Report Authors

**Andrew Parker**  
Scottish Ambulance Service  
Clinical Project Manager

**Dr Mike Donald (Clinical Lead)**  
NHS Tayside  
Emergency Medicine and Retrieval Consultant

**Martin Esposito**  
Scottish Ambulance Service  
Major Trauma Clinical Coordinator

**Jean Bruce**  
NHS Lothian  
Lead Research Nurse

**Jason Cormack**  
Scottish Ambulance Service  
Project Manager
# Contents

1. Foreword 01
2. Executive Summary 03
   2.1 Background 04
   2.2 Key Findings 05
   2.3 Recommendations 05
3. Strategic Background 07
   3.1 Operational Background 08
4. Methodology 09
   4.1 The Trauma Desk 09
   4.2 Trauma Desk Clinicians 10
   4.3 PDSA Cycles 11
5. Data Analysis 12
   5.1 Database and Data Collection 12
   5.2 Summary of Results 12
   5.3 Data Analysis Summary 15
   5.4 Mapping Exercise 16
6. Findings 18
7. Supplementary Discussion 20
8. Recommendations 23
Major trauma is classed as injuries that could potentially result in permanent disability or death. Despite advances in new vehicle technology and public health campaigns, major trauma remains the leading cause of death for people under the age of 45 in Scotland and is estimated to be responsible for approximately 1,200 deaths a year in Scotland. It is the commonest cause of death in children and is responsible for more deaths in children and adolescents combined than all other causes.

In England it is estimated that the annual lost economic output from deaths and serious injury from major trauma is between £3.3 billion and £3.7 billion.

In 2012, a report commissioned by the Royal College of Surgeons of Edinburgh reported that a “major rethink” was required in the provision of care for patients suffering major trauma in Scotland in order to replicate improvements in survival and reduction in disability that have been demonstrated in North America and more recently in England with changes in healthcare policy concerning major trauma management.

Scottish Ambulance Service representation in the report concluded that it would be beneficial for an experienced paramedic to be present in Ambulance Control with the purpose of providing clinical expertise to facilitate the identification and co-ordination of the complex response required for major trauma incidents.

The Major Trauma Pathfinder Project reports the findings of a six-month pilot where an experienced paramedic was present in Ambulance Control with a dedicated role to identify major trauma incidents requiring an enhanced response.

Summary of key findings

- A substantial (160%) increase in deployment of Prehospital Critical Care Teams with a significant increase in the number of patients receiving life and limb saving interventions,
- A clinician focusing on patients suffering from Major Trauma improves activation times of Prehospital Critical Care resources,
- Stand down of Prehospital Critical Care Teams after activation to calls identified by the Trauma Desk is less than that of other staff within the Ambulance Control Centre (ACC),
- MPDS codes assign a level of response to a 999 call. They are not always sensitive to those patients suffering
from Major Trauma without further interrogation by a clinician,

- Critical Care Teams are being stood down on occasions where patients could have benefited from Prehospital Critical Care Intervention,

- Challenges exist in communication when a multi-agency response is required,

- A small team of clinicians being utilised from small specialist teams provides challenges around resilience of staffing the desk and base locations,

- Communication of the crew configuration for Helimed 5 primary missions has improved,

- The current ability for only one person being able to listen to an incoming emergency call can inhibit the Trauma Desk from rapidly identifying Major Trauma or inhibit other aspects of ACC operations,

- Identification of geographical areas where there are sporadic, or no Prehospital Critical Care resources,

- Current data collection relating to Prehospital Critical Care resources by the Scottish Ambulance Service is not optimal.
2. Executive Summary

Major Trauma is the cause of around 1,200 deaths per annum in Scotland. The primary role of the Trauma Desk is to identify patients requiring an advanced Prehospital medical team response, and to expedite the dispatch of that team. A secondary role, identifying patients who would benefit from a Prehospital medical team where one is not available is also addressed. This brings Scotland in line with leading systems of trauma care across the world and takes a significant step towards addressing the most common cause of death in those under 45.

NHS Scotland currently has three established Prehospital medical teams available: Medic 1, based in Edinburgh; Tayside Trauma Team, based in Dundee; and the Emergency Medical Retrieval Service, based in Glasgow. These are consultant led and delivered services working closely with the Scottish Ambulance Service. However, while there are Prehospital medical teams available, there were no dedicated clinical resources identifying instances of Major Trauma. Following a business case, the Scottish Government supported a six month pathfinder project.

The model chosen involved the placement of experienced paramedics within the Ambulance Control Centre, whose sole remit was to identify instances of Major Trauma which would benefit from an advanced Prehospital medical team response. During the operational hours of the desk, this resulted in a 160% increase in the dispatch of advanced Prehospital medical teams providing life and limb saving interventions, along with a reduction in the dispatch time for the teams from nineteen minutes to six minutes.

Additionally, the Trauma Desk was able to contribute to the National Planning Forum review of Major Trauma provision through the identification of the key areas in Scotland not currently covered by an advanced Prehospital medical response. It has further demonstrated that through the use of experienced clinicians rather than algorithm driven decision making, expensive and scarce resources are more appropriately used, with a globally respectable stand-down rate.

This report recommends that the Trauma Desk pathfinder be made a permanent feature within Ambulance Control, with a suitable long term model of management, clinical governance and funding put in place. Further development of the desk, including a pilot of 24 hour a day coverage and investment in improved technology could
potentially improve the nation’s delivery of care to some of the most acutely injured and unwell people in Scotland.

2.1 Background

In many parts of the United Kingdom, the physical resources for advanced Prehospital care have developed faster than the dispatch and control systems.\(^1\) The increase in the range of resources available has determined a need for a control system with an ability to match the correct response to each emergency call.\(^2\) Only 10% of all urban emergency calls require advanced treatment (paramedic or medical response),\(^3\) 40% require basic first aid and as many as 50% are not true emergencies.\(^4,5\)

A system to match optimally trained personnel to the most serious cases is essential.

The evidence base for guidelines for Prehospital triage and immediate medical care is scarce. A review of the available evidence on which to inform decisions on how to optimally configure and inform dispatch processes demonstrates a paucity of high level evidence with, at best, level 3 evidence and expert opinion (Appendix A).

Physician-manned emergency medical teams supplement other emergency medical services in some countries. These teams are often selectively deployed to patients who are considered likely to require Critical Care treatment in the Prehospital phase.

In 2011 a panel, consisting of European experts in physician-based Prehospital Critical Care, was invited to participate in a consensus process. The consensus process was based upon a four-stage modified nominal group technique (NGT) that included a consensus meeting\(^6,7,8,9\). The group identified five top priority areas for research of which the dispatch criteria for Prehospital Critical Care services was included.\(^10\)

The evidence and expert opinion strongly supports the presence of appropriately trained, clinically active, personnel integrated and fundamental to the command and control structure in order to optimise the right resource being dispatched to the right patient at the right time.

A number of recent high level reports have indicated that deficiencies exist in the current service provision for Major Trauma patients and that service enhancements are required.\(^11,12,13\)

The Major Trauma pathfinder project commenced in October 2012; funding was provided by the Scottish Government for a six month project to run parallel with the National Planning Forum (NPF) Major Trauma work. A dedicated trauma desk was established in the West Ambulance Control Centre (ACC) with the ability to view and interrogate all 999 calls in Scotland.

An expert group was established by the Programme Director for ScotSTAR (Scottish Specialist Transport and Retrieval) which included representation from senior Scottish Ambulance Service Managers from the Clinical Directorate, Ambulance Control and Air Ambulance. In addition, the group was supported by Prehospital physicians and Scottish Ambulance Service clinicians.

Clinical co-ordination systems and processes will be fundamental to the success of ScotSTAR and the pathfinder project was a vehicle to test changes in process to inform the wider integration of a single co-ordination hub for all specialist transport in Scotland.

The hours for the Trauma Desk are currently: 08:00 to 18:00 hours Monday to Sunday (70 hours per week). Staff are able to visually interrogate incoming calls and extract further information by either listening to the information as it comes in to the call taker or call the scene back and speak directly to the informant.
The benefits of a single point of contact and experienced clinical coordination include:

- One single cohesive system for all Major Trauma calls,
- Establishment of a sustainable standardised process for NHS Scotland,
- Effective tasking and triaging for Major Trauma in NHS Scotland,
- Safe and effective tasking of the right team, in the right place at the right time,
- Improved efficiency to dispatch times to those patients suffering Major Trauma.

Throughout the six months Plan Do Study Act (PDSA) cycles were undertaken to try alternative options, building on the experience and lessons learned. Data analysis has been completed throughout the course of the project allowing the ability to show where improvements have occurred and also identifying where there are gaps in provision of Prehospital Critical Care resource in Scotland.

### 2.2 Key Findings

- A substantial increase in deployment of Prehospital Critical Care Teams with a significant increase in the number of patients receiving life and limb saving interventions,
- A clinician focussing on patients suffering from Major Trauma improves activation times of Prehospital Critical Care resources,
- Stand down of Prehospital Critical Care Teams after activation to calls identified by the Trauma Desk is less than that of other staff within the ACC,
- MPDS codes assign a level of response to a 999 call. They are not always sensitive to those patients suffering from Major Trauma without further interrogation by a clinician,
- Critical Care Teams are being stood down on occasions where patients could have benefited from Prehospital Critical Care Intervention,
- Challenges exist in communication when a multi-agency response is required,
- A small team of clinicians being utilised from small specialist teams provides challenges around resilience of staffing the desk and base locations,
- Communication of the crew configuration for Helimed 5 primary missions has improved,
- The current ability for only one person being able to listen to an incoming emergency call can inhibit the Trauma Desk from rapidly identifying Major Trauma or inhibit other aspects of ACC operations,
- Identification of geographical areas where there are sporadic, or no Prehospital Critical Care resources,
- Current data collection relating to Prehospital Critical Care resources by the Scottish Ambulance Service is not optimal.

These findings are discussed in more detail in section 6.

### 2.3 Recommendations

- Full integration of the Trauma Desk in to the ACC structure,
- Cover of the Trauma Desk for 24 hours a day for 7 days a week,
- The development of a co-located dispatcher and clinician model,
- Dedicated resource incorporated in to active specialist clinician rotas to give greater resilience for both the specialist teams and the trauma desk,
- Development of robust peer review and governance processes,
• Development of patient focused clinical stand down criteria and processes of Prehospital Critical Care resources for the ACCs,

• Exploration of the ability to expand the scope of the clinician on the trauma desk to support activation and coordination of other specialist resources such as Special Operations Response Team (SORT) and Air Ambulance Helicopter Emergency Medical Service (HEMS) activations,

• Enhance the telephony system in place to allow more than one person to listen to a live call,

• Accurate recording of allocated Prehospital Critical Care resources on the Scottish Ambulance Service C3 system,

• That the Scottish Ambulance Service and territorial NHS Boards take cognisance of the geographical inequities in access to Prehospital Critical Care resources detailed in this paper,

• That the strategic project group for the Trauma Desk take cognisance of the recommendations in the NPF review of Major Trauma.

These recommendations are discussed in more detail in section 8.
Major Trauma Clinical Coordination Evaluation Report

3. Strategic Background

Trauma is increasingly being recognized as a serious global health problem and is the leading cause of death in all groups under the age of 45 accounting for approximately 1,200 deaths in Scotland each year. In addition, trauma causes considerable short and long term morbidity for many people and therefore has a significant personal, social and financial impact on the population of Scotland.

The Scottish Government published the ‘Healthcare Quality Strategy’ in 2010. This strategic document has a number of aims and commits all NHS Health Boards to ensuring that the improvement of the quality of patient care is treated as a priority. The Scottish Ambulance Service published “Working Together for Better Patient Care” in 2010. This outlines their five year strategy for delivering high quality patient care. Following this, in 2011 the Scottish Ambulance Service published their ‘Clinical Strategy 2011-2015’ with one of the specific aims of this document to improve the quality of care offered to Major Trauma patients in Scotland.

