
A novel equipment for measuring the urine output in paediatric patients

Sir,

Paediatric patients undergoing surgery necessitate intravenous (IV) fluid administration to compensate perioperative deficits, third-space losses and haemorrhage.^[1] One of the necessary components of perioperative monitoring for paediatric surgery

of prolonged duration is hourly urine output measurement. Urine measurement via urinary catheter can be used as an indirect marker of renal, cardiovascular and fluid status of the patient.^[2] Feeding tubes are commonly used to catheterise the bladder in infants, neonates and young children since they are cheap and widely available in multiple small sizes.

Usually, the urinary catheter is connected to 100–200 cm long polyvinyl chloride (PVC) tube which is attached to calibrated urobag of 1 L capacity through calibrated uromoter of 100 ml capacity.^[3] Since the dead space of PVC tube is more owing to its long

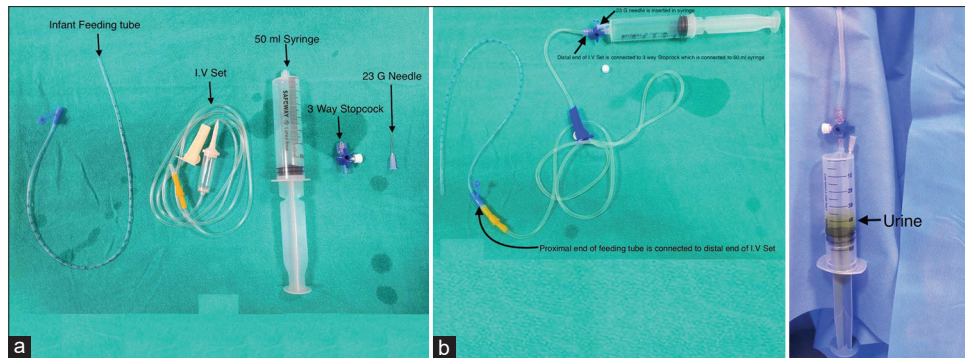


Figure 1: (a) Materials used for making equipment. (b) The equipment

length and diameter, it is difficult to measure urine output accurately as urine is commonly found to be accumulated in PVC tube. To overcome this problem, it requires frequent milking of PVC tube to facilitate the collection of urine in bag. Furthermore, the weight of the urobag can cause traumatic pull at the catheter leading to acute urethral injury.

Numerous calibrated urine-collecting bags with urometer are commercially available in the market but are expensive and not available at all places. Hence, we made new simple equipment for measuring urine output in paediatric patients, especially infants and newborns.

To make this equipment, we used one infant feeding tube (La-med Healthcare Pvt. Ltd, India), one IV infusion set (Romsons Juniors India), one three-way stopcock (La-med Healthcare Pvt. Ltd, India) and one 23G needle [Figure 1a]. Long tubing of IV infusion set can be cut to half or 3/4 length to reduce dead space and unnecessary dragging. The proximal end of the infant feeding tube is connected to the distal end of the IV infusion set. The proximal end of IV infusion set after removal of the sharp piercing spike is connected to a 50 ml syringe after retraction of the plunger through a Polymed three-way stopcock. Urine flows down from the urinary catheter into the IV infusion tube and gets collected in the syringe. A 23G needle is pierced to the syringe so that when urine enters inside, the syringe air will go out through the needle [Figure 1b]. A stopper is applied to the needle hub and partially closed so that urine cannot spill from the syringe as well as air can go outside. All connections are tightly fit which can prevent leaks. This will maintain sterility.

When syringe becomes full of urine, three-way stopcock is closed, needle hub is closed with a stopper, syringe is disconnected from three-way stopcock and then urine can be disposed.

Since there are 1 ml markings on the syringe, this equipment has the potential for very accurate measurement of small amount of urine. Other advantages are that it is simple to make, cost-effective and the dead space of IV infusion set tube is very less.

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Conflicts of interest

There are no conflicts of interest.

Shipra Tandon, Ashutosh Kaushal, Priyanka Gupta, Rudrashish Haldar¹

Department of Anaesthesia, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, ²Department of Anaesthesia, SGGIMS, Lucknow, Uttar Pradesh, India

Address for correspondence:

Dr. Ashutosh Kaushal,
Department of Anaesthesia, All India Institute of Medical Sciences,
Rishikesh - 249 201, Uttarakhand, India.
E-mail: drashutosh.kaushal@gmail.com

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