MACOVA 2020

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BD

Pharmacist's role in vascular access

- Highlight which injectable preparations may/always require administration via a central venous access device.
- Provide information on pH and osmolarity on recommended dilutions so you can make a judgement on appropriate access.

This is just one part of the pharmacists role in providing robust information on safe preparation/administration of injectables. Doing this has been a massive task.

I plan to tell you the story so far...

Start | Medusa HomepageHon

www.injguide.nhs.uk/LogonCheck.asp

Medusa

Terms and conditions Copyright

User: Susan Keeling

Organisation: Imperial College Healthcare NHS Trust

IntraVENOUS drugs

IntraMUSCULAR drugs

Ocular injections

Paediatric IntraVENOUS drugs

Subcutaneous drugs

IntraTHECAL drugs

Documents and links

Injectable Medicines Guide

Use the menu bar at the top right-hand corner of this page to select an activity. Each main function area has a drop-down menu, select the activity you want from the drop-down menu. Alternatively use the links on the left hand-side of the page to select an activity.

Introduction to using this Website

Monographs published / deleted in the last two months

About this website

What's New

IVTEAM update
Intravenous updates from IVTEAM.

Shortages list
Shortages, Discontinuations and Patent Expiries

22/10/2019 - Drug alert
Company led drug alert – Docetaxel Injection 80mg /8ml (22/10/2019)

15/10/2019 - Website statistics
The website statistics for the last quarter April to June 2019 have been published at the bottom of the Documents and links page; currently we are serving over 1million monographs per quarter. Individual statistics for your Trust and hospital can be found through the 'Edit Inj Med Guide' menu – click through 'Report' and 'Trust statistics' – be careful to set the start and end dates correctly – they are easy to get wrong.

NHS Medusa injectable medicines guide website

Questions for the audience

- Who is from the UK?
- Is it used in your organisation?
- Is it easy to find on your local intranet?
- Is it linked to electronic prescribing systems?
- Does your version link to local guidelines?

If the answer is ‘no’ to any of these questions; contact your local chief pharmacist and ask why not.

NHS Medusa injectable medicines guide website

Aim of presentation

- What is it
- Why does it exist in the UK
- What does it try to achieve
- How is it used
- What problems does it try to solve

HISTORICAL PROBLEMS

Information available on safe preparation and administration available from lots of different sources

BUT

- No one source documented all necessary information
- Manufacturers information does not provided everything you need to know
- Locally produced guidelines of variable quality.

IV Drug Administration error

- Approx. 237 million medication errors in England annually - 28% have potential to cause patient harm (1)
- Risk of errors is higher for IVs than for other routes of administration (3,4)
- Recent review suggests 10.1% of IV doses in UK contain an error (5)
- WHO (2017) Global Patient Safety Challenge: 'Medication Without Harm' aims to reduce severe avoidable medication-related harm by 50% over 5 years (2)

Infusion Preparation

Preparation

- Mg - 6 out of 30 Samples contained 4-5 times too much Mg (Wheeler et al ICM 2008)

