



Patient Safety Alert

Risk of death or severe harm from inadvertent intravenous administration of solid organ perfusion fluids

17 April 2018

Alert reference number: NHS/PSA/W/2018/002

Warning Alert

This alert relates to perfusion fluids that are mainly used in solid organ transplantation to perfuse and preserve organs (see notes on page 2). These perfusion fluids are not intended for intravenous administration. If they are, the high potassium content of some of these fluids can cause cardiac arrest.

Review of incidents reported to the National Reporting and Learning System (NRLS) identified an incident where a patient was inadvertently intravenously administered an organ perfusion fluid. The incident report reads:

"Patient undergoing live donor kidney transplant ... 500mls of [perfusion fluid] were infused into the patient via the kidney by the surgical team. The solution was mistakenly assumed to be saline. The [perfusion fluid] contains 80mmol potassium per 1000mls. The patient was therefore given a rapid bolus of 40mmol potassium ... the patient became asystolic and ALS [advanced life support] immediately commenced for cardiac arrest. Spontaneous output returned after two rounds of CPR [cardiopulmonary resuscitation]."

A search of the NRLS over a recent three-year period identified a further incident where perfusion fluid was administered intravenously to a patient undergoing surgical repair of an abdominal aortic aneurysm, causing severe bradycardia that needed emergency intervention. Two more no harm incidents appeared to result from perfusion fluid being placed in theatre and in ward storage areas used for other types of fluids.

Organs are retrieved from deceased donors and then packaged by the National Organ Retrieval Services (NORS)¹, part of NHS Blood and Transplant; while those from live donors are collected by specialist surgical teams in transplant centres.

Hospitals should only stock perfusion fluids where their use has been approved for transplantation surgery or surgical repair of kidneys, or where off-licence use has been approved in major/highly specialist cardiac or vascular surgery centres. Some centres take extra precautions in storing and using these fluids: keeping them in a locked cupboard, keeping a register of use, and ensuring double-checking before administration.

All other hospitals do not need to keep perfusion fluids. NORS will bring perfusion fluids with them to retrieve donor organs at these sites.

To reduce the risk of bags being inadvertently left behind, NHS Improvement will work with NORS to ensure the number of perfusion fluid bags supplied, used and removed is documented. NHS Improvement will also work with the Medicines and Healthcare products Regulatory Agency (MHRA) and product suppliers to encourage changes to packaging to minimise confusion between perfusion fluids and fluids intended for intravenous administration.

Actions

Who: All organisations providing NHS funded-care where organs may be retrieved for transplantation and/or where organ transplantation is undertaken.

When: To start immediately and be completed no later than 31 May 2018.

- 1** Bring this alert to the attention of all those with a leadership role in surgery, operating theatres, intensive care and pharmacy.
- 2** Check which solid organ perfusion fluids have been approved for use in your organisation and for what indication.
- 3** Consider if immediate action needs to be taken locally, and ensure that an action plan is underway, to reduce the risk of confusion between solid organ perfusion fluids and other fluids:
 - (a) in hospitals with transplant units (or major/highly specialist cardiac/vascular surgery units where appropriate): ensure review of storage of solid organ perfusion fluids to reduce the risk of confusion with other fluids for administration to patients
 - (b) in all other hospitals: remove all solid organ perfusion fluids from clinical areas and dispose of them.
- 4** Communicate the key messages in this alert, and your organisation's plan for managing those risks, to all relevant medical, nursing, pharmacy and theatre staff.

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Technical notes

Patient safety incident reporting

The NRLS was searched for incidents occurring since 1 January 2014 if reported by 5 March 2018 and containing the keyword phrases ['perfusion fluid' OR 'Soltran' OR 'Viaspan' OR 'custodial' OR 'perfadex' OR 'Belzer' OR 'university of Wisconsin' OR 'histadine' OR 'pneumoplaegia' OR 'cardioplegia']. All incidents were reviewed and the four incidents described in this alert were identified.

The review also identified a related incident that described water for irrigation being used to perfuse an organ instead of perfusion fluid, resulting in the organ being unusable.

Notes

- Soltran® is also licensed for use in the in vivo perfusion of the human kidney before its surgical repair.
- Perfusion fluids are licensed in the UK as medicinal products or medical devices for the preservation of human organs during transplant procedures. We are however aware that some of these products may be used off-licence in major/highly specialist cardiac and vascular surgery centres during non-transplant surgery.

References

1. National Organ Retrieval Services web page <https://www.odt.nhs.uk/retrieval/national-organ-retrieval-services/>

Stakeholder engagement

- National Organ Retrieval Service, NHS Blood and Transplant
- National Patient Safety Response Advisory Panel (for a list of members and organisations represented on the panel, see improvement.nhs.uk/resources/patient-safety-alerts/)

Advice for Central Alerting System officers and risk managers

This alert needs co-ordinated implementation rather than separate action by individual teams or departments. If you are unsure who will co-ordinate implementation of this alert, seek initial advice from a specialist nurse for organ donation, a theatre manager or an intensive care consultant who will be able to identify the key individuals needed to lead and co-ordinate implementation. All references to perfusion fluids in this alert relate to solid organ perfusion fluids. These are different from the fluids involved in renal dialysis, so the alert is not relevant to those services.

Sharing resources and examples of work

If there are any resources or examples of work developed in relation to this alert you think would be useful to others, please share them with us by emailing patientsafety.enquiries@nhs.net