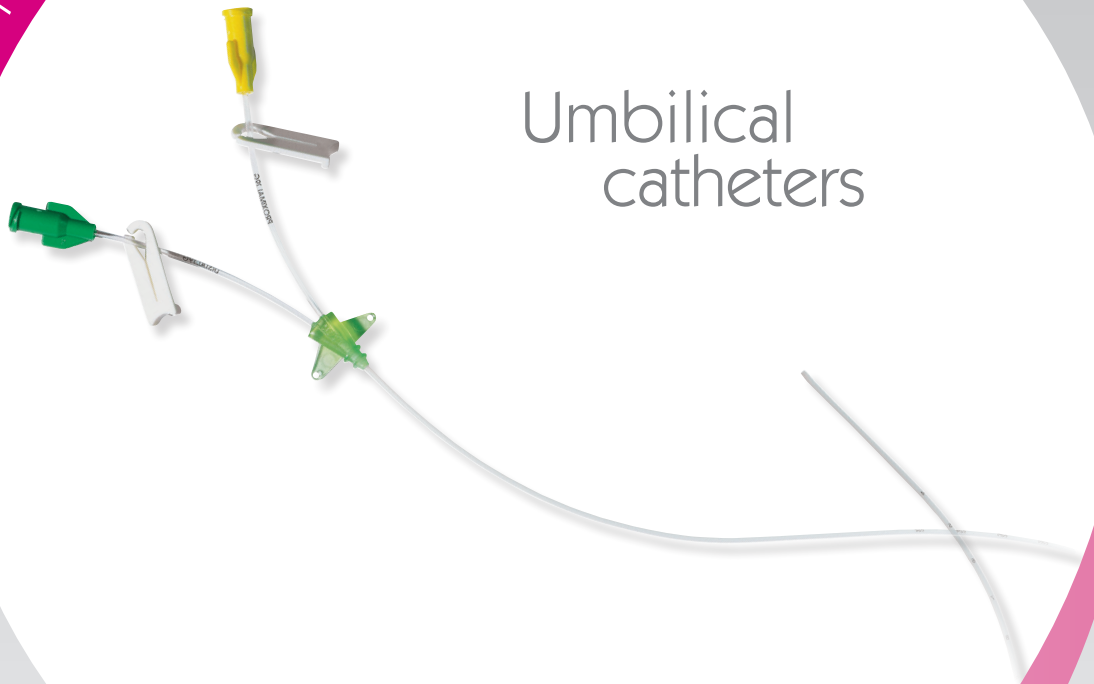




NEONATOLOGY  
Vascular access

Umbilical  
catheters



# Single-lumen umbilical catheters

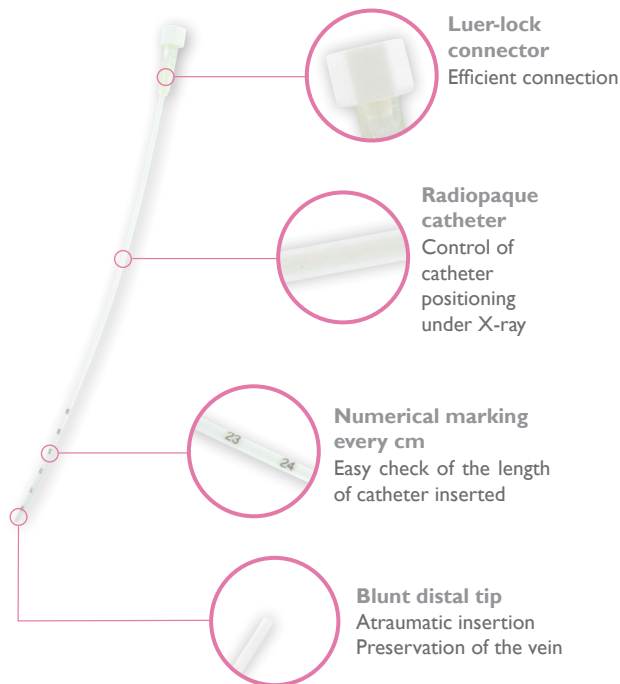
## Umbilical venous catheters are used for:

- Parenteral nutrition & fluid administration
- Drugs administration
- Venous blood sampling
- Transfusion of blood or blood products
- Exchange transfusion