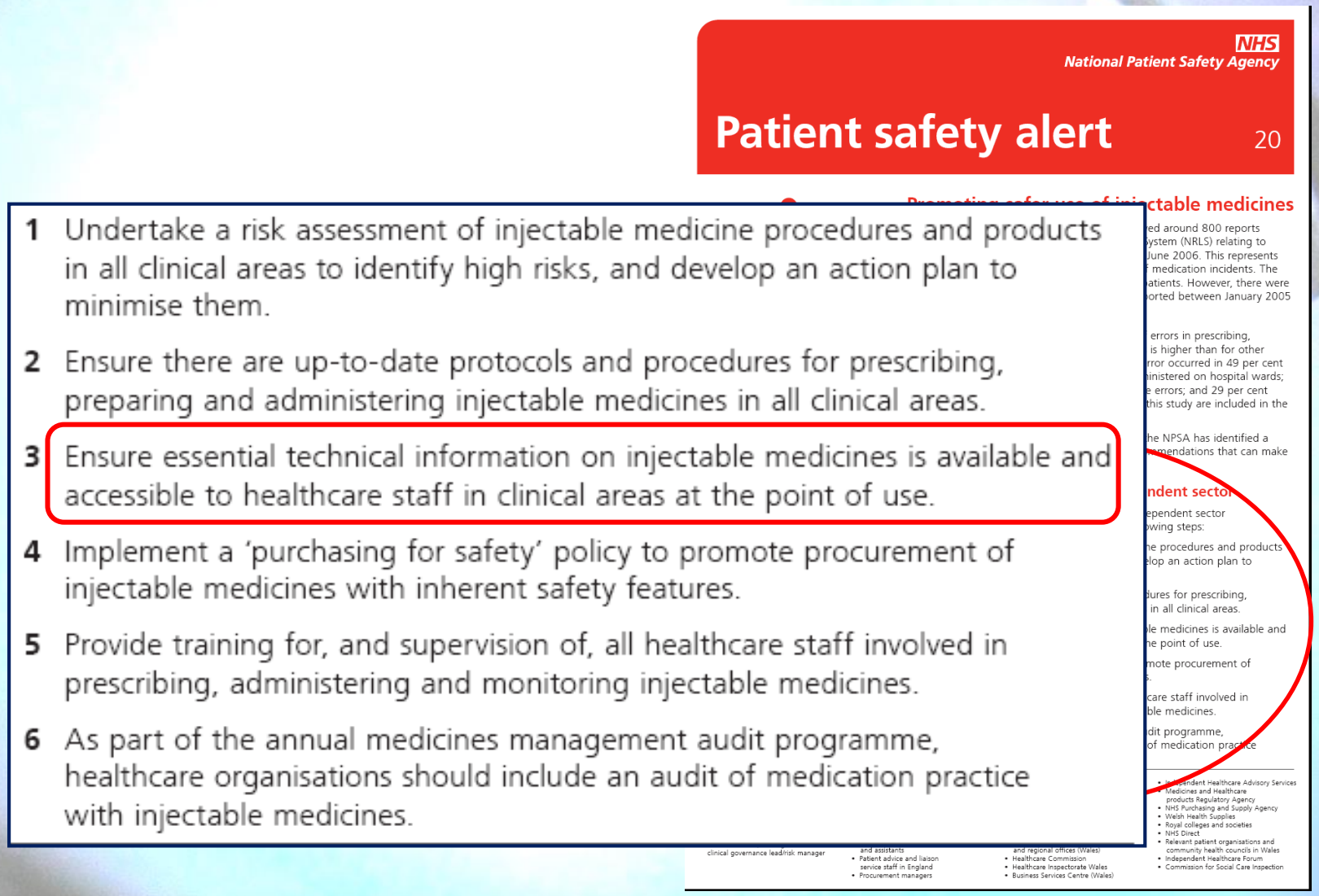
Complex drug regimens

- Progressively more complex drug regimens being prescribed.
- Limited robust information available. RESULTING IN
  - local guidelines produced
  - Many different infusion concentrations in use for the same drug
  - Limited market for new ready to use products

The solution

- 1988 paper IV guide for one hospital.
- Guide was out of date almost immediately – 30 years later I am still doing it.
- Early on other hospitals started to adapt the guide for local use.
- New problem created - Many local guides. All different and of variable quality.
- Consortium established in London to share the work

NPSA Alert 20 (2007)



NHS
National Patient Safety Agency

Patient safety alert 20

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.

NPSA (2007) recommends the injectable medicines guide

3 Ensure essential technical information on injectable medicines is available and accessible to healthcare staff in clinical areas at the point of use.

Some injectable medicines do not have a package insert providing essential technical information about preparation and administration, or the information is insufficient to fully meet the needs of all healthcare staff. For example, an incompatibility between the diluent, infusion, other medicines or administration devices, and associated administration equipment. This technical information is not available in commonly used medicines references such as the British National Formulary.

