

**The New Generation
in Osteochondral Transplantation**

CCOARTM

Cartilage Transplant System

**PRECISION
TARGETING
WITH A
GENTLE TOUCH**

**An Arthroscopic Technique
for Repair of Osteochondral Defects**

F. Alan Barber, MD, FACS



Improved Accuracy

Reproducible and focused
graft harvesting and drilling
with a first-of-kind
perpendicularity device

Protects Chondrocyte Viability^{1,2}

Gentle graft handling
with "no-impact transfer"
and "low-impact delivery"

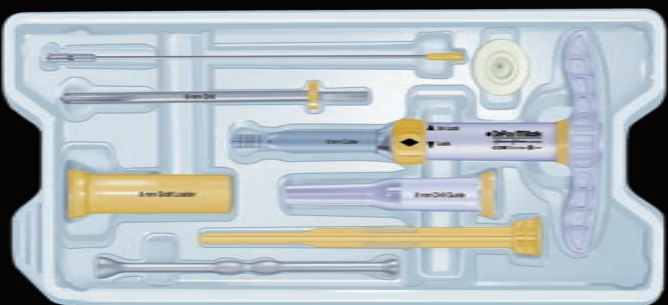
Ease of Use

Intuitive handling and
efficiency combined
in a completely
disposable system

INTRODUCTION

The COR Precision Targeting System is designed to surgically treat full thickness femoral articular cartilage lesions via autograft or allograft transplantation. It is a completely disposable sterile packed system designed for single patient use.

COR Precision Targeting 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 1 cm and 2.5 cm in diameter, in weight-bearing regions of the femoral condyle and who is less than 55 years of age with normal leg alignment. The COR Precision Targeting System offers surgeons a choice of 4 mm, 6 mm, 8 mm, and 10 mm diameter sizes and variability for graft plug depth.



I. PLANNING THE PROCEDURE

An 18-gauge spinal needle is initially used to plan a perpendicular approach to the defect and autograft donor sites. 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, a probe or COR plungers (4 mm, 6 mm, 8 mm) can be used to measure the defect size, determine harvester size(s), and plan graft placement within the lesion. When using more than 1 graft, a 2 mm bone bridge should be preserved between the graft sites to ensure a good press fit.

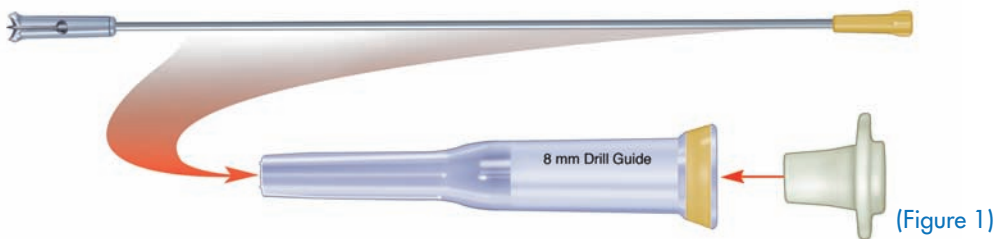
When considering an arthroscopic or open approach, these factors should be evaluated:

- Perpendicular access to donor cartilage
- Matching donor and recipient site articular cartilage contours

II. PREPARING THE RECIPIENT INSERTION SITE WITH COR PRECISION TARGETING PERPENDICULARITY TECHNIQUE

The ability to reproducibly identify a perpendicular position with the COR Precision Targeting system makes it feasible to drill the recipient site before harvesting the graft plug(s). Drilling the recipient site before harvesting the graft plugs allows selecting the best match between the donor grafts and the articular cartilage adjacent to the recipient sites. The recipient site should be prepared, creating well defined, vertical articular cartilage margins.

Loose fragments should be debrided with a shaver, arthroscopic knife, or curette. The size, number, and location of the recipient sites are determined and the recipient sites drilled, keeping a 2 mm bone bridge intact between sites to allow a press fit fixation of the grafts. Since the recipient sites are prepared first, the COR system lets the surgeon choose the best donor location on the femoral surface to harvest a graft.



