The case for Prefilled Syringes

2024

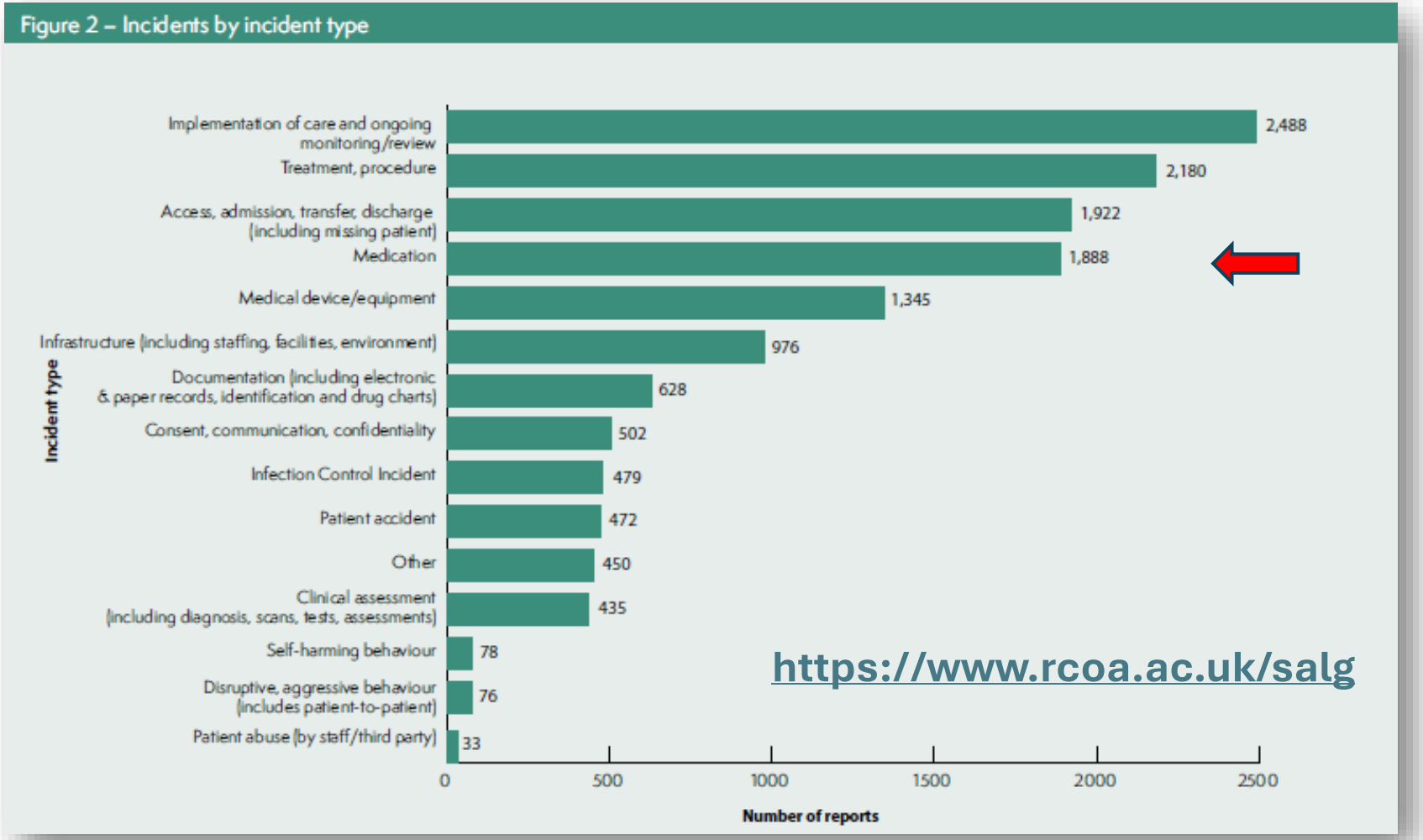
The case for Prefilled Syringes

- Background
- Patient Safety, Human factors
- Time saving, Workforce
- Correct concentrations
- Infection control
- Sustainability
- Cognitive load
- Economics
- Recommendations

Anaesthesia Editorial: **Time for prefilled syringes – everywhere** ***Anaesthesia*****, February 2024.** https://doi.org/10.1111/anae.16181

Critical Incident Reporting

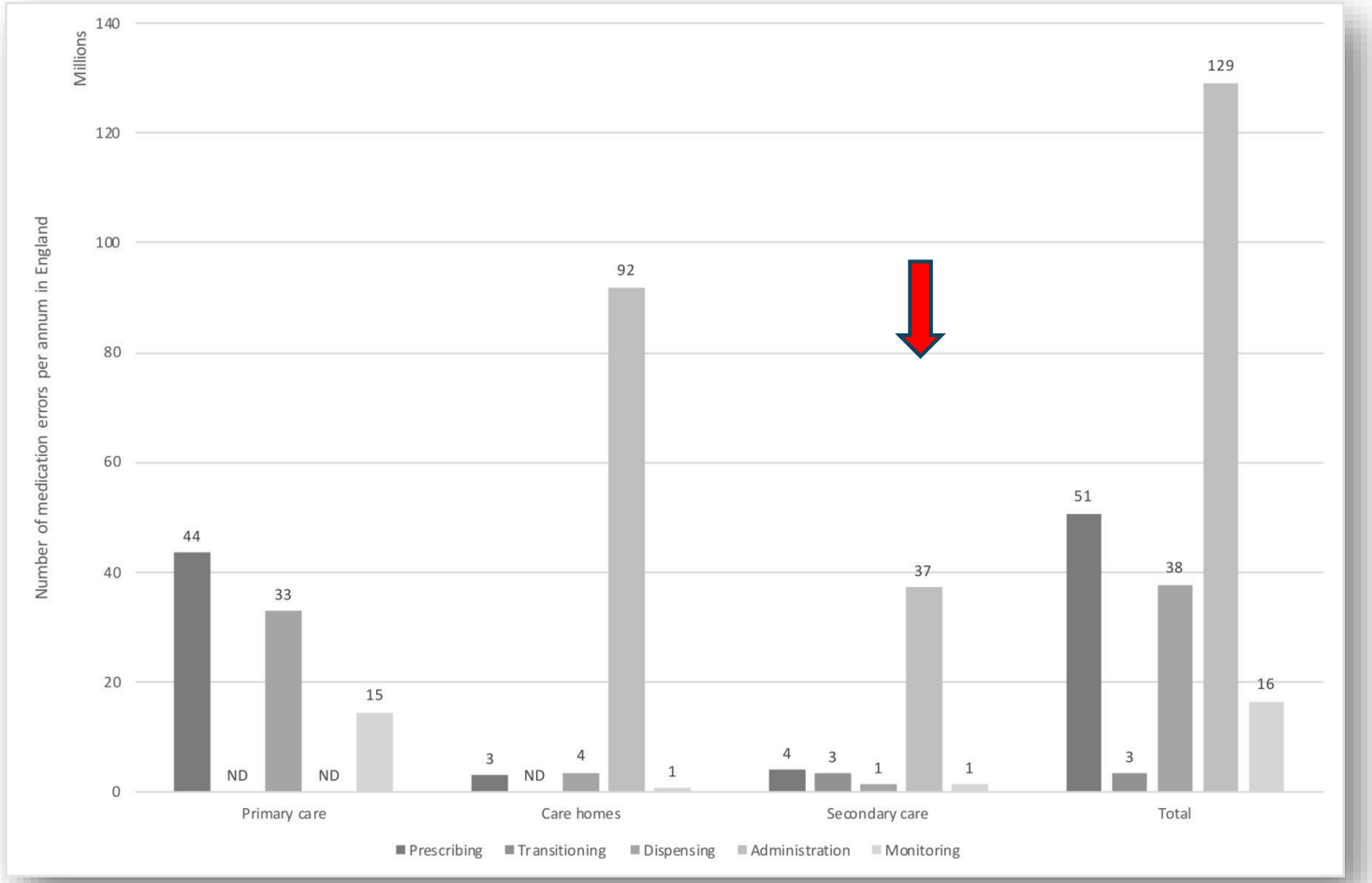
Safe Anaesthesia Liaison Group Patient Safety Update September 2019



