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Emergency nurses' triage narrative data, their uses and structure: a scoping review protocol

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ABSTRACT

Introduction The first clinical interaction most patients have in the emergency department occurs during triage. An unstructured narrative is generated during triage and is the first source of in-hospital documentation. These narratives capture the patient's reported reason for the visit and the initial assessment and offer significantly more nuanced descriptions of the patient's complaints than fixed field data. Previous research demonstrated these data are useful for predicting important clinical outcomes. Previous reviews examined these narratives in combination or isolation with other free-text sources, but used restricted searches and are becoming outdated. Furthermore, there are no reviews focused solely on nurses' (the primary collectors of these data) narratives.

Methods and analysis Using the Arksey and O'Malley scoping review framework and PRISMA-ScR reporting guidelines, we will perform structured searches of CINAHL, Ovid MEDLINE, ProQuest Central, Ovid Embase and Cochrane Library (via Wiley). Additionally, we will forward citation searches of all included studies. No geographical or study design exclusion criteria will be used. Studies examining disaster triage, published before 1990, and non-English language literature will be excluded. Data will be managed using online management tools; extracted data will be independently confirmed by a separate reviewer using prepiloted extraction forms. Cohen's kappa will be used to examine inter-rater agreement on pilot and final screening. Quantitative data will be expressed using measures of range and central tendency, counts, proportions and percentages, as appropriate. Qualitative data will be narrative summaries of the authors' primary findings.

Patient and public involvement No patients involved.

Ethics and dissemination No ethics approval is required. Findings will be submitted to peer-reviewed conferences and journals. Results will be disseminated using individual and institutional social media platforms.

Strengths and limitations of this study

► Because of advancements in artificial intelligence, an increasing number of studies have analysed unstructured narrative data, and artificial intelligence has been formally incorporated into clinical triage nursing software.

► This scoping review will offer an update to previously performed systematic and scoping reviews of unstructured narratives.

► This scoping review will use a search strategy that is more comprehensive than previous systematic reviews that examined unstructured triage narratives for specific clinical presentations.

► This will be the first scoping review to examine unstructured triage nurse narratives and will identify opportunities for additional review or meta-analysis.

► This review will be limited to English language studies and may not capture all studies in the field.

INTRODUCTION

The first interaction most patients will have with a care provider in the emergency department (ED) typically occurs during triage. A nurse will conduct a brief patient assessment, record demographic information and assign a visit code and acuity level.[1] The decisions nurses make during this triaging process are used to stream patients into different parts of the department and ensure they do not deteriorate if medical care is delayed.[1] The triage process originated in battlefield hospitals during the Napoleonic wars,[2] but did not see widespread incorporation into healthcare until the 1960s,[3] a formal taxonomic approach until the 1980s,[4] or national implementation until 1994, when Australia became the first country to do so.[5] Most countries now use both formalised triage processes and validated triage tools,[1] with many systems basing their model on the Australian system.[1 6]

Because triage is typically the first clinical encounter for most patients, the triage record is the first source of in-hospital documentation. In some jurisdictions (such as Canada), national standards guide both the triage process and ED data collection,[7 8] and the vast majority (85%) of EDs collect and report minimum data sets to a national repository.[9–11] These minimum data sets help administrators assess workload trends, compare costs, measure throughput, monitor patient acuity

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and perform pandemic surveillance.[12] Minimum data sets require documentation of a set amount of structured data, but also allow for the optional reporting of significantly more data, such as triage narratives. Despite their routine collection in some jurisdictions, these narratives are not part of the 'minimum' data set,[11 13 14] and until recently have not been used in a consistent manner.

