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M2a Magnum™
large metal articulation

M2a-Magnum™
Operative Technique

BIOMET®

Disclaimer

Biomet UK Ltd, as the manufacturer of this device, does not practice medicine and does not recommend any particular surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and utilising the appropriate techniques for implanting the prosthesis in each particular patient. Biomet UK Ltd is not responsible for selection of the appropriate surgical technique to be utilised for an individual patient. ReCap® is a trademark in the U.S.A.

1. Pre-operative planning

Selection of the correct components is attained through careful pre-operative planning. This can be achieved manually by means of x-ray templates, or digitally by means of a PAC system.

Manual pre-operative planning

The M2a-Magnum™ Hip System provides a comprehensive selection of femoral and acetabular x-ray templates.
These templates are positioned over the Anterior Posterior x-rays to best decide the correct implant size required to help restore the patient's natural anatomy.

Digital pre-operative planning

The M2a-Magnum™ System digital templates are available through various digital template providers. When using digital templating for a primary THR, it is necessary to use a magnification marker with a known dimension. This is required in order for the PAC system to calculate the correct magnification. As soon as the correct magnification has been determined, the PAC system can be used to best decide the correct implant size required to help restore the patient's natural anatomy.

2. Surgical exposure

The M2a-Magnum™ femoral component can be implanted using any of the standard approaches for total hip replacement. The aim of the approach selected is to provide adequate visualisation of both the acetabulum and proximal femur. (Figure 1)

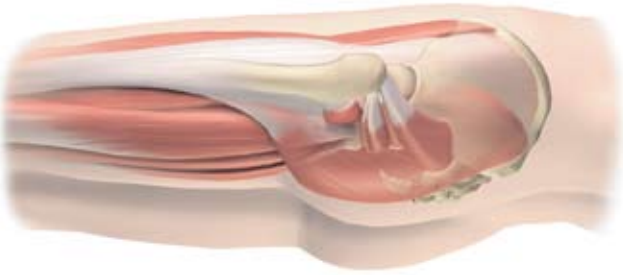

Figure 1

3. Acetabular Preparation and Implant Insertion

Prior to commencing acetabular preparation, it is recommended that the femoral head and neck be resected as per instructed in operative technique for femoral component to be implanted. Once the femoral head has been resected, it is possible to commence acetabular preparation. (Figure 2)

It is important to note that the M2a-Magnum™ acetabular component is a hemispherical design, and therefore requires the acetabulum to be under reamed in order to achieve stable fixation.

Figure 2

3a. Acetabular Reaming

Standard preparation of the acetabulum should commence at this point. It is important to start reaming with the smallest diameter grater reamer available, perpendicular to the acetabulum in order to find the true acetabular floor. Sequential reaming then follows, ensuring that the reamer handle is angled at the same orientation of the component to be implanted. (45 degrees of inclination and 20 degrees of anteversion) Care must be taken at this stage to ensure that the anterior and posterior columns of the acetabulum are not eroded, as this will affect the overall stability of the component. It is recommended that the acetabulum should be reamed either 1mm or 2mm smaller, depending on bone quality, than the acetabular component to be implanted. (Figure 3)

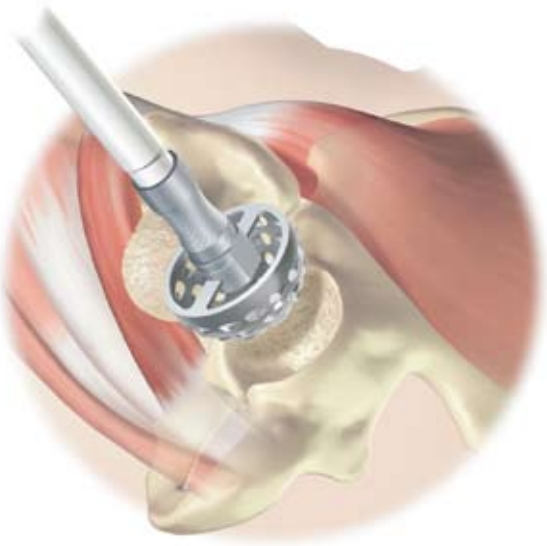

Figure 3

3b. Acetabular Gauging

After reaming, the acetabulum is gauged for sphericity and size, using the acetabular gauges provided. These gauges contain windows that allow direct visualisation of the acetabular floor and also test the stability of the acetabular component prior to implanting the actual acetabular component. The gauge selected should correlate directly with the size of acetabular component to be implanted. (For example, a 56mm acetabular implant requires the acetabulum to be reamed to 54mm diameter. This 54mm reamed acetabulum is then gauged with a 56mm gauge). (Figure 4)

