

NEWS

Patients are at risk because doctors don't know how much IV fluid they need, NICE says

Ingrid Torjesen

London

Doctors need better education on the safe administration of intravenous fluids and electrolytes, because failure to administer them properly causes complications in a fifth of patients who receive them, says new UK national guidance.

Every year tens of thousands of patients are believed to develop complications, some of which are fatal, because they receive the wrong type of IV fluid, too little fluid, or too much fluid, usually because the fluid is given for longer than is necessary. So today the UK National Institute for Health and Care Excellence has published a guideline, *Intravenous Fluid Therapy in Adults in Hospital*,¹ that describes how to assess whether a patient needs IV therapy, what fluids should be given, and for how long.

Mike Stroud, chairman of the guideline development group, told a press briefing on Monday 9 December that the guideline may be the most important one that NICE has ever produced, because, after oxygen, IV fluids are given more frequently than any other acute therapy.

Stroud, a consultant in gastroenterology and general (internal) medicine at Southampton University Hospitals NHS Trust, said that doctors' lack of knowledge about IV fluids was "astonishing." Surveys had shown that nine in 10 doctors didn't know how much water, sodium, and potassium a patient needed over 24 hours, he said.

The guideline urges hospitals to establish systems to ensure that all healthcare professionals involved in prescribing and delivering IV fluids are properly trained and regularly assessed. It says that hospitals should also appoint an IV fluid lead who is responsible for training, clinical governance, and audit and review of IV fluid prescribing and patient outcomes.

Jerry Nolan, a consultant in anaesthesia and intensive care medicine at the Royal United Hospital Bath NHS Trust and a member of the guideline development group, said that NICE would be talking to Health Education England about making education in IV fluids part of mandatory training.

The guideline describes the "five Rs" or essential principles that need to be remembered during fluid management: resuscitation, routine maintenance, replacement, redistribution, and reassessment. It provides four protocols to aid this: assessment, fluid resuscitation, routine maintenance, and replacement and redistribution.

It says that patients should have an IV fluid management plan, which should include details of their fluid and electrolyte prescription over the next 24 hours as part of an ongoing

reassessment and monitoring plan. All patients receiving IV fluids need regular monitoring, initially including at least daily reassessment of clinical fluid status, laboratory values (urea, creatinine, and electrolytes), and fluid balance charts, along with weight measurement twice weekly.

As far back as 1999 the National Confidential Enquiry into Perioperative Deaths identified a significant number of patients who experienced complications as a result of inappropriate use of IV fluids.² Asked why the issue had not been dealt with until now, Stroud said that it had fallen through a gap because IV fluids did not belong in any particular specialty and because NICE did not have its clinical guideline programme at that time.

He explained, "You've got the situation where fluid physiology is taught fairly well, and in gastroenterology the fluid losses are taught, and in cardiology too much fluid being bad for the heart is taught. But no one had the responsibility for taking everything and integrating it into a curriculum of IV fluid prescribing, despite the fact that of all the prescribing done, it is the most widespread for most doctors. It is an astonishing circumstance."

Stroud said that too little fluid could cause kidney failure but that fluid overload was a more common problem, often requiring patients to stay in hospital longer than necessary. Ultimately too much fluid can cause skin breakdown, leading to pressure ulcers and problems with wounds, and can result in "soggy lungs," prompting pneumonia or heart failure.

Nolan said that there had been a tendency to use colloid based fluids (starch, gelatin, or albumin) rather than crystalloids (saline) because larger molecules in colloids were believed to stay in the blood longer and so would be more efficient at increasing blood pressure and at improving blood flow to vital organs. However, the NICE guidance recommends crystalloids.

Earlier this year the Medicines and Healthcare Products Regulatory Agency suspended the licences for hydroxyethyl starch products after studies showed a small increased risk of kidney failure and death. Nolan estimated that until that point a third of IV products used in the UK were based on hydroxyethyl starch. Meanwhile, he added, the UK remained one of the biggest users of IV fluids containing gelatin in the developed world, despite there being little evidence of increased benefit and the fact that they cost more than crystalloids.³

Stroud said that he expected use of colloid based fluids, and in particular those containing gelatin, to "diminish very rapidly" but that they would still have a place in specialised use in

intensive care and anaesthetics, which the NICE guideline does not cover.

bmj.com Research: Hydroxyethyl starch 130/0.38-0.45 versus crystalloid or albumin in patients with sepsis: systematic review with meta-analysis and trial sequential analysis (*BMJ* 2013;346:f839, doi:10.1136/bmj.f839)

- 1 National Institute for Health and Care Excellence. Intravenous fluid therapy in adults in hospital. Dec 2013. www.nice.org.uk/CG174.
- 2 Callum KC, Gray AJG, Hoile RW, Ingram GS, Martin IC, Sherry KM, et al. Extremes of age: the 1999 report of the National Confidential Enquiry into Perioperative Deaths. 17 Nov 1999. www.ncepod.org.uk/pdf/1999/99full.pdf.
- 3 Wise J. NHS should ban use of starch based intravenous fluids, say researchers. *BMJ* 2013;346:f1323.

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