Unstructured triage narratives differ from structured data in that they are not restricted to one of several fixed options. These narratives capture subjective data such as the patient's own reported reason for visiting the ED and the nurse's assessment; and, as such, offer significantly more nuance than an itemised 'presenting complaint', or procedural or diagnostic codes. While unstructured data have historically been difficult to use, recent advances in artificial intelligence (AI) have been applied to rapidly assess large volumes of triage narratives with strategies including natural language processing,[15] computerised keyword searches[16] and computer-aided expert analysis.[17] The results of previous studies suggest that narrative data can be useful for predicting important clinical outcomes such as the need for admission to hospital[18] or receiving a diagnosis of sepsis[19] or influenza.[17] In addition to being predictive of clinical course, narrative data have been used for epidemiological purposes such as tracking characteristics and rates of injury[20] and substance misuse patterns.[21 22] Furthermore, when triage narratives have been added to more traditional approaches for estimating disease prevalence (ie, International Classification of Disease—ICD codes), they have been able to identify significantly more cases,[21 22] with one study showing that triage narratives can more than quadruple (90% vs 21%) the number of cases (road collisions involving drugs or alcohol) identified when compared with ICD codes alone.[21] The ability to identify cases is of particular importance for rare or complex presentations that are not easily captured using existing diagnostic codes.[16] These triage narratives have been clinically operationalised by the Emergency Nurses Association, which incorporated AI into triage decision support.[23] The clinical implementation of AI into triage suggests that the research field is poised to expand significantly, and as such a mapping of the current literature base is needed.

To date, at least three systematic reviews have included triage narratives in their examinations of unstructured clinical data. Two systematic reviews (an initial review[24] and subsequent update[25] authored by the same group) identified 56 papers examining AI approaches to analysing injury surveillance narratives. The reviews included studies that assessed narrative data from any source and any administrative health database, provided that it was assessed using AI algorithms. The reviews included a number of studies that used triage narratives and found that narrative data offered not only an alternative method for performing surveillance, but also offered rich contextual information not otherwise available.[25] A third systematic review, which examined ED syndromic surveillance of influenza, identified 38 studies that tracked illness,

several of which used both nursing triage narratives and nurse assigned complaint codes.[26]

More recently there have been scoping reviews of AI that have examined their use in aiding in medical diagnoses[27] and for clinical decision support.[28] Both reviews examined triage and unstructured narratives data, but they included these with disparate types of data. Additionally, neither study referenced the previously mentioned systematic reviews, and both missed a significant number of studies identified in the systematic reviews that examined AI. Some of these omissions may have been intentional given that one review excluded studies that were linked to specific presentations (such as influenza, chest pain or trauma)[28] or because the other review included only those that explicitly mentioned the use of synonyms for 'artificial intelligence' in their title, were not directly relevant to medicine (eg, public health) or 'did not report outcomes or evaluations' (eg, non-intervention epidemiological studies).[27]

These reviews are foundational and our work will attempt to add to them. The systematic reviews suggest that there is limited use in examining narrative data in general, concluding that a 'lack of guidelines for recording information… and subsequent inconsistencies in the documentation'[24] complicate the use of the data. These conclusions may be either a reflection of the limitations present in AI at the time, or the result of generalising about the ability of narrative data to reflect more narrowly defined and specific presentations (eg, injuries or communicable diseases). The authors of the systematic review limited their searches by excluding grey literature[24 25] and examining only studies indexed on PubMed.[26] The scoping reviews, while more current, have limited their search breadth by using restrictive search strategies that exclude studies linked to specific presentations. Our work will add to other scoping reviews that have examined triage narratives as part of their data; but will offer an updated overview of the early systematic reviews, and will focus on examining the clinical, epidemiological and prognostic value of the narrative data generated by the clinicians who are pushing to incorporate AI into the very earliest stages of clinical documentation: emergency nurses.

Objective

Using the Arksey and O'Malley[29] scoping review framework and PRISMA-ScR[30] reporting guidelines, the goal of our review will be to identify, map and describe the peer-reviewed literature examining nursing triage narratives in order to identify if there is sufficient literature to conduct future systematic reviews on the use of triage narratives for estimating prevalence for other conditions and populations, the use of AI at triage and to determine whether there is sufficient literature to meta-analyse comparisons of prevalence estimates using narratives and other coding sources. To further these goals, we will focus on the following objectives:

1. To describe the populations and locations where the data originated.
2. To determine the types of literature that have been generated on the topic.
3. To describe the authors' reported purpose and conclusion in the literature.