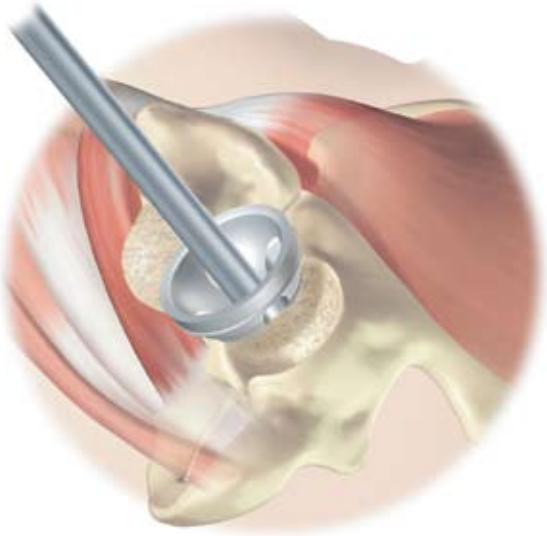

Figure 4

4. Acetabular component impactor assembly

Once happy with the acetabular component size, the components corresponding impaction plate should be selected for assembly onto the impaction handle.

Before assembling the impaction handle to the impaction plate make sure the ball bearing bushing is visable at the tip of the handle. Figure 5. If the ball bearings are not visible, unscrew the strike plate until resistance is felt and pull the bushing out. If the ball bearings are not completely visible, once assembled, the impactor plate will not engage with the cup.

Figure 5

Correct assembly of the impaction handle and impaction plate is achieved by aligning the impaction plate with the tip of the handle so that the slots are aligned. Figure 6. Care should be taken not to push the ball bearings back into the shaft of the impaction handle. Engage the handle with the impactor plate by pushing the two parts together against a hard surface. Confirm that the two parts are flush together and therefore fully seated. Figure 7.

Figure 6

Figure 7

The acetabular component is mounted onto the impaction plate and handle by aligning the fingers of the impaction plate over the cut outs on the peripheral edge of the acetabular component Figure 8.

Figure 8

Once aligned the cup is secured to the handle by turning pulling the strike plate towards yourself and turning it in a clockwise direction until hand tight. Fig ure 9. The cup is now ready to be impacted into the acetabulum.

Figure 9

4a. Acetabular component insertion

Once the acetabular component has been securely locked onto the impaction handle the ReCap acetabular component is impacted into the prepared acetabulum at an angle of 45 degrees of inclination and 20 degrees of anteversion. When correct component seating has been achieved the impaction handle should be removed from the cup. This is achieved by turning the strike plate one-quarter turn anti-clockwise. (Figure 10)

Figure 10

Should there be the need to carry out additional impaction of the acetabular component, size specific cup impactors are available on the ReCap instrumentation tray. (Figure 11)

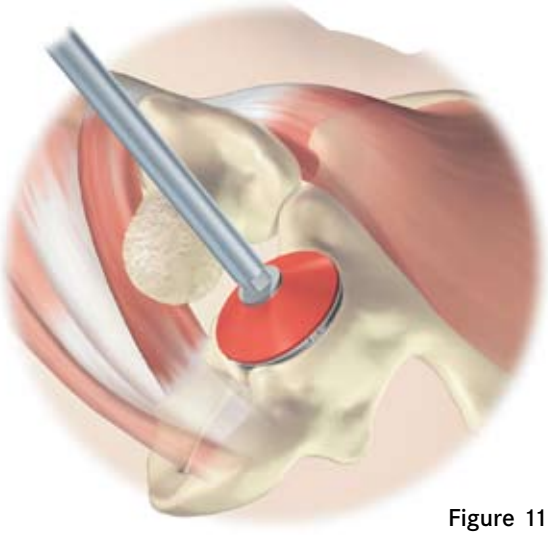

Figure 11

To remove the strike plate from the impaction handle, unscrew the strike plate until you fell resistance. Lever the impactor plate from the inserter handle with the multi-tool. (Figure 12)

