BRITISH COLUMBIA | BC Emergency Health Services

BCEHS Resource Allocation Plan

2013 Review

Summary Report

November 2013

EXECUTIVE SUMMARY

As the legislated authority to provide emergency health services in British Columbia, BC Emergency Health Services (BCEHS) has a responsibility to use resources safely, efficiently and in the best interest of patient safety. In 2012/13, BCEHS undertook an evidence-based review of the Resource Allocation Plan (RAP). The RAP prescribes the qualification, mode and first responder attendance for a given 911 call.

Most emergency health services review their resource allocation on a regular basis in the interests of optimizing patient care and appropriate resource stewardship. BCEHS reviewed the RAP five times since 1997 to ensure the right resource, is sent to the right patient, in the right amount of time. Through regular review of the RAP, BCEHS improves the safety of patients, the public and paramedics, and uses resources responsibly.

Resource allocation benefits from several safety processes:

- When BCAS receives a 911 call, an emergency medical dispatcher enters information provided by the caller into a call assessment system called the Medical Priority Dispatch System (MPDS). This internationally-recognized call assessment system, used by over 2,300 emergency health dispatch systems worldwide, determines the nature of the complaint or event, the acuity of the issue and assigns a code for each call. Currently, BCAS adherence rate to MPDS is 95%, indicating nearly all calls are assessed and prioritized correctly.

- BCAS dispatchers maintain regular contact with the calling party and, when required, may upgrade a call depending on changes to patient condition. All dispatchers have immediate access to supervisors for assistance, if needed.

- Paramedics and first responders can request additional resources to a call.

- The RAP review analyzed clinical and operational data from over 630,000 calls and nearly 900 patient conditions to validate the clinical appropriateness of assigned resources.

The 2012/13 RAP review indicated fewer calls clinically require a lights and siren response or first responders.
BCAS will continue to respond to every 911 call received, however the urgency of response and inclusion of first responders may be different than before. By applying the 2012 data to the approved changes, BCAS generally anticipates:

- 800,000 fewer kilometers driven using lights and siren by ambulances

- 11% increase in Basic Life Support calls
- 22% reduction in Highest Level Available calls

- 54% increase in COLD (no lights and siren) responses
- 29% reduction in HOT (lights and siren) responses

- 35% reduction in First Responder attendance for medical calls

Public and paramedic safety will be increased by reducing the number of calls driven unnecessarily at high-speeds with lights and siren on. Despite training, anytime an emergency vehicle responds with lights and siren there is a risk that they may get into an accident.

The 2012/13 RAP Review demonstrated a safe and evidence-informed approach to resource allocation. BCEHS will review the RAP on an annual basis.

INTRODUCTION

The BCEHS Resource Allocation Plan (RAP) prescribes the qualification, mode and first responder attendance for a given Medical Priority Dispatch System (MPDS) code. BC Ambulance Service (BCAS) reviewed the RAP five times since its introduction to BCAS in 1997; the last review was in 2010. BCEHS Medical Programs, in collaboration with the Quality, Safety, Risk Management and Accredication (QSRMA) program, undertook the 2012/13 review of the RAP to ensure clincial and methodological rigour.

Past RAP reviews examined call volume and basic transport statistics but relied on paramedics and first responders to provide clinical judgement related to resource allocation without evidence to reference. Paramedics reported that they continued to respond to calls with lights and sirens to patients that were not acutely ill and municipalities expressed concern about the frequency of first responder use.

The methodology employed in this review, through the addition of clinical information, shifts from allocation based in opinion and conjecture to one informed by evidence. The methodology supports an efficient and reproducible review for continuous improvement of the RAP. The review demonstrates the benefit of evidence-informed decision making in the context of resource allocation and the positive impact it has on patient, public and provider safety.

This report provides a high-level summary of the review process and RAP as approved by BCEHS Medical Programs and BCAS Operations.

SAFETY

The safety of patients, the public and providers is of the utmost importace to the successful implementation of any RAP. The implementation of the RAP incorporates several safety considerations:

- MPDS contains multiple contextualized safety prompts ensuring appropriate protocols are applied
- BCEHS policy and procedure support response escalation through a dispatch supervisor
- Phased implementation of changes
- Examination of raised concerns
- Interim validation of initial changes
- Incorporation of learnings into annual reviews

METHODOLOGY

The Resource Allocation Plan (RAP) review methodology is comprised of three distinct processes:

1. Derivation of a triage scale

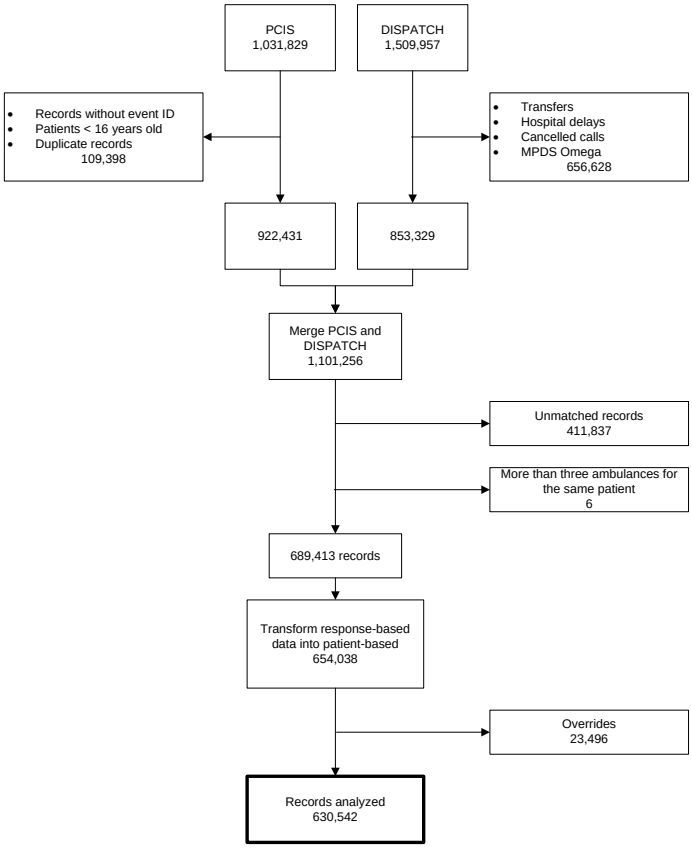
   The Australasian Triage Scale (ATS) is a valid and reliable emergency triage scale used to identify a patient's acuity based on clinical descriptors. The ATS is arranged by physiological domain, providing a comprehensive framework to ensure consideration of all patient types.

   The RAP Working Group used Patient Care Report data elements, such as vital signs, neurological assessment, medication/procedure codes and provider impression to create algorithms by ATS physiological domain to identify the clinical acuity (ATS score). Patients were grouped by Medical Priority Dispatch System (MPDS) protocol. The most urgent clinical descriptor identified determined the final ATS category.

CATEGORY 1 – Cardiac Arrest
Vital signs: Pulse rate = 0
OR
Provider's impression: ("Cardiac arrest: treated" OR "Cardiac arrest: untreated")
OR
Management: Med/Proced. ("CPR")

Partial algorithm for category 1 patients (cardiac domain)

The data represent all clinical and operational matched BCAS responses with scanned and keyed Patient Care Reports for adult patients between January 1, 2011 and December 31, 2012.



2. Indicator development

The RAP Working Group, comprised of physicians, paramedics, dispatchers and first responders, determined the most useful available information to inform decisions. They reviewed each MPDS protocol/determinant/sub-determinant with a descriptive information sheet. Indicators included call volume, completeness of clinical information, ATS triage categorization and cardiac arrest incidence. MPDS compliance per protocol was reviewed on a representative sample basis to inform decision making.