A detailed guide to the safe preparation and administration of common intravenous medicines is available via NHSnet. The Injectable Guide is produced by pharmacists based in approximately 100 different UK hospitals and co-ordinated by the pharmacy department at Hammersmith Hospitals NHS Trust. A new partnership between The Injectable Guide and United Kingdom Medicines Information Service (UKMi) has been formed to expand and develop the content and availability. Contact details concerning this guide are available at: **www.npsa.nhs.uk/health/alerts**

THE INJECTABLE MEDICINES GUIDE WEBSITE IS BORN

- Aims to reduce duplication of effort across the UK and help make poor quality out of date guidance redundant
- A collection of drug monographs with all necessary information in one place.
  - Separate adult and paediatric versions

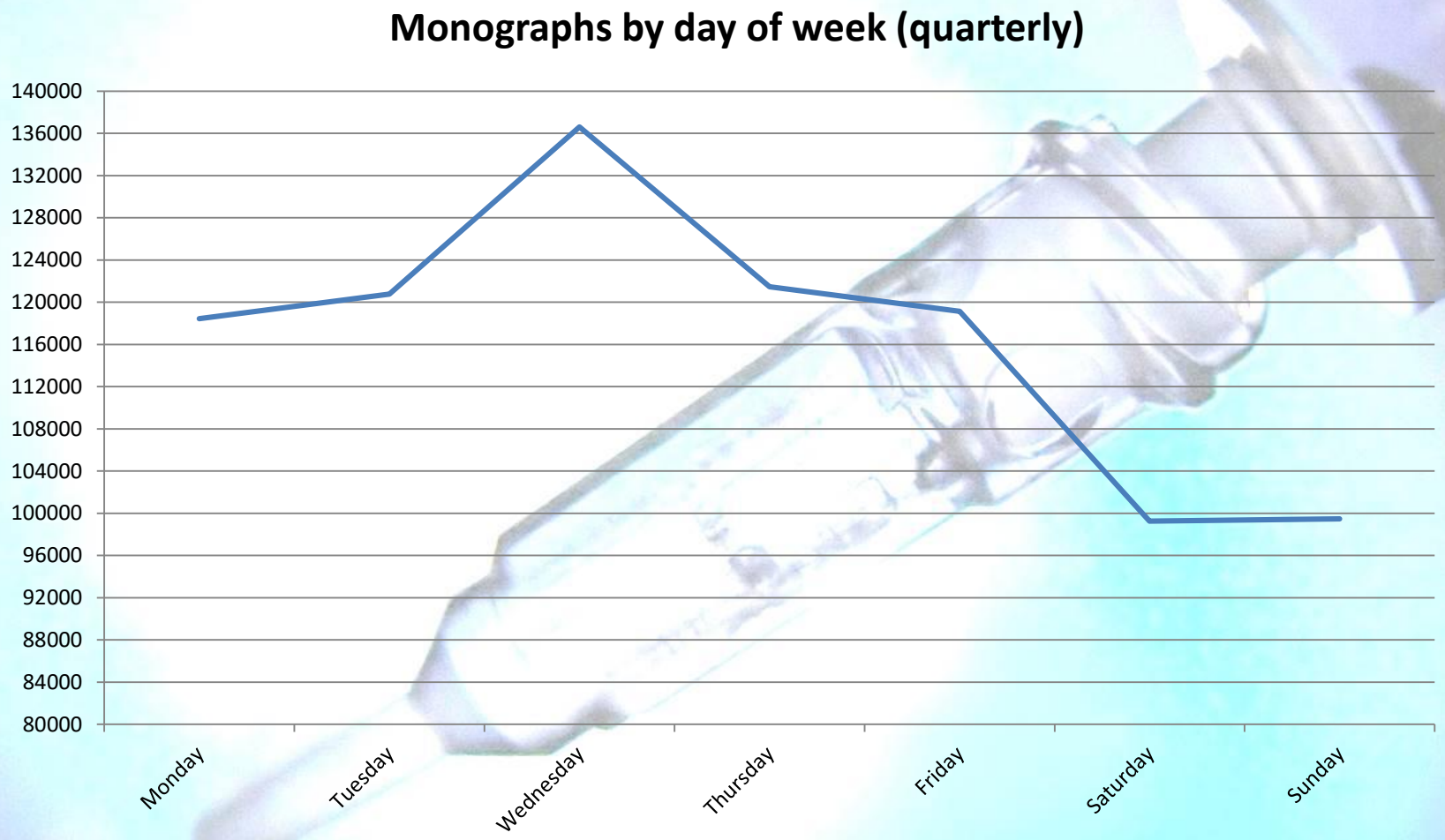
Up to date guidelines – the solution

- A comprehensive (referenced) user guide available to ALL is needed (NPSA alert 20)
- Multidisciplinary input essential
- Centrally held, up-to-date, user friendly and easily accessible 24 hours a day
  - Injectable medicines guide website (‘Medusa’)
  - Produced by a pharmacy consortium across UK
  - Local guidelines/eprescribing can be ‘linked’
  - New issues can be quickly highlighted to all

