



# National Cardiac Arrest Audit

---

## Case Studies

---

### Mapping the “Data Supply Chain”

© 2019

Resuscitation Council (UK) & ICNARC

All rights reserved

Resuscitation Council (UK) & ICNARC disclaims any proprietary interest  
in any trademarks or tradenames other than its own

## Contents

---

Background.....	4
Aim.....	4
Call for case studies.....	4
The “Data Supply Chain”.....	5
Oxford University Hospitals NHS Foundation Trust.....	6
University Hospitals Birmingham NHS Foundation Trust.....	11
Nottingham University Hospitals NHS Trust.....	14
Epsom and St Helier University Hospitals NHS Trust.....	18
Liverpool University Hospitals NHS Foundation Trust.....	21
University Hospitals of Derby and Burton NHS Foundation Trust.....	24
Calderdale and Huddersfield NHS Foundation Trust.....	27
South Tees Hospitals NHS Foundation Trust.....	29
Further information.....	31
Get involved.....	31
Acknowledgements.....	31

## Background

---

### Aim

Working closely with participating hospitals, we see some common challenges emerge.

- Not having any, sufficient or legible information to enter data for NCAA
- Difficulty completing NCAA validation queries
- Local resources (staffing, facilities)
- Lack of communication between departments

We wished to develop a resource to allow hospitals to share experiences, the challenges they have faced locally and solutions they have implemented to improve the data collection process.

### Call for case studies

To help us better understand these challenges, in March 2019, we put out a call for case studies asking, **“how do you collect data at your hospital?”**

We wanted to take a closer look at the journey the data takes from the patient's bedside to validated and locked on the NCAA database. We termed this the "Data Supply Chain".

## The “Data Supply Chain”

To help provide a framework for mapping the flow of data, we identified 6 “links” in the chain:



## Oxford University Hospitals NHS Foundation Trust

Zoe Abel – Resuscitation Officer

---

### Participating hospitals:

- John Radcliffe Hospital
  - o Events in 2018/19 – 127
  - o Tertiary and major trauma centre
- Horton General Hospital
  - o Events in 2018/19 – 23
  - o District general hospital with emergency department, day surgery and a midwife lead unit (MLU)
- Churchill Hospital
  - o Events in 2018/19 – 21
  - o Specialist medicine and surgery



### GENERATED

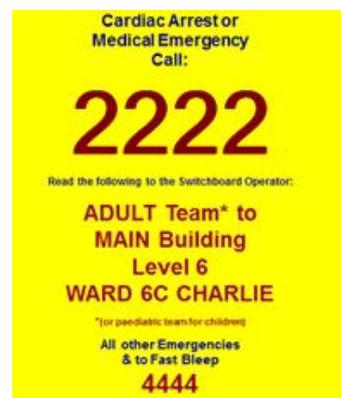
- 2222 call put out by area requiring assistance.
- The specific resuscitation team (including Resuscitation Officers) receives voice and text information via bleeps and attends the event.
- If a member of the team is unable to attend, they call 2222 and make sure the switchboard operator is aware. There is a contingency plan in place to ensure that ‘stand by’ 2222 team members are called via the 2222 voice / text method to attend.
- If a Resuscitation Officer is available, they will attend the 2222 call. Not all 2222 calls are attended by a Resuscitation Officer due to clinical experience, expertise and due to restricted access, e.g. Cath labs.
- ‘Safety huddle’ immediately after event for immediate feedback.



### RECORDED

- Switchboard record information on pro forma and relay information in speech and text form via bleeps to the required team.
- The pro forma used by switchboard to document the call is uploaded to a server.
- Sometimes 4444 calls have been made instead of 2222. Switchboard have been trained in how to manage these calls.

- Ward staff can record details of the event via a ‘resuscitation record’ on EPR (electronic patient record). This is usually done after the event although not consistently.
- The resuscitation department has a pro forma for data collection that is occasionally used by junior members or new starters in the department. The information collected is based on what NCAA and the department require.
- The resuscitation department has produced yellow information posters which are displayed by telephones in all areas. The yellow posters state which team should be asked for and state the location so that they can be easily found. Staff are encouraged to read this poster when calling 2222 so that only essential information is given and to avoid confusion. Terminology is standardised.
- Resuscitation training is mandatory, and attendance is required during a new starter’s induction period and then annually. This is largely in-house and specific to each site. NCAA is championed within these sessions.
- Advances in technology in equipment will provide more accurate and useful data. The Horton site and areas in John Radcliffe have started using Zoll defibrillators which are Wi-Fi enabled allowing data to be collected and downloaded.



