Peritoneal dialysis catheter laparoscopic insertion technique guide

Best practices based on clinical evidence†

†The procedure and techniques described do not represent all medically acceptable protocols; physicians should always use their professional discretion and follow hospital protocol.

Mozarc medical

Empowering patients. Enriching lives.

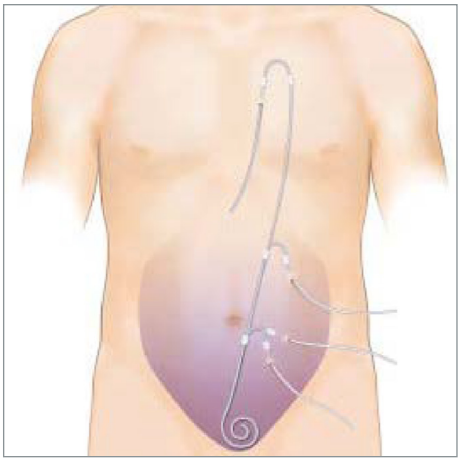
Perioperative planning and preparation[1]

Step 1

Patient landmarking

Assess patient factors such as body habitus, belt location, hernias, surgical scars, and dominant hand. If the patient is a transplant candidate, catheter should be inserted on the left side.[2]

NOTE: It is recommended to perform the assessment with the patient clothed and in both lying and sitting positions. Belt lines are highly variable from patient to patient.



Step 2

Plan surgical incision site[1]

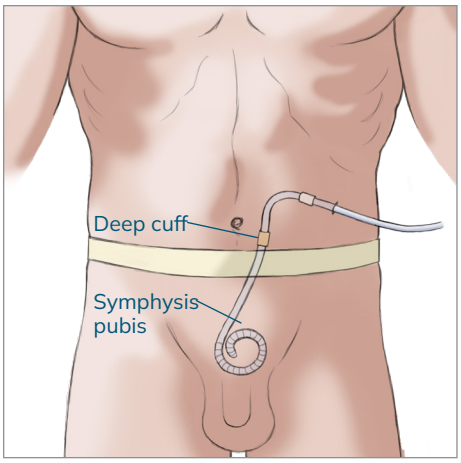
The incision site will be the location of the deep cuff.

MEASURE

With catheter on the abdomen, measure upper aspect of the coil when aligned with the upper border of the symphysis pubis.

Mark the location of the deep cuff.

Incision should be 3 cm lateral of midline and toward the medial aspect of the rectus sheath to avoid vessel complications.



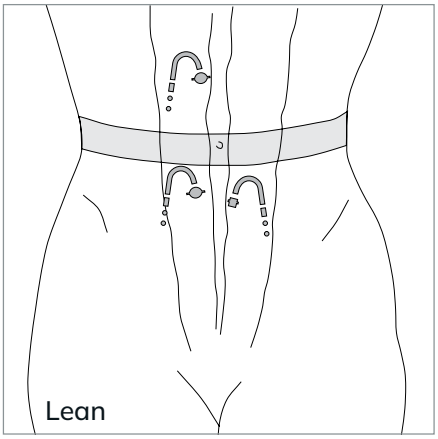
Step 3

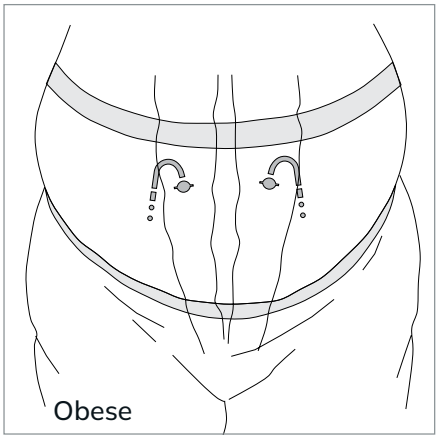
Plan the subcutaneous tunnel tract[1-3]

Tunnel should track either lateral or downward facing; avert pooling of debris, water or sweat.

For swan-neck type catheter, track must follow the catheter shape.

