AGC Total Knee System

CONCISE®

AGC Total Knee System

Concise® Surgical Technique Featuring EquiFlex™ Instrumentation

BIOMET®

AGC TOTAL KNEE SYSTEM
Concise® Surgical Technique Featuring EquiFlex™ Instrumentation

Disclaimer

This brochure provides a description of the surgical technique used by Iain C. Lennox, MD FRCS for informational purposes only.

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 prosthesis in each individual patient.

Biomet UK Ltd, is not responsible for selection of the appropriate surgical technique, nor does it advocate a particular technique to be utilised on an individual patient.

Concise® is a registered trademark of Biomet UK Ltd.

Contents

Surgical Technique

EquiFlex™

Primary Total Knee Instrumentation For the AGC Total Knee Replacement Cruciate Retaining

Introduction

The AGC Concise® Instrumentation featuring EquiFlex™ ligament balancing is designed to ensure that the total knee replacement is appropriately balanced to ensure stability and durability. The knee is balanced in extension first, where the majority of loading occurs. Balancing the knee in flexion follows to ensure that the ligaments will set correct femoral external rotation and correct patella tracking. This method will result in an equal quadrilateral extension and flexion gap.

The EquiFlex™ instrumentation simplifies the process of soft tissue balancing.

Principles of Ligamentous Release

The AGC Concise® Instrumentation, featuring EquiFlex™ is designed for use with the AGC Posterior Cruciate Retaining Total Knee.

Occupying just 4 instrument trays, the system represents a significant advance in instrument management for the modern operating theatre.

Surgical Approach

• The patient is placed supine on the operating table with a lateral support next to their tourniquet and a sandbag under the foot so that the knee will support itself when flexed.

• The leg is elevated, the skin prepared, and the tourniquet inflated.

• An incision should be made from the mid line from the superior pole of the patella to the inferior aspect of the tibial tuberosity. Skin should be retracted superiorly and the quadriceps tendon incised 1 cm above the patella on the medial side with the incision extending medial to the tibial tuberosity.

• From the mid line, the periosteum is released for a few millimetres around both sides of the knee as far back as possible.

• The fat pad should be excised completely and for a few millimetres.

• Large osteophytes on the tibia should be removed.

• The anterior cruciate ligament should be removed with sharp dissection, where it can be seen.

• The patella should be everted and osteophytes around the patella excised.

Concise® Surgical Technique Featuring EquiFlex™ Ligament Balancing Instrumentation

Step 1 - Proximal Tibial Resection

Resection should be perpendicular to the mechanical axis and is accomplished using an extra-medullary surgical technique. The EM resecting guide will produce a neutral or perpendicular resection in coronal and sagittal planes.

• Place the leg in 90° of flexion.

• Secure the ankle clamp to the inferior end of the EM resecting guide with the ankle clamp in the correct orientation for left or right. Place the ankle clamp centrally on the ankle and secure.

• Align the shaft of the EM resecting guide with the medial third of tibial tubercle. *(Fig 1)*

• Sublux the tibia forward allowing the femur to fall behind. The remaining cartilage and anterior cruciate ligament can now be excised.

• Attach the tibial cutting block to the top of the tibial resector using the locating screw.

• Screw the stylus into the top of the tibial cutting guide. *(Fig 2)*

• The resection level is estimated using the stylus. *(Fig 2)* 10mm from an undamaged plateau or 2mm from the most worn side.

• Clamp the EM guide using the thumbscrew and pin the tibial cutting block in place through the lowest holes using bone nails or quick release drills. Remove the stylus.

• Use a 1.27mm Saw Blade to resect the tibial plateau through the slot. *(Fig 3)*

• Remove the tibial resection guide.

Fig 1

Fig 2

Fig 3

Note: *If additional bone removal is necessary, place the block over the pins using the upper holes to remove an extra 2mm of bone.*

• The slope of the resected surfaces can be checked by inserting an E/M rod through the holes in the universal handle and tibial template assembly. *(Fig 4)*

Fig 4

Step 2 - Preparing the Femoral Intramedullary Canal

• Use the 9mm diameter femoral drill to make a hole in the centre of the intercondylar notch approximately 1cm anterior to the emergence of the posterior cruciate ligament. *(Fig 5)*

• Use the drill to enlarge the entry hole to ensure that alignment is referenced from the intramedullary canal and not the entry hole.

