

# A CONCISE BOOK ON SURGICAL INSTRUMENTS - PART 2



**JV'n Dr. Hemant Vyas**

**JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR**

UGC Approved Under 2(f) & 12(b) | NAAC Accredited | Recognized by Statutory Councils

Printed by :  
JAYOTI PUBLICATION DESK

Published by :  
*Women University Press*  
Jayoti Vidyapeeth Women's University, Jaipur

**Faculty of Homoeopathic Science**

**Title:** A CONCISE BOOK ON SURGICAL INSTRUMENTS - PART 2

**Author Name:** Dr. Hemant Vyas

**Published By:** Women University Press

**Publisher's Address:** Jayoti Vidyapeeth Women's University, Jaipur  
Vedant Gyan Valley,  
Village-Jharna, Mahala Jobner Link Road, NH-8  
Jaipur Ajmer Express Way,  
Jaipur-303122, Rajasthan (India)

**Printer's Detail:** Jayoti Publication Desk

**Edition Detail:**

**ISBN:** 978-93-94024-35-9

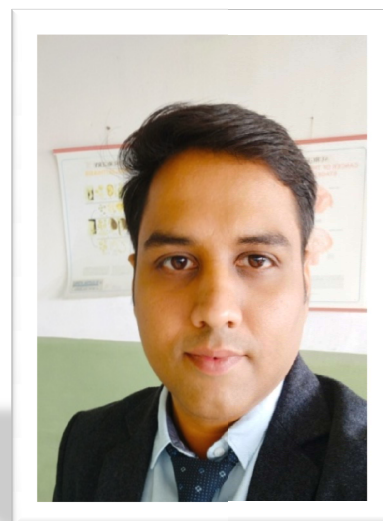
**Copyright ©** - Jayoti Vidyapeeth Women's University, Jaipur

## **INTRODUCTION OF AUTHOR:**

Dr Hemant Vyas is a MD Homoeopath. Currently he is working as Associate Prof. and Head of Department of Surgery at Faculty of Homoeopathic Science under Jayoti Vidyapeeth Women's University, Jaipur.

He has a vast clinical experience of more than 10 years and is Teaching Surgery for more than 5 years. He has written and published 3 research papers in SCOPUS indexed international Journal and 2 in UGC Care listed Journals. He is also an author of a Book – “A Concise Book on Surgical instruments Part - 1” and he has also written book chapters in many edited volumes.

He is famous among students for his thorough knowledge of the subject and his unique style of teaching.



Dr. Hemant Vyas, MD [Homoeopathy]  
[Associate Prof.], HDD (Surgery)

# Acknowledgement

This Book is Dedicated to the loving memory of my  
Grand-Mother



Late Smt. Sitabai Vyas

**Index:**

<b>Sr. No.</b>	<b>Chapter</b>	<i>Page No.</i>
<b>1</b>	<b>Classification of Surgical Instruments by Usage</b>	<i>4</i>
<b>2</b>	<b>Urinary Catheters</b>	<i>6</i>
<b>3</b>	<b>Intravenous Set and Blood Transfusion Set</b>	<i>10</i>
<b>4</b>	<b>Respiratory Tubes</b>	<i>13</i>
<b>5</b>	<b>Nasogastric and Flatus Tube</b>	<i>16</i>
<b>6</b>	<b>Other Tubes</b>	<i>18</i>
<b>7</b>	<b>Ambu Bag</b>	<i>20</i>
<b>8</b>	<b>Bibliography</b>	<i>21</i>

## CHAPTER 1:

### CLASSIFICATION OF SURGICAL INSTRUMENTS BY USAGE

Surgical instruments are designed to perform either diagnostic or therapeutic operations - to locate the cause of a problem, or to treat a problem once it has been found.

Each of the tens of thousands of surgical instruments is designed to perform a specific function.

Those functions may be generally categorized under one of the following uses:

#### **To cut or incise:**

Instruments used for this purpose are frequently referred to as “sharps”. They include scissors, knives, scalpels, chisels and osteotomes, among others.

#### **To retract:**

Hand-held and self-retaining retractors serve this purpose, as well as Instruments such as skins and bone hooks.

