



Surgical Technique

Amplitude is an internationally renowned orthopaedic company that has built a reputation for exceptional engineering, reliable clinical results, and cohesive collaboration with the world's leading surgeons.



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C²® Acetabular Cup

The C²® Acetabular Cup is a modular, cementless implant designed for use in total hip arthroplasty where cup fixation is achieved without the use of bone cement.

To provide optimum press-fit fixation and bone ingrowth, the outer surface is covered with a sintered titanium coating providing primary stability and allowing biological bone integration for secondary fixation.

High-tolerance machining and a stable liner locking mechanism allow easy liner insertion and reduce the potential for wear and particulate debris generation at the cup-liner interface.

The C²® system was developed by Amplitude's team of internationally renowned engineers in collaboration with leading surgeons from around the globe.

Key Features

- Minimal Wear: Highly cross linked polyethylene modular inserts aimed to minimise wear and maximise durability.
- Options: Liners come in neutral and 20° Hooded accepting 32mm and 36mm Heads.
- Screw Hole Covers: Factory installed, minimizing debris migration. Easy to remove when screws are required for additional cup stability.

Indications

The C²® Acetabular Cup is a component of a total hip prosthesis which is indicated for hip arthroplasty to reduce pain and significant disability in cases of:

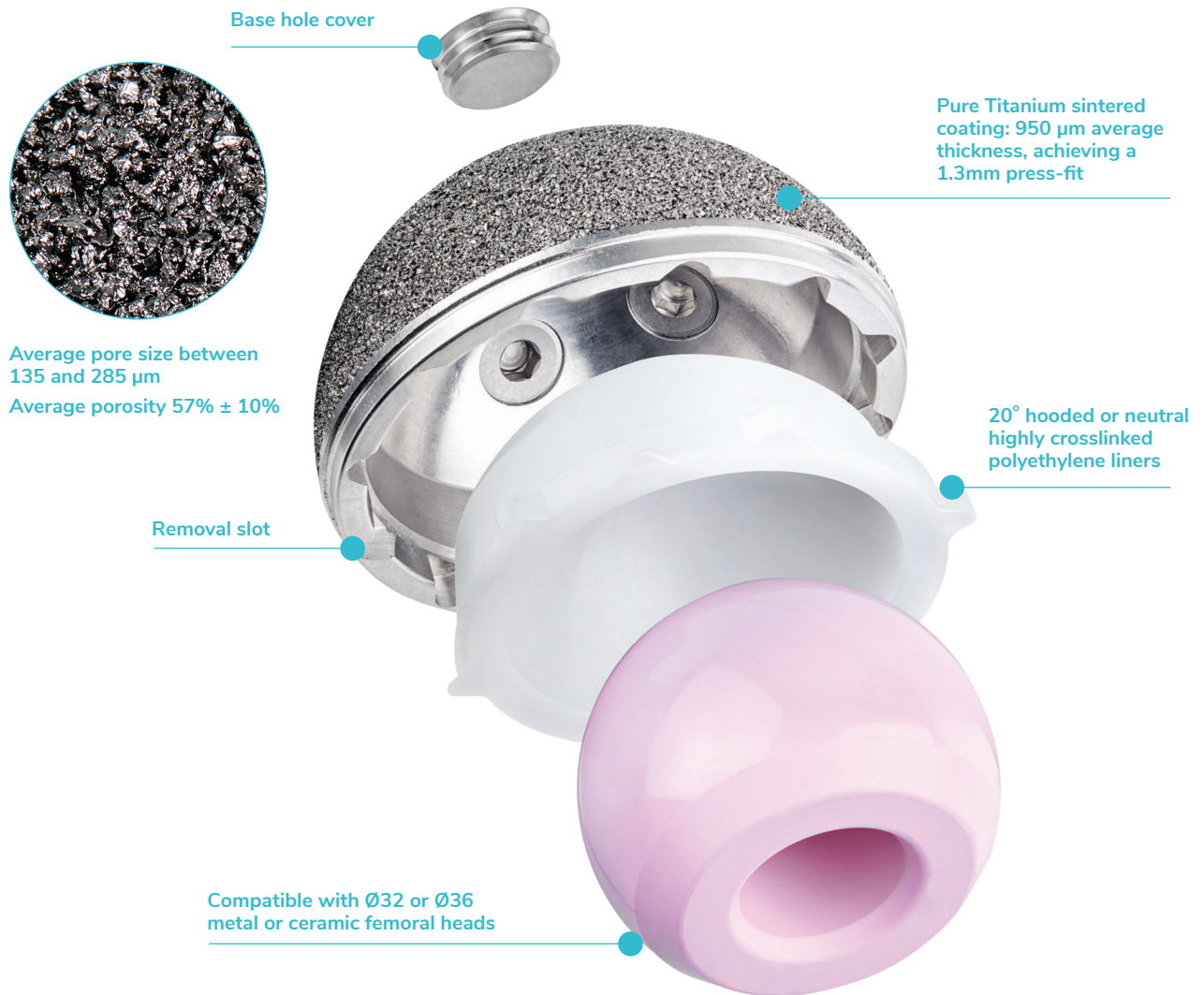
- Primary and secondary hip osteoarthritis
- Osteonecrosis
- Rheumatoid arthritis/inflammatory diseases
- Hip joint arthroplasty when other devices or treatments have failed

The expected clinical benefits of total hip prostheses are better clinical outcomes including but not limited to; reduced pain, increased range of motion and improved quality of life.

TECHNICAL SPECIFICATION

Liner: Bar stock GUR 1020 / Gamma irradiation at 75kGy / Remelting at 150°C.





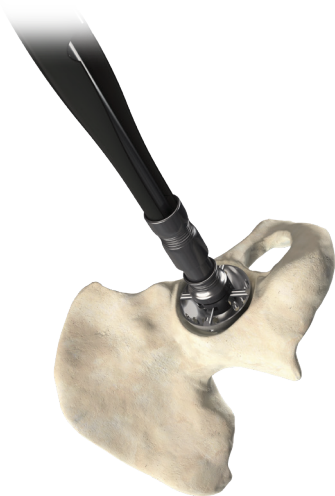
	$\text{\O}48\text{mm}$	$\text{\O}50\text{mm}$	$\text{\O}52\text{mm}$	$\text{\O}54\text{mm}$	$\text{\O}56\text{mm}$	$\text{\O}58\text{mm}$	$\text{\O}60\text{mm}$	$\text{\O}62\text{mm}$	$\text{\O}64\text{mm}$	$\text{\O}66\text{mm}$	$\text{\O}68\text{mm}$
Cup											
$\text{\O}32\text{mm}$ Liner											
$\text{\O}36\text{mm}$ Liner											

*Blue highlighted implants are sent as standard in Australia. Other liner sizes available upon request.

Surgical Technique Overview


1

Acetabular Preparation

An illustration showing a surgical retractor system positioned over a human acetabulum. A long, black, tapered instrument is inserted into the center of the acetabulum, likely for reaming or preparing the surface.

2

Acetabular Trialling

An illustration showing a surgical retractor system over an acetabulum. A long, black instrument is inserted into the acetabulum, and a T-shaped handle is attached to the top of the instrument's shaft, used for adjusting the depth and position of the trial cup.

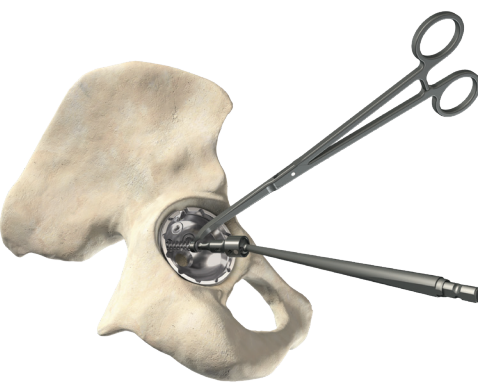
3

Final Cup Insertion

An illustration showing a surgical retractor system over an acetabulum. A long, black instrument is inserted into the acetabulum, and a T-shaped handle is attached to the top of the instrument's shaft, used for adjusting the depth and position of the trial cup.