In many parts of the United Kingdom, the physical resources for advanced Prehospital care have developed faster than the dispatch and control systems. Prehospital Critical Care resources supplement other emergency medical services in some countries. These teams are often selectively deployed to patients who are considered likely to require Critical Care treatment in the Prehospital phase. In Scotland, there are three recognised Prehospital Critical Care Teams: Emergency Medical Retrieval Service (EMRS) based in Glasgow, Tayside Trauma Team (TTT) based in Dundee and Medic1 based in Edinburgh. These are supplemented on an ad hoc basis by a number of British Association of Immediate Care (Scotland) (BASICS) doctors and hospital based response teams.

The increase in the range of resources available has led to the need for a control system to match the correct response to each emergency call.

The evidence base for guidelines for Prehospital triage and immediate medical care is scarce. A review of the available evidence on which to inform decisions on how to optimally configure and inform dispatch processes demonstrates a paucity of high level evidence with, at best, level three evidence and expert opinion (Appendix A).

In 2011, a panel consisting of European experts in physician-based Prehospital Critical Care were invited to participate in a
consensus process. The process was based upon a four-stage modified nominal group technique (NGT) that included a consensus meeting \textsuperscript{6,7,8,9}. The group identified five top priority areas for research of which the dispatch criteria for Prehospital Critical Care services was included\textsuperscript{10}. The evidence and expert opinion strongly supports the presence of appropriately trained, clinically active, personnel integrated and fundamental to the command and control structure in order to optimise the right resource being dispatched to the right patient at the right time.

In the 2012 review of trauma care in Scotland, the Royal College of Surgeons of Edinburgh came to a similar conclusion by recommending the implementation of regional trauma systems in Scotland, similar to current models in England. A fundamental part of a regional trauma system includes having appropriately trained paramedics based in control rooms to identify Major Trauma and coordinate the level of response.

### 3.1 Operational Background

The Major Trauma pathfinder project commenced in October 2012; funding was provided from the Scottish Government for a six month project to run in parallel with the work of the National Planning Forum’s Major Trauma subgroup. The NPF report has now been published and the group charged with strategic management of the Trauma Desk will take forward the relevant recommendations. The pathfinder established the Trauma Desk consisting of a clinician within the West ACC with the virtualisation of all three ACCs.

The pathfinder concentrates solely on Major Trauma cases. The reason for focusing on this cohort of patients is due to a number of reports recently published including Royal College of Surgeons\textsuperscript{11}, STAG\textsuperscript{12} and the work undertaken within NHS England on Major Trauma Services\textsuperscript{12} and the NPF Major Trauma Task and Finish Group to consider options for enhancing the current service.

The reason for the pathfinder rather than a pilot is that there was a consensus view that a single point of contact for triage/tasking is required; there has been some debate on the level/type of clinician required to undertake this role and where they should be based.
The project began with the establishment of a Major Trauma Clinical Coordination Pathfinder Group (MTCCG). The group was established by the Programme Director for ScotSTAR to test the processes around clinical coordination. The group included senior Scottish Ambulance Service Managers from the Clinical Directorate, Ambulance Control, Air Ambulance and Prehospital physicians and other allied health professionals involved in the provision of Critical Care to patients suffering from Major Trauma and those staff identified as being able to contribute as clinicians to staff the desk.

The project was funded by the Scottish Government with the aim of testing processes around the identification of Major Trauma and the dispatching of Prehospital Critical Care resource.

The aim of the MTCCG was to ensure the Trauma Desk (TD) was set up, managed and run appropriately and effectively and to ensure the aims of the project were met. MTCCG meetings chaired by the Clinical Lead have continued on a monthly basis throughout the project and have ensured the positive development of the TD.

4. Methodology

4.1 The Trauma Desk

The Trauma Desk is physically located in the Scottish Ambulance Service, West ACC in Cardonald, Glasgow. Throughout the project the operational hours of the TD were 08:00-18:00, 7 days a week. Trauma Desk Clinicians (TDC) rotate individually on the TD as part of a roster each contributing 0.5 WTE. Whilst having an appointed line manager from the Scottish Ambulance Service Clinical Directorate, the TDCs and TD are an integrated part of the ACC and are directly responsible to the ACC Duty Manager whilst on shift.

The TDCs have the ability to access and assess all incoming 999 calls to the Scottish Ambulance Service. This is achieved by having access to the West C3 software and remote access to the East and North C3 systems. C3 (Command, Control and Communication) is the software used by the Scottish Ambulance Service to process incoming calls and assist with the allocation of appropriate resources. They can then ‘silently’ interrogate (listen in) to these calls as well as ‘actively’ interrogate (call back) callers in order to decide if Prehospital Critical Care resource is required. The Scottish Ambulance Service utilises Medical Priority Dispatch System (MPDS) software to triage incoming calls and this restricts the call takers to scripted questions unless the answer
given requires further clarification. The TDCs work out with this software and can therefore interrogate the call in more depth. This active interrogation is complemented by the TDC’s clinical experience. The TDC can also request situation reports (SITREPs) from attending Scottish Ambulance Service resources as well as contacting these resources directly.

When calls suggestive of Major Trauma are identified the TDC follow algorithms that have been developed to alert the relevant ACC to the requirement of Prehospital Critical Care resource; with the most appropriate resource being dispatched. The relevant ACC can then activate the Scottish Ambulance Service Major Trauma Pathway (Appendix B) The early involvement of an experienced clinician is key to the decision to task the relevant Prehospital Critical Care Team. The three established teams in Scotland have similar clinical skill sets and are based in Dundee, Edinburgh and Glasgow. The Dundee and Edinburgh teams deploy by rapid response vehicle (Tayside Trauma Team/Medic One) and the Glasgow team (EMRS) can deploy by air or by response vehicle. The TDC’s intimate knowledge of the benefits of Critical Care delivery in the Prehospital environment can be weighed against the distance and time to hospital Emergency Department in order to inform decisions regarding the need for Prehospital Critical Care Team deployment.

Instances of Major Trauma are relatively rare and the existing Prehospital Critical Care Teams are a scarce resource. This clinical oversight provided by TDC is essential in ensuring that clinical resource is matched to patient need.

To support the Trauma Desk Clinicians operationally a number of processes and documents have been developed (Appendix E). These include:

- A Trauma Desk Directory,
- Daily Log form,
- Daily Task Guide,
- Daily Call Log.

### 4.2 Trauma Desk Clinicians

Prior to the commencement of the project, five Scottish Ambulance Service paramedics were identified as potential TDCs. All were clinically active and had either extensive experience of trauma care delivery, experience of working as part of a Prehospital Critical Care team or experience of working as part of the Scottish Ambulance Service Air Ambulance. The dynamics of this group included two members of the Scottish Ambulance Service Air Ambulance, two Scottish Ambulance Service paramedics seconded to EMRS as Critical Care Practitioners (CCPs) and one member of the Scottish Ambulance Service Professional Development and Education Department who had prior experience of working on a TD with the London Ambulance Service. All were seconded, from small specialist teams, to the TD on a part-time basis (0.5 WTE), allowing them to continue in their clinical roles. During the project, one of the core staff left the Scottish Ambulance Service resulting in the need for further recruitment of TDCs to maintain the staff establishment. Due to the constraints of the existing teams that contributed to staffing, there was the need to recruit from elsewhere within the Scottish Ambulance Service. Following a recruitment process a member of the Clinical Advisor cohort from ACC was successful and appointed to the team.

A bespoke two day systems training course was developed and run by the Scottish Ambulance Service Information Communication Technology Department allowing staff to navigate the live C3 system to identify those incidents involving Major Trauma. Each member of staff that contributes to the desk has undertaken this course unless previously trained in the use of the system. This allows staff to safely visually interrogate an incoming call and establish if further information is required from either listening to the information as it comes in to the call taker or calling the
scene back. The ability to input notes within the incident to record information gained and required action is also incorporated. New staff receive further induction and shadowing to include trauma desk specific processes and familiarise new staff with listening to calls and interrogating the scene to extract relevant information to identify Major Trauma patients.

In addition, a ‘Guide to Interrogation’ was compiled by the project Clinical Lead. This resource provides practical advice on interrogating for trauma developed from knowledge and experience of other UK Prehospital Critical Care teams and clinical coordination models. As well as general guidance, the document provides interrogation advice and suggests questions for specific trauma mechanisms such as penetrating trauma and road traffic collisions. This document is provided to all TDCs prior to starting on the desk with suggested clinical questions on display whilst on shift.

4.3 PDSA Cycles

Throughout the six months short PDSA cycles were undertaken to try alternative options, building on the experience and lessons learned. Tests of change have been completed using the Model for Improvement utilising the Plan, Do, Study, Act methodology. The project charter (Appendix C) and a summary of the cycles undertake (Appendix D) are attached.
5. Data Analysis

5.1 Database and Data collection

Data analysis has been completed throughout the course of the project allowing the ability to show where improvements have occurred and also identifying where there are gaps in provision of Prehospital Critical Care resource.

A customised Scottish Ambulance Service SharePoint database provided a data entry portal for the clinicians to complete during their working hours. The Daily Call Logs were completed and faxed to the data collator. SharePoint data included:

- Scottish Ambulance Service incident number,
- Call date and time,
- Time of Prehospital Critical Care Team allocation,
- Arrival/leave scene times,
- Stand down reasons,
- Prehospital Critical Care Team allocated,
- ACC activations,
- Major Trauma identified but no resource available.*

The Daily Call Logs collated:
- Time of the incident,
- Incident number,
- Type of interrogation (silent or active),
- Mechanism of injury,
- Patient condition,
- Any challenges listening to the call,
- Prehospital Critical Care Team allocation.

Prior to the commencement of the project, three months of comparative data on allocation times were collated from the Scottish Ambulance Service Management Information System (MIS). In addition, six months of data on activity was collated from a number of sources, including the respective Prehospital teams.

Results are reported in Section 4 as a summary and full results as Appendix F.

* This includes Potential North Area Calls where Major Trauma cases are identified in the North ACC area where there are currently no recognised Prehospital Critical Care Resources.

5.2 Summary of Results

Prior to the commencement of the project, three months of comparative data on activation were collated from the Scottish Ambulance Service Management Information System (MIS).
Results – Comparative Data

The MIS data for the three months recorded a total of 58 Prehospital Critical Care Team taskings.

- The mean time to allocate a Prehospital Critical Care Team was 19 minutes (Range 00:01 to 01:34).

Results - SharePoint Data

Between 22nd October 2012 and the 22nd April 2013 a total of 262 entries were recorded with a total of 190 activations (Table 1) between the hours of 0800 – 1800

- 165 directly from Trauma desk.
- 25 direct from ACC (ACC tasking data collection commenced in December 2012).

Table 1. Total Prehospital Critical Care Team Activations

<table>
<thead>
<tr>
<th></th>
<th>EMRS - Air</th>
<th>EMRS - Road</th>
<th>EMRS via MOD</th>
<th>Forth Valley</th>
<th>Medic 1 - Road</th>
<th>TTT - Air</th>
<th>TTT - Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>46</td>
<td>96</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>1</td>
<td>25</td>
<td>190</td>
</tr>
</tbody>
</table>

- On 76 occasions where Major Trauma was identified Prehospital Critical Care teams were not tasked with the majority due to no Prehospital Critical Care resource available.

- Crew requests accounted for 17 (9%) of team activations.

- Total of 37 Potential North Area Calls were identified (data collection commenced January 2013).

Allocation times (Excluding crew request for trauma team)

- The mean time to allocate Prehospital Critical Care teams by the Trauma Desk was 6 minutes.
- The mean time to allocate a Prehospital Critical Care team by ACC was 7 minutes (reduced from 19 minutes – Figure 1). This may be due to the constant focus on trauma and the high visibility of the clinicians in the ACC.

Figure 1: Comparison of Trauma Team activation across same time frame. N = 73 and 190

The figure above demonstrates a 160% increase in activation of Prehospital Critical Care Resources over the comparable six month periods between October 2011 and April 2013.

Figure 2. Time in Minutes to Allocate Prehospital Critical Care Team by Trauma Desk and ACC
Stand downs

A total of 78 (41%) stand downs occurred whether the team was activated via ACC or the TD. These include incidents where the patient was pronounced deceased (PLE) while team en route.

Excluding Pronounced Life Extinct (PLE) patients the stand down rate reduces to 34.7% with a TD – ACC breakdown outlined below. The most common reason for stand down recorded was “crew request”:

- 52 stand downs out of 165 Trauma Desk Activations – 31.5%.
- 14 stand downs out of 25 ACC activations – 56%.