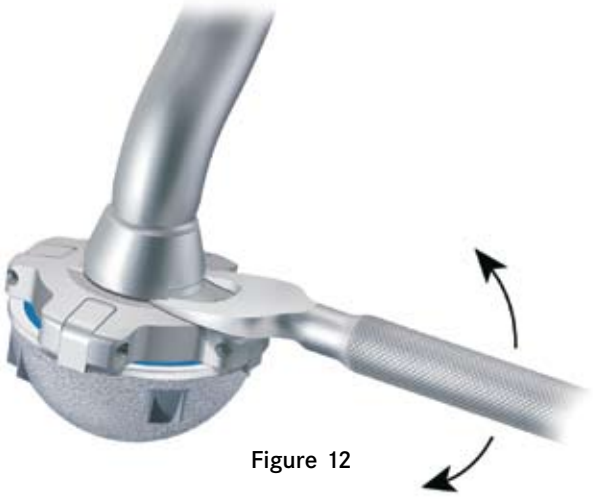

Figure 12

5. Femoral preparation and Implant Insertion

The femur should be prepared as per instructed in the operative technique for the femoral component selected. Once the femoral component has been implanted and the surgeon is satisfied with the component position, it is possible to carry out a full trial reduction of the hip joint. (Figures 13 & 14)

Figure 13

The M2a-Magnum™ trial modular heads are available in 12 diameters, each corresponding to the diameter of acetabular component implanted. One must remember that each modular head is 6mm smaller than the acetabular component. For example, a 50mm diameter acetabular component requires a 44mm diameter modular head.

Figure 14

In order to be able to achieve a stable joint, the trial necks that are used in conjunction with the trial heads are available in various neck lengths. These different neck lengths allow precise reconstruction of the joint, therefore reducing the chance of leg length discrepancies. (Figure 15)

For femoral components with a Biomet type 1 taper, the trial necks are available in 6 different neck lengths (-6mm, -3mm, 0mm, +3mm, +6mm, +9mm), whilst for 12/14 taper components the trial necks are available in 4 different neck lengths (-2mm, 0mm, +4mm, +8mm). (Figure 16)

Figure 15

Figure 16

Whatever femoral component is employed, the aim of the trial head and neck is to allow the precise trial reduction of the joint. It is recommended that the final trial reduction is carried out with the acetabular and femoral components in place, although an interim trial reduction can be completed using trial components.

Once the correct length of neck has been selected, it is assembled with the predetermined M2a-Magnum™ head and assembled as shown. (Figure 17) This assembly is then attached to the femoral component taper and impacted in position with plastic head impactor.

Figure 17

M2a-Magnum™ components are manufactured to very precise tolerance so care must be taken when impacting components ensuring that no damage occurs to the articulation surfaces. Taper surfaces should be dry and clean prior to assembly as any debris may prevent the connecting surfaces from seating.

6. Reducing the Joint

The joint can then be reduced and assessed for stability. Whilst reducing the joint, care must be taken to ensure the articulation surfaces are not damaged. Once the stability, leg length and range of motion has been assessed and deemed suitable, the customary repair of the hip capsule and wound may commence. (Figure 18)

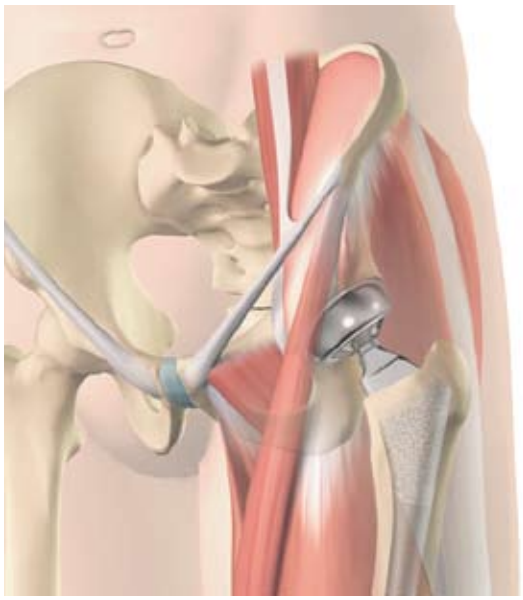

Figure 18

7. Component Removal

In the event that a M2a-Magnum™ modular head and taper insert may need to be removed from the femoral component, the offset punch can be used. (Figure 19)

