Trinity™

Advanced Bearing Acetabular System

Surgical technique

Corin

Trinity™

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Trinity™

Performance | Versatility | Technology

The advanced solution for acetabular hip replacement

Trinity™

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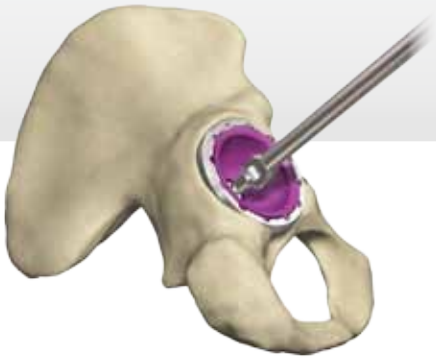

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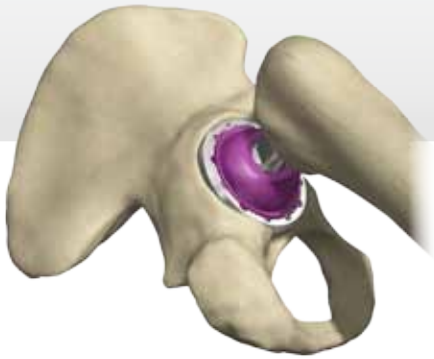

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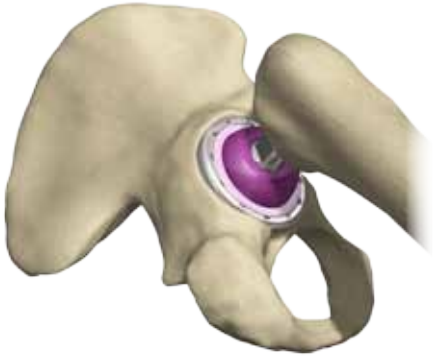

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Introduction

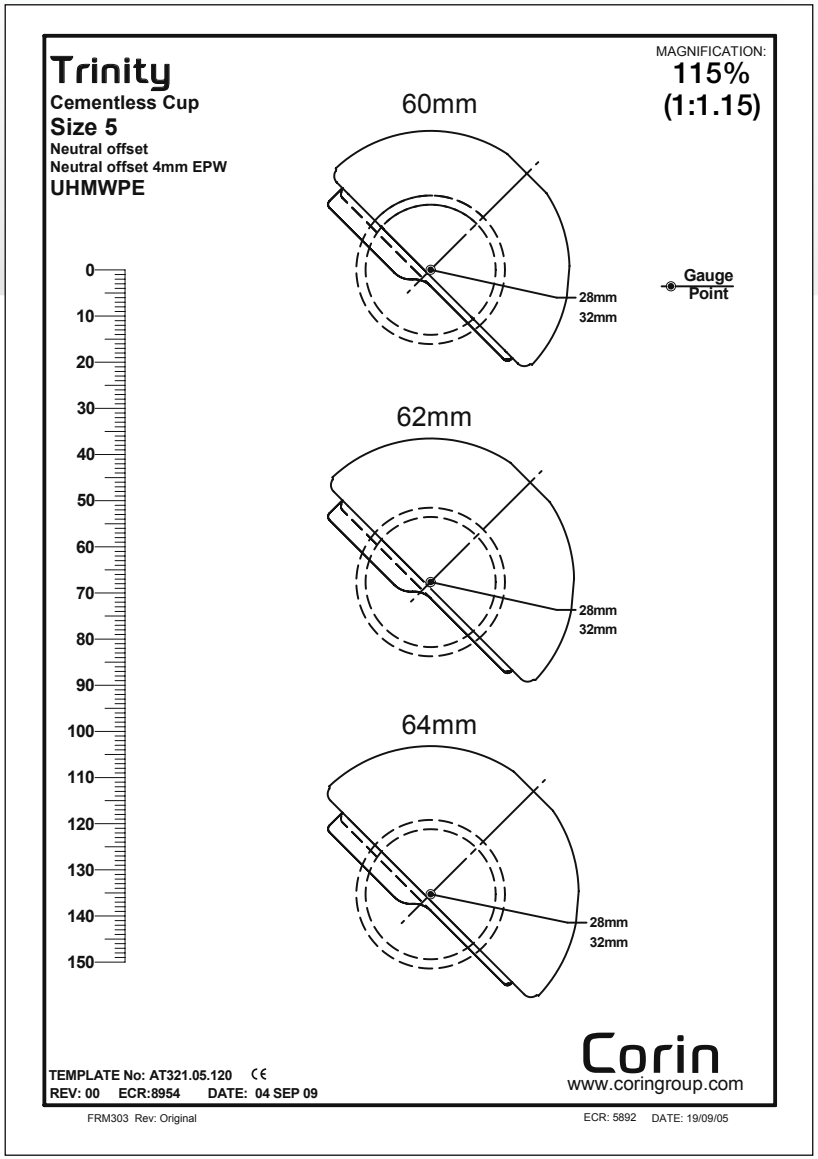
The Trinity advanced bearing acetabular system offers surgeons a wide range of high performance bearings within a versatile system which includes a titanium hemisherical shell that utilises the clinically proven fixation of BONIT™ coating for patient matched solutions.

