Significant Event Audit Case Example: Fentanyl CRI overdose

Section A: Case example on the six stages of a significant event audit

A Significant Event Audit (SEA) is a retrospective audit, which looks at one case in detail from beginning to end to either increase the likelihood of repeating outcomes that went well or to decrease the likelihood of repeating outcomes that went badly. SEAs may result in further development of guidelines, protocols or checklists and may result in the need for additional clinical audits (process/ structure or outcome). SEAs are conducted by bringing your team and the relevant case notes together to discuss the event. It is important that the event is discussed without any blame – allowing team members to provide honest and constructive feedback on how they contributed to the care process. An SEA is completed in 6 stages. The following points will take you through the steps that this practice took to put an SEA into practise.

1. Identify the significant event

Create a brief description of the event, context and outcome to be discussed in the meeting.

In this case a syringe driver delivering a constant rate infusion (CRI) of fentanyl was set to deliver sixty times the patient's dose. This overdose resulted in the patient's heart rate and blood pressure falling lower than expected while under general anaesthesia. This event was identified and rectified with no harm to the patient.

2. Collect all of the relevant information

Gather all relevant information, such as case files and staff accounts etc., which contribute to the case.

Information was collected from the staff members involved in the incident; the clinician directly involved in the care of the patient; hospital sheets and records; and the staff working in the clinical areas.

3. The meeting and analysis

In a team discussion regarding the event, analyse the event and its causes to suggest where changes can be made. Indicate changes that could aid in achieving the desired outcome. It is important to ensure this meeting provides an environment where all staff members are encourage to speak freely and honestly.

A meeting was led by the anaesthesia team, along with the medical team, senior nurses and the ward nurse. The results of the meeting were split into factors that affected the overall results. These were system, human, patient, owner, communication and other. This creates a blame-free meeting, looking at all contributions and getting input from all members of staff. The identifying factors which led to this event were system, people and communication factors. It is possible that other factors also led to the event.

4. Decide what changes need to be made

Confirm which changes should be made, and make a prediction on the effect this will have. It may be that no change is required or there is only a need to disseminate the findings. Where changes are made, they could be in the form of checklists, guidelines or protocols. Following the meeting, a final report detailing the key points raised in stages 1-4 should be written.

In this case the changes discussed in the meeting covered a wide scope, with changes needing to be implemented in numerous areas. These included new standard operating procedures, training for all members of staff and the continuation of embedding a learning culture.

5. Implement the changes

Develop an action plan. What needs to be done by whom, when and how? Ensure the whole practice team is aware of the changes and what role they play in implementing them. Monitor the changes once implemented and set a time to review them. The length of time required for monitoring will be dependent on the event.

Standard operating procedures were put in place for each type of syringe driver and individual training was supplied on their use. Extra syringe drivers were purchased to that departments did not have to share equipment.
Training is to be supplied to team members involved with booking procedures. Rescheduling will take place to ensure that team members have time to care for individual patients appropriately and to ensure that they do not feel rushed to move onto the next patient.

6. Review the changes

The team should sit down together to review the changes and discuss what went well and what didn't. You could also share what you have found with clients and the profession. Further audit may be required to monitor the change.

Process audits will review how consistently the standard operating procedures for fentanyl use are being adhered to. These audits will take place in four months' time [the practice should set a precise date]. You can find out more about process audits at https://knowledge.rcvs.org.uk/quality-improvement/tools-and-resources/clinical-audit/.

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Section B: Significant event audit after a fentanyl CRI overdose.

Title:	Significant event audit after a fentanyl CRI overdose
Date of significant event:	09/04/2018
Date of meeting:	20/04/2018
Meeting lead:	Anaesthesia department
Team members present:	The whole practice team

What happened?

A patient was placed on a fentanyl continuous rate infusion (CRI) to manage operative pain.
The syringe driver to deliver this CRI was set at the correct dose but the rate of delivery defaulted to micrograms per kilogram per minute (µg/kg/min) rather than the micrograms per kilogram per hour (µg/kg/hour) that had been calculated, resulting in the patient receiving an overdose of fentanyl that was sixty times the normal dose.

