

# BEATING HEART TECHNOLOGIES

Conventional & Minimally  
Invasive Therapies



**Medtronic**  
Further, Together



Octopus™ 1 ■ 1997



Octopus™ 3 ■ 2000



Urchin™ ■ 2003



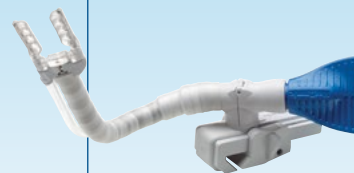
Starfish™ 2 ■ 2002



Octopus™ 4.3 ■ 2004



Octopus™ 2 ■ 1999  
Octopus™ 2+  
Octopus™ 2+ Low-Profile



Octopus™ 4 ■ 2002

## OPCAB

## MICS CABG

# BEATING HEART INNOVATIONS FOR 20 YEARS



Starfish™ NS ■ 2003



Octopus™ TE ■ 2004

## A Competitive Edge

Wherever your practice is along the continuum of beating heart surgery, we can help develop your skill set and support you with the right technologies.

- Our innovative portfolio of stabilizers, positioners and accessory products ensure effective, efficient procedures
- We offer peer-to-peer training in the latest technologies and techniques
- Knowledgeable field presence



Starfish™ Evo ■ 2010



Urchin™ Evo ■ 2010



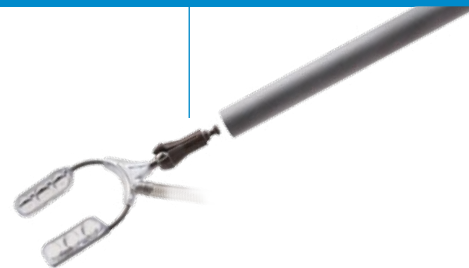
Octopus™ Evolution AS ■ 2010



Octopus™ Evolution ■ 2006



Octopus™ NS ■ 2004



Octopus™ Nuvo ■ 2010



ThoraTrak™ ■ 2008

Legacy Octopus models 1, 2, 2+, 2+ low profile, 3, 4 and TE are no longer available for sale.

Not all patients are candidates for beating heart procedures. Some patients would require cardiopulmonary support during surgery.

### Important Safety Information

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# OPCAB CLINICAL EVIDENCE OVERVIEW

## A Less Invasive Option

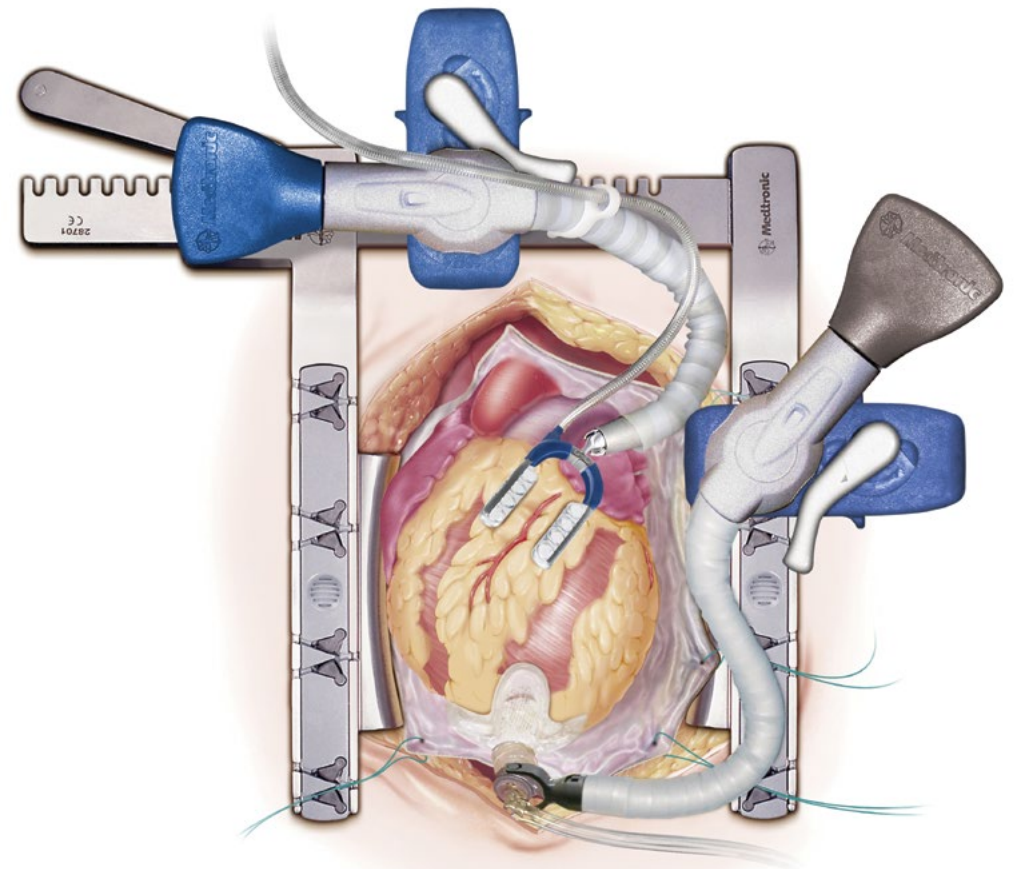
OPCAB has been clinically shown to be less invasive than conventional arrested heart surgery. This off-pump technique, which reduces many of the negative effects associated with going on-pump, is accomplished with Octopus™ technologies — which have helped many cardiac surgeons perform more OPCAB procedures.