#### COLLATED

- All calls are counted, separated and distributed which proves to be very time consuming.
- Each site practitioner has their own system of recording and reviewing calls. This is mainly due to individual experience and site knowledge.
- Every site must enter their own data by a strict deadline on the first of the month onto the department shared Excel spreadsheet.
- Our internal system forces us to complete the correct information due to our mortality policy. This reduces the amount of missing data and eliminates waiting time on any outcome data.
- The area where the event has happened is either called or visited to see the patient notes.
- Electronic Patient Records has all patient’s information and is used to generate a resuscitation record. The format is like the NCAA form. It can be used to piece together information. The system has a box to tick if the call was a false alarm. CareView system in ICU areas is also used to gather cardiac arrest information.
- Any notes in the EPR are amended to be more specific to the event.
- The EPR is double checked and reviewed to highlight events that do not meet NCAA scope i.e. out of hospital events.
- I oversee an Excel spreadsheet document that collects all the recorded information needed for NCAA validation. This is broken down into sites within the

hospital who can enter their own data. It is used to transfer data over NCAA's portal but also to gather extra details requested for NCAA queries.

- We're in the process of using Microsoft Access to manage the way large amounts of event data can be entered, validated and exported. This is a result of being able to communicate with other departments, i.e. our research team, who helped in developing the way data can be collated effectively.
- Ward walks help to keep the familiarity going with staff. This in turn provides good communication that helps when assembling information for the audit.
- Staff are encouraged to nominate a 'resuscitation link practitioner' in their clinical areas to act as a link to the resuscitation team. As an incentive, the link practitioners are offered a place at our annual resuscitation study day.
- Missing ethnicity is a challenge to collect.
- All calls are counted, separated and distributed which is very time consuming. I would be interested in making denominator data collection easier!



#### ENTERED

- The flag status dashboard on the NCAA portal is fine to use.
- Question marks beside field names are helpful when unsure of a query surrounding a field.
- I am solely responsible for entering data, where I oversee a team of 14.
- Once a month, NCAA data are entered in bulk. Data are looked at throughout the month to answer any queries or solve any discrepancies.
- Every site must enter their own data in the spreadsheet by a strict deadline on the first of the month.
- Resetting my password can prove to be frustrating due to the current process.
- Happy with entering the data as it is a system I am used to.



#### VALIDATED

- Experience is a big factor when validating records as I can often pre-empt the queries that pop up and know what is required from me to get my team visit records approved.
- Team Visit Number (TVN) is recorded on the spreadsheet, so that when entering data in NCAA or providing more details, I can immediately identify the team visit record that the event data refer to.
- Outstanding records are followed up each month.
- Ward nurse experience helps when clinical knowledge is needed for certain queries.
- The NCAA data validation advice guide is helpful when validating harder than usual queries.

- Additional information box could be moved up from the bottom of the form, so it is not forgotten.
- A box to tick on the status dashboard to approve when a month has no cardiac events would be useful.
- Tooltips which are seen when hovering over a status or field are good and the whole functionality of the NCAA portal is fine.



## COMPLETED

- Each hospital site is overseen by a senior Resuscitation Officer. The department is managed by a service lead. The day to day operational site management is carried out by resuscitation practitioners.
- We're very pro-active on the topic of communication. Resus committee meetings are regular. Departmental meetings are held every 8 weeks to discuss agendas, issues etc. This is a good way to monitor the standard of the training, communication amongst the team and the data validation for NCAA. There's a strong commitment for development.
- We try to get other departments to network by offering free study days as an opportunity for support, feedback and quality improvement.
- Weekly meetups (harm free) are set up to talk about cardiac arrests within medicine. This is part of the deteriorating patient strategy within the JR. This empowers individuals to keep a dialogue amongst each other which coincidentally raises people's profile around the hospital.
- The report is good at spotting progress and opportunities for improvement.
- Email prompts are good and used to double check the validation data.
- Message of the day could be better used if it was further up on the page.
- Tips and hints could be on the portal rather than the website. This saves times going back and forth from the portal to the website.
- NCAA reports are used to provide performance reviews to the Trust.
- An idea for the NCAA Reports is to colour code similar sized hospitals. I can then monitor how the hospital is doing to similar ones within NCAA for a better comparison.
- There's currently a huge deteriorating project from using the completed data in the NCAA reports. Our Trust is big on using the data for a wider scope.
- Consultant used to trigger a SEND score – developed in Oxford National Early Warning Score (NEWS)2.
- NEWS2 has received formal endorsement from NHS England and NHS Improvement to become the early warning system for identifying acutely ill patients – including those with sepsis – in hospitals in England.
- UCLH developed the system analysis on deteriorating patients. Professor Bryan Williams, chair of medicine at UCLH also chaired the NEWS and NEWS2 development groups for the Royal College of Physicians.

- Data from NCAA are used for the NEWS2 system to investigate their organisations own operations and systems – this is currently under development.

