

Safe enteral and parenteral administration

Nutrisafe® 2 is a complete enteral feeding system designed to prevent wrong route errors with enteral nutrition.



- ✓ Complies with the NPSA⁽¹⁾ safety requirements.
- ✓ Unique design not compatible with luer systems.
- ✓ The only complete system.



Nutrisafe® 2 - The future of safe enteral access



1. National Patient Safety Agency March 2007 Patient Safety Alert 19: Promoting safer measurement and administration of liquid medicines via oral and other enteral routes.

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Safe enteral and parenteral administration

In March 2007 the National Patient Safety Agency (NPSA) issued Patient Safety Alert 19 promoting safer measurement and administration of liquid medicines via oral and other enteral routes¹. The Alert recommends the NHS and the independent sector to use oral syringes and enteral feeding systems with connectors that will not fit intravenous syringes to avoid wrong route errors with oral liquid medicines.

Oral liquid medicines are often administered to babies, young children and adults who have impaired ability to swallow tablets and capsules. These medicines may be measured and administered using a 5 mL medicine spoon, a graduated measure, or a graduated oral/enteral syringe. They may be administered by mouth, or when indicated via a licensed feeding tube. Using intravenous (IV) syringes to measure and administer oral medicines increases the risk of wrong route errors by connection to IV and other parenteral lines.

The design of some enteral feeding systems includes the use of luer ports originally designed for the administration of medicines by the IV route. A European Standard EN 1615:2000 recommended that connectors (but not ports) on enteral feeding systems should be incompatible with other medical device connectors (IV and other parenteral routes). Including luer ports in feeding systems requires the use of a compatible IV syringe for oral liquid medicines and increases the risk of wrong route errors.

Between 2001 and 2004 there were three reports of death²⁻⁴ and between 1997-2004 there were four reports of harm or near misses⁵⁻⁸ in the UK following wrong route errors when oral liquids (medicines, feeds and flushes) were administered IV in error. Flushes include water or, in fluid restricted patients, air, given to clear the contents of the feeding tube. These risks have been recognised worldwide and are addressed in the Department of Health report Building a Safer NHS for Patients 'Improving Medication Safety'⁹.

A review of reports involving wrong route incidents with these products in the National Reporting and Learning System (NRLS) between 1st January 2005 and 31st May 2006 indicated that there had been 33 reported incidents where oral liquids have been administered by the IV route. These reports indicate that the design of medical devices and the methods used to prepare and administer oral liquids need to be improved to minimise the risks of harm.

Although the majority of incidents reported to the NRLS resulted in 'No Harm' and 'Low Harm' outcomes (TABLE 1), they all involved IV administration of oral liquid medicines and feeds and provided learning leading to the development of the NPSA Patient Safety Alert.

EXAMPLES OF REPORTED INCIDENTS

- "A nurse had prepared omeprazole syrup to give via a nasogastric (NG) tube. The nurse was dis-

Clinical outcome ¹⁰	Number of reports
Death	1
Severe (permanent harm)	2
Moderate (significant but not permanent harm, requiring increase in treatment)	2
Low (temporary harm, requiring extra observation or minor treatment)	8
No harm	20
Total	33

TABLE 1 Clinical outcome of NRLS Epidural Incident Reports 1 January 2005 – 31 May 2006.

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tracted while identifying the patient's NG tube and rushed this procedure to go and assist a colleague. As soon as the omeprazole was given the nurse realised that this drug had been given IV via a central line, instead of NG. The drug was immediately withdrawn. The patient's blood pressure dropped. Medical staff were called immediately. A small amount of adrenaline was given to the patient to correct the hypotension. The patient recovered quickly, and did not incur any long term effects." *Outcome – Low Harm.*

- "4mL of furosemide syrup 10mg/mL was drawn up in an IV syringe for NG administration. The nurse who had drawn this up was away from the patient and a second nurse administered the syringe contents IV". *Outcome – Low Harm.*
- "I accidentally gave some spironolactone via the central line. I realised my mistake after injecting approximately 2mL." *Outcome – No Harm.*
- "Child received phenytoin oral suspension by incorrect route – was administered via a Hickman line instead of the gastrostomy tube." *Outcome – No Harm.*
- "20 mL oral paracetamol given to patient in error via central line when prescribed via NG." *Outcome – No Harm.*