## Clinical Benefits

- Safe alternative to on-pump CABG<sup>1</sup>
- Effective option for high-risk patients and women<sup>2,3</sup>
- Diminishes the need for inotropes and blood products<sup>1,4</sup>
- Reduces the incidence of atrial fibrillation<sup>5</sup>
- MICS CABG can reduce length of hospital stays and recovery times even further than traditional on-pump or off-pump CABG<sup>6</sup>

## Octopus Tissue Stabilizers

TS2500	Octopus™ Evolution AS Tissue Stabilizer
TS2000	Octopus™ Evolution Tissue Stabilizer
29403	Octopus™ 4.3 Tissue Stabilizer
29400	Octopus™ 4 Tissue Stabilizer



Octopus™ Evolution AS Tissue Stabilizer  
Starfish™ Evo Heart Positioner

# OCTOPUS™ TISSUE STABILIZERS FOR OPCAB

## Stability Meets Flexibility

Reliable stability for completing a beating heart anastomosis begins with your preferred Octopus device. These tissue stabilizers offer benefits that make it easier for you to deliver the care your patients need.

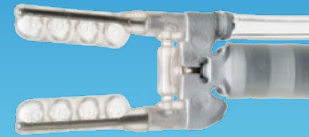
## Enhanced Stability and Flexibility With Both Octopus™ Evolution | Octopus™ Evolution AS

- Effective visualization with lower profile headlink
- Multiple device positions including pods up, pods down, and pods to the side
- Increased flexibility and range of motion
- Longer, effective reach of articulating arm provides easier access to all vessels
- Simple, secure, one-handed attachment of clamp and turret assembly
- Octopus Evolution AS model offers automatic pod spread

## Octopus™ 4 | Octopus™ 4.3 Tissue Stabilizers

- Reliable stability plus flexibility to meet your preference
- Unique headlink design offers malleable pods
- Automatic pod spread

Octopus 4



Octopus 4.3



Octopus Evolution



Octopus Evolution AS  
Tissue Stabilizer



# ACHIEVE ENHANCED VISUALIZATION FOR OPCAB

## Designed for OPCAB Procedures

Our heart positioners work in concert with the Octopus™ tissue stabilizers to facilitate clinical solutions for your OPCAB procedures. Choose from two positioner options, both of which provide enhanced visualization of the anastomotic sites.