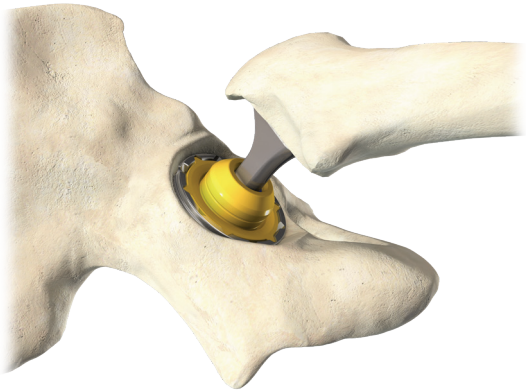
4

Optional: Screws

An illustration showing a human acetabulum with a trial cup in place. Two long screws are being inserted into the acetabulum, one from the top and one from the side, to secure the trial cup. Surgical forceps are used to hold the screws in place.

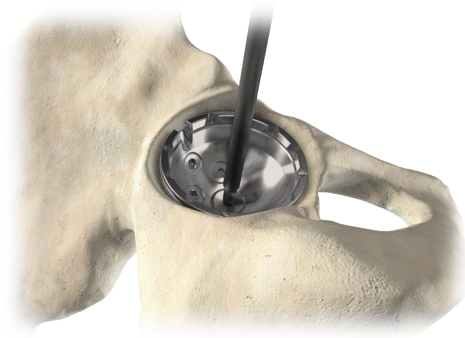
5

Trial Reduction



6

Base Hole Cover Insertion

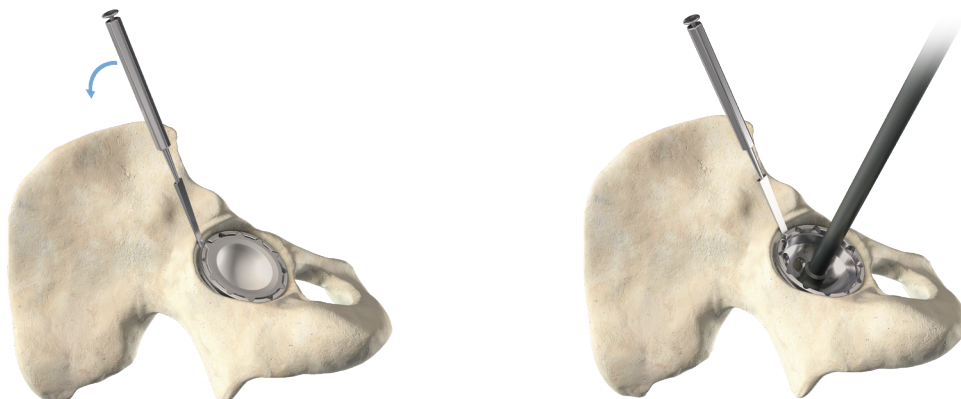


7

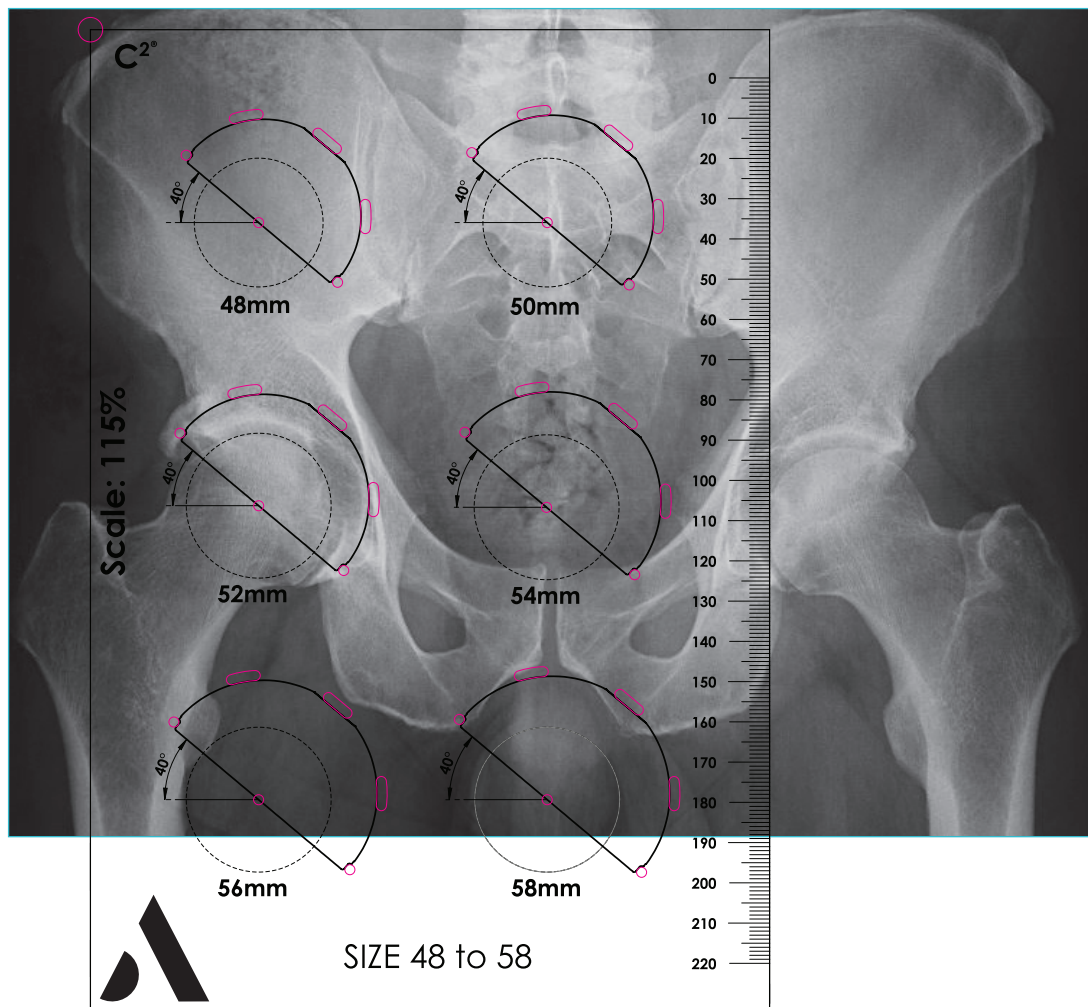
Liner Impaction



Implant Extraction



Pre-Operative Planning



1: Assess Quality of Radiograph

Obtain an adequate AP pelvis X-ray centred on the pubis with attention to the following:

- Pelvic rotation – The symphysis should project centrally through the middle of the sacrum. You should be able to see both of the obturator foramen equally sized and shaped.
- Pelvic flexion – Sacrococcygeal joint to upper symphysis should be approximately 30-50mm. It will be increased if the pelvis was tilted forwards, or decreased if the pelvis was tilted back at the time of X-ray.
- Femoral rotation – Both femora should be internally rotated by 15-20 degrees. You should be able to see more than 2mm but less than 3mm of the lower trochanter.

2: Identify Anatomical Landmarks

You should be able to identify the following landmarks on the radiograph:

- Femoral head centres for both femora – centre of rotation.
- Femoral shaft axis.
- Teardrops.

NOTE

- Templates are provided at 115% scale. Other magnifications are available upon request.
- Templates are available in hard copy and electronic files.



