

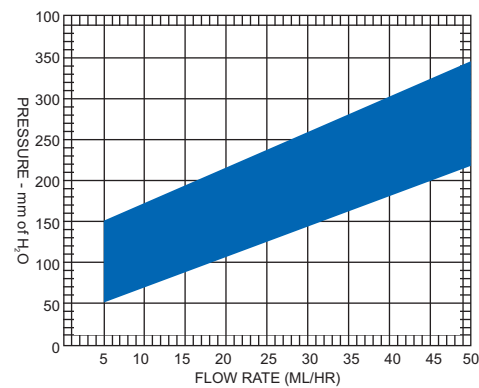
Incorporating a reservoir will add a valve more in system which becomes a two valve type. This facilitates pumping action impossible in two piece system. The reservoir base has holes to anchor it to subcutaneous tissue.

## f FLOW REGULATION BY CHHABRA SYSTEM

Chhabra system fundamentally differs from other systems in flow regulation. Practically all other designers think that higher pressure system is required for LP shunt.

A person having little basic knowledge of Hydrodynamics can easily understand it. You are draining from same 'pot to same pot. Only difference is site of connection.

This is the main reason we have tried to make it nearer to the conventional systems. But there is a limit to the flow which can be obtained by using a small bore tubing. Hence it is higher pressure type than a conventional V A or VP system.



Flow/pressure range chart

Flow ml/hr	Pres mm of water	
5	50-150	55-170
25	130-220	150-250
50	200-300	220-330

- Shorter lumbar catheter will increase the flow rate
- Actual figures may vary depending upon the method of testing.
- Addition of reservoir will reduce flow rate.

## i INDICATIONS

Following are important indications for use of LP shunt.

- Communicating type of Hydrocephalus.
- Pseudo meningocele

- Post meningitic or post haemorrhagic hydrocephalus - Diagnostic procedures.
- Normal pressure hydrocephalus.

## c CONTRAINDICATIONS

This system should not be used in following conditions.

- Non communicating type of hydrocephalus.
- Presence of infections in the cerebrospinal system, meninges, skin, peritoneum or a major infection any where in the body.
- Spinal abnormalities preventing free insertion of lumbar catheter.
- Infants
- Achondroplastic patients with narrow lumbosacral canal.

## p PRESENTATION

Chhabra Lumbar-peritoneal hydrocephalus shunt is supplied sterile in blister packs. A pack contains one lumbar catheter one peritoneal catheter, one small to large connector, one 14 gauge touhey needle and two suture collars. Large and small reservoirs are available separately. Each reservoir is packed in sterile packs

## s SUGGESTED

### IMPLANTATION PROCEDURE

The procedure given here is based on the experience of different surgeons and information available in literature. The surgeon is best advised to use his own experience and discretion.

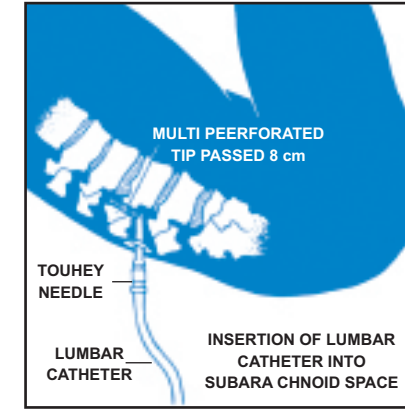
#### Pre Implantation patency check of the system:

With the help of suitable size of blunt needle, saline or distilled water is injected through proximal end of peritoneal catheter. The fluid should flow out freely from slits. Lumbar catheter may be flushed from either side. Reservoir should be flushed by the end bearing the valve.

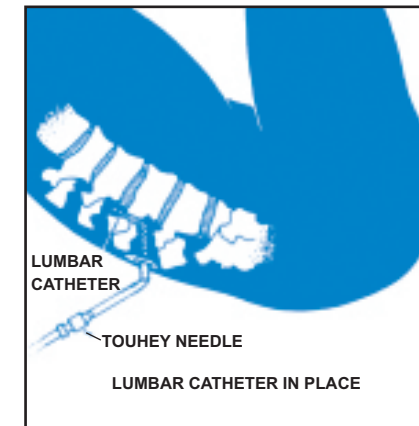
#### Procedure described below is for two piece system.

1. The patient is positioned as for lumbar puncture Part is prepared and draped. Head end should be elevated by 30° to increase pressure in lumbar subarachnoid space.
2. A small incision of 1 cm is made between spinous process L4-L5 or L5-S1.
3. Check the direction of bevel or Touhey needle. It should be pointing cephalad or caudad. Insert the needle.
4. Insert the perforated end of Lumbar catheter. Ensure at least 8 cm of catheter lies inside the subarachnoid space. It is equal to width of four fingers.

