



# Denver™ ascites shunt

## Patient information

Ascites, an accumulation of fluid in the abdominal cavity, is a common complication of cirrhosis of the liver and various types of cancer.

Your doctor has placed a Denver™ ascites shunt to help manage your ascites using a therapy called peritoneovenous shunting (PVS).

### **This therapy can help:**

- Retain nutrients
- Improve your ability to move and breathe
- Improve your appetite by reducing the feeling of fullness
- Increase blood flow through your kidneys
- Increase elimination of excess fluid

For most patients, the Denver shunt provides fast relief from ascites symptoms.



## How the Denver shunt works

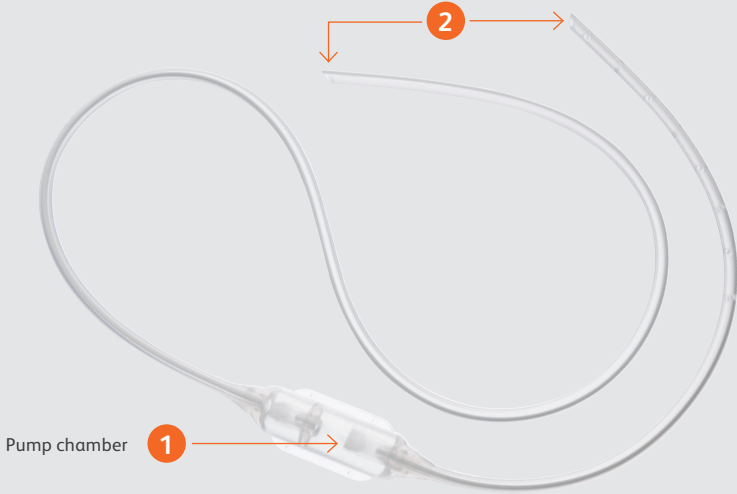
The Denver shunt consists of a pump chamber (*see no. 1 on Figure A*) attached to two catheters (*see no. 2 on Figure A*). Inside the pump chamber are either one or two valves (*depending on the specific shunt your doctor has chosen for you*) that permit fluid flow in only one direction. The shunt is implanted internally, so nothing will show outside your body.

One end of the catheter is placed in your abdomen and the other in one of your veins (*see Figure B*). The pressure of the ascites in your abdomen forces the fluid to flow through the shunt into your circulatory system. This allows you to retain the proteins and nutrients from the fluid in your body, while it helps relieve the discomfort associated with chronic ascites.

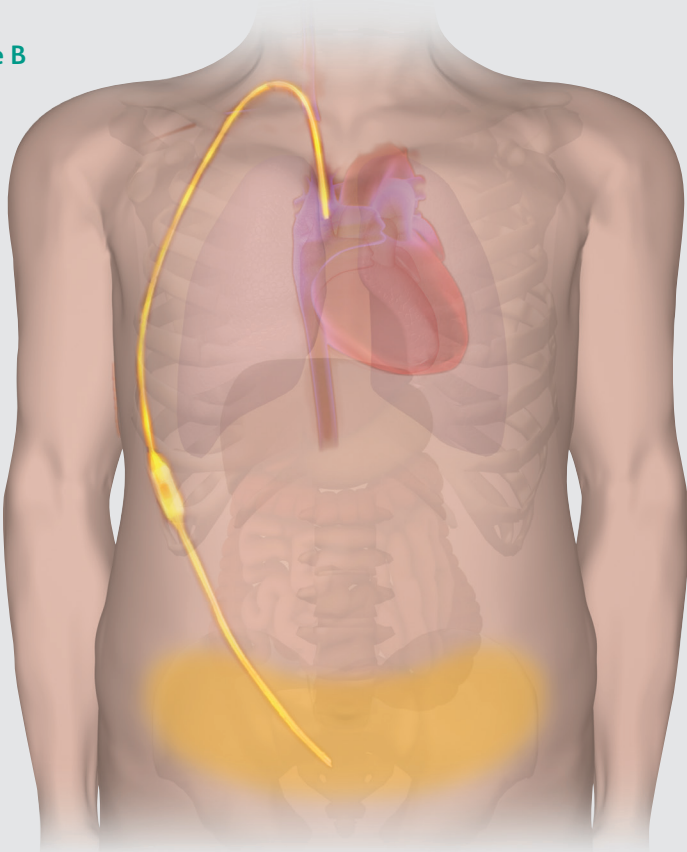
The shunt works automatically, but you will need to pump the chamber every day to help avoid clogging and keep the shunt working (*see information about pumping your shunt under **Patient instructions** and **Frequently asked questions***). You'll know the shunt is working because your ascites symptoms will significantly improve.

