

## **G5 Spine System**

SURGICAL TECHNIQUE

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## Product Information

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The G5 Spine system is a comprehensive thoracolumbar spinal system, which is mainly designed for treatment of spine deformity. The design and production are based on principle of speed, security and simplicity.

**Product Features :**

**Double screw thread design:**

double the screw insertion speed, reducing the occurrence of bleeding, infection and other complication during surgery

**2 types of locking mechanism:**

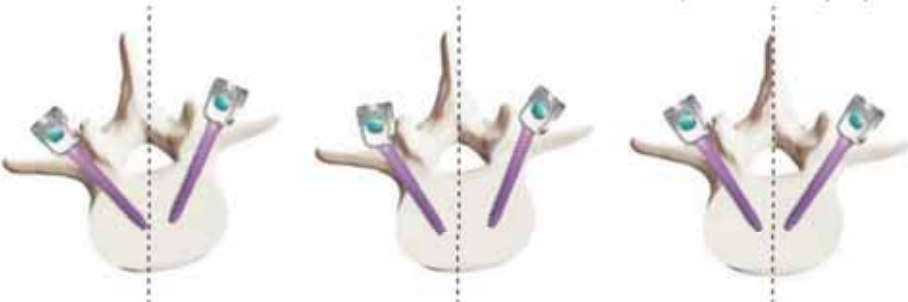
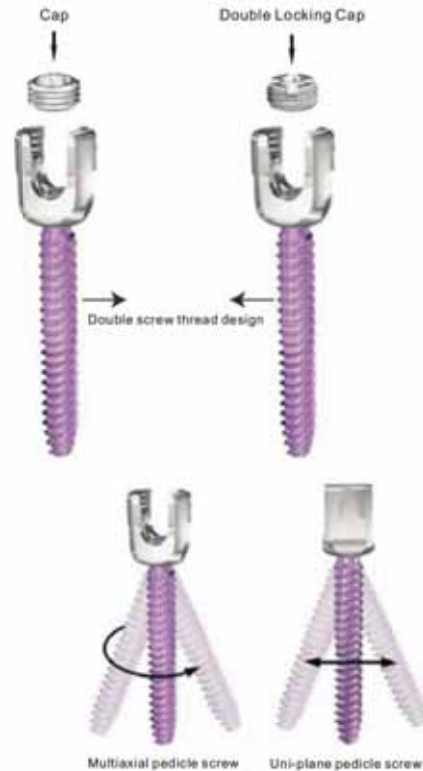
**Mono locking mechanism:** for surgeons who prefer traditional surgery methods and facilitate ordinary surgery.

**Double locking mechanism:** composed by inner cap and outer cap, tighten outer cap can fix the angulation of the pedicle screw, tighten inner screw cap can fix the position of the pedicle screw on the rod. Double locking mechanism is especially suitable for intervertebra degeneration fusion and deformity correction

**2 types angulation pedicle screws:**

**Multiaxial pedicle screw:** 360 degree rotation in a certain angulation range, a type of traditional multiaxial pedicle screw

**Uni-plane pedicle screw:** transverse angulation only, it prevents anti-rotation capability during scoliosis



**Indications**

- Instability of thoracic, lumbar, or sacral spine secondary caused by degenerative disease
- Spinal canal stenosis
- Spinal deformity
- Tumour or tubercolosis in thoracic and lumbar
- Failed previous fusion

**Contradiction**

- Infection
- Obesity
- Pregnant
- Sever osteoporosis
- Mental problem

**Step 1**

**Preparation**

Take general anesthesia and supine position. Use bow shaped bracket to avoid pressure in abdomen and vein.

**Step 2**

**Incision**

Take standard incision way- posterior midline approach. The incision line should be long enough to expose the surgery part of spine. cut lumbodorsal fascia along spinous process and remain supraspinous ligament interspinous ligament, especially the upper side along with instrument located. Elevate periosteum carefully to soft tissue. Spinal muscular tissue should be separated to outside of articular process, when it is necessary, separate outside of transverse process.

