Department of Pharmacy Practice
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INTRAVENOUS MEDICINE COMPATIBILITY: AN EVALUATION OF HOSPITAL PRACTICES

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Objectives

- To determine the usage of catheters and connectors within intensive care units (ICUs) of a hospital in England.
- To identify the types of medicines that are co-infused via Y-site and frequency of this practice in ICUs.
- To determine if intravenous (IV) medicine compatibility is checked before co-administration.

Methods

An inception cohort study was conducted across four ICUs (2 Adult, 1 Cardiothoracic and 1 Neuro ICU) in a large teaching hospital in England. A data collection tool was designed, piloted and used on the ICUs to record (per admitted patient) the use of catheters and connectors, types and frequency of co-infusions and means by which drug compatibility was checked. Data collection was carried out for a period of 7 days or until the patient was discharged. The study was designated as a service improvement and registered with the teaching hospital. All patient data was kept anonymous.

Results

- Out of the 49 patients followed in the study, 29 of those admitted for the 7 day period received two or more co-infusions through the same catheter.
- A total of 142 catheters were used, of which 40 (28.2%) were central catheters with varying numbers of lumens.
- A total of 244 connectors were used of which 65 (26.6%) were Y-site connectors (Figure 1).

Figure 1. Triple lumen central catheter (left) and a Y-site connector (right)

- There were 114 cases recorded of medicines co-administered, which varied in the number of drugs combined (Figure 2).

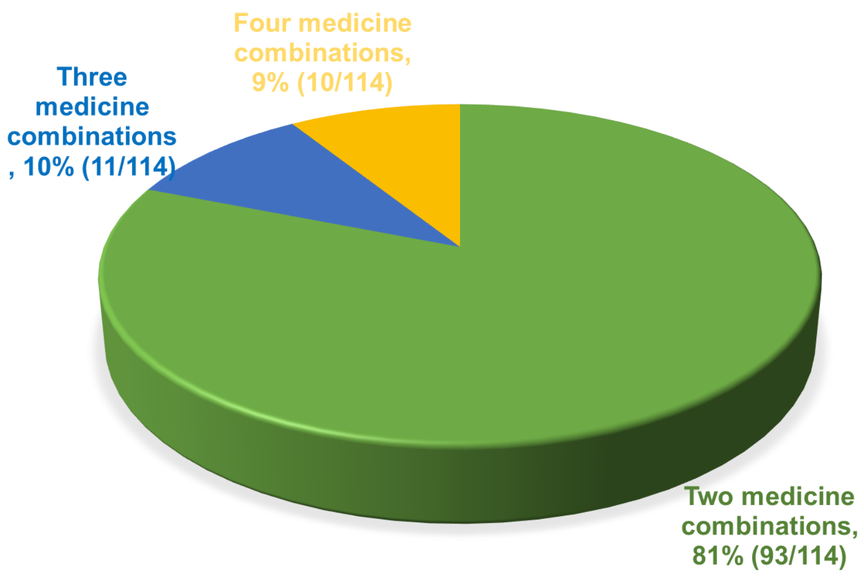

Figure 2. Percentage of number of medicine combinations co-administered

- Thirty medicine combinations were recorded of which propofol and fentanyl were the most frequently administered 39% (45/114).
- Compatibility was checked 90 out of the 114 cases (78.9%) with the remainder either not being verified or not done/checked.
- Of the 90 checked cases, 41.1% (37/90) were based on nurses' experience, 21.1% (19/90) on the compatibility chart and the rest by other means (Figure 3).