Times

The times of the emergency call to the SAS ACC where Major Trauma is identified within the operational hours of the Trauma Desk are detailed in Figure 3. The two calls prior to 08:00 hours were ongoing trauma calls when the clinician came on duty. One call at 18:00 hours the clinician recorded into the database and continued their involvement.

Figure 3. Time of the Emergency Call to the SAS (Major Trauma identified by the TD clinicians)

Medical Priority Dispatch Codes (MPDS)

- Road Traffic Collisions (RTC) accounting for 134 (51%) of all identified trauma calls.
- Falls accounted for 47 (18%) calls.
- Traumatic injuries accounted for 20 (7.6%) calls.

Daily Call Logs

- The trial period consisted of 155 days of which 146 were covered (94.1%). Days uncovered were due to short call off sickness or staff shortfall.
- 3627 calls were listened to over the six months:
  - Initially the numbers of calls listened to and interrogated per day averaged 40 across the catchment area of only the West ACC.
  - Later reduced to approximately 20 calls per day across all three areas.
  - Clinician workload remained constant throughout the 10 hour shift. Figure 4 reflects the weekly clinician activity and the number of activations per week.
- Reasons for not sending a Critical Care team were only collated from January 2013. These include: incident being close to hospital, distance, no team available and those having minor injuries (Table 2).

**Table 2. Reasons for not sending trauma team**

**Management Information System (MIS)**
- 139 recorded Critical Care team activations
  - 15 of these were medical activations for Cardiac/Respiratory arrest, chest pains,
  - Discrepancy of 66 incidents not recorded as Critical Care Team activations.

**MIS recorded activations out with the operating hours of the Trauma Desk**
- 44 activations were recorded with 5 identified as medical incidents.

### 5.3 Data Analysis Summary

Across the duration of the project a number of key themes have been identified. These include:

**Table 2**

<table>
<thead>
<tr>
<th></th>
<th>distance</th>
<th>medical</th>
<th>minor injury</th>
<th>no casualty found</th>
<th>no team avail.</th>
<th>proximity to hosp</th>
<th>PLE</th>
<th>not recorded</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 13</td>
<td>6</td>
<td>2</td>
<td>168</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>50</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Feb-13</td>
<td>14</td>
<td>2</td>
<td>409</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>53</td>
<td>488</td>
<td></td>
</tr>
<tr>
<td>Mar-13</td>
<td>14</td>
<td></td>
<td>301</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>15</td>
<td>336</td>
<td></td>
</tr>
<tr>
<td>Apr-13</td>
<td>14</td>
<td></td>
<td>243</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>277</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>4</td>
<td>1121</td>
<td>3</td>
<td>4</td>
<td>14</td>
<td>133</td>
<td>1341</td>
<td></td>
</tr>
</tbody>
</table>
1. Improved sensitivity and time to dispatch of Prehospital Critical Care resource in relation to identifying Major Trauma. This is demonstrated by patients being identified as suffering from Major Trauma out with the Medical Priority Dispatch Codes that would normally be considered Trauma.

2. There is evidence within the data to suggest that the focus on trauma within the ACC structure has reduced the allocation time for teams even when the Trauma Desk Clinicians are not involved. The data shows that the average activation time for a medical team from the ACC before the implementation of the trauma desk was 19 minutes: during the six month pathfinder period this dropped to 7 minutes.

3. The number of taskings across the period of the pathfinder has almost doubled suggesting that more patients are receiving early Prehospital Critical Care resource that may not have previously. Further analysis would need to be undertaken to observe if there is any seasonal variation within this.

4. The significance of a lower stand down rate should not be underestimated. While the sample size for ACC taskings is not high enough to draw conclusive findings, a 31.5% stand down rate from trauma desk clinicians is comparable to high quality teams globally, most notably London HEMS. Savings both in availability of scarce resources (both teams and equipment) for NHS Scotland and of a financial nature are significant.

5. The data demonstrates that there are some common codes where Major Trauma is identified but these are not absolute and the interrogation by an experienced clinician has delivered early Prehospital Critical Care to patients that fall outwith expected trauma codings. This is outlined in Table 9 of the data appendix.

6. The reduction in number of calls interrogated is steady across all clinicians, with a clear tendency to listen to more calls on the initial shifts. It has been made clear by colleagues within the ACC structure that due to the ability of only one person to listen to a call there was a significant impact on other areas of service delivery. This reduction is vital to ensure the operational success of other functions within the ACC including supervisory support to determine an accurate location for a call and calltaker support by the clinical advisors. The data further demonstrates that the clinicians are able to maintain their focus for a 10 hours shift, in spite of the intensity of the work. The MTCC group has agreed however that this pattern is sub-optimal given the lack of resilience across meal and other breaks.

### 5.4 Mapping Exercise

Throughout the course of the project each incident was logged by the TD clinician in a database. The incident locations of where Major Trauma was identified were collated. These were subsequently mapped by timeframe and whether a critical resource was allocated. The different colours represent the time periods of incorporation of the other ACCs. This has been able to support the exploration of Prehospital Critical Care resources in the North of Scotland. Figure 5 (right) maps the relevant incidents across the period. Additional detailed maps are available in Appendix H.
6. Findings

- A substantial increase in deployment of Prehospital Critical Care Teams with a significant increase in the number of patients receiving life and limb saving interventions.

Since the inception of the Trauma Desk there has been a 160% increase in activation of Prehospital Critical Care Teams to patients suffering from Major Trauma compared to the same time period the previous year.

- A clinician focusing on patients suffering from Major Trauma improves activation times of Prehospital Critical Care Teams.

As demonstrated by the data in section 4, prior to the Trauma Desk pathfinder the average activation time for a medical response was 19 minutes. The Trauma Desk activation time is 6 minutes and the improved focus on trauma in the rest of the ACC has contributed to a reduction of the ACC time to 7 minutes. The improvement in Prehospital Critical Care activation time means that earlier interventions may have a significant clinical impact on patients.

- Stand down of Prehospital Critical Care Teams after activation to calls identified by the Trauma Desk is less than that of other clinicians within the ACC.

Whilst the data for ACC stand down rate is not yet at a level suitable for final conclusions, it is reasonable to say that the Trauma Desk stand down rate of 31% compares to other organisations and is significantly lower than the indicative figure for the ACC. This ensures that Prehospital Critical Care resources are used more efficiently and that financial savings are made – for instance, the cost of a Helimed flight is approximately £800 per hour. The experience of practicing paramedics on the Trauma Desk has been identified as important to this improvement. As the experience of those that contribute to the trauma desk improves it is envisaged that these figures could improve.

- MPDS codes assign a level of response to a 999 call. They are not always sensitive to those patients suffering from Major Trauma without further interrogation by a Clinician.

As discussed in section 4 MPDS codes are not reliable in determining the severity of injury. This is outlined in Table 9 of Appendix F.
• Critical Care Teams are being stood down on occasions where patients could have benefited from Prehospital Critical Care Intervention.

Individual cases have highlighted this with rapid review and feedback at the time. There is an ongoing review of all Stand Down across the period to establish how often this has occurred and if there are interventions that could be delivered at an ACC level to improve this.

• Challenges exist in communication when multi-agency response required.

Staff involved in the Trauma Desk were asked to contribute to the review and organisational learning of some of these incidents.

• A small team of clinicians being utilised from small specialist teams provides challenges around resilience of staffing the desk and base locations.

The key lesson learned being that utilisation of resources from small, specialised teams is not a sustainable option without permanent additional resources contributing to the staffing of the Trauma Desk rota.

• Communication of the crew configuration for Helimed 5 primary missions has improved.

The implementation of a tasking template and clear guidance from the trauma desk on the crew configuration requirements for primary air missions has improved the information relayed to Helimed 5 paramedics and EMRS.

Feedback from both teams has highlighted a reduction in communication and configuration issues and improved use of resources.

• The current ability for only one person being able to listen to an incoming emergency call can inhibit the Trauma Desk from rapidly identifying Major Trauma or inhibit other aspects of ACC operations.

Since this information was recorded approximately 10% of calls deemed relevant on visual inspection of the information by the Trauma Desk Clinician have not been able to be interrogated. The level of impact on overall ACC operations has been more difficult to measure however other clinicians and managers working within the ACC structure have raised concerns.

• Identification of geographical areas where there are sporadic, or no Prehospital Critical Care Resources.

The collation of data for the whole of Scotland since January allowed for the mapping of incidents where there was no Prehospital Critical Care resource available to send.

• Current data collection relating to Prehospital Critical Care Resources is not optimal.

If the callsign for the team is not entered in to the incident but only referred to within the notes of the incident then it is currently unable to be pulled from the Management Information System. This has been raised through the ACC management structure and improvement has been noted ensuring that the information that goes forward to the National Planning Forum’s Major Trauma subgroup is reliable.
7. Supplementary Discussion

The overall aim of the pathfinder was to improve the identification of Major Trauma in Scotland by developing a clinician led TD within the ACC. Whilst the results have been extremely positive there have been challenges as outlined below. Throughout the course of the project the TD has been involved in a number of high profile incidents. This has allowed the clinicians and management of the desk to be involved in the review of these incidents and contribute to organisational learning. It is anticipated, as the TD evolves, that specific Key Performance Indicators (KPI) will be developed to enhance governance and facilitate audit of the Desk. Some suggested KPIs include:

- **Time of call to time of Prehospital Critical Care Team dispatch (Performance standard 10 minutes)**
  - This is important because one of the key benefits is the delivery of Prehospital Critical Care resource to patient earlier following significant injury.

- **Appropriate team dispatched**
  - This is important to ensure that there is assurance that the ACC is dispatching appropriately.

- **Appropriate processes followed by the Clinician to activate the team and communicate with the relevant ACC**
  - This is an important aspect of the governance and accountability of the clinicians.

- **Correct information entered on to the database**
  - This is an important aspect of the governance and accountability of the clinicians and ensures that as Trauma Care in Scotland develops the information that is available from the Trauma Desk is beneficial.

**Data Collation**

Retrospective data to identify current workload and Prehospital Critical Care resource activity using Scottish Ambulance Service data was found incomplete therefore reliance on the local team data proved invaluable.

**Geographic location of Trauma desk**

As part of the project, one week was covered from the East ACC in South Queensferry. Some of the learning obtained was related
to the physical location of the desk. This was situated at the end dispatchers’ desk just across from the call takers and with direct line of vision to the clinical advisors in the room. This allowed for a better overall flow of communication within the room and the ability to pick up cues from the interaction of the call takers receiving emergency calls. Other learning included:

- the limitations of having only two screens reducing the ability to virtualise the three ACCs effectively,
- difficulties in knowing when the resources are available in the West, predominantly the Air Ambulance.

Due to reconfiguration within the West ACC the Trauma Desk was moved. The new location isolated the clinician from being able to make eye contact and extended communication lines with a number of key personnel within the room that support the dispatch of Prehospital Critical Care resources. This means that on occasions staff now need to physically leave their desk space to communicate effectively with each other.

**Staffing Issues**

Staffing shortages meant that on rare occasions the Trauma Desk was not operational. This was a total of eight full shifts and four partial shifts across the six months. On some occasions the Trauma Desk was run from the East ACC by Clinical Advisors not normally involved with the Trauma Desk. This proved beneficial enabling the ACC staff to obtain better understanding of the remit of the Trauma Desk but highlighted the already identified issues at that location as outlined above. In addition this highlighted the need for further familiarisation for the wider established clinician base within the ACC to be able to effectively contribute to the Trauma Desk.

The key lesson learned being that utilisation of resources from small, specialised teams is not a sustainable option without permanent additional resources contributing to the staffing of the Trauma Desk rota.

**Telephonic Technology**

Difficulty in more than one person listening to calls due to the constraints of the current telephony system proved frustrating to the TDCs and Clinical Advisors within ACC. This affected the ability to interrogate the call to extrapolate live time information to enable rapid, effective clinical decision making.

