LIMS Failure September 2016

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IT Failures

- Northern Lincolnshire and Goole NHS Foundation Trust October 2016
  - Computer network & phones affected from Sunday to Wednesday.
  - Planned operations, outpatient appointments and diagnostic procedures were cancelled.
  - Major trauma cases diverted to neighbouring hospitals, together with high-risk women in labour.

IT Failures

- Global cyber attack May 2017
  - Networked analysers affected

IT Failures

- BA computer IT crash May 2017
  - Loss of income, damage to reputation

Background

- LIMS at LTH trust (inc BRI at the time) is Telepath
  - In use for 35 years
  - Maintained by CSC

- Approx 12:30pm on Friday 16th Sept 2016 Telepath crashed for all Pathology depts across all sites: SJH, LGI, BRI.

What to do?

- At BRI, we had a 'contingency plan' that lists the clinical areas/people to inform if Telepath is going/goes down for >30 mins
  - ICU, theatres, Haem Consultant, A&E etc
- Resort to manual methods, EI suspended, could still use BloodTrack for cold chain
- SOP written with a short downtime in mind, not days/weeks

What had happened?

- A number of hard drives containing Telepath information had failed over time
- 16th Sept 2016 the final hard drive failed
- CSC took longer than expected to deliver a replacement
- 'Silver Command' meetings took place between managers, trust board & representatives from BRI

What had happened?

- CSC worked all weekend to fit a new hard drive
- Tried to restore databases from back ups of Telepath data.
- Back ups not complete!
  - Over time the amount of data being backed up had increased massively
  - A second back up had been established at some point, but this did not capture all data

Meanwhile…

- Weekend was horrendous
- Harrogate agreed to take Antenatal samples
- Monday & Tuesday were pretty bad
- Wednesday was fine!
- Thursday all hell broke loose:
  - Anaesthetists given document based on *National Transfusion Committee Guideline for triage of red cell transfusion*:

National Transfusion Committee Guideline for triage of red cell transfusion

Category 1	Category 2	Category 3
These patients will remain highest priority of transfusion	**These patients will be transfused in the Amber but not the Red phase**	**These patients will not be transfused in the Amber phase**
Resuscitation Resuscitation of life-threatening /on-going blood loss including trauma.		
Surgical support Emergency surgery* including cardiac and vascular surgery**, and organ transplantation. Cancer surgery with the intention of cure.	***Surgery/Obstetrics*** Cancer surgery (palliative). Symptomatic but not life-threatening post-operative or post-partum anaemia. Urgent*** (but not emergency) surgery.	***Surgery*** Elective surgery which is likely to require donor blood support (Patients with > 20% chance of needing 2 or more units of blood during or after surgery).
Non-surgical anaemias Life-threatening anaemia including patients requiring in-utero support and high dependency care/SCBU. Stem cell transplantation	***Non-surgical anaemias*** Symptomatic but not life-threatening anaemia.	

National Transfusion Committee Guideline for triage of red cell transfusion

- Only Category 1 & 2 patients taken to theatre.
- '*Patients with a >20% chance of needing 2 or more units during or after surgery*' = anyone going under the knife
- Every single patient going to theatre was crossmatched for at least 2 units.
- Labs hadn't enough space/staff for that level of manual work
- Blood stocks depleted rapidly

The end in sight?

- On Friday 23rd September, Blood Transfusion database was rebuilt & went live.
- Validation required so not in full use until Saturday.
- Blood Transfusion lost 36 hours of data.
- Worked backwards from Bloodtrack to update Telepath for the missing 36 hours.

The end in sight?

