

2. If yes, do you have a guideline which describes how these infusions should be prepared?

Where non-standard glucose concentrations were used and a guideline available, NICUs were asked to share this guideline for the purposes of analysis. Following receipt of the guidelines, they were categorised according to the broad method of glucose solution manufacture:

- Removal of fluid from bag prior to addition of 50% glucose, taking into account published overage.
- Removal of fluid from bag prior to addition of 50% glucose, not taking into account published overage.
- Addition of 50% glucose, without prior removal of fluid from bag.
- Mixing ratios of concentrations in a burette.
- 'Piggybacking' a 50% glucose infusion onto an infusion of 5% glucose, guided by use of an online calculator.

Results 69.2% of the 65 NICUs contacted responded (n=45). 66.7% of respondents (n=30) had guidelines in use: these 30 guidelines were subjected to analysis.

Method a) was used in 6.7% of guidelines seen (n=2); method b) was used in 60% of cases (n=18); method c) was used in 3.3% of cases (n=1); method d) was used in 6.7% of cases (n=2); method e) was used in 10% of cases (n=3). 6.7% of guidelines used a different method according to the glucose concentration required (n=2). 6.7% of guidelines advised preparation of glucose in a syringe rather than an infusion bag (n=2).

Although method b) was the most commonly used, there was wide variation in recommended volumes to be added and/or removed.

Only 6.7% of guidelines reviewed specified the brand of infusion bag to be used (n=2).

Conclusions Considerable variation was seen in the methods of glucose infusion preparation used throughout the UK, suggesting a range of opinions as to the most accurate method of manufacture. Further work is needed to determine the relative accuracy of the different methods, and the clinical significance of the variation observed.

P03 PREPARING GLUCOSE INFUSIONS IN NEONATAL INTENSIVE CARE: DOES IT MATTER WHICH METHOD IS USED?

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Aims Administering intravenous (IV) glucose is common on the Neonatal Intensive Care Unit. Bedside preparation of glucose solutions is often necessary, usually through addition of concentrated 50% glucose to a commercially available bag. Accuracy in the glucose concentration of locally prepared bags will be influenced by a number of factors: variable overages in IV fluid bags, method of preparation and imprecision of measurement during preparation. We aimed to assess the accuracy of three different methods of preparation which had been identified through a national survey.

Methods Bags of 12.5%, 15% and 25% glucose were manufactured through the addition of 50% glucose solution to commercially available bags of 10% or 20% glucose. Three bags of each concentration, were manufactured by each of the methods below:

- Removal of fluid from base bag prior to addition of 50% glucose, taking into account published overage.
- Removal of fluid from base bag prior to addition of 50% glucose, not taking into account published overage.
- Addition of 50% glucose, without prior removal of fluid from base bag.

Three 5 mL samples were then taken from each prepared bag and sent for analysis. Glucose concentration was measured using a quantitative spectrophotometric method. As a control, three 5 mL samples were taken from three bags each of commercially available 5%, 10% and 20% glucose infusion solutions and assayed as above.

Results A total of 81 'test' samples were sent for analysis along with 27 control samples. One 20% glucose control sample was lost in transport meaning that 80 samples were analysed. The median result for each concentration and method was calculated. For method a) where the intended final glucose concentration was 12.5%, 15% and 25%, the actual concentrations obtained were 11.2%, 13.3% and 22.9% respectively. For method b) where the intended final glucose concentration was 12.5%, 15% and 25%, the actual concentrations obtained were 12.4%, 13.4% and 22.0% respectively. For method c) where the intended final glucose concentration was 12.5%, 15% and 25%, the actual concentrations obtained were 12.1%, 13.8% and 20.3% respectively. For the 5%, 10% and 20% control solutions the median reported glucose concentrations were 5.1%, 10.3% and 19.9% respectively.

Conclusions Irrespective of method used and the intended strength, the measured glucose concentration was lower than that being aimed for. In some cases, the glucose concentration was only 80% of that intended. It is not possible to conclude that one method is superior in terms of accuracy. Although it might be possible from our results to suggest the most accurate method for each concentration, this is unlikely to be predictable as manufacturers quote overages as a range rather than an absolute value. In clinical practice, preparation of a glucose solution with a lower concentration than that expected may result in prolonged hypoglycaemia with potential neurological sequelae. An alternative to bedside manufacture of glucose infusion solutions is needed. This could include pharmacy compounding of glucose strengths not commercially available or 'piggy-backing' of 50% glucose onto an infusion of a commercially available strength, ideally supported by a glucose load calculator.

P04 BARRIERS AND FACILITATORS TO MEDICINES ADHERENCE IN CHILDREN: A SYSTEMATIC REVIEW

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Aim Improving adherence to medicines in children with chronic conditions may lead to significant economic and health benefits.¹ To improve adherence, the multifactorial causes of poor adherence should be understood.¹ A systematic review for barriers and facilitators to medicines adherence in children was conducted seven years ago.² We updated this to identify barriers and facilitators to medicines adherence in children reported in the last ten years.

Method A systematic literature search was performed using PubMed, EMBASE, Medline, CINAHL, IPA and Cochrane library databases covering the period November 2008 to