On some occasions following the disconnection from a caller by the call taker, where further information was required to make an informed decision about Prehospital Critical Care resource requirements, the TDC were unable to reconnect with the caller. Attempted call backs would regularly go to voicemail or simply be unanswered. If a caller could be passed directly to the TDC it would improve the time to be able to further interrogate an incident and make a clinical decision.

**Stand Downs**

The stand down rate of the Prehospital Critical Care resources was initially reduced although there remained fluctuations throughout the project possibly relating to staff changes. There is anecdotal evidence and some identified cases where Prehospital Critical Care resources were stood down but had they arrived at the patient would have enhanced the level of clinical care delivered. At the commencement of the project there was no agreed standardised stand down criteria across all Prehospital Critical Care Teams. One template already in place was adapted to develop a tool for use by dispatchers when crews report that Prehospital Critical Care resource was no longer required. Agreement across the three established teams was reached in relation to the criteria for stand down but the ability to implement the tool without clinical interrogation has not been possible to date.
Crew configuration
Helimed 5

The involvement of clear guidance from the TDC, in relation to the need for a Prehospital Critical Care Team to incidents involving Trauma, has improved the process of identifying the crew configuration of Helimed 5. This has removed the decision making from the crew room, with limited information and no ability to further interrogate a call, to the ACC in conjunction with the TDC. A dispatch proforma has also been implemented in conjunction with the Air Ambulance management team to guide the Air Desk and other ACC staff in the transfer of information.

Inequity of access to Prehospital Critical Care teams

The collation of locations where Major Trauma occurs has contributed to the ongoing discussions at the National Planning Forum’s Major Trauma subgroup. There are several hospitals in Scotland that have local bypass protocols in place for Major Trauma. The TD would have an integral role in the development of any national reconfiguration of trauma services to support bypass and/or facilitating secondary retrievals to hospitals designated to receive Major Trauma.

Peer review

Due to the isolated working of the Trauma Desk Clinicians within the ACC, a system that allowed regular peer review of practice would be of benefit, providing improved governance and improvement mechanisms through feedback and support.

Internal Communication

Developing corporate knowledge of the project in the initial phase was challenging. Despite early engagement and an internal bulletin to all staff prior to the commencement of the desk, there did appear to be a lack of knowledge and understanding of the TD throughout the project.

A number of initiatives were undertaken to address this. This included regular visits by the TD Line Manager to the East and North ACCs to liaise with colleagues and develop processes. Additionally, TDCs were invited to present a session as part of the Scottish Ambulance Service Clinical Advisors course at the Scottish Ambulance Academy. The week of testing of the Trauma Desk based in the East ACC also contributed to a greater awareness and understanding for ACC staff.

A frequently asked questions document was developed during the project to deliver information to the wider Scottish Ambulance Service. This has been distributed via the Scottish Ambulance Service communications department.
8. Recommendations

The Trauma Desk is currently managed as a project and for sustainability of the benefits outlined above integration within an appropriate ACC structure is required. It is recommended that the Trauma Desk is aligned with the Specialist Services Desk currently under development, including ScotSTAR, Airwing and SORT (Special Operations Response Team).

- Full integration of the Trauma Desk in the appropriate ACC structure.

- Cover of the Trauma Desk for 24 hours a day for 7 days a week.

Attempts to gain robust data to justify the running of the Trauma Desk 24 hours a day has been difficult to obtain. A pilot of expansion of the Trauma Desk will allow for definitive exploration of the benefits. Costs have been identified and provided to the Scottish Ambulance Service executive team.

- The development of a co-located dispatcher and clinician model.

To streamline the processes between identification and dispatch, the use of a clinician and trained dispatcher team on the Trauma Desk, as opposed to the current clinician only model, is proposed. This could reduce the time between identification and dispatch and also allow for a more specialist approach to these limited resources nationally.

- Dedicated resource incorporated into active specialist clinicians rotas to give greater resilience for both the specialist teams and the desk.

During the pathfinder period, twelve days were left without full cover on the desk. Additionally there were periods where significant overtime was required to cover the desk and specialist teams. Given the importance of both to delivery of clinical care a long term solution is required.

- Development of robust peer review and governance processes.

A system that allowed regular peer review of practice would be of benefit, providing improved governance and improvement mechanisms through feedback and support.
• Development of patient focused clinical stand down criteria and processes of Critical Care resources for the ACCs.

Agreement across the three established teams was reached in relation to the criteria for stand down but the ability to implement the tool without clinical interrogation has not been possible to date.

• Exploration of the ability to expand the scope of the clinician on the Trauma Desk to support activation and coordination of other specialist resources such as SORT and Air Ambulance HEMS activations.

A pilot to test the capacity of the Trauma Desk clinician to support other specialist responses such as HEMS or SORT (Special Operations Response Team) would inform future development and potentially provide efficiency savings through more clinically focused tasking of these rare and expensive resources. This was demonstrated with the introduction of a paramedic dispatching air resources in Ambulance Victoria, Australia in 2010.

• Enhance the telephony system in place to allow more than two people to listen to a live call.

As discussed above there are benefits to the wider ACC of more than two people being able to listen to a call as it comes in to the Service.

• Accurate recording of allocated Prehospital Critical Care resources on the Scottish Ambulance Service C3 system.

As discussed above this allows for an evidence based approach to the NPF review of Major Trauma.

• That the Scottish Ambulance Service and territorial NHS Boards take cognisance of the geographical inequities in access to Prehospital Critical Care resources detailed in this paper.

Out with the ‘central belt’ there is limited access to Prehospital Critical Care resource in Scotland. The maps available in appendix H provide data on incidents of Major Trauma across the country during the pathfinder period.

• That the strategic project group for the Trauma Desk take cognisance of the recommendations in the NPF review of Major Trauma.

The NPF Major Trauma review makes a number of recommendations of the Trauma Desk. It suggests that the Trauma Desk take a role in triaging Major Trauma patients to a Major Trauma Centre while also providing a pre-alert to that Centre. The strategic group should investigate the practicalities of this and develop a plan.
Appendix A – Literature Review

Introduction

In the care for the severely injured, time is an essential factor. To improve survival of trauma patients, high quality care should be implemented as soon as possible following an accident. Many consider that levels of clinical care for the critically injured should be equitable and consistent irrespective of geography or time of day or whether the patient is at the scene, in-transit to hospital or in an emergency department – Critical Care being a clinical process and not a physical place.

The early recognition of the critically injured and dispatch of appropriately trained Prehospital Critical Care teams has traditionally been dependent upon the attending crews recognizing the time critical nature of the injuries sustained and requesting the assistance of enhanced care teams. This method of dispatch of Prehospital Critical Care teams has been demonstrated to be inherently problematic and sub-optimal with regards to time delays.

Internationally, in countries with developed EMS systems, a number of methods of improving dispatch of appropriate resources to the critically injured have been trialled and can be broken down in to the following broad groups:

- Medical Priority Dispatch System (MPDS),
- Autolaunch,
- Mechanism of Injury,
- Anatomic Injury,
- Patient physiology,
- Ambulance control physician dispatch
- Helicopter Emergency Medical Service (HEMS) base dispatch (self-tasking),
- Flight paramedic interrogated dispatch.

Medical Priority Dispatch System (MPDS)

The MPDS is a medically approved, unified system used to dispatch appropriate aid to medical emergencies including systematized caller interrogation and pre-arrival instructions. It was developed between 1976 and 1979 by Dr Jeff Clawson who designed a set of standardized protocols to triage patients via the telephone and thus improve the emergency response system. Dr Clawson states the main objective of MPDS is to “send the right thing to the right person in the right way at the right time.”

The MPDS, or derivatives, is prevalent across Ambulance Service Trusts in the UK.

The MPDS has been demonstrated to be moderately sensitive in predicting the requirement for Advanced Life Support (ALS) or Prehospital Critical Care intervention but non-specific. A low MPDS priority is predictive of no Prehospital intervention however; a high priority is of little predictive value for the requirement of ALS or Prehospital Critical Care intervention.
Autolaunch

Autolaunch is the method of dispatching whereby the dispatcher can send the helicopter or enhanced care team to a scene, as opposed to traditional request-driven dispatch. The principle of Autolaunch is that the helicopter is dispatched to the scene by the dispatcher if certain criteria are met such as mechanism of injury and severity of injuries.

Autolaunch Criteria (Essentially the same criteria developed by the American College of Surgeons Committee on Trauma for the appropriate use of a helicopter for trauma scene flights):

- Major motor vehicle accidents,
- Bicyclist, pedestrian, motorcycle, ATV, prolonged extrication, rollovers, and/or fatality on high speed roads,
- Logging/farm/industrial accidents,
- Multiple casualty accidents,
- Near drowning,
- Area not easily accessed by road,
- Penetrating trauma,
- Gunshot wound, stabbing, etc,
- Major burns.

Berns et al conducted a case control study over a two year period between 1997 and 1999 to identify whether this system of dispatch improved the time to helicopter arrival and subsequently improved patient mortality and/or decreased length of stay in intensive care or hospital. The setting was in the mainly rural areas of south eastern Minnesota, northern Iowa, and western Wisconsin which had, at its disposal, 3 helicopters operated by Mayo Medical Transport. The authors concluded that the autolaunch system reduced the time to scene of the helicopter by 3.64 minutes with no statistically significant impact on length of hospital stay or mortality.

The number of patients in this study was very small (17 in the autolaunch group versus 16 in the traditional dispatch group) which confers great difficulty in determining statistical significance. Only 21% of the autolaunch dispatches were completed by the flight crews, (as opposed to 59% of all flights during the study period). This indicates a stand down rate of 79% for the study period utilizing solely the autolaunch method. The authors indicate that they encountered many problems with education and implementation of this system initially and usage of the system by the dispatchers was initially sub-optimal. The authors also mention that the dispatchers had some difficulty in obtaining good information from the laypersons making the emergency call to the control centre. The authors do not mention the clinical experience of the dispatchers staffing the control centre.
Mechanism of Injury

The literature identifying mechanism of injury came to prominence in the mid to late 1980s with the mechanism of injury criteria being used as a component of triage for the trauma patient. In 2007 Malcolm Boyle of Monash University, Victoria, Australia published a review of the relevant literature relating to mechanism of injury and the predictability of the mechanism criteria for Major Trauma cases. This literature search and review identified five relevant studies that investigated the mechanism of injury alone criteria and their ability to predict Major Trauma or the need for trauma team activation. The author concluded that mechanism of injury criteria alone are not good predictors of Major Trauma or the need for trauma team activation with poor sensitivity and specificity rates that would lead to significant under/over triage.

Of note, one paper quoted in this review did indicate that mechanism of injury in combination with the criteria of “gut feeling” did increase the prediction of Major Trauma patients.

Two further studies have looked at specific mechanisms of injury in terms of prediction of Major Trauma and concluded that “ejection” from four wheeled vehicles and “vehicle rollover” are strongly predictive of high mortality and severe injury and should be considered as mandatory criteria in any field triage decision scheme or dispatch decision tool.

Anatomic Injury

Wuerz et al described HEMS dispatch criteria based on anatomic variables (though combined with mechanism of injury). The authors found that basing dispatch on anatomic variables would result in a nearly acceptable under triage level (13%), but is associated with unacceptable over- triage.

Physiological parameters

Rhodes et al found that dispatch based on abnormal physiological parameters exhibit high sensitivity but poor specificity (98% and 43% respectively) but this was not replicated by Wuerz et al who reported only moderate sensitivity (66%) and a high specificity (86%). The criterion of “loss of consciousness” in context of trauma has been identified as the only really strong discriminator for appropriate HEMS dispatch.

Ambulance control based physician dispatch

Only one paper has been identified which examines the impact of having a control based physician dispatching Prehospital Critical Care resource to critically injured patients. The authors of this Australian paper conducted a pre and post retrospective study comparing historical data from a period of time where an Emergency Physician was present in control and a period of time where Prehospital Critical Care resource dispatch was coordinated by ambulance service paramedics situated in control centre. The findings of the study demonstrated that outcomes for admitted high acuity patients showed no statistical difference between the two dispatch models but for lower acuity patients there was a statistically significant higher rate of clinically unnecessary taskings by the ambulance group. The authors concluded that it would be prudent to reduce
clinically unnecessary retrievals through clinical coordination with appropriately qualified emergency physicians. It is worthy of note that the two lead authors of this paper are emergency physicians.

