
ANESTHESIA SAFETY NETWORK

QUARTERLY PERIOPERATIVE INCIDENTS REPORT
Newsletter #004 -june 2017



**TOWARD EXCELLENCE
IN HEALTHCARE**



INTRODUCTION

Anesthesia Safety Network
Newsletter #004 - June 2017

Thank you!

Without you this platform wouldn't have existed. In one year, we've already shared many reports. The next year will allow us to spread the message that communication, coordination and collaboration are the cornerstones of safer care.

This incident reporting system has been accused of bypassing morbidity and mortality reviews leading to a loss of important data. The lack of expertise would lead to incomplete analysis.

In my opinion, both tools are essential because they encourage healthcare providers to learn from defects. According to Peter Pronovost (1), near misses are viewed as invitations to improve, not proof that a system has enough checks to prevent a catastrophe. That's why we have to share these incidents, otherwise they could be considered as garbage from our healthcare system.



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Last month, the ASN platform was presented to French CRNA, residents and fellows during a meeting organised by the Junior Anaesthetists Association at the Paris-Descartes University. This meeting focused on patient safety in hospitals and new ways to improve teamwork and quality in healthcare.

The French Society of Anaesthesia and Intensive care has endorsed the Anaesthesia Safety Network through a link to our website and a video explaining why we should report our sentinel events. I hope this official support from faculties will lead to a shift in medical training towards human factors and the importance to work as a team. This major endorsement is dedicated to all of you that have supported this platform in France and abroad (airline pilots, HF engineers, sociologists, medical doctors, CRNA,...). I've really appreciated all these exciting discussions and I look forward to receiving your very useful feedback.

Best regards
Frederic MARTIN

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EDITORIAL

The safe design principles are standardised care, independent checks and learning from defects. The root causes of incidents are numerous. The frontline staff are frequently designated as the "bad apple" (2). James Reason wrote in one of his books (3): "Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects ... Their part is that of adding the final garnish to a lethal brew that has been long in the cooking". In order to improve patient safety, we have to use a system approach, searching all the contributing factors that could have led to the incident. One of the most used tools is the London protocol described by Charles Vincent. For Sidney Dekker (2), getting rid of bad apples is part of the old view of human error. Nevertheless, there has to be some accountability in order to reduce the anxiety about blame-free reporting.

This concept of Just Culture has been developed by James Reason and then disseminated by many authors (2). Sydney Dekker wrote: "its function is to fashion appropriate responses to evidence of errors and failures and to preserve the possibility of learning while holding people accountable for unacceptable behaviour".

For many years, anaesthesiology has shared responsibility for quality and safety in the whole perioperative process. Yesterday, the European Society of Anaesthesiology celebrated the 7th anniversary of the Helsinki Declaration (<https://www.esahq.org/patient-safety/patient-safety/helsinki-declaration/full-declaration>). Among the principal requirements, the 7th point emphasised the importance of promoting incident reporting systems.

With your help and also the endorsement of the French Anaesthesiology Society, the ASN platform will contribute to the improvement of quality and safety in Anaesthesiology.

« RATHER THAN BEING THE MAIN
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MEDICATION ERROR DURING A NIGHT SHIFT

Context: weekend shift – Urgent surgery – staff = One CRNA and an anaesthetist. A woman had broken her forearm and an axillary block using ultrasonography was proposed to the patient and accepted.

Usually, in the hospital protocol, there is an injection of IV dexamethasone. The anaesthetist was called to, see another patient in the emergency room. The patient was placed in the operating room after an insistant request from the surgeon. The cutaneous test revealed that the anaesthetic wasn't completely efficient. At the same time, the CRNA's phone rang and the anaesthetist asked for IV bolus of corticosteroids that he had forgotten.

During the preparation of the dexamethasone, the patient who reported some pain disturbed the CRNA. So the CRNA asked for the surgery to be stopped and injected the drug. Immediately, a critical arterial hypertension occurred (240/120 mm Hg) and followed by hypotension. He called for help from the anaesthetist and informed the team. Firstly, they suspected a local anaesthetic toxicity but finally they concluded with an unintentional IV injection of norepinephrine 4 mg instead of dexamethasone 4 mg. At the end of the procedure the patient was admitted to the intensive care unit where she woke up without any harm.