METHODS AND ANALYSIS
Search strategy
The review will be conducted between February and May 2022. We will identify relevant literature through structured searching of online databases and forward citation searches of included studies. With the assistance of a medical librarian, our review will use controlled vocabulary (online supplemental appendix 1) to perform a comprehensive search of the following databases: CINAHL, Ovid MEDLINE, Ovid Embase, Cochrane Library (via Wiley) and ProQuest Central. Because of the long history of triage and the potentially disparate systems that existed prior to national standardisation, the search will be limited to studies published after 1990, 4 years prior to the implementation of the first nationally recognised triage system.[5]

Inclusion and exclusion criteria
In order to be included in this review, identified literature will need to meet all of the following inclusion criteria:

Setting
The literature must address triage that occurs in an ED. Although many services will perform triage to determine who needs care first, the focus of our review is on the narratives generated by triage nurses working in EDs. Emergency care can occur in hospital-based EDs, freestanding EDs and urgent care centres; which can be referred to in a number of ways: emergency room, urgent care centre, accident and emergency, emergency ward and casualty station.[31]

Narrative data
Included literature must assess triage narratives. These are data that are not collected in a categorical manner; they are in a narrative free form. These can be viewed as analogous to a 'chart note'.[32] There are multiple phrases used for this; the most commonly used terms are 'summary', 'narrative', 'free-text or text', 'presenting complaint', 'syndrome or symptom' or 'unstructured description(s)'.[24]

Primary population
Because the primary population of interest is nurses, only narratives generated by nurses will be included. To maintain maximum sensitivity, we define a nurse as someone 'authorised by the appropriate regulatory authority to practice nursing',[33] regardless of their registered title, for example, registered nurses, nurse practitioners, midwife, psychiatric nurses or practical registered nurses.

Study type
Any peer-reviewed primary literature identified in the search will be included, regardless of design. Reviews, commentaries, conference proceedings and results available in abstract form only will not be included.

Language and full-text availability
Only English language literature will be included. Literature will be excluded for any of the following reasons:

Disaster specific triage tools
There are a number of different triage tools used during disasters. Triage in these settings is predicated on speed,[34] and does not typically include either a detailed assessment of the patients nor an unstructured narrative of the assessment. As such they will be excluded from this review.

Providers other than nurses
There are other healthcare providers who may perform triage, for example, paramedics. While there may be some concordance between different healthcare providers,[35 36] only nurse-generated narratives will be included in this review to examine a homogenous practice group.

Reference and data management
Literature identified through the structured searches will be loaded into Covidence (Veritas Health Innovation) where duplicates will be removed and screening will occur. Title, abstract and full-text screening will be performed independently by two reviewers using Covidence and will be guided by prepiloted screening forms (online supplemental appendix 2). Any disagreements on inclusion will be settled by consensus, or if needed by a tie-breaker from a third researcher. Citations will be managed using Zotero (Corporation for Digital Scholarship). Continuous and categorical data will be extracted into a prebuilt online spreadsheet and word processing programs by the lead researcher and independently confirmed by another using prepiloted extraction guides (online supplemental appendix 3).

Data extraction
Data extraction will be guided by the central objectives of the study.[29] First, to describe the populations involved in the studies, we will extract data related to the location of where the studies are being conducted, the number and types of hospitals and departments being assessed and the numbers and types of patients being assessed. Second, to determine the types of literature that have been generated on the topic of interest and the methods used by each of the studies, we will extract data related to the target populations, research designs and data extraction and hypothesis testing techniques. Finally, we will describe the authors' reported purpose for conducting the study or generating the literature, summary of findings or conclusion and whether any reporting guidelines were followed. The purpose will be defined as the study objectives or rationale, and a summary of the authors' findings and reported conclusion or recommendations. Because

AI-specific reporting guidelines have only recently been published,[37] any reporting guidelines used by the authors will be extracted. The data extraction will be guided by a prepiloted guiding document (online supplemental appendix 3) and will occur in two ways: categorical or continuous data, which will be extracted into an online spreadsheet, and narrative data, which will be extracted into a word processing document (online supplemental appendix 3). Prior to data extraction, a sample of 10 studies will be extracted and compared to assess for agreement between reviewers and to determine if the extraction tool needs revision.