**Step 3**

**Pedical Screw Insertion**

**1 Make sure insertion location**

Intersection part of superior and inferior articular process. The intersection is the point when middle line of transverse process and tangent of outcircle meet, which will be insertion place. The insertion plate in lumbar will be the intersection between lateral edge of laminae of vertebra and parapophysis, which will be shaped like lambdoidal ridge. Clean cortical bones in facies articularis and transverse process with polished drill and rongeur, expose cancellous part in pedical then inser: the screw.

There is no transverse process in sacrum spinal and only ala, so the insertion part in sacrum pedical will be different. The surgeon has more choices to insert pedical screw into sacrum because of S1 pedical size and outshape characteristics. The insertion place will be lateral the lower margin of superior articular process.



## 2 Prepare screw hole

Select utilizing awl to drill cortical pedical screw and makescrew entering hole. Enter along hollow pith with straight awl, deep into 50%-80% of the vertebrae avoid damage cortex in front of vertebrae.



## 3 Select pedical screw length

Check hole wall by probe and to make sure there is no damage in hole. Meanwhile, 10mm scale probe can measure screw length. Insert marker, check the screw hole by X-Ray, and read screw length through lateral projection.



## 4 Insert pedical screw

There are monoaxial screwdriver, multiaxial screwdriver, reduction screwdriver, multiaxial reduction screw driver, double locking screwdriver, dual reduction locking screw driver.

Thread the screwdriver in along the hole until the screw head down into the end. When insert multiaxial pedical screw, screw head should be away from 1-2mm bone surface, so as to avoid unflat bone surface make angle between screw head and screw body. The strength causes hex screwdriver head to stop in screw, it is not easy to take out or loosen screw. Screw should be threaded in 50%-80% of vertebrae and parallel with endplate. The entering direction should slide to medium size.

Note:

- thread in when hex head of multiaxial screwdriver and double locking screwdriver inserted totally or it will make hex head deformity and fail surgery.



## Step 4

### Insert Connecting Rod

Use rod template to measure the physical curvature, then bend the Titanium Rod by bending irons in accordance with the bend template. There is no need to make accurate bending for screw position, especially for one secondary fusion.





After depressing, pay attention to bone junction and soft tissue loosen of superior and inferior articular process. Place rod in screw head and reduction with gun-type reduction forceps. Hold screw from the head and tighten gun-type reduction forceps to slide down sleeve to press titanium rod and press into end of screw groove.

Use the elastic nut holder to assemble the cap, therefore the rod is temporarily fixed.



#### G5 spine system has two kinds of locking applications

**Initial fixation of mono locking:** Hold the cap with elastic nuts holder, and insert it into U-head directly.

**Initial fixation of double locking application:** Hold the double locking cap with double locking cap holder and insert it into U-head lightly. Then tighten outer cap of double locking caps. Process distract or compress and anti-rotation. After above steps, tighten inner cap of double locking caps with screwdriver to fix rod initially. If the rod is raised and need be to replaced, process reduction with gun-type reduction forceps. Hold screw at the U-head and tighten gun-type reduction forceps to slide down sleeve to press rod slowly till it's placed into end of screw groove.



Another way to initially fix mono locking: Hold the cap with elastic nuts holder, and insert it into U-head thru the gun-type reduction forceps. The cap should be screwed into the bottom of U-head.

Another method to initially fix double locking application: Hold the double locking cap with double locking cap holder and insert it through sleeve of reduction forceps into U-head lightly. Then tighten outer cap of double locking caps. Process distract or compress and anti-rotation. After above steps, insert the double locking cap screwdriver along the sleeve to tighten inner cap to fix rod initially.



**Step 5****Implanting the bone graft and Compressing**

Distract or compress if required. Temporarily fix the screws at the end that requires distraction or compression, while the screws at the other end are left loose. Distract or compress the temporarily fixed screws, tighten the screws when the distraction or compression is satisfactorily achieved.