- We used photocopies of the components to retrospectively update Telepath.
- We did not enter the G&S results into Telepath unless components had been reserved (too numerous).
- We entered a comment to explain that EI was not available on these samples.
- We had access to a back up spreadsheet of Telepath & Sp-ICE, however, we still had SHOT/SABRE events:

Errors:

Blood Bank Incidents associated with the Telepath Failure 16/9/2016 to 23/9/2016

Error	All errors	LGI	SJH		Error cause
Selection (Irradiated)	2	0	2		Request error failure to indicate special requierments
Selection (HEV Neg)	4	2	2		Request error failure to indicate special requierments
Selection (HEV- and Irradiated)	4	2	2		Request error failure to indicate special requierments
Phenotyped not matched patient no antibodies	2	0	2		Lack of LIMS
Phenotyped not matched patient with antibodies	1	0	1	* enzyme only anti-C not clinically significant	Lack of LIMS, antibody not indicated on form by clinical area
Antibodies not detectable, blood selected compatible by chance	3	0	3	2x anti-K, one anti-C	Lack of LIMS, antibody not indicated on form by clinical area
Manual interpretation of group results incorrect; wrong blood group transfused	1	0	1	A Pos given to A Neg male patient; if had been ABO error XM should have detected	Transcription error by individual
Blood transfused on expired sample (due to recent transfusion)	1	0	1		Workload meant blood being left in fridge too long
Wrong hospital number and date of birth on platelets issued (transcribed from other patient); transfused to correct patient but error not noticed	1	0	1		Transcription error by individual, previous patient details left in labelling program
Blood issued when only short group performed	1	0	1	Blood issued was crossmatched	Testing error not significant
Failure of crossmatch /EI process post return of Telepath	8	0	8	4 had blood transfused, retrospectively checked all OK	Training, communication and workload pressure
Multiple errors: Testing incomplete; blood issued by EI when should have been crossmatched; names spelt incorrectly on labels	1	0	1		Training, communication and workload pressure
Total errors	29	4	25		
Total potentially avoidable	23	4	19		

What's in a name?

- Be careful what you name your dept
  - Blood Bank? Blood Transfusion?
- Blood Bank backed up first
- Blood Sciences backed up second
- Microbiology backed up last
  - Last complete back up 2010
  - Lost 6 years of data
  - Rebuild not completely recovered until end of 2016 – no LIMS until then (!)

Conclusions

- An independent report was published at the end of January 2017
- It concluded that the cause of the failure was a mix of hardware/technical failure and human error.
- Cost to Pathology £700k
- Cost to Trust £5m
- http://www.leedsth.nhs.uk/assets/Board-Meetings

Independent review – findings & learning

- Response to date:
  - Improved back up processes
  - Responsibility for monitoring hardware transferred
  - Hardware upgrades in progress
  - Trust wide risk assessments of critical systems
  - Revised disaster recovery plans
  - Updating of business continuity plans

What went well?

- Great team working – staff pulled together
- Focus on the patient despite difficulties
- Volunteers going 'over & above'
- Team working between Trust & Path IT
- Staff cancelling AL to support colleagues
- Teams coming up with innovative solutions
- Volunteers from other CSUs & labs
- Blood Transfusion/Pathology now have much better recognition in the Trust

What could we have done better?

- Communication:
  - Clarity of messages/inaccurate reporting
  - Didn't include regional/national users
  - Which systems down, which weren't
  - Internal comms, limited access to email in lab
  - Inaccurate lists of GP contacts by CCGs
  - Confusion around criteria for requesting, impacting BT
  - Comms around where samples being sent/phone calls regarding results

What could we have done better?

- Business Continuity Plan:
  - Lack of clarity on how to practically enact
  - Capacity & support from other Trust labs not immediately clear
  - Phone cascade arrangements for letting colleagues know help is required
  - Paper forms having to be developed 'on the hoof'
  - IT links with surrounding Trusts problematic

What could we have done better?

- Other:
  - A&E not sending results with pts to wards contributed to inc phone calls
  - Staff not always able to look for solutions as not clear what the problems were
  - Resilience in the IT system & infrastructure
  - Reprinting of the sample report multiple times for the same patient

How have we/are we acting on this learning?

- Comms strategy development, including cascade from Silver command & messages to all stakeholders with a structured template
- Business Continuity Planning – lots already now in place. Desktop exercise end of Feb
- IT resilience & networking across region (WYAAT)