Pre-operative planning

The radiograph is assessed using the Trinity X-ray templates for the position of the acetabular component and the optimal size for the patient's hip anatomy. The Trinity X-ray templates are available digitally and in acetate format at 100%, 110% 115% and 120% magnification.

Acetabular preparation

The acetabulum is prepared by the release and removal of soft tissue using the surgeon's preferred technique to gain adequate exposure for reaming. Excision of the labrum and osteophytes allows for improved visualisation of the bony anatomy and improves ease of reaming.



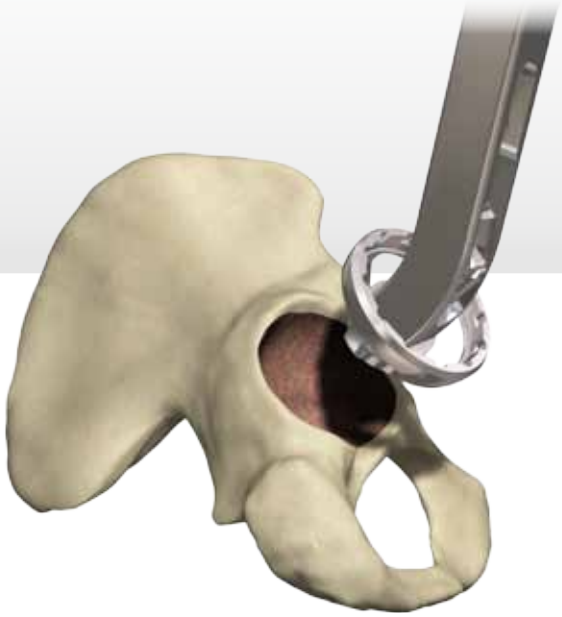
Step 1. Acetabular reaming

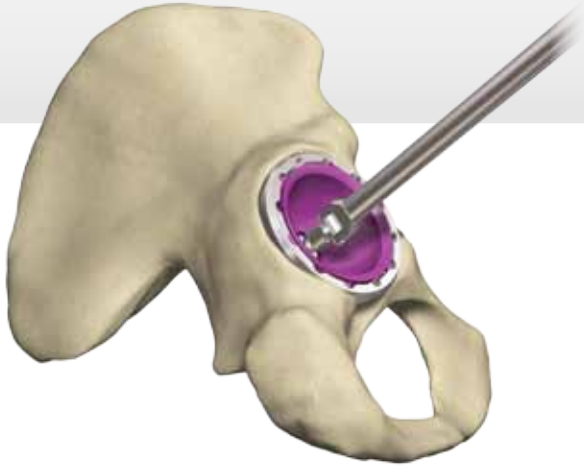
Initially a reamer of 6-8mm smaller than the anticipated size should be used to deepen the acetabulum to bleeding subcondral bone and the level determined by pre-operative templating. Subsequent reamers should be used to centre and deepen the socket until it becomes a true hemisphere.