Data synthesis

Data synthesis will aim to map data in a manner that facilitates comparisons and the identification of gaps in the literature.[29] Extracted data will be presented in tabular format to facilitate the summation and comparison of the nature and scope of existing literature to identify promising topics for future systematic reviews aimed to synthesise findings. Quantitative synthesis of continuous variables such as sample sizes will use counts and measures of range and central tendency (mean or median). Categorical data such as year and location of study, the sources of data, approach to data extraction and methods of hypothesis testing will be expressed as counts and percentages, as the authors' reported purpose for conducting the study and as a summary of their findings will be expressed narratively. Although quality appraisal can be performed,[30] it is not typical to include a critical appraisal within a scoping review as the primary aims are to map the nature and features of the literature, not to provide an unbiased assessment of the findings of the body of literature.[29 38] While we chose to present authors' recommendations from the primary studies in this review, we do so to give a broad sense of what research in the area has generated to date, and to identify areas for future systematic reviews, which will synthesise study findings and also appraise the quality of the studies included in the review.[29] We will, however, report on the proportion of studies that follow formal reporting guidelines. Inter-rater agreement on pilot screening criteria and extraction tools and final screening and extraction results will be assessed and using Cohen's kappa. PRISMA ScR criteria (online supplemental appendix 4) will be used for reporting findings.[30]

Patient and Public Involvement

No patients involved.

ETHICS AND DISSEMINATION
Ethics

This study will be examining previously published academic literature and publicly available grey literature, as such there is no requirement for ethical approval.

Dissemination

Findings from this scoping review will be presented in several ways: (1) Findings will be submitted for presentation at local, and national academic and emergency nursing conferences. (2) We will request the opportunity to present the findings from this review to the Canadian Triage Acuity Scale and Canadian Emergency Department Information System National Working Groups. (3) A final manuscript will be submitted to an open access peer-reviewed journal for publication.

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<u>Appendix 1. Database Search Strategies</u>

Ovid MEDLINE

1	exp Medical Records Department, Hospital/ or exp Dental Records/ or exp Records/ or records or entries.mp
2	(note* or text*).ti,ab
3	exp "Information Storage and Retrieval"/ or exp informatics / or exp Artificial Intelligence/ or natural language.mp. or exp Language/ or exp Pattern Recognition, Automated/ or exp Neural Networks, Computer
4	(text mining or **data mining or machine learning or natural language processing or semantic* or narrative text*** or text descrip* or **text field***).mp.
5	1 or 2 or 3 or 4
6	emergency treatment/ or emergency medicine/ or exp emergency health service/ or evidence based emergency medicine/ or emergency nursing/ or exp emergency care/ or emergency ward/ or (emergicent* or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment*or visit*))).mp. or (triage or critical care or (trauma adj1 (cent* or care))).mp.
7	exp Nursing/ or exp Nursing Staff/ or nurs*.mp.
8	6 or 7
9	Triag*.mp
10	(Austral* Triage Scale or Canadian Triage Acuity Scale or Canadian triage acuity scale or Emergency Severity Index or Manchester Triage Scale or South African Triage Scale or CTAS or ESI or MTS or SATS).ti,ab.
11	9 or 10
12	5 and 8 and 11
13	limit 12 to (yr="1990-Current" and English)

EMBASE Search Filter

1	exp Medical Records Department, Hospital/ or exp Dental Records/ or exp Records/ or records or entries.mp
2	(note* or text*).ti,ab
3	exp "Information Storage and Retrieval"/ or exp informatics / or exp Artificial Intelligence/ or natural language.mp. or exp Language/ or exp Pattern Recognition, Automated/ or exp Neural Networks, Computer/
4	(text mining or **data mining or machine learning or natural language processing or semantics or narrative text*** or text descrip* or **text field***).mp.
5	1 or 2 or 3 or 4
6	emergency treatment/ or emergency medicine/ or exp emergency health service/ or evidence based emergency medicine/ or emergency nursing/ or exp emergency care/ or emergency ward/ or (emergicent* or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment*or visit*))).mp. or (triage or critical care or (trauma adj1 (cent* or care))).mp.
7	exp Nursing/ or exp Nursing Staff/ or nurs*.mp
8	6 or 7
9	Triag*.mp
10	(Austral* Triage Scale or Canadian Triage Acuity Scale or Canadian triage acuity scale or Emergency Severity Index or Manchester Triage Scale or South African Triage Scale or CTAS or ESI or MTS or SATS).ti,ab.
11	9 or 10
12	5 and 8 and 11
13	limit 12 to (yr="1990-Current" and English)