Numerous contributory factors: cognitive overload while caring for the patient, "look-alike drugs" due to medication packaging and storage in the anaesthesia cart, too many distractions (pain, patient, surgeon, phone call). The reporter said that this incident had been analysed during morbidity and mortality review.

This investigation led to a specific sympathomimetic drugs overpack that is labelled red. Control the right storage of drugs in the cart.

Good points : *just culture approach of the incident / root causes analysis and the action (RCA²) / report of the incident*

Ways for improvement: *resist pressure to proceed / reduce task interruption / test efficiency of the anaesthetic before surgery / global approach to improve the distinctiveness of medication packaging (visit this website: <http://ezdrugid.org/index.html>)*

KEY WORDS: *error / sympathomimetic drug / distraction*



Task interruptions, a major source of error.

Job interruptions are one of the major causes of the many mistakes we all make every day. This is particularly due to the fact that we tend to overestimate our cognitive abilities. The psychologist and economy Nobel laureate Daniel Kahneman (4) divided a model of the functioning of the brain based on two more or less independent entities: System 1 and System 2. System 2 is that part of us that we call conscious and rational, of which we are convinced that it is responsible for our decisions. System 2 is resource-limited and a heavy energy consumer. Hence, it tends to hand over duty to System 1, which is much faster and efficient, and whose automatic functioning has been built by evolution and by our many individual experiences. Kahneman has demonstrated, through various experiments, that System 1 leads the dance in the great majority of the situations we encounter. System 2 is activated only in situations requiring cognitive effort. The distribution of tasks between System 1 and System 2 is efficient. It minimizes the effort required and increases our performance. Concerning their respective "computing power", the latest studies (5) suggest the following distribution: 30 to 60 bits per second for System 2, for a total capacity of 10^{18} bits per second for both systems put together (6). System 2 can be assimilated to our working memory, and its limited ability to process 7 ± 2 simultaneous pieces of information (7). When our working memory is full and additional information reaches us, it sheds the heaviest information. The latter is definitely lost. When we are interrupted, the risk is important to forget the task at hand, in whole or in part. It is therefore useful set up strategies to limit their occurrence and consequence.

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Threat: job interruption(s).

Risk: forgetting(s) and error(s).

Strategies :

- If I am engaged in an important task, I do not let myself be interrupted.
- If I have information to convey, I begin by weighting the importance of the task performed by the recipient of the message.
- If the information I have to transmit is urgent, I begin by taking note of the task being performed by the recipient. Once I have transmitted the information, I remind the recipient of what it was doing before I interrupted him.
- The Flight Safety Foundation suggests to ask oneself the following questions to resume work after an interruption :
 1. What was I doing ?
 2. Where was I interrupted or distracted?
 3. What decision or action shall I take to get "back on track"? (8)



REPORT'in



INCIDENT OCCURING AFTER AN AXILLARY BLOCK

A 30 year old woman had trouble with the 5th finger of her hand. The surgeon needed to use a tourniquet cuff, so an axillary block was inserted using 30 ml of lidocaine 1,5% without epinephrine.

The patient was monitored in a dedicated room for loco regional anaesthesia by the resident who had performed the block. He was alone near the patient while he was writing his report. The woman said: "I'm going to sleep now!" and the resident said: "ok" and continued with his report.

A few seconds later, the senior came into the room and discovered that the woman was unconscious. After eliminating other possible causes, he injected an intralipid solution and improved her oxygen level with a ventilation mask. They transferred the patient into the operating room. After the surgery, the patient recovered without residual effect.

This incident was analysed and different contributing factors have been noted such as using a cubital block, administering lidocaine with epinephrine, supervision with a senior and the presence of two care givers while a loco regional block is used during the first thirty minutes.