Fig 5

Step 3 - Setting the Valgus Angle

• Choose the appropriate fixed angle valgus Block (5°/7°) and insert the intramedullary rod through it. Ensure that the valgus block is correctly rotated to indicate Left or Right Leg. (L on top for a left knee and R on top for a right knee).

• Insert the rod and valgus block assembly into the femoral canal to abut the distal femoral condyle. Usually only the least eroded condyle touches the block. *(Fig 6)*

• Rotate the valgus block so that approximately equal amounts of posterior condyles are visible under the block, or so that its anterior surface is horizontal.

Fig 6

Step 4 - Distal Femoral Resection

• Attach the distal cutting block to the distal resection jig by means of the captured thumbscrew in the distal cutting jig. The distal cutting block should be aligned with the '9' mark on the distal jig which coincides with the most distal saw blade slot.

• Locate the distal cutting block and jig assembly into the valgus block; via the two rods of the distal cutting jig locating into the two holes in the valgus block. *(Fig 7)*

Fig 7

• Fully undo the thumbscrew that attaches the cutting block to the distal resection jig and lower the distal cutting block onto the anterior cortex.

• Using three bone nails or quick release drills, secure the distal cutting block to the anterior femur, starting with the distal pin followed by the proximal pins. *(Fig 8)*

Note: *An extramedullary alignment check can be made by attaching the universal handle onto the upper part of the distal cutting jig and passing an extramedullary rod through it.*

Fig 8

• The I/M rod is removed. The valgus block and distal cutting jig are removed by extracting the fixation pins or drills leaving the distal cutting block in place.

• Resect the bone from the distal end of the femur by inserting a sawblade through the most distal cutting slot. This removes 9mm of bone, equal thickness to the distal condyle of the implant. (The proximal cutting slot removes an additional 3mm of bone and would typically be used with a pre-operative fixed flexion contracture. *(Fig 9)*

• Extract the fixation pins and remove the cutting block.

Recommended saw blades are quoted at the end of this guide. Thin blades have a tendency to flex on hard bone, thus failing to achieve an accurate cut.

Fig 9

Step 5 - Establishing the Extension Gap

• Place the knee in extension.

• Use the flexion extension gauge with the larger extension plate. *(Fig 10)* Attach the extension plate to the lower plate and handle setting it at eight.

• With the leg in extension, insert the gauge into the joint space. *(Fig 11)* Rotate the knurled thumbscrew, to wind-out the gauge until the lower extension plate is flush with the proximal tibia and the upper extension plate is flush with the distal femur.

• If the spacer does not sit flush with both surfaces, it is necessary to perform appropriate ligamentous release as required for stability and straight leg alignment.

• Check the alignment of the extension gauge (and thus the resected surfaces) by inserting E/M rods through the universal handle.

• The extension plate upper surface aligns with a number – this is the gap thickness and refers to the joint space **but does not necessarily indicate the tibial bearing thickness.** That should be assessed at trial reduction stage. Take note of the extension thickness as this will be used to assess the joint space in flexion. *(Fig 12)*

• Remove the E/M alignment rods.

• Check that the leg can be manipulated into slight hyperextension with the gauge in place. If necessary, perform a posterior release with the knee in flexion.

• Replace the gap gauge and recheck.

• When fully extended the knee should stress the collateral ligaments equally. If laxity is present on one side then the tight side should be released and the thickness of the gap increased.

• Repeat this procedure until the gauge lies between the cut surfaces of the femur and tibia with the knee in extension and no laxity in either collateral ligament. *(Fig 11)*

If the extension gauge does not sit flush, then repeat distal femoral and proximal tibial resection.

Fig 10

Fig 11

Fig 12

The number that crosses the extension plate determines size of joint space.

Step 6 - Establishing the Flexion Gap

• Remove the extension plate from the gap gauge and replace it with the short flexion plate. *(Fig 13)* The flexion plate is short to allow seating of the spacer gauge on the proximal tibia, whilst preventing impingement of intact femoral posterior condyles.

