Mistakes - Unexpected Learning Experiences

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Disclaimer - Contains grammatical errors, unreferenced pictures, and too many words per slide
Some Definitions

• **Mistake**: an act or judgement that is misguided or wrong.

• **Learn**: to gain or acquire knowledge or skill of something by study, experience, or being taught.

• **Root cause**: a factor that caused a nonconformance and should be permanently eliminated through process improvement.

• **Root cause analysis**: a collective term that describes a wide range of approaches, tools, and techniques used to uncover causes of problems.

• **Balls up**: a bungled or badly carried out task or action; a mess.

• **Massive balls up**: when you realise you’ve made a massive mistake and find yourself in an undeniable tight squeeze without possibility of escape.
Risky Business

• Pathology Queensland prides itself on:
  o Providing expert clinical support
  o Ensuring accurate, timely and appropriate patient results
  o Continual learning
  o Quality improvement

• But…Blood Banking is risky!
  o Requires communication and coordination with external organisations e.g. ARCBS, Theatre
  o Mixed staffing skill level/experience
  o Variety of blood and blood products
  o Unexpected results and urgent situations
Tough Days in the Office

- TPCH handles many complex cases with multifactorial issues
- Treating teams are traditionally very successful and had become accustomed to ‘winning’
- Over a period of a few months, there were a number of patients that were ‘lost’ which had a terrible effect on morale
- Though challenging, this led to an opportunity to assess the way things were done and opportunities to improve
Preventing Mistakes - Risk Assessment

- A risk matrix is used to assess and define the level of risk
- Increases visibility of risks and assists risk mitigation decision making
- Used in a variety of organisations; hospitals, construction and schools
Root Cause Analysis

- Whenever a mistake or near miss is identified it must be reported;
  - Localised to Pathology Queensland – Opportunity for Quality Improvement (OQI)
  - Involves external organisations – AIMS/PRIME/RISKMAN
  - Detailed account of events leading up to error

- Investigator performs the root cause analysis;
  - Focuses primarily on systems and processes NOT individual performance
  - Analysis should be thorough and credible e.g. 5 why’s, ishikawa diagrams, cause/effect
So then they skipped root cause analysis and jumped right to solutions and were surprised when the problem kept occurring.
Root Cause Analysis Outcomes

• Focus on prevention not blame
  o The blame and punish approach teaches others that if they make a mistake, they should make sure no one finds out
  o ‘Human error’ is not the conclusion of an investigation, it is the starting point

• Corrective and preventative action is required

• Aim for error reduction strategies with high power where possible

Table 1. Rank order of error-reduction strategies
Balls Up One

- Patient 1 is a 7F requiring cardiac surgery
- Congenital cardiac defect due to DiGeorge deletion on chromosome 22
- 22q11.2 deletion may also cause a deficiency in the immune mediated T cell response
  - Patients require irradiated products that are as fresh as possible
  - Usually <24 hours irradiated
- MTP activated at 16:05 and ceased at 16:38
- Blood usage – 6 PC, 3 PLT, 5 CRYO, 2 FFP, 1 Ria, 2 PTV
- Medevac grabbed from blood fridge and spiked
  - Not transfused because irradiated units required
- Haematologist approval required during MTP to issue 2-3 day old IRR units
- Patient survived and feedback to the lab was very positive
Balls Up One - However.....

• During MTP, patient 2 had deranged coag results which were released before adequate investigation
• Scientist waited to inform the Haematologist because of the MTP
• In that 30 min period, patient 2’s Consultant had seen the coag results and was considering treatment options
  o Had a history of vWD
• Once discussed with the Haematologist, further investigation of the coags took place and results had normalised
• Scientist started amending the results in Auslab at the same time the Consultant was viewing the page
• Consultant not happy and demanded an official investigation
• Amended report was issued with corrected coag results
Balls Up One - Investigation

• The main factor was the distraction of the MTP activation
  o Supervising Scientist was assisting another Scientist and consulting with the Haematologist
  o The Scientist handling the coag investigation did not want to distract the Haematologist, so
    they waited until the MTP had slowed before informing them about the discrepancy

• Initially the Scientist did not notice the clinical notes of the patient querying a
  previous diagnosis of vW disease, nor the discordant fibrinogen results

• The deranged results occurred due to a bubble in the tube (aliquoted nunc tube)
  o If unexplained results - check for clots, curve, bubbles and repeat

• The requesting Dr was using another Dr's sign on in Auslab

• The Consultant listed on the request form, in Auslab and in ieMR was not correct
  o Therefore we would never have contacted them anyway

• The results should have been removed from Auslab as soon as a discrepancy was
  identified
Balls Up Two

- 46 yr old male presented with cardiogenic shock, vasculitic rash over torso and limbs
- History – suffered from testicular torsion and enjoys two beers a day
- Suffered multiple cardiac arrests
- ECMO inserted but required 90 mins CPR
- Initial blood products – 2PC, 2PLTS, 8PTV
- Multiple ECMO circuit clots and emergent replacements of oxygenator
  - Further CPR
- Not a surgical candidate because too coagulopathic and DIC
- Vasculitic rash spreading ? antiphospholipid syndrome ? autoimmune/Infective process
Balls Up Two cont....