This overdose resulted in the patient's heart rate and blood pressure falling lower than would be expected. The dog was examined and the syringe driver infusion rate error was found. The CRI was immediately stopped, the sevoflurane concentration reduced and a dobutamine infusion commenced. The fentanyl was reversed with naloxone, given to effect. These actions resulted in the heart rate and blood pressure returning to normal and the surgery was able to proceed 15 minutes later with the fentanyl infusion restarted at the correct infusion rate. No lasting patient harm occurred and the owner was informed of the error.

<u>At the SEA meeting we found out the following</u>

A new syringe driver had recently been purchased and it had not been realised that it defaulted to deliver an infusion rate in micrograms per kilogram per minute (µg/kg/min) rather than micrograms per kilogram per hour (µg/kg/hr). The settings changed when the syringe driver, which was normally only used in theatres, had been removed and used in in-patient wards. The other syringe driver in the practice, which was a different make and model, returned to a default millilitres per minute (ml/min) each time it was used. The clinician setting the infusion rate was under time pressure and whilst inputting the correct dose in µg/kg had not appreciated that this dose was going to be delivered every minute rather than every hour.
The syringe driver had been borrowed by the ward staff without communicating this to the anaesthesia staff, or realising that this syringe driver did not return to a default setting. It was noticed by the nurse assisting the procedure that the syringe was emptying far faster than they would normally expect but this did not result in the syringe driver being checked or the dose rate being questioned.

Why did it happen?

System factors:	New syringe driver used without knowledge of instructions
Human factors:	The clinician involved was under time pressure and did not double check the infusion machine rate.
Patient factors:	None
Owner factors:	None
Communication factors:	No communication between the anaesthesia and ward departments.
Other:	Learning and questioning culture not embedded which would have encouraged the nurse to question the flow rate.

What has been learned?

As the practice has become busier, time pressures have mounted on team members, particularly on days when there are a large number of operations that need to be undertaken in the two theatres. Resources need to be allocated to allow efficient movement of cases into theatre, whilst ensuring that sufficient staff are available to support other areas of the practice and that each member of staff feels that they have sufficient time to complete tasks appropriately and safely. Ultimately non-urgent procedures may need to be rescheduled.

With practice expansion there are many new members of the team, making it critical that there is a focus on properly embedding a learning culture as part of the induction training.

It is important to make sure all team members have the confidence to report something that seems 'odd' or 'unusual' to them, particularly where it involves patient care. It was felt, in this specific case, that it was not a lack of confidence to speak out, but more that the nurse who observed the rate at which the syringe driver was emptying had not connected this with the fact that the dose rate might be wrong.

Whilst it is critical to ensure that reporting of any concerns is appropriate and timely, team members should also raise concerns to the correct person, particularly on busy days. This will avoid clinicians being over burdened with issues that can be managed by other members of the team.
Team members need to feel able to communicate with each other when they are feeling stretched and be more vigilant to identify potential errors.

What has been changed?

CPD/ training required:

- All team members involved with patient care will be trained in the use of the varying models of syringe drivers in practice.

New or updated protocols/checklists/guidelines:

- Standard operating procedures will be written for each type of syringe driver
  - A two person procedure for CRI will be instituted:
  - Person A (usually the clinician) will calculate the dose in micrograms/milligrams per kilogram and the micrograms/milligrams per patient and write this down on the hospitalisation or anaesthetic sheet along with the rate (minute/hour/day) and set the syringe driver.
  - Person 2 will read aloud the dose per kilogram, weight of the patient, does of the patient and the rate. This will be checked against the settings on the syringe driver and the initial patient notes.

Further audit required:

- A process audit will be completed to assess how consistently the two person procedure has been followed for all cases prescribed with a fentanyl CRI.

Other:

- Move to one type of syringe driver in the practice to facilitate easy set-up and to minimise errors.
- Continue to embed a learning culture so that all staff feel able to question a procedure.
- Help the learning culture develop easy-to-remember maxims regarding concerns.
  - "see it, say it, sort it"
  - "If it doesn't look right to you then tell someone"

Interested in submitting your own case example? Email us at ebvm@rcvsknowledge.org