CINAHL

1	(MM "Charting+") OR (MM "Coding+") OR (MM "Nursing Orders") OR (MM "Shift Reports") OR (MM "Medical Records") OR (MM "Information Management") OR (MM "Data Analytics")
2	(MH "Decision Making, Computer Assisted+") OR (MH "Data Mining") OR (MH "Data Collection, Computer Assisted") OR (MH "Data Analysis, Computer Assisted+") OR (MH "Artificial Intelligence+") OR (MH "Minimum Data Set+") OR (MH "Health Informatics+")
3	(MH "Emergency Service+") or (MH "Emergency Medicine") or (MH "Physicians, Emergency") OR (MH "Emergency Nurse Practitioners") or (MH "Emergency Nursing+") or (MH "Emergency Patients") or "casualty department*" or ((emergenc* or "ED") N1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment* or visit*)))
4	"Austral* Triage Scale" or "Canadian Triage Acuity Scale" or "Emergency Severity Index" or "Manchester Triage Scale" or "South African Triage Scale" or CTAS or ESI or MTS or SATS or (MM "Triag*")
5	1 or 2 and 3 and 4 (restrict to peer review, with abstract, published 1990-2021)

ProQuest

1	noft(records, hospital) OR noft(records, nursing) OR noft(records, medical) OR noft(medical records, computerized) OR noft(information storage and retrieval systems) OR noft(Informatics) OR noft(Artificial Intelligence) OR noft(natural language) OR noft(machine learning)
2	noft(Emergency Treatment) OR noft(Emergency Medicine) OR noft(emergency medical services) OR noft(emergency service) OR noft(Hospital) OR noft(trauma centers) OR noft(Evidence-Based Emergency Medicine) OR noft(Emergency Nursing) OR noft(casualty department) OR noft(nurse) OR noft(nurs*)
4	noft(Austral* Triage Scale) or noft(Canadian Triage Acuity Scale) or noft(Emergency Severity Index) or noft(Manchester Triage Scale) or noft(South African Triage Scale) or noft(CTAS) or noft(ESI) or noft(MTS) or noft(SATS) or noft(Triag*)

Cochrane

1	[mh "Medical Records Department, Hospital"] or [mh "dental records"] or [mh "Dental Records"] or [mh "Records"]
2	(note* or text *):ti,ab,kw
3	[mh "Information Storage and Retrieval"] or [mh "informatics"] or [mh "Artificial Intelligence"] or [mh "natural language"] or [mh "Language"] or [mh "Pattern Recognition, Automated"] or [mh "Neural Networks, Computer"] or [mh "text mining"] or [mh "data mining"] or [mh "machine learning"] or [mh "natural language processing"] or [mh "semantics"] or [mh "narrative text*"] or [mh "text descrip*"] or [mh "text field"]
4	1 or 2 or 3
5	[mh "Emergency Treatment"] or [mh "Emergency Medicine"] or [mh "emergency medical services"] or [mh "emergency service, hospital"] or [mh "trauma center"] or [mh "Evidence-Based Emergency Medicine"] or [mh "Emergency Nursing"] or [mh "Emergencies"] or [mh "emergent*"] or [mh "casualty department*"]
6	(emergenc* NEAR/1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment* or visit*)):ti,ab,kw
7	[mh "Nursing"] or [mh "Nurs*"]
8	6 or 7
9	[mh "Triage"]
10	("Austral* Triage Scale" or "Canadian Triage Acuity Scale" or "Emergency Severity Index" or "Manchester Triage Scale" or "South African Triage Scale" or "CTAS" or "ESI" or "MTS" or "SATS"):ti,ab,kw
11	9 or 10
12	4 and 8 and 11
13	limit 12 to (yr="1990-Current" and English)

