

The translational anterior cervical plate system

VECTRA-T

Surgical Technique

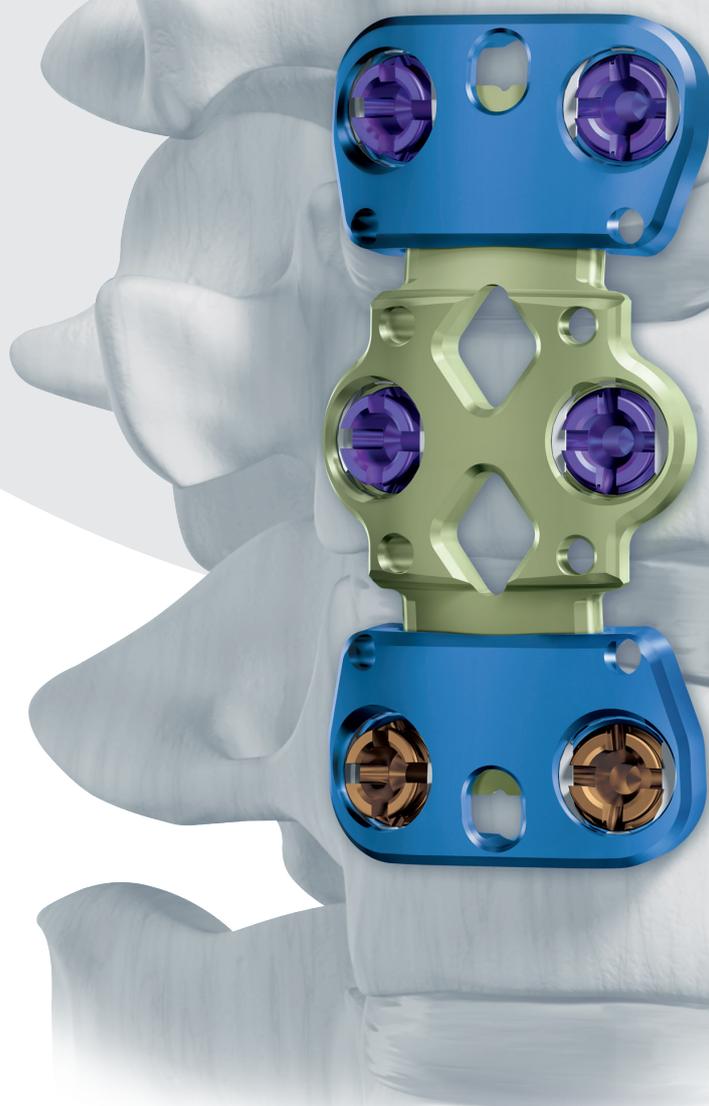


 Image intensifier control

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.depuyshes.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.depuyshes.com/hcp/reprocessing-care-maintenance>

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VECTRA-T. The translational anterior cervical plate system

Plates

- Integrated screw blocking mechanism
- Prelordosed
- 19 mm wide and 2.5 mm profile
- Titanium alloy plate (TAN)



Screws

- Screws are color coded to identify function and diameter¹
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where a larger diameter screw is preferred
- Titanium alloy screws (TAN)