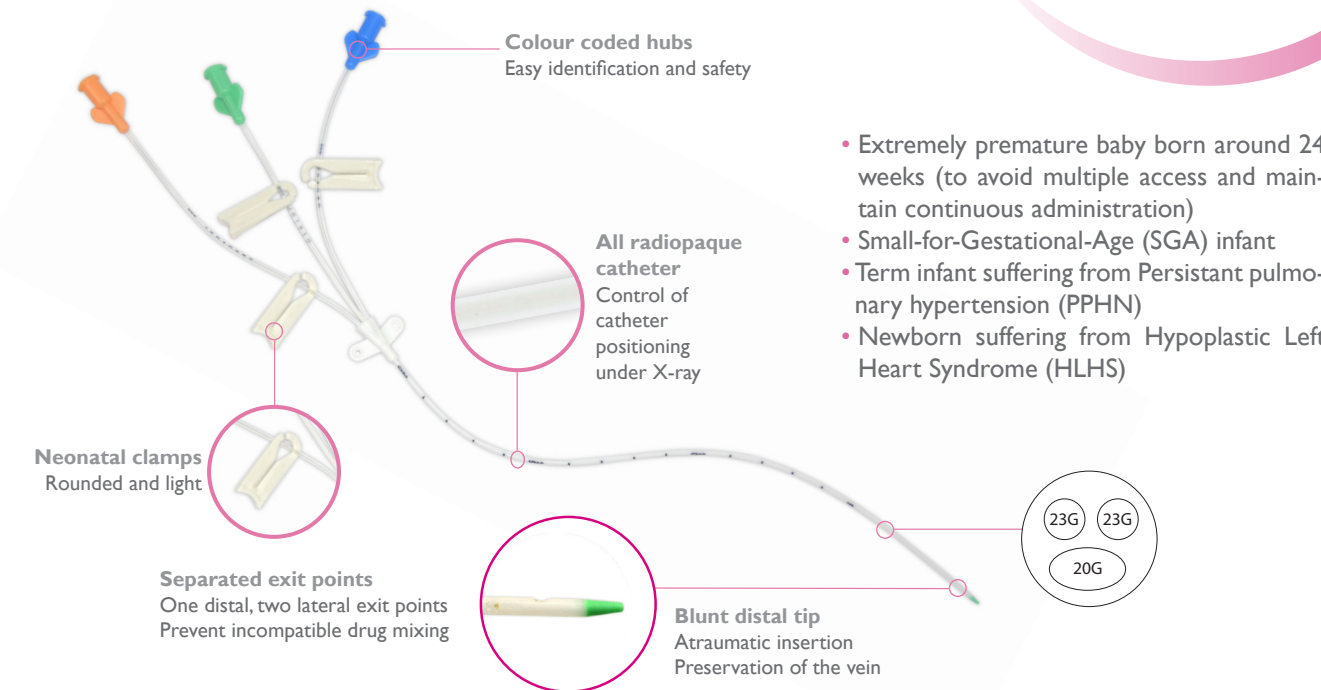
|     | Code    | Size  | Length | Flow rate    |
|-----|---------|-------|--------|--------------|
| PUR | I270.02 | 2.5Fr | 30 cm  | > 3 ml/min   |
|     | I270.03 | 3.5Fr | 40 cm  | > 10 ml/min  |
|     | I270.04 | 4Fr   | 40 cm  | > 10 ml/min  |
|     | I270.05 | 5Fr   | 40 cm  | > 23 ml/min  |
|     | I270.08 | 8Fr   | 40 cm  | > 100 ml/min |
| PVC | 270.03  | 3.5Fr | 37 cm  | > 6 ml/min   |
|     | 270.04  | 4Fr   | 37 cm  | > 16 ml/min  |
|     | 270.05  | 5Fr   | 37 cm  | > 31 ml/min  |
|     | 270.06  | 6Fr   | 37 cm  | > 52 ml/min  |
|     | 270.07  | 7Fr   | 37 cm  | > 80 ml/min  |
|     | 270.08  | 8Fr   | 37 cm  | > 106 ml/min |

## Umbilical arterial catheters are used for:

- Arterial blood sampling
- Arterial pressure measurement
- Blood pH and blood gas analysis
- Fluids and drugs administration