NPSA RECOMMENDATIONS

Patient Safety Alert 19 for the NHS and independent sector:

1 Design, supply and use of oral/enteral syringes

- Only use labelled oral/enteral syringes that cannot be connected to IV catheters or ports to measure and administer oral liquid medicines
- Do not use IV syringes to measure and administer oral liquid medicines
- Make sure stocks of oral/enteral syringes are available in all clinical areas that may need to measure and administer oral liquid medicines in a syringe
- When patients or carers need to administer oral liquid medicines with a syringe, supply them with oral or enteral syringes.

2 Design, supply and use of enteral feeding systems

- Enteral feeding systems should not contain ports that can be connected to IV syringes or that have end connectors that can be connected to IV or other parenteral lines
- Enteral feeding systems should be labelled to indicate the route of administration
- Three-way taps and syringe tip adaptors should not be used in enteral feeding systems

because connection design safeguards can be bypassed.

3 Organisational procedures, training and audit

- Medicines and enteral feeding policies and procedures should identify and manage the risk of administering oral liquid medicines by the wrong route
- These procedures should be part of the organisation's training and competency assessment programmes
- Annual medicines management audits should include a review of the measurement and administration of oral liquid medicines to ensure compliance with local policies and procedures.

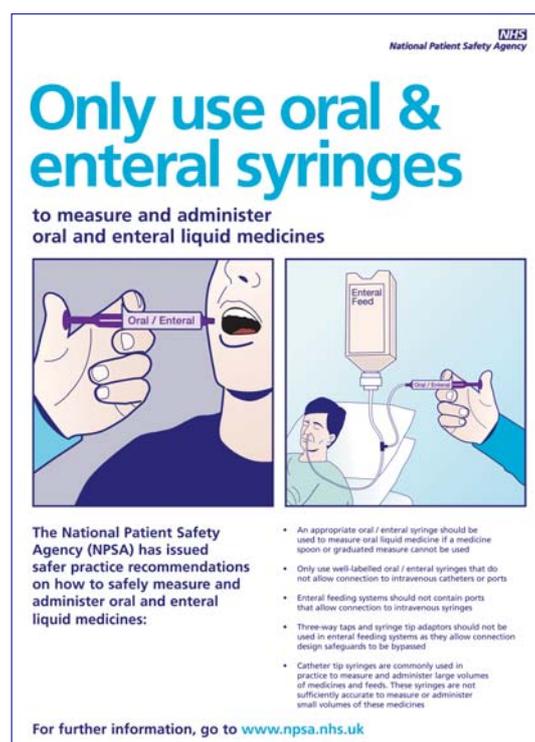


FIGURE 1 Poster produced by the NPSA and distributed to all NHS hospitals in England and Wales to inform staff of the new recommendations.

DEADLINES FOR IMPLEMENTATION

- The use of oral syringes in all clinical areas should be implemented by **30th September 2007**.
- The implementation of all other recommendations should be completed by **31st March 2008**.

MORE INFORMATION

The medical devices industry produces oral/enteral syringes in a range of sizes with tips that are not compatible with IV or other parenteral devices. These syringes are clearly labelled for oral/enteral use and may have coloured plungers or barrels to further help identification.

The Department of Health and NPSA are working together to ensure that primary care dispensers are in a position to issue a range of oral/enteral syringes. As a minimum, a 1mL, 5mL or 10mL syringe should be supplied depending on the dose prescribed.

Oral/enteral devices are supplied sterile and may be for single use only or for single patient use, according to manufacturer's guidance and local medicine policies.

Enteral syringes with catheter tips are not sufficiently accurate for measuring oral liquid medicine, but may be used to administer these medicines.