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

Variable angle screws

purple 4.0 mm

blue 4.5 mm



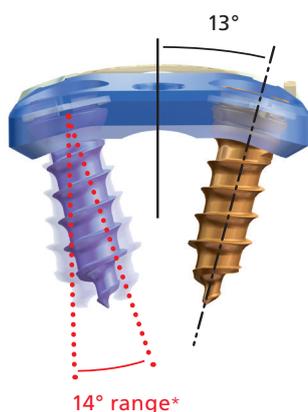
Fixed angle screws

brown 4.0 mm

aqua 4.5 mm

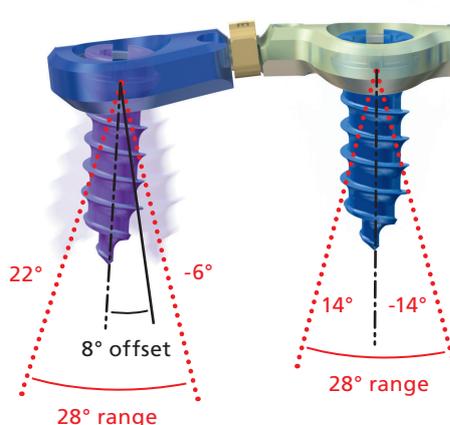


Medial/lateral angulation



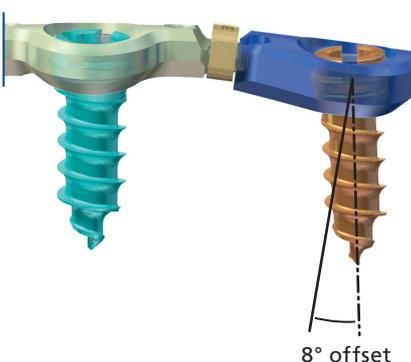
Variable angle screws

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



Fixed angle screws

- Cephalad/caudal: offset of 8°



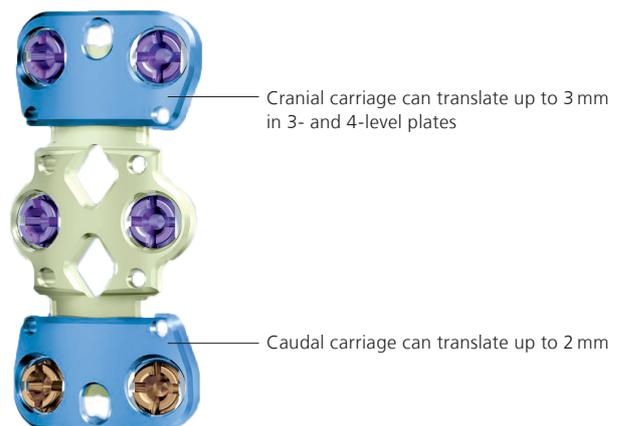
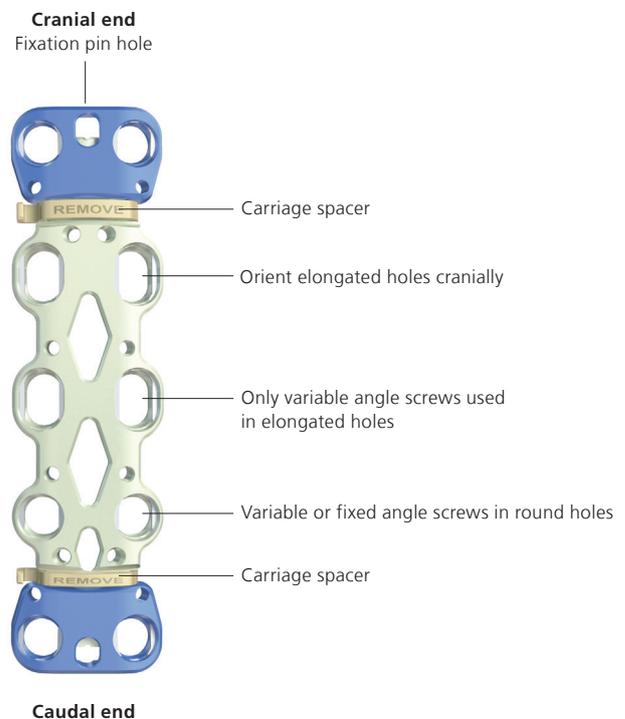
*14° range is applicable to the variable angle screws

Screw placement

- All 3- and 4-level VECTRA-T plates are designed with a recommended cranial end—the end with the elongated holes.
- All screws from the system may be placed in the round screw holes.
- Only the Variable Angle screws may be placed in elongated holes.
- Post holes for the Drill and Screw Guide indicate the end of the elongated hole where screws must be inserted for translation.

Translation

- The carriage on the cranial end (for 3- and 4-level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.
- Total amount of translation can be customized by removing carriage spacers and moving the carriages within the allowable range before screw placement.
- All carriage spacers must be removed after screw insertion.



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}

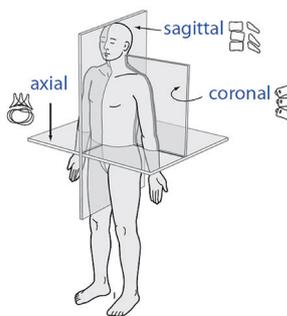
Stability

Stabilization to achieve a specific therapeutic outcome



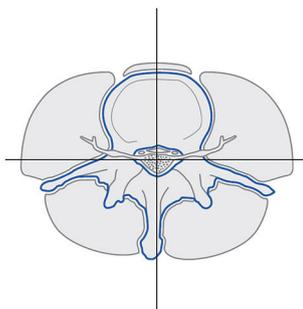
Alignment

Balancing the spine in three dimensions



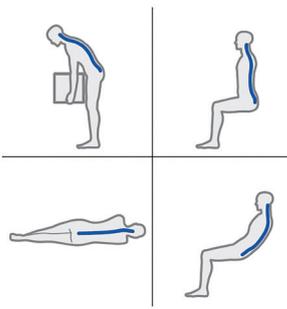
Biology

Etiology, pathogenesis, neural protection, and tissue healing



Function

Preservations and restoration of function to prevent disability



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Implant Selection and Preparation

