Patient Safety Together:
learning, sharing and improving

HSE National Patient Safety Alert

Implementation of NRFit™

Reference: HSENPSA 001/2025 **Priority:** Priority 2 - Action required

Issue Date: 26 November 2025 **Close out date**: 26 November 2027

Mandate:

Call to implement and standardise the use of NRFit™ devices in place of universal Luer connectors.
NRFit™ connectors are designed to prevent accidental misconnections, reducing the risk of serious patient safety incidents.

NRFit™ vs Luer Connector

Who is this alert relevant for?

Senior health service leaders:

- Regional Executive Officers
- National Directors
- Hospital Chief Executive Officers and Managers
- Clinical Directors
- Quality and Patient Safety Leads
- Directors of Nursing and Midwifery

Supported by:

- Clinical teams including anaesthesia, critical care, nursing, radiology, cancer services, haematology
- Staff involved in intrathecal, epidural, and regional block procedures
- Procurement Leads
- Medical Device Safety Leads
- Pharmacy Executive Leads / Chief Pharmacists

What stakeholders were involved in developing this HSE NPSA?

- Health Service Executive (HSE)
- The College of Anaesthesiologists of Ireland
- Health Products Regulatory Authority (HPRA)

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Cáilíocht Náisiúnta agus Sábháilteacht Othar
Oifig an Phriomhoifigigh Cliniciúil
National Quality and Patient Safety
Office of the Chief Clinical Officer

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WHO needs to take action?

This safety critical HSE National Patient Safety Alert (NPSA) is relevant to **all services where medicines are administered intrathecally (near the spinal cord), epidurally (adjacent to the spinal cord) or as a regional block (numbing a nerve or nerves which innervate a part of the body) using medical device consumables (such as Luer syringes, intrathecal syringes or infusion giving sets) that could be substituted with NRFit™ products**.

Action is required by senior health service leaders, supported by clinical teams, and by staff involved in intrathecal, epidural, and regional block procedures, alongside Procurement Leads, Medical Device Safety Leads and Pharmacy Executive Leads/Chief Pharmacists.

WHAT is the safety issue?

Call to HSE / HSE-funded organisations to implement and standardise the use of **NRFit™ devices** in place of universal Luer connectors. NRFit™ (ISO 80369-6) is the international connector standard specifically designed to prevent wrong-route medication incidents during intrathecal, epidural, and regional anaesthesia procedures**.** Unlike Luer connectors, NRFit™ connectors are safety-engineered and intentionally incompatible with IV and enteral systems, eliminating the risk of accidental misconnections. The continued use of universal Luer connectors carries a significant risk of wrong-route administration, which can have fatal consequences, particularly if intravenous medication is inadvertently delivered into the intrathecal or epidural space[1].

HOW to take action?

1. **Establish a short-life working group** with a clinical lead as chair to scope out and coordinate the transition to NRFit™ across all relevant clinical specialties:
   a. Membership of the SLWG should include local business managers, procurement, pharmacists, improvement/project management support, nursing & midwifery and medical device leads to identify all devices that need to transition to NRFit™
   b. Identify all processes involving neuraxial connectors and use of neuraxial routes for administration of medication, regional anaesthesia, or diagnostic procedures
   c. Plan and risk assess the most appropriate and safe process for transition to NRFit™
2. **Manage the required stock** to maintain supplies, local procurement leads must:
   a. Work with local teams to forecast organisational requirements
   b. Contact nationally approved manufacturers for NRFit™ medical device consumables listed on the HSE PACE system to plan for the organisation's stock requirements and ensure organisational readiness. Agree a timeline for transition to NRFit™
   c. Identify all stock areas and prepare to revise stock management systems
3. **Communicate with and prepare all relevant staff**
   a. Clearly communicate agreed timelines and implementation plan to relevant staff
   b. Ensure all relevant policies, procedures and training resources/material for intrathecal, epidural and regional block procedures are updated with reference to the use of NRFit™ devices and are fully accessible. Consider training needs.
4. **Make the change**
   a. Transition to NRFit™ - manage and maintain stock levels and cease re-ordering alternatives (infusion sets/cartridges/reservoirs)
   b. Report any safety issues or incidents to NIMS and the HPRA

WHEN does action need to be completed?

This change should take no more than 24 months from the date of issue of the alert. Actions must be completed by the **26 November 2027**. An update will be sought after 12 months.

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Why is this action required?

In 2010, a new international safety standard for small bore connectors (ISO 80369) was developed by an international group of experts from 31 countries. This included a dedicated connector for neuraxial (spinal) applications (NRFit™ ISO 80369-6) defined as "those for administering medications to neuraxial sites, wound infiltration anaesthesia delivery and other regional anaesthesia procedures, or to monitor or remove cerebrospinal fluid for therapeutic or diagnostic purposes"[2].

The ISO 80369 series was specifically designed to prevent dangerous *wrong-route connections* by making connectors for different organ systems **intentionally incompatible**. NRFit™ connectors eliminate the possibility of misconnecting neuraxial devices with intravenous or enteral systems — an error that could otherwise prove fatal.

While access to a full portfolio of NRFit™ devices and supply chain fragility has delayed its full implementation in Ireland and internationally, industry throughout Ireland has now adopted NRFit™ and has made it available.

Internationally this transition has progressed in countries such as England, Northern Ireland, Scotland, Wales and Japan. This HSE NPSA was drafted based on the alert from the NHS UK issued in 2024[3] and was adapted for the healthcare system in Ireland.

What evidence supports the issuing of this HSE NPSA?