13,952 anaesthetic incidents voluntarily reported
1 Jan 2019 - 30 Mar 2019 (4,651/month)

Medication errors increased 100/month 2011 to 629/month 2019 often 2nd most common class reported

Estimated number of errors per annum in England overall and for each stage of the medication process in each setting



4 UK studies on cost of medication errors, ranging from €68 per error for inhaler medication to €6,927,079 for litigation claims associated with anaesthetic medication errors

BMJ Quality & Safety

Rachel Ann Elliott et al. BMJ Qual Saf 2021;30:96-105

Drug errors in anaesthesia: an analysis of litigation claims against NHS in England 1995–2007

- 30 claims alleged wrong drug given, **suxamethonium in 9**
- 8 claims for awake paralysis peri-partum. After delivery **7 alleged suxamethonium** had been substituted for another drug : 5 syntocinon, 1 gentamicin,1 ondansetron
- ASA Closed Claims database: 14 claims of awake paralysis caused by syringe misidentification or administration of a neuromuscular blocker and induction agent in the wrong order. It was **suxamethonium in 12**

Cranshaw, J., Gupta, K.J. and Cook, T.M. (2009), Litigation related to drug errors in anaesthesia: an analysis of claims against the NHS in England 1995–2007. Anaesthesia, 64:1371-1323.
https://doi.org/10.1111/j.1365-2044.2009.06107.x

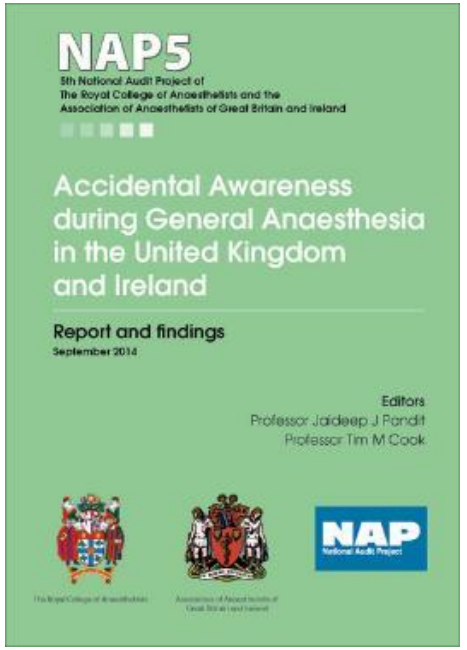
Awareness caused by Suxamethonium errors

2014 National Audit Project 5 (NAP5) reported on 'Accidental awareness during General Anaesthesia in the UK and Ireland'

- NAP5 identified 6 cases of awareness where **labelling errors** occurred, some causing severe patient harm
- **Suxamethonium** was the most frequent **labelling error** involved in 3 cases

Table 13.4. Drugs involved and psychological impact of six ampoule-labelling and one drug-omission error. (*there was a suggestion that parexocib was also intended)

Drug Given	Drug intended	Michigan	NPSA score
Atracurium	Midazolam	4D	Moderate
Suxamethonium	Fentanyl	4	Low
Suxamethonium	Ondansetron	4D	Low
Atracurium	Midazolam*	4D	Low
Cefuroxime	Thiopental	2	None
Water	Thiopental	4D	Severe
Suxamethonium	Fentanyl	4D	Severe



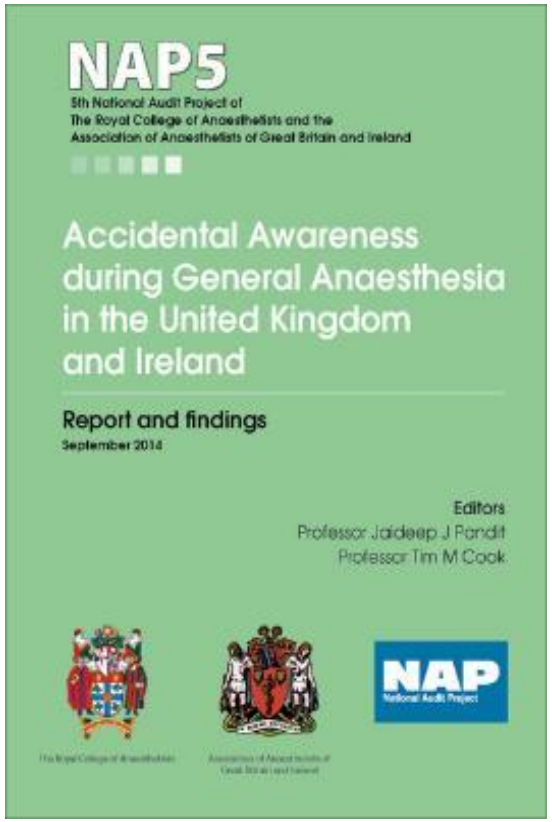
https://www.nationalauditprojects.org.uk/NAP5home

Awareness caused by Suxamethonium errors

- NAP5 identified 10 cases of awareness where **'syringe swaps'** occurred, some causing severe patient harm
- **Suxamethonium** was the most frequent **'syringe swap'** involved in 3 cases

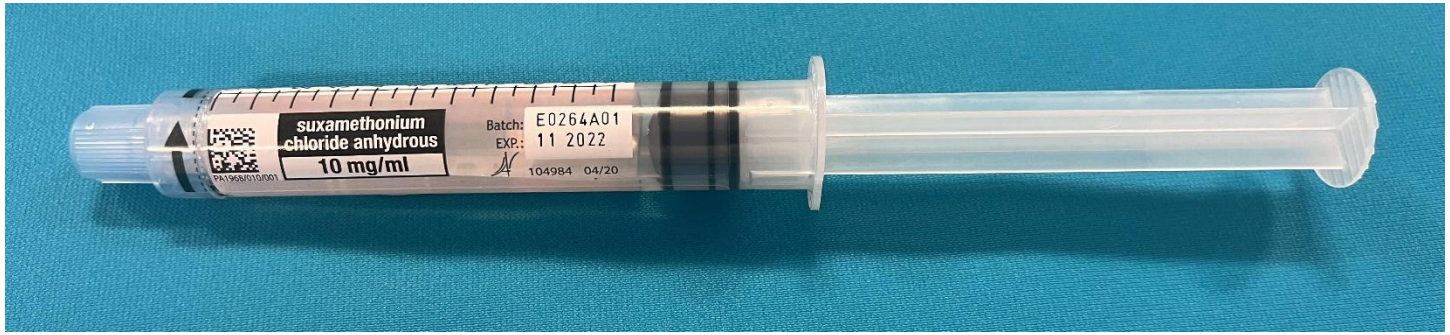
Table 13.3. Drugs involved and psychological impact of ten syringe swaps. (NMBD: unidentified neuromuscular blocking drug)