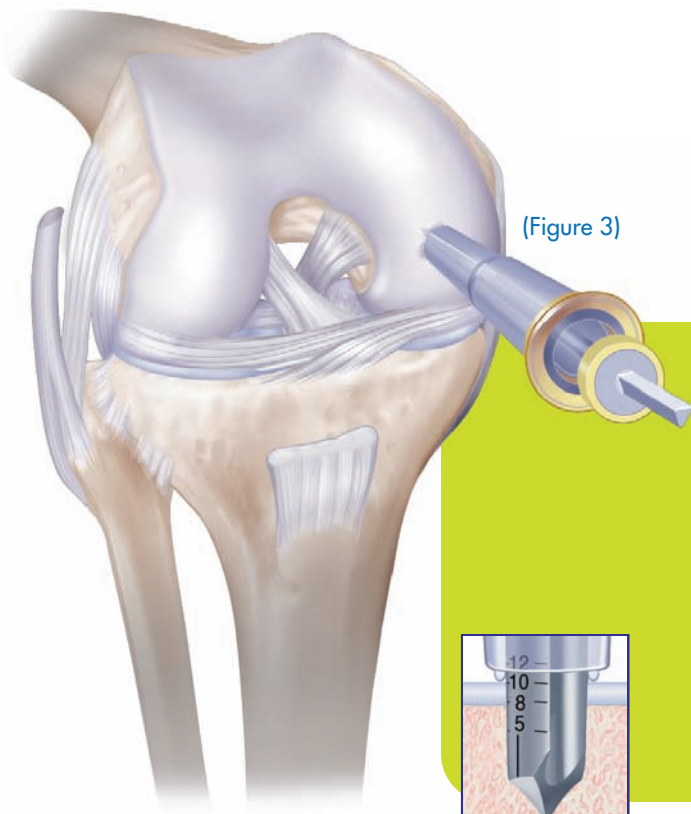
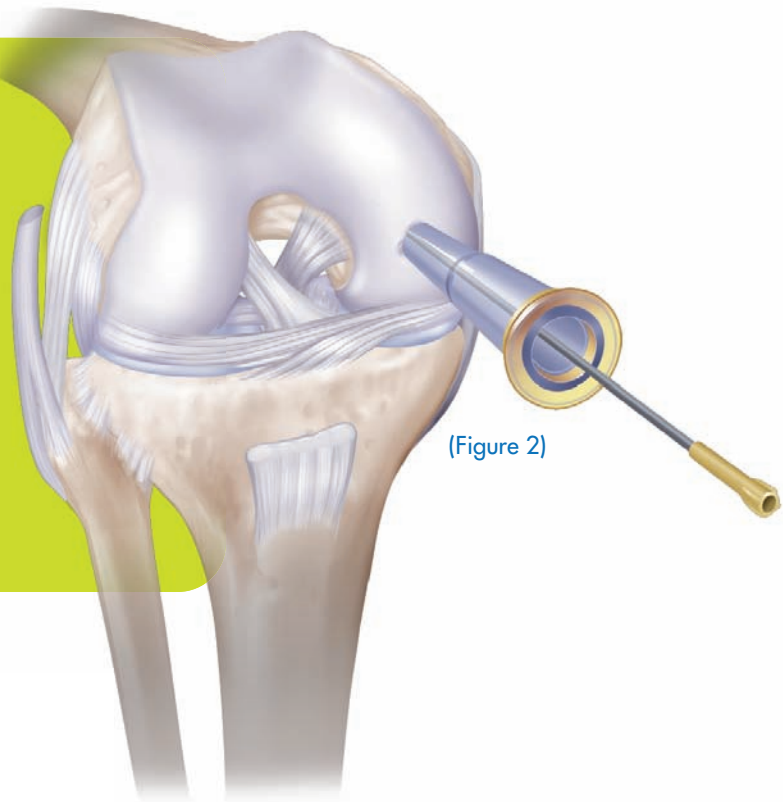
A. Prepare Drill Guide with Perpendicularity Rod

To prepare the COR System for drilling, insert the Perpendicularity Rod (6, 8, and 10 mm sizes only) into the distal end of the Drill Guide and attach the Perpendicularity Rod Cap to the proximal end of the Perpendicularity Rod to create a tight assembly interface (Figure 1).