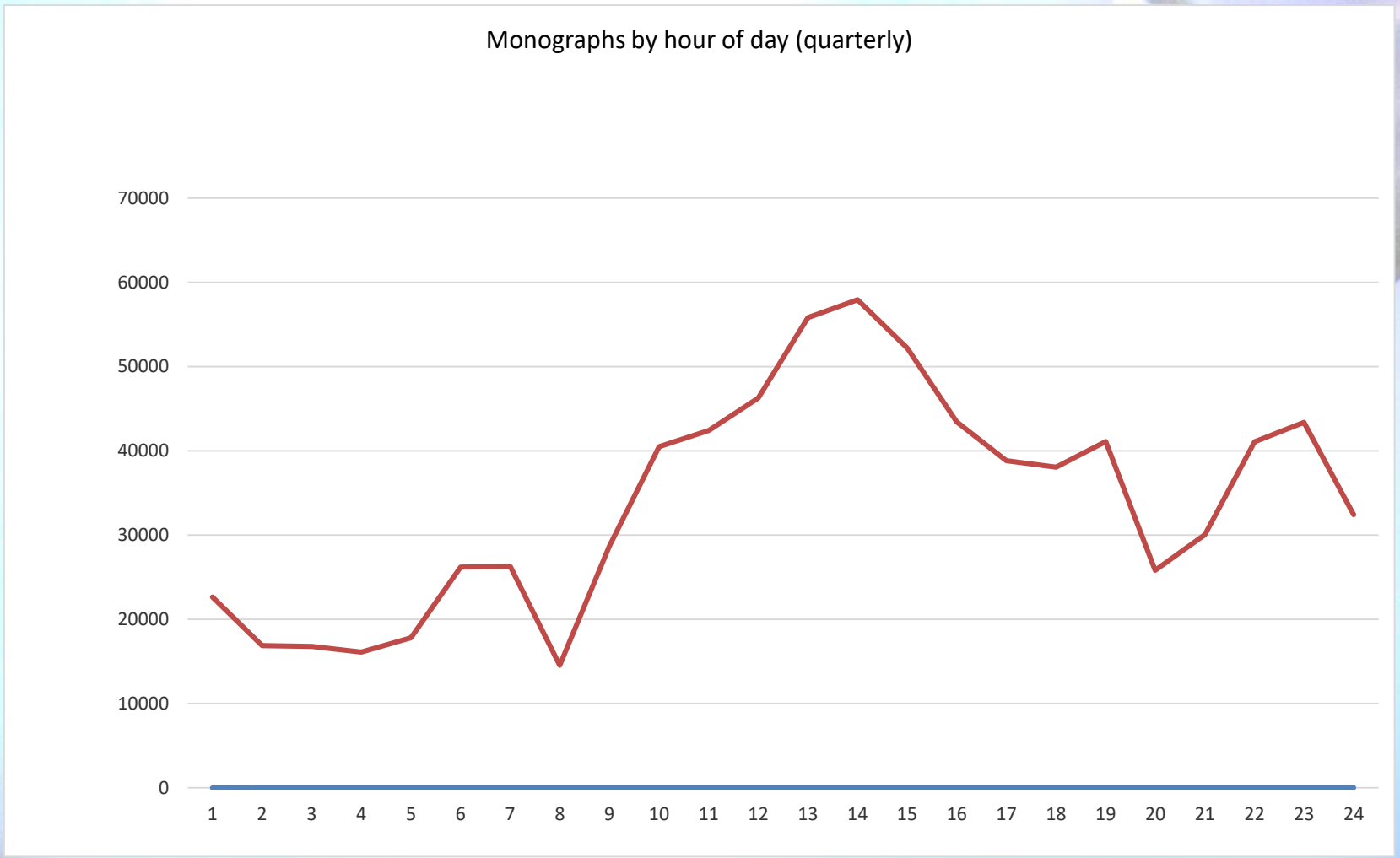
HOW OFTEN IS IT USED?