Drug Given	Drug intended	Michigan	NPSA score
Suxamethonium	Anti-emetic	4D	Severe
Atracurium	Saline flush	4D	Severe
NMBD	Midazolam	4D	Severe
Suxamethonium	Fentanyl	4	None
Suxamethonium	Fentanyl	2	None
Lidocaine	Antibiotic	1	Moderate
Atracurium	Saline flush	4D	Severe
Rocuronium	Midazolam	4D	Severe
Rocuronium	Midazolam	4	Moderate
Cefuroxime	Thiopental	4D	Low



https://www.nationalauditprojects.org.uk/NAP5home

Suxamethonium 100mg in 10ml Prefilled syringe



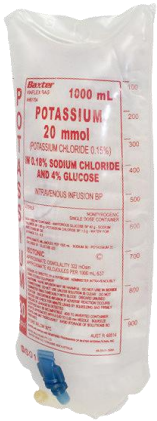
Reduces awareness risk: Correctly Labelled, Distinctive appearance

https://www.medicines.ie/medicines/murexal-10-mg-ml-solution-for-injection-in-pre-filled-syringe-35019/spc

Terminology and definitions

Ready-to-use (RTU): *An injectable medicine is Ready-to-use when it requires no further dilution or reconstitution before transfer to an administration device. For example, a liquid with an ampoule, of the required concentration, that only needs to be drawn up into a syringe*

Ready-to-administer (RTA*): An injectable medicine is Ready-to-administer when it requires no further dilution or reconstitution and is presented in the final container or device, ready for administration or connection to a needle or administration set. For example, an infusion in a bag with no additive required.*



(Glossary of pharmaceuticals terms, WHO, 2016)

Some publications use these terms interchangeably although they have different meanings

Terminology and definitions

Prefilled syringe (PFS): *A ready-to-administer syringe that is filled and then labelled before it enters the final clinical area where it could be immediately administered without further manipulation.* (European Association of Hospital Pharmacists, 2023).

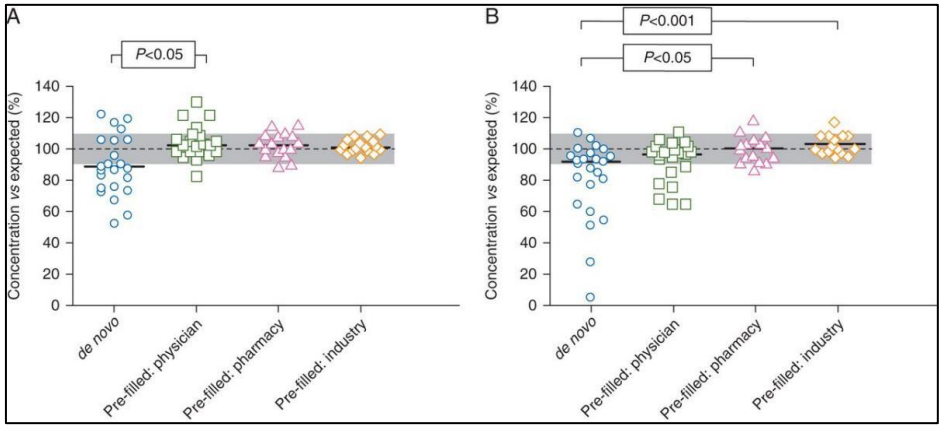
Compounded PFS are pharmacy-prepared in `clean rooms´ with a shelf life of a few weeks
Manufactured PFS are industry made then sterilised with a shelf life of up to three years

Compounded PFS Shelf life 6 weeks

Manufactured PFS Filled <u>then sterilised</u>
Shelf life 2–3 years

Patient Safety, Human Factors -The case for PFS

- The risk of a medication error during preparation is 17 times greater when syringes are prepared by hand.



- The use of PFS cannot prevent all medication errors e.g. wrong syringe selection, administering the incorrect dose (but can reduce these), so their engineered safety benefits make a strong argument for routine use

Adapa RM, Mani V, Murray LJ, et al. Errors during the preparation of drug infusions: a randomized controlled trial. British Journal of Anaesthesia 2012; 109: 729–34.

Human Factors -The case for PFS

- The preparation and administration of injectable medicines is the **most commonly performed task by any anaesthetist**. (≈ 14/case)
- **This process involves more human factors steps** than any other in anaesthesia. (≈ 52 steps)
- Human errors are involved in 80% of patient safety incidents
- Therefore any way of eliminating steps in the preparation and administration of injectable medications is likely to improve patient safety and reduce preventable harm.

Whitaker, D.K. and Lomas, J.P. (2024), Time for prefilled syringes – everywhere. Anaesthesia, 79: 119-122. https://doi.org/10.1111/anae.16181

Human Factors -case for PFS

- NPSA Standard Operating Procedure for Preparing Injectable Medicines in Clinical Areas has 52 steps
- 30 (58%) steps would be eliminated by using a PFS
- 22 (73%) of these eliminated steps could cause harm if performed incorrectly

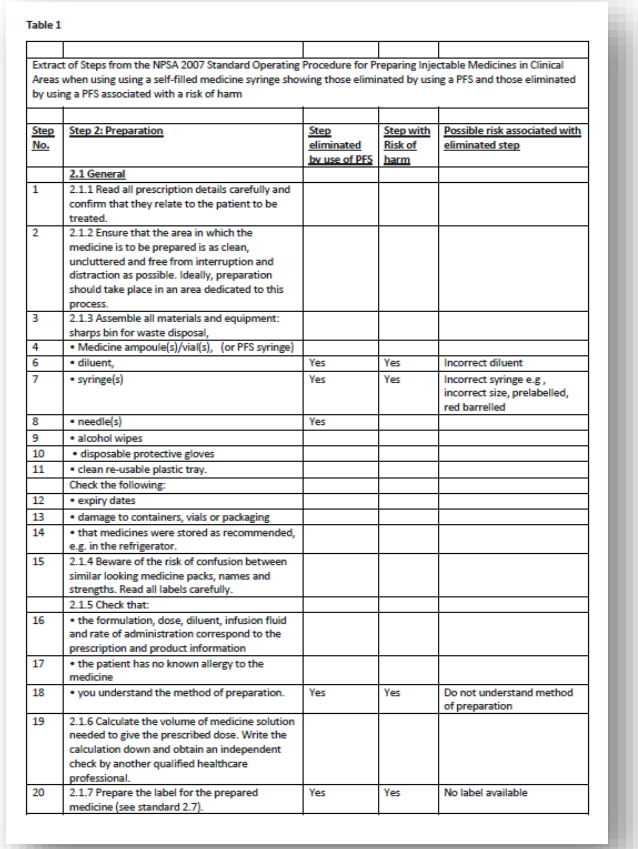


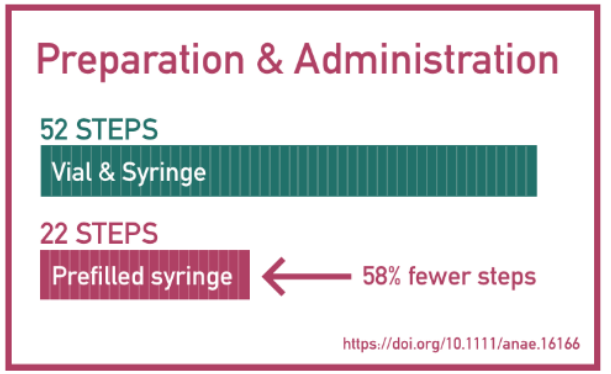
Table 1

Extract of Steps from the NPSA 2007 Standard Operating Procedure for Preparing Injectable Medicines in Clinical Areas when using using a self-filled medicine syringe showing those eliminated by using a PFS and those eliminated by using a PFS associated with a risk of harm

