Maximum Surgical Blood Ordering Schedules (MSBOSs) and their use across the West Midlands

Lorna Cain, Haematology ST5

Suzy Morton, Haematology Consultant

Outline of talk

- Background
- Describe our recent work on use of MSBOSs in the West Midlands
- Organisational aspects
- Summary MSBOS
- Your thoughts and contributions

What is a MSBOS?

JPAC Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee

'In procedures with a high probability of requiring transfusion a maximum surgical blood ordering schedule (MSBOS) should be agreed between the surgical team and transfusion laboratory. This specifies how many blood units will be routinely reserved (in the blood bank or satellite refrigerator) for standard procedures, based on audits of local practice.'

What is a MSBOS?

- First introduced in the 1970s
- 'A gentle barrier to transfusion'[2]
- No national standards
- Guide only and clinical judgement can override

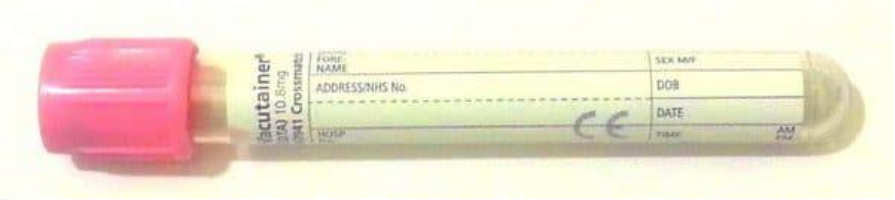
Advantages	• Reduce delays • Minimise wastage • Reduce unnecessary crossmatching/ issuing of blood • Help with blood stock management

What is their role today?

- Two alterations in red cells ordering since the 1970s[3]
  - Patient blood management (identification of pre-op anaemia, minimising intraoperative blood loss, restrictive transfusion strategies) leading to reduction in red cell transfusion
  - Electronic (computer) crossmatch and electronic remote blood issue leading to significant reduction in the time to obtain suitable red cells

- When designing an MSBOS need to consider[4]:
  - Local clinical transfusion practices
  - The availability of blood bank resources and staffing levels

Blood product orders



- Effects of a data driven MSBOS on pre-operative blood ordering practices[5]
  - Eight hospitals in Pittsburgh, USA
  - Analysis of 12 months red blood cell transfusion for each surgical procedure to determine the MSBOS
    - No G&S - <5% patients undergoing the procedure in 12 months received a red cell transfusion
    - G&S only - 5-25% patients received a red cell transfusion
    - G&S with crossmatch - >25% patients received a red cell transfusion
  - Significant reductions in pre-operative testing and red cell crossmatches

- Other recent studies applying similar criteria have concluded that reduced numbers of patients in their institutions warrant a pre-operative G&S or cross-match[6, 7]

Aims of this project

- To determine the current use of MSBOSs across the West Midlands
  - Do hospitals have an up to date MSBOS?
  - Does having electronic issue alter their use?

- To amalgamate and compare the MSBOSs
  - Produce a summary resource which may be useful locally when MSBOSs are being re-written
  - Identify areas of concordance and discordance

