

Anterior cervical plate system

Vectra

Surgical Technique



 Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Processing, Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

Contents

Introduction	Vectra	2
	AO Spine Principles	4
	Indications and Contraindications	5

Product Information	Implants	6
	Vario Case	9
	Instruments	10

Surgical Technique	Option A	
	Variable angle, self-drilling screw	15
	Option B	
	Fixed angle, self-drilling screw	17
Option C	Variable angle, self-tapping screw	19
	Option D	
Fixed angle, self-tapping screw		21

Implant Removal	23
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Bibliography	24
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Vectra. Designed for flexibility and ease of use of the anterior cervical plate system.

Plates

- Integrated blocking mechanism
- Prelordosed
- Large graft visibility window
- 16.5 mm wide and 2.5 mm thin
- Titanium alloy plate (TAN)
- Integral Elgiloy clips lock the screws to the plate



Screws

- Screws are color coded to identify function and diameter ¹
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where higher purchase is required

¹ Self-drilling Screws shown, same color code applies to self-tapping screws

Variable angle screws

- Cephalad/caudal: 28° range
- Medial/lateral: 14° range

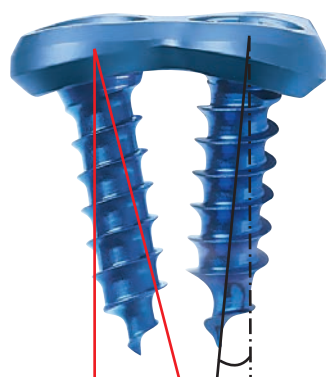


purple 4.0 mm



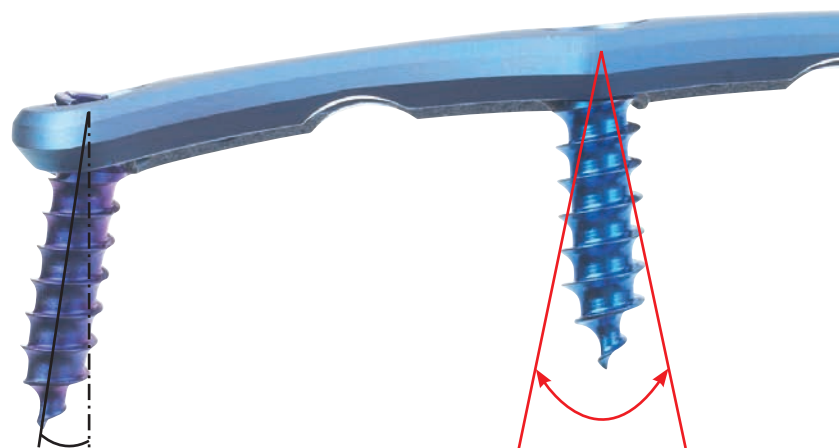
blue 4.5 mm

Medial/lateral angulation



14° range 7° offset

Cephalad/caudal angulation



8° offset

28° range



aqua 4.5 mm



brown 4.0 mm

Fixed angle screws

- Cephalad/caudal: offset of 8°
- Medial/lateral: offset of 7°

Cephalad/caudal angulation



8° offset

Medial/lateral angulation



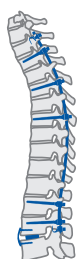
7° offset

AO Spine Principles

The four principles to be considered as the foundation for proper spine patient management underpin the design and delivery of the Curriculum: Stability – Alignment – Biology – Function.^{1,2}