• The gap between the extension and flexion plates should now be set at the same as that measured in extension.

• Insert the long IM rod into the bottom of the appropriately sized A/P femoral cutting block. Rotate the anterior screw clockwise with the universal driver to engage the rod until it reaches the anterior aspect of block. *(Fig 14)*

• The A/P cutting block is usually one size smaller than the tibial plate selected in step 2.

• The M/L size can be validated using the M/L sizer. *(Fig 15)*

Fig 13

Fig 14

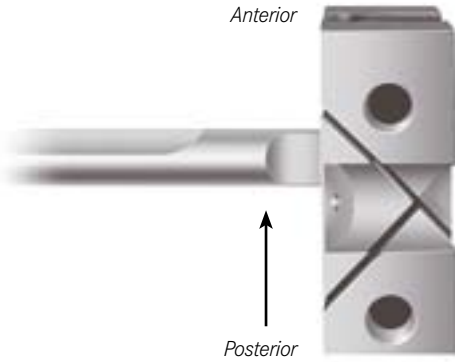

Fig 15

Step 7 - Adjusting the Femoral Cutting Block Position

• With the knee in 90˚ flexion, introduce the A/P femoral block with the long IM alignment rod attached, into the I/M canal.

• Slide the arm of the stylus horizontally to select the appropriate femoral component size and attach the stylus to the block, using the thumb screw.

• Insert the hex driver through the stylus, into the contour block. *(Fig 16)*

• Adjust the A/P position of the contour block by rotating the hex driver clockwise so thar the block moves posterially in relation to the IM Rod. The stylus should now reference the anterior cortex of the femur. *(Fig 17)*

• Insert the gap gauge and flexion plate assembly into the joint space set at the same thickness as extension gap. *(Fig 18)* The contour block should now reference flush with the flexion plate of the gap gauge. *(Fig 19)*

• Correct external rotation of the cutting block will be determined by the correct balancing of the knee. As determined in step 8. Remove the stylus.

Cutting Block Sizing

If the stylus references the anterior cortex of the femur, but the cutting block does not reach the upper flexion plate, upsize the cutting block.

If the stylus correctly references the anterior cortex of the femur but it is not possible to insert the flexion guage, downsize the cutting block.

If with the A/P block and gap gauge in place the knee can be extended past 90° then the flexion gap is too large and a larger A/P block should be used.

Fig 16

Fig 17

Fig 18

Fig 19

Step 8 - Femoral Resection

• Insert bone nails using a pin punch into the recessed chamfer holes and centre hole to fix the position of cutting block. Remove the gap guage assembly. Attach the slot guides on the anterior & posterior aspects of the contour block by tightening the thumbscrews with the universal driver. *(Fig 20)*

• Prior to resection, perform a final check with the reference finger to ensure that anterior notching of the femur will not occur.

• Screw the handles onto either side of the contour block *(Fig 21)*

• Perform the cuts in the following order: anterior, anterior chamfer, posterior and finally posterior chamfer.

• Remove the A/P block pins and I/M rod assembly from the femur.

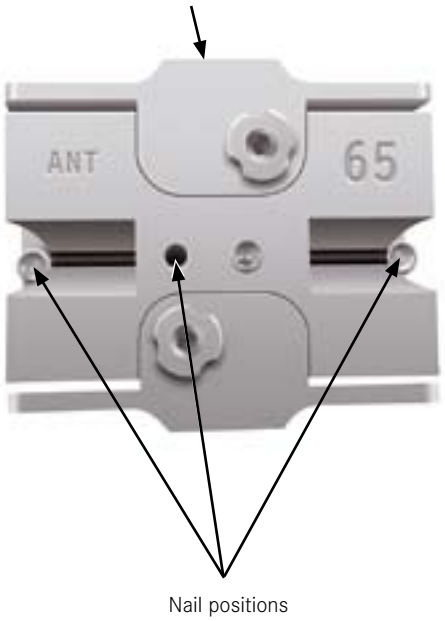

Fig 20

Fig 21

Step 9 - Femoral Component Trial

• Position the selected size AGC femoral trial onto the resected bone, using the femoral inserter/extractor. *(Fig 22)*

Fig 22

• Impact until nearly seated, release the femoral inserter/extractor and finish impacting with the femoral impactor. *(Fig 23)*

Fig 23

• To remove the femoral trial use the femoral inserter/extractor in conjuction with the slap hammer. The pincer tips fit securely into the recesses in the surface of the femoral trial. *(Fig 24)*

Fig 24

Step 10 - Determining the Tibial Component Size & Alignment

• Attch the universal handle to an appropriate size of tibial template and assess coverage to determine the tibial size *(Fig 25)*.