**HEMS base dispatch (self-tasking)**

Garner et al\(^{41}\) have recently published findings from a retrospective registry based study comparing two methods of paediatric Major Trauma case identification in New South Wales, Australia. The authors compared a system where the duty crew of a dedicated head injury trial\(^{42}\) HEMS response team (HIRT) monitored all emergency calls via dispatch software available on HEMS base to determine whether suitable for HEMS response or not. If call identified as suggestive of requirement of enhanced response the team self-tasked to the incident. This system was compared to the standard ambulance dispatch system staffed by ambulance service paramedics who had not rotated through a HEMS service. The authors report that a system utilising physician staffed HEMS crew screening and triaging emergency calls is significantly more effective at identifying cases of severe paediatric trauma than a centralised screening system staffed by paramedics who are not directly involved in provision of the HEMS service. This difference resulted in a higher rate of direct transfer to a paediatric trauma centre and faster times to arrival at the paediatric trauma centre. The significance of this in terms of morbidity and mortality remains unclear with further research required.

The authors of this paper make direct reference to the fatigue associated with call screening and the inattention related to constant vigilance tasks and suggests that rotating the call screening between all members of the HEMS team mitigates these recognised effects to a certain degree.\(^{43,44,45}\)

**Flight paramedic interrogated dispatch**

London’s Air Ambulance (LAA) has the highest sensitivity and specificity with regards to dispatch in the world. LAA have a flight paramedic in the Emergency Operations Centre 24 hours a day with the exclusive role of identifying calls that are deemed appropriate for an enhanced response. 20 years of operation and in excess of 25,000 patient contacts have identified the following criteria that are termed “immediate dispatch”:

- One under (person under a train),
- RTC with death of same vehicle occupant,
- RTC with ejection,
- Person trapped under vehicle (not motorbike),
- Fall over two floor or 20ft,
- Amputation above the wrist or ankle,
- Crew request.

The remainder of the dispatches are termed “Interrogated dispatch” where the flight paramedic will phone the caller back and ask questions that would not normally be asked if using MPDS in order to determine acuity of injuries or illness. Interrogation can
be termed “active” as above or “passive” where the paramedic simply listens in to the call and decides if it warrants further attention.

Recent results from a study examining tasking by LAA, have demonstrated the benefit of a clinically active paramedic dispatcher screening emergency calls within the control room. This is shown in the following figures combined for the previous three years.

<table>
<thead>
<tr>
<th>Immediate dispatch</th>
<th>Interrogate</th>
<th>Crew request</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Total 417</td>
<td>• Total 1375</td>
<td>• Total 411</td>
</tr>
<tr>
<td>• Accurate 245 (58.7%)</td>
<td>• Accurate 959 (69.7%)</td>
<td>• Accurate 297 (72.3%)</td>
</tr>
<tr>
<td>• Inaccurate 172 (41.2%)</td>
<td>• Inaccurate 416 (30.2%)</td>
<td>• Inaccurate 114 (27.7%)</td>
</tr>
</tbody>
</table>

These figures demonstrate that a paramedic dispatcher is almost as accurate at dispatching the LAA team to appropriate incidents as a crew who are actually with the patient. As well as being able to recognize the correct jobs the paramedic dispatcher will activate the team in no more than seven minutes whereas the average times for crew request activations is twenty one minutes.

Review of tasking decisions is a key area that is rigorously scrutinized at monthly service clinical governance meetings and is afforded the same respect as the delivery of the actual Prehospital Critical Care interventions performed on patients.
Appendix B – Major Trauma Management Pathway

**MAJOR TRAUMA MANAGEMENT PATHWAY**

1. **Ambulance Control Centre receives 999 call likely to be Major Trauma**
   - **Advise Clinical Advisor or Trauma desk**

2. **Nearest A&E Ambulance despatched and if Technician only give Paramedic support**
   - **Incidents involving possibility of penetrating or ballistic (gunshot) trauma must have a conveying resource at scene, as these Patients will require rapid removal to an Emergency Department**

3. **If incident may be entrapment, or likely to be preventable, dispatch nearest Site Incident Control Qualitative Officer**
   - **Allocate Task Group**
   - **Unless treatment of ABCs required, first resource on scene will give STIRP / CHALET message to Ambulance Control Centre**

4. **Triage assessment of patient**
   - **If multiple Major Trauma Patients, ensure SORRT is requested**

5. **Ensure Fire & Rescue are en route**
   - **If Patient is freed do not delay transfer to Care of either Medical Team or Emergency Department (ED)**
   - **Incident Officer should consider:**
     1. Await arrival of Medical Team
     2. Meet Medical Team on route to ED
     3. Transfer to ED

6. **Consider meeting Medical Team en route in rural / long distance situations**

**NOTES:**

**Incidents involving the possibility of gunshot injury should only be dealt with under this pathway if isolated or where ‘normal’ Service response is required by Police for incidents where firearms Officers are deployed. Marauding Firearms incidents are not covered by this pathway.**

**Incident Officers should always consider SORRT attendance for singular Major Trauma Patients due to the advantage of additional equipment such as heat/lighting/oxygen.**

**If considering Helicopter support, take into account time taken to commence flight, load, load, start up and arrive at destination, including use of additional resource to transport between Helped and Trauma Unit / A&E Department. Also consider weather.**

**Even if aircraft on route, delay should not occur if patient is packaged and ready to be transported by road. If long distance involved, aircraft can potentially rendezvous with road vehicle.**

**THIS PROCEDURE DOES NOT ALTER SERVICE ARRANGEMENTS FOR DEALING WITH A MAJOR INCIDENT**
Aim
To improve the activation and response of Prehospital Critical Care Resource where available to patients identified within the Ambulance Control Centre suffering from Major Trauma in less than 10 minutes, 90% of the time.

Problem Statement
Trauma is the biggest killer in the first four decades of life and also contributes to a high level of morbidity, resulting in a significant impact on healthcare (2012). The early identification of Major Trauma and activation of Prehospital Critical Care Resources to these patients has been shown to improve outcomes.

There has been no dedicated resource to identifying critically injured patients suffering from Major Trauma within the Scottish Ambulance Service. The early identification of this patient group has the potential to reduce the morbidity and mortality of those patients suffering from Major Trauma. With prompt recognition as part of a multi-disciplinary approach and appropriate management of life-threatening injuries an essential component to maximize the patient’s chance of recovery.

A 3 month retrospective review of activation times of Prehospital Critical Care resource shows an average of 19 minutes from time of call to activation.

Project Scope
Trauma is increasingly being recognized as a serious global health problem. It is the leading cause of death in all groups under the age of 45 and accounts for approximately 1,200 deaths in Scotland each year.

The Scottish Government published the ‘Healthcare Quality Strategy’ in 2010. This strategic document has a number of aims and commits all NHS Health Boards to ensuring that the improvement of the quality of patient care is treated as a priority. The Scottish Ambulance Service published “Working Together for Better Patient Care” in 2010. This set their 5 year strategy for delivering high quality patient care. Following this, in 2011 the Scottish Ambulance Service published their ‘Clinical Strategy 2011-2015’. One of the specific aims of this document is to improve the quality of care delivered to Major Trauma patients in Scotland.

There are a number of factors identified to improve care for those patients suffering from Major Trauma (Figure 1) but the scope of this project is to focus on one aspect as
recommended in the 2012 Trauma Care in Scotland report from The Royal College of Surgeons of Edinburgh of ‘A paramedic should be present in the Ambulance Control room 24 hours a day. His/her role is to identify potential Major Trauma patients and coordinate the response.’ Funding was provided from the Scottish Government for a 6 month project to run in parallel with the work of the National Planning Forum’s (NPF) Major Trauma subgroup, to test this concept within the West Ambulance Control Centre.

### Figure 1 Major Trauma Driver Diagram

**Outcomes**
- Reduction of time to access of meaningful intervention for patients suffering from Major Trauma in the Prehospital setting

**Primary Drivers**
- Early identification in the Ambulance Control Centre of patients suffering from Major Trauma and dispatch of Prehospital Critical Care resource
- Early recognition of patients suffering from Major Trauma by on road staff in the Prehospital setting
- Clear communication to secondary or definitive care provider

**Secondary Drivers**
- Clinician in the Ambulance Control Room to identify patients suffering from Major Trauma
- Activation processes
- Communication Tools
- Major Trauma Assessment Tool
- Major Trauma pathways
- Stand By call and communication tool
- Standardised Handover tool for patients suffering from Major Trauma

### Expected Outcomes

Throughout the course of the project the expectation will be a decrease in time from the time of 999 call to activation of Prehospital Critical Care Resource for those patients suffering from Major Trauma. Additional to this a decrease in stand down of this resource is expected as the clinicians improve their skills in identifying those patients suffering from Major Trauma. The initial timeframe for this to occur is six months but may need to be extended depending on the results.

Numerically the desired outcome is an activation of Prehospital Critical Care resource within 10 minutes of time of call for 90% of patients with an appropriate stand down rate of less than 25%.
Measures

A 3 month retrospective review of activation times of Prehospital Critical Care resource shows an average of 19 minutes from time of call to activation.

To measure effect across the course of the project the following will be recorded.

**Process:** Time of call to activation of Prehospital Critical Care resource

**Outcome:** Rate of Stand Down

**Balancing:** Number of calls listened to and Number of activations (potential to have impact on other areas of Service Delivery). Total number of activations.

In addition to those patients suffering from Major Trauma that Prehospital Critical Care resource responds to, incidents where Major Trauma is identified but no resource is available to send will also be recorded.

**Financial:** Systems and processes remain within budgetary constraints.

Ideas for Change

Embed a Clinician within the Ambulance Control Centre with sole responsibility for identifying patients suffering from Major Trauma between the hours of 0800 – 1800 to test and develop the concept. Develop processes and systems that allow good communication links and efficient activation of Prehospital Critical Care resource. These include:

- Identification of suitable staff,
- Systems training to safely access the Command and Control System to view calls and record information,
- Communication processes for activation of Prehospital Critical Care resource.

2.5 WTE paramedic staff have been funded as well as a data analyst and project manager to test a clinical coordination model as part of the ScotSTAR project.
### Appendix D – PDSA Cycles