#### **To grasp, hold or occlude:**

These include the many types of forceps, including hemostats, dressing and tissue forceps, as well as bone holding forceps. Also included in this group are needle holders.

#### **To dilate or probe:**

These instruments are used to dilate or enlarge openings or to find an area or foreign object.

#### **To cannulate or drain:**

These instruments<sup>3/4</sup>including catheters, drains and cannulas, are generally used to drain a wound.

**To aspirate, inject or infuse:**

These instruments serve to remove unwanted fluids as well as to inject needed fluids into a patient. Among these instruments<sup>3/4</sup>syringes, some needles, trocars and cannulas.

**To suture or ligate:**

Suture or ligation is used to close or rejoin a wound or an area of operation, e.g., a vessel, a nerve or tissue. There are a variety of sutures and clips, as well as suture needles and ligating instruments.



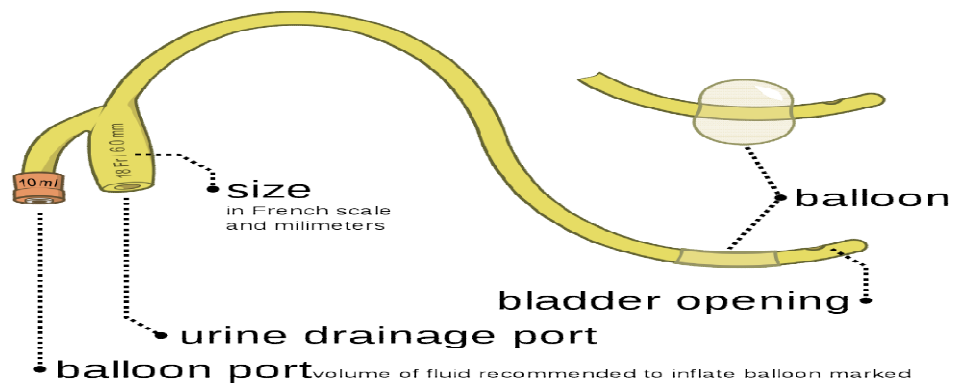
## CHAPTER 2:

### URINARY CATHETERS

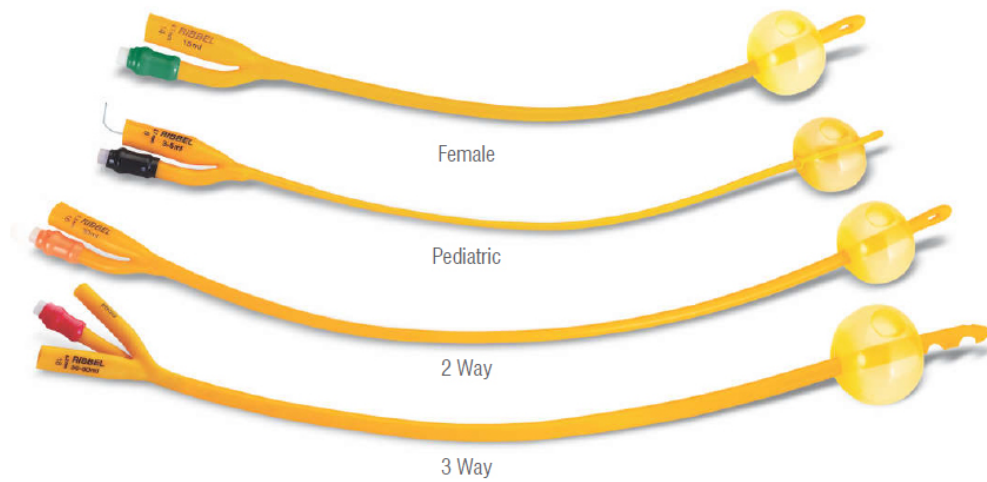
- 1) **Foley's Catheter** – It is a tube like structure which is made of Latex, Silicon and Polyurethane. Those made up of silicon are less irritating and hence more preferable. It is inserted in Urinary bladder through urethra. It consist of 2 lumens 1 for inflation of balloon and another for drainage of urine. For inflation of balloon Sterile water is used ( One should not use Normal saline in place of Sterile water as it is a crystalloid fluid and it may form crystals when it is inserted )

#### HOW TO USE:

- **Female catheterization:** The female urethra is short compared to the male urethra. It is located above the vagina in the pelvis. Insertion of the catheter is facilitated by having the patient lie down on his or her back with the buttocks at the edge of the examination table. Adequate exposure of the urethra is obtained by elevating and supporting the legs by stirrups or placing them in a frog-legged position. Finally, the labia are separated to expose the urethra.
- **Male catheterization:** The male urethra is long compared to the female urethra. A catheter is placed while lying down or in the frog-legged position. If there is a foreskin, it is retracted to its maximal limit.







