



Science of Nursing  
and Health Practices



Science infirmière  
et pratiques en santé

Article de protocole de recherche | Research protocol article

## Follow-Up Interventions in Trauma Patients to Optimize Pain Management or Opioid use and Their Associated Costs: A Scoping Review Protocol

**Interventions de suivi auprès des patients avec des blessures traumatiques pour optimiser la gestion de la douleur ou l'utilisation d'opioïdes et leurs coûts associés : un protocole de revue de la portée**

**Mwanak Kakule Matina**  <https://orcid.org/0009-0003-8506-1354> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Faculty of Nursing, Université Laval, Quebec, Canada

**Caroline Côté**  <https://orcid.org/0000-0003-2097-8738> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Faculty of Nursing, Université Laval, Quebec, Canada

**Léonie Archambault**  <https://orcid.org/0000-0002-8980-3664> Institut Universitaire sur les Dépendances, Quebec Pain Research Network, Quebec, Canada

**Étienne Belzile**  <https://orcid.org/0000-0003-2837-981X> Department of Orthopaedic Surgery, CHU de Québec – Université Laval, Quebec, Canada

**Barbara Haas** Trauma and Critical Care Department, Sunnybrook Health Sciences Centre, Ontario, Canada

**Kelly Kidwell**  <https://orcid.org/0000-0002-1717-4483> School of Public Health, University of Michigan, MI, United States

**Michael Verret**  <https://orcid.org/0000-0003-3257-7878> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Anesthesiology and Critical Care Department, Université Laval, Quebec, Canada

**Line Guénette**  <https://orcid.org/0000-0001-9769-7550> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Faculty of Pharmacy, Université Laval, Quebec, Canada



**Jason Guertin**  <https://orcid.org/0000-0003-1718-5307> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Department of Social and Preventive Medicine, Université Laval, Quebec, Canada

**Laurent Dupuis** Quebec Pain Research Network, Quebec, Canada

**Kadija Perreault**  <https://orcid.org/0000-0002-8608-9661> Quebec Pain Research Network, Department of Rehabilitation, Université Laval, Centre interdisciplinaire de recherche en réadaptation et intégration sociale, Quebec, Canada

**Marc-Olivier Martel**  <https://orcid.org/0000-0002-8143-4622> Quebec Pain Research Network, Faculty of Dental Medicine and Oral Health Sciences, McGill University, Quebec, Canada

**Blanchard Conombo** Institut national de santé publique, Quebec, Canada

**Marc-Aurèle Gagnon**  <https://orcid.org/0000-0002-7974-3389> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Quebec, Canada

**Valérie Turcotte** CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Faculty of Nursing, Université Laval, Trauma program, Centre intégré universitaire de santé et de services sociaux du Nord-de-l'Île-de-Montréal, Hôpital du Sacré-Cœur de Montréal, Quebec, Canada

**Mélanie Bérubé**  <https://orcid.org/0000-0002-6657-3915> CHU de Québec-Université Laval Research Centre, Population Health and Optimal Practices Research Unit (Trauma – Emergency – Critical Care Medicine), Faculty of Nursing, Université Laval, Quebec Pain Research Network, Quebec, Canada

### **Correspondance | Correspondence:**

Mélanie Bérubé

[melanie.berube@fsi.ulaval.ca](mailto:melanie.berube@fsi.ulaval.ca)



## Keywords

trauma; pain;  
opioids; follow-  
up; costs

## Abstract

**Introduction:** Patients with traumatic injuries often experience substantial acute pain, which can lead to chronic pain and persistent opioid use after hospital discharge. However, little is known about interventions to support trauma patients to prevent such health issues and their costs. **Objectives:** To describe the nature and extent of the evidence on follow-up interventions for pain management or optimal opioid use and their economic evaluation in patients with traumatic injuries after hospital discharge. **Methods:** The 6-stage framework for scoping reviews proposed by Arksey and O'Malley and Levac et al., enhanced by the recommendations from the Joanna Briggs Institute guidelines, will be used. CINAHL, Embase, MEDLINE, ProQuest databases, PsycINFO, the Cochrane Central Register of Controlled Trials and Web of Science will be searched. Two reviewers will independently screen, select and extract the data. An interdisciplinary advisory committee and 2 patient partners will be consulted throughout the review process to ensure its relevance. **Discussion and Research Spin-offs:** This scoping review will provide a comprehensive overview of the current state of knowledge on follow-up interventions for adult patients with traumatic injuries to reduce their pain and opioid use after hospital discharge, while taking economic measures into account. The results will inform research and, ultimately, contribute to the sustainable implementation of interventions to prevent chronic pain and opioid use disorder in these patients.