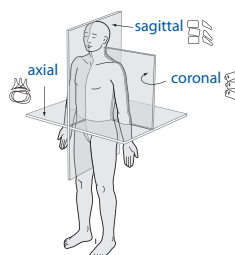
Stability

Stabilization to achieve a specific therapeutic outcome



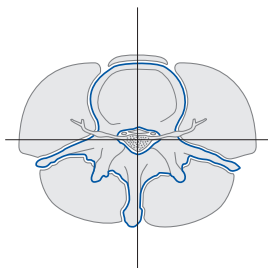
Alignment

Balancing the spine in three dimensions



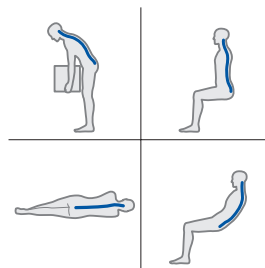
Biology

Etiology, pathogenesis, neural protection, and tissue healing



Function

Preservations and restoration of function to prevent disability



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¹ Aebi et al (1998)

² Aebi et al (2007)

Indications and Contraindications

Intended use

The Vectra System is intended for anterior plate and screw fixation of specified part(s): the cervical spine (C2–C7).

Indications

- Degenerative disc disease (DDD, defined as neck pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies)
- Spondylolisthesis
- Spinal stenosis
- Tumors (primary and metastatic)
- Failed previous fusions
- Pseudarthrosis
- Deformity (i.e kyphosis, lordosis and/or scoliosis)

Contraindications

- Severe osteoporosis
- Any indication where fusion is not required

Note for long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable case.

Implants

Vectra plate options



One-level plates

Art. No.	Hole pair length mm	Total plate length mm
04.613.012*	12	21
04.613.014*	14	23
04.613.016*	16	25
04.613.018*	18	27
04.613.020*	20	29
04.613.022*	22	31
04.613.024*	24	33
04.613.026*	26	35



Two-level plates

Art. No.	Hole pair length mm	Total plate length mm
04.613.126*	26	35
04.613.128*	28	37
04.613.130*	30	39
04.613.132*	32	41
04.613.134*	34	43
04.613.136*	36	45
04.613.138*	38	47
04.613.140*	40	49
04.613.142*	42	51
04.613.144*	44	53
04.613.146*	46	55



* All implants are also available sterile packed. Add suffix "S" to article number.

Three-level plates

Art. No.	Hole pair length mm	Total plate length mm
04.613.245*	45	54
04.613.248*	48	57
04.613.251*	51	60
04.613.254*	54	63
04.613.257*	57	66
04.613.260*	60	69
04.613.263*	63	72
04.613.266*	66	75
04.613.269*	69	78



Four-level plates

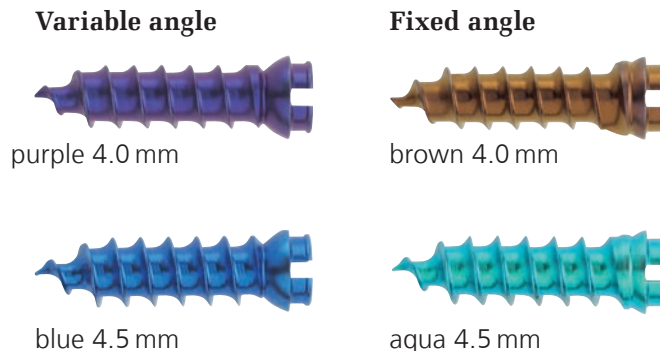
Art. No.	Hole pair length mm	Total plate length mm
04.613.360*	60	69
04.613.364*	64	73
04.613.368*	68	77
04.613.372*	72	81
04.613.376*	76	85
04.613.380*	80	89
04.613.384*	84	93
04.613.388*	88	97
04.613.392*	92	101
04.613.396*	96	105
04.613.400*	100	109



* All implants are also available sterile packed. Add suffix "S" to article number.

