COR SYSTEM

SURGICAL TECHNIQUE

An Arthroscopic Technique for Repair of Osteochondral Defects

***F. Alan Barber**, M.D., F.A.C.S. and **James C.Y. Chow**, M.D.*

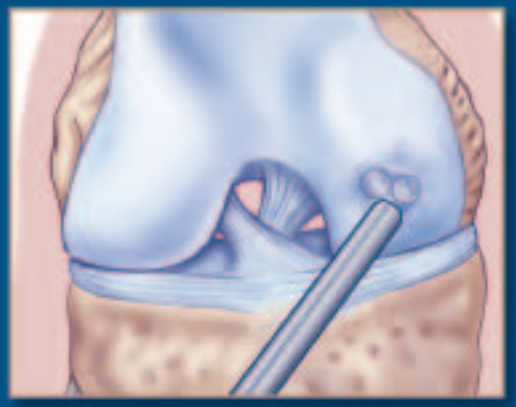
Surgical Technique

COR™ REPAIR SYSTEM

OSTEOCHONDRAL REPAIR SYSTEM

The COR System creates a smooth, contoured articular cartilage surface and offers:

- **CLEAR DELIVERY GUIDE**
  - -View the plug before it is implanted
  - -Adjust the rotation of the plug to match the contour of the recipient site
- **PATENTED CUTTING TOOTH**
  - -Create a clean break during harvesting
  - -No toggling needed to remove the plug
- **OPTIONS**
  - -8mm Depth System for harvesting without measuring
  - -Variable Depth System for deeper defects, including OCD



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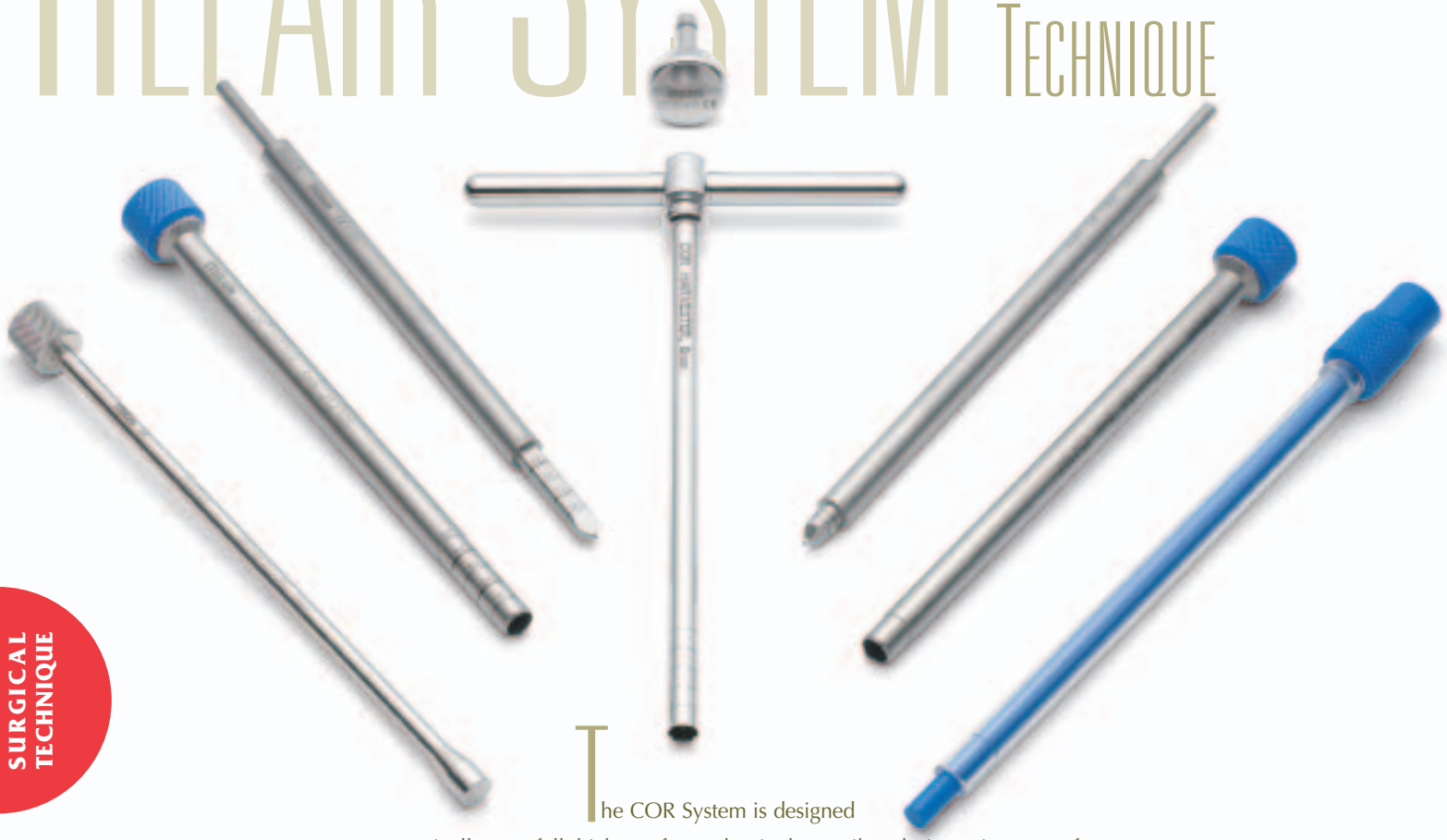
REPAIR SYSTEM SURGICAL TECHNIQUE