Figure 19

Should it be necessary, there is also an instrument available that splits the taper insert from the M2a-Magnum™ modular head. However, it is recommended that new taper inserts and M2a-Magnum™ modular heads be used in any instances where components need to be replaced. Unseen damage to the taper junction or head tolerances can negatively affect the implants performance. (Figure 20 & 21)

Figure 20

Figure 21

Instruments

ReCap®/M2a-Magnum™ Modular Head Tray - Catalogue Number 31-600199

Cat. No.	Description
31-600054	M2a-Magnum Modular Head General Case
31-173738	M2a-Magnum Trial Modular Head Ø38mm
31-173740	M2a-Magnum Trial Modular Head Ø40mm
31-173742	M2a-Magnum Trial Modular Head Ø42mm
31-173744	M2a-Magnum Trial Modular Head Ø44mm
31-173746	M2a-Magnum Trial Modular Head Ø46mm
31-173748	M2a-Magnum Trial Modular Head Ø48mm
31-173750	M2a-Magnum Trial Modular Head Ø50mm
31-173752	M2a-Magnum Trial Modular Head Ø52mm
31-173754	M2a-Magnum Trial Modular Head Ø54mm
31-173756	M2a-Magnum Trial Modular Head Ø56mm
31-173758	M2a-Magnum Trial Modular Head Ø58mm
31-173760	M2a-Magnum Trial Modular Head Ø60mm
31-4000-58	Exact Offset Punch
31-476948	Head Impactor (Optional)
31-139250	Magnum Taper Insert Removal Tool
31-600444	ReCap/Magnum Cup Trial 44 x 38mm
31-600446	ReCap/Magnum Cup Trial 46 x 40mm
31-600448	ReCap/Magnum Cup Trial 48 x 42mm
31-600450	ReCap/Magnum Cup Trial 50 x 44mm
31-600452	ReCap/Magnum Cup Trial 52 x 46mm
31-600454	ReCap/Magnum Cup Trial 54 x 48mm
31-600456	ReCap/Magnum Cup Trial 56 x 50mm
31-600458	ReCap/Magnum Cup Trial 58 x 52mm
31-600460	ReCap/Magnum Cup Trial 60 x 54mm
31-600462	ReCap/Magnum Cup Trial 62 x 56mm
31-600464	ReCap/Magnum Cup Trial 64 x 58mm
31-600466	ReCap/Magnum Cup Trial 66 x 60mm

ReCap® /M2a-Magnum Modular Head Tray
Catalogue Number 31-600199

(note: when ordering catalogue no. 31-600199 please also order either 31-600386 or 31-600388)

ReCap/Magnum Impaction Instrument Tray

Cat. No.	Description
31-600596	ReCap/Magnum St Stl Impaction Instruments Case
31-141038	ReCap/Magnum Acetab Ball Impactor Ø44/38mm
31-141040	ReCap/Magnum Acetab Ball Impactor Ø46/40mm
31-141042	ReCap/Magnum Acetab Ball Impactor Ø48/42mm
31-141044	ReCap/Magnum Acetab Ball Impactor Ø50/44mm
31-141046	ReCap/Magnum Acetab Ball Impactor Ø52/46mm
31-141048	ReCap/Magnum Acetab Ball Impactor Ø54/48mm
31-141050	ReCap/Magnum Acetab Ball Impactor Ø56/50mm
31-141052	ReCap/Magnum Acetab Ball Impactor Ø58/52mm
31-141054	ReCap/Magnum Acetab Ball Impactor Ø60/54mm
31-141056	ReCap/Magnum Acetab Ball Impactor Ø62/56mm
31-141058	ReCap/Magnum Acetab Ball Impactor Ø64/58mm
31-141060	ReCap/Magnum Acetab Ball Impactor Ø66/60mm
31-100588	Acetabular Impactor Handle