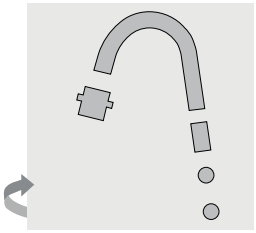
To prevent superficial cuff extrusion, a preformed swan-neck type catheter exit-site is planned **2-3 cm beyond the superficial cuff**, or **4 cm from the exit wound for a straight catheter.**



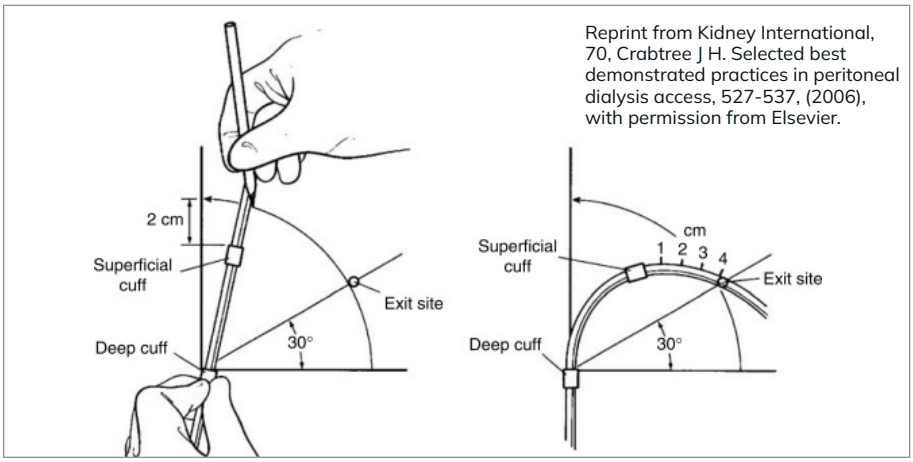


Step 3 (cont'd.)

Stencils or algorithm can be used to help with mapping exit site.



Stencil as shown is for use on left side of patient. Turn over as indicated to use on right side.



Reprint from Kidney International, 70, Crabtree J H. Selected best demonstrated practices in peritoneal dialysis access, 527-537, (2006), with permission from Elsevier.

Step 4

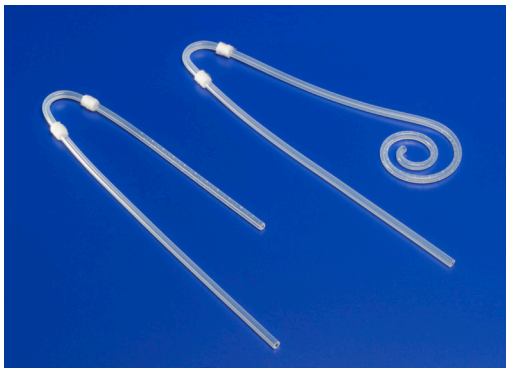
Patient preparation

- Explanation of the procedure.[1]
- Enema or bowel prep may be prescribed.[1,3]
- Day of insertion, shower with a chlorhexidine soap.[1]
- Remove body hair as requested; the use of electric clippers may be suggested.[1,3]
- Patients instructed to empty bladder; Foley catheter is an option if bladder is not emptied.[1,3]
- Prophylactic antibiotic administration suggested.[1-3]

Insertion procedure

Step 1 & 2

1. Prepare patient, environment, and equipment; perform surgical scrub and wear appropriate surgical attire.
2. Anesthetize the skin and surrounding tissues of the tunnel with local anesthesia.[1]



NOTE: If using general anesthesia, the patient must be medically cleared and able to tolerate.[2,3]

Step 3

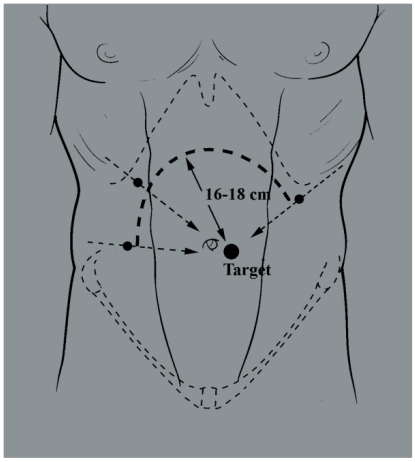
Determine catheter exit site location — if not done preoperatively — and the initial port location, which will be inserted under direct vision.[1]

NOTE: The catheter may be implanted at the medial border of the rectus muscle, between the umbilicus and symphysis pubis, through the rectus muscle just below belt line. Alternately, the catheter may be implanted at the lateral border of the rectus muscle, in a line between the umbilicus and anterior iliac crest.

