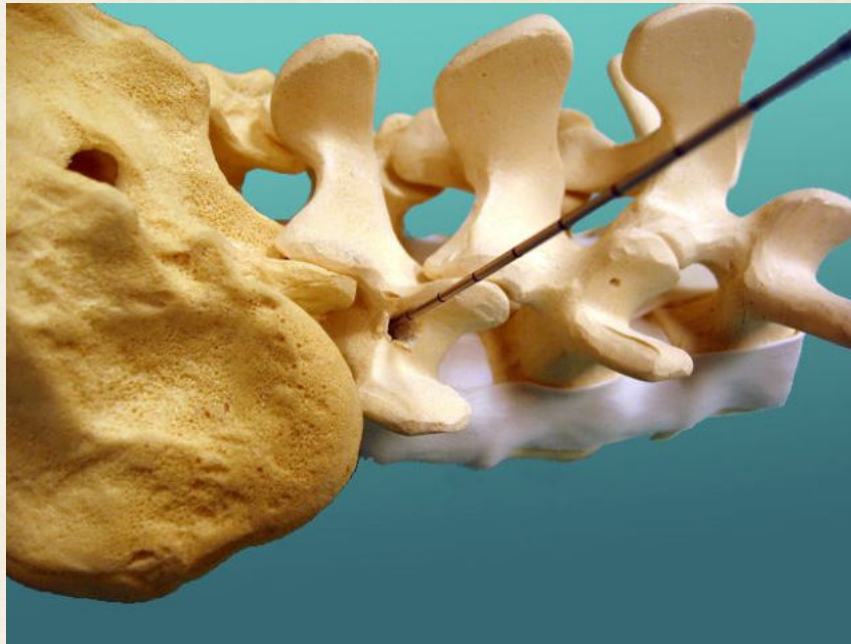
The spine is subperiosteally exposed and if indicated, a decompression is performed.



Decortication must be performed meticulously. Before or after implantation of the **DLP** System, graft may be placed into the posterolateral gutters.

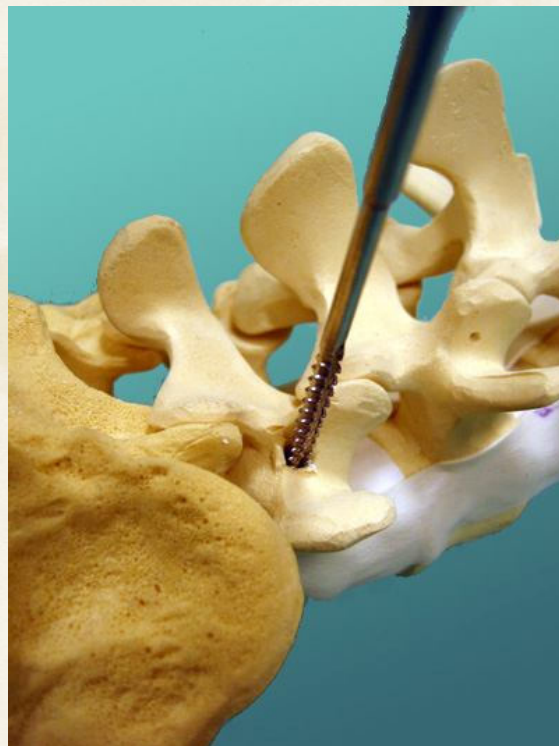
Step 3.

Using the ball tip **Pedicle Sound Probe**, verify bony containment of the pedicle hole by palpating all four walls as well as the bottom of the hole through the pedicle and into the vertebral body.



Step 4.