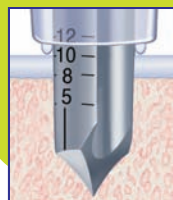
Note: COR Precision Targeting is available with and without perpendicularity. If using a COR system without perpendicularity, drilling will be accomplished without the use of a drill guide. When introducing the Harvester Delivery Guide with Cutting Tool into the joint, a white plastic trocar, laser marked with a "T", will be used in place of the perpendicularity device to help facilitate entry.

B. Recipient Site Drilling

- Insert the Drill Guide and Perpendicularity Rod assembly into the knee. Position the drill guide on the defect site and remove the Perpendicularity Rod Cap (Figure 2).
- Ensure the Drill Guide is perpendicular to the recipient site by maintaining pressure while positioning the Drill Guide until the Perpendicularity Rod is centered.
- While maintaining the Guide/Cutter position, turn the Perpendicularity Rod counter clockwise until it disengages with an audible click or slight recoil. Remove the rod.



- Drilling should be done under direct visualization, keeping the drill oriented perpendicular to the adjacent articular surface. While maintaining this perpendicularity, introduce the same size drill bit from the COR disposable kit and drill the recipient site to the desired depth to match the planned graft length (Figure 3). Remove drill and drill guide.
- Depth markings are at 5 mm, 8 mm, 10 mm, 12 mm, 15 mm, and 20 mm (Figure 4). The sharp tip on the end of the drill allows for a precise placement by creating a starter hole that avoids the drill "walking away" from the desired location. In addition, the concave sides of the fluted drill remove bone during drilling to reduce friction and heat.



(Figure 4)

III. FOCUSED GRAFT HARVESTING WITH COR PRECISION TARGETING PERPENDICULARITY TECHNIQUE

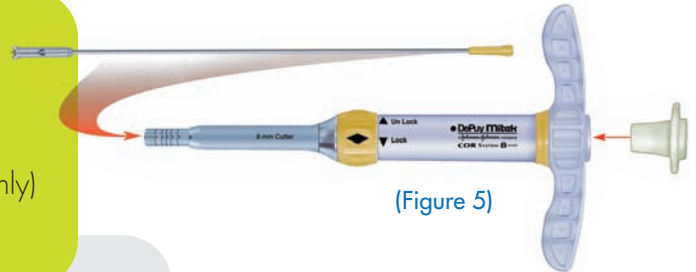
A. Prepare COR System for Harvesting

The COR Harvester Delivery Guide comes with the Harvest Cutting Tool preassembled.

To prepare the COR System for harvesting reighten the Perpendicularity Rod and insert it (6, 8, and 10 mm sizes only) into the distal end of the Harvester Delivery Guide/Cutter. (Figure 5).

Note: To reighten the perpendicularity rod, place the distal end against a firm surface and hold stationary. Push downward on the rod to engage and turn it clockwise with downward pressure until tight. Minimize finger pressure in the tip while tightening.

- The Perpendicularity Rod is properly sealed when the cutting tooth engages the distal cut-out groove on the Perpendicularity Rod (Figures 6a and 6b).
- Attach the Perpendicularity Rod Cap to the proximal end of the Perpendicularity Rod to create a tight interface with the Perpendicularity Rod and the Guide/Cutter (Figure 7). The Perpendicularity Rod functions as an obturator to minimize soft tissue capture as the assembly is inserted into the knee.