### Heart Positioners

HP3500 Urchin™ Evo Heart Positioner

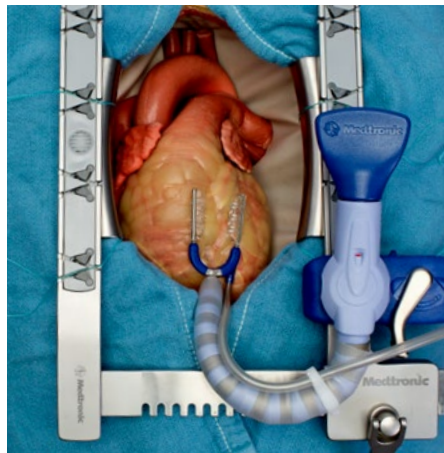
HP3000 Starfish™ Evo Heart Positioner

**Urchin Evo Heart  
Positioner,**

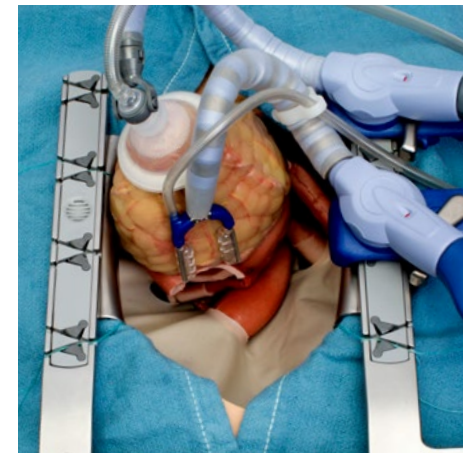
Figures 2, 3 and 4

**Octopus Evolution  
Tissue Stabilizer,**

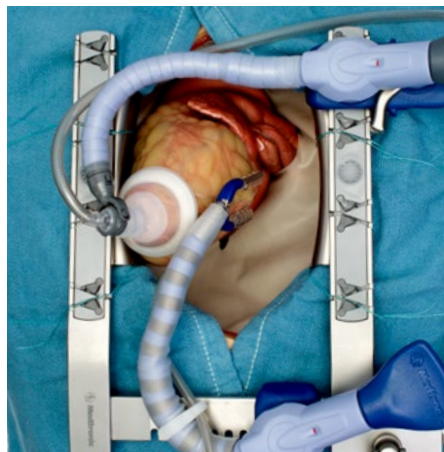
Figures 1-4



**Figure 1.** Anterior Wall Positioning



**Figure 2.** Inferior Wall Positioning  
"Pods Down"



**Figure 3.** Lateral Wall Positioning



**Figure 4.** Inferior Wall Positioning  
"Pods Up"

# OPCAB HEART POSITIONERS

## Stability Enhances Visualization

Access to specialized OPCAB technologies makes it easier for you to move through the procedure. Choose from two different OPCAB positioners to meet your preferences.

### Urchin™ Evo Heart Positioner

- Features an immediate tissue capture that provides effective positioning of the heart
- Delivers enhanced stability of the positioner on the retractor
- Enables a easy single-handed application for setup

### Starfish™ Evo Heart Positioner

- Provides multi-appendage silicone cup which offers effective positioning of the heart
- Offers enhanced stability of the positioner on the retractor
- Facilitates a convenient single-handed application for easy setup