Step No.	Step 2: Preparation	Step eliminated by use of PFS	Step with Risk of harm	Possible risk associated with eliminated step
	2.1 General			
1	2.1.1 Read all prescription details carefully and confirm that they relate to the patient to be treated.			
2	2.1.2 Ensure that the area in which the medicine is to be prepared is as clean, uncluttered and free from interruption and distraction as possible. Ideally, preparation should take place in an area dedicated to this process.			
3	2.1.3 Assemble all materials and equipment: sharps bin for waste disposal,			
4	• Medicine ampoule(s)/vial(s), (or PFS syringe)			
6	• diluent,	Yes	Yes	Incorrect diluent
7	• syringe(s)	Yes	Yes	Incorrect syringe e.g., incorrect size, prelabelled, red barrelled
8	• needle(s)	Yes		
9	• alcohol wipes			
10	• disposable protective gloves			
11	• clean re-usable plastic tray.			
	Check the following:			
12	• expiry dates			
13	• damage to containers, vials or packaging			
14	• that medicines were stored as recommended, e.g. in the refrigerator.			
15	2.1.4 Beware of the risk of confusion between similar looking medicine packs, names and strengths. Read all labels carefully.			
	2.1.5 Check that:			
16	• the formulation, dose, diluent, infusion fluid and rate of administration correspond to the prescription and product information			
17	• the patient has no known allergy to the medicine			
18	• you understand the method of preparation.	Yes	Yes	Do not understand method of preparation
19	2.1.6 Calculate the volume of medicine solution needed to give the prescribed dose. Write the calculation down and obtain an independent check by another qualified healthcare professional.			
20	2.1.7 Prepare the label for the prepared medicine (see standard 2.7).	Yes	Yes	No label available

NHS National Patient Safety Agency

Promoting safer use of injectable medicines. A template standard operating procedure for: prescribing, preparing and administering injectable medicines in clinical areas. 2007 https://webarchive.nationalarchives.gov.uk/ukgwa/20180501163752/http://www.nrls.npsa.nhs.uk/resources/type/alerts/?entryid45=59812&p=3



Whitaker, M.C.A. and Whitaker, D.K. (2024), The impact of using prefilled syringes on a standard operating procedure for preparing injectable medicines in clinical areas. Anaesthesia, 79: 98-99. https://doi.org/10.1111/anae.16166

Time saving, Workforce - The case for PFS

- Experts agree that the largest healthcare problem now is the workforce shortage, hence the 15-year plan to increase staff

- DoH ‘Carter Report’ said that providing just prefilled antibiotics alone would release 4000 wholetime equivalent nursing staff.
- The labour-saving intervention of supplying PFS to clinical areas can contribute to reliably achieving a reduction in staffing pressures in a short timescale.

Department of Health and Social Care. Transforming NHS pharmacy aseptic services in England. 2020. https://www.gov.uk/government/publications/transforming-nhs-pharmacy-ase ptic-services-in england/transforming-nhs-pharmacy-asepticservices- in-England

Correct concentrations -The case for PFS

- As well as PFS having the correct contents, any medicines that need diluting can also be certain to have the correct concentration. (reduces wrong dose errors)
- Simulation studies have shown large variations in the contents of manually filled syringes, with some having no active ingredient at all

- PFS can help the standardisation of medicine concentrations, particularly within departments, which in turn can help prevent medication harm.
- Critical Care simulation studies show that PFS allow medication to be administered much quicker than using manual preparation techniques.

Adapa RM, Mani V, Murray LJ, et al. Errors during the preparation of drug infusions: a randomized controlled trial. British Journal of Anaesthesia 2012; 109: 729–34.

Infection control -The case for PFS

- PFS injection contents are sterile: 6% of the syringes drawn up in operating theatres and 16% of those drawn up on the ward are contaminated. In a clean room or manufacturing facility this is 0%.
- Sterile prefilled saline flush syringes can halve bloodstream infection rates when compared with those filled manually.
- It is astonishing that such evidence has not been given more priority by infection control authorities to change practice.

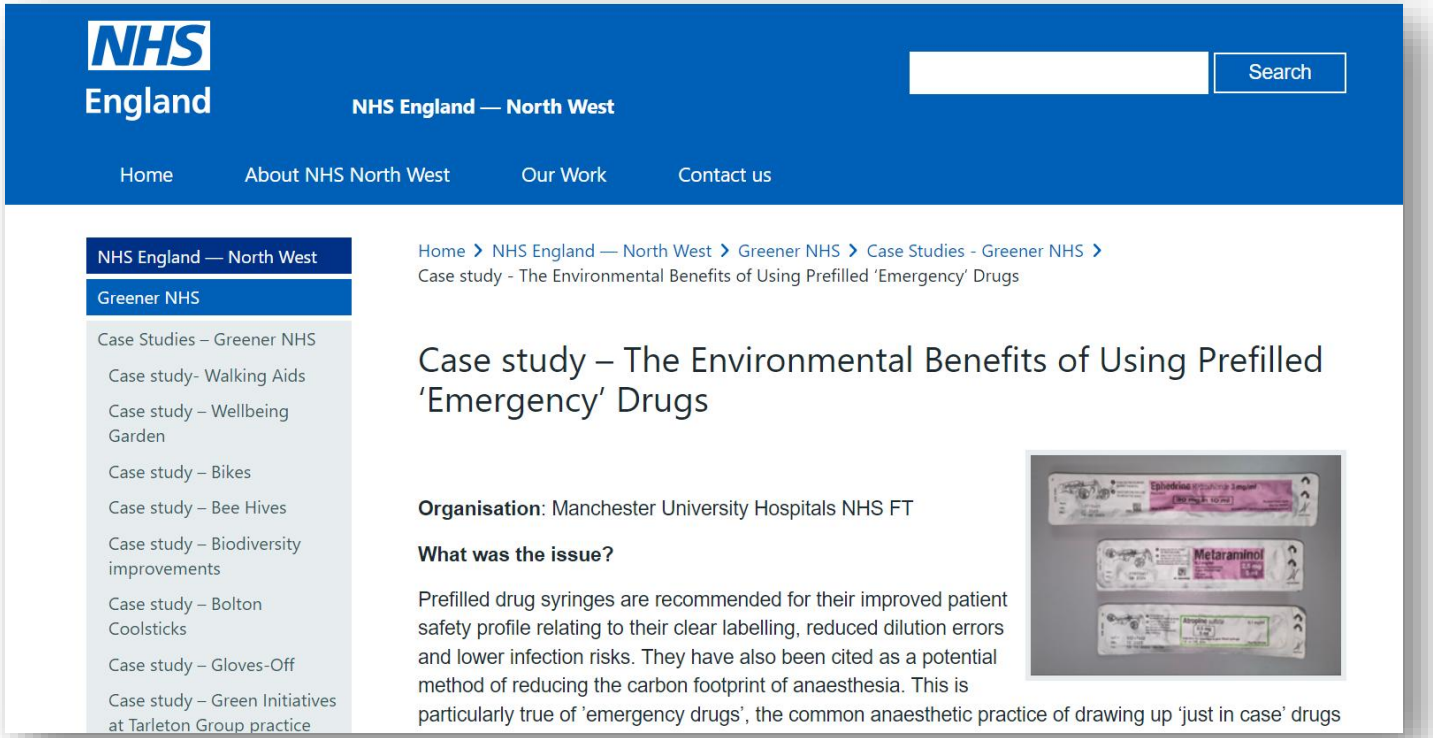
Gargiulo DA, Mitchell SJ, Sheridan J, et al. Microbiological contamination of drugs during their administration for anesthesia in the operating room. Anesthesiology 2016; 124: 785–94.