- Despite bolus heparin – Anti Xa activity only 0.03 IU/mL
  - AT3 level reduced resulting in heparin resistance
- Decision to treat with 1000 IU Thrombotrol three times a day
- AT3 level still reduced at 0.48 IU/mL (0.7-1.3)
- Treatment ceased due to further decline, patient passed away
- Product usage – 1 PC, 8 PLTS, 10 CRYO, 1 RiaStap, 5 AT3, 170g Privigen and 2 Prothrombinex (PTV)
  - Phone request received from ICU requesting 2 PTV – form requested
  - Scientist despatched product and product was infused
  - Form arrived some time later with request for Thrombotrol NOT Prothrombinex
  - Wrong product ordered and infused by ICU
  - Hospital wide review of ordering practices
Balls Up Two – Riskman/Actions

• Contributing factors
  o Note in diary saying AT3 treatment was being ceased for patient
  o No recorded details of phone request by dispensing scientist
  o No established processes around dispensing and recording phone requests at TPCH
  o Training – the products issued should have been checked against the request.

• Actions
  o Discussion with Transfusion CNC regarding ordering practices/processes in ICU
  o Discussion at PBMC – Verbal requests for products will only be accepted in cases of critical bleeding.
  o Process implemented to document phone requests in Auslab and to print a check label
  o Despatching Scientist received refresher transfusion training and competency
  o A comprehensive Transfusion competency developed for all staff
  o Improved labelling for identification of manufactured products in the Blood Fridge.
Balls Up Three

• Transferred from RBH in respiratory distress due to muconium aspiration
• Newborn < 12 hours old
• Treating team querying DiGeorge although there were no cardiac indicators
  o Need to provide Fresh CMV- Irr
• To be placed on ECMO
  o PQ document states that for emergency ECMO primes, units with < 7 days irradiated can be used for prime if a sticker indicating this is placed on the unit.
• ICU test donor units for K+ once primed with a target of <6
  o After 2 washes the K+ was still 6.1 but decision made to proceed
• Paediatric ECMO = grossly deranged coags due to heparin and consumption
• Requirement for AT3 replacement
• Blood usage – 3 PC, 1 PLT, 1 CRYO, 1 FFP, 2 AT3.
Balls Up Three - Investigation

• Without suspected cardiac complications DiGeorge should not have been suspected
• Patient was transferred from RBH at 15.00
  o ECMO insertion was around 23.00
  o Plenty of time to prep for insertion but….
  o Lab not informed of possibility of ECMO until they wanted to start priming...now it’s urgent
• Transfusion staff queried the requirement for Irradiated products/DiGeorge
  o Confirmed by ECMO team numerous times
• Majority of Scientific staff were unaware of sticker requirement for prime units
• Physiological effect of high K+ in transfused irradiated blood products through an ECMO circuit has inconsistent findings
• Riskman directed to Hospital to review their ordering practices.
• Root Cause – Inappropriate ordering
Catching the Balls in Challenging Circumstances

• RL presented to ED with severe cardiomyopathy
• Progressive worsening cardiac, hepatic and renal function
• Patient placed onto VA ECMO
• Minor issues Day 2 to 5 post insertion
  o Left groin site a bit oozy
  o Plasma Hb increases – starts to haemolyse
  o Liver and renal function improvements
  o Potential ECMO removal planned on Day 6

• Unplanned decannulation of ECMO arterial line
• Massive Transfusion – 9 PC (4 Medevac), 1 PLT, 4 RiaStap
• Catastrophic haemorrhage and loss of cardiac output
• Coroner’s case - Patient deceased
Catching the Balls – Lab Problems

- MTP called in the early hours of the morning
  - Only one Scientist on in the Lab
- New ROTEM guided MHP in use at TPCH
- Auslab temporarily corrupted patient UR number
- Quickly issued using the backup Antibody Register program
- Issued PC and PLTS with minimal drama.....but
- RiaStap not listed as a product in Antibody Register
- Hand written label and form for RiaStap

- Emails of thanks received from various members of the treating team for efficiency of product delivery, even though things went really bad.
Other Ball Drops

• Incorrect unit despatched to ward and not checked
• Donor units despatched with incorrect compatibility label attached
• Unvalidated products sent through the PTS
• Compatibility labels falling off bag in PTS
• Phenotyping error leading to Tx reaction
• Biostate issued and administered instead of Advate
• Blood fridge alarm disabled and door left open – products discarded
• Incorrect details scanned in to PTS tracking spreadsheet
• Panel performed and reported as negative when no plasma had been added
• Fya pos unit issued to multiple transfused patient with multiple antibodies
• ETC…..
Less Ball Drops - Improving Our Juggling Skills

- Being more diligent isn’t the answer - nobody comes to work to do a bad job!
- Requirement to report incidents using tools available
- Investigate incidents by performing a thorough root cause analysis
- Improving systems and processes the reduced the likelihood of the error reoccurring

When you make a mistake, there are only three things you should ever do about it: 1. Admit it. 2. Learn from it, and 3. Don’t repeat it.
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