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

Required Instrument

03.600.004 Bending Pliers for VECTRA Plates

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

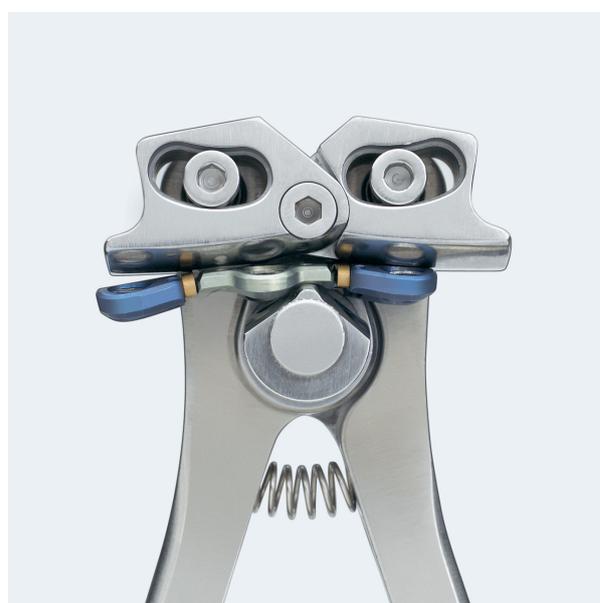
Select a plate with appropriate hole spacing. Plate may be brought in position with the Drill Guide (fixed angle or variable angle).

Precaution: 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.

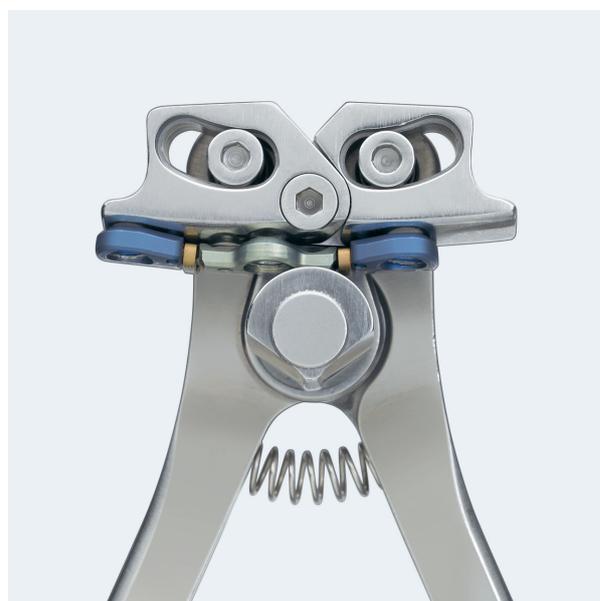
After plate length has been determined, ensure that the prelordosed plate fits the anatomy. The plate contour can be adjusted using the Bending Pliers at the bend grooves of the plate.

Precautions:

- Repeated bending may weaken the plate.
- Do not bend the plate at the holes or carriages.
- Bending the shortest 1- and 2-level plates (450.551, 450.552, 450.561, 450.562 and 450.563) may impede the translational mechanism and is not recommended. These plates are made with additional lordosis.



Increase lordotic bend



Decrease lordotic bend

3. Secure plate with Fixation Pins

Required Instruments

324.101 Fixation Pin for temporary use

324.105 Screwdriver for Insertion, self-holding

Optional Instrument

352.312 Holding Sleeve

When the plate is positioned appropriately, secure it with a Fixation Pin, using the Screwdriver for Insertion and, if needed, the additionally available Holding Sleeve. Screw the pin into the vertebral body. Insert a second pin into the 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:

Awl and Self-Drilling Variable Angle Screws

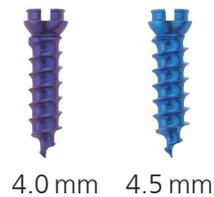
A1. Break cortex

Required Instrument

324.111 Awl \varnothing 2.5 mm with trocar tip

Insert the awl by rocking it into the screw hole. Push down at the desired screw angle, while twisting the awl handle. Remove the awl while maintaining hole and plate alignment. To remove the awl, pull straight up to disengage it from the clip. Do not angle or lever the awl to either side.

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



A2. Insert variable angle screw

Required Instrument

324.105 Screwdriver for Insertion, self-holding

Load the appropriate length variable angle self-drilling screw onto the Screwdriver. 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 suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.