Good points: *diagnostic and treatment*

Ways for improvement : *patient education about local anaesthetic drug toxicity symptoms / Induction of loco regional anaesthesia: same rules as general anaesthesia = Never alone with a patient / blood sample for measuring local anaesthetic concentration*

KEY WORDS: *toxicity / local anaesthetic drug / aloness*

CONTRIBUTORY FACTOR TYPES	CONTRIBUTORY FACTORS
Patient factors	Patient education about local anaesthetic drug toxicity symptoms « I'm going to sleep now! »
Individual (staff) factors	Axillary block realised using 30 ml of lidocaine 1,5% without epinephrine instead of cubital block Use of ultrasonography (?) Lunch time between 11:00 am and 3:00 pm Patient monitored = no alarm warning
Task and technology factors	Resident Hungry No supervision during loco regional procedure – use of ultrasonography (?) Knowledge about local anaesthetic drug toxicity symptoms
Team factors	Resident alone (absence of senior or nurse) No discussion with the surgeon about risk of using a tourniquet cuff and consequences on the type of anaesthesia.
Work environmental factors	Lunch time – handover Dedicated space for loco regional anaesthesia outside the post anaesthesia care unit – availability of ultrasonography
Organisational and management factors	No senior supervision of the resident during procedure
Institutional context factors	



SEVERE ACUTE ARTERIAL HYPOTENSION

A 30 year old woman (ASA 1 physical status) was operated for a prophylactic mastectomy and at the same time a breast reconstruction. The surgeon was late. When he arrived, the patient was with his assistant and he prepared for the surgery drawing his marks and setting up the patient with her two arms, wrapping them along her body. The anaesthetist came back and tried to put the cardio-pulmonary monitoring unit on with great difficulty (especially the blood pressure cuff). Then the anaesthetist proceeded with the general anaesthesia. The blood pressure cuff was leaking so the care giver decided to replace it with a new one during the surgery (no blood pressure reading taken for a period of about 20 minutes but the capnography signal was normal and finally the mean arterial pressure was close to 70 mm Hg).

A few minutes later, the anaesthetist was called by a CRNA¹ to administer general anaesthesia to a morbidly obese patient (BMI 65) for a colonoscopy. After a short briefing, he asked another CRNA (CRNA²) to watch over her patient for him. Then he called another anaesthetist (Anaesthetist²) and informed him that he would probably have to finish the procedure, replacing the CRNA² he had called for help. The CRNA² was waiting for the start of a new surgery.

As expected, the CRNA² was called to continue his shift in another room so he called the anaesthetist². When he arrived 10 minutes later, the patient was in a seated position with a "can't measure" alarm message for 20 minutes. The patient was laid down immediately. Intravenous administration of many phenylephrine bolus were performed with the set up of another blood pressure cuff that was placed on her lower leg.

The surgeon finished his procedure. The patient was transferred into the post anaesthesia care unit and she woke up 30 minutes later with cervical rigidity, head turned on her right side and bilateral mydriasis.

A severe cerebral hypoperfusion was suspected. Finally, she recovered slowly without any consequences except tiredness.

Good points : *temporary harm but likely not permanent*

Ways for improvement : *resist production pressure (dysfunction of monitoring device) / reduce numbers of handover (the first anaesthetist declared that he didn't called the anaesthetist₂ because he was the chief of the anaesthesia department) / situation awareness of the care givers in the OR (Don't change position without feedback from anaesthesia team) / set up of the alarm.*

KEY WORDS : *pressure to proceed / handover / communication*

ACUTE HAEMORRHAGE AFTER GREENLIGHT LASER VAPORISATION OF THE PROSTATE

At 6:00 pm, an anaesthetist was called by a nurse in the ward for unusual bleed, 6 hours after a laser vaporisation of the prostate. The surgeon was aware of the situation for 4 hours but he wasn't concerned and was too busy to come (scheduled appointments with patients in his office). The anaesthetist thought the patient should return to the OR for an emergency procedure (tachycardia, painful, pale). So he decided to transfer him in the PACU. The first hemocue revealed an anemia (8 g/dl) then two events occurred causing the postponement of the care. Firstly, the surgeon said that he will come back in one hour at the end of his planned appointment and it was not necessary to call for one of his colleagues. Secondly, while the team staff were checking the clinical assessment, they discovered that one document was missing for blood transfusion.

Suddenly, a severe hypotension arose leading to an extremely urgent surgery under general anaesthetic with the transfusion of three frozen plasmas and three red blood cell products.