Vectra screw options

- Variable angle screws (purple and blue)
- Fixed angle screws (brown and aqua)
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where higher purchase is required
- Monocortical screw lengths range from 12–18 mm (self-drilling and self-tapping cancellous screws)
- Bicortical screw lengths range from 18–26 mm (self-tapping cortex screws)
- Screws are color coded to identify type and diameter
- Material: Titanium alloy (TAN)



Standard screws

Self-drilling screws, cancellous

04.613.514/516*	4.0 mm, variable angle, 14 mm, 16 mm
04.613.564/566*	4.5 mm, variable angle, 14 mm, 16 mm
04.613.714/716*	4.0 mm, fixed angle, 14 mm, 16 mm
04.613.764/766*	4.5 mm, fixed angle, 14 mm, 16 mm

Available lengths

Self-drilling screws, cancellous

04.613.512–518*	4.0 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.562–568*	4.5 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.712–718*	4.0 mm, fixed angle, 12–18 mm, increments of 2 mm
04.613.762–768*	4.5 mm, fixed angle, 12–18 mm, increments of 2 mm

Self-tapping screws, cancellous

04.613.612–618*	4.0 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.662–668*	4.5 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.812–818*	4.0 mm, fixed angle, 12–18 mm, increments of 2 mm
04.613.862–868*	4.5 mm, fixed angle, 12–18 mm, increments of 2 mm

Self-tapping bicortical screws, cortical

04.614.618–626*	4.0 mm, variable angle, 18–26 mm, increments of 2 mm
04.614.668–676*	4.5 mm, variable angle, 18–26 mm, increments of 2 mm

* All implants are also available sterile packed. Add suffix "S" to article number.

Vario Case

Vectra Vario Case

68.613.000 Vario Case for Vectra and Vectra-T,
without Contents

68.613.000.02 Insert, size 1/4, for additional items,
for Vario Case No. 68.613.000

68.613.020 Module for Vectra-T Plates 4.0/4.5, for
Vario Case No. 68.613.000

68.613.030 Insert for Screws, for Vectra and
Vectra-T, for Vario Case 68.613.000

Optional

68.613.021 Additional Module for Vectra-T Plates
4.0/4.5, for Vario Case No. 68.613.000

Instruments

Plate manipulation instruments

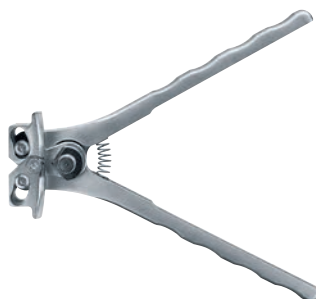
324.101 Fixation Pin for temporary use
Holds the plate securely to the bone
prior to final placement of screws.



352.312 Holding Sleeve, for No. 324.105
For use with Screwdriver 324.105.



03.600.004 Bending Pliers for Vectra Plates
For contouring Vectra plates to
the desired curvature.



Screw site preparation instruments

311.402 Tap for Cancellous Bone Screws
Ø 4.0 mm, length 220 mm
In combination with 324.107



311.404 Tap for Cancellous Bone Screws
Ø 4.5 mm, length 220 mm,
Holding Sleeve, for No. 324.105



324.107 Handle with Quick Coupling
For use with drill bits and taps.



324.111 Awl Ø 2.5 mm with trocar tip
Breaks the cortex.



324.151–159 Drill Bit Ø 2.5 mm, lengths 12–20 mm,
2-flute, for Quick Coupling
In combination with 324.107



03.613.222–
226 Drill Bit Ø 2.5mm, lengths 22–26 mm,
2-flute, for Quick Coupling
In combination with 324.107



387.292 Screw Length Indicator for Cervical Spine Expansion Head Screws, length up to 50 mm



03.600.002 Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T

Functions as a plate holder and works as a guide for drill bits when preparing insertion of fixed angle screws.



03.600.003 Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T

Functions as a plate holder and works as a guide for drill bits when preparing insertion of variable angle screws.



03.613.001 Drill and Screw Guide, for Vectra and Vectra-T
Facilitates use of awl, drill bits, and taps and allows for fixed and variable angle screw insertion.



03.614.002 Compression Drill Guide 8.5/3.1 for Vectra and Vectra-T



Screw insertion instruments

324.105 Screwdriver for Insertion, self-holding
For inserting screws and temporary
fixation pins.



Extraction and revision instrument

324.071 Cleaning Instrument for Screw Head
For removal of tissue in the screw head
prior to attaching the Screwdriver for
Extraction.