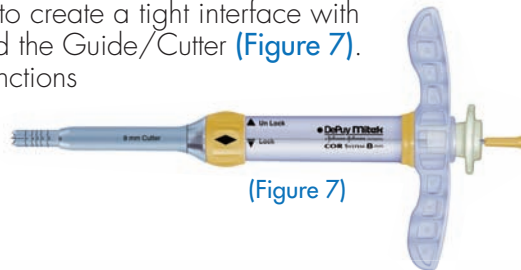
(Figure 5)



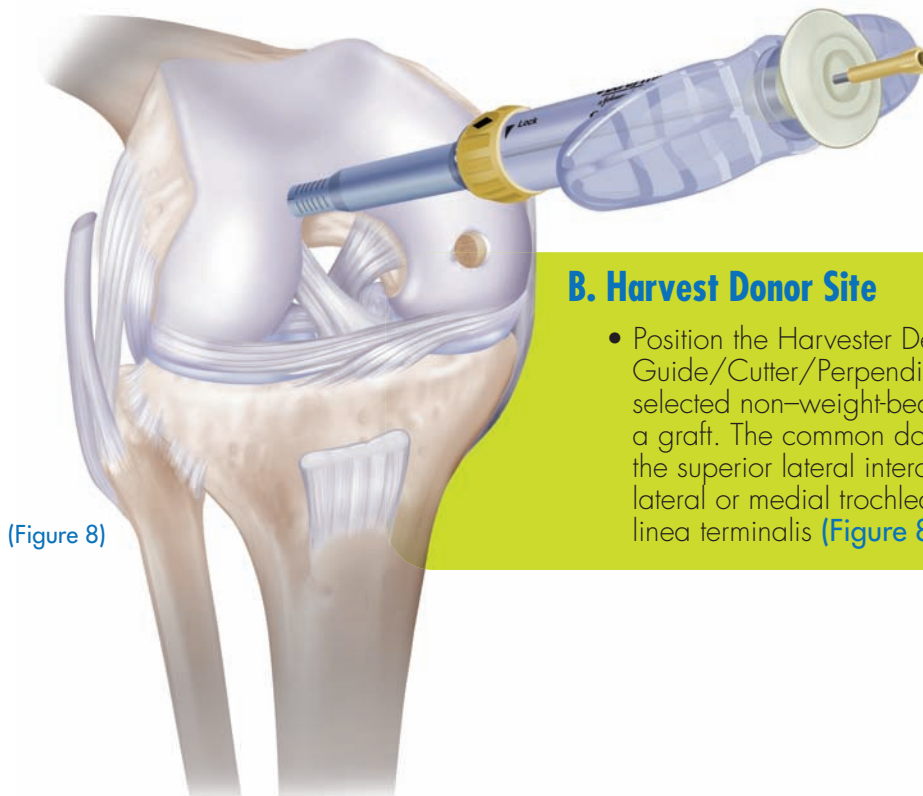
(Figure 6a)



(Figure 6b)