SURGICAL TECHNIQUE



The COR System is designed to surgically treat full thickness femoral articular cartilage lesions via autograft or allograft transplantation. The COR System's tubular cutting instruments arthroscopically harvest osteochondral grafts from a non-weight-bearing donor site. The osteochondral plugs are then press fit into a precisely drilled socket within the defect site. COR may be used in an arthroscopic or an open procedure if access to the defect or donor site is difficult. Generally, the ideal patient for this procedure is one with a focal traumatic lesion, between 1cm^2 and 2.5cm^2, in weight-bearing regions of the femoral condyle and who is less than 55 years of age. Instrumentation is used to harvest osteochondral plugs to repair symptomatic lesions resulting from traumatic injury or osteochondritis dissecans. Examples of these chondral and osteochondral lesions may be found in the femoral condyle, patella and trochlea.

The COR system further offers surgeons a choice of variable (up to 25mm) or finite (8mm) length grafts and facilitates graft insertion when using Clear Delivery Guides.*

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* Designed in conjunction with William Barnes, M.D., Macon, GA, and Donald Rose, M.D., New York, NY

COR OSTEOCHONDRAL

PLANNING THE PROCEDURE

An 18-gauge spinal needle is initially used to plan a perpendicular approach to the defect and autograft donor sites **(Figure 1)**.

Chondral defect and donor sites are arthroscopically inspected, debrided and measured to determine the number and size of grafts to be harvested. Beginning at the margin of the lesion, Harvesters (distally calibrated in 4mm, 6mm and 8mm diameters) are used to plan graft placement within the lesion by lightly scoring the defect surface to form a template pattern. To ensure that the grafts maintain a press fit, a 1-2mm bone bridge between grafts should be preserved **(Figure 2)**.

When considering an arthroscopic or open approach, these factors should be evaluated:

- Perpendicular access to donor cartilage
- Matching the donor cartilage and recipient contour site

The unique feature of this system, the Cutter Tooth, underscores the graft to ensure precise harvesting of an osteochondral plug **(Figure 3)**. The X-Calibrator Cutters have application where increased bone stock is required or to manage an OCD lesion.

HARVESTING COR GRAFTS

A disposable Cutter is attached to the Harvester by screwing the two hubs together **(Figure 4a)**. Insert the metal Plunger into the Harvester **(Figure 4b)**. The Plunger functions as an obturator to minimize soft tissue capture as the assembly is inserted into the joint. After the Harvester is positioned within the joint, replace the Plunger with the Anvil **(Figure 4c)** to minimize fluid loss.

Position the Cutter/Harvester assembly on the selected non-weight-bearing surface to harvest a graft. Ensure that the distal end of the Cutter is perpendicular to the surface prior to taking the donor graft.

