National Cardiac Arrest Audit (NCAA): in-hospital cardiac arrests for paediatric patients

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NCAA Steering Group member

Supported by Resuscitation Council (UK) and ICNARC
NCAA and scope of data collection

- NCAA is the national clinical audit of in-hospital cardiac arrest in the UK and Ireland

- Scope for data collection -
  ...
  ...all individuals (excluding neonates) receiving chest compression(s) and/or defibrillation and attended by the hospital-based resuscitation team in response to a 2222 call...
Paediatric

- For these analyses, paediatric was defined as an individual aged less than 16 years
Children’s hospitals

- Participation for children’s hospitals is presented as:
  - Standalone children’s hospitals
  - Combined children’s hospitals
Standalone children’s hospitals
(children’s hospital participates as separate site)

• 5 of 9 standalone children's hospitals participate

Participants
• Alder Hey Children's Hospital
• Great Ormond Street Hospital
• Royal Manchester Children's Hospital
• Sheffield Children's Hospital
• Birmingham Children's Hospital

Non-participants
• Royal Aberdeen Children's Hospital
• Royal Hospital for Sick Children, Edinburgh
• Royal Hospital for Sick Children, Glasgow
• Royal Belfast Hospital for Sick Children
Combined children’s hospitals
(children’s hospital participates as combined site)

- 10 of 13 combined children’s hospitals participate

**Participants**
- Oxford Children’s Hospital
- Southampton Children’s Hospital
- Queen Mary’s Hospital for Children
- Nottingham Children’s Hospital
- Bristol Royal Hospital for Children
- Great North Children's Hospital
- Leeds Children's Hospital
- Evelina London Children's Hospital
- Derbyshire Children's Hospital
- Leicester Children's Hospital

**Non-participants**
- Royal Alexandra Children’s Hospital
- Tayside Children’s Hospital
- The Noah’s Ark Children’s Hospital for Wales
Paediatric arrest analyses

- Paediatric arrests are categorised by:
  - those occurring in children’s hospitals (standalone and combined children’s hospitals)
  - those occurring in non-children’s hospitals (all other participating acute general hospitals)

- Paediatric arrests are presented for the five-year period from:
  - 1 April 2011 to 31 March 2016
### Number of paediatric arrests

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 April 2011 - 31 March 2012</td>
<td>59</td>
<td>72</td>
<td>131</td>
</tr>
<tr>
<td>1 April 2012 - 31 March 2013</td>
<td>68</td>
<td>111</td>
<td>179</td>
</tr>
<tr>
<td>1 April 2013 - 31 March 2014</td>
<td>62</td>
<td>127</td>
<td>189</td>
</tr>
<tr>
<td>1 April 2014 - 31 March 2015</td>
<td>95</td>
<td>115</td>
<td>210</td>
</tr>
<tr>
<td>1 April 2015 - 31 March 2016</td>
<td>103</td>
<td>119</td>
<td>222</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>387</strong></td>
<td><strong>544</strong></td>
<td><strong>931</strong></td>
</tr>
</tbody>
</table>

Note: the numbers of hospitals participating have increased over time
Number of paediatric arrests

Mean number: 46.6

Note: the numbers of hospitals participating have increased over time.
Note: the numbers of hospitals participating have increased over time
Paediatric arrests

- Characteristics (n=931)
Age (years)

Mean age (years): 2.9

Percentage of in-hospital cardiac arrests attended by the team

Age group (years)

<1 | 1-4 | 5-10 | 11-15

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Sex (% male) over time

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Reason for admission to hospital (%)

Percentage of in-hospital cardiac arrests attended by the team

Reason for admissions to/attendance at/visit to your hospital

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Reason (% medical) over time

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Duration (days) from admission to 2222 call

Mean duration (days): 18.7

Number of days from admission to 2222 call

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Mean duration (days) over time

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Location of arrest (%)

Percentage of in-hospital cardiac arrests attended by the team

Location of arrest

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Location (% ward) over time

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Status (% resuscitation ongoing) over time

