

**NATIONAL RETRIEVAL GROUP**  
**29 March 2017**

**TRIGGERS FOR REVIEW OF NORS TEAM CAPACITY**

## **EXECUTIVE SUMMARY**

As part of the NORS Review undertaken in 2014/15, it was agreed that NORS team capacity would be reviewed by the National Retrieval Group (NRG). A paper was presented to NRG in November 2016 with more detail about the process for triggering a review of capacity. NRG asked for more options as it was felt there was not sufficient evidence to support the 70% trigger for a review.

This paper will explore the rationale behind the 70% trigger, and will present a range of further options for when a review of capacity should be triggered.

NRG is asked to state their preferred option for triggering a review of NORS team capacity.

## **BACKGROUND**

As part of the NORS Review undertaken in 2014/15, it was agreed that NORS team capacity would be reviewed by the National Retrieval Group (NRG). Retrieval activity is monitored and summarised in the annual NORS Reports which are submitted to NRG before being uploaded onto the ODT website. The annual report is also discussed as a standing agenda item at the Contract Review Meetings with the NORS Teams.

The NORS Review recommended team capacity is monitored at NRG and, when a team is busy at least 70% of their time on call, a review of demand would be triggered.

Activity by NORS team, including the percentage of days each team spent attending at least one potential donor when oncall, has been monitored by the Commissioning Team. There have been quarters where a team has been busy on 70% of occasions, but this is not consistent.

## **NORS REVIEW – MODELLING DEMAND**

A key area of the NORS Review was realignment of capacity and extensive modelling took place to inform the report.

### Activity Assumptions

The NORS Review looked at demand based on activity in 2013/14. The measures included the number of donor attendances, the percentage of days each team attended at least one donor, travel times, location and density of donors attended length of retrievals and heatmaps showing the time of day/day of the week NORS Teams were most frequently mobilised.

Donation activity assumptions were also made up to 2019/20 and it was assumed the number of abdominal team donor attendances would increase from 1728 (2013/14) to

2500 (2019/20), while cardiothoracic donor attendances would increase from 565 to 808 over the same period.

All of these factors were taken into consideration when modelling future demand and the impact on NORS Team Capacity.

### Principles

Four different demand-based scenarios were modelled to help understand the capacity requirements:

- Cardiothoracic NORS Team actual activity – 2013/14
- Abdominal NORS Team (as individual teams) actual activity – 2013/14

The 2013/14 model was based on the actual individual calls for retrieval per hospital, day of the week/hour of the day, and actual muster time and theatre time

- Cardiothoracic NORS Team projected activity – 2019/20
- Abdominal NORS Team (as individual teams) projected activity – 2019/20

The 2019/20 model was based on projected individual calls for retrieval per hospital, day of the week/hour of the day, assuming NHSBT were to achieve its 2020 targets, using the sampling of historic patterns.

The modelling was based on mobilising the closest available team, rather than the previous zonal system.

If all teams were busy, the modelling indicated that there was no team immediately available.

Different scenarios were then modelled, showing different combinations of various teams on call.

### Findings

The demand-based modelling showed that the projected donor requirements for 2019/20 would be reasonably served by 4-5 cardiothoracic and 8-9 abdominal teams on-call 24/7 every day.

The findings also supported the current arrangements of 7 abdominal teams and 3 cardiothoracic teams on-call 24/7 every day.

Using the results from the 2013/14 simulations, it is important to note that:

- Based on 7 abdominal teams on-call, the proportion of days in the year with at least one attendance was 33-69%
- The rota of three cardiothoracic teams on-call means the proportion of days in the year with at least one attendance was 31-54%

## **CRITERIA AND METHODOLOGY**

The NORS Review workstream to look at capacity and future demand was chaired by Chris Callaghan, Consultant Transplant Surgeon, and key contributors included Dr Paul Murphy and Dr Dale Gardiner, Consultant Intensivists for advice and expertise on asystole prediction tools in potential DCD donors, Mr Steven Large, Consultant Cardiothoracic Surgeon and Mr Simon Messer, Research Registrar, for exploring potential for DCD heart donation, and Mr Steven Tsui Consultant Cardiothoracic Surgeon for data on the cardiothoracic scout pilot.

The following tools and methodologies were used:

- Literature review of tools to predict time between withdrawal of treatment and asystole in potential controlled DCD donors
- Discussions with stakeholders at NORS Challenge meetings, July and October 2014
- Analysis of the current NORS model, retrieval team activity, travel times, donor locations, daily and seasonal activity, retrieval timings, retrievals by non-NORS teams, and lost donors due to the retrieval process
- Projected increases in donation activity to 2019/20, based on the effects of key Taking Organ Transplantation to 2020 (TOT2020) initiatives
- Development of a mathematical simulation model to simulate different NORS service configurations (Laura Hontoria del Hoyo and Sally Rushton, NHSBT)

The workstream proposed the following criteria for assessing reconfiguration options:

- Workload should be relatively evenly spread across teams
- Optimal number of retrievals per team per 24 hours is less than 3
- Proportion of 24 hour periods when a team does not attend a donor should be less than 30%
- The majority of one-way travel times should be less than 3-4 hours
- Additional issues (costs, stakeholder acceptability, skills mix, training, infrastructure, efficiency, geographical cover)

These criteria were presented to the Review Board, and at the second Challenge meeting, and were supported as the key measure for reviewing capacity.