The knee's superior and lateral zone of the intercondylar notch, often removed when an ACL reconstruction notchplasty is performed, may provide the easiest arthroscopic access. An alternative non-weight-bearing donor site is located laterally on the femoral condyle, superior to the sulcus terminalis.

With a heavy mallet, tap the Anvil portion of the assembly until the Cutter reaches the depth-stop or desired calibration on variable depth Cutter **(Figure 5a)**. Note: if the Anvil no longer fits snugly inside the Harvester, replace the O-Ring on the Anvil shaft.

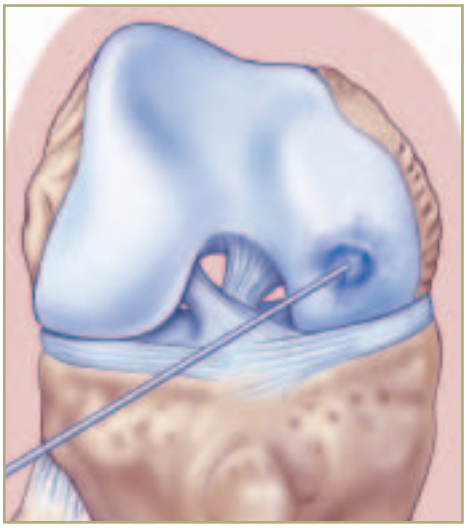


Figure 1

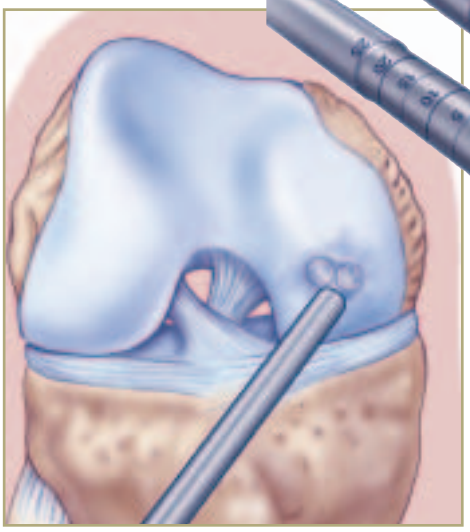


Figure 2

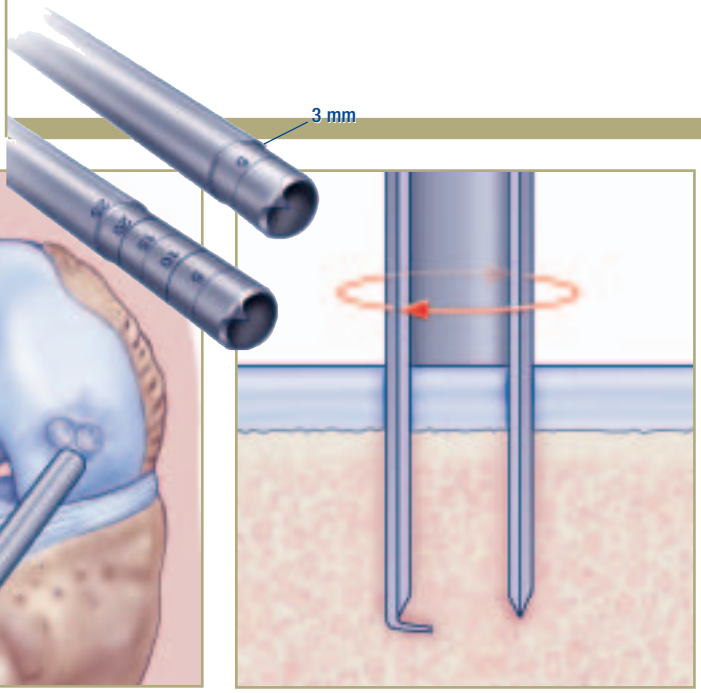


Figure 3

REPAIR SYSTEM

Rotate the T-Handle of the Harvester clockwise at least TWO complete revolutions **(Figure 5b)**. Supportive pressure must be maintained on the T-Handle during rotation to ensure control of plug depth.