Bertoglio S, Rezzo R, et al. Pre-filled normal saline syringes to reduce totally implantable venous access device associated bloodstream infection: a single institution pilot study. Journal of Hospital Infection 2013; 84: 85–8.

Sustainability -The case for PFS

- Anaesthesia has embraced sustainability, and one way to protect the environment is to reduce the amount and use of disposable equipment.
- Both manual and PFS preparations still use plastic syringes but having injectable medicines supplied in ready-to-administer PFS removes large quantities of glass ampoules, packaging, needles and the transport of all these unnecessary items to the hospital.
- There are also additional cost savings in not having to pay for the expensive disposal of these items.

Royal College of Nursing. Freedom of Information Follow up Report on Management of Waste in the NHS. 2018. https://www.rcn.org.uk/Professional-Development/publications/pdf-006683



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Case study - The Environmental Benefits of Using Prefilled 'Emergency' Drugs

Case study – The Environmental Benefits of Using Prefilled 'Emergency' Drugs

Organisation: Manchester University Hospitals NHS FT

What was the issue?

Prefilled drug syringes are recommended for their improved patient safety profile relating to their clear labelling, reduced dilution errors and lower infection risks. They have also been cited as a potential method of reducing the carbon footprint of anaesthesia. This is particularly true of 'emergency drugs', the common anaesthetic practice of drawing up 'just in case' drugs

https://www.england.nhs.uk/north-west/greener-nhs/case-studies-greener-nhs/case-study-the-environmental-benefits-of-using-prefilled-emergency-drugs/#:~:text=Following%20the%20approval%20and%20introduction,a%20GWP%20reduction%20of%2086%25.

What was the Delivering a Net Zero NHS benefit?)

Global Warming Potential = (GWP)

Pre-intervention 100% (52/52) of theatres audited drew up emergency drugs with an average 585 syringes of emergency drugs wasted per theatre per year, generating 6.1kg of waste. This gave a GWP for production and disposal of 34.2 $kgCO_2eq$ for the wasted drugs. Following the approval and introduction of prefilled syringes there was a substantial change in practice with 63% of theatres no longer drawing up emergency drugs at all, reducing waste to 93 syringes per theatre per year, with a mass of 0.8kg and GWP of 4.7$kgCO_2eq$. This represents a GWP reduction of 86%.

Cognitive load -The case for PFS

- PFS have been shown to reduce cognitive load, particularly in time-critical situations. This improves the working environment for staff, thus enabling them to concentrate on other patient care issues.
- A study on the impact of PFS and equipment preparation in pre-hospital emergency anaesthesia simulation showed no lapses or errors in medicine preparation and consequently the cognitive load of team members was significantly reduced

Yang Y, Rivera AJ, Fortier CR, et al. A human factors engineering study of the medication delivery process during an anesthetic. Anesthesiology 2016; 124: 795–803.

Swinton P, Corfield AR, Moultrie C, et al. Impact of drug and equipment preparation on pre-hospital emergency Anaesthesia (PHEA) procedural time, error rate and cognitive load. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2018; 26: 82.

Economics -The case for PFS

- A barrier to PFS is the higher purchase price compared with individual ampoules of many now out-of-patent, low-cost anaesthetic drugs.
- 15% of all healthcare budgets are spent on managing adverse events, which can be decreased with the use of PFS. (NHS = £23bn)
- One of the highest ever NHS medical negligence payouts of £24 million was caused by a mix-up of two unlabelled 10 ml syringes.
- This 'Safety' benefit also decreases the environmental harm of all the extra drugs and equipment needed to manage these additional adverse events, providing both a patient safety and sustainability dividend.

Slawomirski L, Auraaen A, Klazinga NS. The economics of patient safety. 2017. https://www.oecd-ilibrary.org/content/ paper/5a9858cd-en

Economics -The case for PFS

- Over 28% of the 10 billion doses of injectable medicines sold globally every year are in PFS but only 4% of these are used in the acute sector.
- The initial higher purchase price is often “knee jerkly” used to override or fail to further consider their undoubted patient safety and other benefits
- This spurious economic argument is easily countered by a consideration of the wider systemic financial benefits: elimination of costs of manual preparation items and time; bacteraemia treatment; wastage; errors; and medico-legal bills, which can save £millions.

Benhamou D, Piriou V, Vaumas C, et al. Ready-to-use prefilled syringes of atropine for anaesthesia care in French hospitals - a budget impact analysis. Anaesthesia, Critical Care and Pain Medicine 2017; 36: 115–21.

Larmene-Beld KHM, Spronk JT, Luttjeboer J, et al. A cost minimization analysis of ready-to-administer prefilled sterilized syringes in a Dutch Hospital. Clinical Therapeutics 2019; 41: 1139–50.

Despite higher unit cost versus ampoules, PFSs can provide savings to healthcare due to several factors

Description of costs	Use of CPM	Use of PFS	Differential
Cost of drug products *(empty syringe, drug, diluent, needle, gauze, disinfectant)*	**+** • The costs of the medication itself, various items needed to prepare a syringe • Time needed to prepare one syringe not evaluated	**+++** • The costs of the medication itself • Cost of the medication itself will be balanced by other cost categories	**644% of costs**
Cost of medication errors *(remedial medications administered, length of hospital stay, staff)*	**+++** • Complex CMP preparation in stressful context leads to increased risks of medication errors	**+** • Frequency of medication errors reduced with PFS use	**77% of savings**
Cost of bacteremia *(due to contamination) (remedial medications administered, length of hospital stay, staff)*	**+++** • Contamination during reconstitution by ICU nurses varies from 7% to 44%	**+** • Minimal manipulations required reducing the likelihood of contamination	**99% of savings**
Cost related to wastage of drugs prepared in advance	**++** • In the emergency setting, 90% of drugs are prepared in advance and an estimated 85% are unused and wasted	**NA** • No waste occurs with the use of a PFS	**100% of savings**
Total costs	**+++**	**+**	**~70% of savings**

Larmené-Beld KHM, Spronk JT, Luttjeboer J, et al. A Cost Minimization Analysis of Ready-to-Administer PFS in a Dutch Hospital. Clin Ther. 2019;41(6):1139

Benhamou D, Piriou V, De Vaumas C, et al. Ready-to-use pre-filled syringes of atropine for anaesthesia care in French hospitals - a budget impact analysis. Anaesth Crit Care Pain Med. 2017;36(2):115-121.

Economics -The case for PFS

Annual Costs of 864,246 parenteral administrations in a Dutch hospital were calculated

CPM – Conventionally prepared, PFS – Prefilled syringe

Three scenarios were analysed:	**Annual costs**	**Saving on all CPM**
All preparations as CPM	$ 16.0 million	
50% as CPM and 50% as PFSs	$ 9.1 million	43% $ 6.9 million
All preparations as PFSs	$ 4.7 million	71% $11.3 million

Costs were strongly influenced by decreased risk of medication errors and contamination of intravenous medication.