1 Acetabular Preparation

1. Remove any peripheral osteophytes and resect the labrum. Make sure to remove any osteophytes that could obstruct cup placement.
2. Prepare the acetabulum starting with smaller sized acetabular reamer than the templated size.
3. Gradually increase the reamer diameters until bleeding subchondral bone has been exposed increasing the reamer size sequentially until the planned size is achieved.
4. Clear out the base of the acetabulum, making sure to remove any bone fragments that could interfere with placement of the trial cup.



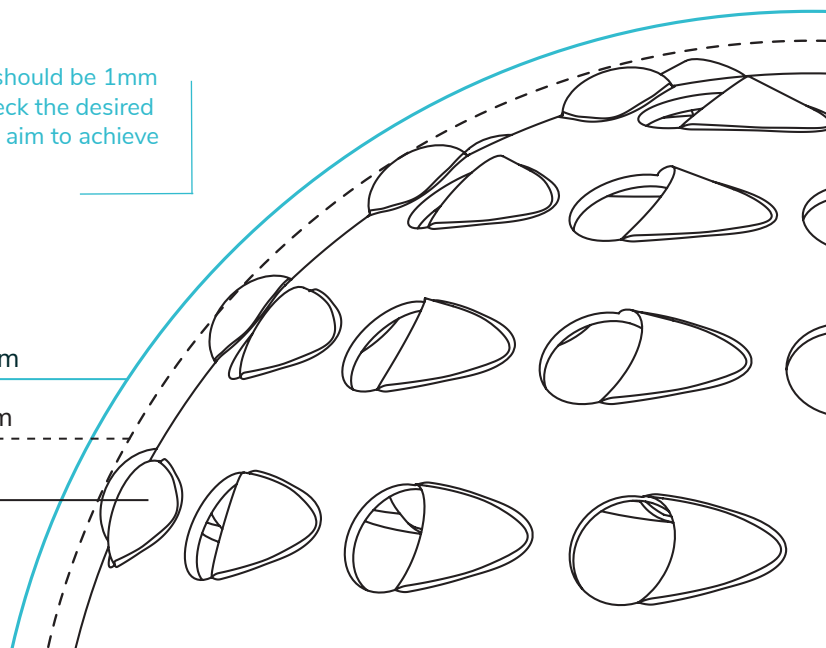
RECOMMENDED IMPLANT SIZING

To obtain a good press-fit fixation the final reamer should be 1mm smaller than the definitive cup. It is important to check the desired depth, height and size of the definitive cup with the aim to achieve complete contact of the cup.

Final Cup - 54mm

Trial Cup - 53mm

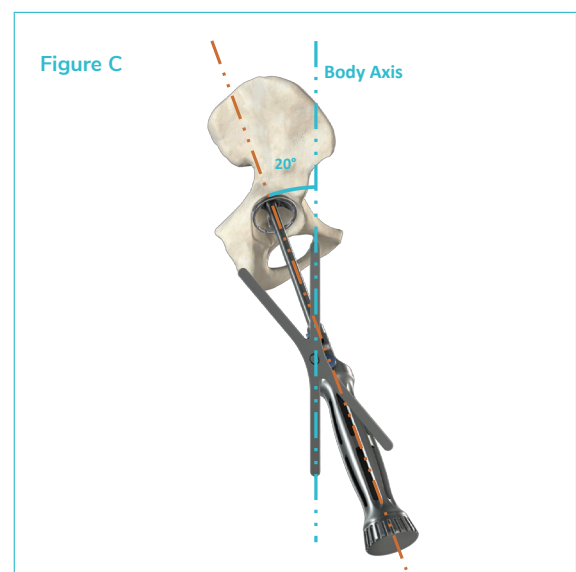
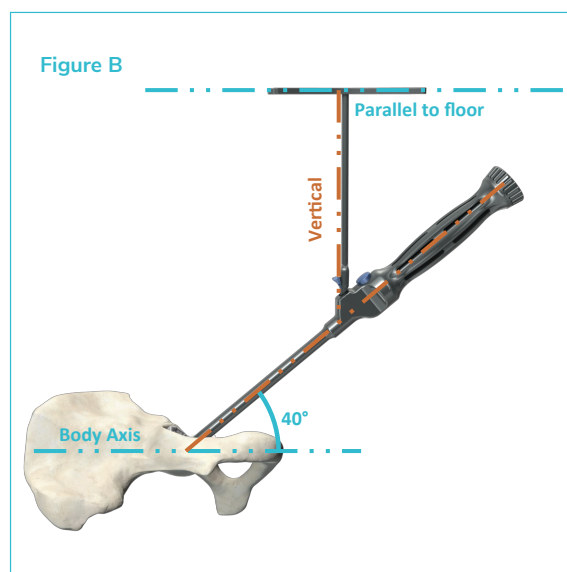
Reamer - 53mm



2 Acetabular Trialling

Acetabular trialling can be done with either the lightweight handle or the adjustable straight impactation handle. For the latter, refer to Appendix A for assembly instructions.

1. Select a trial cup of the same size as the last reamer, then screw the straight impactor handle firmly into the trial cup (Figure A).
2. For a posterolateral approach, the hip the alignment guide can assist with cup positioning. Place the alignment guide on the adjustable straight impactation handle to set a 40° inclination angle (Figure B) and a 20° anteversion angle (Figure C).
3. Impact the trial cup with the alignment guide on the handle. Maintain the chosen inclination and anteversion angles. Consider the bone coverage and contact of the cup to correctly seat the component.
4. When the trial cup is stable, a trial reduction can be performed using the trial liners (optional). See page 13 for more information on this step.



3 Final Cup Insertion

1. Take the final cup out of its packaging. The definitive cup should be 1 size larger than the validated trial cup.
2. If the need for fixation by screws has been pre-determined prior to cup impaction, remove the screw hole covers on the table using the 3.5 mm straight hex driver.
3. Screw the cup on the impactor handle, ensuring the thread is completely engaged to eliminate cross threading on impaction.
4. Attach the alignment guide to the support on the handle if necessary.
5. Place the cup in the reamed acetabulum at the chosen inclination and anteversion or, using the alignment guide as a reference (40° inclination and 20° anteversion), seat the cup with a series of firm mallet blows to the strike plate on the base of the impactor.
6. Release the cup by unscrewing the impactor.
7. Check the primary fixation, that the cup is fully seated.