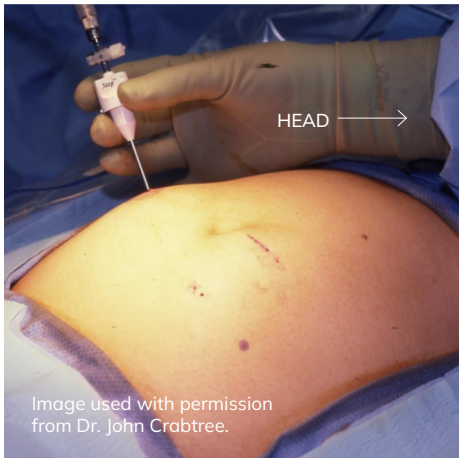
Step 4

Establish a pneumoperitoneum via Veress needle, open technique or optical viewing trocar.[1-4]

NOTE: Subcostal midclavicular line may be preferred to avoid hernias. Needle should be placed on the opposite side of the intended insertion site, between the umbilicus and anterior iliac crest.



Veress needle entry options



Pneumonperitoneum via Veress needle

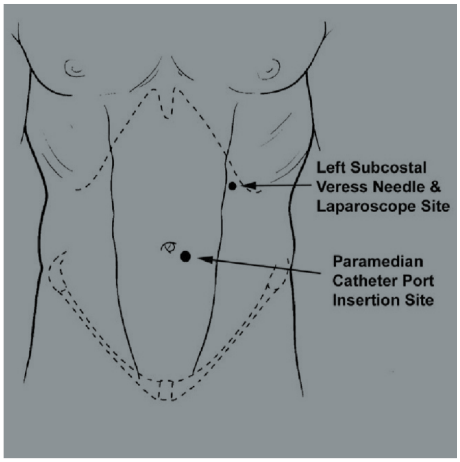
Step 5

Use laparoscopic instruments per physician's preference.[3]

Average of two ports:

- One port for the camera.
- One port for the optional grasping instruments.
- Use a 5 mm or smaller port to visualize, using a 0 degree or 30 degree scope.
- Minimize the size and number of trocar ports to prevent leaks.

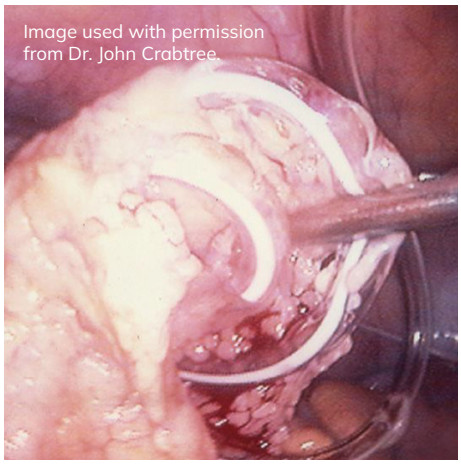
TIP: Camera port should be far enough away from the catheter port to allow for adequate visualization of the implant procedure; avoid periumbilical area.



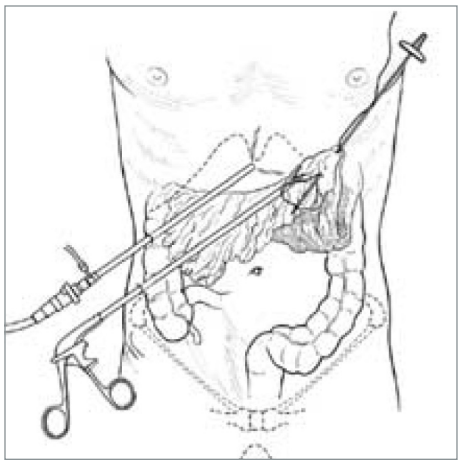
Puncture technique

Step 6

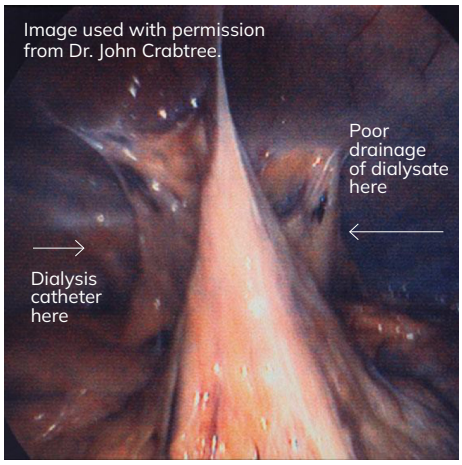
Explore abdomen; repair hernia or perform omentopexy and/or adhesiolysis if desired.[1]
Note the epigastric vessels to avoid injury during catheter placement.[2]



Redundant omentum wrapped in catheter coil



Example: An Omentopexy involves the omentum being fixed to the upper abdominal wall†