# University Hospitals Birmingham NHS Foundation Trust

Luke Jeyes – Resuscitation Officer

---

## Participating hospitals<sup>1</sup>:

- Birmingham Heartlands Hospital
  - o Events in 2018/19 – 184
  - o Emergency department
  - o 1069 beds
- Good Hope Hospital
  - o Events in 2018/19 – 97
  - o Emergency department
  - o 525 beds
- Solihull Hospital
  - o Events in 2018/19 – 34
  - o 216 beds



## GENERATED

- A 2222 call is made.
- There's one switchboard amongst three sites.



## RECORDED

- 2222 calls are on a call recorded system.
- Switchboard are good at recording the calls. They are rarely asked for missing calls.
- The switchboard records all calls, not just cardiac arrest, whilst on the phone.
- The switchboard uses a paper diary that sits by emergency phone and is used as back up.
- The details recorded are the call time, the emergency, ward/department, which site, pager group and who has taken call. Also, a phone extension form is used.
- Half hour after the call, switchboard will contact the ward to get patient name and ID number.

---

<sup>1</sup> Queen Elizabeth Hospital, Birmingham due to join in 2020

- Critical care outreach team nurses 24/7 sometimes have documentation of the 2222 call. They call the switchboard first to get call time for their notes.



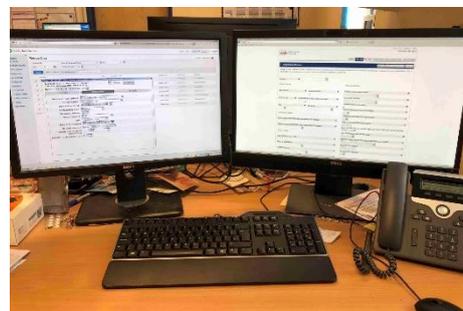
## COLLATED

- I use a database software solution (Concerto) that has all the information in one place.
  - Our patient admin system (which includes outreach records data) connects with the database.
  - Notes are scanned into the system.
  - Intensive care admissions have extra details on the system.
  - Easy to train users on the database.
- If it's a busy day, data may be missing. The resuscitation team will then have to investigate.
- Information is collected from a variety of sources:
  - Accident & Emergency notes.
  - Bleep Outreach Nurse. Missing data are rare as the outreach nurses enter the data on the database.
  - Calling the ward. First question that's asked is if it was a cardiac arrest. Quick way to know if the call may meet the scope.
  - Patient notes.
  - Resuscitation Officers collect the 2222 call details from the switchboard. These are checked every morning, during the week. Weekend and bank holiday calls are checked the following working day.
  - An Excel spreadsheet is used to cross reference calls on the system and to check missing data too.



## ENTERED

- Data are reviewed before being entered.
- Data are entered a couple of times a month or when there is spare time.
- Two screens are used. Takes approx. 45 seconds to enter a team visit record.
- Concerto is coordinated with IT to match the format of the NCAA validation form. This speeds up how data are entered.





## VALIDATED

- I can pre-empt queries due to my long experience entering NCAA data.
- I now know the importance of clear confirmation notes, providing context and referring to specific data from the event when necessary.



## COMPLETED

- Team has access to standard reports to retrieve denominator data for entry on the NCAA portal. They can also contact the performance team to easily retrieve this information.
- To monitor pending outcomes, the database system (Concerto) has a live resuscitation list with cases that are waiting to go in NCAA (or already entered but still in hospital). They are looked at and entered at the end of the month. When 2222 calls are followed up, we look at the pending outcomes as well as the electronic handover.
- Message of the day and the validation reminders are effective.
- A suggestion would be to have a dashboard when you log into NCAA to see data completeness for the reporting year(s).

### Participating hospitals:

- Queen’s Medical Centre
  - o Events in 2018/19 – 117
  - o Emergency department and major trauma centre
- City Hospital, Nottingham
  - o Events in 2018/19 – 119
  - o Planned care site, including heart centre



### GENERATED

- The 2222 cardiac arrest call is placed by the staff member in the clinical area.
- The call is received by the resuscitation team members via a bleep and they attend the site of the cardiac arrest.
- Occasionally, the incorrect team will be called. Sometimes there is confusion between neo-natal and paediatric calls, so the wrong team is summoned. If an area is calling the wrong team then bespoke training in the clinical area is given to highlight the importance of sending the correct team.
- In process of obtaining 2222 stickers to go on all phone handsets Trust-wide, which is still in progress.
- A newsletter is sent out to resuscitation link nurses with up to date information to be shared with their teams.



