

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Notes from stakeholder workshop discussion- intravenous fluids therapy in children.

These following questions formed part of the discussion of the breakout groups at the stakeholder workshop.

-Does the proposed GDG composition look appropriate?

Group 1	Group 2	Group 3
The group suggested including three nurses from subspecialties including surgery, PICU and A&E.	The group suggested changing paediatric intensive care staff to paediatric intensivist but would not want to exclude a consultant nurse so perhaps 'paediatric care specialists.'	The group suggested adding a neonatologist to the group.
The group felt that representation on the GDG should come from specialist and non-specialist centres.	The group suggested a traumatologist, but then agreed that this was already included.	The group recommended ensuring that there was representation from a secondary hospital.
The group agreed that the GDG should include a neonatologist.		

The group felt that the clinical pathologist could be a co-optee to attend the GDG for relevant questions.		
The group did not feel that primary care representation was needed.		

- Should the guideline include other population groups or are there any currently listed that could be excluded?

Group 1	Group 2	Group 3
The group felt that children with AKI were not a priority for inclusion, as these children were likely to be cared for in specialist settings.	The group discussed the inclusion of under 4 weeks post-term and came to the conclusion that it is too big and complex an area to include, as it would take away from other areas, however they did hope that there would be a guideline that covered this population.	The group felt that there was inconsistency between inclusion and exclusion population subgroups, as, for example, patients with sepsis often require inotropes, or go on to develop organ failure.
The group felt that the inclusion of children who have undergone trauma and the exclusion of those with brain injury	The group suggested exclusion of children with CKD 1-3 as it is about who is managing them, and they would all	The group suggested giving special consideration to those at high risk of hyponatraemia or

was contradictory as the majority of children seen who have undergone trauma would have a brain injury.	be managed by a paediatric nephrologist.	hypoglycaemia.
The group felt that otherwise, the list of populations seemed appropriate.		The group agreed that neonate babies are an at risk population and there is a lot of uncertainty regarding appropriate fluid replacement so therefore they should be included. A large proportion of babies who need i.v. fluids are neonates who are discharged and return to hospital with bronchiolitis.

- Should the guideline include the use of intravenous fluids in neonates and pre-term babies?

Group 1	Group 2	Group 3
The group felt that there were likely to be some babies who would require different management strategies	No (as above). The group discussed the inclusion of under 4 weeks post-term and came to the conclusion	The group felt that it was appropriate to exclude preterm babies, and very young neonates in their first

<p>and that this group should be excluded. However, it was felt that the current cut-off of 4 weeks was too high and that it was likely that babies in the first 48 hours of life would need different management and should be excluded.</p>	<p>that it is too big and complex an area to include, as it would take away from other areas, however they did hope that there would be a guideline that covered this population</p>	<p>few days of life. However, neonates of 2-3 weeks are often managed in the same way as infants, and are an important group for consideration.</p>
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- Should the guideline include community settings, or is it appropriate to focus on hospital settings?

Group 1	Group 2	Group 3
<p>The group did not feel that IV fluids were given frequently in community settings (other than TPN and end of life care) and therefore it wasn't appropriate to include community settings.</p>	<p>The group felt that it should be hospital only. If they have IV fluids then it will be in the hospital. The only time they could think of that would be outwith a hospital is at end of life, which was assumed would be covered by the quality standard for end of life care.</p>	<p>The group considered that only a very small percentage of IV fluids were given in the community, and so it was appropriate to focus on hospital settings.</p>

- Is the list of fluids comparisons appropriate or are there any which we need to add/remove?

