ADEPT®
Extra Fixation Cup

Operative Technique

Delivering Results Through Performance
For pre-operative planning, surgical approach and assessment of head size, please refer to the ADEPT® Hip Resurfacing System Operative Technique.

ADEPT® Extra Fixation Cup was developed in collaboration with Mr J O’Hara FRCS, Consultant Orthopaedic Surgeon, Royal Orthopaedic Hospital, Birmingham, United Kingdom.

The Extra Fixation Cup may be used in dyplastic hips with severe supero-lateral acetabular deficiency. This cup has a unique flange with two discrete pairs of screw holes for left or right hips. The Extra Fixation Cup sizes range from 58 - 66mm in 4mm increments. Screw lengths range from 16 - 88mm in 4mm increments.

Patent Pending, European Application No.05252456.8.
USA Application No.11/110,646.
**Step 1**

**Expose the acetabulum**

Excise the labrum and remove osteophytes to visualise the entire acetabular rim. Clear soft tissue and cartilage to reveal the true floor of the acetabulum. A clear unrestricted view should be achieved.

**Step 2**

**Ream the acetabulum**

Use successively sized reamers to relocate the true acetabular position, biasing the reamers accordingly to preserve deficient acetabular wall. If bone graft is to be used to fill the superior defect, clear soft tissue from the grafting area and prepare the bone surface. Check which Extra Fixation Cup size options are available from the head size assessment. Correct assessment of reamed size can only be made with the Cup Trials, which are 1mm smaller than the cups on diameter. These must be a firm fit when fully seated in the acetabulum. Under normal circumstances reaming to 2mm less than cup size is appropriate. However, 1mm less in small sclerotic acetabulae and 3mm less in larger cancellous acetabulae may be appropriate.

**Note:** It is advisable to ream 1-2mm deeper than the hemisphere, so the larger hemispherical cup engages fully to the rim. Insufficient depth is highlighted by a tendency for the Cup Trial to ‘jump out’ when moved and should be rectified by further reaming.
**Step 3**

**Cup Trial**

Screw the handle fully into the selected Cup Trial, position and impact into the acetabulum. Check that full bone contact is achieved around the trial edge.

Assess the fit by letting go of the trial handle to see if it holds in the acetabulum. Also try to move the trial (it should be firm but just possible to rotate whilst fully seated).

Remove the trial and wash the acetabulum with a pressurised saline lavage and dry thoroughly.
Step 4

Preparation

Assemble the Screw Driver into the ‘T’ Handle. Holding the Extra Fixation Cup, assemble both Drill Guides into the appropriate holes for a left or right hip. Tighten with the Screw Driver.

Alternatively, this may be done after the cup is assembled on the Cup Introducer or after impaction. However this may prove to be more difficult.
**Step 5**

**Prepare cup implant**

To mount the cup implant on the Cup Introducer, open the latch by lifting the knob forwards until the latch is fully open.

Slide the dovetail section of the Low Profile Impaction Cap into the recess on the Cup Introducer. Close the latch by pulling the knob backwards until it locks completely. Adjust the rotational position of the two fins before tightening fully.

**Step 6**

**Cup Alignment Aerial**

An optional Cup Alignment Aerial can be attached to the Cup Introducer which can help to guide the cup into a position of 45° abduction and 20° anteversion in the acetabulum (when inserted in the correct hole for either a left or right hip as indicated). Recent work has shown that a steep cup inclination angle can lead to the premature loss of fluid film lubrication.

Therefore, it is recommended that the definitive acetabular implant should be guided into a defined position of 35° and 20° anteversion in the acetabulum, with the Alignment Rod used as a reference for orientation.
**Step 7**

**Position and impact cup**

With the pelvis orientated in the true lateral position, the Alignment Rod should be in line with the longitudinal axis of the trunk. In this position, the cup is positioned at $45^\circ$ abduction and $20^\circ$ anteversion. To achieve the recommended $35^\circ$ abduction, lower the instrument by $10^\circ$ in the sagittal plane as shown.

The flange should be positioned superiorly, rotated slightly posterior (approximately opposite the obturator foramen). The Drill Guides will indicate the axis of the screws and there should be sufficient bone available in both positions to accommodate the screws (minimum length 16mm).