Adhesions

Step 7

Make a 1 cm to 2 cm incision at the catheter insertion site; enter abdominal wall using either[1-4]:

- 10 mm trocar
- 7/8 mm trocar system
- Pull-apart sheath and dilator
- Quill™* catheter and cuff implanter

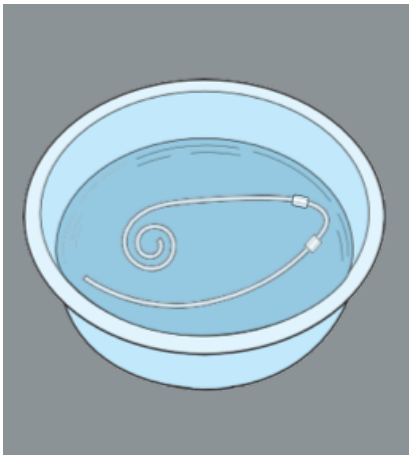
Step 8

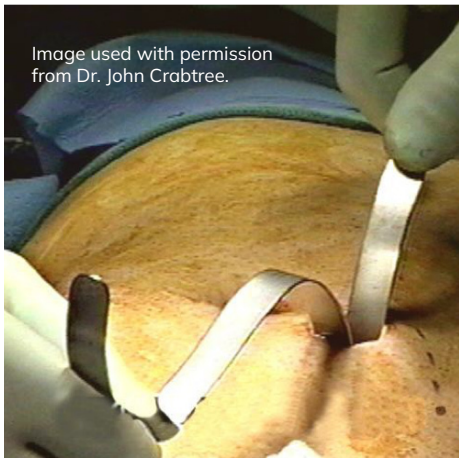
Choose insertion point in the paramedian rectus sheath.[3]
Place the deep cuff between anterior and posterior rectus sheaths.[3]

†Crabtree et al. Selective performance of prophylactic omentopexy during laparoscopic implantation of peritoneal dialysis catheters. *Surg Laparosc Endosc Percutan Tech* 2003; 13:180-184. https://journals.lww.com/surgical-laparoscopy/Abstract/2003/06000/Selective_Performance_of_Prophylactic_Omentopexy.8.aspx

Step 9

Soak the catheter in sterile saline and squeeze cuffs to expel air immediately prior to insertion.[1,3] Make a 1 cm to 2 cm incision.[1]





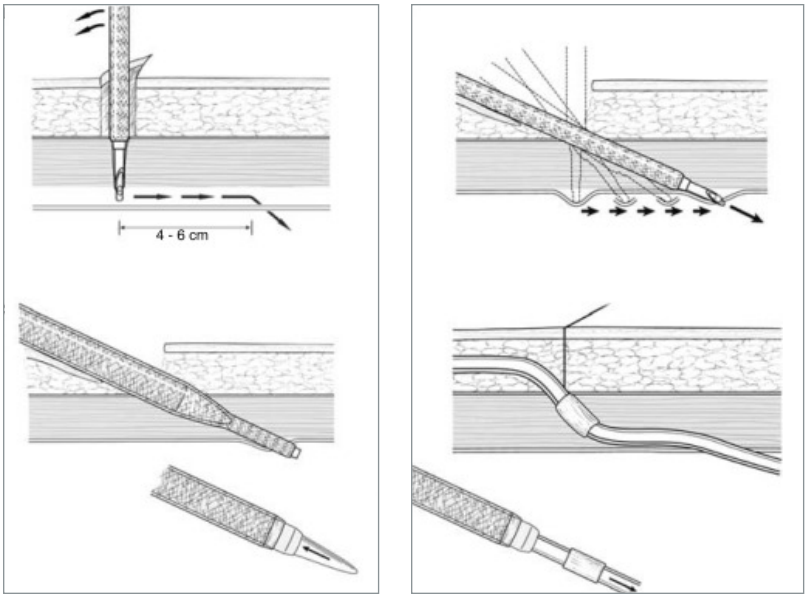
Step 10

Create a rectus tunnel sheath.[1-3]

Advance the trocar or pull-apart sheath through the anterior and posterior rectus sheaths, but not through the peritoneum.

Under direct vision, tunnel the trocar or pull-apart sheath in the preperitoneal space, 5 cm down to the midline of the abdomen. **Then** pierce the peritoneum.

NOTE: Some physicians suggest a tunnel of 4 to 6 cm to reduce tip migration.[1]



Reprint from Kidney International, 70, Crabtree J H. Selected best demonstrated practices in peritoneal dialysis access, 527-537, (2006), with permission from Elsevier.