### RECORDED

- The 2222 call is captured by switchboard via Nerve Centre (healthcare system); there was a paper logbook before this. The log was not reliable as staff had to walk to obtain the book, so it was often out of reach. Calls were not logged, especially if Trust was busy or under pressure. The system is simple, and all calls are recorded. The switchboard is based in other hospital within the Trust (20 mins away) so the system is a lot better for accessing information.
- 2222 calls are checked daily to see where the calls have been generated. Typically, around 1200 calls are generated in a year for medical emergencies/cardiac arrest calls, alone.

- 2222 calls are followed up to ascertain whether the patient details meet the NCAA scope.
- To aid the follow up process, ward staff complete an audit form to return to Resuscitation Officer, post 2222 call, which has worked well. It's used as a backup if the call was not logged. The missed call is chased up with a switchboard colleague to educate the staff member on the importance of call capture.
- It took eight months to design and implement the 2222 medical documentation form. The design phase started in 2018. The 2222 medical documentation form is there to capture all relevant information post cardiac arrest. Also, the form aids the cardiac arrest team with the documentation process when they are away from their wards.
- There are regular team meetings every month (face to face) and a resuscitation committee meeting every quarter. These meetings work effectively, especially when trouble shooting issues.

Completed by (print name):  Nottingham University Hospitals NHS Trust

**Post 2222 audit form:**  
**MUST be completed after every 2222 call made**  
 Please return this form ASAP to the Resuscitation Training Department at the City Hospital Campus

Patients Name:	Affix Patient Label	Date of call:
DOB:		Time of call:
K Number:		Ward:

If you have any additional comments please write these on the back of the form

Did the Patient have Chest Compressions (CPR)? (Please Tick)		
Yes		No
If No what was the reason for the call? (Please Tick)		
Medical Emergency		Vaso-vagal
False Call		Other:

2222 Staff Attenders (Please Tick)		
Medical Registrar		Anaesthetist
F1		Hospital at Night
F2		Resuscitation Officer
CCU Nurse		Other:

Resuscitation Training Department  
 City Hospital ext. 56054 Draft June 2017 *We are here for you*



## COLLATED

- Patients basic details (full name and K number) are asked when calling to obtain the data, as well as if the patient received chest compressions. Although it can be a challenge to locate the information.
- Sometimes documents are not scanned properly or scanned in a mixed fashion. The clinical areas are often called daily but can be difficult to chase up the staff due to other commitments.
- If the staff member is unsure if CPR was commenced, this patient is marked '??CPR' on the Excel spreadsheet. Patients with CPR take priority and their patients notes are searched for information.
- It can be a time-consuming process going through patient notes if we're unsure if CPR was commenced, especially if it turns out to be a medical emergency instead.
- Multiple systems are used within the Trust that must be accessed separately making transfer of data from the software to the Excel document challenging.
- Patient notes, digital health records and NOTIS (clinical information system) are used to check for patient details.
- Patient notes are analysed on Digital Health Record. This is easier to organize than having the case studies ordered for each patient. NOTIS and Nerve Centre are used to obtain details for NCAA validation.
- An Excel spreadsheet is used to gather this information in once place for validation. The spreadsheet reduces the number of queries to answer in NCAA

and it's an easy way to access extra information if required to provide more detail for a query. The spreadsheet is also set out to a similar format to the NCAA Team Visit Record.

- Unable to achieve 100% completion for the ethnicity field. Efforts to attain a full representation of patients' ethnicity to look at trends or high-risk groups for investigation and staff training are ongoing. This was initially picked up from the NCAA report. The resuscitation chair is the medical lead and is aware of this.



## ENTERED

- Once the data necessary for NCAA submission is available, I will complete it on the NCAA portal. Generally, I audit the notes and submit the data in NCAA at the same time to aid with easier completion. This also helps if there are areas that get flagged as I can address them straightaway.
- If I have patients that are still in hospital, I will check monthly and update the log.
- I will also look prior to the data deadline if patients are still in hospital and update accordingly to prevent a delay in our report being generated.
- Entering the data can be very challenging as there are other commitments. Any spare time is used to complete a case review for submission. Completing team visit records as you go helps to keep on-top of queries, rather than planning office days.
- At times, access to patient notes prove to be difficult due to meetings, coroners review or delays with DHR.
- As the only one person entering the data, it can prove to be difficult to manage time.
- The last additional box is always used to reinforce confirmation notes or as a reminder that the Team Visit Record was checked.



## VALIDATED

- Queries are answered as they arise, whilst entering data, to prevent long pauses between data analysis and submitting.
- I receive the 8-week reminder for submission, which I like as time flies!
- I can double check that all have been submitted and that all the data are correct.
- I will submit the denominator data after the 8-week reminder.
- Being pro-active and being a step ahead is the key to meeting the quarterly deadlines.
- Three years' experience helps when retrieving the details required and pre-empting the queries.



## COMPLETED

- Prior to deadline day, I will triple check all the data and any outstanding information required so that the quarter report isn't delayed.
- I will add on any relevant additional information and then the data are completed.