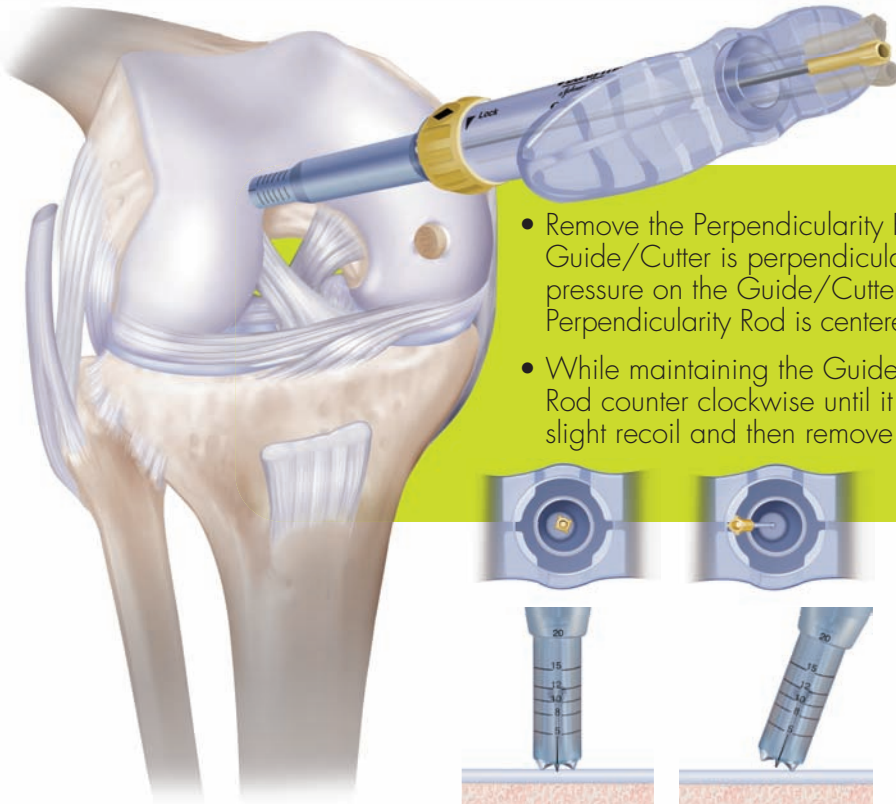
(Figure 7)



(Figure 8)

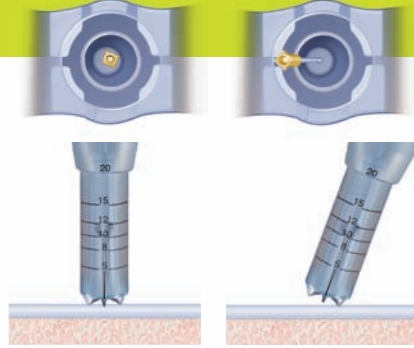
B. Harvest Donor Site

- Position the Harvester Delivery Guide/Cutter/Perpendicularity assembly on the selected non-weight-bearing surface to harvest a graft. The common donor sites for harvest are the superior lateral intercondylar notch and the lateral or medial trochlear ridge above the linea terminalis (Figure 8).



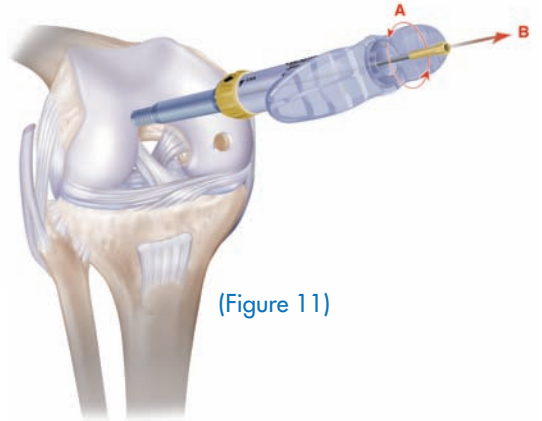
(Figure 9)

- Remove the Perpendicularity Rod Cap and ensure that the Guide/Cutter is perpendicular to the desired graft site by maintaining pressure on the Guide/Cutter while slowly positioning it until the Perpendicularity Rod is centered (Figures 9, 10a, and 10b).
- While maintaining the Guide/Cutter position, turn the Perpendicularity Rod counter clockwise until it disengages with an audible click or slight recoil and then remove the Rod (Figure 11).