ReCap® Impaction Instrument Tray
Catalogue Number 31-600597

M2a-Magnum™Modular Head Trial Taper Adaptor Set 12/14 Catalogue Number 31-600388

Cat. No.	Description
31-600362	Taper Adaptor (12/14) -2mm
31-600363	Taper Adaptor (12/14) 0mm
31-600364	Taper Adaptor (12/14) +4mm
31-600365	Taper Adaptor (12/14) +8mm

M2a-Magnum™Modular Head Trial Taper Adaptor Set Type 1 Catalogue Number 31-600386

Cat. No.	Description
31-482590	Taper Adaptor (T1) -6mm
31-482591	Taper Adaptor (T1) -3mm
31-482592	Taper Adaptor (T1) 0mm
31-482593	Taper Adaptor (T1) +3mm
31-482594	Taper Adaptor (T1) +6mm
31-482595	Taper Adaptor (T1) +9mm

Implants

M2a-Magnum™ Modular Head Type 1 Taper Adaptors

Cat. No.	Description
130818	Magnum Tpr Adptr 38-40mm –6mm (T1)
130819	Magnum Tpr Adptr 38-40mm –3mm (T1)
130820	Magnum Tpr Adptr 38-40mm STD (T1)
130821	Magnum Tpr Adptr 38-40mm +3mm (T1)
130822	Magnum Tpr Adptr 38-40mm +6mm (T1)
130823	Magnum Tpr Adptr 38-40mm +9mm (T1)
139252	Magnum Tpr Adptr 42-50mm –6mm (T1)
139254	Magnum Tpr Adptr 42-50mm –3mm (T1)
139256	Magnum Tpr Adptr 42-50mm STD (T1)
139258	Magnum Tpr Adptr 42-50mm +3mm (T1)
139260	Magnum Tpr Adptr 42-50mm +6mm (T1)
139262	Magnum Tpr Adptr 42-50mm +9mm (T1)
139264	Magnum Tpr Adptr 52-60mm –6mm (T1)
139266	Magnum Tpr Adptr 52-60mm –3mm (T1)
139268	Magnum Tpr Adptr 52-60mm STD (T1)
139270	Magnum Tpr Adptr 52-60mm +3mm (T1)
139272	Magnum Tpr Adptr 52-60mm +6mm (T1)
139274	Magnum Tpr Adptr 52-60mm +9mm (T1)

M2a-Magnum™ Modular Heads

Cat. No.	Description
157438	M2a Magnum Modular Head Sz 38mm
157440	M2a Magnum Modular Head Sz 40mm
157442	M2a Magnum Modular Head Sz 42mm
157444	M2a Magnum Modular Head Sz 44mm
157446	M2a Magnum Modular Head Sz 46mm
157448	M2a Magnum Modular Head Sz 48mm
157450	M2a Magnum Modular Head Sz 50mm
157452	M2a Magnum Modular Head Sz 52mm
157454	M2a Magnum Modular Head Sz 54mm
157456	M2a Magnum Modular Head Sz 56mm
157458	M2a Magnum Modular Head Sz 58mm
157460	M2a Magnum Modular Head Sz 60mm

ReCap® Cementless Over-Size PC Acetabular Components

Cat. No.	Descriptioners
130846	ReCap OS PC Acetabular Comp 38/46mm
130848	ReCap OS PC Acetabular Comp 40/48mm
130850	ReCap OS PC Acetabular Comp 42/50mm
130852	ReCap OS PC Acetabular Comp 44/52mm
130854	ReCap OS PC Acetabular Comp 46/54mm
130856	ReCap OS PC Acetabular Comp 48/56mm
130858	ReCap OS PC Acetabular Comp 50/58mm
130860	ReCap OS PC Acetabular Comp 52/60mm
130862	ReCap OS PC Acetabular Comp 54/62mm
130864	ReCap OS PC Acetabular Comp 56/64mm
130866	ReCap OS PC Acetabular Comp 58/66mm
130868	ReCap OS PC Acetabular Comp 60/68mm