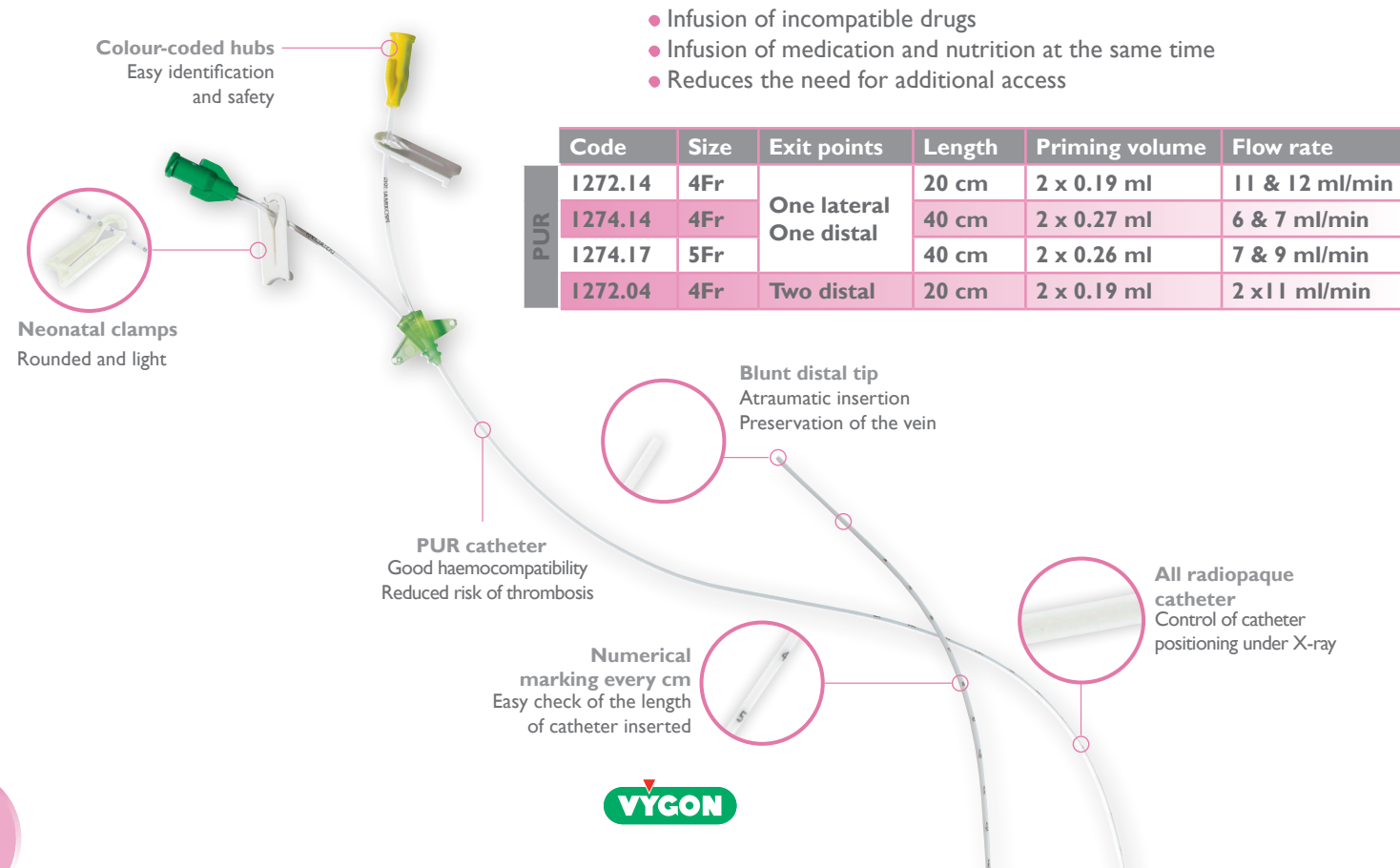
# Triple-lumen umbilical catheter



- Extremely premature baby born around 24 weeks (to avoid multiple access and maintain continuous administration)
- Small-for-Gestational-Age (SGA) infant
- Term infant suffering from Persistent pulmonary hypertension (PPHN)
- Newborn suffering from Hypoplastic Left Heart Syndrome (HLHS)

| PUR | Code      | Catheter |        |           | Distal lumen |                  |               | Medial lumen |                  |               | Proximal lumen |                  |               |
|-----|-----------|----------|--------|-----------|--------------|------------------|---------------|--------------|------------------|---------------|----------------|------------------|---------------|
|     |           | Fr       | Length | Ext. Ø mm | G            | Flow rate ml/min | Prim. vol. ml | G            | Flow rate ml/min | Prim. vol. ml | G              | Flow rate ml/min | Prim. vol. ml |
|     | V02I273I5 | 4.5      | 20     | 1.5       | 20           | 7.4              | 0.20          | 23           | 2                | 0.17          | 23             | 2.1              | 0.17          |

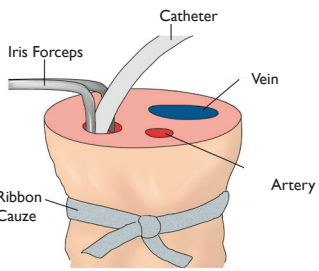
# Double-lumen umbilical catheters



|     | Code    | Size | Exit points               | Length | Priming volume | Flow rate      |
|-----|---------|------|---------------------------|--------|----------------|----------------|
| PUR | I272.14 | 4Fr  | One lateral<br>One distal | 20 cm  | 2 x 0.19 ml    | 11 & 12 ml/min |
|     | I274.14 | 4Fr  |                           | 40 cm  | 2 x 0.27 ml    | 6 & 7 ml/min   |
|     | I274.17 | 5Fr  | Two distal                | 40 cm  | 2 x 0.26 ml    | 7 & 9 ml/min   |
|     | I272.04 | 4Fr  |                           | 20 cm  | 2 x 0.19 ml    | 2 x 11 ml/min  |