**Major Trauma Clinical Coordination (Trauma Desk) PDSA Cycles**

**Aim:** To improve the activation and response of Prehospital Critical Care Resource where available to patients identified within the Ambulance Control Centre suffering from Major Trauma in less than 10 minutes, 90% of the time.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Do</th>
<th>Study</th>
<th>Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop bespoke training package for TDC staff to safely navigate Command and Control System.</td>
<td>2 Day training package delivered to staff. Initially viewing calls of one Ambulance Control Centre only.</td>
<td>Staff able to navigate C3 system. No adverse incidents reported. Activation of resources process required prior to moving to remote sites.</td>
<td>Engage with systems training team to develop more robust activation processes.</td>
</tr>
<tr>
<td>Engaged with systems training team to develop algorithm and process for activation.</td>
<td>Algorithm developed with specific stand alone radio identified within East ACC.</td>
<td>Shown to TDC on shift and felt that it could work.</td>
<td>Engage with remote ACC. Anticipated that algorithm will change.</td>
</tr>
<tr>
<td>Engaged with Duty team on shift in EACC.</td>
<td>Initial radio identified was not in an easily accessible location.</td>
<td></td>
<td>Identified a more suitable radio to use.</td>
</tr>
<tr>
<td>Test Call made by Trauma Desk Clinician.</td>
<td>Location and ergonomically, radio shown not to be suitable.</td>
<td></td>
<td>Process amended to utilise Urgent Call Back for activation.</td>
</tr>
<tr>
<td>Third screen required to view all three C3 systems concurrently.</td>
<td>2nd monitor card and third screen setup tested.</td>
<td>No adverse issues identified.</td>
<td>3rd screen used throughout remainder of the project.</td>
</tr>
<tr>
<td>Test Call made by Trauma Desk clinician.</td>
<td>Process shown to work in test scenarios. Trauma Desk call sign flagged on East ACC system.</td>
<td>Following implementation a number of Trauma Desk Clinicians found the process difficult to work with in practice.</td>
<td>Process amended to utilise a warning on the system next to the incident of the need to activate the Prehospital Critical Care team with an urgent call back as a backup for non action.</td>
</tr>
<tr>
<td>Tested on incidents and then implemented.</td>
<td>Shown to work in practice.</td>
<td>Need for consistent process in the West ACC identified.</td>
<td>East ACC algorithm amended to reflect clinician within the room and not remote for West ACC.</td>
</tr>
<tr>
<td>Plan</td>
<td>Do</td>
<td>Study</td>
<td>Act</td>
</tr>
<tr>
<td>------</td>
<td>----</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>New process communicated and implemented within West ACC.</td>
<td>Shown to work in practice.</td>
<td>Feedback from ACC that some more information around rationale for activation would be useful.</td>
<td>Process amended to include rationale for activation within the warning.</td>
</tr>
<tr>
<td>Implemented amended process.</td>
<td>Feedback from ACC that amendment is useful.</td>
<td>Some warnings not actioned with delays in activation or activation of Prehospital Critical Care resource not occurring. Trauma Desk Clinicians stating that there are occasions that they are working out with their remit by directly activating the teams where delays in dispatch occur.</td>
<td>Blended model of dispatcher and clinician being developed to test.</td>
</tr>
<tr>
<td>Trauma desk run from East ACC for a week during project.</td>
<td>Desk identified at the end dispatchers’ desk just across from the call takers and with direct line of vision to the clinical advisors in the room.</td>
<td>Better overall flow of communication within the room and the ability to pick up cues from the interaction of the call takers receiving emergency calls. Limitations of having only 2 screens reducing the ability to virtualise the 3 ACCs effectively. Difficulties in knowing when the resources are available in the West, predominantly the air ambulance.</td>
<td>Highlight learning within evaluation report for both physical location and challenges faced.</td>
</tr>
<tr>
<td>New process developed from previous documents, communicated and implemented in relation to identification of Major Trauma within the North ACC.</td>
<td>Shown to work in practice.</td>
<td>Feedback from ACC North staff positive. Prehospital Critical Care delivered to patients suffering MT in the North and MT calls logged where no Prehospital Critical Care resource available.</td>
<td>Recommendation within evaluation document to explore CC resource options in the North.</td>
</tr>
</tbody>
</table>
## Daily Call Log PDSA Cycles

Aim: To record clinician activity, Trauma Team activation and activation rationale.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Do</th>
<th>Study</th>
<th>Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop log sheet to record calls interrogated and implement in to daily practice.</td>
<td>Calls and overall daily activity recorded</td>
<td>Unable to reflect level of activity across the day</td>
<td>Incident number, MPDS codes, mode of interrogation and Time of day added to call log</td>
</tr>
<tr>
<td>New call log put in to practice</td>
<td>Improvement in ability to review activity</td>
<td>Large amount of variability in recording by different clinicians</td>
<td>Development of inclusion of patient condition and mechanism of injury</td>
</tr>
<tr>
<td>New call log tested by single clinician</td>
<td>Improvement in ability to review patient condition</td>
<td>Insufficient space for comments</td>
<td>Layout of form changed to landscape</td>
</tr>
<tr>
<td>New call log tested by 2 clinicians</td>
<td>Improvement in ability to record comments</td>
<td>Unable to quantify reasons for not sending a team and taskings not undertaken by the trauma desk.</td>
<td>Additional section added to incorporate ACC tasking and reasons for not sending a team.</td>
</tr>
<tr>
<td>New call log implemented</td>
<td>Reason for no send able to be identified.</td>
<td>Unable to listen to call and sitrep request and receipt being recorded as free text. Unable to differentiate information gained between active and silent interrogation.</td>
<td>Additional sections added as a tick box for unable to listen and sitrep as a time for request and receipt Second row inserted to differentiate outcomes from silent and active interrogation</td>
</tr>
</tbody>
</table>

Daily Call Log PDSA Cycles

Aim: To record clinician activity, Trauma Team activation and activation rationale.
Appendix E – Operational Aspects

Operational Aspects of the Trauma Desk.

Trauma Desk Directory

A ‘TD Directory’ was compiled and is available for reference on the TD. This comprehensive document contains a range of resources including background information regarding the three national Prehospital Critical Care Teams, team area coverage maps, useful contact numbers for colleagues, hospitals, other emergency services as well as guides to airwave usage and ACC procedures. This document has been regularly updated throughout the pathfinder.

Daily Log Form

A ‘Daily Log Form’ is completed by the TDCs at the start of each shift. This form requires the TDC to log the contact names for a set group of internal colleagues. Potential issues such as expected adverse weather or technical faults may also be logged. The Daily Log Form can then be used as a communication aide-memoir when contacting colleagues throughout that shift.

<table>
<thead>
<tr>
<th>SCOTSTAR TRAUMA DESK DAILY LOG SHEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
</tr>
<tr>
<td>Air Desk</td>
</tr>
<tr>
<td>GAMA</td>
</tr>
<tr>
<td>ERMS</td>
</tr>
<tr>
<td>HELIMED 5</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>HELIMED 5</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>HELIMED 76</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TTT</td>
</tr>
<tr>
<td>MEDIC 1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ACC WEST</td>
</tr>
<tr>
<td>ACC NORTH</td>
</tr>
<tr>
<td>ACC EAST</td>
</tr>
</tbody>
</table>
**Daily Task Guide**

The ‘Daily Task Guide’ was compiled with the aim of ensuring all those working on the TD follow similar procedures when setting up, operating and closing down the desk at the end of the shift. Whilst aimed at any new TDCs it is an available resource for all those working on the TD.

**Daily Call Log**

The ‘Daily Call Log’ was designed to capture information relating to TDC daily activity and the clinical decisions involved in relation to the identification of Major Trauma and the dispatch of Prehospital Critical Care resources. It is completed by the TDCs during their shift with the information collated by the project’s research nurse. These documents have been fluid throughout the course of the project and their development is outlined in Appendix D with the final version used outlined below.

<table>
<thead>
<tr>
<th>YES/NO</th>
<th>Type Interrogation</th>
<th>Mechanism</th>
<th>Patient Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### YES/NO Type

**Mechanism**

- Send
- ACC task?
- unable to listen
- crew reg for TT
- sitrep reg
- sitrep received

**Patient Conditions**

- Send
- ACC task?
- unable to listen
- crew reg for TT
- sitrep reg
- sitrep received
Database
A customised Scottish Ambulance Service database, SharePoint, provided a data entry portal for the clinicians to complete during their working hours. This included all incidents where a Prehospital Critical Care Team was activated by either the Trauma Desk Clinician (TDC) or from the Ambulance Control Centre (ACC). Any calls that were “missed” were also collated. A missed call could be one where the clinician was busy with another call, no teams were available or if the incident was out with the reach of a Prehospital Critical Care Team. Later in the project potential north calls were collated separately.

Data Collection
Prior to the commencement of the project, three months of comparative data were collated from the Scottish Ambulance Service Management Information System (MIS). This was cross referenced with three months of EMRS data. SharePoint data included Scottish Ambulance Service incident number, call date and time, time of Prehospital Critical Care Team allocation, arrival/leave scene times, stand down reasons, which trauma team was allocated and ACC activations.

The daily call logs collated, time of the incident, incident number, type of interrogation (silent or active), mechanism of injury, any problems listening to the call and if a Prehospital Critical Care team was allocated.

The daily call logs and SharePoint were cross referenced to ensure all trauma and missed calls were recorded on both of the data collection systems. Non conformant information was queried and corrected.

To substantiate the data, a request to the Scottish Ambulance Service MIS produced weekly reports of Prehospital Critical Care team allocation by searching for their unique identification call sign. These reports included Scottish Ambulance Service incident number, call date and time, time of Prehospital Critical Care team allocation, arrival/leave scene times and stand down reasons. These reports were subdivided to provide data both within hours of operation of the Trauma Desk and Out of Hours.

Data Protection and Collation
The audit was fully compliant with the current information governance and data protection requirements. No identifiable data was recorded on the system.

Results – Comparative Data
The MIS data for three months recorded a total of 58 Prehospital Critical Care Team taskings. The mean time to allocate a Prehospital Critical Care Team was 19 minutes (Table 1). EMRS – Road taskings were recorded but EMRS – Air taskings were not identified. The minimum time recorded on the MIS information of one minute was unable to be substantiated by EMRS data. There were three duplicates calls which were removed from the data. Times that the Prehospital Critical Care Teams were mobile or on scene were missing on 33 (40%) incidents.
Table 1. Time to Allocate a Prehospital Critical Care Team (hh:mm)

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC Tasking</td>
<td>00:14</td>
<td>00:01</td>
<td>01:34</td>
<td>00:19</td>
</tr>
</tbody>
</table>

Data obtained from a number of sources including Scottish Ambulance Service systems and Prehospital Critical Care Team data recorded a total of 73 activations over a six month period in 2011/12. For the same six month period in 2012/13, following the launch of the Trauma Desk, the data showed a total of 190 activations.

Results - SharePoint Data

Between 22nd October 2012 and the 22nd April 2013 a total of 262 entries were recorded into the SharePoint Database.

Activations

A total of 190 activations (Table 2 and Figure 1) with 165 directly from Trauma Desk (Table 3) and 25 direct from ACC (Table 4). The ACC tasking data collection commenced in December 2012. The EMRS – Road team were the most frequently used with 96 (50%) of all activations. When ACC taskings occurred this was frequently whilst the Trauma Desk clinician was still interrogating the call.

Table 2. Total Prehospital Critical Care Team Activations

<table>
<thead>
<tr>
<th></th>
<th>EMRS - Air</th>
<th>EMRS - Road</th>
<th>EMRS via MOD</th>
<th>Forth Valley*</th>
<th>Medic 1 - Road</th>
<th>TTT - Air</th>
<th>TTT - Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>46</td>
<td>96</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>1</td>
<td>25</td>
<td>190</td>
</tr>
</tbody>
</table>

Table 3. Prehospital Critical Care Teams activated by Trauma Desk per month

<table>
<thead>
<tr>
<th></th>
<th>EMRS - Air</th>
<th>EMRS - Road</th>
<th>EMRS via MOD</th>
<th>Medic 1 - Road</th>
<th>TTT - Air</th>
<th>TTT - Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 12</td>
<td>1</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Nov 12</td>
<td>11</td>
<td>18</td>
<td>1</td>
<td>3</td>
<td></td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>Dec 12</td>
<td>5</td>
<td>8</td>
<td></td>
<td>5</td>
<td></td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Jan 13</td>
<td>4</td>
<td>21</td>
<td>1</td>
<td></td>
<td></td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Feb 13</td>
<td>5</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>Mar 13</td>
<td>8</td>
<td>15</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>Apr 13</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>95</td>
<td>1</td>
<td>13</td>
<td>1</td>
<td>15</td>
<td>165</td>
</tr>
</tbody>
</table>
Table 4. Prehospital Critical Care Teams activated by Ambulance Control Centre

<table>
<thead>
<tr>
<th></th>
<th>EMRS - Air</th>
<th>EMRS - Road</th>
<th>Forth Valley*</th>
<th>Medic 1 - Road</th>
<th>TTT - Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator busy</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Other reasons</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>10</td>
<td>25</td>
</tr>
</tbody>
</table>

*Forth Valley is a local ad hoc team available when required.

Figure 1. Monthly Prehospital Critical Care Team Taskings

76 entries where the Prehospital Critical Care Teams were not tasked are detailed in Table 5. These do not include incidents where the patient was already deceased at scene. Potential North Area Calls were only recorded from January when interrogation of calls via the North ACC commenced. If the incident was located within the area covered by the North ACC, the reason for not allocation was recorded as a Potential North Call. If the incident was covered by the East or West ACC “distance” was an option. This allowed for identifying trauma in the North of the country. From January 2013 a total of 37 Potential North Area Calls were identified.
Table 5. Reasons for Prehospital Critical Care Team not tasked

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential North Area Call</td>
<td>37</td>
</tr>
<tr>
<td>Team on call</td>
<td>10</td>
</tr>
<tr>
<td>Distance</td>
<td>8</td>
</tr>
<tr>
<td>Helimed in use</td>
<td>8</td>
</tr>
<tr>
<td>Coordinator busy</td>
<td>8</td>
</tr>
<tr>
<td>ACC did not action C3 warning</td>
<td>1</td>
</tr>
<tr>
<td>Attempted to dispatch but Pilot states too dark</td>
<td>1</td>
</tr>
<tr>
<td>No access to call</td>
<td>1</td>
</tr>
<tr>
<td>Proximity to hospital</td>
<td>1</td>
</tr>
<tr>
<td>Weather/No dispatch</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>76</td>
</tr>
</tbody>
</table>

Allocation times

The time taken to allocate Prehospital Critical Care Teams by both Trauma Desk clinicians and ACC show a similarity over the 6 month period and are shown in Table 6 and Figure 2. The mean time for ACC activation reduced from 19 minutes, prior to the Trauma Desk, 7 minutes. This may be due to the constant focus on trauma and the high visibility of the clinicians in the ACC.