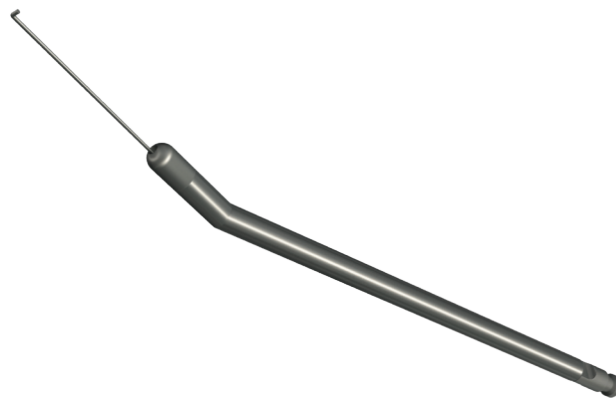
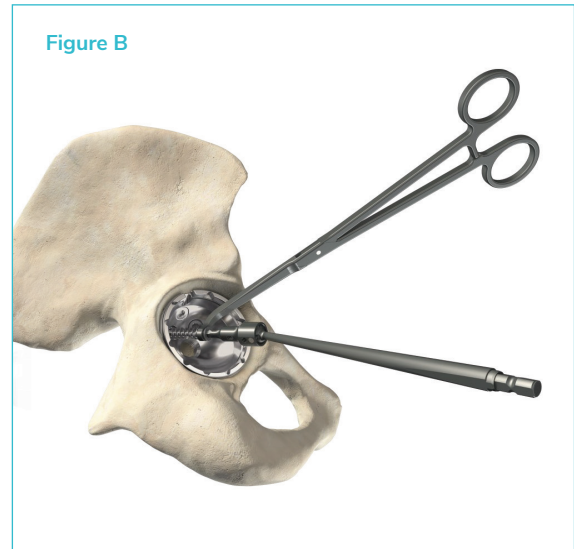
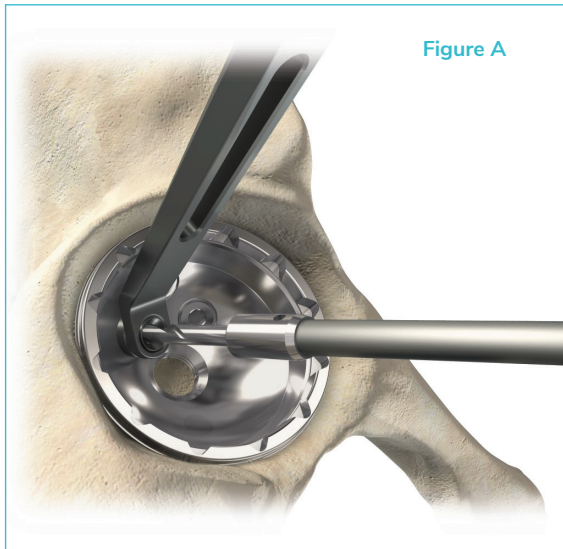


NOTE

The adjustable straight impactor allows orientation of the screw holes relative to the alignment guide by pushing the blue button and rotating the strikeplate.

4 Optional: Screws

If required, additional fixation of the cup can be achieved with screws.

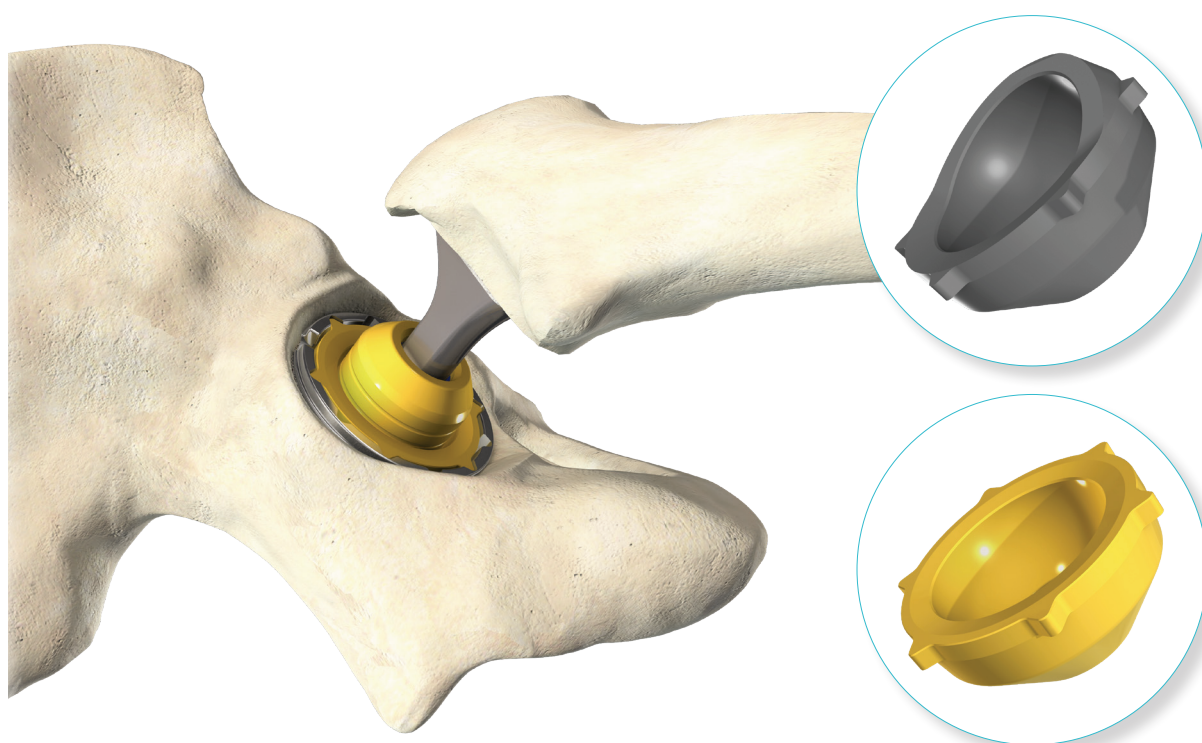


1. If the screw hole covers have not been removed prior to impaction, they need to be removed from the cup in-situ using the 3.5mm U-joint hex driver.
2. Place the 4mm flexible drill (20, 30 or 40mm length) on power (Figure A).
3. Use the drill guide to drill into one of the screw holes (30° or 45° angles available on the drill guide). The position of the screw holes should be in the posterior-superior quadrant.
4. Determine the required screw length using the depth gauge: bottom-out the wire to the drilled hole then slide the body until it makes contact with the cup. The appropriate screw length can be read from the scale as indicated.
5. Hold the appropriate screw with the screw holding forceps then position the screw in the implanted cup (Figure B).
6. Fully insert the screw using the 3.5mm straight hex driver or the 3.5mm U-joint hex driver, assembled on the ratchet handle. Make sure the screw is sitting flush with the inner surface of the cup as it could prevent the liner from sitting properly.

5 Trial Reduction

Prepare the femur by following the surgical technique for the chosen stem.

1. Using the straight hex driver, screw the trial liner that is the same size as the final cup (or trial cup if applicable) that corresponds to the desired femoral head size, either with a neutral flat or 20° hooded edge.
2. Refer to the chart on page 5 for more information on available liner sizes.



Trial liners use the following colour code matching the corresponding head trial:

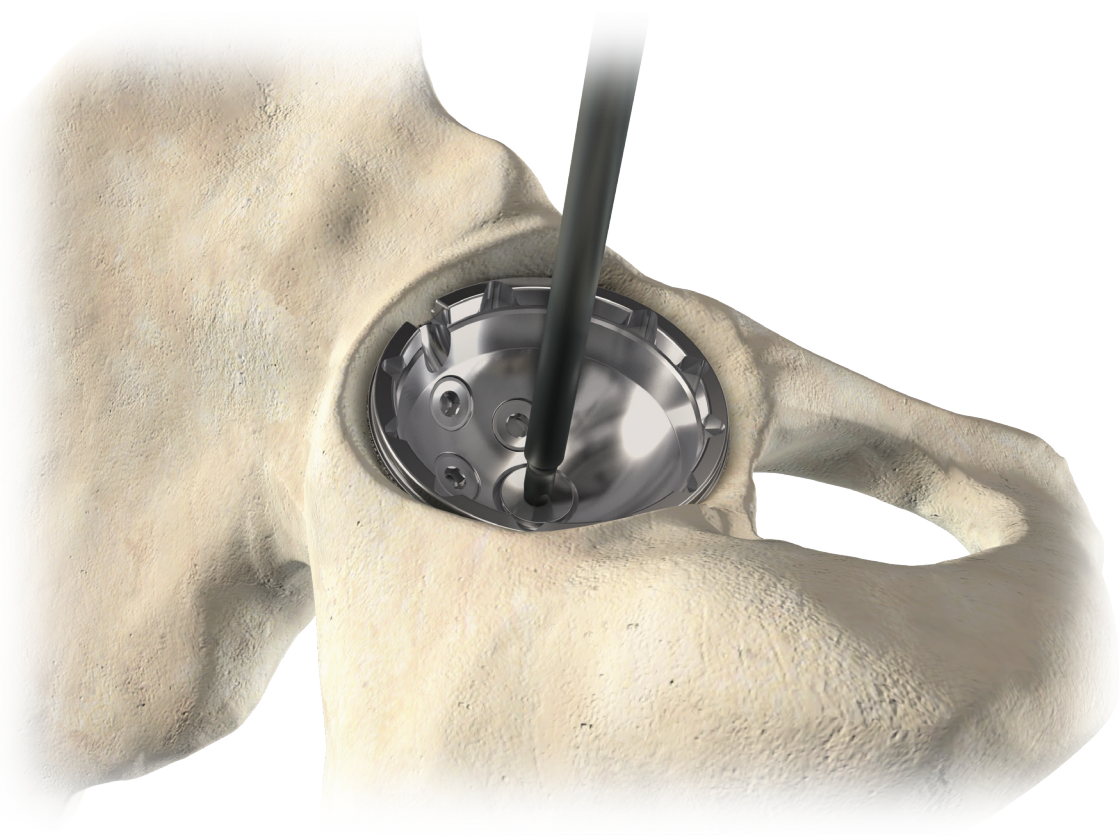


Perform trial reduction in order to test the joint range of motion and stability with the chosen components. Remove the trial liner when trials are satisfactory.



Base Hole Cover Insertion

1. Press the base hole cover onto the tip of the driver to achieve retention of the component.
2. Insert the threaded base hole cover using one of the tapered hex drivers.
3. Irrigate and dry the interior of the cup, ensuring that there is no debris in the base hole cavity.
4. Screw the base hole cover into the base hole and confirm the rim is seated in the cup.
5. Remove the driver directly in line with the insertion angle.

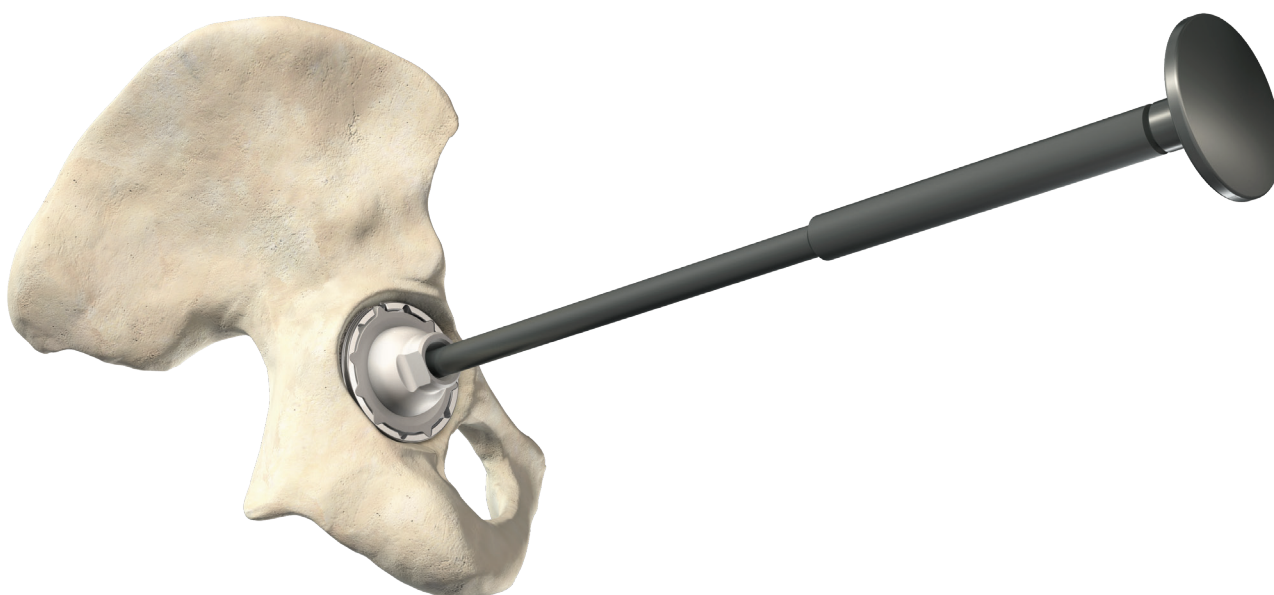


NOTE

When removing the driver, make sure not to toggle it side to side.

7 Liner Impaction

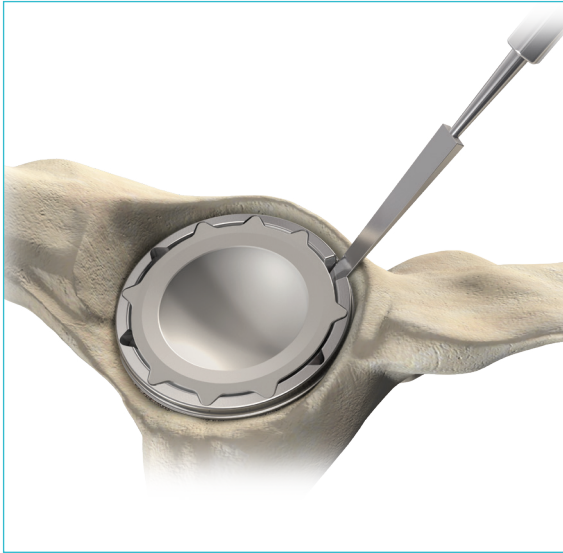
1. Make sure the interior of the cup is clean and dry and that no screws are protruding from their seating.
2. Position the liner by hand, making sure the tabs are correctly aligned with the slots of the cup. It is preferable not to place the de-rotation tabs in the removal slot. If using a 20° hooded liner, make sure the hood is appropriately positioned.
3. Select a liner impactor tip of the correct diameter to match the internal diameter of the liner.
4. Attach the impactor head to the tip of the impaction handle (either the lightweight impactor or the adjustable impactor).
5. Firmly impact the liner in the cup to engage the locking mechanism. Make sure the liner is correctly impacted. A fully seated liner must be flush with the rim of the cup.



NOTE

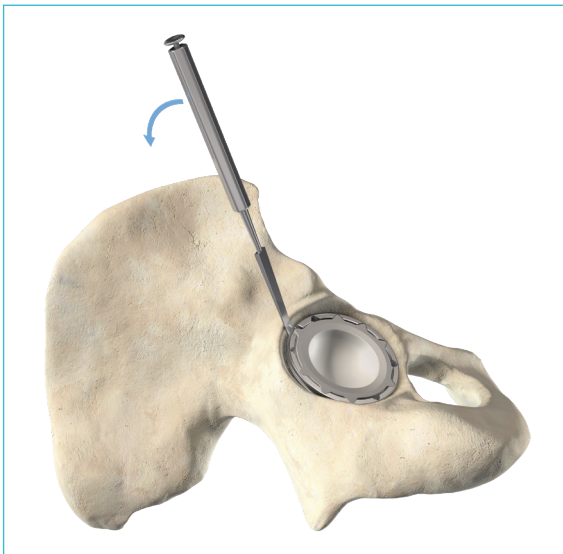
An impacted liner cannot be removed and re-used. If repositioning is necessary, a new liner must be used.

Implant Extraction



Liner Removal

If, for some reason, the liner needs to be removed, the acetabular cup features a slot in the rim. This allows the surgeon to remove the liner by levering it out with a thin and narrow instrument from the general instrumentation, such as a narrow osteotome.