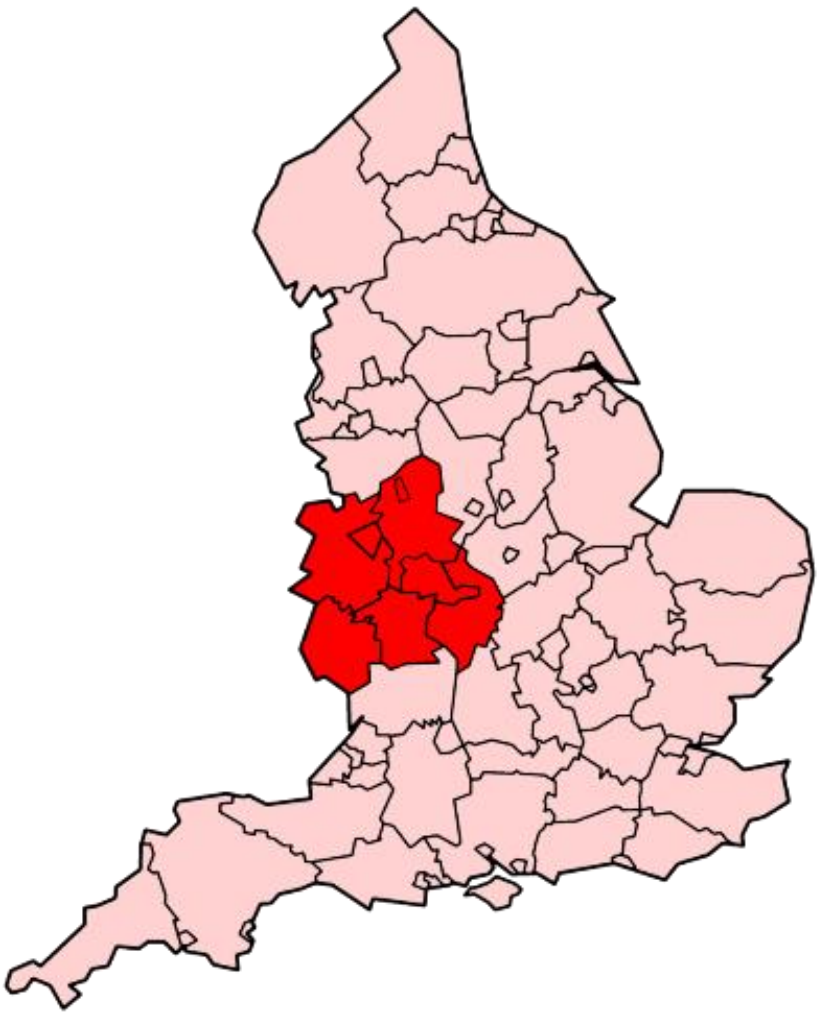
Methods

- Project approved by West Midlands Regional Transfusion Audit committee
- Email to all hospitals via Regional Transfusion Committee administrator sent in November 2019 requesting:
  - Copy of MSBOS if available and review date
  - Use of electronic and/ or remote issue
- Summary regional MSBOS devised

Results

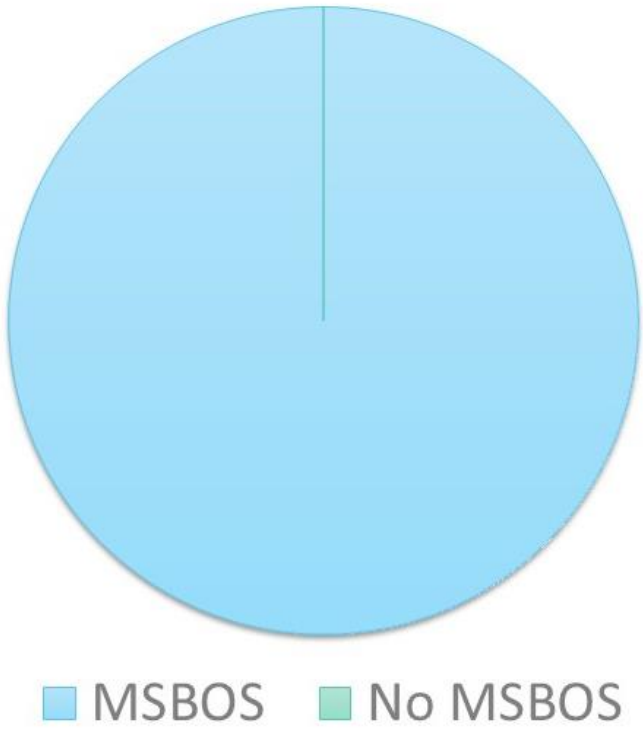
- **83% (15/18) organisations responded**

- According to the RTC website there are 23 organisations, therefore **5 sites** unintentionally not contacted
  - Royal Orthopaedic Hospital
  - Birmingham Nuffield
  - BMI Droitwich Spa
  - BMI Priory
  - Wolverhampton Nuffield