Crew requests have been removed from these calculations. Crew requests accounted for 17 (9%) of Prehospital Critical Care team activations. These were not cases that had been missed but often a request for additional analgesia or sedation.

Table 6. Time taken to allocate Prehospital Critical Care Team (hh:mm)

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma Desk Tasking</td>
<td>00:04</td>
<td>00:00</td>
<td>00:30</td>
<td>00:06</td>
</tr>
<tr>
<td>ACC Tasking</td>
<td>00:04</td>
<td>00:01</td>
<td>00:33</td>
<td>00:07</td>
</tr>
</tbody>
</table>
Figure 2. Time Taken to Allocate Prehospital Critical Care Team by Trauma Desk and ACC

Stand downs

Stand downs of Prehospital Critical Care Teams were also collated (Table 7). Prehospital Critical Care Teams were stood down, in total, on 78 occasions (41%) including those occasions where the patients were later deceased at scene (PLE). When those patients who are PLE are excluded from the stand downs (as there is an intention to treat) this percentage reduces to 34.7%. If a patient is PLE then that tasking is considered appropriate.

The most common reason for a stand down were documented as “crew request” and further information or interrogation was not obligatory by the Trauma Desk clinicians.

Table 7. Reasons for Stand downs of Prehospital Critical Care Teams

<table>
<thead>
<tr>
<th>Reason</th>
<th>Dispatched by ACC</th>
<th>Dispatched by Trauma Desk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crew on scene</td>
<td>8</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>Further information from scene</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Crew left scene</td>
<td></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Manager on scene</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Weather</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Hoax</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Inaccessible</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Diverted to another call</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No patient found</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Scene unsafe</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Dr on scene</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>52</td>
<td>66</td>
</tr>
</tbody>
</table>
Out of the 165 Trauma Desk activations, the teams were stood down on 52 occasions (31.5%). The ACC activations had 14 stand downs out of the 25 activations (56%). The Prehospital Critical Care Team Stand downs totalling 66 (excluding PLE) are detailed in Table 8.

**Table 8. Prehospital Critical Care Team Stand downs – excluding PLE**

<table>
<thead>
<tr>
<th></th>
<th>EMRS - Air</th>
<th>EMRS - Road</th>
<th>Medic 1 - Road</th>
<th>TTT - Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC Tasking (n= 25)</td>
<td>4</td>
<td>3</td>
<td></td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Trauma Desk Tasking (n= 165)</td>
<td>11</td>
<td>28</td>
<td>5</td>
<td>8</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>28</td>
<td>8</td>
<td>15</td>
<td>66</td>
</tr>
</tbody>
</table>

**Times of Day**

The times of the trauma emergency call to the Scottish Ambulance Service ACC were recorded and are detailed in Figure 3. These are only those recorded within the Trauma Desk operational hours. The 2 calls prior to 08:00 hours were still ongoing trauma calls when the clinician came on duty. One call at 18:00 hours the clinician recorded into the database and continued their involvement.

**Figure 3. Time of the Emergency Call to the Scottish Ambulance Service (Major Trauma identified by the clinicians)**
Medical Priority Dispatch Codes (MPDS)

The MPDS codes were recorded to give an indication of the causes/mechanism of the trauma incidents (Table 9). These were also recorded on all the missed calls and Potential North Area call. The most common being Road Traffic Collisions (RTC) accounting for 134 (51%) of all identified trauma calls. Falls accounted for 47 (18%) calls and traumatic injuries were 20 (7.6%).

Table 9. Medical Priority Dispatch Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Code Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>Road Traffic collision (RTC)</td>
<td>134</td>
</tr>
<tr>
<td>17</td>
<td>Falls</td>
<td>47</td>
</tr>
<tr>
<td>30</td>
<td>Traumatic injuries</td>
<td>20</td>
</tr>
<tr>
<td>09</td>
<td>Cardiac Arrest</td>
<td>13</td>
</tr>
<tr>
<td>27</td>
<td>Stabbing</td>
<td>13</td>
</tr>
<tr>
<td>07</td>
<td>Burns/explosions</td>
<td>7</td>
</tr>
<tr>
<td>31</td>
<td>Unconscious</td>
<td>6</td>
</tr>
<tr>
<td>22</td>
<td>Industrial Accident</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Drowning</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>Psychiatric</td>
<td>4</td>
</tr>
<tr>
<td>33</td>
<td>Transfer</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Convulsions/Fitting</td>
<td>2</td>
</tr>
<tr>
<td>03</td>
<td>Animal bites</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>Assault</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Chest Pains</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>262</td>
</tr>
</tbody>
</table>

Results – Daily Call Logs

The six month trial period consisted of 155 days of which 146 were covered (94.1%). Days uncovered were due to sickness or resilience.

3627 calls were listened to over the 6 months. Initially the numbers of calls listened to and interrogated per day averaged 40 but this later reduced to approximately 20. Table 10 shows the number of calls each clinician listened to with Table 11 showing the average per month. The reductions were in response to the redesign of the daily call logs and as the clinicians became more experienced in their role. As time progressed more detailed information per call was documented rather than those listened to silently and actively interrogated by contacting the original caller directly.
Table 10. Number of calls listened to by the Trauma Desk Clinicians

<table>
<thead>
<tr>
<th>Clinician</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 12</td>
<td>91</td>
<td>246</td>
<td>49</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>396</td>
</tr>
<tr>
<td>Nov 12</td>
<td>194</td>
<td>329</td>
<td>220</td>
<td>34</td>
<td>128</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>914</td>
</tr>
<tr>
<td>Dec 12</td>
<td>75</td>
<td>53</td>
<td>167</td>
<td>107</td>
<td>36</td>
<td>14</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>493</td>
</tr>
<tr>
<td>Jan 13</td>
<td>128</td>
<td>69</td>
<td>104</td>
<td>123</td>
<td>28</td>
<td>8</td>
<td>180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>640</td>
</tr>
<tr>
<td>Feb 13</td>
<td>84</td>
<td>26</td>
<td>195</td>
<td>29</td>
<td>94</td>
<td>42</td>
<td>36</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>515</td>
</tr>
<tr>
<td>Mar 13</td>
<td>125</td>
<td>82</td>
<td>21</td>
<td>75</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>56</td>
<td></td>
<td>375</td>
</tr>
<tr>
<td>Apr 13</td>
<td>100</td>
<td>5</td>
<td>52</td>
<td>72</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td>29</td>
<td>294</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>797</td>
<td>807</td>
<td>491</td>
<td>581</td>
<td>378</td>
<td>161</td>
<td>263</td>
<td>36</td>
<td>9</td>
<td>75</td>
<td>29</td>
<td>3627</td>
</tr>
</tbody>
</table>

Clinicians recorded when they were unable to listen or access a call. This occurred when there were too many other personnel within the Scottish Ambulance Service also in the call. This occurred on 154 (8.4%) occasions out of the 1824 calls listened to from January 2013 (Table 12).

Table 11. Average number of calls listened to per month

<table>
<thead>
<tr>
<th>Number of Days covered per Month</th>
<th>Average Number of Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 12</td>
<td>10</td>
</tr>
<tr>
<td>Nov 12</td>
<td>30</td>
</tr>
<tr>
<td>Dec 12</td>
<td>26</td>
</tr>
<tr>
<td>Jan 13</td>
<td>31</td>
</tr>
<tr>
<td>Feb 13</td>
<td>28</td>
</tr>
<tr>
<td>Mar 13</td>
<td>31</td>
</tr>
<tr>
<td>Apr 13</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 12. Number of calls unable to access

<table>
<thead>
<tr>
<th>Unable to access call</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 13</td>
<td>59</td>
</tr>
<tr>
<td>Feb 13</td>
<td>39</td>
</tr>
<tr>
<td>Mar 13</td>
<td>24</td>
</tr>
<tr>
<td>Apr 13</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
</tr>
</tbody>
</table>
Although the number of calls interrogated has remained reasonably constant during the later few months it has not impacted on the number of Prehospital Critical Care team activations. Figure 4 reflects the daily clinician activity and the number of activations per day.

**Figure 4. Daily Clinician Activity and Prehospital Critical Care Team Activations**

Clinician workload remained constant throughout the 10 hour shift (Figure 5). On 2 occasions an incident occurred at 18:00 which the clinician continued to deal with. The time of call was only recorded on the Call log after the 8th November 2012.

**Figure 5. Clinician Activity by Hour of the day**
The reasons for “not sending” a Prehospital Critical Care Team to an incident were only collated from the beginning of January 2013 after further changes to the call logs. 1121 patients were reported as sustaining minor injuries. If the incident was close to a nearby hospital it was also recorded as a reason not to send a team. If the patient was reported to be “purple” or PLE before a team was activated this was only recorded in the Call logs. This differs to those recorded in SharePoint - those where a Trauma Team is activated but is PLE whilst the team in en route. In some instances no reasons were recorded for tasking or non tasking. On three occasions no casualties were found – where the casualties had left the scene (Table 13).

Table 13. Reasons for not sending a Prehospital Critical Care Team

<table>
<thead>
<tr>
<th></th>
<th>distance</th>
<th>medical</th>
<th>minor injury</th>
<th>no casualty found</th>
<th>no team avail.</th>
<th>proximity to hosp</th>
<th>PLE</th>
<th>not recorded</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 13</td>
<td>6</td>
<td>2</td>
<td>168</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>50</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Feb 13</td>
<td>14</td>
<td>2</td>
<td>409</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>53</td>
<td>488</td>
<td></td>
</tr>
<tr>
<td>Mar 13</td>
<td>14</td>
<td>2</td>
<td>301</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>15</td>
<td>336</td>
<td></td>
</tr>
<tr>
<td>Apr 13</td>
<td>14</td>
<td>2</td>
<td>243</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>277</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>4</td>
<td>1121</td>
<td>3</td>
<td>4</td>
<td>14</td>
<td>133</td>
<td>1341</td>
<td></td>
</tr>
</tbody>
</table>

Results – Management Information System (MIS)

MIS recorded activations within the operating hours of the Trauma Desk

Over the trial period the MIS recorded 139 activations of a Prehospital Critical Care Team during the operating hours of the Trauma Desk. Of these 15 were medical and therefore not included in the final total of 124. The medical incidents were indicated as cardiac/ respiratory arrest, chest pains or convulsions/fainting.

This leaves a discrepancy of 66 incidents not recorded as Prehospital Critical Care Team activations in the Scottish Ambulance Service MIS system. A random number of these were investigated and initial enquires showed that in most cases the Prehospital Critical Care Team is not “allocated” to the incident. The record is found within the sequence of events or notes. A second finding was that if the ERMS team were on the Helimed they too were not “allocated” to the incident at times. Only the Helimed call sign was recorded.

MIS recorded activations out with the operating hours of the Trauma Desk

44 activations were recorded with 5 identified as medical incidents. The times of the 39 incidents identified as trauma as shown in Figure 6. This equates to 6.5 incidents per month.