## Résumé

**Introduction :** Les patients ayant subi des blessures traumatiques souffrent souvent de douleurs aiguës importantes, qui peuvent entraîner des douleurs chroniques et une consommation persistante d'opioïdes. Cependant, il existe encore peu d'informations sur les interventions visant à soutenir ces patients afin de prévenir de tels problèmes de santé ni sur leurs coûts. **Objectifs :** Décrire la nature et l'étendue des données disponibles sur les interventions de suivi pour la gestion de la douleur ou l'utilisation optimale des opioïdes et leurs coûts chez les patients avec blessures traumatiques après leur congé de l'hôpital. **Méthodes :** Le cadre en 6 étapes de Arksey et O'Malley et Levac et al. pour les revues de portée, enrichi par les lignes directrices de l'Institut Joanna Briggs, sera utilisé. CINAHL, Embase, MEDLINE, ProQuest, PsycINFO, le registre Cochrane et Web of Science seront interrogés. Deux évaluateurs indépendants examineront, sélectionneront et extrairont les données. Un comité consultatif interdisciplinaire et 2 patients partenaires seront consultés tout au long du processus de la revue afin d'en garantir la pertinence. **Discussion et retombées anticipées :** Cette revue de la portée fournira un état actuel des connaissances sur les interventions de suivi destinées aux patients avec des blessures traumatiques visant à réduire leur douleur et leur consommation d'opioïdes, tout en considérant des mesures économiques. Les résultats éclaireront la recherche et, ultimement, contribueront à la mise en œuvre durable d'interventions de prévention de la douleur chronique et de trouble d'usage d'opioïdes chez ces patients.

## Mots-clés

trauma; douleur;  
opioïdes; suivi;  
coûts

## INTRODUCTION

---

Patients with traumatic injuries often experience acute pain, which can become chronic (Powelson et al., 2019; Rosenbloom et al., 2016). Chronic pain affects up to 80% of patients with traumatic injuries (Fabricant et al., 2013; Kolstadbraaten et al., 2019; Moreno et al., 2018; Rosenbloom et al., 2013), with up to 30% reporting moderate to high intensity pain (Bérubé et al., 2019). Considering the intense pain associated with traumatic injuries, 40% to 95% of trauma patients receive an opioid prescription at discharge from trauma centers in many high-income countries (El Moheb et al., 2022; Grzelak et al., 2022; Johnston et al., 2023; McLaughlin et al., 2025; Schaffer et al., 2022; Torp et al., 2025) and up to 20% of opioid-naïve patients will become persistent opioid users (more than 3 months), as documented in Canada and the United States (Grzelak et al.; Mauck, Zhao, et al., 2024; McLaughlin et al.; Torp et al.).

Chronic pain and persistent opioid use result in many negative individual-level and social consequences. Individuals who develop chronic pain may have permanent pathophysiological changes in their central nervous system (Bérubé et al., 2016; Chapman & Vierck, 2017) and are shown to have poorer emotional and mental health compared to those living without chronic pain (Dueñas et al., 2016). In addition, up to 50% of persons experiencing chronic pain report a reduced ability to perform their daily activities and impaired social functioning, which can lead to increased disability and decreased quality of life (Cáceres-Matos et al., 2020; Dueñas et al., 2016; Dueñas et al., 2020; Hadi et al., 2019). As a result, the total direct and indirect costs following chronic pain are estimated to reach \$ 40 billion in Canada yearly (Government of Canada, 2021). Direct costs refer to expenses directly related to the treatment of the injury, such as consultations, medication, and hospitalizations, whereas indirect costs refer to productivity losses, including reduced work capacity and caregiver burden (Zemedikun et al., 2021). Similarly, opioid use beyond 3 months post-trauma center discharge has been associated with a 30% increase in the relative risk of overdose

(Bedson et al., 2019; Bell et al., 2019; von Oelreich et al., 2020), and prescribing opioids beyond this time frame has been shown to increase the risk of opioid use disorder by up to 50% (Bell et al., 2022; Beyer et al., 2021). Persistent opioid users also report more psychological distress (Cochran et al., 2020; Trevino et al., 2013) and a poorer quality of life (Desai et al., 2019) than non-users. These negative outcomes increase incrementally with the duration of opioid use (Brat et al., 2018; Deyo et al., 2011). Furthermore, the average total cost of persistent opioid use in patients with traumatic injuries, considering both direct and indirect expenditures, was estimated to be \$30,000/year per patient (Hahn et al., 2018). This would represent over \$1 billion in Canada yearly considering that 20% (Mauck, Zhao, et al., 2024) of the 260 000 (Parachute, 2022) hospitalized trauma patients each year in Canada could become persistent opioid users.