Supplemental material

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1   **Appendix 2. Screening Form: Nurses' Narrative Triage Data: A Scoping Review Protocol**

2   **First Author (year):**   **Date of screening:**   **Assessor's Initials:**

3   **Article Title:**

4   **DECISION:** ☐Include   ☐Exclude   ☐Reference Review   ☐Additional Review

5   Complete this form sequentially. Instructions are written in red:

1. Study type	Does the article discuss emergency department data? If the answer is 'yes', proceed to question 2 If the answer is 'no' mark 'exclude' on the top of the form.
2. Aim	Does the article discuss unstructured narrative data in <u>any</u> way? If the answer is 'yes', proceed to question 3 If the answer is 'no' mark 'exclude' on the top of the form.
3. Population	A. Does the article discuss nurses, nursing, triage documentation, or presenting complaints? If the answer is 'yes', proceed to question 4 If the answer is 'no', proceed to question 3B: B. Does the article discuss unstructured emergency narratives generated by providers other than nurses? If the answer is 'yes' mark as 'reference review' on the top of the form. If the answer is 'no' mark 'exclude' on the top of the form.
4. Study Type	A. Is the article a <u>primary</u> report from published?[1] If the answer is 'yes', proceed to question 5 If the answer is 'no', proceed to question 4B: B. Did the article report on a review (scoping, systematic, narrative)? If the answer is a 'yes' mark as 'reference review' on the top of the form. If the answer is 'no', mark as 'exclude' on the top of the form.
5. Language and Full Text availability	Is the text available in English? If the answer is 'yes', mark 'Include' If the answer is 'no', mark as 'additional review' on the top of the form.

6

7

8

9 **Research Question**: To map the literature examining nurses collected triage narratives: where
10 data has been generated, what types of literature examine the issue; and to describe author
11 reported purposes and conclusions.

12 **Review Method**: Scoping Review

13 **Definitions:**

14   1. **Emergency Department:** There is a surprising lack of consistency in terminology.
15   Emergency care can occur in hospital-based emergency departments and freestanding
16   emergency departments and urgent care centers. They can be referred to in many ways,
17   these include: Emergency Room (ER), Urgent Care Center, Accident and Emergency
18   (A&E), Emergency ward, casualty station.[1]

19

20   2. **Unstructured narrative data:** These are data that are not collected in a categorical
21   manner; rather in a narrative free form. These can be viewed as analogous to a "chart
22   note". There are multiple phrases used for this, most commonly: Summary or narrative
23   Free-text or text, Presenting complaint, Chief Complaints, Syndrome/symptom,
24   description(s).[2]

25

26   3. **Primary Population:** The primary population of interest are nurses. Nurses for the
27   purpose of screening include all skill levels (or bands) of nursing, these include:
28   Registered Nurses (NP), Registered Psychiatric Nurses (RPN), Licenced Practical Nurses
29   (LPN).

30

31   4. **Language and Full Text availability:** Only full text English-language literature will be
32   included; conference proceeding and abstracts will be excluded.

33 **References**

34 [1] Khangura JK, Flodgren G, Perera R, Rowe BH, Shepperd S. Primary care professionals
35 providing non-urgent care in hospital emergency departments. Cochrane Database of Systematic
36 Reviews. 2012(11).

37 [2] McKenzie K, Scott DA, Campbell MA, McClure RJ. The use of narrative text for injury
38 surveillance research: a systematic review. Accident Analysis & Prevention. 2010 Mar
39 1;42(2):354-63.

1   **<u>Appendix 3. Data Extraction Instructions for Scoping Review of Triage Narratives</u>**

2   Data will be extracted from studies into one table to facilitate comparisons. Multiple reports of a single
3   study will be marked and grouped together in the data extraction tables to prevent double-counting the
4   results originating from a single sample or intervention. Please complete all fields. If there are no data for
5   a given field please mark "Not Applicable" or "Not reported".