There is no other data source to check these activations to evidence if there is other trauma occurring out with operational hours.
Figure 6. Prehospital Critical Care Team Activations – out of Trauma Desk operational hours
# Appendix G – Trauma Specialist Course Outline

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome – Housekeeping (toilets/fire alarm/breaks/etc)</td>
<td>09:30</td>
</tr>
<tr>
<td>Introductions/ Course Objectives / issue course documentation (checklist, critique, etc)</td>
<td>11:00 – 11:15</td>
</tr>
<tr>
<td>MPDS Overview - PowerPoint</td>
<td></td>
</tr>
<tr>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>Airwave at Incidents - PowerPoint</td>
<td>Include Practical Changing Talkgroups on Hand Portable Airwave Terminal</td>
</tr>
<tr>
<td>Lunch</td>
<td>12:45 – 13:15</td>
</tr>
<tr>
<td>Launching / Closing RDP – Multiple RDP on one screen</td>
<td></td>
</tr>
<tr>
<td>Launching C3</td>
<td></td>
</tr>
<tr>
<td>Change password in C³</td>
<td>Data Protection / Caldecott Guidelines</td>
</tr>
<tr>
<td>Logging off C3 and RDP</td>
<td></td>
</tr>
<tr>
<td>Data Protection and security implications of C³</td>
<td></td>
</tr>
<tr>
<td>Desktop Environment</td>
<td></td>
</tr>
<tr>
<td>Coffee Break</td>
<td>15:00 – 15:15</td>
</tr>
<tr>
<td>Escape from call opened in error</td>
<td></td>
</tr>
<tr>
<td>DEMO STOP – Stress importance why don’t stop</td>
<td></td>
</tr>
<tr>
<td>Recall Call RC screen - WAI / ACT / ALL / EMG / URG / EU / ALC / AR / Location Filter</td>
<td></td>
</tr>
<tr>
<td>Quick Call View</td>
<td>Use urgent call</td>
</tr>
<tr>
<td>Questions &amp; Review of day</td>
<td>17:00</td>
</tr>
<tr>
<td>Day 2</td>
<td>Times</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Open call from RC Screen</td>
<td></td>
</tr>
<tr>
<td>Interpret Urgent Call Screen – from/to/allocated resources/notes</td>
<td>May be used in cases of Inter-Hospital Transfer</td>
</tr>
<tr>
<td>Interpret Emergency Call Screen – callback/location/problem text/Case Entry answers/CRI / allocated resources/notes</td>
<td></td>
</tr>
<tr>
<td>Adding notes to a call</td>
<td>Importance of this must be stressed</td>
</tr>
<tr>
<td>Coffee Break</td>
<td>11:00 – 11:15</td>
</tr>
<tr>
<td>Other agency informed options – how to record/view</td>
<td></td>
</tr>
<tr>
<td>Adding / amending call warnings</td>
<td></td>
</tr>
<tr>
<td>Resource information on a call – callsign / type / crew / progress times</td>
<td>Remember to advise on Auto At Scene</td>
</tr>
<tr>
<td>SOE – from inside call</td>
<td></td>
</tr>
<tr>
<td>Lunch;</td>
<td>12:45 – 13:15</td>
</tr>
<tr>
<td>Resource Status Screen – AR/SUN/RRU/Callsign Filter</td>
<td></td>
</tr>
<tr>
<td>Resource Log (possibly RLE)</td>
<td></td>
</tr>
<tr>
<td>MES – Messaging in C3</td>
<td></td>
</tr>
<tr>
<td>Coffee Break</td>
<td>15:00 – 15:15</td>
</tr>
<tr>
<td>Interpretation Exercise</td>
<td></td>
</tr>
<tr>
<td>Notes Roleplay</td>
<td></td>
</tr>
<tr>
<td>Feedback if required</td>
<td></td>
</tr>
<tr>
<td>Checklist Completion / Certification.</td>
<td></td>
</tr>
<tr>
<td>Course review / critique completion</td>
<td></td>
</tr>
</tbody>
</table>
## TRAUMA DESK INDUCTION

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Notes</th>
<th>Completed and understood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Computer</td>
<td>Start up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sign on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C3 West</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remote desktops East and North</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sign off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shut down</td>
<td></td>
</tr>
<tr>
<td>2. Telephony</td>
<td>Headset setup</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Login</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Call listening</td>
<td>Clear rationale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enter on to notes</td>
</tr>
<tr>
<td>3. Airwave</td>
<td>Sign out handset</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change talk group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Airwave comms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sign in handset</td>
<td></td>
</tr>
<tr>
<td>4. Call Interrogation</td>
<td>Guide to interrogation</td>
<td>Copy received</td>
</tr>
<tr>
<td></td>
<td>Note entry</td>
<td>‘Trauma desk listening’</td>
</tr>
<tr>
<td></td>
<td>Recording</td>
<td>Enter information gained from listening</td>
</tr>
<tr>
<td>5. Tasking flows</td>
<td>West ACC</td>
<td>Copy received</td>
</tr>
<tr>
<td></td>
<td>East ACC</td>
<td>Copy received</td>
</tr>
<tr>
<td></td>
<td>North ACC</td>
<td>Copy received</td>
</tr>
<tr>
<td>6. Call Log</td>
<td>Guidance and explanation</td>
<td>Copy received</td>
</tr>
<tr>
<td>7. SharePoint</td>
<td>Guidance and explanation</td>
<td>Copy received</td>
</tr>
<tr>
<td>8. Trauma Desk Directory</td>
<td>Familiarisation and explanation</td>
<td></td>
</tr>
<tr>
<td>9. Daily Duties</td>
<td>Guidance and explanation</td>
<td>Copy Received</td>
</tr>
</tbody>
</table>

**Trauma Desk Clinician**

Name: ___________________________ Signature: ___________________ Date: __________

**Trauma Desk Mentor**

Name: ___________________________ Signature: ___________________ Date: __________
Appendix H – Mapping Exercise

Identified Trauma Incidents from 0800 – 1800 22/10/12 to 22/04/13 (Central Belt)

[Diagram of Major Trauma Incidents in Central Belt with marked incidents from 22/10/12 to 22/04/13]
Identified Major Trauma (West ACC only) 22/10/12 – 03/11/12
Identified Major Trauma (West and East ACC) 04/11/12 – 06/01/13

[Map of Scotland with major trauma incidents marked]

Major Trauma Incidents
04/11/2012 - 06/01/2013

Incidents
Motorways
Major roads
Other roads
Subdivisions
Lakes
Settlement with population over 30,000

Contains NRS data © Crown copyright and database right [2013]
Contains Ordnance Survey data © Crown copyright and database right [2013]
Identified Major Trauma (West, East and North ACC) 07/01/13 – 22/04/13
Prehospital Critical Care Team Activation and Non Activation following identification of Major Trauma
Prehospital Critical Care Team Activation and Non Activation following identification of Major Trauma (Central Belt)
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC</td>
<td>Ambulance Control Centre</td>
</tr>
<tr>
<td>MPDS</td>
<td>Medical Priority Dispatch System</td>
</tr>
<tr>
<td>BASICS</td>
<td>British Association of Immediate Care (Scotland)</td>
</tr>
<tr>
<td>C3</td>
<td>Command and control communication system</td>
</tr>
<tr>
<td>CCP</td>
<td>Critical Care Practitioner</td>
</tr>
<tr>
<td>EMRS</td>
<td>Emergency Medical Retrieval Team based in Glasgow</td>
</tr>
<tr>
<td>Helimed 5</td>
<td>Scottish Ambulance Service Helicopter Resource based in Glasgow</td>
</tr>
<tr>
<td>HEMS</td>
<td>Helicopter Emergency Medical Service</td>
</tr>
<tr>
<td>Medic 1</td>
<td>Royal Infirmary of Edinburgh based Critical Care resource</td>
</tr>
<tr>
<td>MIS</td>
<td>Management Information Service</td>
</tr>
<tr>
<td>MTCCPG</td>
<td>Major Trauma Clinical Coordination Pathfinder Group</td>
</tr>
<tr>
<td>NFP</td>
<td>National Planning Forum</td>
</tr>
<tr>
<td>PDSA</td>
<td>Plan Do Study Act</td>
</tr>
<tr>
<td>ScotSTAR</td>
<td>Scottish Specialist Transport and Retrieval</td>
</tr>
<tr>
<td>SITREP</td>
<td>Situation report</td>
</tr>
<tr>
<td>SORT</td>
<td>Special Operations Response Team</td>
</tr>
<tr>
<td>Tayside Trauma Team</td>
<td>Ninewells Hospital, Dundee based Critical Care resource</td>
</tr>
<tr>
<td>TDC</td>
<td>Trauma Desk Clinician</td>
</tr>
<tr>
<td>WTE</td>
<td>Whole Time Equivalent</td>
</tr>
</tbody>
</table>
Acknowledgements

During the early stages of the TD the lead paramedic for London’s Air Ambulance, Mr Graham Chalk visited the TD and was able to provide valuable mentoring sessions to the staff that contributed to the desk. Through his role and with his wealth of experience he is considered a world expert in the field of clinical coordination of Critical Care resource. Mr Chalk has overall responsibility of the paramedic staff attached to London’s Air Ambulance and is integral to the Clinical Governance of this service.

Mr Stuart Elms, Operations Manager, Essex and Hertfordshire Air Ambulance who provided guidance on clinical co-ordination.

The East of England Ambulance Service who hosted experiential learning for a Trauma Desk Clinician on their established Clinical Co-ordination Desk.

The management and staff within Ambulance Control Centre for their support and guidance.

Emergency Medical Retrieval Service, Medic 1 and Tayside Trauma Team, the three established Critical Care Teams in Scotland for their ongoing support in developing Prehospital Critical Care response.

The members of the Major Trauma Clinical Coordination Project Group who continue to guide and support the ongoing development of this successful project.

The Trauma Desk Clinicians who are ever vigilant looking for those patients suffering from Major Trauma that would benefit from Critical Care intervention and continually developing the role with the ACC.

The Information Communication Technology Department for their support and flexible approach to training clinicians to safely navigate the command and control system.

Stephen Maxwell and the communications team for their support in developing the SharePoint database and supporting the project.

Martina Petr and the Scottish Ambulance Service Management of Information team for their assistance and support in mapping the incidents of Trauma and collating the data for the period of the project.
References


2 Stevenson KA, Willemain TR. Analysing the process of screening calls for emergency services. Massachusetts Institute of Technology Technical Report No. 08-74. Mass., USA:Operations Research Centre MIT, 1974


11 Major Trauma in Scotland, Royal College of Surgeons, 2012 located at http://www.rcsed.ac.uk/media/167859/web_trauma%20care%20report%202012.pdf


13 http://www.dh.gov.uk/health/2012/04/majortraumacentres/


33 Qazi K, Wright MS, Kippes C. Stable paediatric blunt trauma patients: is trauma team activation always necessary? J Trauma 1998 45(3):562-4
36 Champion HR, Lombardo LV, Shair EK. The importance of vehicle rollover as a field triage criterion. J Trauma 2009;67(2):350–7
Equality and Diversity

The Scottish Ambulance Service believes that embedding equality and diversity across all that we do has a significant impact on the service we provide to our patients and the experience of the workplace for all our staff. The Board opposes all forms of unlawful discrimination on the grounds of age, disability, gender, gender reassignment, marriage and civil partnership, pregnancy and maternity, race and ethnicity, religion / belief and sexual orientation.

Information about the Service, the full financial accounts for 2012/13 and details of the organisation and operation of the Service can be obtained from:

Corporate Affairs and Engagement Department
National Headquarters, Gyle Square,
1 South Gyle Crescent, Edinburgh, EH12 9EB

T: 0131 314 0000
E: scotamb.communications@nhs.net
W: www.scottishambulance.com

A full Annual Report is also available on our website. A summary is available in other languages and formats on request. Please telephone the Interpretation and Translation Service on 0131 242 8181 and quote reference number 13-1304.

Gheibhearr làn Aithisg Bhliadhnaic cuideachd air an lārach-lìn againn. Tha geàrr-chunntas ri fhaighinn ann an cànànn agus cruthan eile eile iarratas. Feuch an cuir thu fòn chun t-Seirbhéis Eadar-mhineachaidh is Eadar-theangachaideach air 0131 242 8181 agus a'irmich a'ireamh clàraidh 13-1304.


Pełny raport roczny dostępny jest również na naszej stronie internetowej. Na żądanie dostępna jest skrócona wersja raportu w innych językach oraz formatach. Prosimy zadzwonić do Biura Tłumaczeń (ang.Interpretation and Translation Service) pod nr tel. 0131 242 8181 i podać nr referencyjny13-1304.