Group 1	Group 2	Group 3
<p>The group felt that saline 0.45% and saline 3% should be considered but otherwise the fluids seemed appropriate.</p>	<p>Starches have had their license suspended and the decision is pending the EMA decision, which will probably be (the end of) next year. The group decided not to take it out as it is pre-empting legislation but it is something to keep in mind.</p>	<p>The group mentioned that starches have recently been taken off the market.</p> <p>The group felt we should exclude sucrose fluids based on the decision of the European Medicines Agency and Medicines and Healthcare Products Regulatory Agency to suspend its use due an increased risk of renal dysfunction and mortality in critically ill or septic patients who received hydroxyethyl starch (HES) compared with crystalloids (simple salt solutions). The UK Commission on Human Medicines (CHM) has concluded that the benefits no longer outweigh the risks.</p>
	<p>The group thought it best to take out starches vs crystalloids and as this is covered by synthetic colloid vs crystalloids; also</p>	
	<p>The group thought it best to take out gelatin or starch vs physiological solution or 0.9% NaCl - as gelatin is covered by synthetic colloid and the physiological solution is covered by crystalloids</p>	
	<p>The group thought glucose should be taken out in resuscitation as it is not used in</p>	

	resuscitation	
	Add solutions with glucose vs solutions without glucose and hypotonic fluids (half normal saline with glucose) for maintenance.	The group felt that considering the dextrose content of fluids was important.
	The group were unclear of the meaning of bolus resuscitation vs infusion. Was it for children with gastroenteritis and replacing over 48 hours - assumed to do with deficit of fluids or is it regarding the bolus challenge - push with a syringe or an infusion device?	One group mentioned that there is a large RCT currently underway in Melbourne comparing different concentrations of dextrose. It will be a useful study to include if the timing of its publication corresponds with the guideline.

- Would the development of a standardised fluid balance chart to aid safer prescribing and improved fluid balance recording be a useful part of this guideline?

Group 1	Group 2	Group 3
The group felt that standardisation of these charts would be useful as there is currently significant duplication in	The group felt that as most of the people prescribing are trainees, and fairly junior the charts would help	The group felt that developing a standard template would be a useful exercise, but that standardising all charts

workload as these are being developed across the UK.	rational prescribing. They thought that a standard NHS chart would be useful.	was a step too far.
The group identified that using a standardised chart would be helpful for trainees who may move between trusts regularly.		The group felt that identifying a list of key elements that should be included on a balance chart would be a helpful alternative.

- Would the development of an algorithm summarising IV fluid therapy management be a useful tool?

Group 1	Group 2	Group 3
The group felt that algorithms work well and help to improve safety and that this would be a useful thing to include in the guideline.	The group thought that algorithms would be a useful tool as they thought it was practical for on the ground delivery. They further thought that having a standardised chart and algorithm married together will ensure everyone is working the same way.	The group agreed that an algorithm would be a very useful output, and would be likely to see high use as a reference tool.

- What are the top three safety priorities in the prescription and administration of intravenous fluids in children and young people?

Group 1	Group 2	Group 3
<p>The group felt that the administration of the wrong amounts of fluids and the wrong fluid combinations was an important safety priority. The group notes that making up fluids manually increases the risk of mistakes and infection.</p>	<p>The group felt that assessment, calculation and reassessment (one issue) were important.</p>	<p>The group felt that priorities were: standardisation of practice; fluid balance monitoring; knowledge of fluid composition and prescribing.</p>
	<p>The group mentioned administration of fluids, and are we going to look at pumps?</p>	<p>The group agreed that the operating system of setting up and dispensing i.v. fluids is an area where mistakes are made. They agreed that identifying the common mistakes and including these in the training material would greatly reduce the risk of adverse events.</p>
	<p>The group said that the adult guideline found that there is too much fluid being administered, and questioned whether this was the same for the paediatric population. One member of the group said that figures show that 1/3 is prescribed above what is required when looking at sales</p>	

	<p>and the population. The group highlighted that assessment of how much fluid is given per weight or size of child needs to be taken into consideration and individualised therapy is required. Paediatric patients are individualised all the time and therefore getting the correct weight is important as children are prescribed on this whereas adults a lot more is guessed.</p>	
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- Where evidence is unavailable in children and young people, are there questions for which it may be appropriate to extrapolate from adult data?

Group 1	Group 2	Group 3
<p>The group felt that this would need to be considered on a question by question basis, as it was likely that there were some areas for which it would be appropriate to extrapolate for adult data but others where</p>	<p>The group felt that there was no paediatric data, so it is totally dependent on how much you can extrapolate. However given that children's physiology is so different extrapolation will be very difficult.</p>	<p>The group felt that it would be appropriate to extrapolate in many areas, but not all, such as fluid volumes and dextrose requirements. This would have to be considered on a question by question</p>

this would be inappropriate.		basis.
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- What issues relating to training would it be useful for the guideline cover, taking into account patient safety?

