Introduction
This is a guide for students and researchers to research published in journals, and some reports, on the topic of frequent users of Emergency Departments and EMS / Ambulance Services. The guide is based on an extensive search of the literature using databases (Medline, CINAHL, EMBASE and PubMed) additional searches of references and citations and a rigorous selection process. See Methodology. 135 articles and two reports are included in the final selection. The complete database is available via Mendeley here.

The guide is divided into the following section:

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Systematic Reviews

What is a systematic review?
“A systematic review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Researchers conducting systematic reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making.” (Cochrane 2013)

Systematic reviews included in this guide
Althaus et al. (2011) look at the effectiveness of interventions for frequent users. Kumar and Klein (2013) review the effectiveness of the most used intervention, case management. LaCalle and Rabin (2010) look at the evidence to inform policy on frequent users. Their conclusions are that they are heterogeneous as a group, are less well than the general population and there is insufficient research on subgroups within the frequent user category. Scott et al. look at available research on the characteristics of frequent callers to ambulance services.


Studies included in this systematic review are listed [here](#).


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**Reviews**

**What are Reviews?**

These reviews are identified using MeSH heading Publication Type: Reviews. MeSH defines reviews as being “… published after examination of published material on a subject. It may be comprehensive to various degrees and the time range of material scrutinized may be broad or narrow, but the reviews most often desired are reviews of the current literature.” (MeSH 2013).
Reviews included in this guide
Lowthian (2011) looks at research on the increasing use of Ambulance Services over time. Nelson (2011) reviews research using the idea of a patient journey after patients first presentation at the emergency department.


Main Subject Headings
Subject headings with three or more documents attached. Click through to see records/articles.


**Characteristics:** Characteristics [28] / Alcohol Abuse [24] / Drug Users [22]


Bibliography Dashboard

Subject Coverage of journals
Each journal title included in this bibliography has been categorised by its main subject area using Scimago Journals Subject Classification (Scimago 2013). The subject areas are represented graphically in Figure 1.

The graphic illustrates the topic is mostly covered in Emergency Medical journals with a significant spread across other topics including mental health, clinical conditions and public health.

Analysis by number of articles in each journal title
The highest number of articles are published in Emergency Medicine journal titles, with 27 articles from the *Annals of Emergency Medicine*. The “long tail” including articles from medical, mental health and health related titles.
Analysis of publication year

The bibliography included research published since 2000. Articles published earlier are included if they formed part of a systematic review. The total number of articles is n=137. Articles published in 2013 are also excluded (n=8). n=109 were included in the range 2000-2012. Figure 3. The chart indicates an upward trend in publication of research in this area.

Methodology

Search Question

Identify research on frequent users of Ambulance, EMS and Emergency Department services and the strategies deployed to manage their use of emergency medical services (EMS).

Scope of Enquiry

The scope of enquiry provides a definition of the specific terms used in the research question and sets the parameters of the broader topic the research question addresses.

The initial focus of the search was Ambulance Services/EMS. This was expanded to include all users of the Emergency Department, a percentage of whom will arrive by Ambulance and the rest arrive by other means. Those who are frequent users of the Emergency Department, or the groups that they represent, are likely to be frequent Ambulance Service/EMS users.

The first concept in this review is frequent, regular or heavy users of Ambulance/EMS and Emergency Department services. Some of these patients may be better treated by other services in primary care, or their health conditions managed so that they do not become critical or acute requiring emergency treatment. Studies included in this review address the issue of frequent users and attempt a definition of frequent use as part of their methodology.

The second area is who frequent users are, or who they are as identified by existing research. The review looks for studies that identify specific characteristics of people who use Ambulance/EMS and Emergency Department services and defined groups and subgroups.
The third area is proposed solutions or case studies and initiatives that have managed or reduced the use of Ambulance/EMS and Emergency Department services from frequent users by providing alternatives or additional support.

The fourth area is to look for studies that address specific areas of emergency medical provision, in particular Ambulance Services. Specifically to see if research identifies differences in the users, the type of use and the strategies to manage use of emergency ambulances as distinct from self referral to the emergency department.

**Purpose of the Enquiry**
This is the primary purpose, to map the literature and create a useful resource on the current state of research.

**Search Strategy**

**Concept one**
Search in Title and Abstract for:

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ambulance* OR paramedic* OR prehospital OR ems
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combined with Emergency Medical Services as a MeSH/ CINAHL subject heading. Emergency Health Service in EMBASE/EMTREE.

**Concept two**
Not the proximity indicator, Near 3 or N3, meaning finding words within three word in the order that I specify, may change according to the database used.

```
frequent N3 user* OR frequent N3 attend* OR regular N3 user* OR repeat N3 user* OR heavy N3 user* OR emergency N3 utili*
```

**The actual search**
Search terms as they were entered into search using NICE Evidence Search - HDAS and PubMed.

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#1 Emergency Medical Services (Subject Heading)
#2 prehospital OR paramedic* OR ambulance* OR EMS
#3 Combine #1 OR #2
#4 frequent N3 user* OR frequent N3 attend* OR frequent N3 attend* OR frequent N3 attend* OR regular N3 user* OR repeat N3 user* OR heavy N3 user* OR emergency N3 utili*
#5 Combine #3 AND #4
```

**Limits**
English language articles from the last 10 years.
Selection Process

The selection process was managed using a bibliographic package, Mendeley.

The Initial search generated N=758 articles

The first parse through the results adopting a problem solving approach, tagged results Red=Not include, Amber=Maybe include but need more information and Green=Include. A second review of Amber results, obtaining abstracts where missing generated a final Green set of N=235 articles.

Each article was tagged using a combination of MeSH terms and user generated terms. Articles which were found did not fit the criteria, after closer examination and a review of full text were removed. The final selection of tagged records identified N=108 as relevant.

All the items included in the four identified Systematic Reviews were added manually, even if they were published pre 2003 or were in a foreign language. The final set was N=135 articles and two reports, N=137.

The methodology is informed by and modelled on processed developed by Arksey and O’Malley (2005) and Levac et al. (2010).

References


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