Urchin Evo  
Heart Positioner



Starfish Evo  
Heart Positioner



# ACHIEVE ENHANCED VISUALIZATION FOR MICS CABG

## Patients Seek Out a Faster Recovery

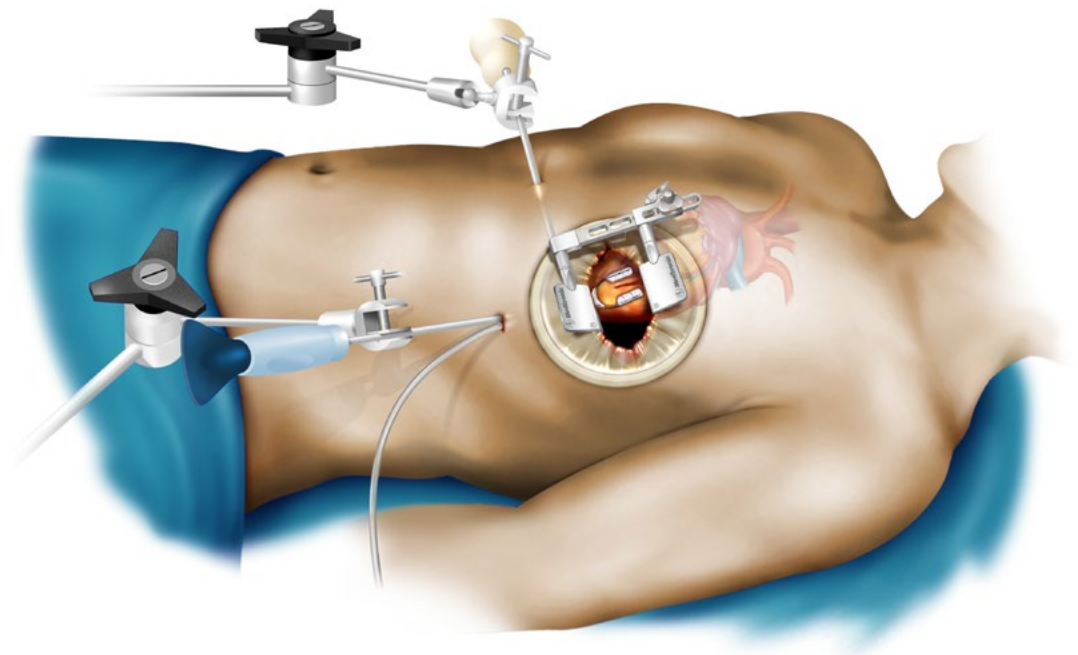
We understand that patients look to you for advice on the right treatment options. Patients undergoing MICS CABG have similar outcomes to the conventional beating heart procedure, but with the added benefit of eliminating the median sternotomy, and associated morbidities,<sup>1,2</sup> — along with possible decreased recovery time.<sup>6</sup> Like OPCAB, MICS CABG requires special training and instrumentation to help you achieve enhanced visualization.

## Clinical Benefit

- MICS CABG can reduce length of hospital stays and recovery times even further than traditional on-pump or off-pump CABG<sup>6</sup>

## MICS CABG Instruments (Figure 5)

TSMICS1	Octopus™ Nuvo Tissue Stabilizer
HP102	Starfish™ NS Heart Positioner
28610	ThoraTrak™ MICS Retractor System



**Figure 5.** Remote insertion of the Starfish NS and Octopus Nuvo shafts

## Important Safety Information

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# MICS CABG TECHNOLOGIES

## Take Your Next Step With MICS CABG

The Octopus Nuvo Tissue Stabilizer was inspired by the Octopus Evolution. This minimally invasive stabilizer offers the flexibility, stability, and ease-of-use.

## Octopus™ Nuvo Tissue Stabilizer

- Familiar stabilization technology from your OPCAB procedures
- Designed with a smaller headlink for MICS CABG procedures
- Engineered with malleable pods
- Offers increased headlink flexibility and range of motion
- Features a quick connect system

## Starfish™ NS Heart Positioner

- Enables multivessel therapy through a small thoracotomy
- Helps present coronary artery for direct vision anastomosis
- Provides in-line suction

## ThoraTrak™ MICS Retractor System

- Accommodates various cardiovascular procedures and anatomies with interchangeable blades.
- Low-profile design
- Octopus retractor adapter attaches to Thoratrak retractor rack for use of standard Octopus stabilizer.

ThoraTrak MICS  
Retractor System



Retractor  
Adapter



Octopus Nuvo  
Tissue Stabilizer



Starfish NS  
Heart Positioner



# PROCEDURAL EASE WITH ENABLING TECHNOLOGIES

## OctoBase™ Sternal Retractor

The OctoBase retractor provides the platform for countless mounting positions for our stabilizers and positioners. The unique rail slot design allows for multiple blade configurations. Several choices for blades are available, including: regular/deep, fixed/swivel and wide-skirted.

## Disposable Suture Inserts

The suture inserts are designed for easy insertion into the OctoBase retractor. They provide suture retention slots for pericardial suspension.