To prevent the consequences of chronic pain and persistent opioid use in patients with traumatic injuries, support through follow-up interventions when transitioning from the hospital back to the community is essential. These interventions would help prevent issues related to pain faced by trauma patients in the recovery phase, which were shown to be caused by missed communication opportunities, as well as problems in the coordination, continuity, and personalization of care following discharge (Christie et al., 2016; Finstad et al., 2021; Grzelak et al., 2022). In this regard, for better support, previous studies revealed that trauma patients want more information about the impact of their injury, pain management, prevention of opioid use disorder, and the services available to help them cope with their condition after hospital discharge (Bérubé et al., 2024; Christie et al.; Finstad et al.; Grzelak et al.).

## OBJECTIVES

Follow-up interventions have become increasingly important, as survival rates among trauma patients have improved in recent years (Truchon et al., 2017; Van Breugel et al., 2020). However, little is known about those that optimize pain management and opioid use, as well as their empirical support and costs. Therefore, this study

aims to map and describe the available evidence on follow-up interventions targeting pain management or opioid use among trauma patients, including their economic evaluations. Given that follow-up care interventions after traumatic injury remain relatively recent (Wake et al., 2022), this scoping review will provide an overview of current knowledge and help identify directions for future research.

## METHODS

---

The research questions and this protocol was developed in collaboration with a multidisciplinary team (i.e., nurse practitioners, trauma surgeons, anesthesiologists, general practitioners, pharmacists, psychologists, social workers, rehabilitation professionals, a health economist) specialized in trauma care, patient navigation, pain management and/or the prevention of opioid use disorders. Patient partners who have experienced traumatic injury and chronic pain and have used opioids for more than 3 months were involved in refining the research question, developing the study protocol, and defining the eligibility criteria through iterative discussions.

This scoping review will follow the methodological framework developed by Arksey and O'Malley: 1) identifying the research question, 2) identifying relevant studies, 3) selecting the studies, 4) charting the data, 5) collating, summarizing and reporting results, and 6) consulting with interested parties to inform or validate findings (Arksey & O'Malley, 2005; Levac et al., 2010). Our protocol is reported following Joanna Briggs Institute (JBI) guidelines (Peters et al., 2022; Pollock et al., 2022) and is registered with the Open Science Framework ([osf.io/j5e7s](https://osf.io/j5e7s)).

### STEP 1: IDENTIFYING THE RESEARCH QUESTIONS

Based on the recommended Population-Concept-Context framework for conducting a scoping review, our research questions are (Peters et al., 2020):

- 1) What are the characteristics of follow-up interventions (e.g., content and activities,

timing of administration, healthcare professionals involved and delivery mode) for optimizing pain management or opioid use in adult patients with traumatic injuries after hospital discharge?

- 2) What are the outcomes related to pain, opioid use, and costs after the implementation of follow-up interventions, and what is the level of evidence of the studies that evaluated them?

### STEP 2: IDENTIFYING RELEVANT STUDIES

**Information Sources.** Published studies in the following databases will systematically be searched: CINAHL (EBSCO), Embase (Ovid), MEDLINE (PubMed), PsycINFO (Ovid), the Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science (Clarivate). The grey literature, using ProQuest for dissertations and theses, will be searched. Given the research questions, which aim to describe follow-up interventions and their associated outcomes, the focus will be on completed studies and will not search for other forms of grey literature. Also, the references of included articles, dissertations, and theses will be screened to identify any additional eligible studies.

**Search Strategy.** According to the recommendations of the Peer Review of Electronic Search Strategies (McGowan et al., 2016), a rigorous systematic search strategy, in collaboration with an information specialist and revised by a librarian, will be developed. A combination of search terms relating to trauma patients, pain and opioid use, as well as follow-up interventions, will be used. These terms will include text terms, as well as MESH (MEDLINE) and Emtree (EMBASE) terms. The pilot search strategy will be conducted in the EMBASE (Ovid) and MEDLINE (PubMed) databases. Relevant words from the titles, abstracts and texts of the retained studies will be collected. These words and index terms will be added to the search strategy, which will be run through all the selected databases for this review. To ensure the sensitivity of the search strategy, a verification, ensuring that the strategy returned a set of five preidentified studies (Anthony et al., 2020; Bérubé et al., 2022; Bérubé et al., 2019; Gaines-Dillard, 2015; Vranceanu et al.,

2019) meeting our eligibility criteria, was done. An example of the MEDLINE search strategy is presented in Table 1 (end of the document).

