Collecting data to look at Central Line Associated Blood Stream Infections

Every unit will have developed their own method of data collection and what works in some may not work in others! The following is a collection of tips and definitions that are commonly used which people may find of use.

Definitions

Central Venous Catheter

An intravenous catheter that terminates at or close to the heart in one of the great vessels and which may be used for monitoring, delivering drugs or sampling blood.

In paediatrics this will include lines placed in the great veins (femoral, subclavian, internal or external jugular, umbilical) but also long lines sited more peripherally, where the line terminates in a great vein.

Note the CDC criteria do not consider ECLS cannulae as central venous cannulae but centres providing ECLS support will generally be collating evidence of blood stream infections and reporting it to the Extracorporeal Life Support Organisation.

Patient days

The number of patients admitted to the unit x their length of stay in days.

CVC patient days

The number of patients on the unit who have at least one central venous catheter (CVC) in situ x the length of time in days that the line is in situ for.

This will generally be less than your patient days as not all patients admitted will have a CVC in situ for any / all of their stay.

Total CVC days

Some patients may have more than one CVC in situ. So if they have 2 CVC's and are on the unit for 10 days that would equate to 20 CVC days. If you're collecting both – this number will never be less than your CVC patient days.

 The commonest denominator and the one that is used by the CDC (Centers for Disease Control and prevention) is CVC patient days. Whichever you choose doesn't matter as what you're looking at is trends over time. The advantage in using the CDC definition is comparable targets.

Again individual units will collect this data differently. Some have chosen to add it to their Paediatric Critical Care Minimum Dataset (PCCMDS) forms, others do a paper audit once a day, others have electronic patient records and can capture the data from this.

Central Line Associated Blood Stream Infection

A laboratory confirmed blood stream infection where a central line was in place for > 2 calendar days on the date of the event or within 48 hours of the line being removed.

To meet criteria for a laboratory confirmed blood stream infection as a result of a central line, the child must have:

- A positive blood culture for a pathogenic organism
- Signs and symptoms of a systemic inflammatory response
- The organism is not related to infection at another site

If the organism grown is a skin commensal, then the CDC criteria require 2 positive cultures with the same organism.

Different centres may choose to treat as a line infection with only one positive culture with a skin commensal organism depending on the child's clinical state e.g. a preterm neonate.
Similarly to above whether you choose to stick to CDC criteria or incorporate wider criteria isn't important as you will be following your own trends over time and looking to see what interventions make a difference.

Validating infections

Again every centre will have their own way of doing this. Ideally it should involve both the clinical team caring for the child who will know the clinical context and also the microbiology team. Some centres review their data with an infectious diseases consultant.
It's useful in looking at cases to identify preventable factors and recurrent themes. This can allow targeted risk reduction strategies.

What is important about the data is a sense of staff ownership and responsibility. If its devolved to a remote group with limited bedside input, it's harder for the bedside staff to either be aware or perceive momentum to improve.