## Epsom and St Helier University Hospitals NHS Trust

Jane Cushnie – Resuscitation Officer

---

### Participating hospitals:

- Epsom Hospital
  - o Events in 2018/19 – 48
  - o Emergency Department, day-case units and in-patient units (CCU) for: cardioversion, angiography, insertion of loop monitors and pacemakers. (There is facility for stenting in an emergency)
- St Helier Hospital
  - o Events in 2018/19 - 90
  - o Emergency Department, Regional Renal Unit, day-case units and in-patient units (CCU) for: cardioversion, angiography, insertion of loop monitors and pacemakers. (There is facility for stenting in an emergency)



### GENERATED

- Resus Officers are aware of the scope for NCAA. All 2222 calls are followed up to assess suitability of inclusion for NCAA.



### RECORDED

- A 2222 call is made by any staff member.
- All 2222 calls are documented by switchboard. The time, date, location, extension number and any short messages are recorded via paper form. The Resus Service audit calls electronically via Excel.
- Resus Officers carry 2222 bleeps, so they are aware of all calls within hours and attend if possible. Resus Officers work 9am - 5pm or 8am - 4pm so would attend 2222 calls if possible, during this time (Mon - Fri).
- We contact switchboard at the beginning of each day to identify any calls we may have missed outside of these hours. i.e. on Monday, we would need to follow up all calls since 5pm Friday.
- Resus Officer collects the switchboard log to cross reference all call information, weekly.
- Doctors write cardiac arrest event details in patient notes as well as completing The Cardiac Arrest Audit form at the end of event. This is kept in the cardiac arrest trolley folder on each ward. One copy is kept in notes and the other copy is sent to the Resus Service. (Compliance with this is not as good as we'd like - we

are currently developing a new scribe form which we hope will also serve as a more effective audit form)

- Defibrillator records event details.
- I'm currently implementing a "script" for operators to ensure exact location is received. This was prompted by an incident in which the team were called to a specialist unit where some went to the new unit and others went to the old unit. This was clearly a risk and it was identified that operators need to gain specific information regarding location, especially as we have two separate sites which are ever-developing. We also emphasise the need to give clear location details in our resus training sessions. We are meeting with the switchboard manager to discuss and agree a simple form.
- Currently developing a daily cardiac arrest team meeting as an opportunity to improve communication within the team which includes a reminder to complete the audit form. Unfortunately, this has taken longer to establish than hoped as it has been difficult to organise meetings with the key stakeholders together; i.e. medics, anaesthetics and critical care, in order to agree the logistics of the daily meeting, especially location and time of day. We have researched the advantages and methods of implementing it and have had positive responses to initial discussions. We wanted to ask the junior doctors about their experiences and concerns but had very little response from questionnaires. We remain enthusiastic about its value and hope to implement this within the next few weeks.



#### COLLATED

- Resus Officer speaks to ward staff to gather event details and identify any concerns.
- Notes and audit forms are read, if available.
- If a patient has died following the cardiac arrest event and has left the ward, the notes will be held with the bereavement team where we can access them for event details.
- If notes are unavailable, information sought via iPM/iCM (patient administration systems).
- Defibrillator data is downloaded by Resuscitation Officer and stored on computer.
- DATIX (incident reporting and risk management software) is discussed and/or submitted if necessary. This is our method of reporting issues that may need investigation or escalation. If there has been a problem identified at a cardiac arrest e.g. equipment broken or missing, a DATIX report would be submitted to log and report the incident. It may be that we are unsure if a DATIX needs to be submitted so we may discuss with our manager and staff from Risk Management first.



#### ENTERED

- All (3) resus officers in our team gather and record data for NCAA so we discuss any queries that might arise. I oversee the audit and feedback any discrepancies

I notice as a learning point. We cross reference the data in our cardiac arrest audit data monthly to ensure we have accurate information.

- Email sent to ward manager by Resuscitation Officer to offer further debriefing opportunity to all staff involved, using defib download data. Other support offered are further training or counselling with Occupational Health.
- Our cardiac arrest audit maintains a log of outcomes, so we know whether patients are still in hospital, have been discharged or have died.
- The Resus Officers can identify the exact location of the call to prevent validation queries.
- Details of any 2222 call are entered in the internal cardiac arrest audit and if event meets scope, details goes in NCAA; usually same day if possible.



#### VALIDATED

- NCAA TVR's are checked (at least) weekly and resolved immediately if possible. We discuss with the resus service team if necessary, to reduce and learn from "mistakes". This would be an informal discussion e.g. if I had noticed that a colleague had not entered the NHS number, I would explain the various methods we could try to access this information rather than leaving the question blank. It may be that this is not known to me until the TVR highlights it, but it would still be an opportunity to discuss.
- Internal CA audit updated with outcome (at least) weekly.
- Monthly total calls cross-referenced with NCAA data to ensure consistency and accuracy.