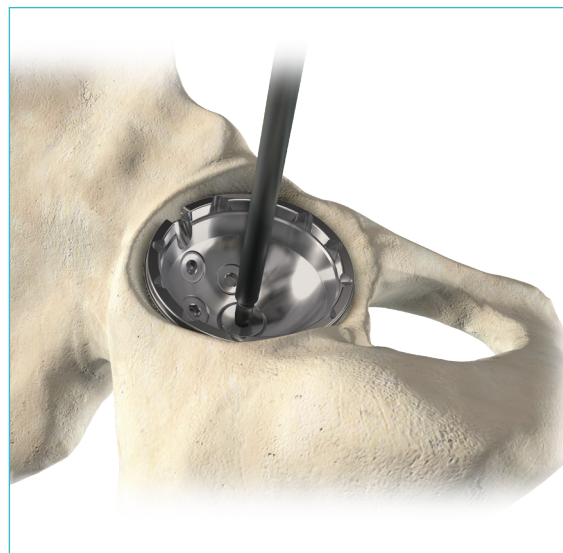


NOTE

Once removed, liner should be discarded and not reused.

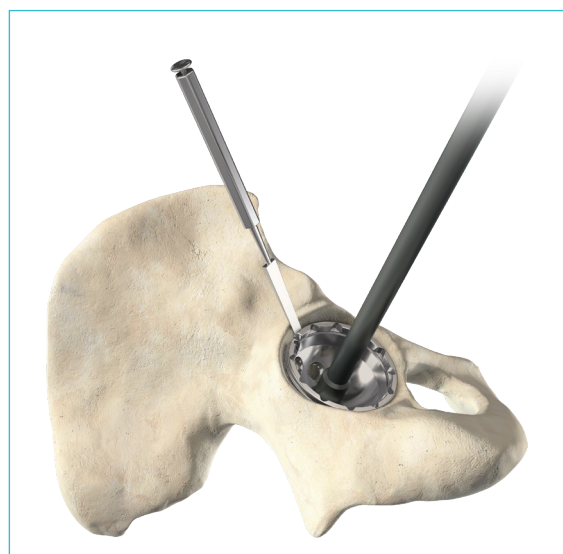
Cup Removal

1. Remove any screws present in the cup using the 3.5 mm straight hex driver or the 3.5 mm U-joint hex driver.
2. Using explant devices or flexible chisels, remove bone ingrowth on the porous coating, working circumferentially around the rim of the cup.
3. Remove the base hole cover using the 3.5 mm straight hex driver.
4. Screw the lightweight impactor or the adjustable impactor into the base hole and use it to remove the cup from the acetabulum.



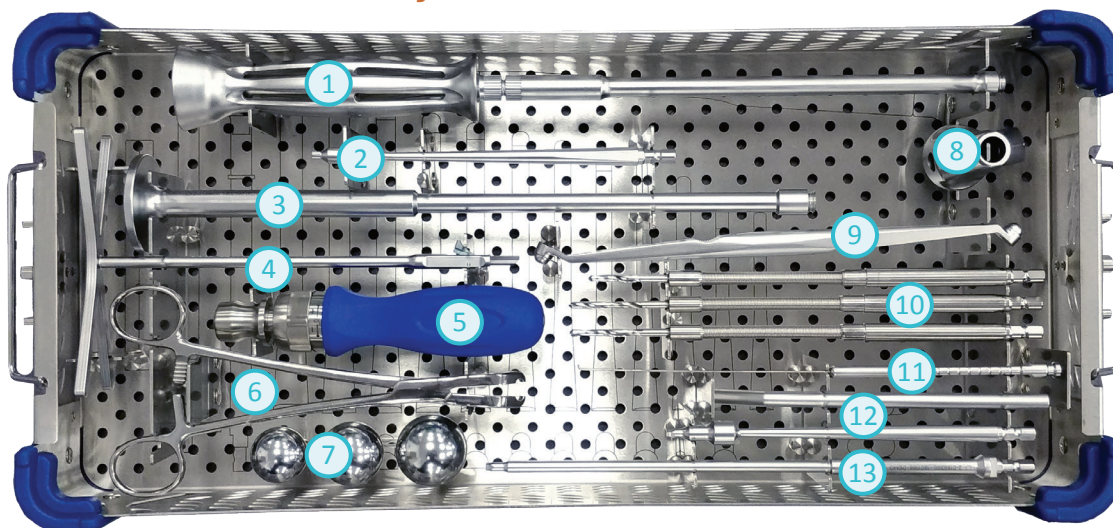
NOTE

The TORX T20 driver supplied in the tray must only be used in revision cases to remove the former TORX T20 screws. Do not use the TORX T20 to remove H3.5 screws.



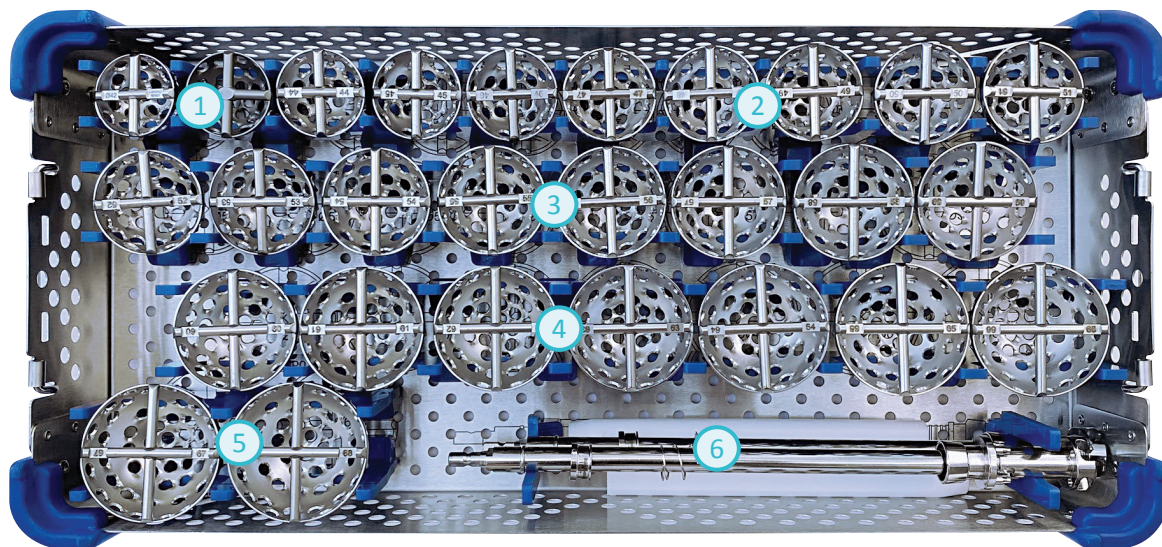
Instrumentation

C²® General Instruments Tray



REF	DESCRIPTION	REFERENCE	QTY
1	Adjustable Straight Impaction Handle - 7/16" Tip	2-0106300	1
2	TORX T20 Driver Tip - Zimmer/Hall fitting	2-0189500	1
3	Lightweight Handle - 7/16" Tip	2-0188600	1
4	Alignment guide for adjustable impaction handle	2-0106200	1
5	Ratchet Handle - Zimmer/Hall fitting	2-0192200	1
6	Screw Holder Clamp for large head fixation screw	2-0188700	1
7	Liner impactor tip - 7/16" Thread - Ø28 mm	2-0188828	1
7	Liner impactor tip - 7/16" Thread - Ø32 mm	2-0188832	1
7	Liner impactor tip - 7/16" Thread - Ø36 mm	2-0188836	1
8	Orientable support for alignment guide	2-1100300	1
9	Drill Guide - 30° & 45° angle	2-0189200	1
10	Flexible Drill Ø4 - Length 20 mm	2-0188940	1
10	Flexible Drill Ø4 - Length 30 mm	2-0188930	1
10	Flexible Drill Ø4 - Length 40 mm	2-0188920	1
11	Depth Gauge with Hook	2-0189100	1
12	H3.5 mm U-Joint Hex Driver Tip - Zimmer/Hall fitting	2-0189400	1
13	H3.5mm Retentive Straight Hex Driver Tip - Zimmer/Hall fitting	2-0189300	1