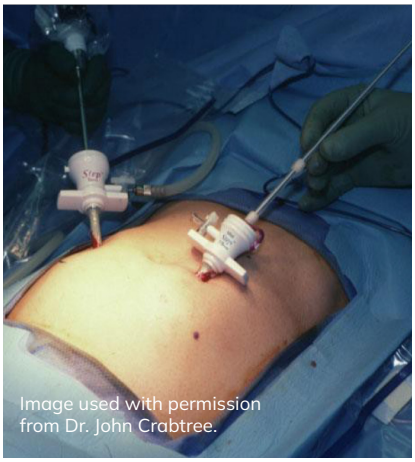
Step 11

Use straightening stylet to introduce the catheter through trocar/pull-apart sheath into the peritoneal cavity.

Position between the anterior and posterior rectus sheaths.[3]

Hold the pull-apart sheath/port and remove the straightening stylet.

Ensure deep cuff is positioned between anterior and posterior rectus sheath for optimal ingrowth.



Step 12

Create a subcutaneous tunnel using tunneling stylet, or Faller tunneling trocar.[3]

A) Tunneling stylet

1. Anesthetize skin exit site about 6 cm to one side of entry side and make a 5 mm incision.
2. Shape the stylet to define the tunnel shape, if desired, using stencil or algorithm.
3. Push the catheter over the plastic end of the stylet until it meets the hub; slide cap over the connection and remove the catheter clamp.
4. Insert tip of stylet into incision; thread through the tissue to exit site, exiting at a downward angle to the skin.

NOTE: For straight tunnel, suggest slanting tunnel slightly upwards to lessen risk of catheter migration.

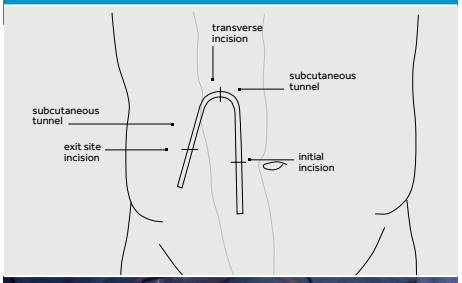
5. Spread the tunnel entrance with a hemostat; guide the cuff into the tunnel.
6. Pull the stylet through the exit site, positioning cuff deep subcutaneously 2 cm to 3 cm from the exit to avoid cuff infection or extrusion; clamp catheter.
7. Detach the tunneling stylet carefully and discard.

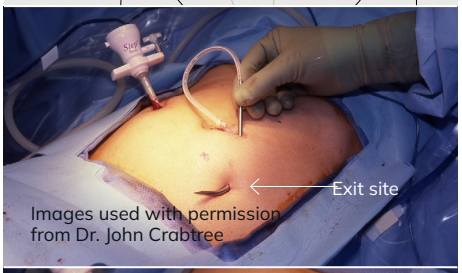
B) Faller tunneling trocar

1. Anesthetize the tunnel path, make a 1.5 cm transverse incision about 6 cm above the initial incision; follow the stencil outline if applicable.
2. Make a tunnel in the subcutaneous tissue between the two incisions using a trocar and then remove trocar.

NOTE: Follow the stencil outline or algorithm, if applicable.

3. Wet the subcutaneous cuff thoroughly with saline and squeeze to expel air.
4. Pull catheter through the tunnel using a hemostat.
5. Place the bent portion of the catheter in the pocket and allow the external tip to lie naturally on the surface of the skin to determine the direction of the subcutaneous tunnel.
6. Make a 3 cm to 4 cm incision below the cuff, making sure the portion of the tunnel between the subcutaneous cuff and the exit site incision is the same size as the catheter.
7. Bluntly probe a subcutaneous tunnel (if needed) from the upper incision down to the subcutaneous cuff using hemostat or closed forceps.
8. Attach the Faller tunneling trocar and tunnel down and out through the exit site.
9. Detach the trocar.