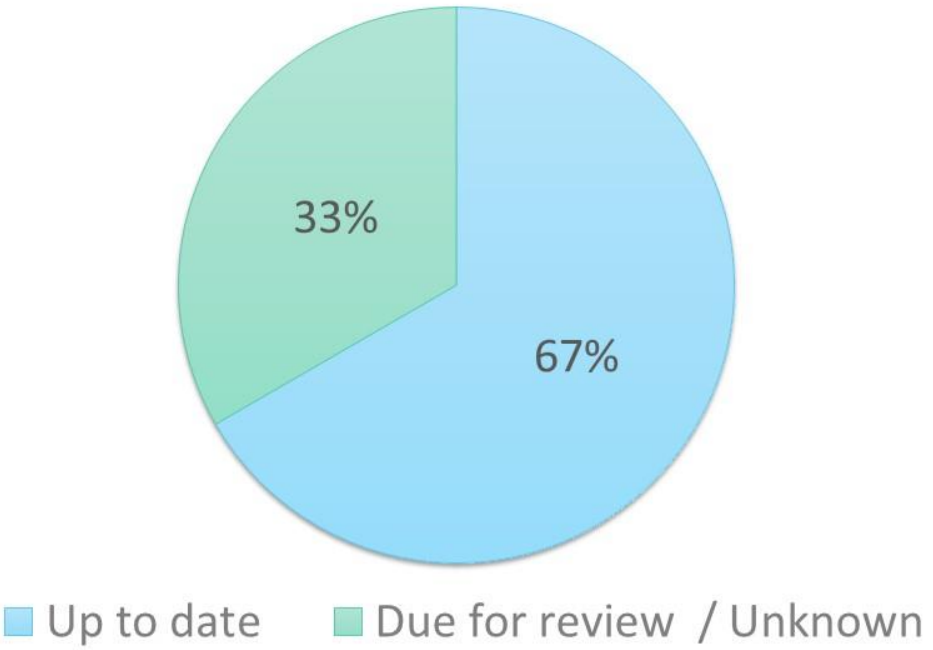
Organisational aspects

- **100% (15/15) have an MSBOS**



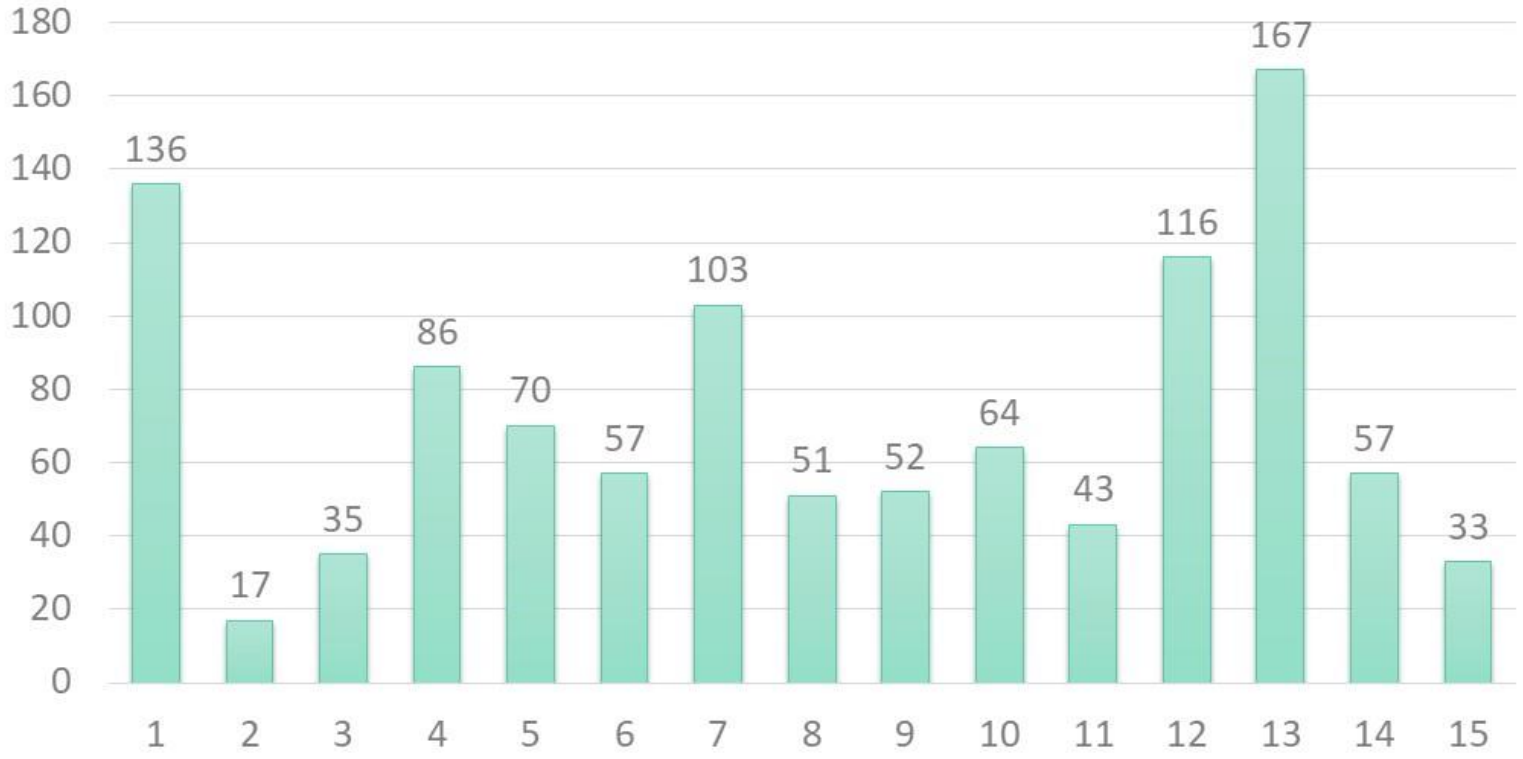
Organisational aspects

- **67% (10/15) MSBOSs are up to date**



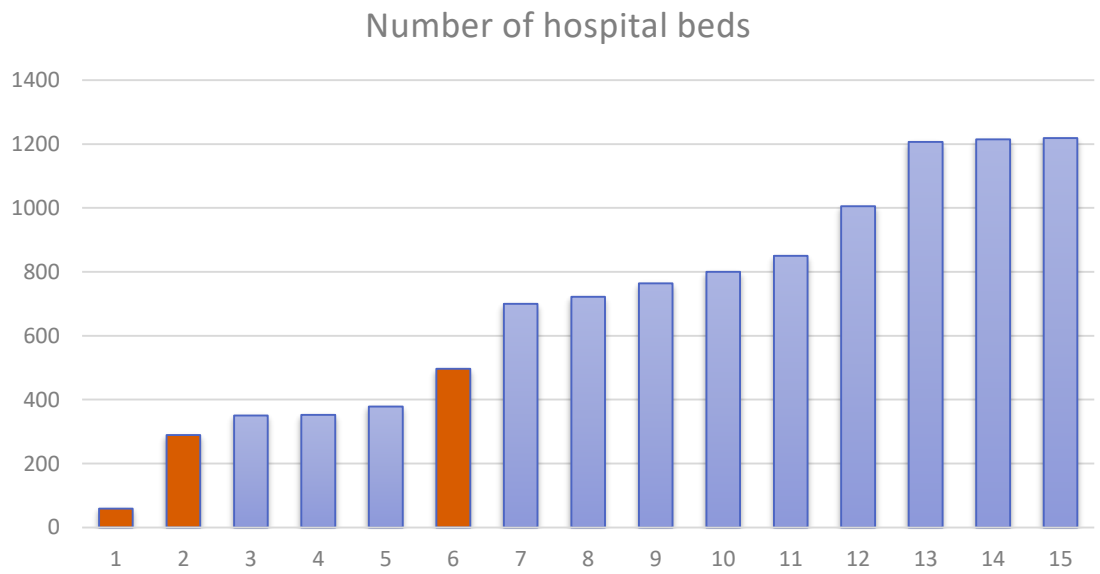
Organisational aspects

- **Number of procedures on each MSBOS: range 17 – 167**



Organisational aspects

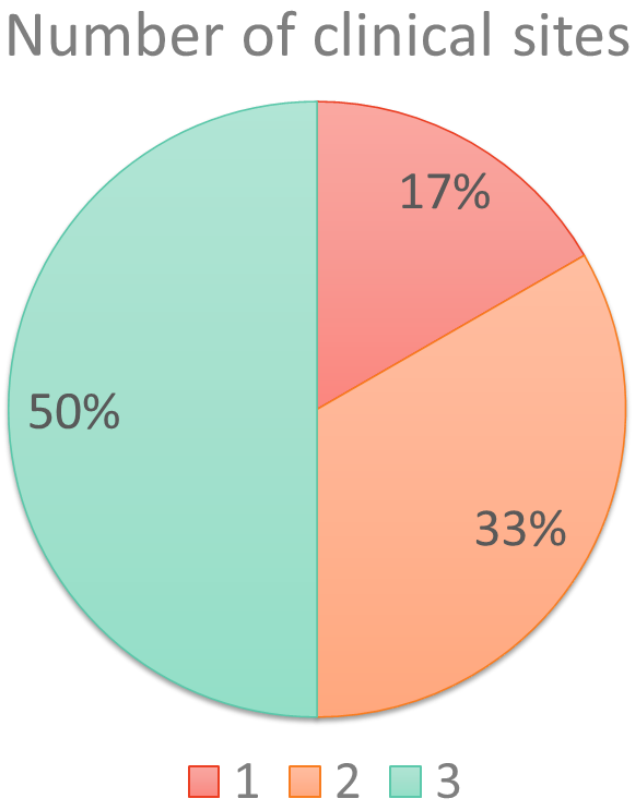
- **80% (12/15) organisations do electronic issue**



Columns in red indicate hospitals which do not do electronic issue

- **No hospitals currently do remote issue**

Organisational aspects



Organisational aspects

‘Important to ensure pre-op clinics are using appropriate, consistent ordering’

‘Our hospital no longer operates with a defined MBOS. This was phased out when we moved to electronic issuing’

‘MSBOS is primarily used by pre-op assessment to determine which patients need a group and screen sample. It is used by Blood Bank to determine which of these patients need units issuing for operative cover’

