The Leeds Teaching Hospitals NHS
NHS Trust

IT Failure

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Recent IT Failures

Lincolnshire NHS trust restarts services following virus outbreak

Northern Lincolnshire and Goole NHS Foundation Trust claims its business as usual today after containing virus threat

Northern Lincolnshire and Goole NHS Foundation Trust claims that the majority of its IT systems are now up-and-running following a virus outbreak on Sunday.

The outbreak - about which the Trust has refused to release much details - led to cancelled operations in the three hospitals operated by the Trust, as well as hospitals in a neighbouring NHS trust with which it shares some systems.

Patients had been advised to consider almost all appointments or operations cancelled from

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NHS seeks to recover from global cyber-attack as security concerns resurface

Cybersecurity centre says teams 'working round the clock' to fix systems rendered inaccessible by international ransomware attack

- What is 'WannaCry' and why is it attacking the NHS?
- Have you been affected by the cyber-attack?

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Ransomware behind NHS Lanarkshire cyber-attack

28 August 2017 | Glasgow & West Scotland Share

Background

- LIMS at Leeds Teaching Hospitals NHS Trust
  - iLab TP (Telepath)
  - Current hardware ~6 years old
  - System been in place ~35 years

- Friday 16th Sept 2016 12:30pm
  - Telepath crashed for all Pathology departments across all sites (3 Teaching Hospitals across 2 cities)

When LIMS fails; this is the plan

- Suspend routine testing
- Test urgent requests only
- Use a manual recording system
- Suspend Electronic Issue; serological crossmatch all red cells
- When IT is running again, catch up

How long will this plan work?

- Few hours? - Yes
- 24 hours? - Yes
- 48 hours? – Just about

- 1 week? – No
- 2 weeks? – No!
- 6 weeks? – Definitely not!

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 other affected trust

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

Returning to a manual system

- Does everyone really know how to do this?
- Where and how do you record things?
- How do you deal with special requirements?
- What about transfusion history?
- Who's got an antibody?
- Where are all the staff we need?
- Is there enough room?

Change to group and save rules

- Patient not recently transfused (within last 3 months), sample valid for 90 days
- Assume all patients recently transfused – sample valid for 72 hours only
- Patients suitable for EI – if valid group and save, issue of suitable blood takes a few minutes
- No patients suitable for EI - if valid group and save, serological crossmatch takes a minimum of 40 minutes, depending on workload

Meanwhile…

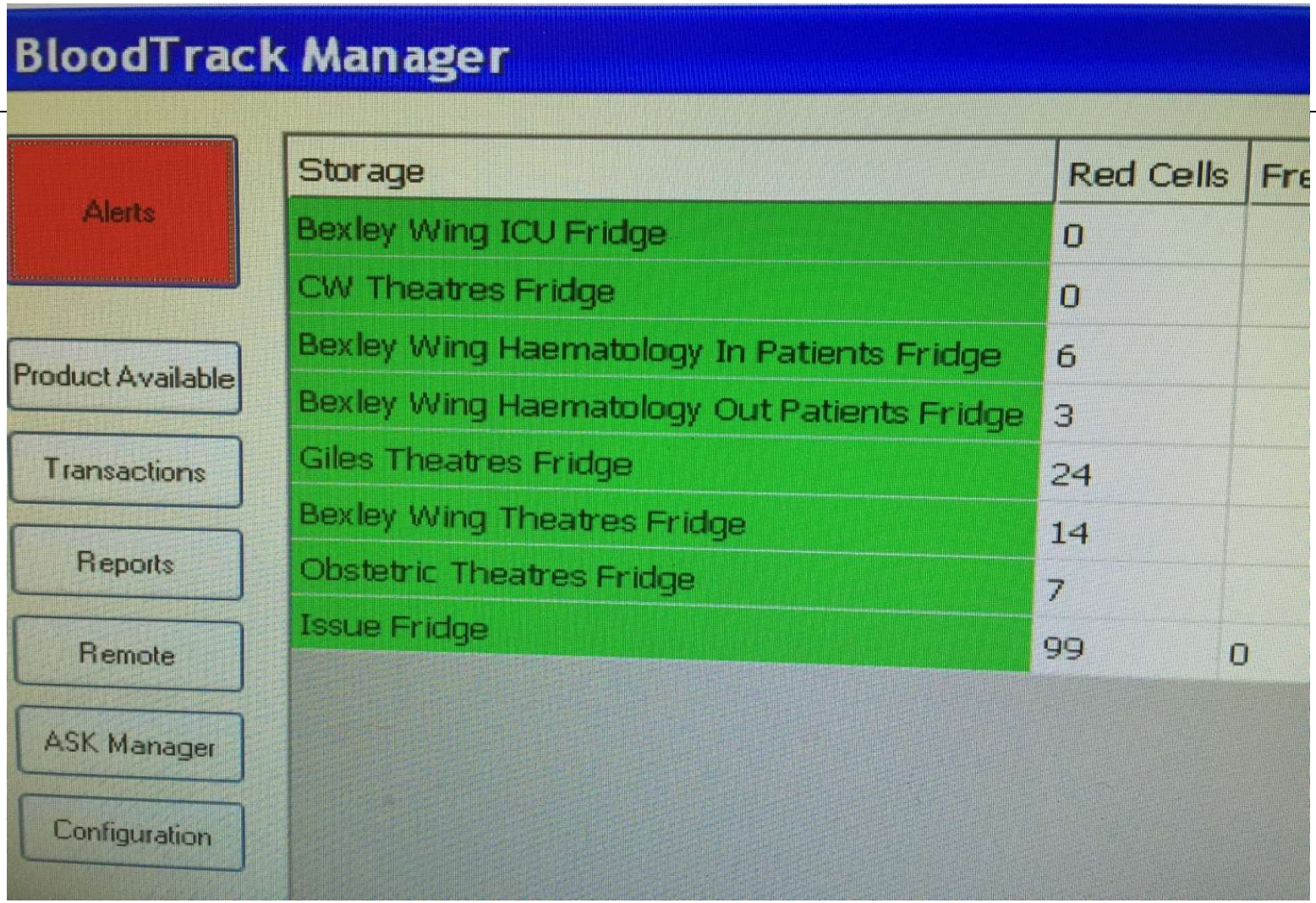
- Weekend was horrendous
- Another trust agreed to take Antenatal samples
- Monday & Tuesday were pretty bad
- Wednesday was fine!
- Thursday all hell broke loose:
  - Anaesthetists given document based on *National Transfusion Committee Guideline for triage of red cell transfusion*:

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


BloodTrack Manager
Alerts
Product Available
Transactions
Reports
Remote
ASK Manager
Configuration
Storage
Red Cells
Fre
Bexley Wing ICU Fridge
0
CW Theatres Fridge
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Bexley Wing Haematology In Patients Fridge
6
Bexley Wing Haematology Out Patients Fridge
3
Giles Theatres Fridge
24
Bexley Wing Theatres Fridge
14
Obstetric Theatres Fridge
7
Issue Fridge
99
0

The end in sight?

- On Friday 23rd September, Blood Transfusion database was rebuilt (completed 16:30)
- Validation took 8 hours
- Full use from 02:30 Saturday 24th
- Blood Transfusion lost 36 hours of data from 15th and 16th September
- Worked backwards from BloodTrack to update Telepath for the missing 36 hours.

The end in sight?

- Took approx. 3 weeks to fully update and check that all components were accounted for
- Operated 72 hour rule until update complete
- We had access to a back up spreadsheet of Telepath & Sp-ICE, however, we still had SHOT/SABRE events:

Errors

- 29 Errors, 23 potentially avoidable
  - 12 special requirements not met (irradiated and/or HEV Neg, or phenotyped matched)
  - 8 crossmatching errors post return of Telepath
  - 4 patients with historic antibodies (2x anti-K, 2x anti-C), no longer detectable received blood. All were antigen negative by chance
  - 2 labelling errors detected
  - 1 testing error (abbreviated group only performed)
  - 1 unit transfused on expired sample (>72 hours old)
  - 1 wrong group transfused (A Pos to A Neg male), error in transcription of results

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

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.

- IT resilience & networking across region (WYAAT)

MHRA inspection August 2017

- 2.5 hours discussing LIMS failure of 2016

- A major finding for IT including:
  - No GMP awareness training had been provided to the Trust IT staff.
  - There was no Service Level Agreement (SLA) set up with the Trust IT to define their roles and responsibilities.
  - A gap analysis had not been performed on all the GMP computerised systems against the Data Integrity Guidance published in 2015.

Summary

- Risk assess the loss of your IT systems
- Ensure good processes in IT department
  - Maintenance
  - Back-up
- Have a good disaster recovery plan
- Have a robust manual back-up system
  - Cope with short or long downtimes
  - Test to see if it works
- When IT fails involve clinicians in decision making
  - Who to test?
  - Who to transfuse?
  - Priorities

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