Use the double locking screws at the vertebral requiring inter vertebral fusion. After the pedicle screws are fixed, tighten the outer cap to achieve parallel fixation. When distracting the screws, the inter vertebral gap can be distracted parallelly. Insert the cage and compress parallel. Compared with the common multi-axial pedicle screws, it is easier to totally take out the disc and insert the cage.



With the same principle, when the double locking pedicle screws are applied to scoliosis, after the rod and double locking caps are fit, tighten the outer cap and locate the anterior distraction rod on the head of the screw to prevent rotation, so that the anti-rotation function will not lose because of the change of the screw head angle.

The anti-rotation procedure can also be achieved by using Uni-plane pedicle screws. The Uni-plane pedicle screw cannot move sideways, so the spiral deformity can be corrected by rotate the screws sideways.

**Step 6****Final Locking**

Tighten the screws when all the implants are fit in position.

Method of tightening the mono locking device: Locate the counter torque over the screw and rod. Fit the nut screwdriver rod into the torque limiting screwdriver and tighten the cap. (Tighten the cap until the torque limiting screwdriver clicks)

Method of tightening the double locking device: Locate the counter torque over the screw and rod. Tighten the outer cap with outer cap screwdriver. Fit the inner cap screwdriver rod into the torque limiting screwdriver and tighten the inner cap. (Tighten the cap until the torque limiting screwdriver clicks)

**Step 7****Fitting the crosslink and suturing the cut**

Fit the crosslink system. Suture the cut properly according to actual situation.

## Implants

Product No.	Product Description	Size
33401025	G5 Monoaxial Pedicle Screws	φ4.5X25
33401030	G5 Monoaxial Pedicle Screws	φ4.5X30
33401035	G5 Monoaxial Pedicle Screws	φ4.5X35
33401040	G5 Monoaxial Pedicle Screws	φ4.5X40
33401045	G5 Monoaxial Pedicle Screws	φ4.5X45
33401050	G5 Monoaxial Pedicle Screws	φ4.5X50
33401055	G5 Monoaxial Pedicle Screws	φ4.5X55
33402025	G5 Monoaxial Pedicle Screws	φ5.0X25
33402030	G5 Monoaxial Pedicle Screws	φ5.0X30
33402035	G5 Monoaxial Pedicle Screws	φ5.0X35
33402040	G5 Monoaxial Pedicle Screws	φ5.0X40
33402045	G5 Monoaxial Pedicle Screws	φ5.0X45
33402050	G5 Monoaxial Pedicle Screws	φ5.0X50
33402055	G5 Monoaxial Pedicle Screws	φ5.0X55
33403025	G5 Monoaxial Pedicle Screws	φ5.5X25
33403030	G5 Monoaxial Pedicle Screws	φ5.5X30
33403035	G5 Monoaxial Pedicle Screws	φ5.5X35
33403040	G5 Monoaxial Pedicle Screws	φ5.5X40
33403045	G5 Monoaxial Pedicle Screws	φ5.5X45
33403050	G5 Monoaxial Pedicle Screws	φ5.5X50
33403055	G5 Monoaxial Pedicle Screws	φ5.5X55
33404030	G5 Monoaxial Pedicle Screws	φ6.0X30
33404035	G5 Monoaxial Pedicle Screws	φ6.0X35
33404040	G5 Monoaxial Pedicle Screws	φ6.0X40
33404045	G5 Monoaxial Pedicle Screws	φ6.0X45
33404050	G5 Monoaxial Pedicle Screws	φ6.0X50
33404055	G5 Monoaxial Pedicle Screws	φ6.0X55
33405030	G5 Monoaxial Pedicle Screws	φ6.5X30
33405035	G5 Monoaxial Pedicle Screws	φ6.5X35
33405040	G5 Monoaxial Pedicle Screws	φ6.5X40
33405045	G5 Monoaxial Pedicle Screws	φ6.5X45
33405050	G5 Monoaxial Pedicle Screws	φ6.5X50
33405055	G5 Monoaxial Pedicle Screws	φ6.5X55
33406030	G5 Monoaxial Pedicle Screws	φ7.0X30
33406035	G5 Monoaxial Pedicle Screws	φ7.0X35
33406040	G5 Monoaxial Pedicle Screws	φ7.0X40
33406045	G5 Monoaxial Pedicle Screws	φ7.0X45
33406050	G5 Monoaxial Pedicle Screws	φ7.0X50
33406055	G5 Monoaxial Pedicle Screws	φ7.0X55
33407030	G5 Monoaxial Pedicle Screws	φ7.5X30
33407035	G5 Monoaxial Pedicle Screws	φ7.5X35
33407040	G5 Monoaxial Pedicle Screws	φ7.5X40
33407045	G5 Monoaxial Pedicle Screws	φ7.5X45
33407050	G5 Monoaxial Pedicle Screws	φ7.5X50
33407055	G5 Monoaxial Pedicle Screws	φ7.5X55