Fig 25

• Remove the tibial template.

• Assess joint tentioning using trial tibias of an appropriate size, starting with 8mm bearing. *(Fig 26)*

Fig 26

• Use a progressively thicker trial bearing until the joint is stabilised.

• Articulate the limb from flexion to extension to align the tibial trial.

The Flexion Test; *When the knee is flexed the ankle touches buttock with patella reduced.*

• Mark the anterior cortex of the tibia directly under the reference lines on the tibial trial. These can be used to re-align the template handle.

• Remove the trial and re-insert the template/handle.

• Alternatively, the template can be rotated on the plateau until an alignment handle placed through the universal handle lies over the mechanical axis, generally recognised to be 1cm medial to the mid point between the malleoli.

Fig 27

• The template can now be pinned into position using two short bone nails.

Step 11 - Preparing the Tibial Plateau

• The tibial component stems increase in length according to the size of the component.

• Locate the tibial tower guide onto the tibial template handle assembly and attach it with the captured thumbscrew, located anteriorly.

Note: *For cemented procedures use the tibial punch.*

• Insert the punch correctly oriented into the tower *(Fig 27)* and drive it down until the mark on the punch corresponds to the size of tibia chosen as indicated on the tower guide. *(Fig 28)*

Fig 28

• In dense bone it may be helpful to first use the cementless I-beam tibial chisel prior to using the tibial punch.

• For cementless procedures use the cementless tibial I-Beam chisel in the same manner as described for the punch. This provides a tapered I-beam profile channel, fitting the stem exactly .

Step 12 - Final Trial Reduction

• With the trial components inplace, leg alignment should now be evaluated with the leg in full extension. If it is not satisfactory it may be necessary to perform a ligamentous release.

• During trial reduction the trial component can be medialised or lateralised to achieve optimal patella tracking.

• Full extension and flexion and normal patella tracking should be observed.

• Drill the peg holes using the femoral stop drill.

Step 13 - Cementing the Components

• Use a small piece of resected bone to plug the femoral intramedullary canal to reduce any post-operative blood loss into the wound.

• All resected surfaces must be thoroughly cleaned, preferably with pressurized lavage and dried. It is advisable to use suction to remove the debris and liquid trapped in the cavities of the trabecular bone.

• Cement is applied to all the internal surfaces of the femoral component and to all the resected femoral bone surfaces. Similarly, cement is applied to the underside of the tibial component and the tibial plateau.

The components can be implanted simultaneously or sequentially. In a tight knee, it may be easier to insert the tibial component first.

• Care should be taken to prevent scratching the polished metal surfaces of the femoral and tibial components and the polyethylene of the tibial and patellar components.

• After impacting the components, care should be taken to remove all extruded surplus cement, especially from the posterior condyles of the femoral component. The cement can be pressurised whilst setting by extending the leg to 0° or slight hyperextension.

Ordering information - AGC Implants

Femoral Components

PCL Retaining

Universal V2 Porous Femoral Components Components		Universal V2 Interlok™ Cemented Femoral Components	
155411	55 mm	155421	55 mm
155412	60 mm	155422	60 mm
155413	65 mm	155423	65 mm
155414	70 mm	155424	70 mm
155415	75 mm	155425	75 mm

Anatomic Interlok Femoral Components

Right		Left	
152830	55 mm	152840	55 mm
152832	60 mm	152842	60 mm
152834	65 mm	152844	65 mm
152836	70 mm	152846	70 mm
152838	75 mm	152848	75 mm

Anatomic Porous™ Cemented Femoral Components

Right		Left	
152730	55 mm	152740	55 mm
152732	60 mm	152742	60 mm
152734	65 mm	152744	65 mm
152736	70 mm	152746	70 mm
152738	75 mm	152748	75 mm