It is preferable to avoid butting the flange on the edge of the acetabulum, as this may displace the cup or prevent it from seating fully. Bone graft may be placed prior to inserting the cup or at a later stage.

Impact the cup with several firm hammer blows until fully seated. A change in impact note should be heard when the cup is fully seated. Confirm this by observing peripheral cup/bone contact.

Test the firmness of the cup fit by trying to gently rock the pelvis with the Cup Introducer.

Remove the Cup Introducer by pushing the knob forwards.

A gentle twisting motion will release the Cup Introducer.
Step 8
Assess cup orientation

Do not separate the cap without first assessing cup orientation and inserting the screws.

Assess orientation by observing the cup face in relation to the acetabular rim and flange position.

Use the Punch to adjust the cup position by careful impaction on the rim or, if necessary, re-attach the Cup Introducer to remove and reposition the cup. Attaching the Slide Hammer will aid cup removal.
**Step 9**

Drill posterior pilot hole (Ø3.2mm Drill)

Assemble the Cup Pusher on the Straight Handle. Whilst pressing the Cup Pusher, drill the posterior pilot hole, advancing slowly with light pressure. Feel for and stop drilling at the inner cortical layer of the iliac spine. Remove the posterior Drill Guide with the Screw Driver.
Step 10

Enlarge posterior hole (Ø4.5mm Drill)

Enlarge the posterior hole using the 4.5mm Drill through the cup flange. Once again advance slowly with light pressure, whilst supporting the implant with the Cup Pusher. Feel for and stop drilling at the inner cortical layer of the iliac spine.
**Step 11**

Measure depth

Use the Depth Gauge to determine posterior screw length. Ensure the nose of the Depth Gauge is in contact with the flange. Maintain pressure on the Cup Pusher in order to avoid movement of the implant.
Step 12

Insert posterior screw

Insert the posterior screw by hand, taking care not to cross thread. Push with both the Cup Pusher and the Screw Driver as the screw tip enters cortical bone to prevent cup lift off. Once the screw tip engages bone, the power driver may be used to advance the screw over the majority of its length (set drill to high torque setting).

However, final tightening of the screws should always be done with the manual ‘T’ Handle.

Step 13

Insert anterior screw

Repeat stages 9-12 for the anterior screw.
**Step 14**  
Assemble Modular Cap Remover  
Screw the cap remover onto the Straight Handle and tighten fully.

**Step 15**  
Remove Impaction Cap  
Locate the socket over the hexagonal nut in the centre of the Impaction Cap.  
Strike the end of the handle with two firm hammer blows to cut the cables.  
Turn the handle clockwise one full turn to withdraw the cables and release the Impaction Cap from the cup. If the handle will not turn, strike again, to ensure that the cable is cut fully. Remove the impaction cap and check all cables are fully removed from the cup.
**Step 16**

**Alternative cable cutting**

Impact can be avoided altogether by cutting the cables in two positions with Backup Cable Cutters. Use the Modular Cap Remover to withdraw the cables and release the cup as shown in Step 15 (2-3).
**Step 17**

Graft acetabular defect

Fill any gaps between cup flange and superior acetabulum with bone graft. Cover with a surgical mesh to stabilise.
Appendix A | Instrument Inventory

- **'T' Handle**
  - 270770

- **Drill Guide (x2)**
  - 270370

- **Cup Pusher**
  - 270036

- **Ø4.5mm Drill (x2)**
  - 270372

- **Ø3.2mm Drill (x2)**
  - 270371

- **Screw Driver**
  - 270378

- **Depth Gauge**
  - 270376
Appendix B | Implant Sizing Chart

ADEPT® Resurfacing Head

ADEPT® Metal-on-Metal Cup

ADEPT® Extra Fixation Cup

ADEPT® Extra Fixation Screw (length, mm)

| 48 | 54 | 56 |
| 50 | 56 | 58 |
| 52 | 58 | 60 |
| 54 | 60 | 62 |
| 56 | 62 | 64 |
| 58 | 64 | 66 |

| 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 | 64 | 68 | 72 | 76 | 80 | 84 | 88 |