#### COMPLETED

- NCAA TVR's are checked to ensure there are no orange/light blue flags.
- The Denominator data is entered on approximately the seventh of each month when data is received from Trust Information Management via an email.
- In addition, the NCAA report is shared on the Trust website, in training, on info boards and at Resus Committee and College Quality Assurance Committee meetings.
- "Unexpected non-survivors" from NCAA Report are sent to a senior doctor to review in Mortality meetings. Sending the details of these visits to the Mortality group is a new initiative resulting from our wish to share the information more widely and was suggested at our Resus Committee meeting, but we have not had further feedback from them.

### Participating hospitals:

- Aintree University Hospital
  - o Events in 2018/19 – 78
- The Royal Liverpool University Hospital
  - o Events in 2018/19 – 80



### GENERATED

- MET (Medical Emergency Team) call is made from location of arrest (e.g. ward) via 2222. If the call is made for a cardiac arrest, the voice over from communications will say “medical emergency team and anaesthetic team to (location)”. Since implementation of NEWS, we can average over 200 MET calls per month for climbing news score (7+) however cardiac arrests have reduced by over 50%.



### RECORDED

- Initially we struggled to gain cardiac arrest information we were confident was accurate for the audit. We were using paper charts kept on the arrest trolley that were to be faxed to the office.
  - o These were meant to be completed in real time but were often completed retrospectively so details recorded may not always have been accurate. Obviously faxing documents also incurs problems with messages not being received, systems being down etc.
- Nurse practitioners attend all MET calls and post-event will complete a “form” on our electronic notes system detailing their interventions.
- Resuscitation Trainers record any data they capture from attending MET calls on their database (attendance subject to training commitments).
- Given that in-hospital cardiac arrests shouldn’t often be a sudden, unexpected event, we adopted the viewpoint that calling the MET should be recorded on DATIX (our critical incident reporting system).
  - o This is so we could not only review the cardiac arrest data, but also robustly review the effectiveness of the prior escalation, monitoring and interventions to ensure these were adequate.
- Ward based staff complete DATIX post-MET call (with a capture of around 85%).

- The system requests all the NCAA dataset entry information and additional evidence on who performed defibrillation and what was the NEWS (National Early Warning Score) prior to the call.
- The DATIX system is reviewed daily by Resuscitation Officers to ensure correct procedures are followed and correct/adequate escalation was made prior to the event.
- If there are any points for improvement, these are fed back to ward staff and evidence of action must be sent back. Some RCAs (Root Cause Analysis) are picked up at this point also.
- This feedback is discussed in a weekly safety meeting, led at divisional nurse level with compulsory attendance by matrons. Trends are also identified at this meeting, using NCAA data where relevant, and highlighting areas that aren't recording data.
- While capture isn't complete for all non-arrest calls, the cardiac arrests are now all being submitted in DATIX.
- Since the implementation of NEWS (National Early Warning Score) in our Trust, the MET calls were being made for raised NEWS scores and not just cardiac arrests. Calls were averaging in excess of 200 per month which meant interventions such as contacting the switchboard, or the wards post event were simply not realistic for us.
  - This has seen a decrease of cardiac arrests by over 55% with this number still reducing.
  - We're also managing to admit patients earlier to higher level care beds and sometimes the prior escalation is prompting the discussion around DNACPR. All these things are instrumental in reducing our cardiac arrest numbers, which in turn increases compliance of recoding and reporting (the main reason cited for non-reporting was work pressure and time constraints when dealing with post arrest patients or bereaved relatives).



#### COLLATED

- Forms completed on our electronic note system can be pulled into a daily report by the Resuscitation Officers who can identify the cardiac arrests for review before entering onto NCAA.
- As the calls for the cardiac arrest are recorded electronically, this means we can pull more meaningful data bespoke to area/directorates. Unfortunately, there are still challenges to achieving complete capture.
  - I attended an NCAA conference and heard many similar stories. One of the Resuscitation Officers presenting could hear her bleep from home and was calling the hospital to gain data for her arrest audit compliance. While this was dedicated (and worked!) it may have been more appropriate for me to have a walkie talkie rather than repeatedly calling!?
- A report is taken from the switchboard diary, daily. This gives us the time and location of the MET calls, so we can enter this onto a database held by Resuscitation Training. We have a clear idea of the number of calls made across the Trust which are all MET calls and not just for cardiac arrest.

- Our case notes are reviewed online via our electronic notes system to retrieve any required data which is cross-checked with other reports e.g. DATIX, to ensure accuracy.
- Invariably the CPC won't have been recorded so we'll visit or call the ward to discuss with the clinical team what this was and why it's important that it's recorded.