## PROCESS

When a review has been triggered, the commissioning team will prepare a report, making recommendations on where and when changes in on-call capacity should occur.

For any increases in capacity, the proposal will be to start by increasing one of the part-time teams to full-time. The team must be within three hours road travel of the busiest areas.

The report should include a cost/benefit analysis.

The report will be submitted to SMT for approval and to NRG for sign off, before any discussions with the NORS centres.

***NB – as at March 2017, there has been no increase in the number of donor attendances since 2013/14 so the current team configuration should be adequate to meet demand.***

## OPTIONS

There are five options for the point at which a review into demand and capacity should be triggered. In line with the NORS Review Recommendations, in addition to the options presented below, we would also review demand and capacity if a donor was lost (for example, if a family withdrew consent) and the investigation found this was due to

inadequate capacity. However the intention is to ensure we review demand regularly to ensure there is sufficient capacity to avoid such a scenario and as such Option Five is the least preferred option.

### **Option One: 70% Trigger for Abdominal and Cardiothoracic**

Based on the NORS Review Capacity Workstream, the proportion of 24 hour periods when a team does not attend a donor should be less than 30%, ie teams should be busy at least 70% of the time.

These criteria were presented to the Review Board, and at the second Challenge meeting, and were supported. Therefore, teams should reasonably expect to be busy for at least 70% of their time when on-call.

Option One uses the 70% marker as a trigger for a review and suggests this is implemented as follows:

- All abdominal or cardiothoracic NORS teams are busy at least 70% of their time on call for three successive quarters.
- If an abdominal or cardiothoracic NORS team is inactive at least 70% of their time on call for three successive quarters.

Advantages – the NORS Review Capacity Workstream clearly outlined this as a preferred option. Having a single trigger point is fair and equitable across abdominal and cardiothoracic teams. The experts felt this was a reasonable criterion and this was supported by the wider stakeholder community

Disadvantages – NRG felt this trigger was not backed up by robust evidence. There is a clear lower limit for review of activity, but no upper limit for an individual team, hence the suggestion a review is triggered when all teams on-call are busy for >70% of the time.

### **Option Two: NORS Review Modelling Demand Trigger**

Based on the modelling carried out as part of the NORS Review and the NORS Review Implementation Board (see Findings, above), the current model of 7 abdominal and 3 cardiothoracic teams on-call meant teams could expect to be out between of 33-69% and 31-54% of days respectively.

Therefore, if a team exceeds the upper limit over three consecutive quarters, a review would be triggered. Likewise, if a team is below the lower limit over three consecutive quarters, a review would be triggered.

To monitor this activity accurately, only retrievals attended by an on call NORS Team would be monitored (exclude occasions where teams attend and are paid the workforce tariff for doing so).

Advantages – the graphs for monitoring these data are familiar to all stakeholders, trigger would be in line with the modelling carried out as part of the NORS Review and Implementation.

Disadvantages – is it equitable to have different measures for cardiothoracic and abdominal teams?

### Option Three: Downtime Trigger

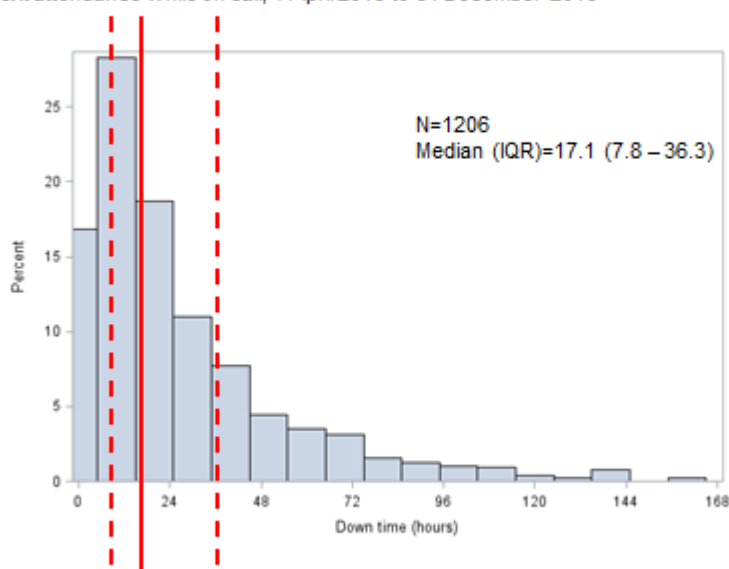
This shows how long teams are at their base between attendances to give a better idea of busyness. Data excludes time away from base, includes travel times, and uses time from back to base until next actual departure whilst on call. We do not know the exact back to base time so estimated it by adding the time it took teams to get from their base to the donor hospital on the outgoing journey, and assuming the same for return.

