

# Venous access hubs significantly restrict flow through intravenous cannulae

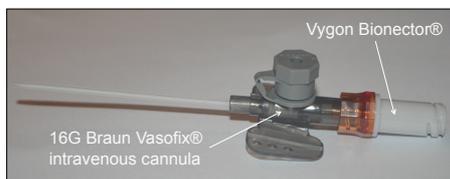
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## Introduction

In our hospital, labour ward staff may insert a 16G cannula into labouring women. We noticed that an needleless venous access hub, in our hospital, the Vygon Bionector® (Figure 1) is attached to these cannulae before intravenous infusions are commenced. We were told was in accordance with hospital policy by ward staff. We also noted the appearance of these access hubs in women transferred from the labour ward to theatre and hypothesised that they were likely to cause a significant restriction in flow of intravenous fluid.

Figure 1



## Methods

We standardised the running of 500 ml of 0.9% sodium chloride solution from a height of 1.3 m via a blood giving set through various cannula setups (Figure 2). The time taken in each case was noted. This was repeated five times per setup and a mean result taken. The resulting times were then converted into a flow rate.

Figure 2

### Setup

- A 16G cannula\* via gravity
- B 16G cannula\* pressurised to 300 mmHg
- C 16G cannula\* with access hub†
- D 16G cannula\* with access hub† pressurised to 300 mmHg
- E 18G cannula\* via gravity
- F 20G cannula\* via gravity

\*Vasofix®, Braun AG, Germany; †Bionector®, Vygon SA, France

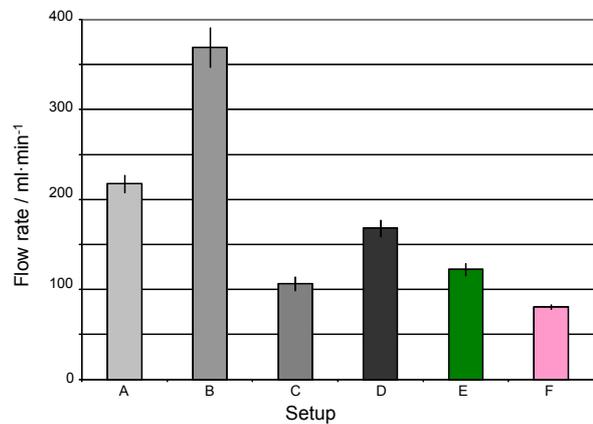
## Results

The absolute and relative flow rates are summarised in Figures 3 and 4.

Figure 3

Setup	Flow rate ± standard deviation / ml·min <sup>-1</sup>	Flow rate relative to 16G via gravity
A	217 ± 5	-
B	369 ± 11	170 %
C	106 ± 4	49 %
D	168 ± 5	77 %
E	122 ± 4	56 %
F	80 ± 1	37 %

Figure 3



## Discussion

Antenatal and post-partum haemorrhage remains one of the top causes of maternal death.<sup>1</sup> Hospital policy states that venous access hubs should be used with all intravenous cannulae due to evidence of reduced systemic infection rates, reduced needlestick injury and reduced blood spillage.<sup>2,3</sup>

The use of such hubs effectively halves the maximum possible flow in 16G cannulae and would have a greater effect on larger bore devices, a finding consistent with previous studies and the manufacturer's literature.<sup>4-6</sup> Inserting large bore cannulae, often without local anaesthesia and then in effect converting them into small bore cannulae is of dubious benefit to patients who are at risk of life threatening complications.

## Recommendations

- We recommend that access hubs should not be used in patients at risk of haemorrhage, including labouring women for whom intravenous access is required. Venous access hubs may be appropriate in certain ward areas, for example in stable patients receiving intermittent infusions or maintenance fluids.
- We also recommend that through appropriate time and job planning, clinical staff are facilitated in their engagement with quality improvement projects.
- We highlight the importance of training in leadership to medical curricula, to our professional role and to patient care.<sup>7</sup>

## References

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