V2 Interlok™ Moulded Tibial Components (ArCom®)

158470	8 x 63mm
158471	10 x 63mm
158472	12 x 63mm
158473	14 x 63mm
158475	18 x 63mm

158490	8 x 71mm
158491	10 x 71mm
158492	12 x 71mm
158493	14 x 71mm
158495	18 x 71mm

158520	8 x 83mm
158521	10 x 83mm
158522	12 x 83mm
158523	14 x 83mm
158525	18 x 83mm

158540	8 x 91mm
158541	10 x 91mm
158542	12 x 91mm
158543	14 x 91mm
158545	18 x 91mm

158480	8 x 67mm
158481	10 x 67mm
158482	12 x 67mm
158483	14 x 67mm
158485	18 x 67mm

158500	8 x 75mm
158501	10 x 75mm
158502	12 x 75mm
158503	14 x 75mm
158505	18 x 75mm

158530	8 x 87mm
158531	10 x 87mm
158532	12 x 87mm
158533	14 x 87mm
158535	18 x 87mm

V2 Porous Moulded Tibial Components (ArCom®)

158370	8 x 63mm
158371	10 x 63mm
158372	12 x 63mm
158373	14 x 63mm
158375	18 x 63mm

158390	8 x 71mm
158391	10 x 71mm
158392	12 x 71mm
158393	14 x 71mm
158395	18 x 71mm

158410	8 x 79mm
158411	10 x 79mm
158412	12 x 79mm
158413	14 x 79mm
158415	18 x 79mm

158430	8 x 87mm
158431	10 x 87mm
158432	12 x 87mm
158433	14 x 87mm
158435	18 x 87mm

158380	8 x 67mm
158381	10 x 67mm
158382	12 x 67mm
158383	14 x 67mm
158385	18 x 67mm

158400	8 x 75mm
158401	10 x 75mm
158402	12 x 75mm
158403	14 x 75mm
158405	18 x 75mm

158420	8 x 83mm
158421	10 x 83mm
158422	12 x 83mm
158423	14 x 83mm
158425	18 x 83mm

158440	8 x 91mm
158441	10 x 91mm
158442	12 x 91mm
158443	14 x 91mm
158445	18 x 91mm

Sawblades

32-401164	Oscillatory Sawblade Hall Type
32-401165	Oscillatory Sawblade Stryker Type
32-401166	Oscillatory Sawblade Howmedica Type
32-401167	Oscillatory Sawblade 3M Type
32-401168	Oscillatory Sawblade A.O Type
32-401195	Oscillatory Sawblade Stryker 2000 Type
32-401169	Oscillatory Sawblade 3M Maxi Drive Type

Pre-operative Planning

32-401455	AGC Universal V2 X-Ray Overlay 110%
32-401456	AGC Universal V2 X-Ray Overlay 115%
32-401457	AGC Universal V2 X-Ray Overlay 120%
32-401107	AGC Valgus Angle X-Ray Template

ArCom® Patella Components

11-150820	ArCom Poly Patella Button 31mm
11-150822	ArCom Poly Patella Button 34mm
11-150824	ArCom Poly Patella Button 37mm

Concise® Instrumentation Featuring EquiFlex™ Kit Listing (32-421600)

Tray 1

Cat. No.	Description	Qty
32-467261	Universal Step drill	2
37-100011	Intramedullary rod	1
37-100150	Quick - release chuck	1
37-100026	IM Drill/ Reamer	1
32-420160	Pin Puller	1
37-100370	Distal Resection jig	1
37-100021	Distal cutting block	1
37-100067	Distal cutting block	1
37-100357	Valgus guide 7 Degree	1
37-100355	Valgus guide 5 Degree	1
37-100007	Slap Hammer Assembly	1