OctoBase  
Sternal Retractor



Disposable  
Suture Inserts

## Mister/Blower

22120	Clearview™ Blower/Mister (handpiece only)
22150	Clearview™ Blower/Mister (with tubing set)
29150	AccuMist™ Blower/Mister

## Shunts

31100	1.00 mm shunt, 14 mm between bulbs
31125	1.25 mm shunt, 14 mm between bulbs
31150	1.50 mm shunt, 14 mm between bulbs
31175	1.75 mm shunt, 14 mm between bulbs
31200	2.00 mm shunt, 14 mm between bulbs
31225	2.25 mm shunt, 14 mm between bulbs
31250	2.50 mm shunt, 14 mm between bulbs
31275	2.75 mm shunt, 14 mm between bulbs
31300	3.00 mm shunt, 14 mm between bulbs

## Quickflow DPS

33100	Quickflow DPS Distal Perfusion System
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## Sternal Retractor

28701	Retractor with stainless steel insert blanks
28702	Stainless steel insert blanks - standard
28703	Swivel blades - standard depth
28704	Swivel blades - deep
28705	Fixed blades - standard depth
28706	Fixed blades - deep
28707	Suture holder inserts - disposables
28709	Retractor handle - replacement component
28710	Fixed skirted blades - deep

# ENABLING TECHNOLOGIES

## AccuMist™ Blower/Mister

- Offers advanced fluid/gas mixing technology to create a consistent, predictable blood-clearing mist.
- The malleable shaft and on/off control on the handpiece make it an excellent choice for facilitating a bloodless field.

## ClearView™ Blower/Mister

- Designed to improve visualization of the surgical site.
- An irrigation mist gently clears blood from the site, improving visualization without drying or desiccating delicate tissue.

## ClearView™ Intracoronary Shunt

- Provides a clear anastomotic site during the procedure while providing blood flow to the distal myocardium.
- The soft silicone body with tapered tips is designed for atraumatic insertion and removal. Tags and tips are radiopaque.
- Multiple sizes are available to accommodate from 1.0 to 3.0 mm diameter vessels.

## QuickFlow DPS

- The system contains a complete set of components designed to quickly establish aorta-to-coronary perfusion during the beating heart procedure.

AccuMist  
Blower/Mister



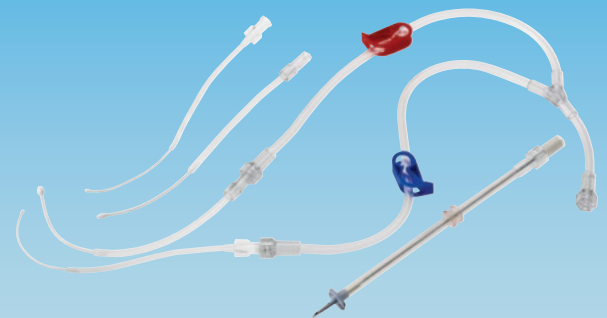
ClearView  
Blower/Mister



ClearView  
Intracoronary Shunt



QuickFlow DPS



## Ordering Information

### BEATING HEART PRODUCTS

TS2500	Octopus™ Evolution AS Tissue Stabilizer	
TS2000	Octopus™ Evolution Tissue Stabilizer	
29403	Octopus™ 4.3 Tissue Stabilizer	
29400	Octopus™ 4 Tissue Stabilizer	
HP3500	Urchin™ Evo Heart Positioner	
HP3000	Starfish™ Evo Heart Positioner	
ESE	(1) Octopus™ Evolution Tissue Stabilizer, (1) Starfish Evo Heart Positioner	
EUE	(1) Octopus™ Evolution Tissue Stabilizer, (1) Urchin™ Evo Heart Positioner	
EAUE	(1) Octopus™ Evolution AS Tissue Stabilizer, (1) Urchin™ Evo Heart Positioner	
EASE	(1) Octopus™ Evolution AS Tissue Stabilizer, (1) Starfish™ Evo Heart Positioner	
43ES	(1) Octopus™ 4.3 Tissue Stabilizer, (1) Starfish™ Evo Heart Positioner	
4ES	(1) Octopus™ 4 Tissue Stabilizer, (1) Starfish™ Evo Heart Positioner	
43EU	(1) Octopus™ 4.3 Tissue Stabilizer, (1) Urchin™ Evo Heart Positioner	
4EU	(1) Octopus™ 4 Tissue Stabilizer, (1) Urchin™ Evo Heart Positioner	
28030	Vacuum Regulator (reusable)	

### BLOWER/MISTERS

22120	ClearView™ Blower/Mister (handpiece only)	10 count
22150	ClearView™ Blower/Mister (with attached tubing set)	5 count
29150	AccuMist™ Blower/Mister	10 count