# Insertion technique

1. Use strict aseptic technique, disinfect the abdominal wall and cord stump. Place a sterile drape with central opening.
2. Loosely tie an umbilical tape around the cord stump to control bleeding. Cut the umbilical cord horizontally 1 cm above the skin, remove any clots which may obstruct the vessel lumen.
3. Identify the vessels: arteries are small, thick walled spiralling vessels and vein is larger and thin walled.
4. Prime the catheter and if required dilate the vessel using iris forceps.
5. Advance the catheter using short, smooth strokes.
6. Use the cm markings on the catheter to note the length of catheter inserted.
7. Place a suture in the wall of the cord taking care not to puncture the catheter.
8. Dress the catheter according to your local policies.

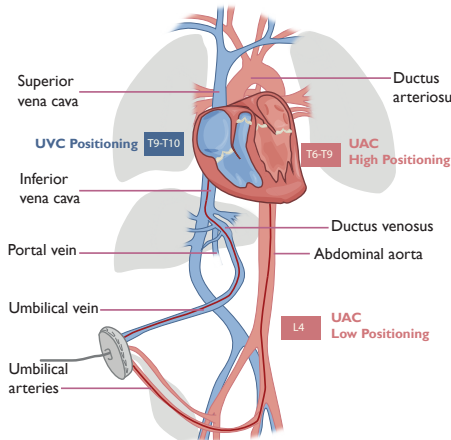


## Positioning:

Always check the location of the catheter by radiography.

**For arterial catheterization:** Umbilical arterial catheter can be sited either in the high position or the low position though the higher position is associated with lower complication rates <sup>(1,2,3)</sup>. Use of high positioning of umbilical arterial catheter is recommended <sup>(4)</sup>.

**For venous catheterization,** the catheter tip should be placed beyond the ductus venosus in the central venous system (inferior vena cava). In emergency situations, the catheter can be inserted 2-3 cm (until blood is returned) and emergency meds can be given. The catheter should not be left in this location and should be removed after giving emergency medications.



## Umbilical Placement Set

The umbilical placement set is a procedure pack containing all the necessary material to place an umbilical catheter

- **Save time and money** by reducing preparation time / Improving stock management/ Reducing waste
- **Increase safety** by reducing the risk of infection / Simplifying procedure / Traceability
- **Instruments dedicated to neonates:** Neonatal tourniquet designed to reduce skin trauma / Non adhesive drapes respectful of the fragile skin of newborns.



Code  
80199.695

- |  |                                     |  |
|--|-------------------------------------|--|
| • 18 G hypodermic safety needle                          | • 1 red gallipot 60 ml              | • Needle holder                              |
| • 20 G hypodermic safety needle                          | • Outer wrap                        | • Measuring tape                             |
| • Scalpel  | • Instructions for use              | • 1 ml syringe                               |
| • Drapes without adhesive                                | • Umbilical tape                    | • 3 ml syringe                               |
| • 40x40cm fenestrated transparent drape with "Easy-peel" | • Measuring guide                   | • 5 ml syringe                               |
| • Drape towels   | • Mosquito haemostat curved         | • Vessel dilator probe                       |
| • 1 pair of suture scissors                              | • Mosquito haemostat ,straight      | • 3.0 silk suture with curved cutting needle |
| • 10 swabs 10 x 10, 8-ply                                | • Iris forceps, "full curved"       | • Tray 20 x 15 x 4 cm                        |
| • 10 swabs 5 x 5, 8-ply                                  | • Iris forceps, half curve          | • 2 fixation strips                          |
| • 1 transparent gallipot 60 ml                           | • Iris forceps, straight            |  |
|  | • Iris forceps, straight with teeth |  |

## Bibliography

1. Sawyer, T.L. (2011) Umbilical Arterial Catheterization Accessed
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3. McCormick, P.C. Stein, B.M. (1990) Functional anatomy of the spinal cord and related structure, Journal of Neurosurgery, Vol 1, pp:469-89
4. Kaleidoscope Hunter Children's health Network, Guideline Umbilical Arterial Catheter in NICU August 2009

## OBSTETRICS NEONATOLOGY ENTERAL

For further information, please contact: [questions@vygon.com](mailto:questions@vygon.com)

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Vygon – 5, rue Adeline • 95440 ECOUEN • FRANCE  
 Reception: +33 (0)1.39.92.63.63 – Service clients France: +33 (0)1.39.92.63.81  
 Export customer service: +33 (0)1.39.92.64.15  
 Fax: +33 (0)1.39.92.64.44 • [www.vygon.com](http://www.vygon.com)

  
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