- In some hospitals, wards have full access and these typically reach usage of over 10,000 monographs per month
- Some hospitals provide printed copies to wards
- Some hospitals, a Pharmacy information source only
- **Usage**
- Typical usage – 350,000 monographs per month
- Usage overnight and at weekends

When is it used?



What time of day is it used



What does a monograph try to do?

- Interpret the SmPC and package leaflet in a user friendly way.
- Fill in the gaps missing in other resources e.g. BNF – licensed products only.
- Highlight important differences between different generics.
- Link to new medicine related ‘issues’ can be added.
- Link to local guidelines can be added
- Link to computerise prescribing systems possible
- Provide an electronic calculator/example calculation tables
- Highlights poor quality product labelling

Print monograph

Intravenous - ADULT

Ceftriaxone

LINKS TO RELATED MONOGRAPHS AND OTHER INJECTABLE ROUTES:

Ceftriaxone - Intramuscular

Contains a PENICILLIN-like structure (see 'other comments' section below)

'HELP' text is available for most monograph headings; click the monograph heading or the icon.

MEDICINE NAME:

Ceftriaxone

TRADE NAME(S):

Rocephin® (Roche)
Ceftriaxone (non-proprietary)

PRESENTATION OF MEDICINE:

Vials containing ceftriaxone powder for reconstitution (as sodium salt).
Strengths available: 250mg, 1g and 2g.(1)

METHOD OF ADMINISTRATION

IV injection: Give over 5 minutes, preferably into a large vein.
IV infusion (preferred method): Give over at least 30 minutes.(1,5)
Doses of 4g may be given by administering 2 x 2g infusion vials back-to-back, by adding the total dose to an infusion bag, or by giving 2g twice a day.

INSTRUCTIONS FOR RECONSTITUTION

IV injection: Reconstitute with water for injections to obtain a 100mg in 1mL concentration, e.g. reconstitute a 1g vial with 10mL.
IV infusion: Reconstitute with sodium chloride 0.9% or glucose 5% to obtain a 50mg in 1mL concentration e.g. reconstitute a 2g vial with 40mL.(1)

Nursing advantages

- Reduce time spent on infusion preparation because all necessary information is in one place
- Simplifying preparation should help reduce error:
  - Calculation errors
  - Reconstitution errors
  - Diluent errors
  - Infusion rate errors
  - Labelling errors

‘Help’ text and why it helps

Monograph headings have ‘help’ text to explain information in each heading and the rationale for the stated information.

Where does Medusa recommendation on central administration come from?

Previous RCN Standards for infusion therapy: Central administration for preparations

- pH less than 5 or over 9
- Osmolarity greater than 600mOsmol/L

Current VHP guidelines (see 'help' text) match this.

Pharmacists need a reference!

- pH/osmolarity not in SmPC so has been measured or calculated if unavailable from manufacturer. Manufacturers often reluctant to provide this information.

Method of administration section

- States if an infusion must be administered via a central venous access device e.g. potent vasodilators.
- ‘This medicine’ has a low/high pH/osmolarity and may cause venous irritation and tissue damage in cases of extravasation. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely using a recognised phlebitis scoring tool. Resite cannula at first signs of inflammation.

MANAGEMENT OF ETRAVASATION

- Work going on to produce a generally acceptable management of extravasation guideline to include all IV's not just cytotoxics which can be adapted locally if necessary. Medusa will include this once it is finalised.
- 'Documents and links' page of website has local guidelines listed which people have been happy to share with us.

Where does infusion pump recommendations come from?