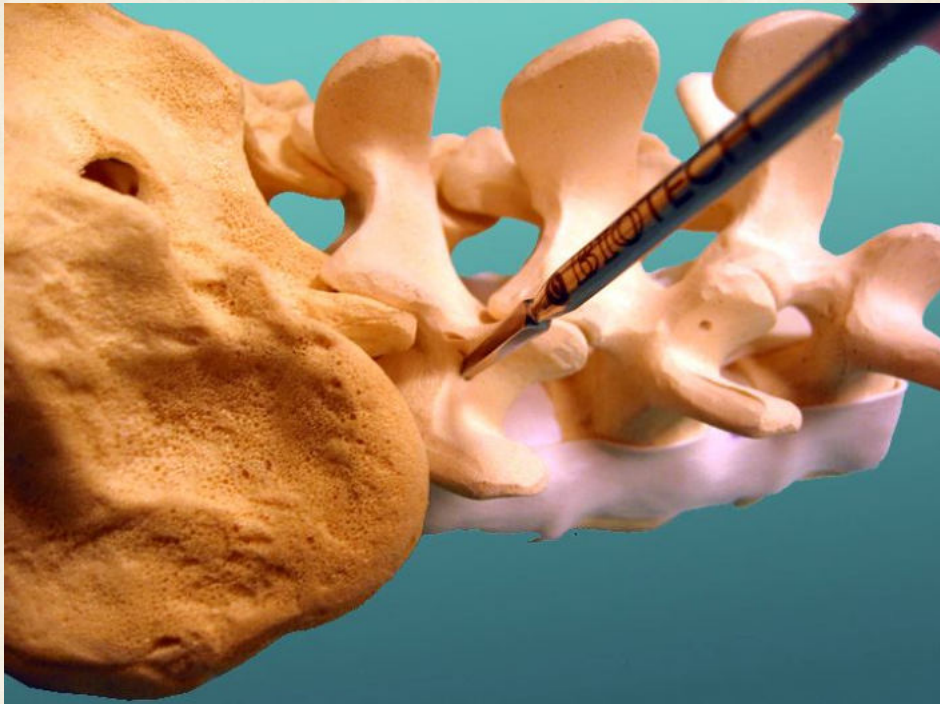
Different size of **Taps** are available in the system to prepare the pedicle hole for inserting the polyaxial screws. The corresponding tap is selected for the chosen screw diameter and advanced into the pedicle hole.



Pedicle Preparation

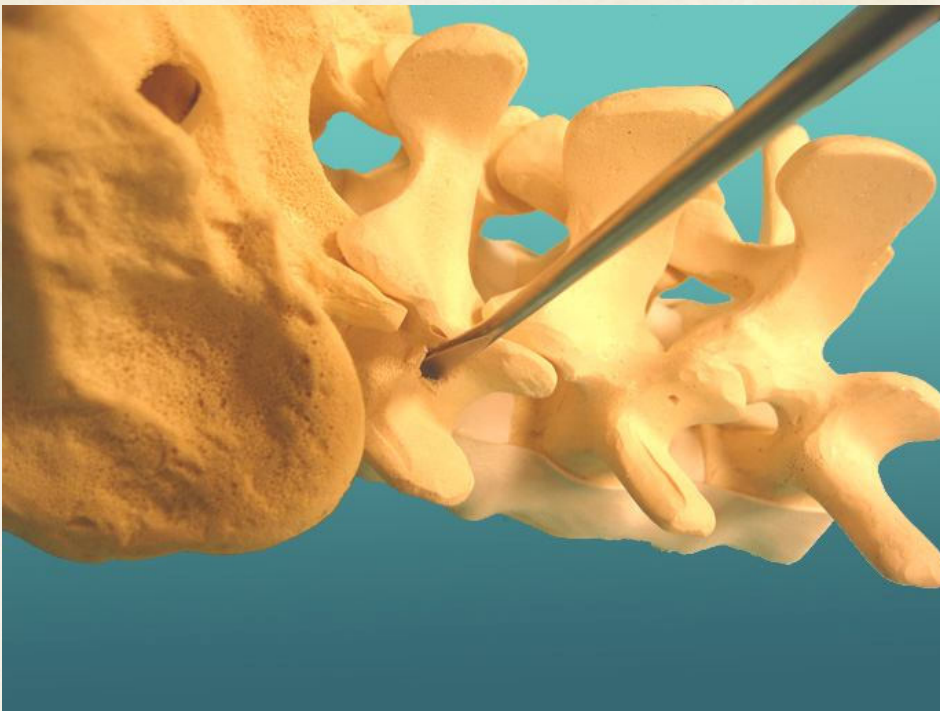
Step 1.