Precautions:

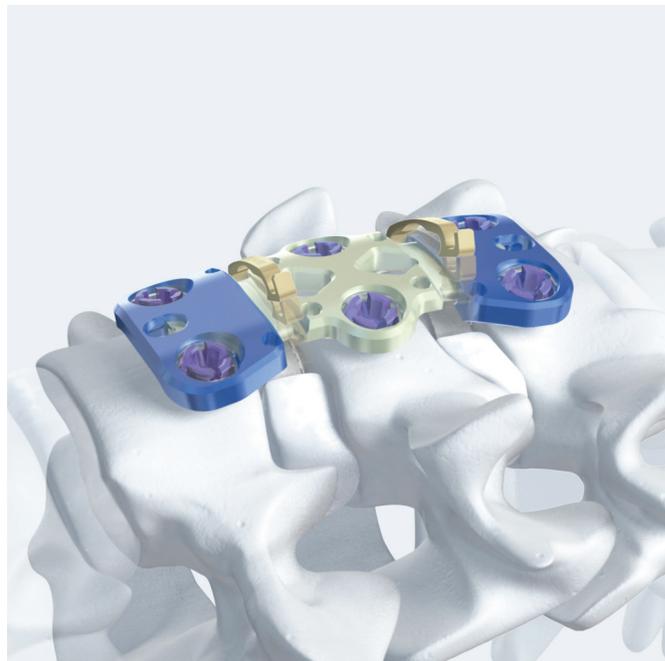
- Only the variable angle screws from the system may be placed in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- Any screws from the system may be placed in the round screw holes.
- It must be considered that the intervertebral discs 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.
- The total amount of translation can be customized by removing carriage spacers and moving the carriages within the allowable range before screw placement.
- The carriage on the cranial end (for 3- and 4- level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.



A3. Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.



Option B:

Drill Sleeves and Self-Tapping Screws

B1. Select Drill Guide

Required 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

Choose either the fixed angle or variable angle Drill Guide. Color bands on Drill Guides correspond to the color of the screws associated with each guide.



B2. Drill pilot hole

Required Instruments

324.151–159 Drill Bits \varnothing 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling

03.613.222–226 Drill Bits \varnothing 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling

324.107 Handle with Quick Coupling

Optional Instrument

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

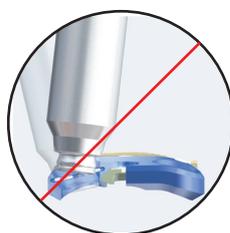
Insert the Drill Guide by rocking it into the screw hole. Use the appropriate length drill bit and handle to drill the pilot hole for the screw. The depth stop will contact the Drill Guide to limit drilling depth.

- ⓘ **Precaution:** Intraoperative imaging should be used to check the drilling operation.



B3. Remove Drill Guide

Remove the Drill Guide by pulling straight up to disengage it from the clip. Do not angle or lever the sleeve to either side.



B4. Insert screw

Required Instrument

324.105 Screwdriver for Insertion, self-holding

Optional Instruments

311.402 Tap for Cancellous Bone Screws
Ø 4.0 mm, length 220 mm

311.404 Tap for Cancellous Bone Screws
Ø 4.5 mm, length 220 mm

324.107 Handle with Quick Coupling

Load the appropriate length variable angle or fixed angle self-tapping screw onto the screwdriver. 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 suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.

Precautions:

- Only the variable angle screws from the system may be placed in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- Any screws from the system may be placed in the round screw holes.
- 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.
- Any screws from the system may be placed in the round screw holes.
- The total amount of translation can be customized by removing carriage spacers and moving the carriages within the allowable range before screw placement.
- The carriage on the cranial end (for 3- and 4-level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.



B5. Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.



Option C:

Drill and Screw Guide

C1. Insert Drill and Screw Guide

Required Instrument

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

Use the Drill and Screw Guide in the small post holes.