#### ENTERED

- If this is an arrest call that meets NCAA entry criteria, it is then recorded for entry later.
- Entries are often submitted during an admin session rather than real time due to work pressures (we knew we'd never win the fastest entry category...!). I pull the cardiac arrests from our database and use a combination of DATIX reports, electronic notes, inpatient management system to collate required information. If there is a lack of clarity or clear records, then this will be followed up by discussion with clinical teams.
- Entries are checked on DVR as we enter new records as this is an invaluable way of picking up simple errors made such as date of birth (easy to type the current year rather than the patient's DOB).



#### VALIDATED

- During the session for entering new data, the validation status is also checked and amended if required. The final checks are made, denominator data entered once we get the email from NCAA to let us know the close date is imminent.



#### COMPLETED

- Once completed, the cycle begins again. Once our report is received myself and my manager read this separately then meet to discuss any trends and changes. This is fed back in a simplified report to the Trust board with any requirements for actions decided.

Participating hospitals:

- Derby Hospital
  - o Events in 2018/19 – 154
- Queen’s Hospital, Burton
  - o Events in 2018/19 – 79



**GENERATED**

- An event occurs that fits our resus team calling criteria
- A call is made to switchboard and the resus team are paged to the location.

**Resuscitation Team calling criteria**

- All cardiac arrests
- All respiratory arrests
- Sudden unexplained reduced level of consciousness

<b>The Resuscitation Team may also be activated for an acute change in any one of the following:</b>	
<b>Airway</b>	At risk Obstructed airway Noisy breathing / stridor Problem with tracheostomy tube
<b>Breathing</b>	Respiratory rate < 8 min Respiratory rate > 30 min
<b>Circulation</b>	Pulse rate < 40 min Pulse rate > 120 min Systolic blood pressure < 90 mmHg
<b>Disability (Neurology)</b>	Repeated or prolonged seizures

2222

**Other: Any patient causing concern who does not fit the above criteria**



**RECORDED**

- Switchboard keeps a diary record of all 2222 calls received, including where possible, the hospital number of the patient. They would ring the area who made the call one or two hours after the event.
- All calls, including previous 24 hours (midnight to midnight) and 2222, are copied onto a sheet for collection the following morning by the Resuscitation Trainer. The sheet provided by switchboard is overall a positive thing. It does enable us to catch calls out of hours and weekends when we would not be attending them. As a negative, very occasionally we encounter a call that has not been added to our sheet.

- As a backup we also have a Trust Resuscitation Documentation form that should be completed at the time of the arrest by those attending. They are kept on the resus trollies and can be completed by any staff member at the arrest and ideally finished by the Resuscitation Team Leader. The carbon copy of this is sent to our department.
- Unfortunately, the Trust Resuscitation Documentation form is quite frequently not completed. When the form is completed, the amount and quality of data on it is very variable which is why we do not rely solely on this for our data collection. Either way, we may get information about the missed call which we can then follow up.
- All staff are advised to also document information in the nursing and medical notes as appropriate.



### COLLATED

- The NCAA data for our hospital are collected by the Resuscitation Trainers. We have a team of 13 trainers who are allocated daily (Monday to Friday) to follow up the previous 24-hour calls. Weekend calls are all followed up on the Monday. If the call fits the NCAA scope a data collection form is completed on review of the notes.
- 2222 calls are collected from the switchboard by the Resuscitation Trainer allocated for that day.
- The trainer can use the Trust computer system and the patient's hospital number to check the current location of the patient and read the documentation. If necessary, the ward staff are questioned for extra details.
- Deceased patient's notes are examined in the bereavement office.
- Communication is very good as our team are all based within the Clinical Skills department in three offices and we work together delivering training. If there are any questions regarding completion of the NCAA data collection form, team members will come and ask for clarification. Likewise, if I have any questions that cannot be answered by looking at our spreadsheet, I will ask the person responsible for collecting the information on that day or the individual who attended the call.
- All 2222 (both cardiac and non-cardiac) calls are also logged onto an excel spreadsheet within the department.



### ENTERED

- Data is entered several times a week on average. Any queries can usually be answered by the trainer or by looking at the information on the spreadsheet.
- If the patient is still in hospital, a note is made on another form which includes date of 2222 call, NHS number, present location and the date the event was last checked.
- When inputting new data, these are reviewed using the hospital system (the Lorenzo system).

- If we have or can find the patient's hospital number in addition to their details, then this system enables you to see:
  - The status (alive or dead).
  - All the demographics.
  - The current location within the hospital.
  - Plus, the time of the call.
- All this information allows me to know which ward to ring for information and where the notes are likely to be.
- The resuscitation forms have a patient sticker attached. One copy is in the medical notes and the other copy is sent to our department with the available patient number.