Remove the Harvester with its graft by simultaneously twisting the T-Handle as it is withdrawn from the joint **(Figure 5c)**. Because of the unique undercutting tooth, there is no need to toggle the Harvester, reducing damage to the side walls. Unscrew the Cutter from the Harvester. The bone graft will remain protected within the Harvester tube until it is ready to be transplanted into the defect site.

Confirm graft length and evaluate the cartilage surface contour **(Figure 6a)**. Be aware that when a deep plug is harvested, compression during harvest may yield a slightly shorter graft than the calibration suggests. For example, a 15mm length cut may yield a 12mm plug after compression. Therefore, it is recommended that the donor graft be harvested prior to drilling the defect site socket. As an alternative, a calibrated Plunger may be inserted into the Harvester to verify plug length **(Figure 6b)**. If additional bone grafts are needed to repair the defect, the same Cutter can be used to repeat the process.

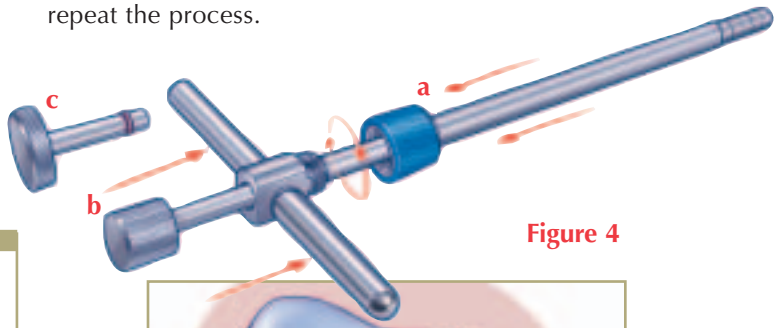


Figure 4

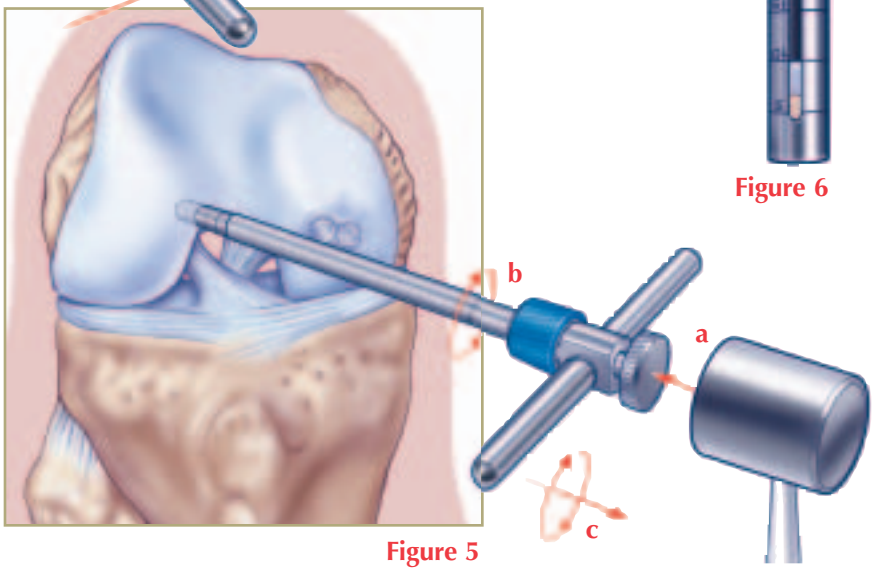


Figure 5

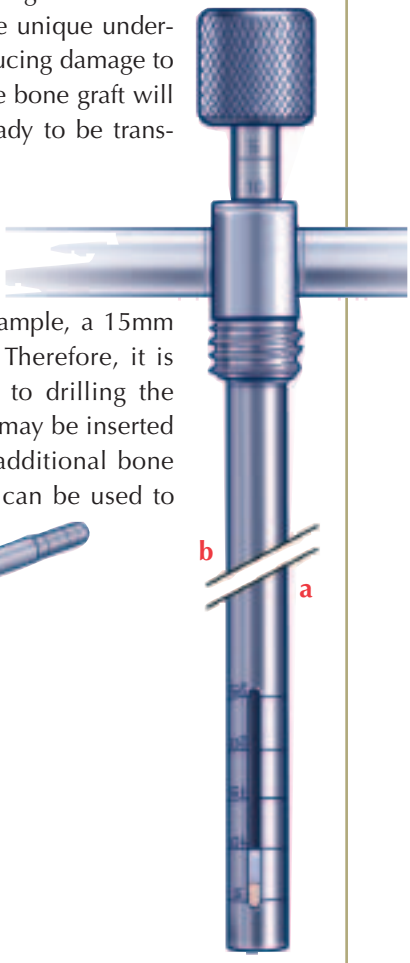
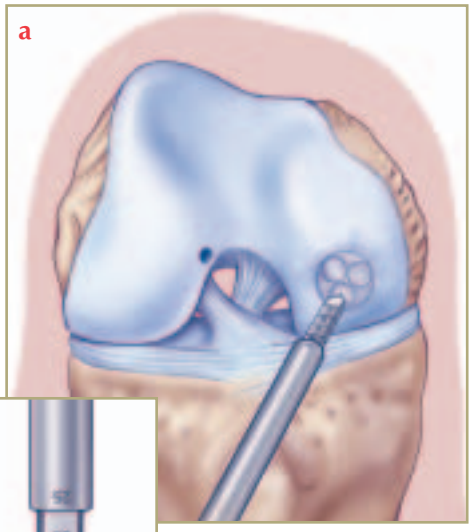


Figure 6

DEFECT SITE PREPARATION

Loose fragments should be debrided from the defect site with a shaver, arthroscopic knife or curette. The margins of the defect should be well-defined to receive the transplanted autografts. Keeping in mind the number of grafts to be transplanted, position the COR Drill Bit near the margin of the defect **(Figure 7a)**. Drill to the depth that corresponds to the harvested graft's confirmed length **(Figure 7b)**.

The entire defect may be drilled at once, maintaining a 1-2mm bone bridge between recipient sockets, or corresponding grafts may be implanted after each hole is drilled to maintain a tight press fit.