### OCTOBASE™ RETRACTOR SYSTEM

28701	Retractor with (1 set) stainless steel insert blanks (reusable); blades are not included with this product code	
28702	Stainless steel insert blanks - standard (reusable) - replacement	1 set
28703	Swivel blades - standard depth (reusable)	1 set
28704	Swivel blades - deep (reusable)	1 set
28705	Fixed blades - standard depth (reusable)	1 set
28706	Fixed blades - deep (reusable)	1 set
28707	Suture holder inserts (disposable)	10 count
28709	Retractor handle - replacement component	
28710	Fixed skirted blades - deep (reusable)	1 set

### CLEARVIEW™ INTRACORONARY SHUNTS

31100	1.00 mm shunt, 14 mm between bulbs	
31125	1.25 mm shunt, 14 mm between bulbs	
31150	1.50 mm shunt, 14 mm between bulbs	
31175	1.75 mm shunt, 14 mm between bulbs	
31200	2.00 mm shunt, 14 mm between bulbs	
31225	2.25 mm shunt, 14 mm between bulbs	
31250	2.50 mm shunt, 14 mm between bulbs	
31275	2.75 mm shunt, 14 mm between bulbs	
31300	3.00 mm shunt, 14 mm between bulbs	

### MICS CABG

MICS3	MICS CABG Starter Pak with (5) Octopus™ Nuvo, (5) Starfish™ NS and (1) ThoraTrak™	
TSMICS1	Octopus™ Nuvo Tissue Stabilizer	
HP102	Starfish™ NS Heart Positioner	
28042	Table Clamp	
28045	Octopus™ Retractor Adapter	
28601	Blade, LIMA Standard	
28602	Blade, LIMA Deep	
28603	Blade, Long Thoracotomy Standard	
28604	Blade, Long Thoracotomy Deep	
28604B	Blade, Long Extended Mount Standard	
28605	Blade, Short Thoracotomy Standard	
28606	Blade, Short Thoracotomy Deep	
28606B	Blade, Short Extended Mount Standard	
28610	ThoraTrak™ MICS Retractor System	
28611	Retractor Rack	
NUB3	(1) Starfish™ NS Heart Positioner, (1) Octopus™ Nuvo Tissue Stabilizer	

### QUICKFLOW DPS DISTAL PERFUSION SYSTEM

33100	Quickflow DPS Distal Perfusion System, (5) kits	
Kit Contents: (1) tubing set, (2) 2.0 mm elongated arteriotomy cannulae, (1) 3.0 mm elongated arteriotomy cannula, (1) 4.0 mm elongated arteriotomy cannula, (1) 14-gauge aortic root cannula		

### REFERENCES

1. Puskas J, Cheng D, Knight J, et al. Off-pump versus conventional coronary artery bypass grafting: a meta-analysis and consensus statement. From the 2004 ISMICS Consensus Conference. *Innovations*. 2005; 1: 3-27.
2. Puskas J, Thourani V, Kilgo P, et al. Off-pump coronary artery bypass disproportionately benefits high-risk patients. *Ann Thorac Surg*. 2009;88:1142-7.
3. Mack MJ, Brown P, Houser F, et al. On-pump versus off-pump coronary artery bypass surgery in a matched sample outcome of women. A comparison of outcomes. *Circulation*. 2004; 110. (suppl II):II-1-II-6.
4. Reston JT, Tregear SJ, Turkelson cm. Meta-analysis of short-term and mid-term outcomes following off-pump coronary artery bypass grafting. *Ann Thorac Surg*. 2003; 76:1510-15.
5. Cheng DC, Bainbridge D, Martin JE, Novick RJ. The Evidence-based Perioperative Outcomes Research Group. Does off-pump coronary artery bypass reduce mortality, morbidity, and resource utilization when compared with conventional coronary artery bypass? A meta-analysis of randomized trials. *Anesthesiology*. 2005; 102:188-203.
6. McGinn JT, Usman S, Lapierre H, Pothula VR, Mesana TG, Ruel M. Minimally invasive coronary artery bypass grafting: dual center experience in 450 consecutive patients. *Circulation*. 2009; 120:578-584.

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**For more information, contact your local Medtronic Beating Heart Representative. U.S. Customer Service: (800) 328-1357.**

**Not all products are approved in every geography.**

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