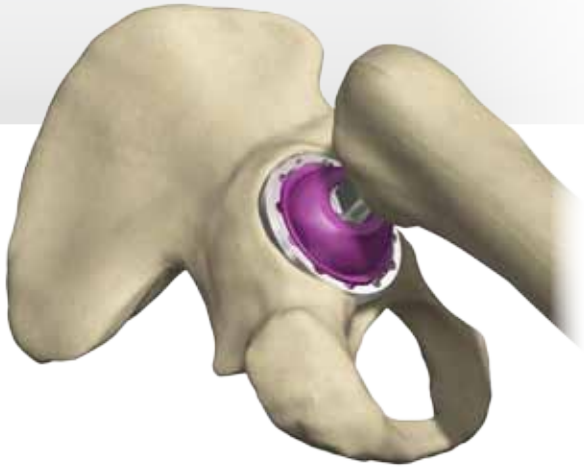
Hemispherical acetabular reamers are available in 1mm increments. The Trinity shell, including coating, is 1mm larger than the nominal size (as labelled). To achieve a 1mm press-fit in hard bone the acetabulum should be reamed line to line with the nominal cup size. In order to achieve a 2mm press-fit, it is recommended that the surgeon reams 1mm less than the nominal size (see reamer guide).

Reamer guide

Nominal shell size as labelled	Ream line-to-line ream (1mm press-fit)	Ream 1mm under-ream (2mm press-fit)	Trial	Shell size including coating
44mm	44mm	43mm	44mm	45mm
46mm	46mm	45mm	46mm	47mm
48mm	48mm	47mm	48mm	49mm
50mm	50mm	49mm	50mm	51mm
52mm	52mm	51mm	52mm	53mm
54mm	54mm	53mm	54mm	55mm
56mm	56mm	55mm	56mm	57mm
58mm	58mm	57mm	58mm	59mm
60mm	60mm	59mm	60mm	61mm
62mm	62mm	61mm	62mm	63mm
64mm	64mm	63mm	64mm	65mm
66mm	66mm	65mm	66mm	67mm
68mm	68mm	67mm	68mm	69mm







Step 2. Acetabular shell trials

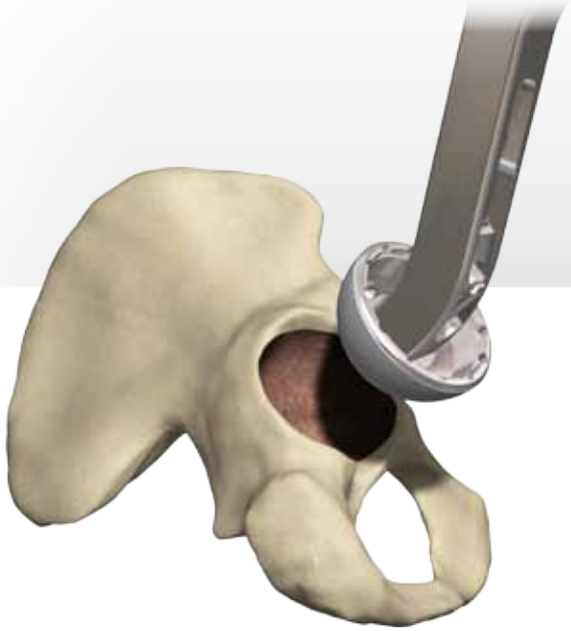
The appropriate sized shell trial is selected and attached to the introducer handle (available offset or straight). The shell trials are available in 2mm increments and are used to determine the definitive shell position and size. The shell trial represents the implant minus the coating and is therefore 1mm smaller than the definitive implant (i.e. the geometry of the cup without the coating). The windows in the trial can be used to confirm that full seating has been achieved.