M2a-Magnum™ Modular Head 12/14 Taper Adaptors

Cat. No.	Descriptioners
130824	Magnum Tpr Adptr 38-40mm –2mm 12/14
130825	Magnum Tpr Adptr 38-40mm STD 12/14
130826	Magnum Tpr Adptr 38-40mm +4mm 12/14
130827	Magnum Tpr Adptr 38-40mm +8mm 12/14
130829	Magnum Tpr Adptr 42-50mm –2mm 12/14
130830	Magnum Tpr Adptr 42-50mm STD 12/14
130831	Magnum Tpr Adptr 42-50mm +4mm 12/14
130832	Magnum Tpr Adptr 42-50mm +8mm 12/14
130834	Magnum Tpr Adptr 52-60mm –2mm 12/14
130835	Magnum Tpr Adptr 52-60mm STD 12/14
130836	Magnum Tpr Adptr 52-60mm +4mm 12/14
130837	Magnum Tpr Adptr 52-60mm +8mm 12/14

ReCap® Cementless Over-Size HA/PC Acetabular Components

Cat. No.	Descriptioners
130846HA	ReCap OS HA/PC Acetabular Comp 38/46mm
130848HA	ReCap OS HA/PC Acetabular Comp 40/48mm
130850HA	ReCap OS HA/PC Acetabular Comp 42/50mm
130852HA	ReCap OS HA/PC Acetabular Comp 44/52mm
130854HA	ReCap OS HA/PC Acetabular Comp 46/54mm
130856HA	ReCap OS HA/PC Acetabular Comp 48/56mm
130858HA	ReCap OS HA/PC Acetabular Comp 50/58mm
130860HA	ReCap OS HA/PC Acetabular Comp 52/60mm
130862HA	ReCap OS HA/PC Acetabular Comp 54/62mm
130864HA	ReCap OS HA/PC Acetabular Comp 56/64mm
130866HA	ReCap OS HA/PC Acetabular Comp 58/66mm
130868HA	ReCap OS HA/PC Acetabular Comp 60/68mm

ReCap® Porous Coated Acetabular Component

Cat. No.	Description
157844	ReCap PF PC Acetabular Comp Ø 44/38mm
157846	ReCap PF PC Acetabular Comp Ø 46/40mm
157848	ReCap PF PC Acetabular Comp Ø 48/42mm
157850	ReCap PF PC Acetabular Comp Ø 50/44mm
157852	ReCap PF PC Acetabular Comp Ø 52/46mm
157854	ReCap PF PC Acetabular Comp Ø 54/48mm
157856	ReCap PF PC Acetabular Comp Ø 56/50mm
157858	ReCap PF PC Acetabular Comp Ø 58/52mm
157860	ReCap PF PC Acetabular Comp Ø 60/54mm
157862	ReCap PF PC Acetabular Comp Ø 62/56mm
157864	ReCap PF PC Acetabular Comp Ø 64/58mm
157866	ReCap PF PC Acetabular Comp Ø 66/60mm

ReCap® HA/Porous Coated Acetabular Component

Cat. No.	Description
157944	ReCap PF HA/PC Acetabular Comp Ø 44/38mm
157946	ReCap PF HA/PC Acetabular Comp Ø 46/40mm
157948	ReCap PF HA/PC Acetabular Comp Ø 48/42mm
157950	ReCap PF HA/PC Acetabular Comp Ø 50/44mm
157952	ReCap PF HA/PC Acetabular Comp Ø 52/46mm
157954	ReCap PF HA/PC Acetabular Comp Ø 54/48mm
157956	ReCap PF HA/PC Acetabular Comp Ø 56/50mm
157958	ReCap PF HA/PC Acetabular Comp Ø 58/52mm
157960	ReCap PF HA/PC Acetabular Comp Ø 60/54mm
157962	ReCap PF HA/PC Acetabular Comp Ø 62/56mm
157964	ReCap PF HA/PC Acetabular Comp Ø 64/58mm
157966	ReCap PF HA/PC Acetabular Comp Ø 66/60mm