The median is the time at which 50% of times are lower and 50% are higher. The lower quartile is the time that 25% of times are lower and 75% are higher.

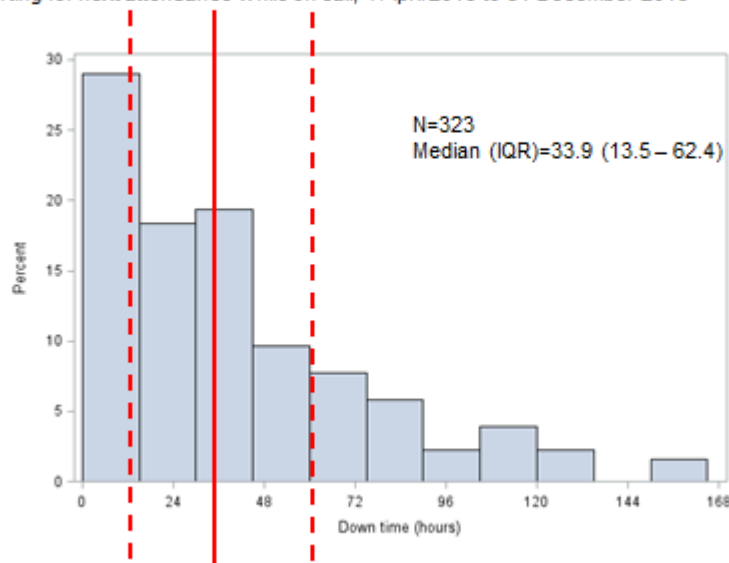
The graphs below show the lower quartile is 7.8 hours for abdominal teams and 13.5 hours for cardiothoracic teams. If a team has a median time that is lower than these national lower quartiles then they have a much lower down time than seen across other teams. This means a team is busier than their colleagues and they are spending less time at base.

The upper quartile is 36.3 hours and 62.4 hours respectively. If a team has a median time that is higher than these national upper quartiles then they have a much longer down time than seen across other teams. This means a team is less busy than their peers and is spending more time at base than their colleagues.

Down time between abdominal NORS team returning to base and departing for next attendance while on call, 4 April 2016 to 31 December 2016



Down time between cardiothoracic NORS team returning to base and departing for next attendance while on call, 4 April 2016 to 31 December 2016



Therefore, a review would be triggered when a team's downtime is outside the upper or lower quartiles for nine months (three quarters).

Advantages – this gives a single figure against which NORS team downtime can be assessed.

Disadvantages – this could be perceived as a negative measure.

#### **Option Four: Weekly Maximum Number of Retrievals**

The maximum potential number of donor attendances for a team in one week can be estimated using the median time it takes to attend a donor. This was calculated using all donor attendances by an on call retrieval team between 4 April 2016 and 31 December 2016. An assumed down time of 2 hours between donor attendances was accounted for.

For abdominal teams the median out time was 8 hours 30 minutes, and so the maximum number of donors an abdominal team could attend in a week would be 16.

For cardiothoracic teams the median out time was 9 hours 40 minutes, and so the maximum number of donors a cardiothoracic team could attend in a week would be 14.

A review would be triggered when a team hits the maximum number of donors attended in a week.

Advantages – this is a simple measure; the NORS Review recommended a maximum of three donor attendances in 24 hours which would not be exceeded based on the maximum numbers presented here.

Disadvantages – does not take into account particularly long or short donor attendances; there is no lower limit so this would need to be agreed.

### **Option Five: Incident Trigger**

With this option, we would not trigger a review based on activity - the review would be triggered ONLY if a donor was lost due to insufficient NORS capacity.

This is the least preferred option, as we would not want to wait until a family withdrew consent or a donor was lost before reviewing adjusting capacity to meet demand.

Should a donor be lost due to insufficient NORS capacity, the NORS Review Implementation Board agreed a review of capacity would take place, but the intention is to avoid this scenario.

### **ACTION**

NRG is asked to agree their preferred option for monitoring demand.

### **NEXT STEPS**

The outcome will be shared with ODT SMT who will review the data and the preferred option(s). SMT will ask Statistics and Clinical Studies to prepare a report for the next NRG with the final agreed measures and supporting data.

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**Kate Martin – Statistician, Statistics and Clinical Studies, ODT**  
**With thanks to Theodora Pissanou, CRF NORS Lead**