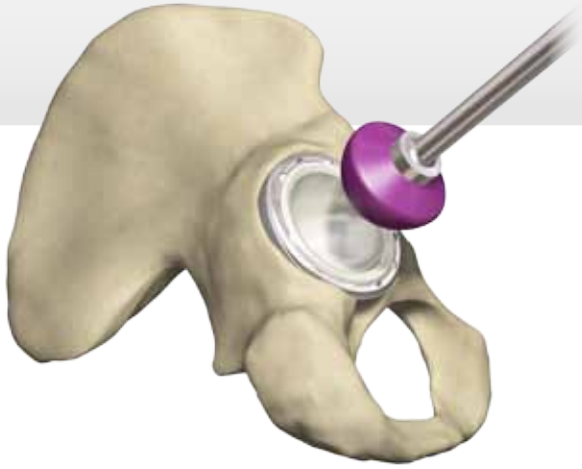
Step 3. Acetabular liner trials

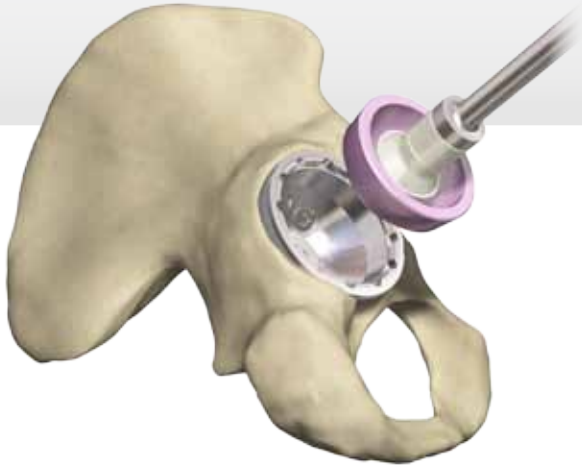
Following seating of the acetabular shell trial, the appropriate liner trial (ceramic or polyethylene) can be inserted. The screwdriver is used to lock this into position via the apical screw hole.

Step 4. Trial reduction

The appropriate femoral head trial is used to perform a trial reduction, taking the hip through a full range of motion and stability assessment with all trial components in position. Once the position of the shell trial is correct diathermy can be used around the rim to mark the depth and orientation of the shell when seated.







Step 5. Acetabular shell implantation

The acetabular shell component is securely threaded onto the acetabular introducer handle (available offset or straight) and the shell is impacted until fully seated, indicated by a change in tone. The transverse ligament is a useful landmark for shell orientation[1]. The acetabular alignment guide can be used to assist in component orientation in abduction (45°) and anteversion (20°). An apical hole occluder (packaged with the shell) is then screwed into the shell until flush using the screwdriver.

If screw insertion is required please see Appendix A (p10).

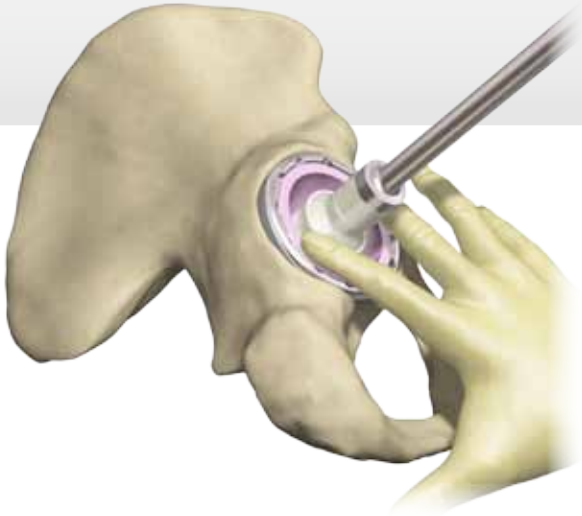
Step 6. Liner insertion

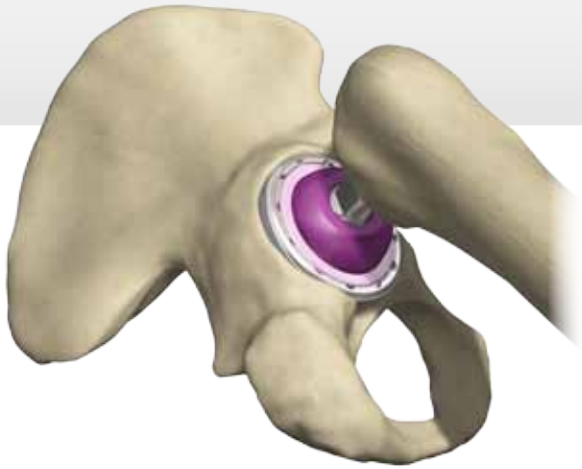
Following insertion of the femoral component, the required liner is selected (ceramic or polyethylene). Ensure the shell is free from any debris before placing the liner in the correct position in the shell.