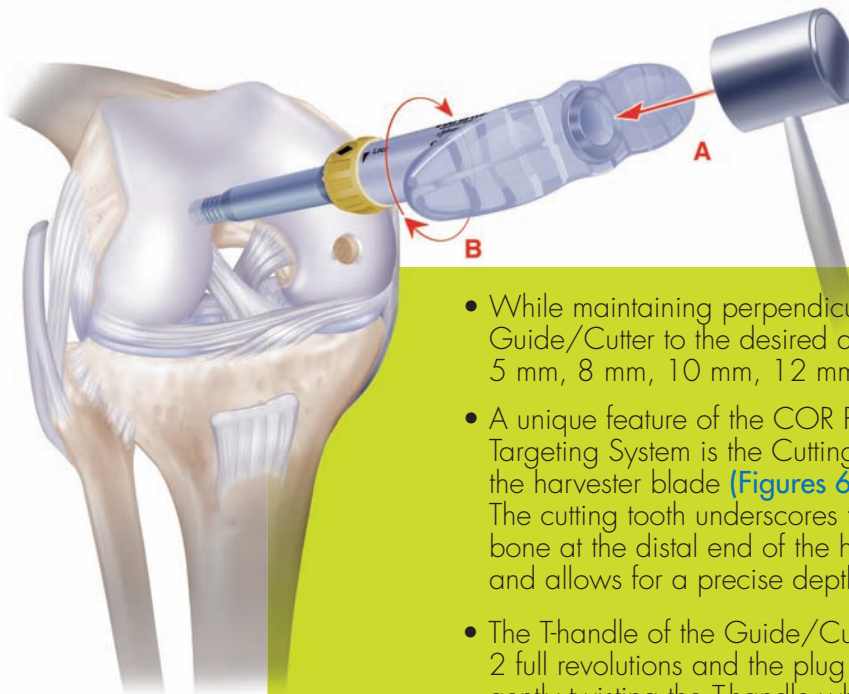


(Figure 10a)

(Figure 10b)

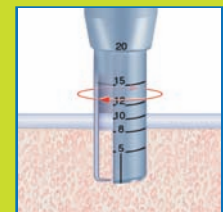


(Figure 11)



(Figure 13)

- While maintaining perpendicularity, use a mallet to tap the Guide/Cutter to the desired depth mark. Depth markings are at 5 mm, 8 mm, 10 mm, 12 mm, 15 mm, and 20 mm (Figure 12).
- A unique feature of the COR Precision Targeting System is the Cutting Tooth on the harvester blade (Figures 6a and 12). The cutting tooth underscores the cancellous bone at the distal end of the harvester tube and allows for a precise depth cut.
- The T-Handle of the Guide/Cutter is rotated 2 full revolutions and the plug is removed by gently twisting the T-Handle while withdrawing (Figure 13). Care should be taken to avoid toggling or rocking the Guide/Cutter when removing



(Figure 12)

C. Prepare graft for delivery to recipient site (“No-impact transfer”)

- On a firm surface, insert the Guide/Cutter into the graft loader (Figure 14a).
- Push the Guide/Cutter firmly until it makes contact with the bottom of the loader by pushing the graft on the cancellous bone side of the graft plug, thus positioning the graft in the Harvester/Delivery Guide (Figures 14b and 14c)

(Figure 14a)



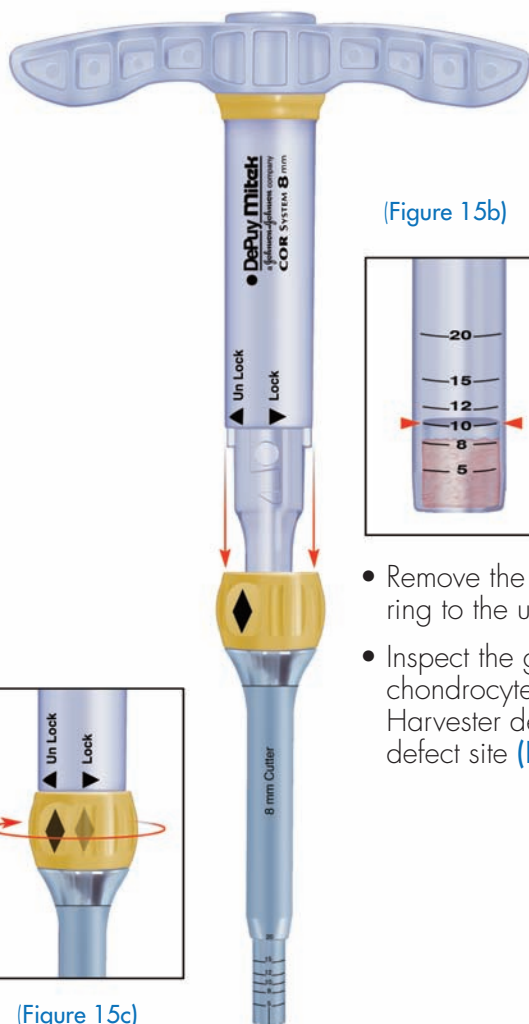
(Figure 14b)