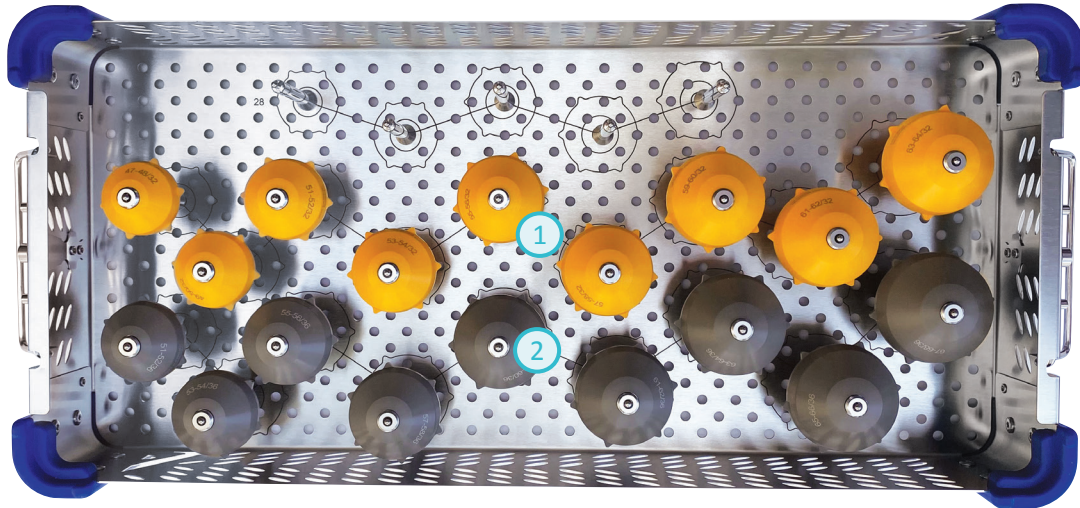
Acetabular Reamer Tray



REF	DESCRIPTION	REFERENCE	QTY
1	Reamer Head 42mm - 43mm	2-0192942 - 50142043	1ea
2	Reamer Head 44mm - 51mm	112-092-044 - 112-092-051	1ea
3	Reamer Head 52mm - 59mm	112-092-052 - 112-092-059	1ea
4	Reamer Head 60mm - 66mm	112-092-060 - 112-092-066	1ea
5	Reamer Head 67mm - 68mm	112-092-067 - 112-092-068	1ea
6	Reamer Handle + White Sleeve	112-092-005	2

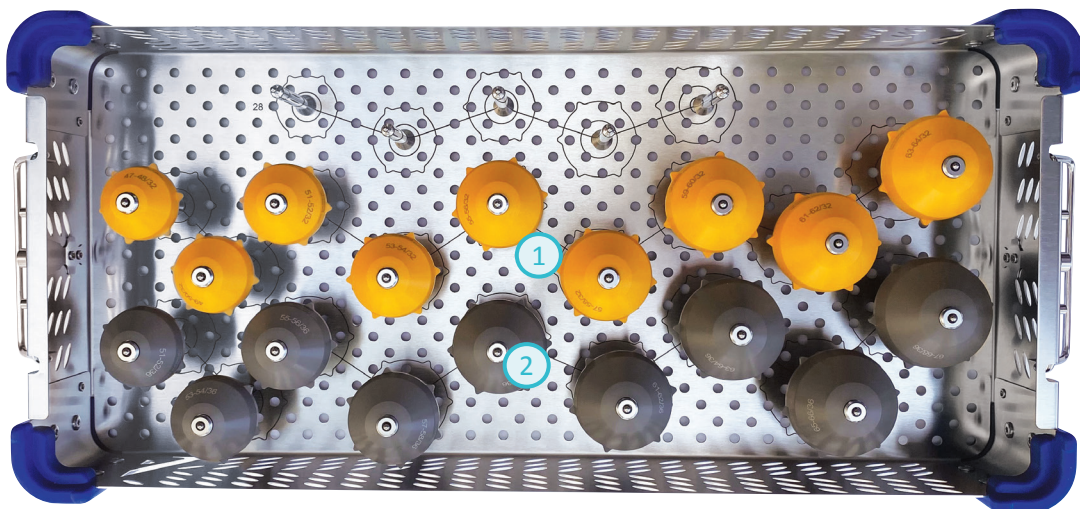
Instrumentation

20° Hooded Trial Liner Tray



REF	DESCRIPTION	REFERENCE	QTY
1	C ² [®] Trial Liner - Hooded - Size 47-48/32 to 63-64/32	2-0190048 to 2-0190064	1ea
2	C ² [®] Trial Liner - Hooded - Size 51-52/36 to 67-68/36	2-0189952 to 2-0189968	1ea

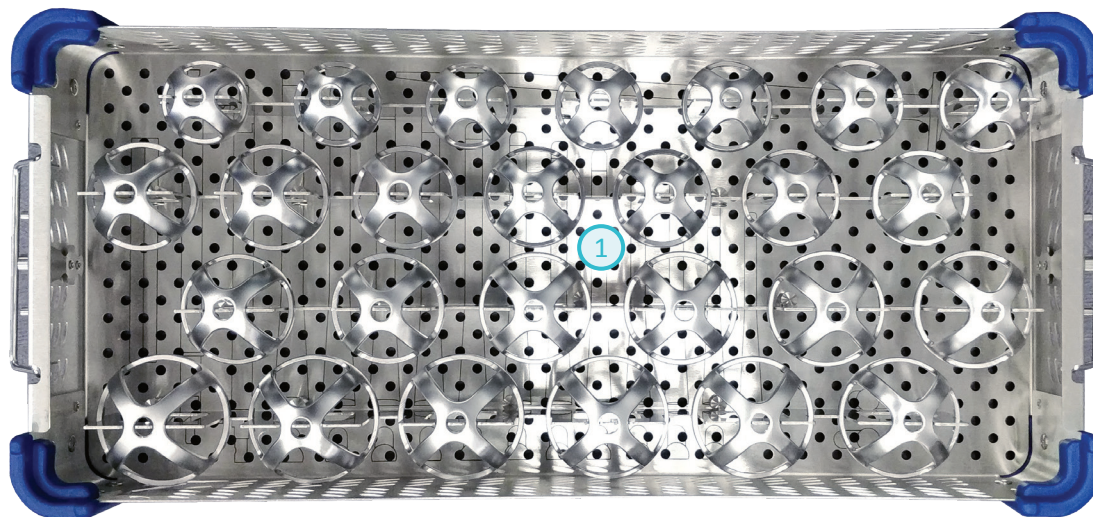
Neutral Trial Liner Tray



REF	DESCRIPTION	REFERENCE	QTY
1	C ² [®] Trial Liner - Neutral - Size 47-48/32 to 63-64/32	2-0190048 to 2-0190064	1ea
2	C ² [®] Trial Liner - Neutral - Size 51-52/36 to 67-68/36	2-0189652 to 2-0189668	1ea