2) Three Way Foley's Catheter – It has three Lumens

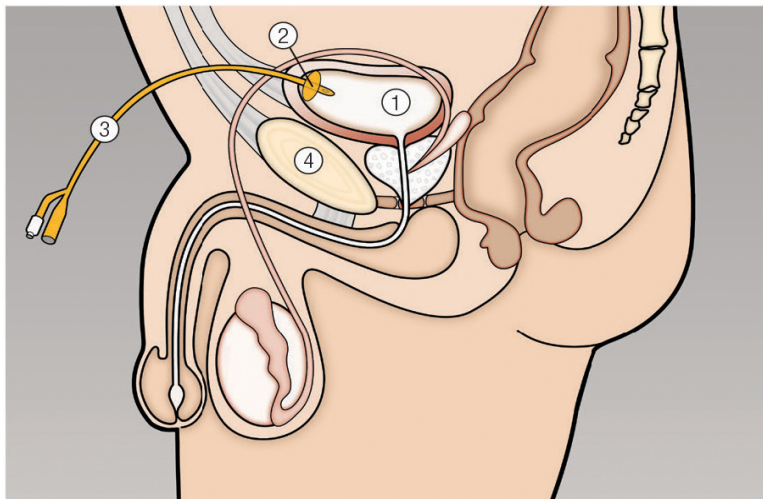
- I. For Urinary drainage
- II. To inflate the Balloon
- III. Irrigation of Bladder



- 3) Malecot Catheter – It is also called as Mushroom Catheter as it has Mushroom or flower like structure near its tip. It is used in percutaneous drainage of Nephrostomy and renal pelvis post renal or bladder injury.



- 4) Supra Pubic Catheter – It is inserted inside the bladder directly through an incision given below the umbilicus



Male Suprapubic Catheter (Bladder and Bowel Community)

- 5) K90 Catheter (Single lumen Catheter) – Use when urine drainage for single time is needed



## CHAPTER 3

### INTRAVENOUS SET AND BLOOD TRANSFUSION SET

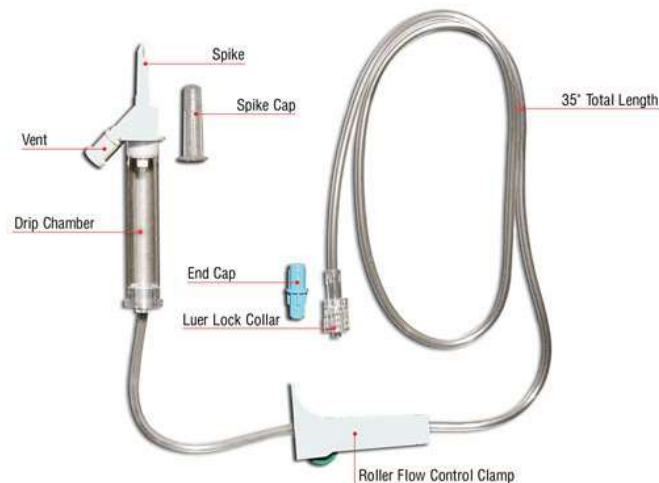
#### 1. INTRAVENOUS SET (IV SET): Used to administer intravenous fluid