After exposure, the pedicle entry point is prepared with an **Awl** (or curette).



Step 2.

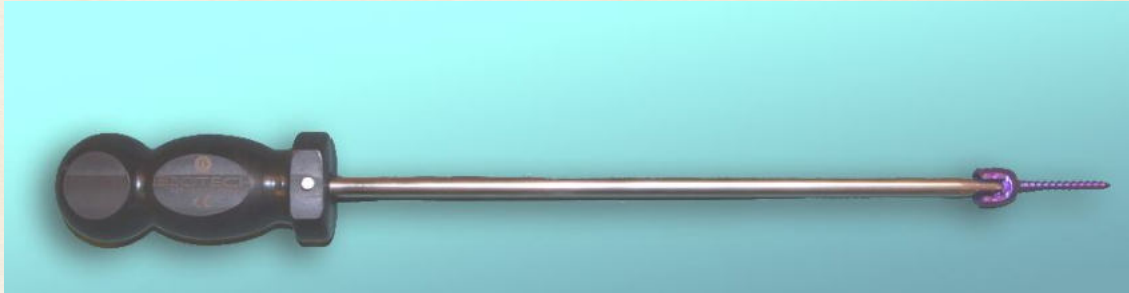
Use pedicle probe to open the pathway by advancing the **Probe** to the appropriate depth with rotating movements. Special care should be taken not to violate the pedicle walls.



Screw selection and insertion

Step 5.

Polyaxial screws are available in several diameters and lengths. Determine the appropriate screw length by using the depth gauge on the Pedicle Sound Probe. The polyaxial screws may be loaded freehand by using the appropriate **screw driver**. The screw is inserted into the pedicle to the desired depth.



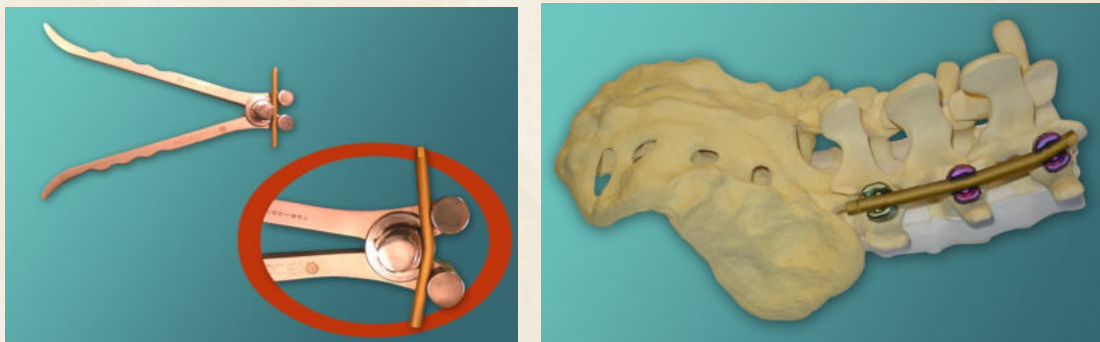
NOTE: Do not drive the polyaxial screw into the pedicle hole so tightly that variable angulation of the seat on the screw is compromised.



Rod contouring

Step 6.

Once all polyaxial screws have been inserted, choose the appropriate rod length, according to the construct. If necessary, contouring of the selected rod may also be performed using the **Rod Bender**.