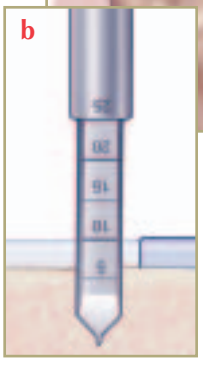


Figure 7

Graft Implantation

Figure 8

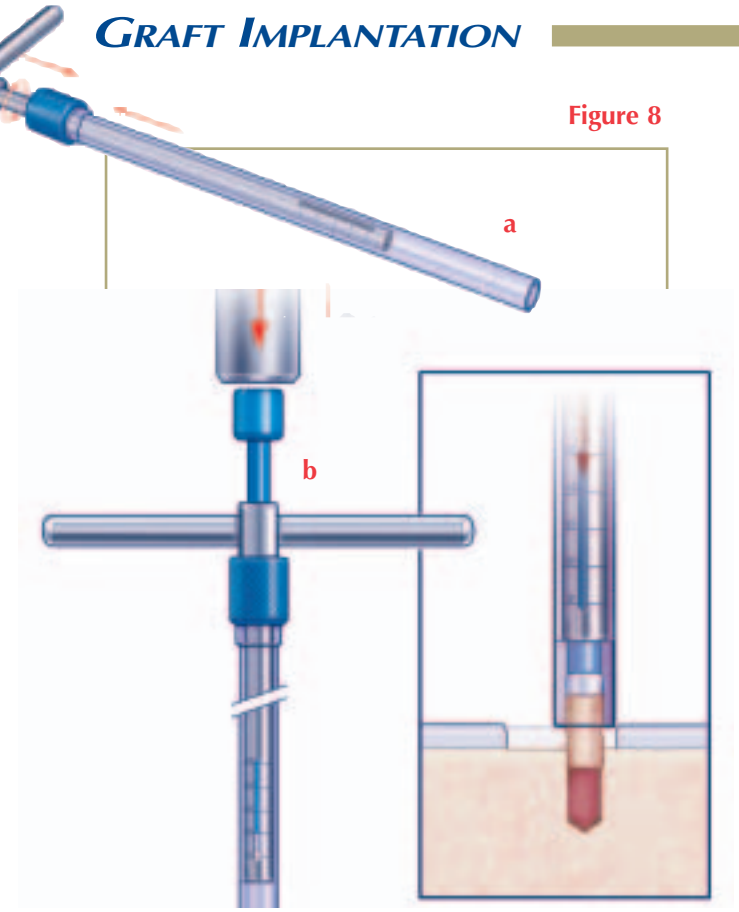


Figure 9

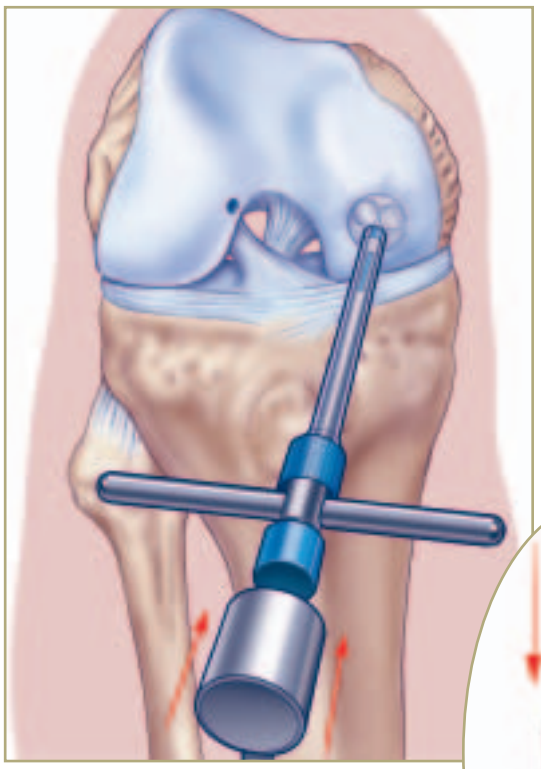


Figure 10

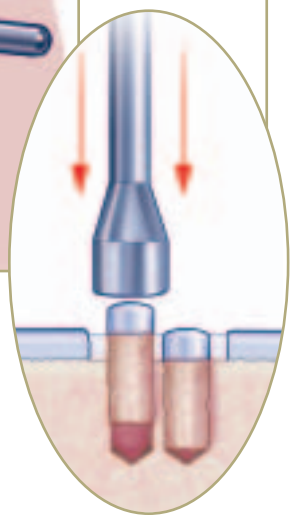
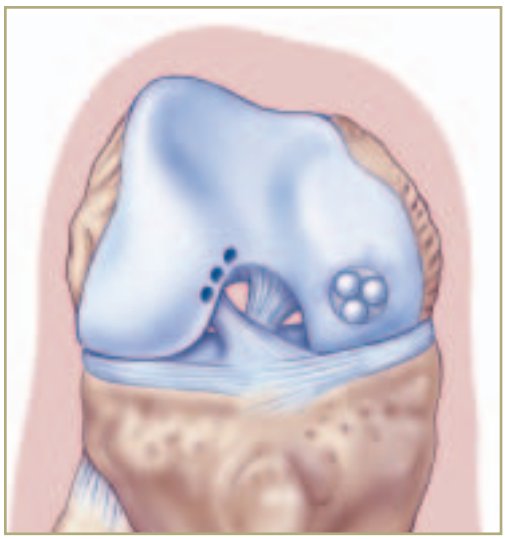


Figure 11



Screw the disposable Clear Delivery Guide onto the first graft's Harvester **(Figure 8a)**. Insert the plastic Plunger into the proximal end of the Harvester. Place the assembly on a firm surface and gently tap the Plunger to advance the graft into the Guide's distal tip. The Clear Delivery Guide barrel may be rotated to align the graft's cartilage contour to fit the adjacent cartilage surface topography **(Figure 8b)**. Note: If a compressed bone plug will not advance down the Harvester, replace the plastic Plunger with a metal Plunger. When the plug begins to move, finish delivery using the longer plastic Plunger.