- A literature review published in 2020, described 133 cases from 1999 to 2019 of neuraxial to intravenous (or vice versa) misconnection events leading to wrong-route medication errors causing the deaths of 26 patients, and serious injury such as paraplegia, spinal cord injury, and seizures in 20 patients[4].
- On reviewing HSE national incident data it was identified that 20 incidents were reported between January 2023 to June 2024 where a drug was connected to the wrong access. Seven incidents may have been prevented with NRFit™ connectors. Fortunately, none of these have led to serious harm however the risk for serious harm does exist.

What stakeholders were involved in issuing this HSE NPSA?

This alert has been developed collaboratively by the following groups:

- Health Service Executive (HSE)
  - National Cancer Control Programme
  - National Clinical Programme for Anaesthesia
  - National Medication Safety Programme
  - National Patient Safety Alerts Committee
  - Procurement
  - National Quality and Patient Safety
  - Office of the Nursing and Midwifery Services Director
- The College of Anaesthesiologists of Ireland
- Health Products Regulatory Authority (HPRA)

Issues and risks of not changing to NRFit™

- The risk of a neuraxial or regional wrong route medication error leading to severe harm or death.
- The risk of inadvertent intravenous injection or infusion of wrong drug to neuraxial route. Internationally, fatal events have occurred from IV medications given intrathecally (e.g. vincristine).
- Preventable patient harm can lead to litigation and loss of public trust.
- Increased cost and complexity in managing two different systems of connectors and potential inconsistent practice across Irish hospitals and services.

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National Change

In preparation for this HSE National Patient Safety Alert the HSE engaged with manufacturers to notify them of this change and assess whether or not there would be any demand and supply issues and to consider any medical device issues. The major suppliers of neuraxial and regional block medical device consumables have confirmed that they can supply the full range of NRFit™ compatible medical device consumables to all the HSE hospitals in Ireland. Having several suppliers available will ensure supply chain in Ireland. This change may result in a slightly higher cost to the purchaser initially as the HSE transition to the currently less commonly used devices with NRFit™. It should be noted that as demand and production increases for NRFit™ products, this higher cost is expected to reduce.

While all major manufacturers are producing enough NRFit™ products to meet current demand, it is critical that transitioning hospitals accurately forecast their NRFit™ requirements well in advance of actual switch over, as it is not possible to use/connect any Luer products with any NRFit™ products. Some hospitals operate a lean stockholding policy, it is recommended that while transitioning to NRFit™ they should hold a sufficient buffer stock of the full suite of NRFit™ products to meet their requirements and to protect against any delays in the supply chain. It will be important for local procurement to support the service with accurate forecast requirements as supply will be demand led. This must be communicated with the manufacturers in advance of go-live date to help prepare for the change. For customer and vendor enquiries please contact Procurement.Helpdesk@hse.ie; for support when registering or accessing the PACE system, contact Register to access PACE.

When accessing PACE, please find the information on the relevant NRFit products under these catalogue references:

- HSE 27385 - National DPS Qualification for NRFit Consumable Products (Approved Supplier List)
- HSE 19833 - National Contract for PCA Infusion Pumps

While it is noted that some Irish hospitals have already made or commenced this transition to NRFit™ a national approach to this change project will promote patient safety and leverage on the 'economies of scale'. For any hospital to do this independently would be more challenging and costly.

In summary, there may be an initial cost implication, which is expected will ultimately reduce, and accurate forecasting (with buffer stock) of NRFit™ product requirements will be critical.

Where can I get **further information?**

- GEDSA checklists. GEDSA is a non-profit organization that promotes the NRFit® brand name for ISO 80369-6 connectors https://stayconnected.org/nrfit/nrfit-conversion-information-tools/nrfit-transition-checklists/
- For information on HSE National Patient Safety Alerts in general please visit www.hse.ie/pst or email patientsafetytogether@hse.ie

References

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2. https://www.hse.ie/eng/services/list/5/cancer/profinfo/medonc/sactguidance/itc%20report%20onc%20med%20safety%20rev%20final.pdf
3. https://www.england.nhs.uk/2024/01/transition-to-nrfit-connectors-for-intrathecal-and-epidural-procedures-and-delivery-of-regional-blocks/
4. Viscusi et al (2020) Neuraxial and peripheral misconnection events leading to wrong-route medication errors: a comprehensive literature review Thomas Jefferson University, Philadelphia, Pennsylvania, USA
5. Narayanan, S.M. (2025) Improving safety in regional anaesthesia – adopting the NRFitTM System, Ir Med J; May 2025; Vol 118; No. 5; P69

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Appendix 1: Comparison: NRFit™ Connector vs Luer Connector

Fig 1: NRFit™ Connector (yellow, left) vs Luer Connector (clear, right)

Feature	NRFit™ Connector (ISO 80369-6)	Luer Connector
Compatibility	Dedicated to neuraxial & regional anaesthesia; cannot connect to IV/enteral	Universal, fits across many devices (IV, enteral, neuraxial, etc.)
Safety Risk	Low — incompatible with non-neuraxial devices	High — allows misconnections (IV ↔ enteral ↔ neuraxial)
Uses	Spinal anaesthesia, epidurals, regional blocks, intrathecal drug delivery	IV infusions, enteral feeding, general syringes
Appearance	Slightly longer, smaller bore, often yellow-coded	Standard male/female taper
Standard	ISO 80369-6 (global safety standard)	Legacy, widely used

Source: Narayanan, S.M. (2025) Improving safety in regional anaesthesia – adopting the NRFitTM System, Ir Med J; May 2025; Vol 118; No. 5; P69