Product No.	Product Description	Size
33408025	G5 Reduction Pedicle Screws	φ4.5X25
33408030	G5 Reduction Pedicle Screws	φ4.5X30
33408035	G5 Reduction Pedicle Screws	φ4.5X35
33408040	G5 Reduction Pedicle Screws	φ4.5X40
33408045	G5 Reduction Pedicle Screws	φ4.5X45
33408050	G5 Reduction Pedicle Screws	φ4.5X50
33408055	G5 Reduction Pedicle Screws	φ4.5X55
33409025	G5 Reduction Pedicle Screws	φ5.0X25
33409030	G5 Reduction Pedicle Screws	φ5.0X30
33409035	G5 Reduction Pedicle Screws	φ5.0X35
33409040	G5 Reduction Pedicle Screws	φ5.0X40
33409045	G5 Reduction Pedicle Screws	φ5.0X45
33409050	G5 Reduction Pedicle Screws	φ5.0X50
33409055	G5 Reduction Pedicle Screws	φ5.0X55
33410025	G5 Reduction Pedicle Screws	φ5.5X25
33410030	G5 Reduction Pedicle Screws	φ5.5X30
33410035	G5 Reduction Pedicle Screws	φ5.5X35
33410040	G5 Reduction Pedicle Screws	φ5.5X40
33410045	G5 Reduction Pedicle Screws	φ5.5X45
33410050	G5 Reduction Pedicle Screws	φ5.5X50
33410055	G5 Reduction Pedicle Screws	φ5.5X55
33411030	G5 Reduction Pedicle Screws	φ6.0X30
33411035	G5 Reduction Pedicle Screws	φ6.0X35
33411040	G5 Reduction Pedicle Screws	φ6.0X40
33411045	G5 Reduction Pedicle Screws	φ6.0X45
33411050	G5 Reduction Pedicle Screws	φ6.0X50
33411055	G5 Reduction Pedicle Screws	φ6.0X55
33412030	G5 Reduction Pedicle Screws	φ6.5X30
33412035	G5 Reduction Pedicle Screws	φ6.5X35
33412040	G5 Reduction Pedicle Screws	φ6.5X40
33412045	G5 Reduction Pedicle Screws	φ6.5X45
33412050	G5 Reduction Pedicle Screws	φ6.5X50
33412055	G5 Reduction Pedicle Screws	φ6.5X55
33413030	G5 Reduction Pedicle Screws	φ7.0X30
33413035	G5 Reduction Pedicle Screws	φ7.0X35
33413040	G5 Reduction Pedicle Screws	φ7.0X40
33413045	G5 Reduction Pedicle Screws	φ7.0X45
33413050	G5 Reduction Pedicle Screws	φ7.0X50
33413055	G5 Reduction Pedicle Screws	φ7.0X55
33414030	G5 Reduction Pedicle Screws	φ7.5X30
33414050	G5 Reduction Pedicle Screws	φ7.5X50
33414055	G5 Reduction Pedicle Screws	φ7.5X55
33414035	G5 Reduction Pedicle Screws	φ7.5X35
33414040	G5 Reduction Pedicle Screws	φ7.5X40
33414045	G5 Reduction Pedicle Screws	φ7.5X45