Larmené-Beld KHM, Spronk JT, Luttjeboer J, et al. A Cost Minimization Analysis of Ready-to-Administer PFS in a Dutch Hospital. Clin Ther. 2019;41(6):1139

Annual Costs of parenteral administrations in NHS hospitals

- Assuming similar costs in 170 NHS Hospitals converted to £GBP (170 an estimate, some Mental Health etc have little PFS use)
- Using PFS for 50% of administrations in each hospital saves £6.6m
- Therefore 170 x £6.6m = £1222m = about £1bn saved/yr in NHS
- Also100,000 injections save £1m, so each PFS use saves NHS £10
- If only an approximation PFS use is NOT A COST it **SAVES MONEY** ++

Larmené-Beld KHM, Spronk JT, Luttjeboer J, et al. A Cost Minimization Analysis of Ready-to-Administer PFS in a Dutch Hospital. Clin Ther. 2019;41(6):1139

Economics -The case for PFS

- Anaesthetists are generally fiscally responsible, but some seem to take great pride in illogically and hazardously providing all their services on a shoestring.
- 60 years ago surgeons stopped preparing their own sutures by cutting lengths of silk and threading them through the eyes of needles to now speedily opening sterile prefilled prelabelled **Ready-to-administer** packets of expensive state-of-the-art polymers with needles already attached.

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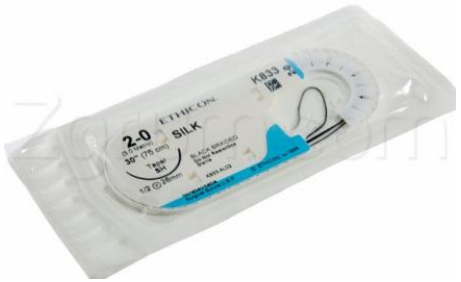
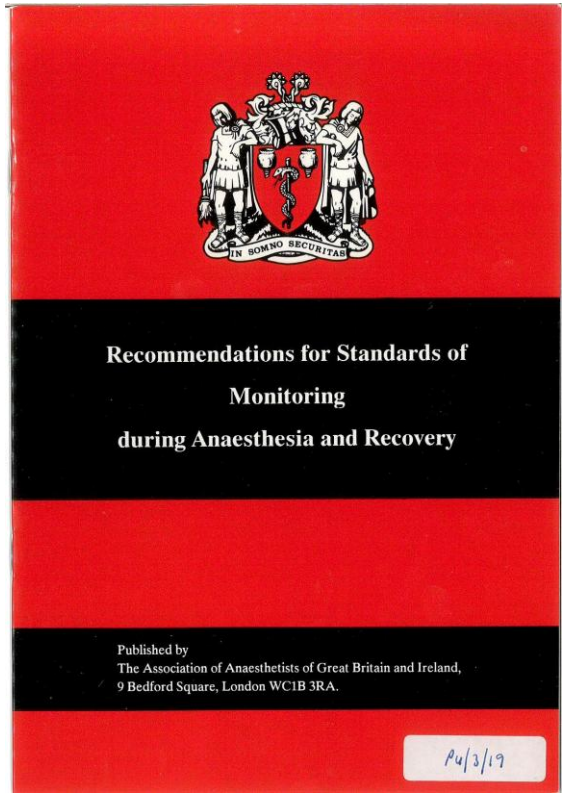


Economics -The case for PFS

- Laparoscopic surgery successfully developed with equipment, technology and disposables with no apparent concern for the cost or value.
- Robotic surgery now advances while the anaesthetist continues to manually draw up drugs in the face of convincing patient safety evidence
- Surprisingly, hospitals have purchased sterile PFS of lidocaine in urinary catheter kits for over 20 years
- This difference in standards for urethral catheterisation and direct injection into patients' veins is illogical and unjustifiable

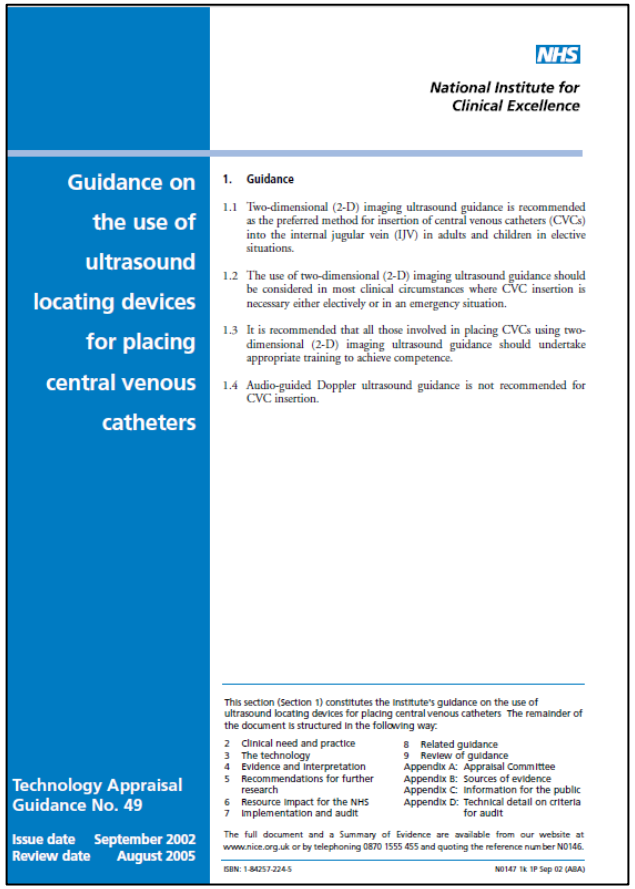
Economics -The case for PFS

- Prompt culture change is possible.
- The 1988 introduction of monitoring standards during anaesthesia was huge advance in patient safety with most hospitals purchasing numerous sets of very expensive equipment within 5 years of its national recommendation to maintain their College recognition for training
- Prefilled syringes represent one of the few occasions in clinical practice where investment in technology completely buys out so many human factors related error steps.



Economics -The case for PFS

- Ultrasound equipment for insertion of central venous access was thought particularly expensive when first introduced but now has widespread adoption.
- Routine use of ultrasound for regional anaesthesia is a cultural norm now that its safety benefit of reduced harm and cognitive load is evident.
- Recently, growing support for universal videolaryngoscopy has shown it is possible for the profession to successfully make the case for the procurement of new safety innovations.



NHS
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Guidance on the use of ultrasound locating devices for placing central venous catheters

1. Guidance

1.1 Two-dimensional (2-D) imaging ultrasound guidance is recommended as the preferred method for insertion of central venous catheters (CVCs) into the internal jugular vein (IJV) in adults and children in elective situations.

1.2 The use of two-dimensional (2-D) imaging ultrasound guidance should be considered in most clinical circumstances where CVC insertion is necessary either electively or in an emergency situation.

1.3 It is recommended that all those involved in placing CVCs using two-dimensional (2-D) imaging ultrasound guidance should undertake appropriate training to achieve competence.

1.4 Audio-guided Doppler ultrasound guidance is not recommended for CVC insertion.

This section (Section 1) constitutes the Institute's guidance on the use of ultrasound locating devices for placing central venous catheters. The remainder of the document is structured in the following way:

2 Clinical need and practice
3 The technology
4 Evidence and interpretation
5 Recommendations for further research
6 Resource impact for the NHS
7 Implementation and audit
8 Related guidance
9 Review of guidance
Appendix A: Appraisal Committee
Appendix B: Sources of evidence
Appendix C: Information for the public
Appendix D: Technical detail on criteria for audit

The full document and a Summary of Evidence are available from our website at www.nice.org.uk or by telephoning 0870 1555 455 and quoting the reference number N0146.