**Figure A**

One end of the catheter is in your abdomen, the other end in one of your veins.



**Figure B**



## Patient instructions

In order for the pump to function correctly, you must follow these instructions.

### In your doctor's office:

- Make sure your doctor notes whether you have a single- or double-valved pump chamber.
- Ask your doctor if the pump's location can be marked, so you can easily find it.

### In your home:

**Pump your shunt** by first locating your pump chamber, which should be in the area of your lower rib cage. Lie on your back.

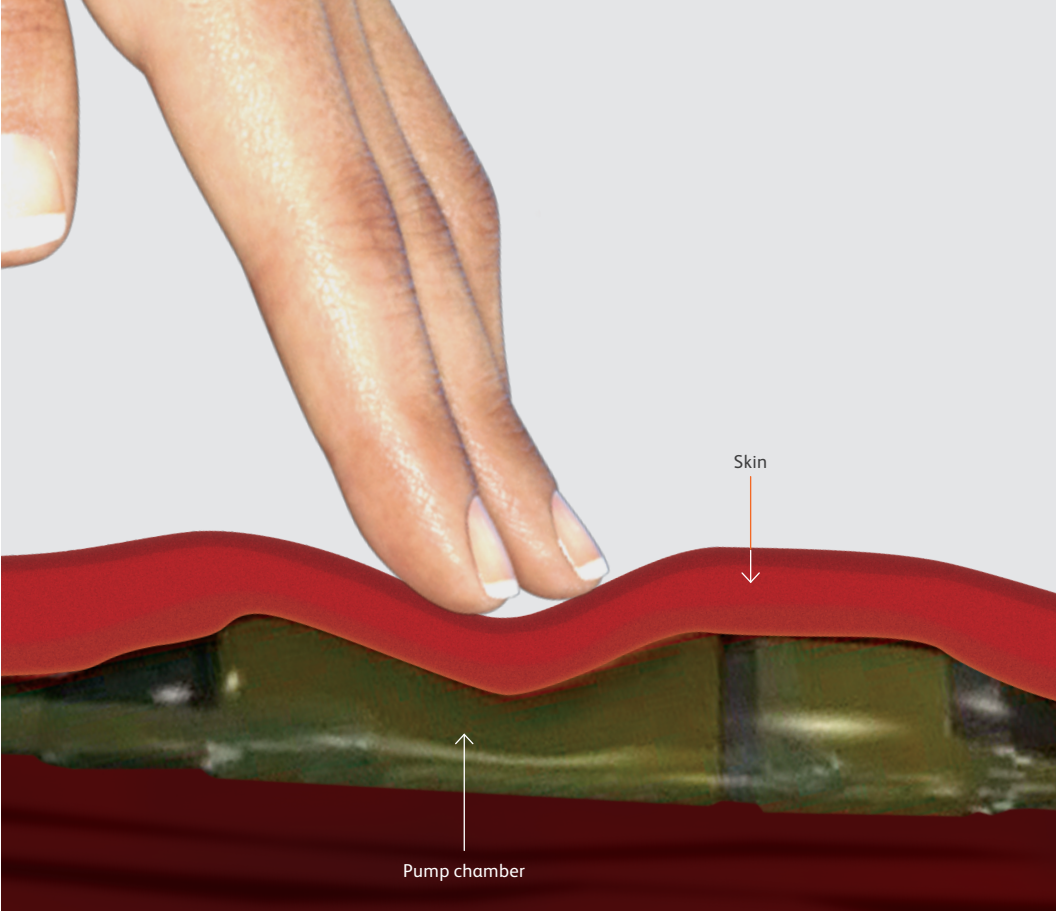
## You must lie flat in order for the Denver shunt to function.

In order for the ascites fluid to flow through the shunt, you must lie flat. It will significantly slow or even stop if you are sitting at a 45- to 90° angle.

Lying down while getting a full night's rest should be enough to keep the flow going.