- No document specifies which infusions should be given using a pump
- Paediatrics: Pump recommended for all infusions.
- Adults: MHRA guidance for HCP's on using and managing infusion systems – Dec 2013
  - now withdrawn but still available and used as guidance since nothing else has replaced it

Example calculations and an electronic rate calculator

- NPSA Alert request to include in 'Medusa' monographs
- Impossible to do because :-

➢ Locally areas had standardised on a set of infusion concentrations but these differed across the UK

➢ SmPC's recommend a diluent but often do not recommend a specific concentration /volume

Infusion concentrations – the problem

- Infusions traditionally made in clinical area so subject to personal opinion
- Manufacturer/BNF provides information on diluent to use but not necessarily the dilution to prepare.
  - Multiple methods locally adopted – often inconsistent not just between hospitals but also between different clinical areas of same hospital
- 'Standard' UK wide concentrations needed

Why are standard infusion concentrations needed?

- Helps to avoid confusion day to day and when staff move.
- Example calculation tables which work for most scenarios can be added to monographs.
- ‘Big Pharma’ can consider new ready to use preparations with a bigger market – lower cost.
- Drug libraries for SMART pumps can be more easily created locally mainly to match other units. Is a national drug library achievable?

Infusion concentrations – the solution

- National surveys to establish standard infusion concs acceptable to most (adults and paeds)
- Recommended list (endorsed by ICS/FICM) produced - includes 16 commonly used infusions. More under discussion.
- Critical care areas encouraged to use the list.
- Medusa monographs updated to reflect agreed concentrations.
- Example calculation tables and calculator developed

EXAMPLE CALCULATION:

The infusion rate can be calculated from the following equation:

$$\text{Glyceryl trinitrate infusion rate (mL/hour)} = \frac{\text{Dose (micrograms/minute)} \times 60\text{(minutes)}}{\text{Concentration (micrograms/mL)}}$$

For example: To administer a dose of 100micrograms/minute of glyceryl trinitrate using a solution of 50mg in 50mL (1mg in 1mL; 1000micrograms in 1mL), the calculation would look as follows:

$$\text{Glyceryl trinitrate infusion rate} = \frac{100\text{(micrograms/minute)} \times 60}{1{,}000\text{(micrograms/mL)}} = 6\text{mL/hour}$$

Show Calculator

Calculate Glyceryl trinitrate infusion rate (mL/hour) from dose

Dose ____ (micrograms/minute) X 60 (minutes) = ____ (mL/hour)

Concentration ____ (micrograms/mL)

Perfom calculation | Alternative calculation method (calculate Dose from Infusion rate)

NB: Infusion pumps can only be set to one decimal place. If the calculation produces a figure to two decimal places when setting the infusion pump figures of 0.05 and above should be rounded UP to the next decimal place and figures below 0.05 should be rounded DOWN. e.g. 5.25mL/hour should be rounded up to 5.3mL/hour.

Link to example calculation tables: The table provided by the following 'link' details calculated infusion rates for a selection of doses of glyceryl trinitrate using a 1mg in 1mL (1000micrograms in 1mL) infusion **Link to table**

THE FUTURE

- Medusa Advisory board needs more input from nurses and medics. Currently top heavy with pharmacists.
- Redesign of website based on Bath university project
- App
- Other routes
- Cytotoxics
- BNF dose link to top of monograph. We have purposely not included doses as doing so is a potential risk
- Work more closely with all multidisciplinary groups, BNF, eMC, similar international initiatives and ‘big Pharma’

References

- 1. Elliott RA, Camacho E, Campbell F, et al. Prevalence and economic burden of medication errors in the NHS in England. Policy Research Unit in Economic Evaluation of Health & Care Interventions; 2018.
2. Medication without harm - Global Patient Safety Challenge on Medication Safety. Geneva: World Health Organization; 2017.
3. McLeod MC, Barber N, Franklin BD. Methodological variations and their effects on reported medication administration error rates. *BMJ Qual Saf* 2013;22:278-89.
4. Keers RN, Williams SD, Cooke J, et al. Prevalence and nature of medication administration errors in health care settings: a systematic review of direct observational evidence. *Ann Pharmacother* 2013;47:237-56.
5. Sutherland A, Canobbio M, Clarke J, et al. Incidence and prevalence of intravenous medication errors in the UK: a systematic review. *Eur J Hosp Pharm* 2018;

Further information on the website

Please come and talk to me today

OR Email me

Keeling.susan@nhs.net

Demonstration version of website

www.injguide.nhs.uk

User name: Ivdemo

Password: Bolus7