Types-

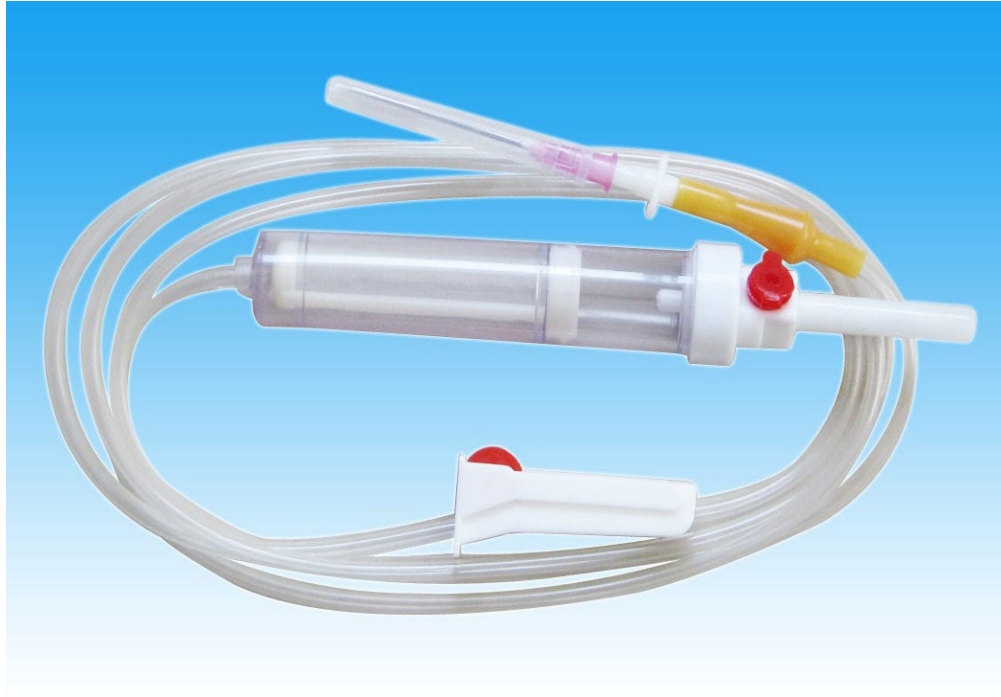
##### I. Micro Drip set – for use in Pediatric patients



##### II. Macro Drip Set – For use in adult patients



#### 2. BLOOD TRANSFUSION SET (BT SET): used for transfusion of Blood and blood products. It is somewhat similar to IV set, the difference is seen in Drip Chamber as it is provided with a filter which separates clots and clumps and restricts them from transfusion.



3. Scalp Vein Set (SV Set) Butterfly Scalp Set: It is primarily used for venepuncture. It is also known as wing infusion set. Used for short time period.



4. IV Cannula: It is used to access the vein

Size:

No. 14 – Orange Color

No. 16 – Gray Color

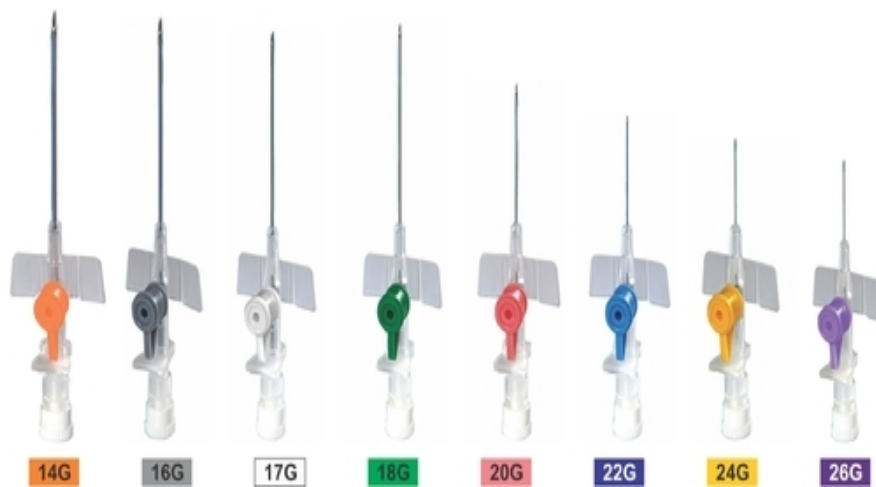
No. 18 – Green Color

No. 20 - Pink Color

No. 22 – Blue Color

No. 24 – Yellow Color

Use: for IV fluids, Blood transfusion, Intravenous Medication, Parenteral Nutrition and Chemotherapy.



