University Hospitals Sussex

St Richard's Hospital
Spitalfield Lane
Chichester
West Sussex
PO19 6SE

14th March 2023

Dr K Henderson

Assistant Coroner for the County of West Sussex

Coroner's Office

West Sussex Record Office

Orchard Street

Chichester

West Sussex

PO19 1DD

Dear Dr Henderson,

RE: Regulation 28 Report to Prevent Future Deaths – Teegan BARNARD

I am writing in response to the Regulation 28 Report issued following the Inquest into the death of Teegan Marie Barnard.

Following Teegan's death there has been intense focus to ensure that our maternity services are of the highest quality and are safe, and this is ongoing.

Following the CQC visit to our maternity services in 2021 we have worked with the Maternity Safety Support Program (MSSP) and developed our Maternity Improvement Program (MIP) with their support.

We have also worked hard to achieve the requirements of year 4 of the Clinical Negligence Scheme for Trusts (CNST). The Trust achieved 154 of the 155 requirements for our submission which is a huge achievement and is indicative of our focus on the safety of our maternity services. Our evidence was rigorously assessed by the internal auditors (BDO) and reviewed by the Local Maternity and Neonatal system governance lead and ICB panel.

The Trust is also confident that the staff involved worked to the best of their abilities during this tragic event.

In the Regulation 28 Report concerns are raised about the following issues.

1. The resuscitation algorithm (4H's and 4T's) for PEA arrest
2. Surgical emphysema
3. The Investigation following Teegan's death.

4. Trust Clinical Governance procedures.

Our responses are outlined below but also address matters of factual accuracy.

(1) The resuscitation algorithm and (2) surgical emphysema

You have raised concerns that although there are 8 contributory causes of Pulseless Electrical Activity (PEA) cardiac arrest (the 4H's and 4 T's), only one of these, tension pneumothorax, also causes a sudden inability to ventilate a patient; it was therefore determined that there was a delay in the team identifying this as the cause of the PEA arrest. Concern has also been raised that there was a delay in the team identifying surgical emphysema despite the presence of indicative signs.

The Trust has been copied into the PFD response from the Royal College of Anaesthetists and UK Anaesthetic Association and note their comment that Bilateral pneumothoraces occurring on emergence from a general anaesthetic, especially one for surgery that did not include thoracotomy or thoracoscopy, is so rare that most anaesthetists will never encounter such a situation.

However, the Trust recognises that for staff to perform optimally in extremely challenging situations such as maternal cardiac arrest appropriate training is essential. The Trust has therefore taken action to ensure all the appropriate members of the Multi-Disciplinary Team (MDT) have received the necessary training to be able to manage obstetric emergencies. An audit conducted in January 2023 demonstrates that over 90% of the obstetric, anaesthetic and midwifery staff that work within the labour ward environment across the entire organisation had received this MDT training. This reaches the stringent standards set for training by the Clinical Negligence Scheme for Trusts year 4 requirements. Of note maternal collapse has been a scenario within the training program since the beginning of the year and includes reference to the 4H's and 4T's.

There has been a strong commitment to learning from these events from the anaesthetic team as well as the wider MDT. The following points demonstrate that commitment:

a. Team learning at structured clinical governance events.
b. Inclusion of the management of tension pneumothorax in the regular SIM sessions for the anaesthetic trainees at St. Richard's Hospital. This includes the significance of facial swelling and surgical emphysema. The trainers are planning SIM demonstrations of all the national anaesthetic regulation 28 notices and will play the recordings at teaching and clinical governance meetings.
c. The Trust's anaesthetists have carefully reviewed The Royal College of Anaesthetists (RCA) guidance on the management of increased airway pressure for the ventilated patient which forms part of their Quick Reference Guide to Anaesthetic Emergencies Quick Reference Handbook (QRH) | The Association of Anaesthetists. Although the current handbook does not refer to surgical emphysema or tension pneumothorax in the management of increased airway pressures, we also note that, in their response to the PFD, the RCA and AA will share the learning that bilateral pneumothoraces can be a cause of failure to ventilate leading to cardiac arrest in the absence of trauma or thoracic surgery- through the SALG's Patient Safety Update.

We believe that it is important that the evidence of [redacted], the obstetric anaesthetic expert witness at the inquest is considered as context to the findings of the Regulation 28 Report. [redacted] verbatim comments reflect on the actions of the team and are shown below.

"I am satisfied that the medical team that responded and were working in the early hours of 10th September, their actions were reasonable and what was done, was done in a timely manner".

"I am satisfied that the team were thinking what on earth could have caused this. There was anaphylaxis and or angioedema, as a combined diagnosis and they were thinking what has this patient had - a Caesarean section, Post-Partum Haemorrhage, therefore the H (Hypovolemia) due to massive blood loss was such they pre-emptively without any evidence of blood loss activated the major obstetrics haemorrhage plan, I think the 4 H's and 4 T's were being thought of."