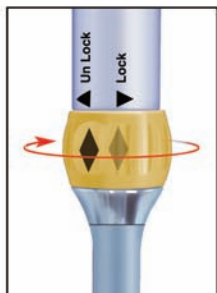
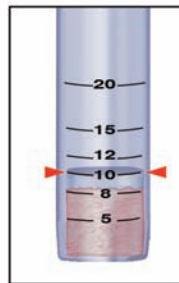
(Figure 14c)



(Figure 15a)



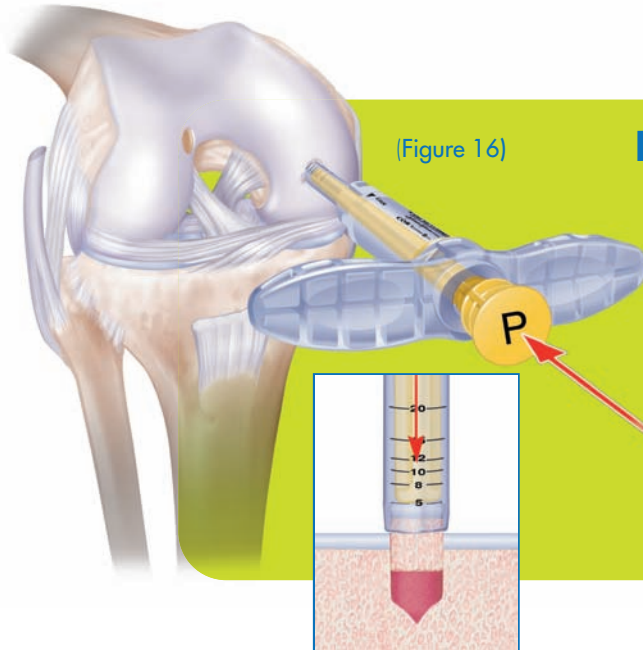
(Figure 15b)



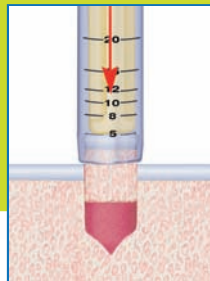
(Figure 15c)

- Remove the Cutter from the Guide by twisting the bayonet ring to the unlock position (Figures 15a and 15b)
- Inspect the graft for quality, length, and shape. To protect chondrocyte viability, the graft plug will remain within the Harvester delivery guide until it is ready for transplant into the defect site (Figure 15c)

“Low-impact delivery”



(Figure 16)



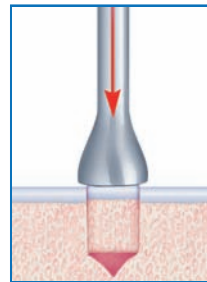
(Figure 17)

D. Graft Insertion (Low-impact delivery)

- Insert the Plunger into the Harvester/Delivery Guide carefully to avoid premature graft deployment.
- Insert the Guide into the knee over the recipient site and align the Guide perpendicularly over the drilled recipient hole.
- While holding the Guide aligned over the recipient hole, gently tap the plunger with a mallet until it is seated at the bottom of the guide to deliver the graft into the pre-drilled matching recipient hole (Figures 16 and 17). Remove the guide and evaluate the position of the graft.