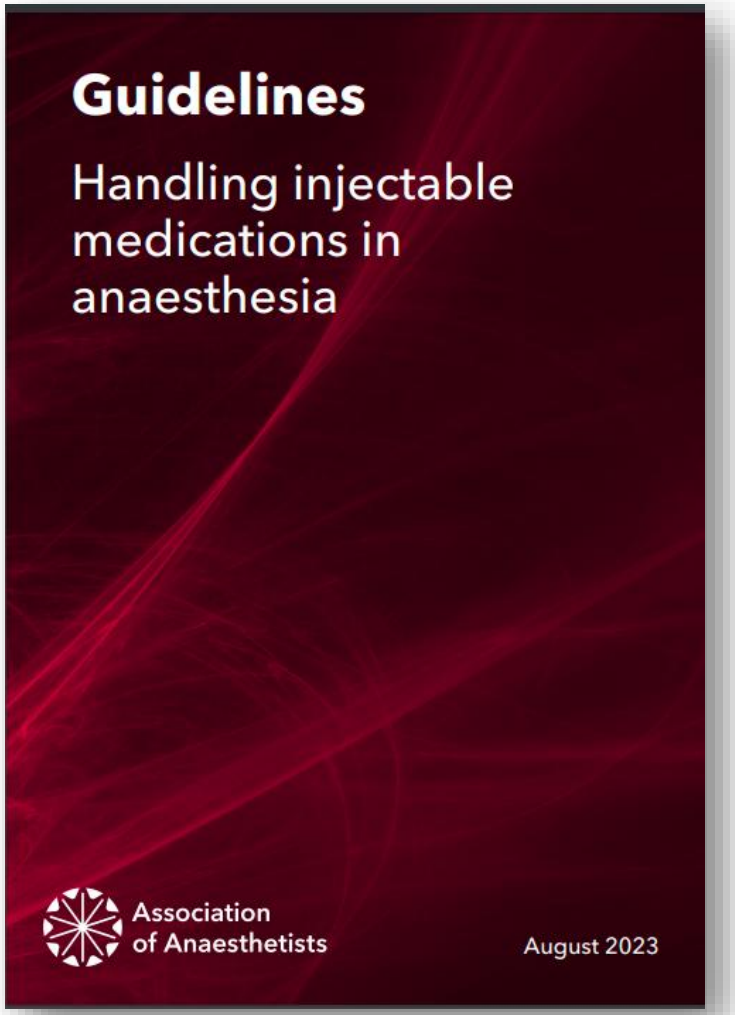
Technology Appraisal Guidance No. 49

Issue date September 2002
Review date August 2005

ISBN: 1-84257-224-5 N0147 1k 1P Sep 02 (ABA)

Recommendations

1. Safe handling of medicines requires clear institutional policy within multiple departments as well as careful individual practice.
2. Departments of anaesthesia should have policies for safe handling of medicines.
3. Pharmacy departments should promote purchasing for safety, consistent supply and purchase from those companies complying with good labelling practice.
4. Prefilled syringes have multiple advantages, and their purchase and use should be promoted.
5. Standardisation of fit-for-purpose physical structure and medicine storage in workplaces should be developed.
6. Technological solutions that reduce the opportunity for error should be explored and adopted whenever possible.
7. Standardisation of practice for syringe labelling and handling should be promoted and should form part of the curriculum for training anaesthetists. This should reduce the risk of errors when anaesthetists work together.
8. Individual anaesthetists may have characteristics that affect their working; these should be recognised by the individual as well as their department, and suitable adjustments to practice made.



Kinsella SM, Boaden B, El-Ghazali S, et al. Handling injectable medications in anaesthesia. Anaesthesia 2023; 78: 1285-1294.

Many International Recommendations for Prefilled Syringes

Many Recommendations say **always use PFS wherever possible**

Not routinely using PFS should now have to be justified and acknowledged as a safety risk in Trust Risk Registers.

Group	Year	Recommendation
NPSA	2007	*"For high-risk injectable products: Provide ready-to-administer products of standard strength."*(Promoting safer use of injectable medicines, NPSA, NHS **NPSA Patient safety alert 20**
APSF	2010	*"Routine provider-prepared medications should be discontinued whenever possible."* *"Standardized pre-prepared medication kits by case type should be used whenever possible."* (APSF Medication Safety Conference 2010)
NPSA	2010	*"Consideration should be given to the supply and use of ready to administer infusion products, e.g. prefilled syringes of fast acting insulin 50 units in 50 mL sodium chloride 0.9%"*(Safer administration of insulin, NPSA, NHS, 2010)
EBA	2011	*"The EBA recommends that pre-filled syringes should be used wherever possible."* (Safe Medication Practice Recommendation, EBA, 2011)
RPS	2018	*"Medicines should be presented as prefilled syringes wherever possible."* (Professional guidance on the safe and secure handling of medicines, RPS, 2018)
ANZCA	2021	*"Consideration should be given to supplying selected drugs for intravenous use in prefilled and pre-labelled syringes rather than in ampoules."* (Guideline for the safe management and use of medications in anaesthesia, ANZCA, 2021)
ISMP	2022	*"Maximize the use of manufacturer-prepared, pharmacy-prepared, or commercially prepared (e.g., from a compounding pharmacy or outsourcing facility) syringes in the perioperative setting for adult, paediatric, and neonatal medication doses."*(Guidelines for Safe Medication Use in Perioperative and Procedural Settings, ISMP, 2022)

Purchasing for safety

This page is part of the wider 'Aspects of previous patient safety alerts that should inform broader local safety initiatives' set of webpages.

Connectors to reduce risk of wrong-route enteral, intravenous, and spinal/intrathecal administration

Selecting medication presentations for safety

Previous alerts highlighted the requirement for certain medicines to be available in a **ready-to-administer presentation to improve safety**; for example, epidural infusions, **insulin syringes for continuous insulin infusions and high-risk injectable products.** However, undertaking risk assessments and selecting medication presentations that will reduce the risk of error, as outlined in the 'Promoting safer use of injectable medicines alert', is a principle that applies to all medications administered within healthcare.

Organisations should focus on the wider context of a purchasing for safety agenda. This should consider the general principles of simplifying and rationalising the range and presentation of all medicines, **including the provision of ready-to-administer or ready-to-use injectable products.**

https://www.england.nhs.uk/patient-safety/patient-safety-insight/patient-safety-alerts/enduring-standards/informing-broader-local-safety-initiatives/purchasing-for-safety/ **2024**

NHS
National Patient Safety Agency

Patient safety alert

20

Alert

28 March 2007

Immediate action	☐
Action	☑
Update	☐
Information request	☐

Ref: NPSA/2007/20

Promoting safer use of injectable medicines

The National Patient Safety Agency (NPSA) received around 800 reports a month to its National Reporting and Learning System (NRLS) relating to injectable medicines between January 2005 and June 2006. This represents approximately 24 per cent of the total number of medication incidents. The majority of these resulted in no or low harm to patients. However, there were 25 incidents of death and 28 of serious harm reported between January 2005 and June 2006.