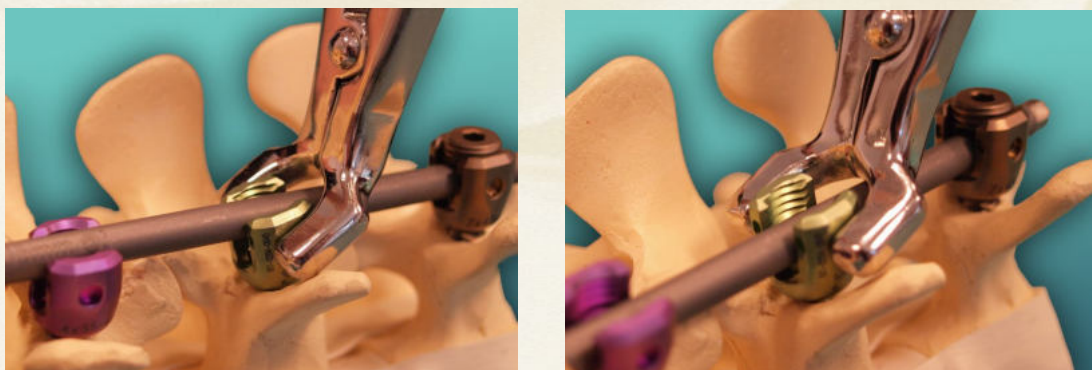


With the help of the **Rod Holder**, placement and adjusting of the rods are possible, once the rod is bent to the desired contour:



Step 7.

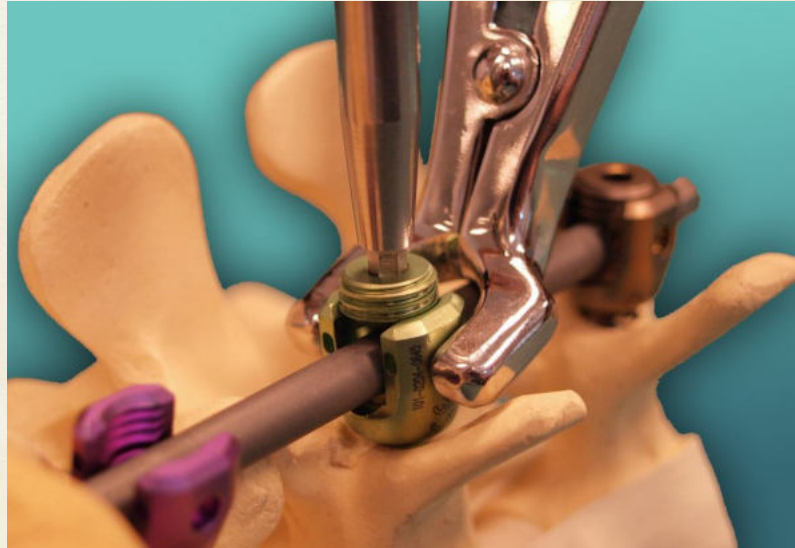
Use the **Rod Pusher** device to ensure appropriate seating of the rod into the screw head:



Locking screw application

Step 8.

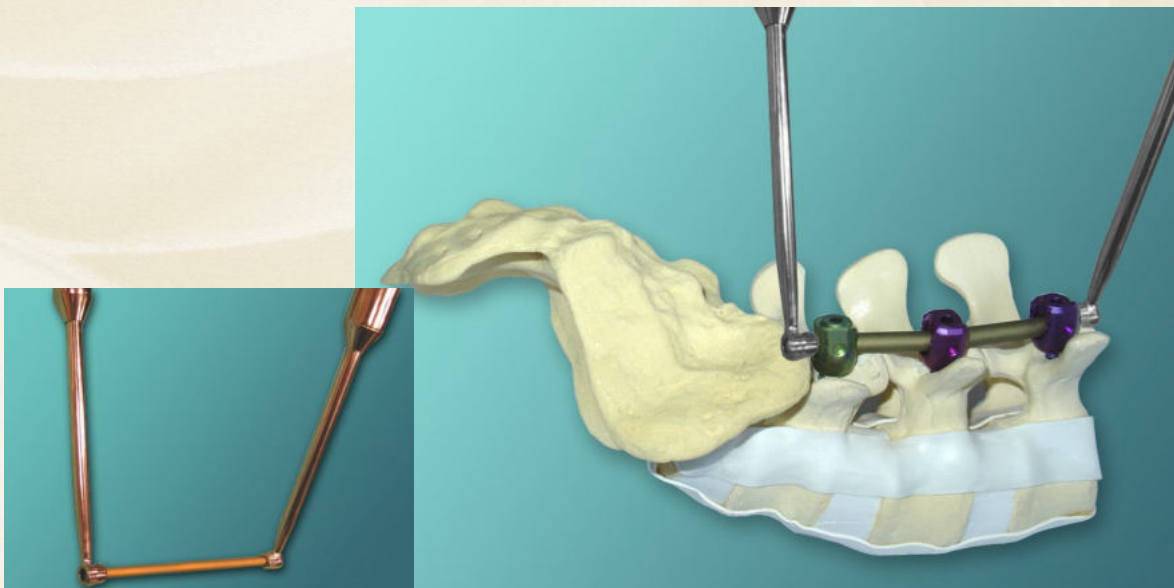
Apply the locking screws to secure the construct, once all polyaxial screws are inserted and the rods placed in the screw seat. Place all locking screws provisionally, without tightening them.