352.311 Screwdriver for Extraction.
For extracting screws from the plate.



Surgical Technique

1. Approach

Using the standard surgical approach, expose the vertebral bodies to be fused. Prepare the fusion site as per the appropriate technique for the given indication.

2. Select and bend plate

Optional instruments

03.600.002	Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T
03.600.003	Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T
03.600.004	Bending Pliers for Vectra Plates

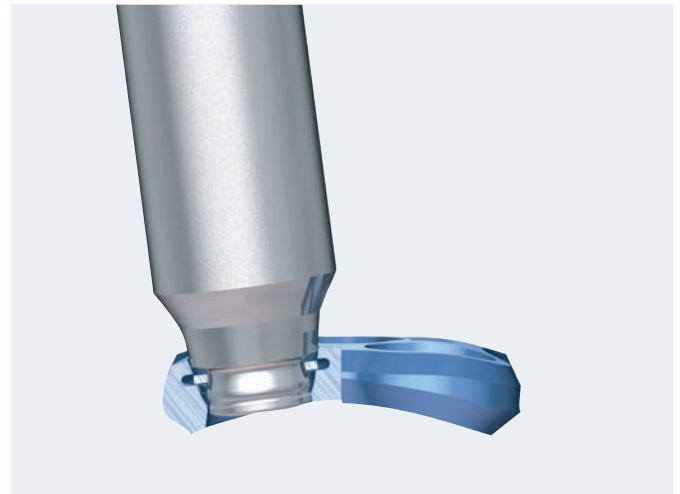
Select appropriate plate size.

Plate may be brought in position with the Drill Guide (fixed angle or variable angle).

Precautions:

- It must be considered that the intervertebral discs in the neck region are slightly inclined from antero-caudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- Only bend the plate at the bending notches or else the holes may distort.
- Repeated bending may weaken the plate.
- Do not bend the plate at the holes or carriages.

Once the correct plate size has been chosen, determine plate alignment. The Bending Pliers may be used to give the plate its correct lordotic curvature.



Tip of Drill Guide snaps into clip in plate hole



Increase lordotic bend



Decrease lordotic bend

3. Secure plate with temporary Fixation Pins

Required instruments

324.101	Fixation Pin for temporary use
324.105	Screwdriver for Insertion, self-holding
352.312	Holding Sleeve, for No. 324.105

After the plate is placed in the appropriate position, it is secured with Fixation Pins. Insert the first Fixation Pin using the Screwdriver for Insertion and the additionally available Holding Sleeve. Screw the pin into the vertebral body. Insert a second pin into the diagonally opposite plate hole.

Additional temporary Fixation Pins may be inserted if desired.

- ⓘ **Precaution:** Intraoperative imaging should be used for a lateral view of the position of the fixation pins to indicate the potential positions of the screws.



Option A

Variable angle, self-drilling screw



A4. Break cortex

Required instrument

324.111 Awl \varnothing 2.5 mm with trocar tip

Optional instrument

03.613.001 Drill and Screw Guide, for Vectra and Vectra-T

Determine the entry point and trajectory for the screw. Insert the awl at the desired angle into the screw hole and push down while simultaneously twisting the awl handle. Remove the awl maintaining hole and plate alignment.

- ⓘ **Precaution:** Intraoperative imaging should be used to verify awl position.

Optionally the Drill and Screw Guide can be introduced with the alignment post in the diamond window and used as a guide for the following steps.

Insert the tip of the drill guide at an angle, as shown, and rotate the instrument forward until the tip is engaged. The tip of the drill guide snaps into the clip in the plate hold.

The awl may be used with either the fixed- or variable-angle single-barrel drill guide to break the cortex.