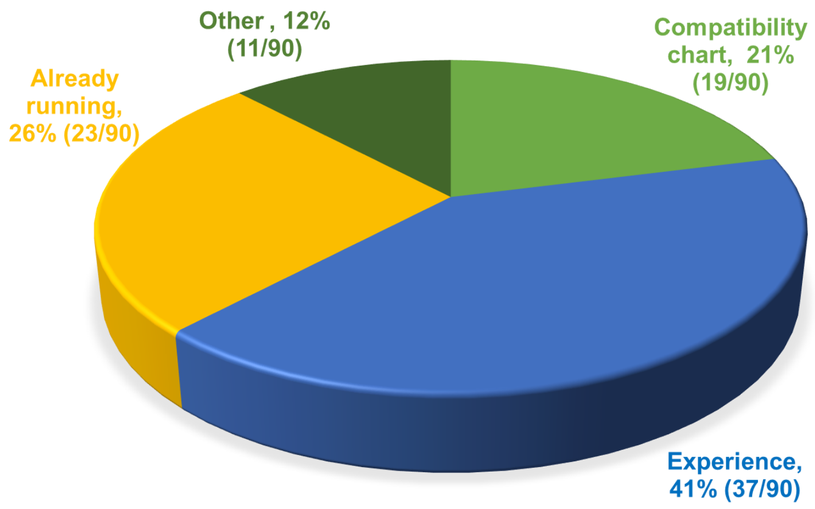

Figure 3. Percentage of different ways compatibility was checked

Discussion

Co-administration of multiple intravenous medicines is usually facilitated by a Y-site connector where medicines combine before entering the bloodstream. Compatibility must be ensured for the safe delivery of IV medicines as incompatibility has the potential to compromise therapeutic efficacy or cause an adverse effect.

Nurses had access to an evidence based comprehensive compatibility chart to assist with checking compatibility (Figure 4).

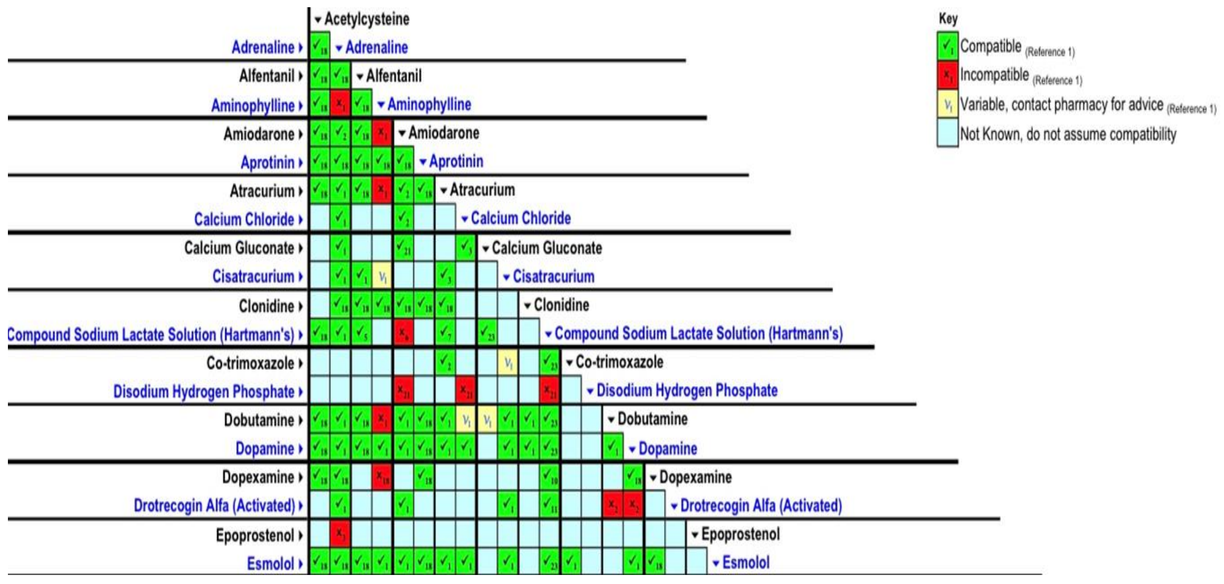

Figure 4. Thames Valley compatibility chart[1]

However, the most common way of checking compatibility was by nurses anecdotal experience. The chart reflects data for two medicine combinations but in some cases three or four medicines were combined. There is no clear explanation as to how compatibility was confirmed in such cases.

Conclusion

Co-administration of multiple medicines via Y-site connector seems to occur frequently in ICUs. Further work is needed to explore the rationale for how nurses make decisions regarding the co-administration of two or more medicines down the same line and how this may affect patients.

References

1. Thames Valley Critical Care Network Pharmacists Group, Thames Valley Y-Site Intravenous Drugs Compatibility Chart, (2011)

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