Rod rotation

Step 9.

After placing the rods and locking screws, the rods might be rotated using the two **Rod Rotator Forceps**, in order to achieve the desired anatomical curvature.



Once the rod is fully rotated, the locking screws are provisionally tightened.

In Situ Bending

Step 10.

Bending the rod in situ is also possible, in case it is deemed necessary, by utilising the two **In Situ Bender** Devices:



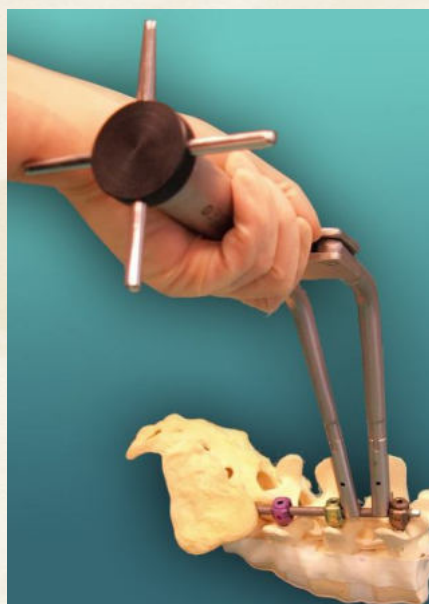
NOTE: Care should be taken not to overload the implant – bone interface or notch the rod!

Compression or distraction

Step 11.

Compression or distraction is possible to achieve by the DLP System. The locking screws of the polyaxial screws should be inserted, but not tightened.

Use the **Contractor and Distractor Device** by rotating the knob on the top to achieve the desired compression or distraction. Tighten the locking screw through the Cannulated Screw Head Holding and Rod Pushing Device in order to secure the achieved correction.



Repeat the above steps for each screw, where compression and distraction is deemed necessary.