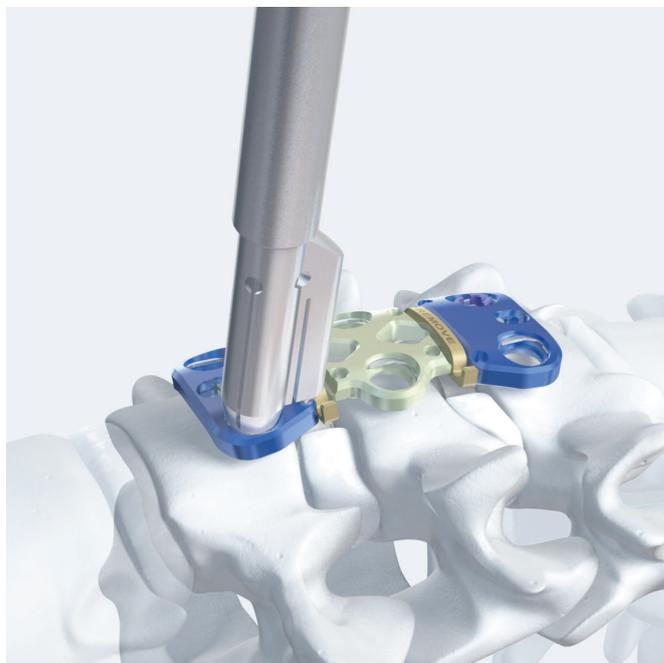
C2. Drill

Required Instruments

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T
324.151–159	Drill Bits Ø 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling
03.613.222–226	Drill Bits Ø 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling
324.107	Handle with Quick Coupling

Optional Instruments

311.402	Tap for Cancellous Bone Screws Ø 4.0 mm, length 220 mm
311.404	Tap for Cancellous Bone Screws Ø 4.5 mm, length 220 mm
324.111	Awl Ø 2.5 mm with trocar tip
387.292	Screw Length Indicator for Cervical Spine Expansion Head Screws, length up to 50 mm



Insert the appropriate length drill bit through the barrel of the Drill and Screw Guide and drill the hole. The depth stop will contact the guide to limit drilling depth.

- ⓘ **Precaution:** Intraoperative imaging should be used to check the drilling operation.

Alternatively

Insert the Awl through the barrel of the Drill and Screw Guide, pushing down while twisting the awl handle.

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

C3. Insert screw

Required Instruments

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

Insert the appropriate length screw through the barrel of the Drill and Screw Guide and advance it until the screw head almost engages the plate (as indicated by the groove on the screwdriver shaft lining up with the top of the Drill and Screw Guide). Retract the Drill and Screw Guide by pulling it along the screwdriver shaft, just before the screw seats in the plate hole, to visually confirm that the screw is seating. Advance the screw until it lags the plate to the bone.

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

Precautions:

- Only the variable angle screws from the system may be placed in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- Any screws from the system may be placed in the round screw holes.
- 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.
- The total amount of translation can be customized by removing carriage spacers and moving the



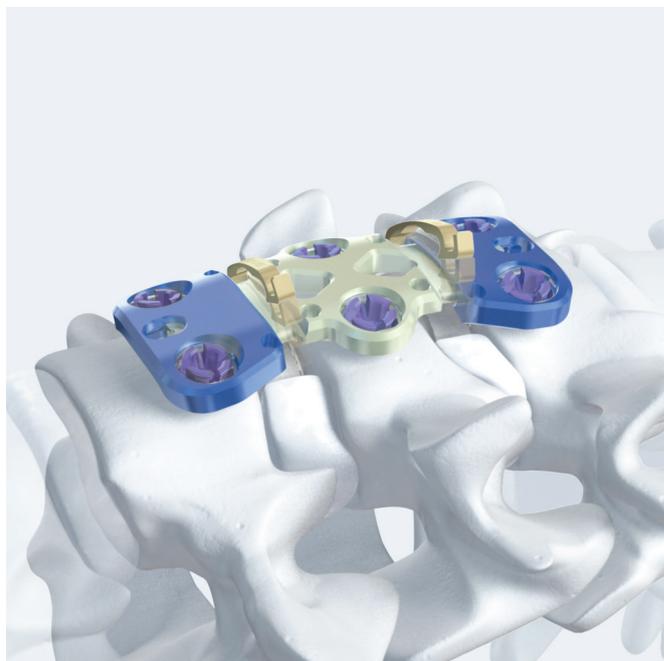
carriages within the allowable range before screw placement.

- The carriage on the cranial end (for 3- and 4-level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.

C4. Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.



Implant Removal

1. Clean screw head

Required Instrument

324.071	Cleaning Instrument for Screw Head
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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.

Precautions:

- 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.
- A screw can be inserted and removed two times. If a screw is removed a third time the plate needs to be replaced.
- If the inner shaft knob is not fully tightened to the handle, breakage of the driver may occur and could potentially harm the patient.

Warning: 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.



Insert the driver shaft into the screw head recess.



Tighten the knob on the handle to thread the inner shaft into the mating thread of the screw.



Advance the sleeve downward.



Turn the handle counterclockwise while holding on to the sleeve to extract the screw.

3. Remove plate

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

Indications and Contraindications

Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effects and Residual Risks. Instructions for Use are available at www.e-ifu.com and/or www.depuy-synthes.com/ifu.

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-Verlag.