All oral/enteral syringes containing oral liquid medicines must be labelled with the name and

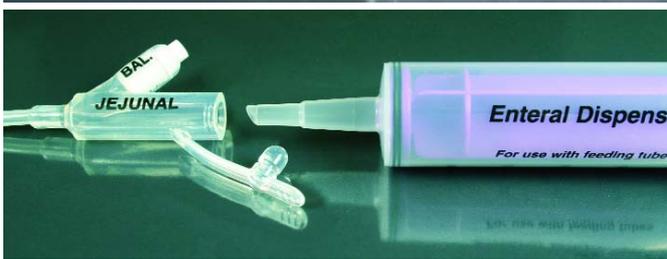
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FIGURE 2.
Female luer connector to fit male luer ports on enteral feeding tubes, (reverse luer connector combination).



Catheter tip connector to fit catheter tip ports on enteral feeding tubes.



Non luer; (non standard connector that does not fit any non-flexible port).



strength of the medicine, the patient's name and the date/time of preparation, immediately after preparation, by the person who prepared them, unless preparation and oral administration is one uninterrupted process and the unlabelled syringe does not leave the hands of the person who prepared it. Only one unlabelled syringe must be handled at one time.

Currently the medical devices industry supplies enteral administration and extensions sets with a range of connectors. The connectors used are:

- Male luer tips to fit female luer ports on enteral feeding tubes (standard IV/parenteral connector combination).
- Female luer connector to fit male luer ports on enteral feeding tubes (reverse luer connector combination).
- Catheter tip connector to fit catheter tip ports on enteral feeding tubes.
- Non luer (non standard connector that does not fit any non-flexible port).

Connector combinations 'b, c and d' (FIGURE 2) reduce the risk of wrong route errors in practice and meet the NPSA recommendations. Connector combination 'a' which uses a standard luer combination is not safe in practice and should not be used for the administration of oral/enteral liquids.

The NPSA recommends that healthcare organisations should only purchase enteral feeding devices with connector combinations 'b,c and d'. Enteral

feeding devices with connector combination 'a' should NOT be purchased.

These recommendations do not prevent the medical devices industry from developing new connector combinations which reduce the risk of wrong route error, either 'in house' or in response to any future European Standard Connector Design.

The NPSA has had meetings with representatives from the medical devices industry and informed them of these recommendations. It is anticipated that device manufacturers will incorporate these safer connector combination designs into their product ranges within 12 months of this Patient Safety Alert, if they have not done so already.

NHS organisations should undertake a risk assessment of the enteral feeding system devices currently used:

- They should identify which enteral feeding system devices and practices do not meet the NPSA recommendations.
- They should develop an action plan to manage these risks.
- They should only purchase enteral feeding system devices with the recommended connector combinations from 31st March 2008.
- NHS purchasing organisations will be able to provide information on these devices.
- In the interim, where devices with the recommended ports and connectors are not available, they should acknowledge the risk of continuing to use these devices through the Organisation's Risk Register, implement local risk management strategies to minimise these risks, and seek to purchase safer devices as soon as possible.

REFERENCES

1. **National Patient Safety Agency.** Patient Safety Alert 19 Promoting safer measurement and administration of liquid medicines via oral and other enteral routes. March 2007. (<http://www.npsa.nhs.uk>)
2. **Fatal report of wrong route errors with oral liquid medicines.** Personal communication from the MHRA to the NPSA. 2004.
3. **BBC News.** Catastrophic error killed baby. BBC News 10th May 2004. (<http://news.bbc.co.uk/1/hi/wales/3701181.stm>)
4. **Cousins D.H., Upton D.R.** Medication errors: Oral paracetamol liquid administered intravenously: Time for hospitals to issue oral syringes to clinical areas? *Pharmacy in Practice* 2001; **7**: 221.
5. Report of harm following route errors with oral liquid medicines. Personal communication from the MHRA to the NPSA. 2004.
6. **Cousins D.H., Upton D.R.** Medication errors: Use of oral syringes to administer medicines to children. *Pharmacy in Practice* 1999; **9**: 18-19.
7. **Cousins D.H., Upton D.R.** Medication errors: Inappropriate syringe use leads to fatalities. *Pharmacy in Practice* 1998; **8**: 209-10.
8. **Cousins D.H., Upton D.R.** Medication errors: Increased funding can cut risks. *Pharmacy in Practice* 1997; **7**: 597-98.
9. **Department of Health.** Building a safer NHS for patients. Improving medication safety. 2004. (www.dh.gov.uk)