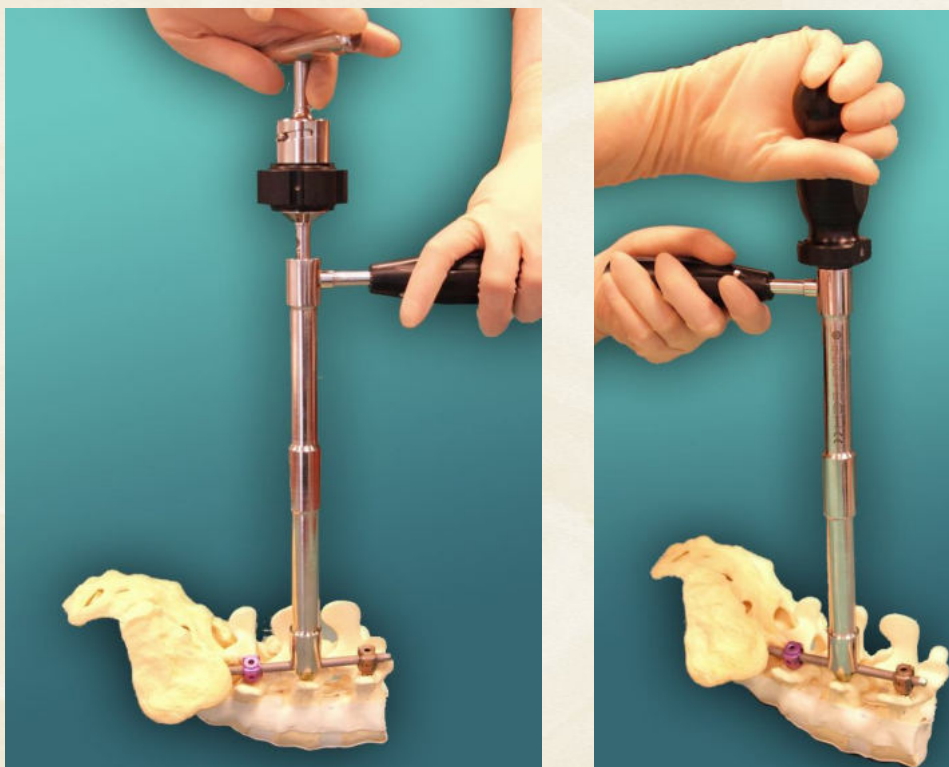
Final locking

Step 12.

After the correction procedures tightening, check the proper implant placement with radiographs. Place the **Cannulated Screw Head Holding and Rod Pushing Device** on the head of the seated screw. This will allow also an additional possibility of pushing the rod into place.

Insert the **Torque Wrench for locking screw** through this cannulated device and tighten the locking screw.

Finally, use the screw driver also to ensure and check best possible tightening stability.



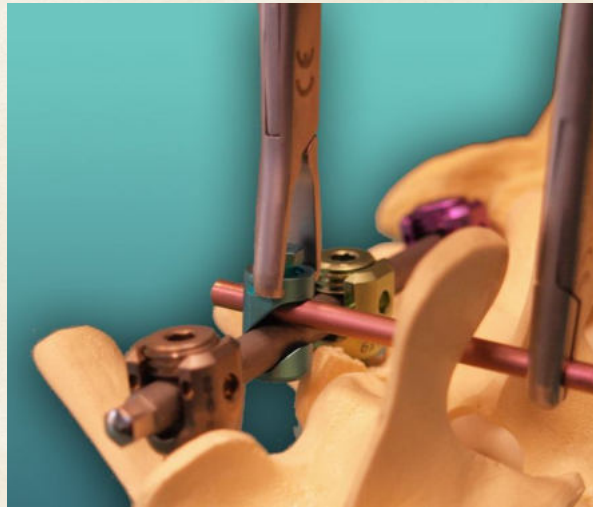
Transverse connection

Step 13.

Should additional torsional stability required, transverse rod and transverse connectors may be applied.

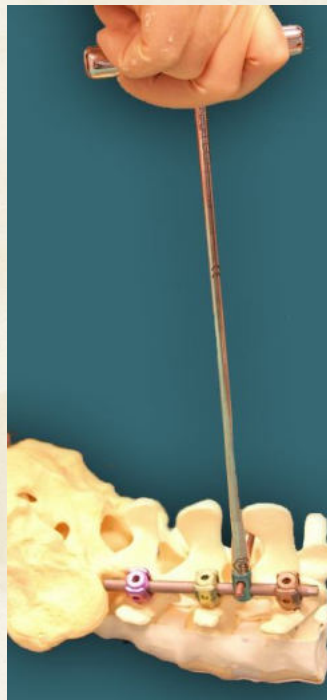
Transverse rods are available in 40mm, 60mm, and 80mm lengths. Two transverse connectors are utilized to secure the rod in the desired location.

Place the transverse connector around the 6mm longitudinal rod with the **Transverse Connector Forceps** and hold it in place.



Insert the transverse rod through the connector with the **Rod Holding Forceps**.

Apply a second transverse connector on the opposite side the same way. After positioning the transverse rod through both connectors, the set screw is tightened with the available **Screw Driver** and **Torque Wrench for transverse connector**.



The transverse connectors should be applied after the construct has been assembled and the locking screws tightened.

Closure

Step 14.