### How to pump your shunt:

- If you have a double-valved shunt, press the center of the chamber down as far as you can, then release it. Wait one second for the pump chamber to expand, then repeat 20 times. Do this pumping procedure twice per day (see *Figure C*).
- If you have a single-valved shunt, compress the pump chamber with one hand. Before releasing it, press or pinch the tubing that you feel under your skin, about an inch above the pump chamber. As you continue to press or pinch the tubing, release the pump chamber. Then release the tubing. Continue to pump in this alternating fashion 20 times. Repeat this pumping procedure twice per day.
- Pumping may be uncomfortable at first if the pump chamber is close to the incision site. Once the incision site heals, it should not be painful to pump.
- It is best to pause for a second between each pump so that the pump chamber re-expands.



**Figure C** —View of the shunt pump chamber underneath the skin

**Watch for any of these signs that the shunt may not be functioning:**

- Your abdomen fills with fluid again.
- Pump chamber is solid—cannot be compressed.
- Pump chamber, after being compressed, does not re-expand as normal.

If your ascites return or the shunt seems clogged, contact the doctor who implanted your shunt. Your doctor can repair or replace the shunt in most cases.

To avoid the risk of air entering the pump, let your doctors know you have a Denver shunt before any medical procedures, especially laparoscopic surgery.



## Frequently asked questions

### How do I pump the shunt?

The pump chamber is typically placed on your lower rib cage; your doctor may have marked its location with a marker. Lie on your back: firmly press the center of the chamber down as far as you can, then release it. Wait a second for the pump chamber to refill, then repeat (see *Figure C* on previous page).

### How often should I pump my shunt?

Unless otherwise instructed by your doctor, you should pump the shunt while lying down 20 consecutive times in the morning upon waking and 20 consecutive times at night before you go to sleep. Please see the steps in the **Patient instruction** section of this brochure.

### How much fluid goes through my shunt each time I pump it?

With each pump, one milliliter (mL) of fluid is moved from your abdomen, through the shunt and into your vein. So with each pumping session, 20 mL of fluid is moved, which is less than an ounce of fluid, or about four teaspoons. Remember, the main reason for pumping is to help prevent clogging. Fluid moves on its own through the shunt when you are lying down.

## **I know how much fluid was being drained when I had a paracentesis. Can I tell how much fluid is drained by the shunt?**

It is difficult to estimate how much fluid is flowing or at what rate, since each patient is different. Fluid will flow spontaneously through the shunt throughout the day, whenever the ascites fluid creates enough pressure to push it up through the shunt and into your vein. This will typically occur when you are lying flat.

## **How long will I have my shunt in place?**

Your doctor will probably leave your shunt in place as long as it is controlling your ascites. Some patients have had the shunt in place a year or more.

## **What if I don't lie flat or I use a pillow while I sleep?**

Using a normal pillow is fine, but if you sleep at a 30- to 45-degree angle or greater, the ascites fluid may not flow through the shunt. This will probably cause the ascites fluid to build up again. If you cannot sleep while lying flat at night, try lying flat periodically throughout the day to allow for the ascites fluid to move through the shunt.

## **What if the ascites fluid starts to build up again?**

If fluid has been controlled, then starts to build up again, it is typically an indication that the shunt is clogged. A clogged shunt may be repaired or replaced relatively easily. Contact the doctor who implanted your shunt.

## **What do I do if I can't pump the shunt (*if the chamber won't compress or re-expand*)?**

This is typically an indication that the shunt is clogged. A clogged shunt may be repaired or replaced relatively easily. Contact the doctor who implanted your shunt.

## **Who do I call if I have a problem with my shunt? Should I go to the emergency room?**

You should contact the doctor who implanted your Denver shunt for help. A clogged shunt does not typically require a visit to the emergency room.

Doctor, please complete the following.

**Type of Denver ascites shunt placed:**

- Double-valved shunt                       Single-valved shunt

If patient prefers, place a mark on skin to indicate location of shunt.

**Pumping instructions:**

- While lying down, forcibly pump 20 times. Do this two times a day  
(*once prior to bedtime and once prior to rising in the morning*).

- Other \_\_\_\_\_  
\_\_\_\_\_

Doctor's phone number:  
\_\_\_\_\_

Call if you have any concerns about shunt function.

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