Good points : *detection and call for help by the ward nurse / transfer into PACU*

Ways for improvement : *loss of situation awareness (illness severity) / communication among team members / cognitive aid for severe bleeding / cognitive bias (conservatism bias: bleeding after a laser vaporisation of the prostate is impossible)*

KEY WORDS : *situation awareness / documentation missing / greenlight surgery*

DIFFICULTY WITH VENOUS ACCESS

A morbidly obese patient with gastroesophageal reflux disease was scheduled for a laparoscopic cholecystectomy under general anaesthesia. The first attempt for venous access failed. A second one succeeded with difficulty in the antecubital fossa (18G catheter). The anaesthetist was concerned about this venous access so he injected 10 ml of saline serum, without any pain. The patient was moved in the operating room and was transferred onto the operating table. A 500 ml crystalloid bag was connected to the venous catheter but the flow rate was low. Despite this warning and after denitrogenation, the anaesthetist proceeded with a crush induction with intravenous propofol and suxamethonium. Fifteen seconds later, the patient was still awake saying:

"It's strange, it's not as fast as usual". Nothing after 30 seconds! The anaesthetist worrying about a myorelaxation without hypnosis and the difficulty to ventilate and intubate the patient decided to add sevoflurane through the facemask. He informed the team members of the emergence of a possible critical situation and called for a colleague help. Another anaesthetist arrived and after a situation point, she put on an efficient venous catheter. The patient didn't remember this event during postoperative period.

Good points : *point of situation / anticipation*

Ways for improvement : *high probability of inefficient venous access = NO GO / unusual situation = call for help before proceeding to next step (inhaled anaesthesia) / impact of ostrich effect*

KEY WORDS : *venous access / crush induction*



EQUIPMENT UNAVAILABLE

At 8:00 am, a patient was scheduled for a permanent pacemaker implantation. An external pacemaker had been inserted for an acute atrioventricular block in cardiologic intensive care. He had completely recovered. A general anaesthesia was performed and a few seconds after the orotracheal intubation, a hypertension peak occurred leading to the injection of IV beta-blocker. Immediately, a new atrioventricular block occurred leading to a pulseless electrical activity. The team members tried to turn on the external pacemaker but the plug that was available wasn't designed for this device. During the cardiac resuscitation, they tried to contact the head nurse but she was out of her office and nobody knew where the right connector had been stored. A new external pacemaker was finally inserted and the patient was admitted into the intensive care unit without any evident harm.

Good points : *No permanent harm*

Ways for improvement : *standardisation of medical device / checklist and anticipation of potential critical event / cognitive aids "pulseless electrical activity" / cross-check with cardiologist before injection of antihypertensive drugs / speaking up about discomfort*

KEY WORDS : *checklist / external pacemaker / medical device*



« BLACK HOLE » AND BLOOD PRESSURE MEASUREMENT

A 70 year old patient was operated of a spine surgery at the end of the shift (6:15 pm). She had a history of arterial hypertension. The beginning of the anaesthesia procedure was normal despite a very boring and exhausting shift. She was placed in a prone position and then the surgery began. Fifty minutes after the skin incision, a severe bradycardia with no available pulse oximetry data occurred. The mean arterial blood pressure value was close to 65 mm Hg. The anaesthetist discovered that the arterial blood pressure hadn't been controlled for 50 minutes (written message on the monitor). In fact during the installation in a prone position the automatic blood pressure cuff had been turned off. The anaesthesia data measured during surgery was automatically transferred onto a computer. The new measurement discovered a severe arterial hypotension (55/30) corrected by use of IV bolus of phenylephrine and crystalloids. She woke up in the PACU with no evident harm.

Good points : *No harm*

Ways for improvement : *reduce duration of a shift / no alarm from medical device when no important data has been checked during 5 minutes while there are pulse, oximetry recorded. / situation point at the beginning of the surgery (Time out for example)*