Tray 2

Cat. No.	Description	Qty
37-100052	Universal Pin Impactor	1
32-421101	55mm AGC Femoral Contour Block	1
32-421102	60mm AGC Femoral Contour Block	1
32-421103	65mm AGC Femoral Contour Block	1
32-421104	70mm AGC Femoral Contour Block	1
32-421105	75mm AGC Femoral Contour Block	1
37-100027	React 3.5mm Hex Driver	1
32-421107	IM Rod-200mm	1
32-421108	M8 Float Screw	6
32-421109	M6 Lock Screw	6
32-421110	Contour Block Guide	2
32-421111	AGC Stylus Assembly	1
32-421112	IM Rod Long-300mm	1
32-421468	AGC Flexion/Extension Gauge	1
32-421469	AGC Equi-Flex Flexion Gauge	1
32-421121	55mm AGC Femoral Trial	1
32-421122	60mm AGC Femoral Trial	1
32-421123	65mm AGC Femoral Trial	1
32-421124	70mm AGC Femoral Trial	1
32-421125	75mm AGC Femoral Trial	1
37-100025	React Inserter / Alignment Handle	1
37-100032	React E/M rods	2
37-100050	React Universal Contour Block Handle	2
37-100598	React Plastic Case 160mm x 60mm	1
32-467619	Quick Release Drills Bit	2
32-420898	Short Nail	2
32-421833	Std Nail	4
37-100003	Anterior Reference Finger	1

Concise™ Instrumentation Featuring EquiFlex™ Kit Listing (32-421600)

Tray 3

Cat. No.	Description	Qty
37-100004	Femoral impactor	1
37-100155	Tibial tray impactor	1
37-100006	Tibial stem punch	1
37-100100	Tibial stem chisel	1
37-100024	EM guide assembly	1
37-100023	Ankle clamp	1
37-100030	RH cutting block	1
37-100120	LH cutting block	1
37-100005	Chisel guide	1
37-100063	Tibial template 63mm	1
37-100067	Tibial template 67mm	1
37-100071	Tibial template 71mm	1
37-100075	Tibial template 75mm	1
37-100079	Tibial template 79mm	1
37-100083	Tibial template 83mm	1
37-100048	Resection Stylus	1

Tray 4

Cat. No.	Description	Qty
37-100200	Tibial Trial 63mm x 8mm	1
37-100201	Tibial Trial 63mm x 10mm	1
37-100202	Tibial Trial 63mm x 12mm	1
37-100203	Tibial Trial 63mm x 14mm	1
37-100205	Tibial Trial 63mm x 18mm	1
37-100220	Tibial Trial 67mm x 8mm	1
37-100221	Tibial Trial 67mm x 10mm	1
37-100222	Tibial Trial 67mm x 12mm	1
37-100223	Tibial Trial 67mm x 14mm	1
37-100225	Tibial Trial 67mm x 18mm	1
37-100240	Tibial Trial 71mm x 8mm	1
37-100241	Tibial Trial 71mm x 10mm	1
37-100242	Tibial Trial 71mm x 12mm	1
37-100243	Tibial Trial 71mm x 14mm	1
37-100245	Tibial Trial 71mm x 18mm	1
37-100260	Tibial Trial 75mm x 8mm	1
37-100261	Tibial Trial 75mm x 10mm	1
37-100262	Tibial Trial 75mm x 12mm	1
37-100263	Tibial Trial 75mm x 14mm	1
37-100265	Tibial Trial 75mm x 18mm	1
37-100280	Tibial Trial 79mm x 8mm	1
37-100281	Tibial Trial 79mm x 10mm	1
37-100282	Tibial Trial 79mm x 12mm	1
37-100283	Tibial Trial 79mm x 14mm	1
37-100285	Tibial Trial 79mm x 18mm	1
37-100300	Tibial Trial 83mm x 8mm	1
37-100301	Tibial Trial 83mm x 10mm	1
37-100302	Tibial Trial 83mm x 12mm	1
37-100303	Tibial Trial 83mm x 14mm	1
37-100305	Tibial Trial 83mm x 18mm	1

Notes :

AGC Total Knee System

CONCISE®

FLK162 / 12.06

Biomet UK Ltd
Waterton Industrial Estate
Bridgend, South Wales
CF31 3XA, United Kingdom

Tel. +44 (0)1656 655221
Fax. +44 (0)1656 645454

www.biomet.co.uk

BIOMET®

AGC Total Knee System

CONCISE®