A5. Insert variable angle screw

Required instrument

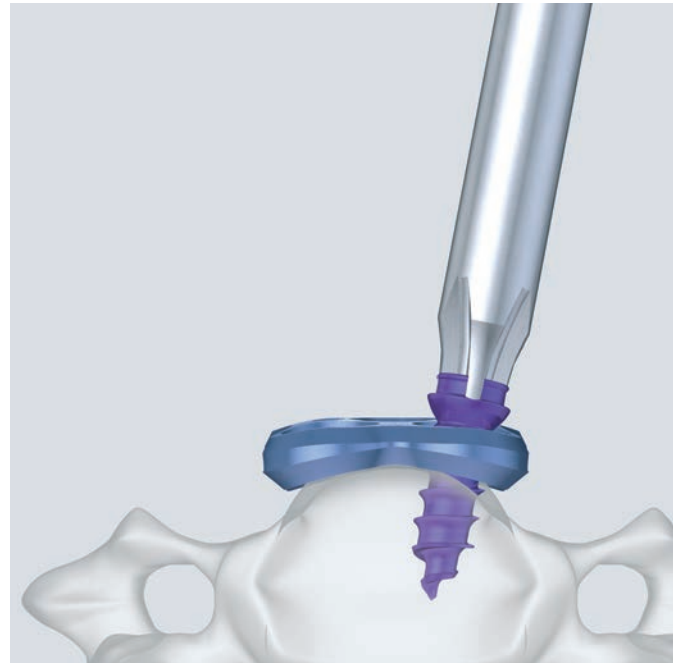
324.105 Screwdriver for Insertion, self-holding

Load a self-drilling variable angle screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated and the plate is lagged to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- It must be considered that the intervertebral discs in the neck region are slightly inclined from antero-caudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.



Option B

Fixed angle, self-drilling screw



B4. Break cortex

Required instruments

324.111	Awl Ø 2.5 mm with trocar tip
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T

Introduce the Drill and Screw Guide in the small posthole of the plate. Insert the awl in the Drill and Screw Guide and push down while simultaneously twisting the awl handle. Remove the awl maintaining hole and plate alignment.

- ⓘ **Precaution:** Intraoperative imaging should be used to verify awl position.

The Drill and Screw Guide must be introduced with the alignment post in the small hole adjacent to the screw hole and used as a guide for the following steps.



B5. Insert fixed angle screw

Required instruments

324.105	Screwdriver for Insertion, self-holding
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T

Load a self-drilling fixed angle screw of the appropriate length onto the Screwdriver for Insertion. Insert the loaded Screwdriver in the Drill and Screw Guide and advance the screw until the head of the screw is fully seated in the plate.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- It must be considered that the intervertebral discs in the neck region are slightly inclined from antero-caudal to postero-cranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.



Option C

Variable angle, self-tapping screw



C4. Drill pilot hole

Required instruments

03.600.003	Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T
324.107	Handle with Quick Coupling
324.151–159	Drill Bit \varnothing 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling
03.613.222–226	Drill Bit \varnothing 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling

Optional instruments

03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
387.292	Screw Length Indicator for Cervical Spine Expansion Head Screws, length up to 50 mm
311.402	Tap for Cancellous Bone Screws \varnothing 4 mm, length 220 mm
311.404	Tap for Cancellous Bone Screws \varnothing 4.5 mm, length 220 mm

Select a drill bit and screw of appropriate length.

Insert the Drill Guide into the desired hole inclined to the appropriate direction for drilling. Insert the Drill Bit into the Drill Guide and drill to desired depth. The drill will stop at the depth indicated on the drill when the stop contacts the top of the Drill Guide.

⚠ Caution: Intraoperative imaging should be used to check the drilling operation.

Remove drill guide and bit.