Product No.	Product Description	Size
33447025	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X25
33447030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X30
33447035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X35
33447040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X40
33447045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X45
33447050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X50
33447055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.0X55
33448025	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X25
33448030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X30
33448035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X35
33448040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X40
33448045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X45
33448050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X50
33448055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ4.5X55
33449025	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X25
33449030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X30
33449035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X35
33449040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X40
33449045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X45
33449050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X50
33449055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.0X55
33450025	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X25
33450030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X30
33450035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X35
33450040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X40
33450045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X45
33450050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X50
33450055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ5.5X55
33451030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X30
33451035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X35
33451040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X40
33451045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X45
33451050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X50
33451055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.0X55
33452030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X30
33452035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X35
33452040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X40
33452045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X45
33452050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X50
33452055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ6.5X55
33453030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X30
33453035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X35
33453040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X40
33453045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X45
33453050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X50
33453055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.0X55
33454030	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X30
33454035	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X35
33454040	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X40
33454045	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X45
33454050	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X50
33454055	G5 Double Locking Multiaxial Reduction Pedicle Screws	φ7.5X55



Product No.	Product Description	Size
33455000	Cap	



Product No.	Product Description	Size
33456000	Double Locking Cap	



Product No.	Product Description	Size
33457050	Rod	φ5.5X50
33457060	Rod	φ5.5X60
33457070	Rod	φ5.5X70
33457080	Rod	φ5.5X80
33457090	Rod	φ5.5X90
33457100	Rod	φ5.5X100
33457110	Rod	φ5.5X110
33457120	Rod	φ5.5X120
33457130	Rod	φ5.5X130
33457140	Rod	φ5.5X140
33457150	Rod	φ5.5X150
33457160	Rod	φ5.5X160
33457170	Rod	φ5.5X170
33457180	Rod	φ5.5X180
33457190	Rod	φ5.5X190
33457200	Rod	φ5.5X200
33457210	Rod	φ5.5X210
33457220	Rod	φ5.5X220
33457230	Rod	φ5.5X230
33457240	Rod	φ5.5X240
33457250	Rod	φ5.5X250
33457260	Rod	φ5.5X260
33457280	Rod	φ5.5X280
33457300	Rod	φ5.5X300
33457350	Rod	φ5.5X350
33457400	Rod	φ5.5X400
33457420	Rod	φ5.5X420
33457450	Rod	φ5.5X450
33457500	Rod	φ5.5X500
33457550	Rod	φ5.5X550





Product No.	Product Description	Size
33458028	φ5.5 Crosslink, adjustable	28~31mm
33458031	φ5.5 Crosslink, adjustable	31~36mm
33458036	φ5.5 Crosslink, adjustable	36~41mm
33458041	φ5.5 Crosslink, adjustable	41~51mm
33458051	φ5.5 Crosslink, adjustable	51~70mm



Product No.	Product Description	Size
33459016	φ5.5 Crosslink, fixed	16mm
33459020	φ5.5 Crosslink, fixed	20mm
33459022	φ5.5 Crosslink, fixed	22mm
33459026	φ5.5 Crosslink, fixed	26mm



Product No.	Product Description	Size
33460026	φ5.5 Crosslink, Straight adjustable	28~31mm
33460031	φ5.5 Crosslink, Straight adjustable	31~36mm
33460036	φ5.5 Crosslink, Straight adjustable	36~41mm
33460041	φ5.5 Crosslink, Straight adjustable	41~51mm
33460051	φ5.5 Crosslink, Straight adjustable	51~70mm



Instruments



108110 Awl

108120 Straight Awl

108130 Curved Awl



108140 Probe

108150 T-Handle With Quick Coupling

108170 Rod Pusher



108180 Hex Rod Rotation Wrench

108190 Rod Holder forceps

108210 Compressor



108220 Distractor

108230 Rod Push Forceps

108240 Reduction Forceps



108250 Break Off Protector, for PolyNices

108260 Break off Iron

108270 Marker Inserter





108400 Medium-Lateral Reduction Device



108460 Reduction Device