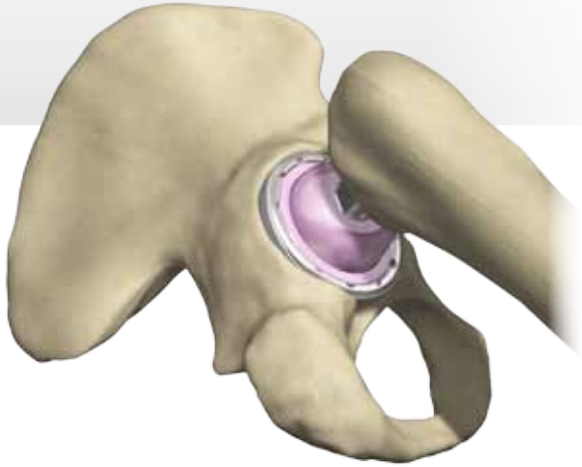
For the polyethylene liner verify that the anti-rotational tabs are correctly orientated in the shell before fully seating using the impactor connected to the pusher or the straight introducer. Verify the liner is fully seated and that the anti-rotational tabs are flush with the castellations in the acetabular shell.

If the polyethylene liner needs to be extracted please see Appendix B (p11).

When inserting the ceramic liner the sucker should be used to ensure accurate alignment of the liner within the shell.







The ceramic liner is securely held in place with two fingers, one placed either side of the rim, whilst the sucker is detached.

Ensure the ceramic liner is correctly aligned by running a finger around the rim of the shell. **Impact firmly using the impactor connected to the pusher or the straight introducer.**

If the ceramic liner needs to be extracted, please see Appendix B (p11).

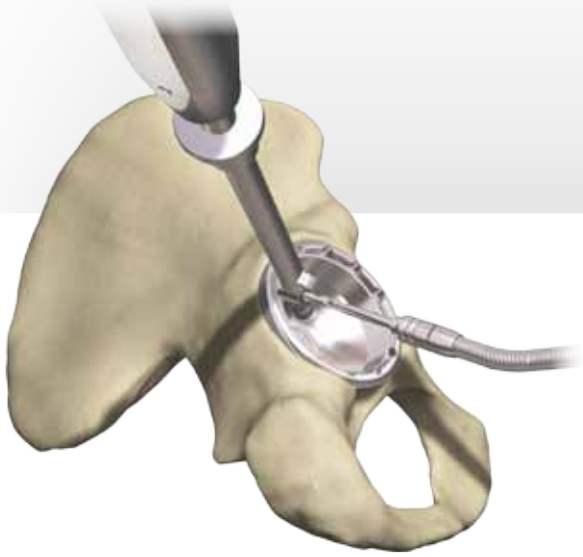
Step 7. Final trial reduction

A final trial reduction is performed to assess the range of motion, hip stability and limb length using a trial modular head.

Step 8. Final reduction and closure

The required head size and length is selected. The hip is reduced, the range of motion, hip stability and limb length are checked. The hip is closed using the surgeon's preferred technique.

Appendix A



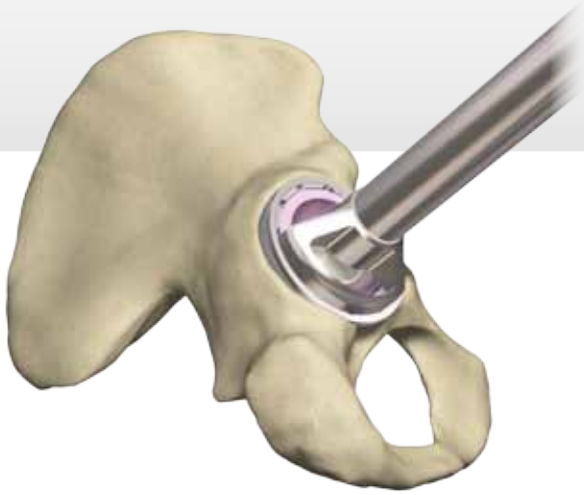
Screw insertion

The Trinity acetabular shell has three holes designed for insertion of screws. These holes are sealed with three occluders which must first be removed using the screwdriver should screws be required. The flexible drill and modular drill guide can be used to drill the required angle and depth for the screw. Drill bits are available in lengths of 15, 30, 45 and 60mm.

The depth gauge is used to assess the resultant length of the screws required.

6.5mm Trinity self-tapping cancellous bone screws can then be inserted using the screwdriver. Screws are available in lengths of 15-65mm in increments of 5mm.

Appendix B



Liner extraction

If the polyethylene liner needs to be extracted, the polyethylene liner extractor can be used. The longer arm of the extractor is placed inside the bearing and the shorter arm clamped to the outside rim. The extractor is then levered in both directions (pivoting against the rim) until the liner becomes loose.