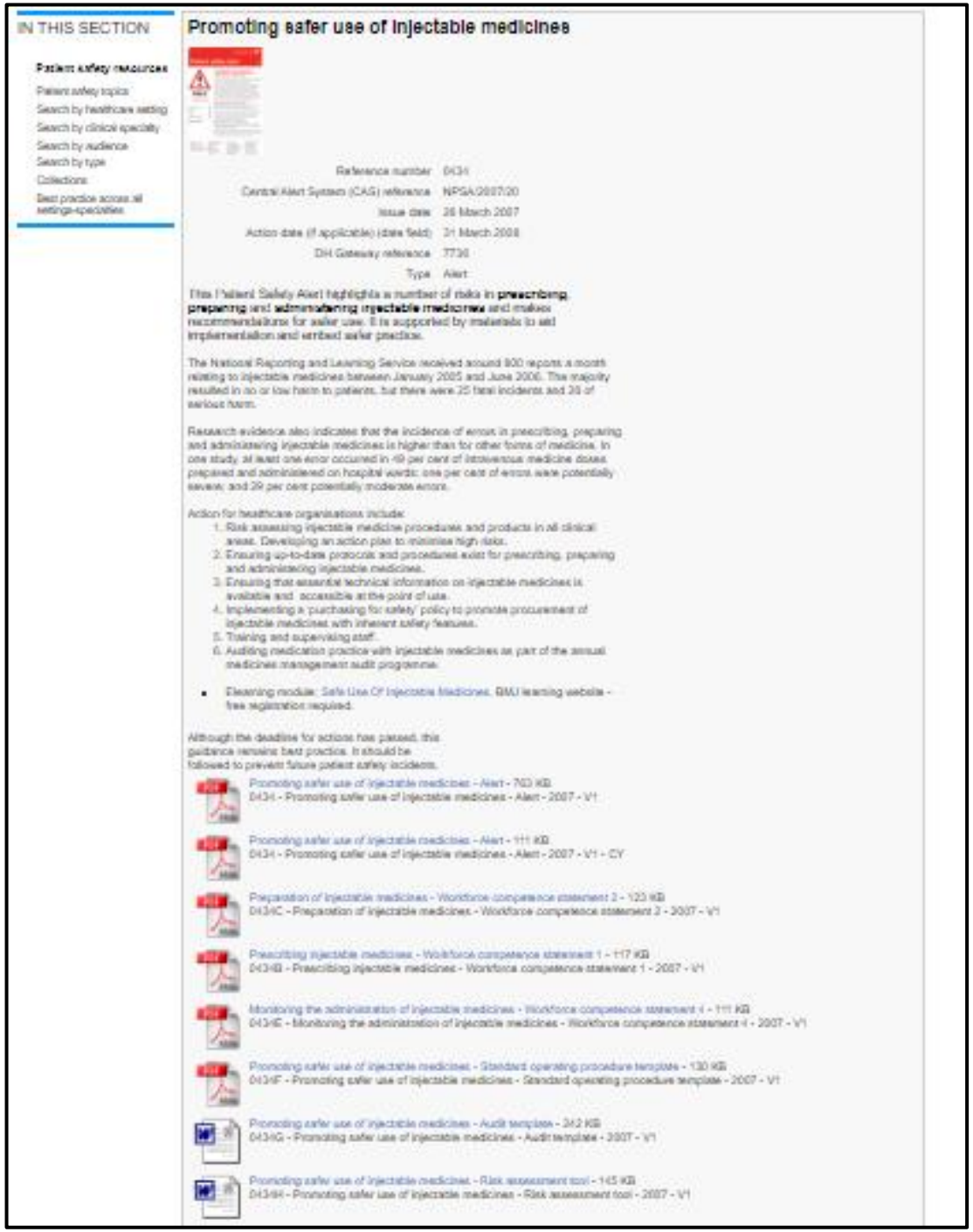
Research evidence indicates that the incidence of errors in prescribing, preparing and administering injectable medicines is higher than for other forms of medicine.[1-2] In one study, at least one error occurred in 49 per cent of intravenous medicine doses prepared and administered on hospital wards; one per cent were judged to be potentially severe errors; and 29 per cent potentially moderate errors[1] (more details about this study are included in the background section on page 6).

Using data from the NRLS and other evidence,[3] the NPSA has identified a number of latent system risks and is making recommendations that can make the use of injectable medicines safer.

Action for the NHS and the independent sector

The NPSA is recommending that all NHS and independent sector organisations in England and Wales take the following steps:

1. Undertake a risk assessment of injectable medicine procedures and products in all clinical areas to identify high risks, and develop an action plan to minimise them.
2. Ensure there are up-to-date protocols and procedures for prescribing, preparing and administering injectable medicines in all clinical areas.
3. Ensure essential technical information on injectable medicines is available and accessible to healthcare staff in clinical areas at the point of use.
4. Implement a 'purchasing for safety' policy to promote procurement of injectable medicines with inherent safety features.
5. Provide training for, and supervision of, all healthcare staff involved in prescribing, administering and monitoring injectable medicines.
6. As part of the annual medicines management audit programme, healthcare organisations should include an audit of medication practice with injectable medicines.



Royal College of Anaesthetists | ACSA Anaesthesia Clinical Services Accreditation

STANDARD

2.2.1.1 All departments should have a policy for the safe and secure handling of medicines that follows "Safe drug management in anaesthetic practice 2020".

EVIDENCE REQUIRED

Copy of written policy. ACSA review team will confirm on walkabout and with staff groups that policy is routinely followed.

PRIORITY

1

CQC KLoEs

Safe; effective; responsive; well-led

HIW DOMAINS

Safe and effective care

HIS DOMAINS

Safe, effective and person-centred care delivery; policies, planning and governance

REFERENCES

2.7.35 All staff involved in the prescribing, dispensing, preparing, administering and monitoring of medicines must be appropriately trained.

2.7.36 All theatre staff involved in any aspects of the use of medicines should have access to up to date resources on safe preparation and administration of medicines, and access to a pharmacy service for advice.

2.7.37 There must be a system for ordering, storage, recording and auditing of controlled medicines in all areas where they are used, in accordance with legislation.

2.7.39 Robust systems should be in place to ensure reliable medicines management, including accurate medication history taking and documentation on admission, medication storage facilities, stock review and management, supply, expiry checks, and access to appropriately trained pharmacy staff to manage any medicine shortages.

2.7.40 All local anaesthetic solutions should be stored in a separate storage unit from intravenous infusion solutions, to reduce the risk of accidental intravenous administration of such medication.

2.7.41 All medication containing infusions and syringes should be clearly labelled and ideally colour coded in accordance with the anaesthesia recommended scheme.

HELPNOTE

The policy should be formulated with particular reference to Appendix C of the Royal Pharmaceutical Society's *Safe and Secure Handling of Medicines guidance* and the RCoA and Association of Anaesthetists' Safe Management of Drugs in Anaesthetic Practice guidance

ROYAL PHARMACEUTICAL SOCIETY

Professional guidance on the safe and secure handling of medicines

All the principles in the core guidance regarding the safe and secure handling of medicines apply to operating theatres (including some interventional areas in hospital settings such as radiology and cardiac catheterisation labs).

C1 As outlined in the core guidance, manipulation of medicines in clinical areas is minimised and medicines are presented as prefilled syringes or other 'ready-to-administer' preparations wherever possible, e.g. infusion bags.

Recommendation

7. In common with the RPS's professional guidance on the safe and secure handling of medicines, the Working Party strongly recommends the use of drugs prepared in prefilled syringes. The presentation of IADs in this format is particularly advantageous, as the majority of prefilled syringes are tamper-evident and would therefore not need storage in tamper-evident containers, the contents of which may be difficult to visualise and access.

Summary -The case for Prefilled Syringes

- The elimination of the multiple steps in preparing an intravenous medication, drawing it into a syringe aseptically and then correctly labelling the syringe is one of the few genuine hard-engineering opportunities to improve the safety of medication administration during anaesthesia.
- Anaesthesia has been left far behind in the implementation of PFS
- Anaesthetists, as the specialists in, and most frequent exponents of, intravenous practice **should now be demanding Prefilled Syringes**.
- If demands are unheeded organisations should record this decision in their Trust Risk Register and address it through their safety management system
- Using PFS for only 50% of injections in hospitals can save NHS £1bn /yr

Merry A, Wahr J, eds. Introduction to medication safety in anesthesia and the perioperative period. Medication Safety during Anesthesia and the Perioperative Period. Cambridge: Cambridge University Press, 2021: 1–17.

The case for Prefilled Syringes

2024