Position the graft over the drill hole. Tap the Plunger to press the plug into the undersized hole so that it is flush with the surrounding host cartilage **(Figure 9)**. If the graft surface is elevated from the host cartilage, insert the Tamp into the joint and lightly tap until the plug is level with the surrounding surface **(Figure 10)**. Repeat the process to transplant grafts until the desired graft pattern is accomplished **(Figure 11)**.

Post-Operative Patient Protocol

Recommendation by F. Alan Barber, M.D., F.A.C.S. and James C.Y. Chow, M.D.

Generally, the patient maintains non-weight-bearing status during the first 3 weeks, with motion as tolerated. During the next 3-6 weeks, partial weight-bearing is advised (approximately 50%). After 12 weeks, if the patient regains full range of motion and shows no signs of effusion, light running may be initiated. Once the patient can run comfortably without problems, he or she may begin high-impact and full-pivoting activities.

** The patient's condition may require deviating from these recommendations; therefore, it is up to the treating surgeon to decide the timing for weight-bearing activities following surgery.*

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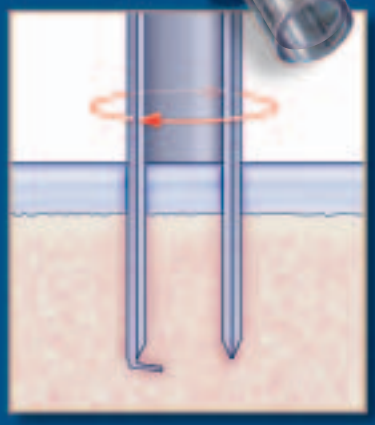
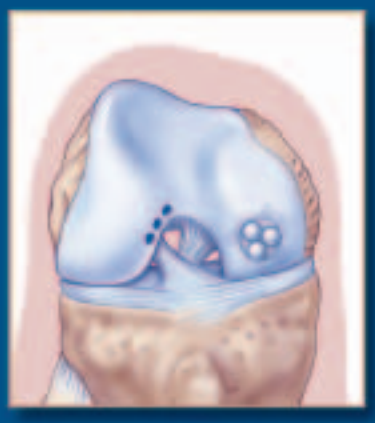
COR™ Osteochondral Repair System





Ordering Information

Catalog Number	Description	Packaging	Unit/Box
COR System			
252101	4mm Standard Cutter, 8mm Depth	Sterile	1
252102	6mm Standard Cutter, 8mm Depth	Sterile	1
252103	8mm Standard Cutter, 8mm Depth	Sterile	1
252104	4mm X-Calibrator Cutter, Variable Depth	Sterile	1
252105	6mm X-Calibrator Cutter, Variable Depth	Sterile	1
252106	8mm X-Calibrator Cutter, Variable Depth	Sterile	1
252201	4mm Clear Delivery Guide/Plunger	Sterile	1
252202	6mm Clear Delivery Guide/Plunger	Sterile	1
252203	8mm Clear Delivery Guide/Plunger	Sterile	1
4mm Components			
252305	4mm Harvester		
252306	4mm Delivery Guide		
252307	4mm Plunger		
252308	4mm Anvil		
252309	4mm Drill Bit, 8mm Depth		
252310	4mm X-Calibrator Drill Bit, Variable Depth		
6mm Components			
252311	6mm Harvester		
252312	6mm Delivery Guide		
252313	6mm Plunger		
252314	6mm Anvil		
252315	6mm Drill Bit, 8mm Depth		
252316	6mm X-Calibrator Drill Bit, Variable Depth		
8mm Components			
252317	8mm Harvester		
252318	8mm Delivery Guide		
252319	8mm Plunger		
252320	8mm Anvil		
252321	8mm Drill Bit, 8mm Depth		
252322	8mm X-Calibrator Drill Bit, Variable Depth		
Other Components			
252301	COR Sterilization Tray		
252302	Universal Bone Tamp		
252304	COR Spacer		
252303	Arthroscopic Bone Tamp		
252323	COR Anvil Replacement O-Rings (6)		

Surgeon's Signature *Date*

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