If the ceramic liner needs to be extracted the ceramic liner extractor rod is attached to the sucker and placed in the liner. The extractor plate and handle then slides over the rod. The tabs on the plate are placed in the shell castellations and the locking screw is tightened. The extractor is lightly tapped and the ceramic liner can be removed.

If the ceramic liner is misaligned prior to impaction the extractor can be used to remove the liner. The liner must be checked for damage (and if so disposed of) prior to reseating.

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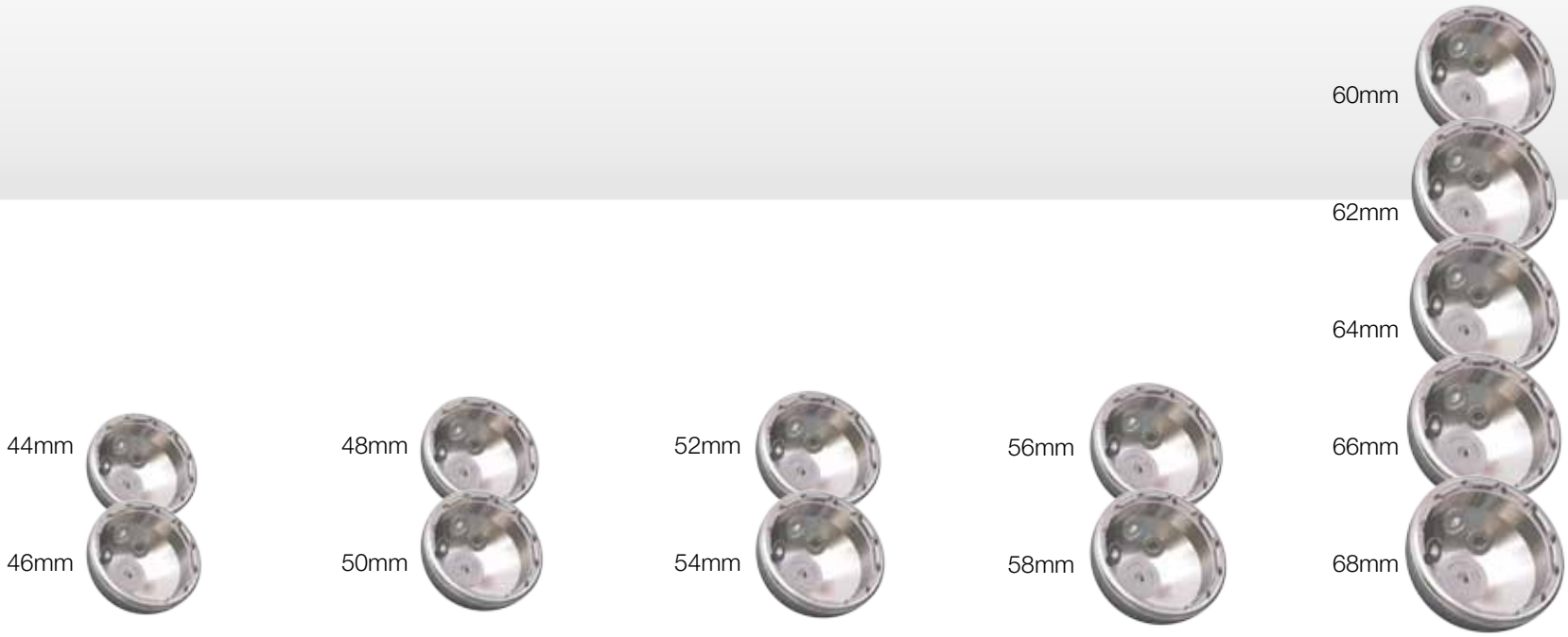
Compatibility chart



Trinity shell outer diameter	44mm / 46mm	48mm / 50mm	52mm / 54mm	56mm / 58mm	60mm / 62mm / 64mm / 66mm / 68mm
Taper size	01	02	03	04	05
Ceramic liner	28mm	32mm	36mm	40mm	40mm
Polyethylene liner	28mm	28mm / 32mm	28mm / 32mm	28mm / 32mm	28mm / 32mm