## CHAPTER 4:

### RESPIRATORY TUBES

1. Tracheotomy Tubes: This tube is directly inserted in trachea by making an incision above thyroid cartilage.

This is made of polyvinyl chloride. It is a **single tube**.

Once the tube is introduced within the trachea, the cuff is inflated by using 3-5 ml of air.

The cuff prevents leakage of air and prevents **acid aspiration syndrome (Mendelson's syndrome)**.

If this tube gets blocked, it is an emergency. In such cases, the tube has to be cleaned and mucus plugs have to be removed.

Otherwise, the tube is removed, the tracheal opening is kept open with the help of tracheal dilator and a new tube is introduced.

Alternatively, endotracheal intubation may need to be done to ensure patency of the airway.

Use:

For Prolonged intubation

Used in Upper airway obstruction



Tracheostomy Tube



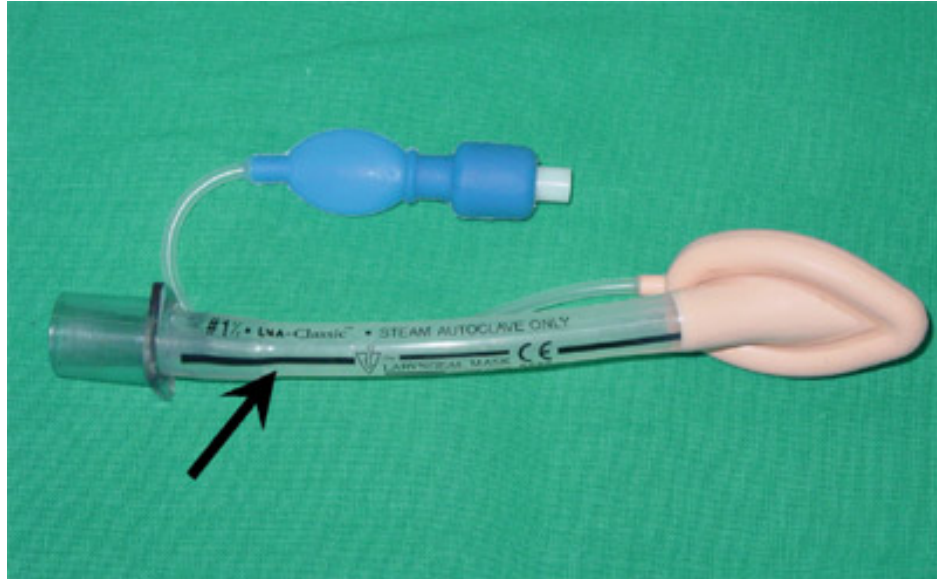
2. Endotracheal Tubes: This tube is inserted in trachea through mouth

Use: Establish and maintain a patent airway  
This tube is used for prevention of aspiration.



3. Laryngeal Mask Airway: This is a mask which is used during Emergency when Endotracheal intubation is not possible in a patient.

Use: To create a patent airway.



4. Double lumen airway tube: It is also known as combi tube.  
Use: During Emergency for Mechanical Ventilation in Respiratory distress patient.



## CHAPTER 5: NASOGASTRIC TUBE and FLATUS TUBE

1. Nasogastric Tube/ Ryles Tube: Also called as NG Tube, This tube is inserted in stomach through Nostril. It has lead balls at its tip which is provided to detect its position through X ray after insertion.
  - This is also called **Nasogastric tube**. At the end of this tube there are **lead shots**. After introducing within the stomach, its position is confirmed by pushing 5-10 ml of air and auscultating in the epigastrium or aspirating gastric juice. It is a long tube having 3 marks. When the tube is passed up to the 1st mark, it enters the stomach. Usually it is passed up to 2nd mark.
  - Ryle's tube** is Life Saving in **acute gastric dilatation**.
  - **In volvulus of the stomach, it is impossible to pass a Ryle's tube.**
  - Ryle's tube is used to decompress the stomach as in intestinal obstruction or pyloric stenosis.
  - It is used in the diagnosis of GI haemorrhage
  - It is also used to provide enteral nutrition to comatose patients or critically ill patients.