Descriptive Statistics by MPDS

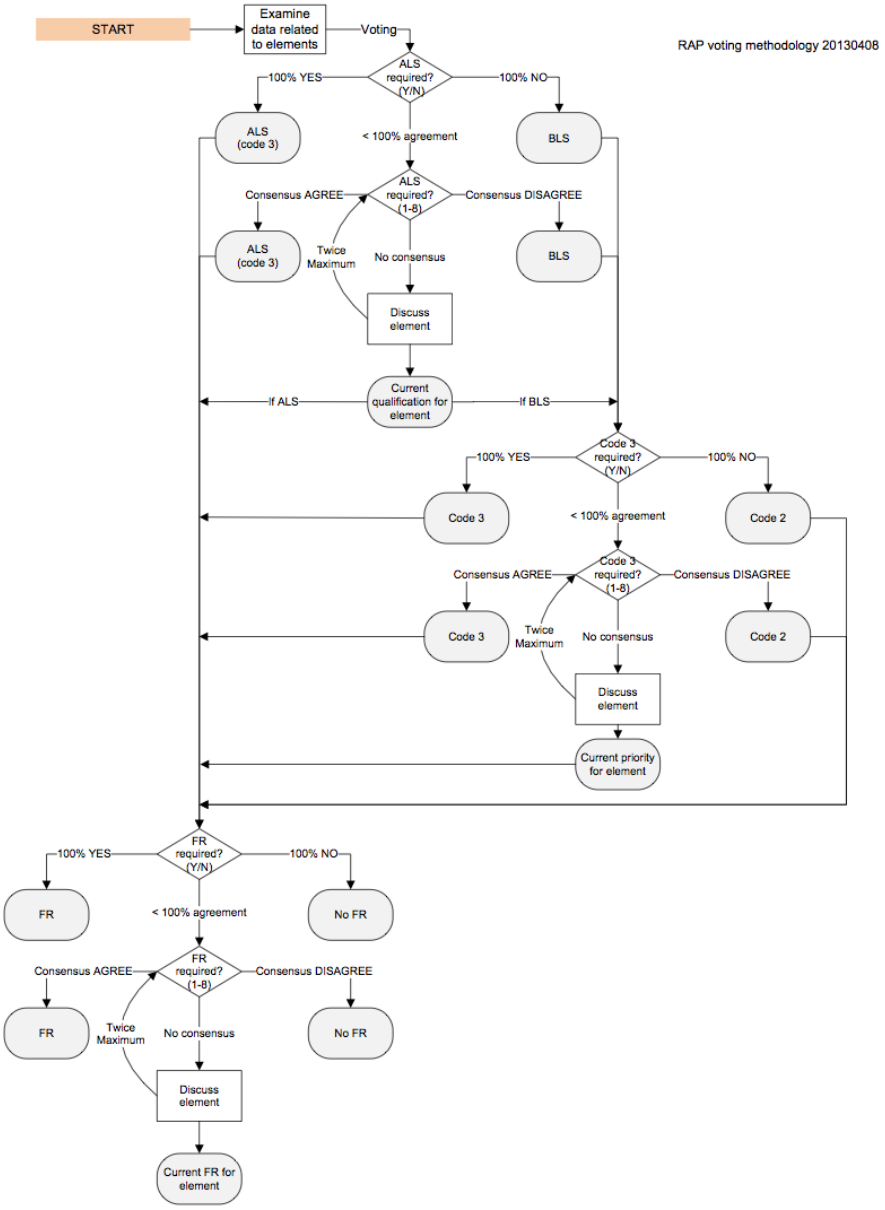
mpds=05A01

Description	Back Pain - NON-TRAUMATIC back pain
Frequency	9669
Proportion (%)	1.53
Vitals completed (#)	7217
Vitals completed (%)	74.6
Overall transport (#)	9242
Overall transport (%)	95.6
ALS transport (#)	56
ALS transport (%)	0.6
ATS1 (#)	38
ATS1 (%)	0.4
ATS2 (#)	143
ATS2 (%)	1.5
ATS3 (#)	3494
ATS3 (%)	36.1
ATS4 (#)	489
ATS4 (%)	5.1
ATS5 (#)	189
ATS5 (%)	2.0
ATS NC (#)	5316
ATS NC (%)	55.0
ATS accuracy (#)	189
ATS accuracy (%)	2.0
Cardiac arrest (#)	3
Cardiac arrest (%)	0.0

Information sheet for non-traumatic back pain (MPDS protocol 05-A-01)

3. Modified Delphi method

The RAP Working Group anonymously voted each element of RAP (qualification, response, first responder response) using an iterative method to ensure dissent was addressed with discussion focusing on the data and re-voted. Elements which did not reach consensus after three votes defaulted to the 2011 RAP elements. Working Group recommendations and defaults were forwarded to a final adjudication panel consisting of senior medical and operational leadership.



RESULTS

The 2012/13 RAP review indicated fewer calls clinically require a lights and sirens response or first responders. By applying the 2012 data to the approved changes, BCAS generally anticipates:

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DISCUSSION

The 2012/13 RAP review demonstrated the importance of clinical information, in addition to transport statistics, to sustainable RAP reviews. The review design enabled reproducible data merging, transformation and analysis for frequent and consistent reviews.

Several limitations were evident during the review. Data quality is a challenge in many healthcare service delivery organizations. To mitigate this impact, indicators included measures associated with the robustness of clinical information per MPDS protocol. The National Academies updated MPDS protocols during the review process. The working group conservatively mapped new protocols to similar existing protocols to ensure consistent evaluation across MPDS versions. Finally, broader representation would better inform the review process.

The working group and other providers put forward considerations for future reviews:

- Examine the possibility of resource allocation based on measures such as geography, population density, available services and incidence of other diseases
- Examine the possibility to include the scope of practice differences within Primary Care Paramedics and First Responders
- Examine the possibility of advanced statistical techniques such as inter-rater reliability, multiple imputation and receiver operating characteristic analysis

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