Group 1	Group 2	Group 3
The group felt that it was important that training in this area was mandatory as there were long standing problems for healthcare professionals in the use of intravenous fluids, as highlighted by variation in practice.	The group felt that the issues for training were the same as in adults. Need improved training on the composition of fluids and what effect it has on patient.	The group felt that there was a need for improved training, to cover administration of fluids as well as prescribing.
The group felt that it was important for all healthcare professionals, including doctors and nurses, to have access to national frameworks and training tools and that these should include monitoring as well as prescribing.	The group mentioned that the use of a fluid lead was recommended in the adults guideline, and this can lead to a standard of what is appropriate through induction of core topics.	The group felt that more harm could be avoided by improving the safety of available systems and the opportunities for error, in addition to providing training.

- Are there any patient information needs specifically relating to IV fluid therapy in children that need to be included?

Group 1	Group 2	Group 3
<p>The group felt that there were no specific patient/carer information needs for the administration of intravenous fluids, particularly if community care is not included in the guideline. The group felt that the information needed for parents/carers and children would be specific to the clinical condition and therefore, be individualised.</p>	<p>The group thought that they could get a pamphlet for adults but could not think what it would say other than 'your child needs fluid' and they questioned whether this was really needed.</p>	<p>The group felt that there were no specific needs that could not be covered by the generic patient experience guidance.</p>
<p>The group felt that general communication styles were more important for parents and children who are being given intravenous fluids and that this was covered in the NICE guideline on patient experience.</p>		

- What is current practice in relation to the use of body weight versus surface area calculations in determining an individual's IV fluid requirements? Is this an area where there is huge variation in clinical practice? Are there specific subgroups which would determine using one method over another?

Group 1	Group 2	Group 3
<p>The group felt that the use of surface area calculations was more accurate, particularly for those children and young people with a high BMI, for whom the use of weight to calculate fluid requirements can result in fluid overload. The group agreed that this was therefore important from a patient safety perspective.</p>	<p>The group agreed that everyone uses body weight and they doubted any variation in practice. They did think that although it is not used, it may be useful to use body surface area. The group noted that calculation to use on the weight is most important.</p> <p>Acute renal failure patients require fluid worked out to the minute amount for insensible fluid losses.</p>	<p>The group felt that this was an area of uncertainty. They considered that there might not be evidence available to make a recommendation, but that a research recommendation could be made.</p> <p>The group agreed that body weight is mostly used. It has historically been the measurement used and is still is today. One clinician said body surface area is sometimes used but the group felt that it was not an area worth focusing on and we should have a research recommendation on this instead of doing a formal review. Another</p>

		SH felt that body surface area may be more relevant for overweight patients
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- Are there any specific equalities considerations that the guideline needs to take into account?

Group 1	Group 2	Group 3
The group felt that the discussions relating to the use of surface area for children with a high BMI and neonates reflected the main equalities considerations.	The group felt that there were no further issues than what is in the scope and mentioned fasting but noted that children are exempt from starvation (e.g for Ramadan). They did not think that there were any equalities issues that encroached on practice.	The group did note that there may be some equalities considerations in relation to children who observed fasting and Jehovah's witness and the use of albumin. However, the group felt that this situation was different to adults, as where there is a clinical need for a fluid, the healthcare professional can undergo steps legally to ensure that this fluid is given.
The group did note that there may be some equalities considerations in relation to children who		The group felt that we should remove the strata of different religious groups who may not wish certain

<p>observed fasting and Jehovah's witness and the use of albumin. However, the group felt that this situation was different to adults, as where there is a clinical need for a fluid, the healthcare professional can undergo steps legally to ensure that this fluid is given.</p>		<p>fluids be prescribed. The group felt this approach may discriminate against some groups if we look at some and not all. It was felt that clinicians deal with these concerns already by discussing the treatment options with the parents and if needs be they will enforce certain treatments to ensure the best outcome for the patient.</p>
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