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Add a Subtitle if Needed

Your name here

# Introduction

*This is part A) in the project plan [sv: projektredogörelse].*

*The background/introduction should summarise the scope of the problem, what is known about the problem, what is not known, what specific knowledge gap the study is supposed to fill and why this is important. It should end be stating the aim of the study. The background should be 4-5 paragraphs long and each paragraph should be between 3-5 sentences. Strive to make the paragraphs about the same length.*

*bibliography.bib includes an example reference. Add additional references in that file as bibtex entries and then cite in text using: “(1)”. One can convert DOIs’ to bibtex entries using* [*https://www.doi2bib.org/*](https://www.doi2bib.org/)*. If you use Zotero you can simply export entries to bibtex Ctrl-Shift-C, however you need to first setup Quick Copy to export to bibtex (*[*https://www.zotero.org/support/creating\_bibliographies#quick\_copy*](https://www.zotero.org/support/creating_bibliographies#quick_copy)*)*

Trauma is a major global public health concern. It causes over four milion death and affects hundreds of millions each year, among those younger populations are the most affected (2). The initial management of trauma patients once they reach hospital is very time sensitive and error prone (3) [(4)](5), and shock is the most common potentially preventable death within the first 24h of injury(6). It is also the second major cause of early mortality in trauma patients (7), and patients in shock have a higher mortality rate than those not(8).

The definition for shock is circulatory failure leading to insuficient perfusion and oxygenation of tissue and organ(9). There are four types of causes, which are hypovolemic, obstructive, cardiogenic and distributive. These causes can occur alone or in combination. The most usual one during trauma are hypovolemic in form of a large bleeding(4).

To differentiate the severity of trauma shock, we can divide shock into different degrees. One of such classification is the ATLS classification for major haemorrhage. The classification is divided into four classes, based on the patients: estimated bloodloss, heart frequency (HF), bloodpressure (BP), pulse pressure, respiratory rate (RR), mental status and urine output. However, this only meant to be used for hypovolemic shocks and not the other types. There is other classification for predicting massive transfusion (TASH, ABC), triaging (RETTS) or tracking the clinical deterioration of patients (NEWS2). The common denominator for these classifications is they are all roughly based on vital parameters, however none of them is specifically designed to classify trauma shock degree regardless of the type/cause of shock. ATLS in this regard, even though having its own shortcomings(10), still is one of the most used classifications for this topic(Källa).

One way to improve trauma care quality is trough identifying Opportunities for Improvement (OFI). This method has an advantage compared to traditional mortality reviews in that it also includes non-fatals. There are different processes to finding OFIs, but one of the primary ways is structured multidisciplinary morbidity and mortality reviews of patient cases (11). In order for the review content to be as comprehensive as possible for trauma care, the Donabedian quality of care framework can be used(12). It is based on the three factors of structure, process and outcome. By following this framework, healthcare providers will be able to systematically find and address OFIs[källa?]. This will in turn improve the effectiveness of trauma care, directly impacting mortality and morbidity[källa?/8].

This study aims to describe the types of opportunities for improvement for adult trauma patients arriving in shock, and to assess how the degree of shock is associated with opportunities for improvement.

# Methods

*Refer to the appropriate reporting guideline for details. If you are developing, updating or validating a clinical prediction model then use* [*TRIPOD*](https://www.equator-network.org/reporting-guidelines/tripod-statement/)*. If you are conducting an observational study, for example a cohort or case control study in which you assess associations between some exposure and an outcome then use* [*STROBE*](https://www.equator-network.org/reporting-guidelines/strobe/)*.*

Study design We conducted a registry based retrospective cohort study, using data from the trauma registry and trauma care quality database at the Karolinska University Hospital in Solna. We then linked the two databases to assess what types of OFI occurred in patients arriving in shock and use adjusted logistic regression to assess the association between the degree of shock and odds of opportunities for improvement.

Setting The trauma registry includes about 14000 patients treated at Karolinska University Hospital in Solna between 2012 and 2023. The trauma care quality database is a subset of the trauma registry and includes about 8000 patients selected for review between 2014 and 2023. Karolinska University Hospital in Solna acts as a level one trauma center according to critera set by American College of Surgeons(), and treats all major trauma in the greater metropolitan area of Stockholm.

Participatns Every trauma patient at Karolinska University Hospital is included in a morbidity and mortality review process, which involves both individual case evaluations by specialized nurses and audit filters. Patients identified with a high potential for OFIs are discussed at multidisciplinary conferences. The identified OFIs are then categorized into broader areas. The multidisciplinary conferences are held every six to eight weeks, during which an average of ten patient cases are reviewed by experienced specialists from all trauma-related fields. The presence or absence of OFIs is determined by consensus among all participants and is documented in the trauma care quality database.

To qualify into the trauma registry, requires admission by trauma team activation or any admission with an Injury Severity Score (ISS) of more than nine. We included all patients in … between … and … We excluded patients younger than 18 and/or were dead on arrival.

Variable and measurements To classify the patients “heart rate”, “blood pressure”, “respiratory rate” and “mental status” will be used as independent variables for classification of shock regardless of their cause. Based on these four measurements, the patients will be classified into four groups roughly based on the same value as in the ATLS trauma shock classifications. The outcome will be OFI recorded in the trauma care quality database and are binary when used to calculate the association with degree of shock. The subgroups of OFI will be explored and reported in a list, and therefore non-binary.

# Project Update and Timeline

*This is part B) in the project plan [sv: projektredogörelse].*

*Save the image generated from the Gantt chard spreadsheet into the assets folder, rename it to project-gantt.png*

|  |
| --- |
| **The Gantt chart will be displayed here when you place it in the assets folder under “project-gantt.png”** |

**The Gantt chart will be displayed here when you place it in the assets folder under “project-gantt.png”**

Doing right now: - Introduction - Methods

To do: - Coding for regression - Analysis - Results - Discussion - Conclusion and Abstract

# Back-up Plan

*This is part C) in the project plan [sv: projektredogörelse]*

# References

1. This is an example of a BibTex entry. You can get the BibTex entry of any article using its doi from for example https://www.bibtex.com/c/doi-to-bibtex-converter/. You can remove this entry once you start putting your own entries here. 9999 Aug;1(1):1–2.

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