"Having read the statements and putting myself in the position of this team, although they were treating, it was not blind or obvious. I don't think I would have stuck needles in the chest earlier. The opening of the abdomen was 2- fold; to release the gas but also to stop any bleeding. The most likely (cause of) deterioration of a woman who collapsed (on labour ward), looking as an obstetric anaesthetist, is that there has been some sort of catastrophic haemorrhage, because that is where the surgical activity has been, they opened the abdomen, released the gas and ROSC and there was no bleeding."

(3) Investigation after Teegan's Death

The coroner raises the concern that there was no local investigation by the anaesthetic team before or after the HSIB report. However, initiating a local investigation in parallel to the HSIB investigation would have been contrary to national guidance.

The Trust followed the recognised process for a maternal death and the incident was notified as a Serious Incident with a 72-hour report submitted at the appropriate time. This was followed by notification to HSIB. The incident fits the HSIB criteria, and the appropriate guidance was followed in response to the event. Of note, the guidance to Trusts from HSIB states: -

Our maternity investigations have replaced a trusts' internal maternity serious incident investigations. We involve the trust and share the investigation reports as they are completed. Trusts continue to investigate maternity events that fall outside the specified criteria. (Information for trusts and staff — HSIB)

The anaesthetic team cooperated fully with the HSIB investigation and responded comprehensively to the draft report. The outputs were discussed at length within the Trust in a number of forums and continues to be, including at the Intensive Care and Maternity Mortality and Morbidity meetings. This feedback was not fully reflected in the final report.

Trust Clinical Governance Procedures

Although the Trust followed existing national guidance, additional safeguards have been put in place to ensure our processes for investigating maternal deaths are robust. In the Regulation 28 notice, the Trust's decision not to undertake a local investigation alongside the one initiated by HSIB is highlighted. At the inquest the Trust presented evidence demonstrating the very clear national guidance indicating that the HSIB investigation should replace the need for local scrutiny as described above. However, in response to the coroner's concerns, the Trust has developed a draft SOP that defines the actions required when an HSIB investigation takes place

and includes consideration of the need or otherwise for a parallel local investigation. This will be ratified by the end of March 2023.

As an organisation we are proud of our record of learning from deaths and working to improve preventable mortality. Improvements in mortality are both True North and Breakthrough Strategic Objectives at the trust – the latter with a specific focus on improving the recognition and management of the deteriorating patient. As an organisation, Learning from Deaths processes are well developed and scrutinised closely by our Quality Committee and Trust Board on a quarterly basis.

In terms of wider learning in this specific case, senior representatives from the safety and clinical leadership teams, as well as the whole team of senior clinicians involved, attended the inquest and listened carefully throughout in this complex case.

Factual accuracy

We raise two matters in respect of the factual accuracy of the Regulation 28 Notice in respect of the following passage of text.

'At or around 0545 with the enduring PEA cardiac arrest, an ongoing inability to ventilate by any means possible, and the continuing absence of chest movement and breath sounds on auscultation, the whole-body swelling was recognised to be due to surgical emphysema from a presumptive diagnosis of bilateral tension pneumothoraces. At or around 0548 hours bilateral thoracostomies were undertaken with return of spontaneous circulation.'

The Regulation 28 Report indicates that the PEA cardiac arrest began at 0510-0515 with a return of spontaneous circulation (ROSC) at 0548 which occurred with the treatment of the tension pneumothoraces. We believe the duration of the cardiac arrest and timing of the return of spontaneous circulation stated in the Regulation 28 report are inaccurate. Evidence provided by HSIB in their investigation report (p 27-28) indicates that ROSC occurred 13 minutes earlier at 0535. This is corroborated by the Defibrillator records that indicated that the cardiac arrest lasted 17 minutes.

The evidence provided by the Trust based on the clinical record also indicated that ROSC occurred earlier than the coroner records, and when the abdomen was opened alleviating the intrabdominal pressure, prior the drainage of the tension pneumothoraces.

Modern defibrillators provide real-time feedback on the quality of resuscitation, and it is of note that the analysis of the quality of CPR provided throughout the event was excellent with minimal interruptions.

Summary

In summary the Trust:

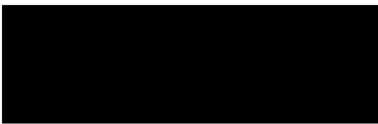
- Has developed and implemented a Maternity Improvement Program,
- Has achieved a very strong year 4 CNST submission.
- Has provided a robust program of training for the multidisciplinary group of staff working on our labour wards that prepares them for situations such as this.

- Has reviewed and strengthened processes for decision making about the local investigation of incidents referred to HSIB.

As an organisation we are committed to providing the highest quality maternity services and believe our commitment to the Maternity Improvement Program and achievements in governance, the Clinical Negligence Scheme for Trusts Year 4 submission and training for the multidisciplinary team demonstrate this.

Finally, our thoughts and sympathy are with Teegan's family; we recognise just how this has been the most traumatic event for them and on behalf of University Hospitals Sussex NHS FT, I want to extend my sincere condolences.

Yours sincerely



Chief Executive