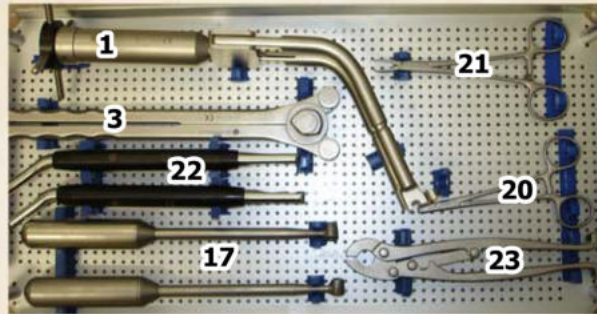
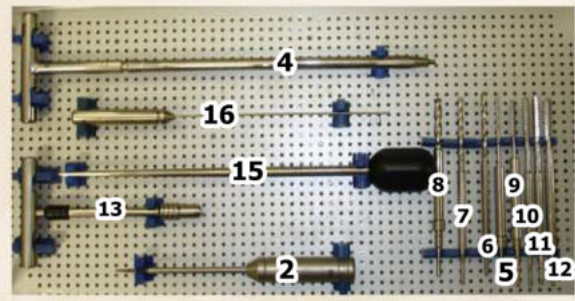
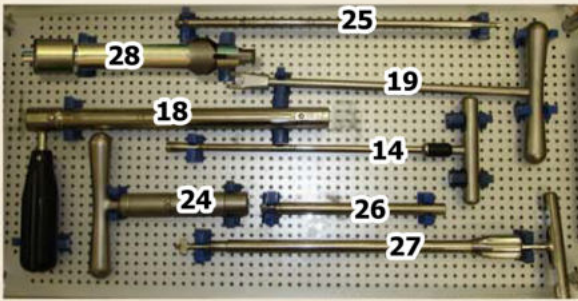
Perform the wound closure in a usual way after the implantation of the **DLP** Polyaxial Screw System is complete.

Indications

The **DLP** Polyaxial Screw System is a thoracolumbar spinal fixation system intended for use as a pedicle screw fixation system, limited to skeletally mature patients. The use of the system is indicated for the treatment of *degenerative disc disease, spondylolisthesis, trauma* (fracture or dislocation), *deformity, or curvature* (scoliosis, kyphosis, lordosis), *tumor, stenosis, pseudoarthrosis, previous failed fusion*. The safety and effectiveness of these devices for any other conditions are unknown.

Contraindications

The **DLP** Polyaxial Screw System is contraindicated in patients with *spinal infection or inflammation, morbid obesity, mental illness, alcoholism or drug abuse, pregnancy, metal sensitivit, foreign body sensitivity, patients with inadequate tissue coverage over the operative site or open wounds local to the operative area*.



BIOTECH DLP - Dorso-Lumbar Polyaxial Screw Instrument Set

Nr.	Code	Description	Quantity/set
1.	728-0014-0004	Contractor-distractor device	1
2.	728-0010-0001	Straight punch	1
3.	728-0012-0001	Rod bender	1
4.	728-5000-0002	Screwdriver	1
5.	728-3000-0004	Drill for 4 mm screws	1
6.	728-3000-0005	Drill for 5 mm screws	1
7.	728-3000-0006	Drill for 6 mm screws	1
8.	728-3000-0007	Drill for 7 mm screws	1
9.	728-4000-0004	Thread cutter for 4 mm screws	1
10.	728-4000-0005	Thread cutter for 5 mm screws	1
11.	728-4000-0006	Thread cutter for 6 mm screws	1
12.	728-4000-0007	Thread cutter for 7 mm screws	1
13.	728-0007-0007	Drill chuck	1
14.	728-0005-0005	T-wrench 6mm	1
15.	728-0009-0001	Pedicle probe	1
16.	728-0010-0018	Pedicle sounder probe	1
17.	728-0010-0009	Hex Key positioner	2
18.	728-5000-0001	Cannulated Screw Head Holding and Rod Pushing Device	1
19.	728-5000-0004	Rod Pusher Fork Device	1
20.	728-1000-0002	Rod holding forceps	1
21.	728-0010-0011	Transverse rod connector forceps	1
22.	728-0012-0002-02/03	In situ bender (Left/right)	2
23.	728-0010-0008	Rod holder	1
24.	728-0005-0007	Torque wrench	1
25.	728-0005-0010	Screwdriver for Torque wrench - 3.5mm	1
26.	728-0005-0011	Screwdriver for Torque wrench - 6mm	1
27.	728-0005-0008	Cannulated Screw Head Holding T-screwdriver	1
28.	728-0010-0022	Rod reduction device	1



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