6   <u>Table Items:</u>

7   1. Study ID: This will include the Author and Year, Digital Object Identifier, or Covidence assigned ID
8   number.
9

10   2. Extractor - First and Last initial of the author extracting the data.
11

12   3. Sample Data
13   *Data Source*

14   a. **Country/State/City:** Where the study data originated from. Extract as much information as
15   possible in this field starting from least to most specific, separating levels with commas. If
16   there are multiple responses at the same level separate them with a forward slash. Ex:
17   Canada, Alberta, Edmonton/Calgary.
18   b. **Triage System:** Extract the name of the system, include specifics on versions or electronic if
19   offered. (Ex: CTAS 2018, eCTAS)
20   c. **Source of Data:**
21   i. **Endorsing Organizations:** Extract the full names of any endorsing organization.
22   (Ex: CTAS guidelines - National Emergency Nurses Association, Canadian
23   Paediatrics Society, Canadian Association of emergency Physicians).
24   ii. **Source of Primary Data:** Refers to where the primary data were accessed from. For
25   example, a provincial or national registry, or from hospital electronic records, these
26   can include Regionalized Emergency Data Sets (Canadian Institute for Health
27   Information, National Hospital Ambulatory Medical Care Survey, National
28   Trauma Data Bank, etc).
29

30   *Population*

31   d. **Number of Emergency departments:** Extract the number of hospitals or urgent care centres
32   reported. If the hospital reports more than one department at one site record each as a unique
33   department (Ex: University of Alberta Hospital Emergency, Stollery Hospital Emergency)
34   e. **Number of records:** Extract the number of patient records or visits that underwent final
35   analysis. (Repeat visits by the same patient are counted individually)
36   f. **Number of patients:** If the study records the number of providers collecting data record the
37   number included in the final analysis.
38

39   4. Study Data
40   *Design*

41   a. **Qualitative or Quantitative**: Select one, for mixed or multiple methods record "both". For
42   position statements or guidance documents record "not applicable"
43   b. **Design type**: Record the authors reported design.
44   *c.* **Population of interest**: Summarize the authors' population of interest.
45

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46   *Data extraction methods*

47   d. **Automated:** If the authors used any form of automated technology (ex: machine learning,
48   artificial intelligence) to extract data record the type used. (Ex: bag of words, keyword, index
49   searching)
50   e. **Not automated:** If data were manually extracted summarize the approach used (ex. Expert
51   review and analysis of narrative).
52
53   *Hypothesis testing*

54   f. **Internal uses:** Describe what the authors used the data for (ex: making predictions about
55   admission).
56   g. **External comparisons:** If the authors compare narrative data to other data sources (ex: ICD
57   codes) summarize the data external data types.
58   h. **Statistical testing methods**: Describe the statistical testing techniques.
59
60 5. Data collected
61   *Description of data collected*
62   Extract any description of the narrative triage data collected (Ex: number of words in a narrative,
63   number of errors in a narrative, completeness of records, etc.).
64
65   *What were the authors' objectives?*
66   Extract what the authors report as the primary intention of their study. For primary research this
67   could be the hypothesis being tested or phenomena being described. For guidance documents this
68   could be a position, recommendation, or practice standard.
69
70   *What were the authors findings or conclusions?*

71   Extract any recommendations made by the authors. This could include that further research is
72   needed, or suggestions for future use of narrative data examples could include quality assurance,
73   research, etc.

74
75 6. **Presence of quality appraisal:** Extract any reported formal reporting or quality frameworks, or any
76   other quality assessments measures.
77

78   Data Extraction Form: Triage Narrative Scoping Review

1. Study ID	2. Extractor	3. Sample Data	4. Study Data	5. Findings
		Data Source a) **Country/State:** b) **Triage System:** c) **Source of Data:** *Population* d) **Number of emergency departments:** e) **Number of records:** f) **Number of patients:** g) **Number of providers:**	*Design* a) **Qualitative or quantitative design?** b) **Design type:** c) **The population of interest:** *Data extraction methods:* d) **Automated (specify method):** e) **Not automated:** *Hypothesis testing* f) **Internal uses:** g) **External comparators:** h) **Statistical testing methods (if used):**	*Description of data collected:* *What were the data used for?* *What were the authors' objectives?* *What were the primary findings?* *Were reporting guidelines used?*

79

1 **Appendix 4. PRISMA diagram for the proposed search**

2