The Universal Tamp may be used to fine tune graft placement. 8 mm side is recommended for 4 mm and 6 mm grafts and the 12 mm side is recommended for 8 mm and 10 mm grafts. (Figure 18) The repair is now completed.

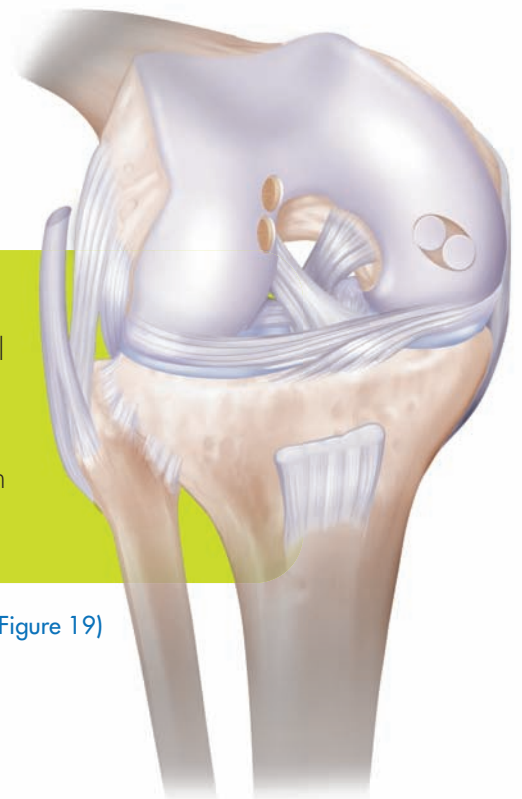
(Figure 18)



E. Multiple Graft Repair (Figure 19)

In many cases multiple grafts may be needed to repair a full thickness articular cartilage lesion. If additional grafts are required, the Harvester/Delivery Guide and Cutter may be reassembled and the process repeated until the appropriate number of grafts have been taken. It is important to maintain a 2 mm bone bridge between the drilled holes to allow for a secure graft press fit.

(Figure 19)



IV. POST-OPERATIVE PATIENT PROTOCOL

Recommendation by F. Alan Barber, MD, FACS

Generally, the patient is non-weight-bearing during the first 3 weeks after surgery, with knee motion as tolerated. Progressive weight bearing is allowed until 6 weeks at which time full weight bearing begins. Half-speed running may begin after 12 weeks, if the patient regains full range of motion and shows no signs of effusion. Once the patient can run comfortably without problems, high-impact and full-pivoting activities are allowed.

COR Precision Targeting Ordering Information		COR Sizing Instruments (Optional/Reusable)	
Catalog Number	Description	Catalog Number	Description
252107	COR Disposable Kit, 4 mm	252307	COR Plunger, 4 mm
252108	COR Disposable Kit, 6 mm	252313	COR Plunger, 6 mm
252109	COR Disposable Kit, 8 mm	252319	COR Plunger, 8 mm
252110	COR Disposable Kit, 10 mm		
252111	COR Disposable Kit, 6 mm w/Perpendicularity		
252112	COR Disposable Kit, 8 mm w/Perpendicularity		
252113	COR Disposable Kit, 10 mm w/Perpendicularity		



For more information, call your DePuy Mitek representative at 1-800-382-4682 or visit us at www.mitek.com. DePuy Mitek, Inc., 325 Paramount Drive, Raynham, MA 02767
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References: 1. Barozjani BH, Chen AC, Bae WC, et al. Effect of impact on chondrocyte viability during insertion of human osteochondral grafts. *J Bone Joint Surg.* 2006;88:1934-1943.
2. Data on file. DePuy Mitek, Inc., 2007.

*Compared to currently available osteochondral transplant systems which rely solely on visual estimates for graft positioning, instead of instrumentation measuring perpendicular placement.