C5. Insert variable-angle screw

Required instrument

324.105	Screwdriver for Insertion, self-holding
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Optional instrument

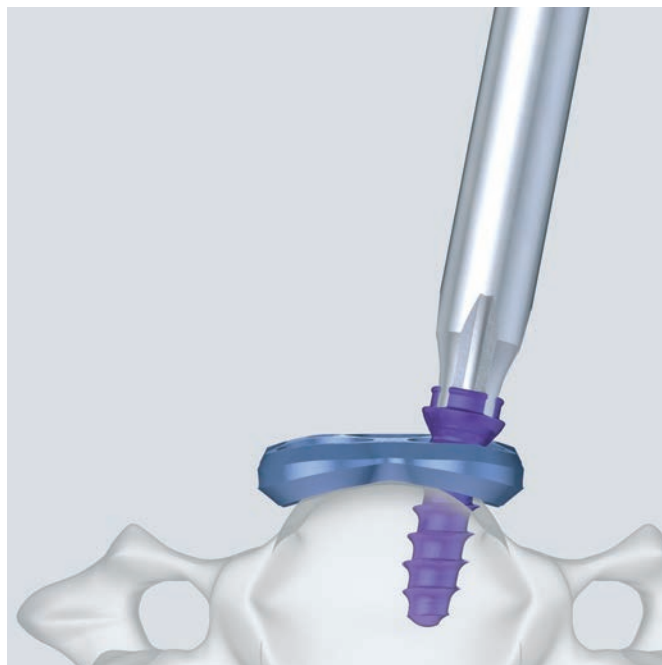
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
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Load a variable angle self-tapping screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- It must be considered that the intervertebral discs in the neck region are slightly inclined from antero-caudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.



C6. Optional instrumentation

Optional instruments

311.402	Tap for Cancellous Bone Screws Ø 4 mm
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311.404	Tap for Cancellous Bone Screws Ø 4.5 mm
---------	--

Dense bone may be tapped using the Tap for 4.0 mm or 4.5 mm cancellous screws.

Option D

Fixed angle, self-tapping screw



D4. Drill pilot hole

Required instruments

03.600.002	Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T
324.107	Handle with Quick Coupling
324.151–159	Drill Bit \varnothing 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling
03.613.222–226	Drill Bit \varnothing 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling

Optional instruments

03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
387.292	Screw length indicator, depth up to 50 mm
311.402	Tap for Cancellous Bone Screws \varnothing 4 mm, length 220 mm
311.404	Tap for Cancellous Bone Screws \varnothing 4.5 mm, length 220 mm

Select a drill bit and screw of appropriate length.

Insert the Drill Guide fully into the desired hole so that the correct fixed angle screw trajectory is given.

Insert the Drill Bit into the Drill Guide and drill to desired depth. The drill will stop at the depth indicated on the drill when the stop contacts the top of the Drill Guide.

⚠️ Caution: Intraoperative imaging should be used to check the drilling operation.

Remove drill guide and bit.



D5. Insert fixed-angle screw

Required instrument

324.105	Screwdriver for Insertion, self-holding
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Optional instrument

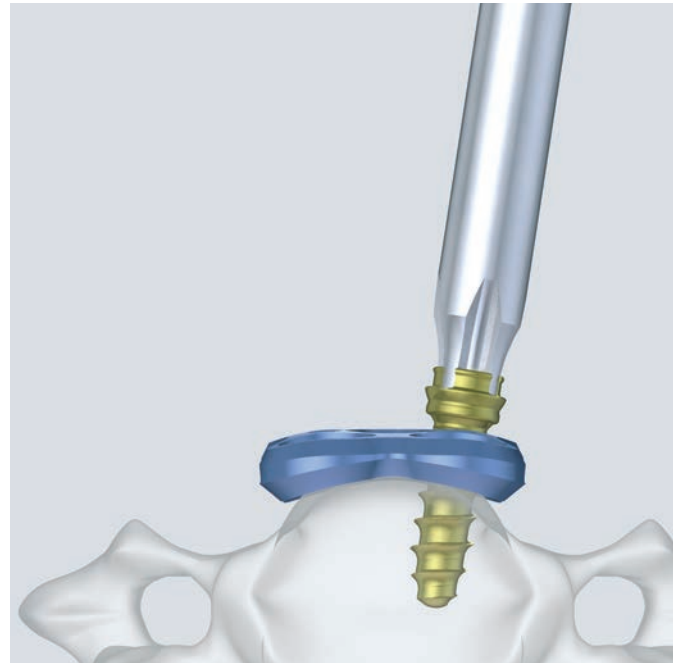
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
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Load a fixed angle self-tapping screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- It must be considered that the intervertebral discs in the neck region are slightly inclined from antero-caudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.