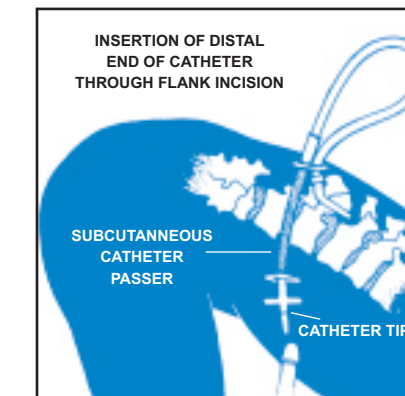
If retraction of catheter is required and resistance is being encountered, retract the needle a little, push the catheter then withdraw it.



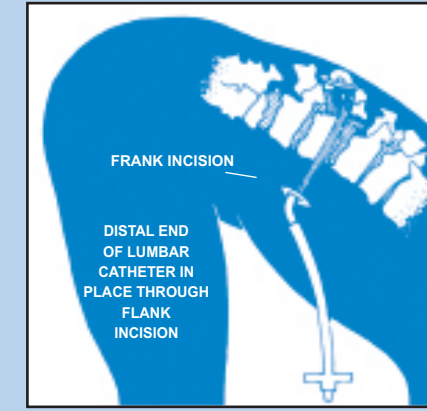
5. Withdraw the touhey needle keeping the catheter in situ. The CSF should be flowing out of the catheter slits. Tilt the table back to normal position.



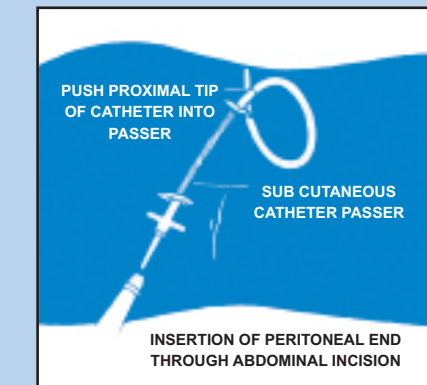
6. To anchor the catheter use smaller suture collar around lumbar catheter and suture it to the subcutaneous tissue.
7. A flank incision is given at a suitable distance. The Lumbar catheter is passed subcutaneously and end is brought out through the flank incision with the help of subcutaneous catheter passer or any other method used by the surgeon.



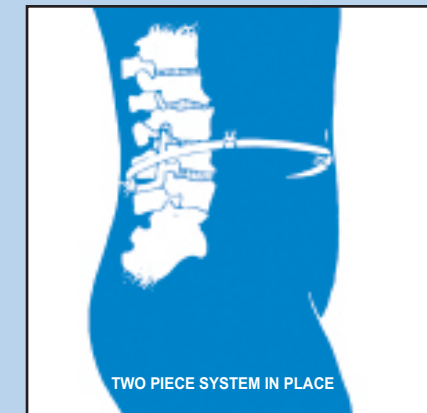
8. Make a small incision two centimeters below the umbilicus in midline through the linea alba.



9. Pass peritoneal catheter subcutaneously from midline incision to flank incision. At this point any excess length may be trimmed.



10. Join two catheters with the help of a large to small connector. Ligatures used to secure catheters on connector may be anchored to subcutaneous tissue. The ligatures should be thick enough 1-0 or 2-0 and care is exercised to avoid cutting the tubing by using excessive force.



11. The distal end of the peritoneal catheter is inserted inside the peritoneal cavity by using any method preferred by surgeon. In the figures here a trocar method is shown. Otherwise an open method may be employed.
12. Large suture collar is used to secure the peritoneal catheter in the area of midline incision. Close all incisions.

be all free from disease & sufferings

**SURGIWEAR®**  
AN ISO 13485 : 2003 COMPANY

# CHHABRA LUMBAR-PERITONEAL HYDROCEPHALUS SHUNT SYSTEM

## *i* INTRODUCTION

Chhabra LP shunt system is designed for percutaneous placement through 14 G Touhey needle. It is a better alternative for communicating hydrocephalus with several distinct advantages.

Chhabra system is available in two versions. A standard two piece model convertible into three piece model by adding a reservoir, available separately.