Use: In Gastric Lavage

For direct insertion of food in stomach

2. Flatus Tube- To Remove Flatulence, it is inserted through anus.

**flatus tube / rectal tube**



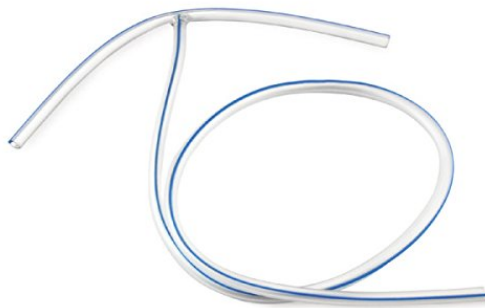
## CHAPTER 6:

### OTHER TUBES

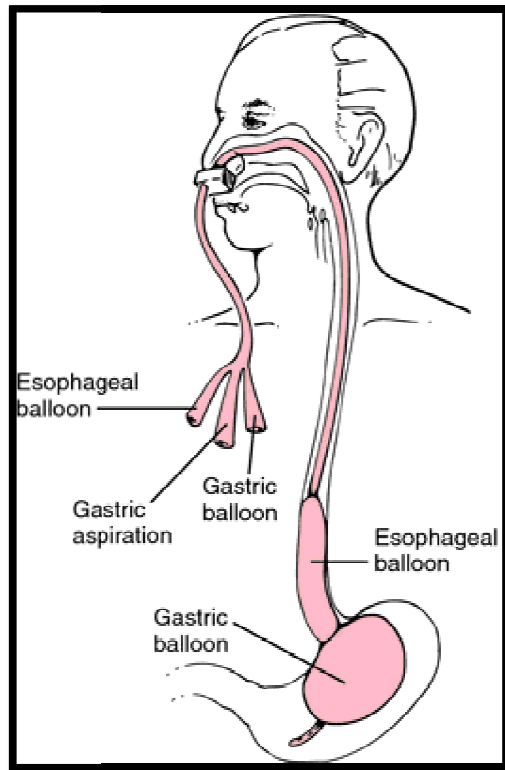
1. Gastrostomy Tube: also known as PEG Tube- Percutaneous Endoscopic Gastrostomy Tube. It is directly inserted from abdominal wall inside the stomach via an incision.
  - a. Use: for direct insertion of fluid and Medicines inside stomach.



2. T-Tube – used for drainage of bile during Cholecystectomy.



3. Sengstaken Blakemore tube: It is a three way catheter which has two balloons. One balloon stays in oesophagus and another in stomach.
  - a. Use- To prevent and stop Esophageal Variceal Bleeding



4. Suction Catheter: It is available in different color code, Used for removal of secretions like mucous and saliva



## CHAPTER 7:

### AMBU BAG (Manual Resuscitator)

A self-refilling bag-valve-mask unit with a 1–1.5 liter capacity, used for artificial respiration which, while suboptimal for the non-intubated patient, is effective for ventilating and oxygenating intubated patients, allowing both spontaneous and artificial respiration.

#### Parts:

1) Face mask 2) Bag 3) Reservoir bag 4) Tubing

#### Uses:

- For giving intermittent positive pressure ventilation.
- For mechanical ventilation.
- During resuscitation.
- During suction of trachea in meconium aspiration.
- In epiglottitis and life threatening croup.

#### DIFFERENT PARTS OF MANUAL-RESUSCITATOR





## **BIBLIOGRAPHY**

- 1. Bedside Clinics in Surgery by Makhan Lal Saha**
- 2. Manipal Manual of Surgery by K. Rajgopal Shenoy**
- 3. K Medic Surgical Instruments**



Contact Us:

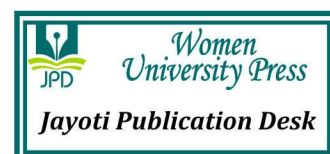
University Campus Address:

## Jayoti Vidyapeeth Women's University

Vadaant Gyan Valley, Village-Jharna, Mahala Jobner Link Road,  
Jaipur Ajmer Express Way, NH-8, Jaipur- 303122, Rajasthan (INDIA)

(Only Speed Post is Received at University Campus Address, No. any Courier Facility is available at Campus Address)

Pages : 21  
Book Price : ₹ 150/-



Year & Month of Publication-8/31/2022