‘Our MSBOS only applies to IAT crossmatches (14% of total issues) and patient’s with a Hb below 100g/l. All other procedures except cardiac which are eligible for EI don’t have blood issued but are kept to one side on day of operation with an “issue on demand” sticker.’

Blood ordering pathways

<table>
<tr><th colspan="2">‘Conventional’ blood ordering pathway

73% (11/15)</th><th>‘Issue on demand’ pathway

27% (4/15)</th></tr>
<tr><td>Blood issued for the patient as per the request (guided by MSBOS)</td><td>Blood issued as per the request (guided by MSBOS, different numbers of red cell units specified if red cell antibodies identified)</td><td rowspan="2">If no Abs/low Hb then request set aside, for ‘issue on demand’ (reliant on electronic issue)

If Abs/low Hb then blood issued as per request</td></tr>
<tr><td>40% (6/15)</td><td>33% (5/15)</td></tr>
</table>

West Midlands Summary MSBOS

- 1 hospital excluded (paediatric procedures only)
- Interventional radiology procedures excluded
- Red cell units only

- 226 total procedures
- Recommended number of red cell units to be ordered detailed in the summary if the procedure features on ≥ 3 MSBOSs

West Midlands Summary MSBOS

- Anticipated challenges:
  - Some sites will do more complex cases of the same procedures
  - Hard to describe the average: provided min, max and mode

- Unexpected challenges:
  - The number of procedures
  - Variation in use of sub-categories:
    ‘colectomy’ or ‘total, hemi, partial, sigmoid colectomy’
  - Description of the operation sometimes unclear:
    ‘hernia repair’, ‘nailing’
  - Only a few procedures with no GS specified

West Midlands Summary Maximum Blood Ordering Schedule (MSBOS)

- A procedure is included in the table if it features on features on ≥ 3 MSBOSs
- Appendix 1 details procedures that feature on <3 MSBOSs

Freq = number of MSBOSs that feature this surgical procedure
Min = minimum stated number of red cell units
Max = maximum stated number of red cell units

GS - Group and antibody screen
GS* - GS and crossmatch 2 units if red cell antibodies (or low Hb)
GS - GS and crossmatch 4 units if red cell antibodies (or low Hb)**
GS*- GS and crossmatch 6 units if red cell antibodies (or low Hb)**