## *a* ADVANTAGES

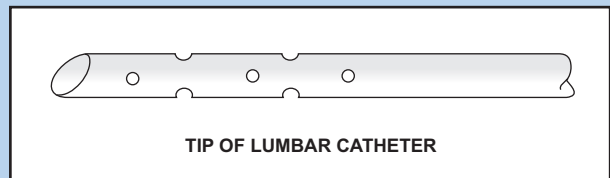
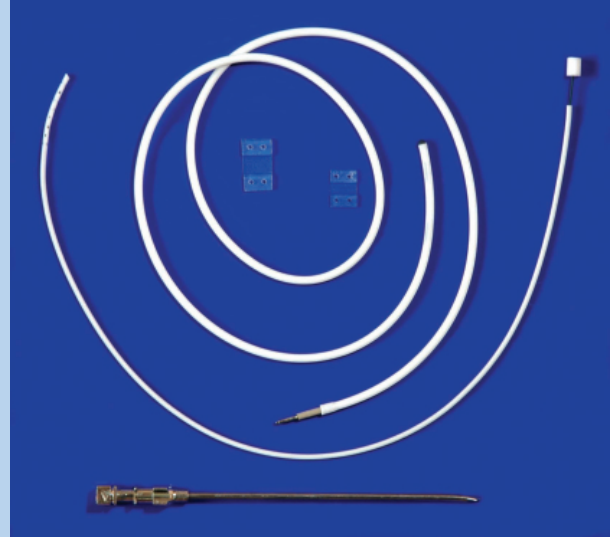
A LP system has many advantages over a VA or VP system in cases of communicating hydrocephalus .

1. Completely extracranial, therefore eliminates the need to invade further an already compromised brain and ventricular system.
2. No laminectomy is required.
3. Shorter, less traumatic procedure, most suitable for local anaesthesia.
4. Reduces post operative morbidity, shorter hospitalisation.
5. Less chances of getting proximal end blocked due to absence of choroid plexus around drainage site.
6. Low risk of skin erosion, because of implantation in softer area.
7. C.S.F. Passes through it's normal course. No risk of converting communicating type of hydrocephalus to non communicating type.
8. Chhabra system differs from other systems. It has large bore distal catheter. Thereby offers less resistance to fluid flow, Replacement of distal catheter is easier.

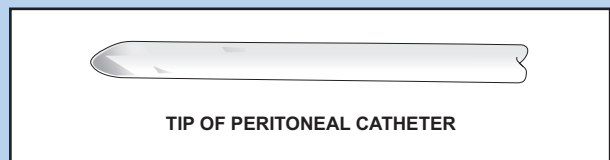
## *d* DESCRIPTION

Standard model of Chhabra LP system is a two piece system. It has a lumbar and peritoneal catheter. Both catheters are joined by a small to large connector.

Lumbar catheter is thin tube with open end and multiple perforations. It is 40 cm long kink resistant tube.



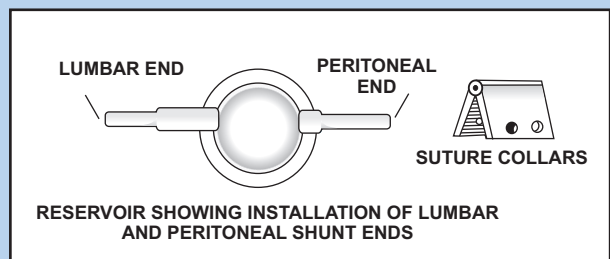
Distal catheter or peritoneal catheter is Salmon type. Obliquely cut end is the distal end and bears slits. The slits provide unidirectional flow and regulate discharge rate. All catheters are radio-opaque.



The connector supplied with the set is small to large type. Connector is fragile. It is made of special polymer based on fluorocarbon plastic. It can be autoclaved also.

There are two suture collars in the set. One is large and the other one is small. Larger collar anchors peritoneal catheter small anchors lumbar catheter. The touhey needle is 14 gauge and of special design for use with the set. No other touhey needle is recommended for use with Chhabra LP system.

In order to flush, pump or inject some thing into the shunt system, a reservoir manufactured by Surgiwear, is available. Adding a reservoir will make the system a three piece one. There are two sizes of reservoir. Small reservoir is suitable for younger and thin patients. The reservoir has a unidirectional 'slit in spring valve'. The valve end is proximal end and connected with the lumbar catheter.

