

**Table 3. Flush volumes for CVADS**

| Line type  | Age       | Blood discard volume | Suggested Flush volume for pre and post line use | Heparin dose   |
|--|-----------|----------------------|--|--|
| <b>PICC/Midlines</b><br>It is not possible to withdraw blood from a 1-2fr PICC                       | < 1 year  | 1ml                  | 0.5ml  | 10 units/ml  |
|  | 1-3 years | 2.5ml                | 0.6  | 10 units/ml  |
|  | > 3 years | 3.5ml                | 0.8  | 10 units/ml  |
| <b>Central Venous Catheters</b>  | < 1 year  | 1 ml                 | 0.5-1ml  | 10 units/ml  |
|  | 1-3 years | 2.5ml                | 1-2.5mls   | 10 units/ml  |
|  | > 3 years | 3-5ml                | 3-5 mls  | 10 units/ml  |
| <b>Hickman/Broviac</b>   | < 1 year  | 1 ml                 | As per surgeons                                  | 10 units/ml  |
|  | 1-3 years | 2 ml                 | As per surgeons                                  | 10 units/ml  |
|  | > 3 years | 3-5 ml               | As per surgeons                                  | 10 units/ml  |
| <b>Implantofix</b><br>In some cases it may be requested that blood is withdrawn from an Implantofix. | < 1 year  | N/A                  | 1ml -2.5 mls                                     | 10 units/ml  |
|  | 1-3 years | N/A                  | 1ml- 2.5mls                                      | 10 units/ml but Use 100units/ml when on discharge for patients with CF |
|  | > 3 years | N/A                  | 1ml-2.5mls                                       | 10 units/ml  |
| <b>Umbilical Venous Catheters</b>  | < 1 year  | 1ml                  | 0.5-1ml  | 10 units/ml  |
|  | 1-3 years | N/A                  | N/A  | 10 units/ml  |
|  | > 3 years | N/A                  | N/A  | 10 units/ml  |
| <b>Permcath-Vascath</b>  | < 1 year  | 1ml                  | 0.5-1ml  | See guideline  |
|  | 1-3 years | N/A                  | N/A  | See guideline  |
|  | > 3 years | N/A                  | N/A  | See guideline  |

### 3.1 Introduction to Central Venous Access Devices: Hickman®, Broviac® Catheters

The Hickman and Broviac catheters are a central venous access device commonly used in the paediatric age group especially for Haematology/Oncology patients. It is made of silicone and is approximately 90cm long. It is cut to the appropriate size for each individual child at the time of its insertion. Catheters are inserted under general anaesthesia via the subclavian, internal or external jugular vein with a subcutaneous tunnel to the anterior or lateral chest wall. The external end exits from the chest wall usually lateral to the right breast. The catheter has a short Dacron cuff on its outer surface, situated under the skin, above the point of exit from the chest. This is designed to act as a barrier to infection and to anchor the line in the subcutaneous tissue. These catheters may have single, double or triple lumens, which allows multiple, and concurrent venous access.