#### VALIDATED

- Validation queries are answered as soon as they are seen, usually on entering the new data. However, I frequently get timed out and lose the information I have started to enter. A longer time-out period would be helpful.
- Data for patients who were in hospital originally are also re-checked and entered if they have left the hospital.
- Once the validation reminder is received, all outstanding queries are checked again and resolved if possible.
- If it is available, the denominator data is entered at the end of the month.



#### COMPLETED

- The denominator data is entered, if not already done, once the final reminder email is received. The validation reminders are very useful, and the frequency is manageable.

Participating hospitals:

- Huddersfield Royal Infirmary
  - o Events in 2018/19 – 46
  - o Emergency department and ICU
- Calderdale Royal Hospital
  - o Events in 2018/19 – 58
  - o Emergency department, ICU, Coronary Care, Stroke/Midwifery and Paediatric acute care



**GENERATED**

- Event occurs within the hospital and a 2222 call is placed to switchboard. One hour after the 2222 call has been placed, the switchboard operator calls the area to document whether the incident was a cardiac arrest.



**RECORDED**

- Event is documented at the time or soon afterwards.
- The Electronic Patient Record (EPR) is used to document the event by medical /nursing staff and a cardiac arrest audit form is completed by the medical registrar.
- Once data is documented in the EPR records and audit form, the audit form is then sent to the clinical audit team.



**COLLATED**

- EPR and defibrillator data cards can be downloaded or printed from Critical Care defibrillators and Automated External Defibrillators if the initial rhythm is not documented on the audit form.
- Any missing audit forms for confirmed cardiac arrests via the hospital switchboard are highlighted to the Resuscitation Officers who review the EPR and request a completed form from the medical staff involved in the incident.



## ENTERED

- Clinical audit team review audit forms as received and submit information to NCAA for those which meet the scope once per month. Every quarter, any data that needs reviewing is highlighted by NCAA.



## VALIDATED

- This is done once per quarter.



## COMPLETED

- When all data is validated via NCAA.

## South Tees Hospitals NHS Foundation Trust

Mandy Yates – Resuscitation Officer

---

### Participating hospitals:

- The James Cook University Hospital
  - o Events in 2018/19 – 121
  - o 1,024 beds
  - o Range of district general hospital and specialist services
  - o Major trauma centre



### GENERATED

- A 2222 call is put out to the hospital switchboard and the patient receives CPR and/or Defibrillation.



### RECORDED

- All 2222 calls are recorded by the hospital switchboard. The place and time of the call are entered in a Red Folder in the supervisor's office.
- A Cardiac Arrest Treatment form is filled out straight away after the event by the ITU SHO (Senior House Officer) who is on call at the time of the arrest. This form is a duplicate form (white copy goes in patient's notes and pink copy is either filed in a folder (on the wall in ITU) or posted straight to the resus office who record the data. The form has been designed to replicate everything needed for the NCAA inputting.



### COLLATED

- Every weekday morning, I call the switchboard to retrieve all the 2222 calls that have been recorded. These are entered into a database for tracking.
- Cardiac Arrest Treatment forms are collected daily from ITU/post
- On the sixth of each month I log into the hospitals Admissions Report and print off the previous months' admissions.
- Any missing forms are chased up with the SHO on call. It's their responsibility to fill in these forms. Sometimes ward staff are contacted if there is any missing data.
- The hospital's CAMIS (patient administration system) is accessed to find out when the patient was admitted in order to confirm ethnicity and check for discharge date.



## ENTERED

- Data is entered as and when information is received.
- If a patient remains in hospital, they are flagged in the database and checked daily on the Hospital's CAMIS system to see when they have died or been discharged. This information is then entered for NCAA.
- On the sixth of each month the total admissions from the admissions report are entered as well as the denominator data for the previous month's data.
- At the beginning of each month I have a reminder to enter the number of calls (this is checked against the number of cases entered and from the numbers received from Switchboard).



## VALIDATED

- CAMIS is logged into daily to check if any patients who were still in hospital have been discharged or have died.
- If the patient has died, then NCAA is then updated straight away. If the patient has been discharged, an email, along with a form, is sent to the consultant the patient was under at discharge. The form has all the Neurological Scores and meanings on it. This gets emailed back to me and the NCAA is updated.



## COMPLETED

- Every time I log into NCAA it is checked for outstanding errors or validation queries.

## Further information

---

### Get involved

We would like to encourage all participants to continue sharing experiences, challenges and best practice. If you have a success story you would like to include here, please contact the NCAA team at [ncaa@icnarc.org](mailto:ncaa@icnarc.org).

### Acknowledgements

The NCAA Team would like to thank all participants who have submitted case studies and given feedback on the data collection process.