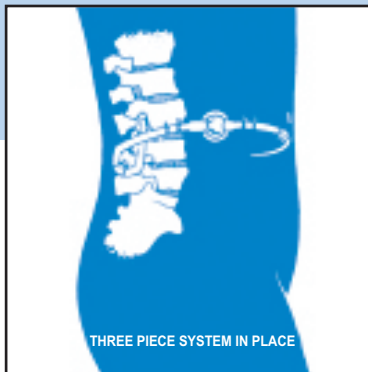


be all free from disease & sufferings

**SURGIWEAR®**  
AN ISO 13485 : 2003 COMPANY

### Use of three piece system (Standard pack + reservoir)

1. The flank incision is positioned above the iliac crest.
2. The reservoir is connected at the junction of lumbar and peritoneal catheter.



Note- Proximal end of reservoir is the one with valve. It should be connected with lumbar catheter.

3. Holes in base or reservoir are to be used to anchor the reservoir with subcutaneous tissue.

### Patency check of system.

post Implantation patency check may be done by injecting approximately 2 mCi of Technetium 99 albumin into the cervical subarachnoid space or if used into the reservoir. The flow of isotope may be traced into peritoneal cavity by using scintillation camera.

## P PRECAUTIONS

- Ligatures used to secure tubing on connector should not be too tight or very fine. This will avoid cutting of tubing.
- Direction of reservoir connections should be checked carefully.
- Always use suture collars supplied.
- No other touhey needle is to be used in place of one supplied with the pack.
- Excessive out flow of CSF through the system during implantation should be avoided as far as possible to prevent problems due to low pressure.

## C COMPLICATIONS

Following are some of the important complications caused by the use of shunt systems besides the complications of the

disease, medications, surgical procedure.

- Obstruction of shunt, common site in LP shunt is peritoneal catheter.
- Mechanical failure, defect, or separation of shunt components.
- Infection is a common and serious problem. Removal of shunt may be necessary.
- Skin erosions over the shunt system.
- Excessive lowering of intracranial pressure.
- Subcutaneous exudation of CSF along shunt pathway.
- Scoliosis, Hyperlordosis, Kyphoscoliosis perforation of bowel, unilateral uretral obstruction.

## b BIBLIOGRAPHY

Bimini. A" A Modified Technique for the Construction of a Lumbo<sup>c</sup> Peritoneal Shunt. ACTA NEUROCHIRURGICA, 28 (1973) 189-192.

Dakters. J.GDD. Yashon, T.J. Croft and R.J. White. "Cerebrospinal Fluid Diversion". ARCH. SURG. 96 (January 1968). 5657.

Eisenber, Howard M. Robin I Davidson and John Shillito "Lumboperitoneal Shunts". J. NEUROSURG. 35 (October 1971 ). 427 -431.

Greenblatt, Samuel H and Donald H. Wilson "Persistent Cerebrospinal Fluid Rhinorrhea Treated by Lumboperitoneal Shunt. J. NEUROSURG. 38 (April 1973). 524-526.

Gutterman Paul "Acute Spinal Subdural Hematoma Following Lumbar Puncture. SURG. NERUROL., 7, (June 1977). 355-356.

Kushner Jack Eben Alexander Jr. Courtland H. Davis Jr. and David Kelly. "Kyphoscoliosis Following Lumbar Subarchnoid Shunts". J.NEURSUGS., 34 (June 1971). 783-791.

Seiman W.R. Spetzler C. Wilson and J. Grollmus "Percutaneous Lumboperitoneal Shunt" Review of 130 Cases. NEUROSURG., (March 1980). 255-257

### PRODUCT INFORMATION DISCLAIMER

G. Surgiwear Limited has exercised reasonable care in the choice of materials and manufacture of this product. G. Surgiwear Limited excludes all warranties, whether expressed or implied by operation of law or otherwise, including, but not limited to any implied warranties of merchantability or fitness for a particular purpose. G. Surgiwear Limited shall not be liable for any incidental or consequential loss, damage or expense, directly or indirectly arising from use of this product. G. Surgiwear Limited neither assumes nor authorizes any other person to assume for it, any other or additional liability or responsibility in connection with this product.

European Authorised Representative

Obelis s.a.,

34, Av. De Tervuren, bte 44 BELGIUM

Tel: +32 2 732 5954 Fax: +32 2 732 6003

e-mail: mail@obelis.net

Made in India by:

**G. Surgiwear Limited**

Rasoolpur Jahanganj, Shahjahanpur-242001

Tel: +91 5842-223818 Fax: +91 5842-222190

e.mail: surgewear@hotmail.com

Delhi: 65454565, Mumbai: 66994258, Ahmedabad: 27545218

**SURGIWEAR®**  
AN ISO 13485 : 2003 COMPANY

[www.surgiwear.co.in](http://www.surgiwear.co.in)