GENERAL SURGERY	Freq	Min	Max	Mode
Cholecystectomy	12	0	GS*	GS
Hernia repair - femoral, inguinal	4	GS	2	GS
Hernia repair - hiatus	5	GS	GS*	GS
Laparotomy	8	GS	2	GS
Splenectomy	10	GS	6	GS
Vagotomy, scrotomyotomy, pyloroplasty	5	GS	GS	GS
COLORECTAL				
	Freq	**Min**	**Max**	**Mode**
Abdominal perineal resection	13	GS	4	2
Anterior resection rectum	6	GS	4	GS, 2
Colectomy (including total, hemi, partial, sigmoid, Hartmann's)	14	GS	3	GS
Colostomy	6	GS	GS	GS
Delormes procedure	3	GS	GS	GS
Ileostomy	8	GS	GS	GS
Reversal of colostomy or Hartmann's	5	GS	2	GS
Reversal of ileostomy	3	GS	GS	GS
UPPER GASTROINTESTINAL				
	Freq	**Min**	**Max**	**Mode**
Gastrectomy NOS	4	GS*	2	GS*, 2
Partial gastrectomy	7	GS	2	GS
Total gastrectomy	6	GS	3	2
Gastrostomy	5	GS	GS	GS
Oesophagectomy	6	GS	6	3
HEPATOBILIARY				
	Freq	**Min**	**Max**	**Mode**
Endoscopic Retrograde Cholangiopancreatography (ERCP)	3	GS	GS	GS
Liver biopsy	8	GS	GS	GS
Whipple procedure/Pancreatectomy, pancreatic resection	4	2	4	4

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West Midlands Summary MSBOS

The most frequent procedures

	Freq	Min	Max	Mode
Colectomy (including any of total, hemi, partial, sigmoid, Hartmann's)	14	GS	3	GS
Total hip replacement (THR)	14	0	2	GS
Abdominal perineal resection	13	GS	4	2
Total knee replacement (TKR)	13	GS	2	GS
Cholecystectomy	12	0	GS*	GS
THR Revision	12	GS	4	2
Prostatectomy - open	12	GS	3	2
Transurethral resection of prostate (TURP)	12	GS	2	GS

The procedures with the most variation

	Freq	Min	Max	Mode
Splenectomy	7	GS	6	2
Oesophagectomy	6	GS	6	3
Elective open abdominal aortic aneurysm repair	7	GS**	6	4

Common procedures that appear infrequently

	Inclusion	Order	Transfusion rate[7]
Appendicectomy	14%	0 or GS	0.2%
Haemorrhoidectomy	14%	GS	1%
Varicose vein surgery	29%	GS	0%

Other comments

- 7% (1/15) MSBOS had different red cell requirements for different named surgeons
- 7% (1/15) MSBOS details different G&S requirements for different hospital sites

Limitations

- Data collection spread out from November 2019 – November 2020
- No data on whether MSBOS being followed for blood product ordering
- No data on clinician awareness of the blood ordering pathways
- No data on impact on blood stocks management of the different ordering pathways

Summary

- MSBOSs certainly continue to have a role in the West Midlands
- MSBOS being incorporated into the blood ordering pathway differently in different trusts
- There is marked variation in the number of procedures listed and numbers of red cell units recommended between MSBOSs

Recommendations & future work

- Update the regional email distribution list and have multiple contacts per hospital
- Check descriptions of the surgical procedures in local MSBOSs are clear and sufficiently detailed
- Consider comparing local ordering requirements with the summary MSBOS and discussing with your hospital transfusion committee if markedly different
- Future projects:
  - Audit of pre-op blood ordering and the number of units actually transfused for surgical procedures
  - Audit clinician awareness of MSBOS and blood ordering pathways in each trust
  - Consideration of a list of procedures that could be specified as not even needing a G&S

Thankyou to the contributing organisations:

- The Dudley Group NHSFT
- George Eliot Hospital NHS Trust
- The Royal Wolverhampton Hospital Trust
- Sandwell and West Birmingham Hospitals NHS trust
- Shrewsbury and Telford Hospital NHS Trust
- South Warwickshire NHS Foundation Trust
- Spire Parkway Hospital
- University Hospitals Birmingham NHSFT (Heartlands, Good Hope, Solihull)
- University Hospitals Birmingham NHSFT (Queen Elizabeth Hospital)
- University Hospitals Coventry and Warwickshire NHS Trust
- University Hospitals of Derby and Burton NHS Foundation Trust
- University Hospitals of North Midlands NHS Trust
- Worcester Acute Hospitals NHS Trust
- Wye Valley NHS Trust

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Discussion

Lorna.cain@nhs.net