Ordering information

Acetabular shells

321.01.344	44mm	Taper size 1
321.01.346	46mm	Taper size 1
321.02.348	48mm	Taper size 2
321.02.350	50mm	Taper size 2
321.03.352	52mm	Taper size 3
321.03.354	54mm	Taper size 3
321.04.356	56mm	Taper size 4
321.04.358	58mm	Taper size 4
321.05.360	60mm	Taper size 5
321.05.362	62mm	Taper size 5
321.05.364	64mm	Taper size 5
321.05.366	66mm	Taper size 5
321.05.368	68mm	Taper size 5

CoCr modular heads (12/14)

E321.028	Small	-3.5mm	28mm
E321.032	Small	-4.0mm	32mm
E321.128	Medium	0.0mm	28mm
E321.132	Medium	0.0mm	32mm
E321.228	Long	+3.5mm	28mm
E321.232	Long	+4.0mm	32mm
E321.332	Extra long	+7.0mm	32mm

Biolox delta™ ceramic modular heads (12/14)

104.2800	Small	-3.5mm	28mm
104.3200	Small	-4.0mm	32mm
104.3600	Small	-4.0mm	36mm
104.4000	Small	-4.0mm	40mm
104.2805	Medium	0.0mm	28mm
104.3205	Medium	0.0mm	32mm
104.3605	Medium	0.0mm	36mm
104.4005	Medium	0.0mm	40mm
104.2810	Long	+3.5mm	28mm
104.3210	Long	+4.0mm	32mm
104.3610	Long	+4.0mm	36mm
104.4010	Long	+4.0mm	40mm
104.3215	Extra long	+7.0mm	32mm
104.3615	Extra long	+8.0mm	36mm
104.4015	Extra long	+8.0mm	40mm

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UHMWPE neutral offset liner

321.01.028	28mm	Taper size 1
321.02.028	28mm	Taper size 2
321.02.032	32mm	Taper size 2
321.03.028	28mm	Taper size 3
321.03.032	32mm	Taper size 3
321.04.028	28mm	Taper size 4
321.04.032	32mm	Taper size 4
321.05.028	28mm	Taper size 5
321.05.032	32mm	Taper size 5

UHMWPE +4mm offset liner

321.01.128	28mm	Taper size 1
321.02.128	28mm	Taper size 2
321.02.132	32mm	Taper size 2
321.03.128	28mm	Taper size 3
321.03.132	32mm	Taper size 3
321.04.128	28mm	Taper size 4
321.04.132	32mm	Taper size 4
321.05.128	28mm	Taper size 5
321.05.132	32mm	Taper size 5

Biolox delta™ ceramic liner

321.01.428	28mm	Taper size 1
321.02.432	32mm	Taper size 2
321.03.436	36mm	Taper size 3
321.04.440	40mm	Taper size 4
321.05.440	40mm	Taper size 5

UHMWPE +4mm offset oblique liner

321.01.228	28mm	Taper size 1
321.02.228	28mm	Taper size 2
321.02.232	32mm	Taper size 2
321.03.228	28mm	Taper size 3
321.03.232	32mm	Taper size 3
321.04.228	28mm	Taper size 4
321.04.232	32mm	Taper size 4
321.05.228	28mm	Taper size 5
321.05.232	32mm	Taper size 5

UHMWPE neutral offset 4mm elevated wall liner (EPW)

321.01.328	28mm	Taper size 1
321.02.328	28mm	Taper size 2
321.02.332	32mm	Taper size 2
321.03.328	28mm	Taper size 3
321.03.332	32mm	Taper size 3
321.04.328	28mm	Taper size 4
321.04.332	32mm	Taper size 4
321.05.328	28mm	Taper size 5
321.05.332	32mm	Taper size 5

Apical occluder (packed with shell)

321.100	Apical occluder

Screw hole occluder (packed with shell)

321.101	Screw hole occluder

6.5mm cancellous screws

321.015	15mm
321.020	20mm
321.025	25mm
321.030	30mm
321.035	35mm
321.040	40mm
321.045	45mm
321.050	50mm
321.055	55mm
321.060	60mm
321.065	65mm

Notes

References:

1. Archbold HAP, Mockford B, Molloy D, McConway J, Ogonda L, Beverland D. The transverse acetabular ligament: an aid to orientation of the acetabular component during primary total hip replacement: a preliminary study of 1000 cases investigating postoperative stability. *J Bone Joint Surg, [Br]* 2006;88-B(7):883.

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