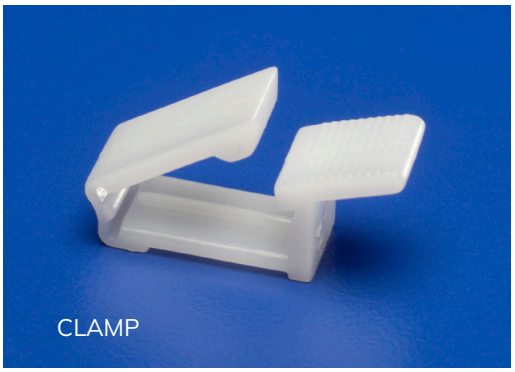


Step 13

Attach the adapter (plastic or titanium) and clamp; ensure there are no kinks or twists in the catheter.[3]


TITANIUM ADAPTER


PLASTIC ADAPTER


CLAMP

Step 14

Attach a transfer set and assess catheter function.[1]

Step 15

Check patency by instilling saline/heparinized saline and assessing for leaks, hemostasis, and rate of outflow; at least 200 mL should drain in one minute.[3]

Step 16

Close subcutaneous tissue and the entry site with an absorptive suture; do not suture the exit site.[3]

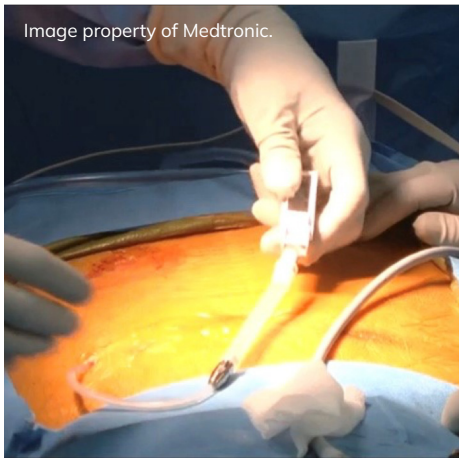


Image property of Medtronic.

Step 17

Complete incision closure with sterile adhesive strips, secure catheter to skin to reduce exit site movement and dress and tape area securely.[3]

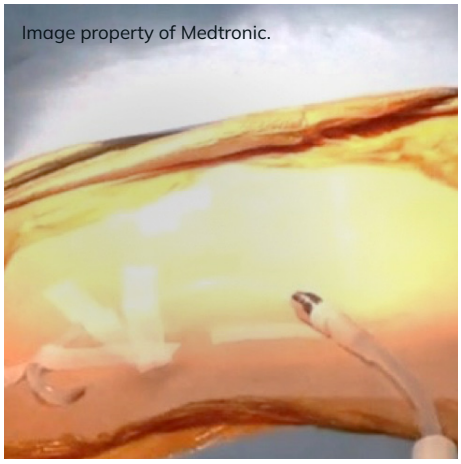


Image property of Medtronic.

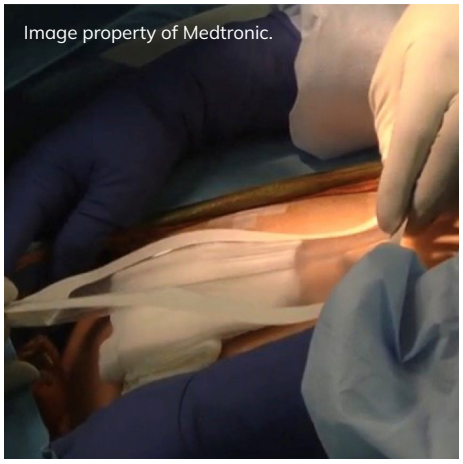


Image property of Medtronic.

Step 18

Optimally, dialysis should start in two weeks. If immediate dialysis is needed, use reduced infusion volumes and increase as tolerated.[1,2,5]

For more information:
In the United States, call 800-962-9888
Outside the United States, call 508-261-8000

1. Crabtree JH, Fishman A. A laparoscopic method for optimal peritoneal dialysis access. *The American Surgeon.* 2005;71(2): 135-143.
2. Haggerty S, Roth S, Walsh D, et al. Guidelines for laparoscopic peritoneal dialysis access surgery. *Surg Endosc.* 2014;28(11):3016-3045
3. Argyle™ peritoneal dialysis catheters and kits [package insert]. Mansfield, Ma: Medtronic; 2019.
4. Crabtree JH. Selected best demonstrated practices in peritoneal dialysis access. *Kidney International.* 2006;70:527-537

See the device manual for detailed information regarding the implant procedure, indications, contraindications, warnings, precautions, and potential complications/adverse events.

For further information, please call Mozarc Medical, in the United States call 1-800-962-9888 and for international inquiries, call 508-261-8000, and/or consult Mozarc Medical's website at www.mozarcmedical.com.

CAUTION: Federal law restricts these devices to sale by or on the order of a physician.

710 Medtronic Parkway
Minneapolis, MN 55432
800.962.9888
508.261.8000

MozarcMedical.com

Mozarc medical
Empowering patients. Enriching lives.