D6. Optional instrumentation

Optional instruments

311.402	Tap for Cancellous Bone Screws Ø 4 mm
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311.404	Tap for Cancellous Bone Screws Ø 4.5 mm
---------	--

Dense bone may be tapped using the tap for 4.0 mm or 4.5 mm cancellous screws.

Implant Removal

1. Clean screw head

Required instrument

324.071 Cleaning Instrument for Screw Head

If access to the screw head is blocked by tissue, use the Cleaning Instrument for Screw Head to clean out material. Insert the instrument into the screw head and twist the handle back and forth until material is removed.

2. Remove screw

Required instrument

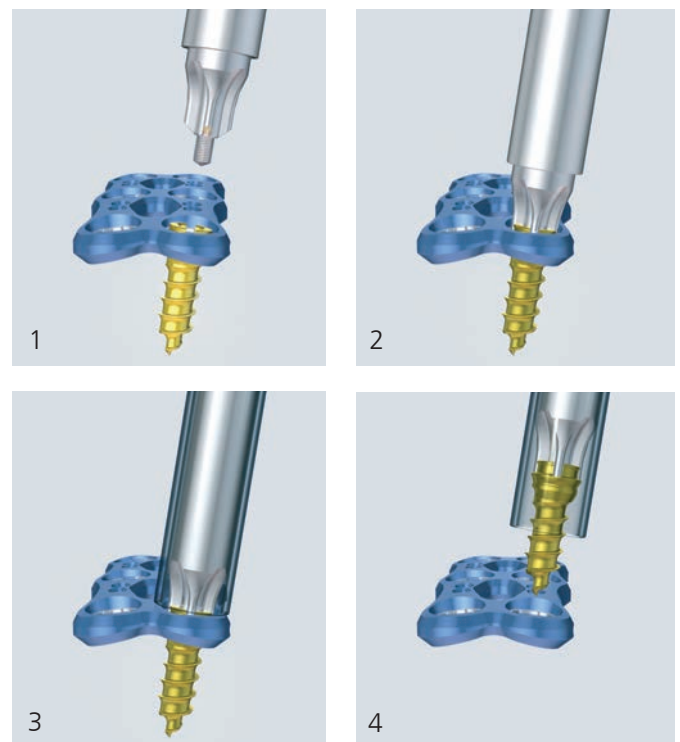
352.311 Screwdriver for Extraction

For screw removal the Screwdriver for Extraction must be used.

Insert the driver shaft into the screw head recess. Tighten the knob on the handle to thread the threaded tip of the inner shaft into the mating thread of the screw. Advance the sleeve downward to contact the upper surface of the plate by turning the sleeve clockwise.

Do not rotate the sleeve after it has contacted the surface of the plate. While holding the sleeve, turn the handle counterclockwise to extract the screw.

Precaution: After the second screw insertion trial, the plate needs to be replaced.



3. Remove plate

After all the screws have been removed, the plate can then be removed.

Precaution: If the inner shaft knob is not fully tightened to the handle, breakage of the driver may occur and could potentially harm the patient.

Precaution: The extraction screw driver should only be used for screw removal; use of the extraction screwdriver for screw insertion may lead to driver and/or implant breakage.

Bibliography

Aebi M, Arlet V, Webb JK, (2007): AOSPINE Manual (2 vols), Stuttgart, New York: Thieme.

Aebi M, Thalgott JS, Webb JK (1998): AO ASIF Principles in Spine Surgery. Berlin: Springer.