Trial Acetabular Cup Tray

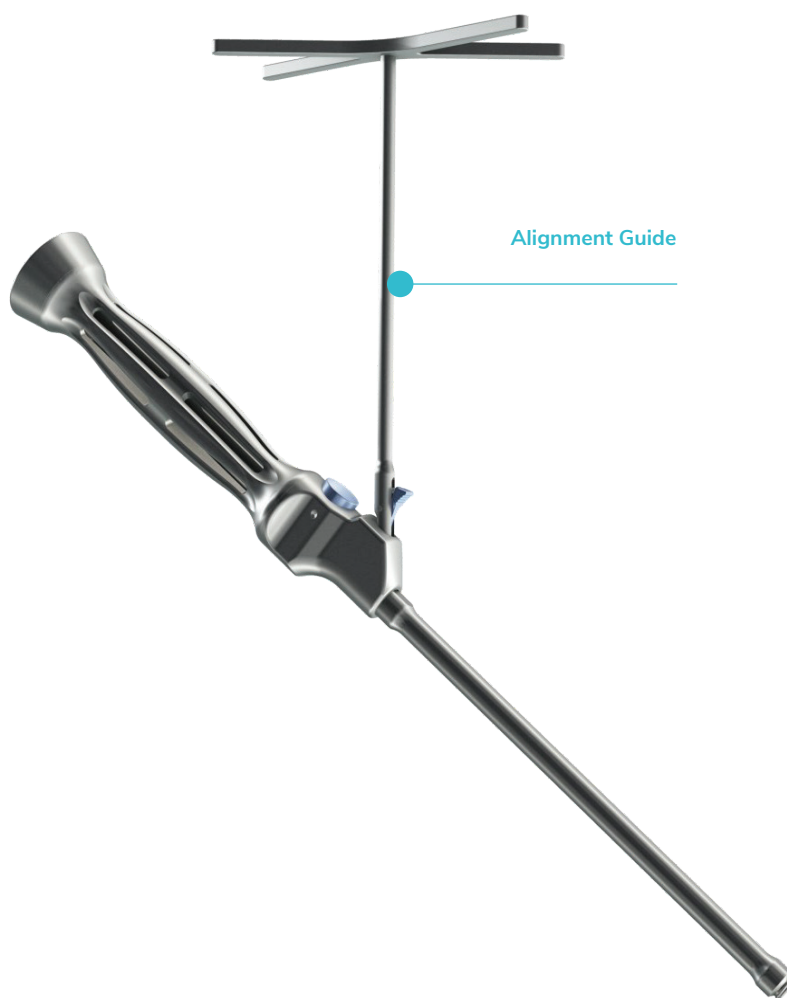
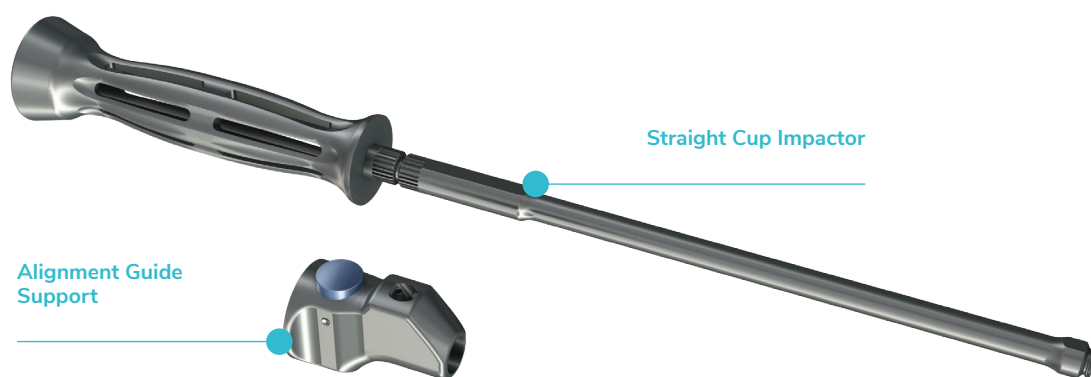


REF	DESCRIPTION	REFERENCE	QTY
1	Trial Cup - Size 47 to 68	2-0192847 to 2-0192868	1ea

Appendix A - Cup Impactor Assembly

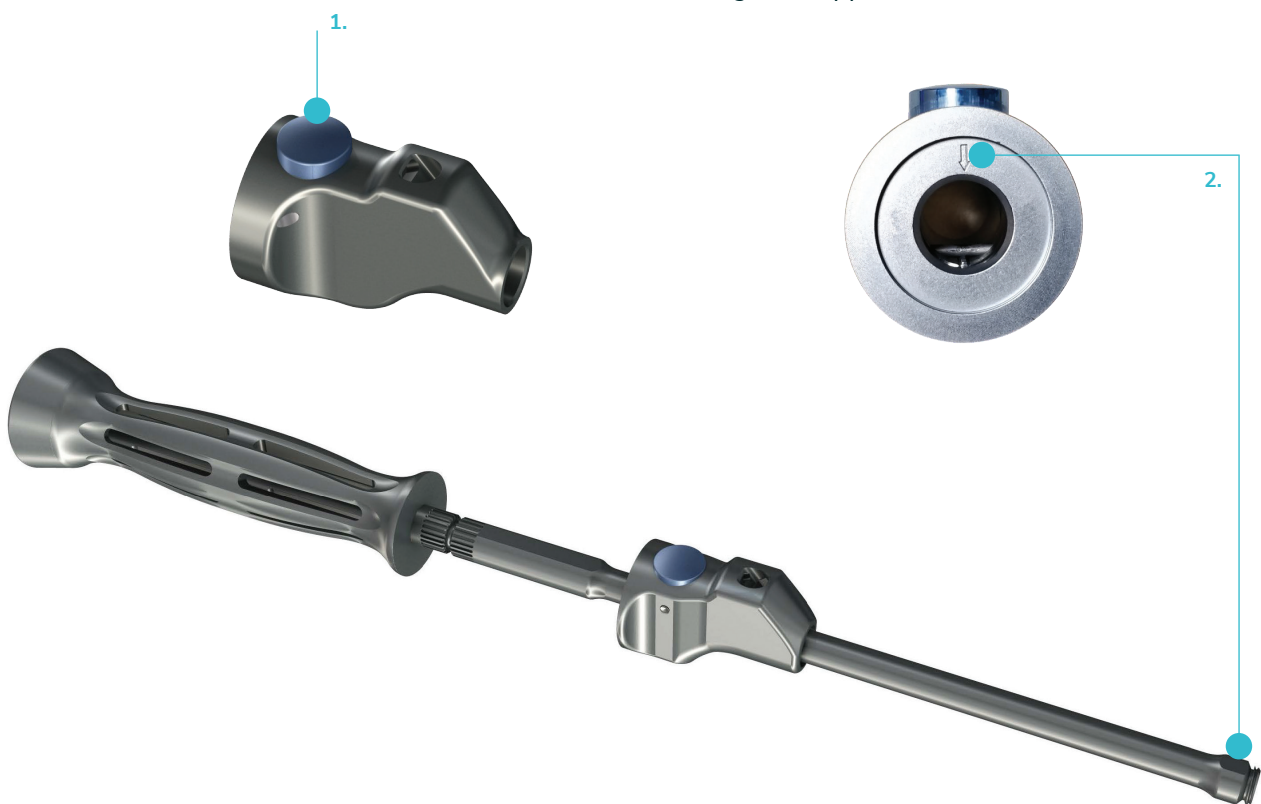
The adjustable straight impactation handle has three components:

- Straight Cup Impactor
- Alignment Guide Support
- Alignment Guide



Assembly

1. Push the blue button of the alignment guide support.
2. Align the arrow inside the alignment guide support with the groove on the threaded end of the cup impactor and slide the alignment guide along the shaft.
3. Align the arrow inside the alignment guide support with the groove on the serrated area of the cup impactor and finish assembling the adjustable support.
4. Release the blue button.
5. Clip the alignment guide to the orientable guide support.



Disassembly

To disassemble these components, follow the same steps in reverse order, but align the groove on the alignment support external surface with the groove on the handle to correctly orient the support for removal.





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