Status at team arrival:
Resuscitation ongoing (%)

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Documented rhythm (%) over time

- Shockable - VF/VT
- Non-shockable - asystole
- Non-shockable - PEA

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Duration (mins) of resuscitation for those achieving ROSC>20 mins*

*Excludes arrests before 1 May 2014 as fields were not collected
Duration (mins) of resuscitation for those not achieving ROSC>20 mins*

*Excludes arrests before 1 May 2014 as fields were not collected.
Reason resuscitation stopped (%)
Reason (% ROSC>20 mins) resuscitation stopped over time

![Graph showing the percentage of ROSC > 20 mins resuscitation stopped over time from April 2012 to March 2016. The line graph shows an increase in the percentage of resuscitation stopped over time.](https://example.com/graph.png)

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Post-arrest location for those achieving ROSC > 20 mins

- Percentage of in-hospital cardiac arrests with ROSC > 20 minutes

- Post-arrest location categories:
  - Emergency admissions unit
  - ICU or ICU/HDU
  - HDU
  - PICU
  - PHDU
  - CCU
  - Other intermediate care area
  - Obstetrics area
  - Ward
  - Other internal location
  - Mortuary
  - Other hospital
  - Not in hospital
  - Missing

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Post-arrest location (% PICU) over time

Post-arrest location: PICU (% of ROSC > 20 minutes)

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Paediatric arrests

• Characteristics (n=931)

• Outcomes
  – ROSC>20 mins (n=931)
  – Hospital survival (n=886 excluding re-arrests)
Number of individuals 886

Reason resuscitation stopped

Dead 322 (36.3%)

Alive 564 (63.7%)

Missing 0 (0.0%)

Alive = ROSC>20 minutes
ROSC > 20 mins (%) by patient characteristics

Overall

By presenting rhythm:
- Shockable - VF/VT
- Non-shockable - asystole
- Non-shockable - PEA

By age group (years):
- <1
- 1-4
- 5-10
- 11-15

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ROSC > 20 mins (%) by documented rhythm over time

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ROSC > 20 mins (%) by age over time

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Number of individuals 886

Reason resuscitation stopped

- Dead 322 (36.3%)
- Alive 564 (63.7%)
- Missing 0 (0.0%)

Status at discharge from your hospital

- Dead 431 (48.6%)
- Survival to hospital discharge 440 (49.7%)
- Patient still in your hospital 15 (1.7%)
- Missing 0 (0.0%)
Hospital survival (%) by patient characteristics

- Overall
- By presenting rhythm:
  - Shockable - VF/VT
  - Non-shockable - asystole
  - Non-shockable - PEA
- By age group (years):
  - <1
  - 1-4
  - 5-10
  - 11-15

Survival to hospital discharge (% of individuals)
Hospital survival (%) over time

Survival to hospital discharge (% of individuals)

- Apr 11-Mar 12
- Apr 12-Mar 13
- Apr 13-Mar 14
- Apr 14-Mar 15
- Apr 15-Mar 16

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Hospital survival (%) by documented rhythm over time

![Graph showing hospital survival by documented rhythm over time. The graph includes data for Apr 11-Mar 12, Apr 12-Mar 13, Apr 13-Mar 14, Apr 14-Mar 15, and Apr 15-Mar 16. The y-axis represents survival to hospital discharge (% of individuals), and the x-axis represents the time periods. The graph shows three categories: Shockable - VF/VT, Non-shockable - asystole, and Non-shockable - PEA. The data trend shows a general increase in survival for Shockable - VF/VT and a decrease for Non-shockable - asystole and Non-shockable - PEA.](image-url)
Hospital survival (%) by age over time

Survival to hospital discharge (% of individuals)


<1  1-4  5-10  11-15

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CPC at hospital discharge (%)
CPC at hospital discharge (%) over time

- CPC 1 or 2
- CPC 3 or 4 or 5
- CPC missing

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Any questions for NCAA...

...please email: ncaa@icnarc.org