KEY WORDS : *fatigue / arterial hypotension / medical device*



OVERCONFIDENCE AND HAZARDOUS EVENT

Handover at 6:00 pm in PACU between an anaesthetist and his colleague working during the night shift. An 82 year old patient was anaesthetised for the implantation of a vascular access device. The anaesthetist reported that the procedure seemed to be difficult for the surgeon who was angry and stressed ("as usual"). Because of many painful attempts, the anaesthetist proceeded with a general anaesthesia and then he punctured easily the left subclavian venous ("as usual"). No difficulty was declared (number of attempts unknown). At the end of the implantation, the patient woke up in the PACU but he needed an oxygen mask (10 l/min) in order to have adequate oxygenation. The night anaesthetist was concerned. The lung auscultation assessed a decrease of breath sound in the left lung. At 7:55 pm, he asked for an urgent chest X-ray but the technician wasn't reachable, despite four phone calls. A few minutes later, onset of ventricular arrhythmia then ventricular tachycardia happened with hypoxemia. A left tension pneumothorax was suspected and a needle decompression was performed with a 14 G needle resulting in a restoration of VT to sinus rhythm after hearing a whoosh of air. Five minutes later, the radiology technician arrived because she had forgotten her phone in the cloakroom. The chest X-ray revealed a left pneumothorax drained with thoracostomy (chest tube).

Good points : *diagnosis and action*

Ways for improvement : *crisis code / call for help early / being aware of fatigue and cognitive bias such as overconfidence / use of ultrasonography for pneumothorax diagnosis*

KEY WORDS : *iatrogenic / pneumothorax / overconfidence*



DYSFUNCTION OF DEFIBRILLATOR

Two colleagues called an anaesthetist for help in order to try to resuscitate a man who had been operated a few days before. When he arrived in the ward, the emergency card was in the room with the defibrillator. One of the doctors was performing the cardiac massage while the other one was trying to insert an intravenous access. All the equipment for the oro-tracheal intubation had been prepared. The "helper" decided to put the pads on the chest of the patient. There was no signal on the monitor and an alarm message "dysfunction of the battery". Due to stress and tunnelisation, nobody noticed that crucial information. The power cord of the defibrillator was missing. The nurse (in charge of checking it) had informed the technician many times during the past few days but it hadn't been fixed.

Good points : Call for help / call for code cart

Ways for improvement : Lack of follow up concerning technician support / Silent defibrillator alarm / lack of safety warning for quick and easy visual information (for example: "remove before flight ribbon")

KEY WORDS : dysfunction of medical device / ergonomy of defibrillator DSA

STRESS, COMPLEX RELATIONSHIP AND FOLLOWING GUIDELINES

An anaesthetist (examining a patient in the ward) was called by the operating theatre head nurse. She phoned because she'd been informed that a patient was bleeding two hours after the childbirth. The surgeon was viewed as a poor skilled practitioner losing frequently her self-control during a crisis code. According to the head nurse, the surgeon asked for urgent access to an operating room. That wasn't the usual procedure leading to the fear of a massive hemorrhage. When the patient was admitted into PACU, the anaesthetist tried to gain more information from the obstetrician (suspicion of a vaginal thrombus with an estimated blood loss of 500 ml). Because the patient wasn't "shocked", he injected 10 ml of lidocaine 2% with epinephrine into the epidural catheter. The obstetrician was very stressed and immediately performed a revision of the uterus followed by a genital examination without inserting a bladder catheter despite the demand of the team. She placed a bladder catheter at the end of the procedure confirming an overdistension (1000 ml). The second blood sample hadn't been performed because the blood loss wasn't judged significant for the anaesthetist. The patient was crying. This situation was very conflicting. That's why the anaesthetist finally inserted a second venous catheter and took another blood sample at the same time (no abnormal values after the analysis).

Good points : *Deal with a supposed emergency*

Ways for improvement : *information transmission between stakeholders (SBAR) / conflict between medical team that can screw up the outcome / avoid to make subjective judgement*

KEY WORDS : hemorrhage / teamwork / communication

CONCLUSIONS

- High performance team = 3 C's (communication, coordination, collaboration)
- Beware of silent alarm and poor ergonomic devices
- Patient education about critical symptoms to declare during and after a specific procedure
- Anticipate call for help

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CRM AND HUMAN FACTORS IN PRACTICE :

- Martin Bromiley. Just a routine operation. In : Youtube [13'56»]. <https://www.youtube.com/watch?v=JzlvgtPlof4>
- NHS Maternity Care – Awareness Campaign In : Vimeo [8'21»]. <http://voiceinside.co.uk/>

COMING SOON :

- The 2017 International Forum on Perioperative Safety and Quality jointly provided by ASA and ESA – Friday, October 20 Seaport Hotel I Boston, MA