### STEP 3: SELECTING STUDIES

**Population.** Any study assessing follow-up interventions for adult trauma patients aged 18 years or older to manage their pain or optimize their opioid use after hospital discharge will be included. “Trauma patients” include those with orthopaedic injuries, traumatic brain injuries, spinal cord injuries, thoracic injuries, abdominal injuries or multiple injuries. Since the trauma population can sometimes be studied alongside elective surgical populations, studies including patients with conditions other than traumatic injuries will only be retained if they comprise at least 75% of trauma patients or report data by subgroup. The 75% threshold will be assessed based on the sample composition indicated in the section devoted to study methods or results; in case of ambiguity, the corresponding author will be contacted for clarification. If no response is received, studies will be excluded and reasons noted.

**Concept.** Follow-up interventions will need to meet the following criteria: 1) it is initiated upon or after discharge from the hospital and continued after hospital discharge; 2) it involves a direct or indirect (e.g., web-based intervention) interaction between the patient and a healthcare professional; and 3) it aims to assess, treat, educate, or provide counseling to patients regarding their pain or opioid use (Hill et al., 2016; Joiner et al., 2022; Wake et al., 2022), and/or it provides the economic measures of such an intervention (Drummond et al., 2015).

Furthermore, studies that assessed at least one of the following outcomes will be included: 1) pain measured with validated unidimensional [e.g., Numeric Rating Scales (Jensen et al., 1986)], multidimensional scales [e.g., McGill Pain Questionnaire (Melzack, 1975), Brief Pain Inventory (Cleeland, 2009)] or proxy pain outcomes (Gewandter et al., 2015), including function [e.g., WHO Disability Assessment Schedule version 2 (Üstün, 2010)], well-being [e.g., Quality of recovery-15 (Stark et al., 2013)], quality of life [EuroQol 5-Dimensions, 5-level (Herdman et

al., 2011)], satisfaction [e.g., Global impression of change (Guy, 1976)] or 2) opioid use measured in oral morphine equivalent daily dose (MEDD), refills or cessation (Gewandter et al., 2021). Studies that conducted an economic evaluation based on recognized measures, including the incremental cost-effectiveness ratio, incremental cost-utility ratio, incremental net monetary benefit, incremental net health benefit, or the incremental cost-benefit ratio associated with interventions will be considered (Drummond et al., 2015).

Comparators will include no follow-up or standard follow-up intervention by the trauma team, rehabilitation team or a general practitioner. Given our study objectives, randomized controlled trials, quasi-experimental studies, prospective and retrospective observational cohort studies, as well as cross-sectional and case-control studies will be included. Qualitative studies, abstracts, protocols, and editorials will be excluded. Literature reviews (e.g., systematic or scoping) will be excluded, but their reference lists will be screened for additional primary sources.

**Context.** Studies should focus on the period of preparation for discharge from hospital and the period following discharge from hospital upon return to the community, regardless of the country, to obtain a global overview of the interventions and their impact. No language restrictions will be applied, but the search will be limited for 1990 and onward, which corresponds to the advent of organized trauma systems (i.e., care provided from the scene of the traumatic event until the patient’s return to the community) (United States Congress, 1990). The DeepL translator (<https://www.deepl.com/translator>) will be used for studies written in languages other than English or French (Takakusagi et al., 2021).

EndNote (version X9.3.3, Thomson Reuters, 2018) will be used to manage citations. Electronic and manual methods will be used to identify and remove any duplicates. Then, pairs of reviewers (MKM, MAG) will independently screen the titles and abstracts, and then the full texts using Covidence (Veritas Health Innovation, 2025). To ensure the reliability of the selection process, both reviewers will use a systematic and iterative approach to pilot test the process on a random selection of 250 article citations until an acceptable

agreement is achieved ( $\kappa > 0.8$ ) (Higgins, 2023). The sample size of 250 was selected based on JBI recommendations for achieving an inter-rater agreement in large search yields (Peters et al., 2022). Any discrepancies that arise during the review process will be resolved by consulting a senior member of the research team (MB). The search strategy and selection process and reasons for exclusion will be documented using a PRISMA flow diagram (Page et al., 2021). If full texts are unavailable through institutional access or interlibrary loans, the first and last authors will be contacted; if still unobtainable, studies will be excluded with reasons noted.

#### **STEP 4: CHARTING THE DATA**

A standardized data extraction form (see Table 2 and Table 3 at the end of the document for a preliminary version) will be created. It will be iteratively pilot-tested by two reviewers (MKM and MAG) with methodological and content expertise on a random selection of five studies until an acceptable agreement is achieved ( $\kappa > 0.8$ ) (Higgins, 2023). This will ensure that all necessary data is captured appropriately, as recommended by the JBI guidelines on scoping reviews (Hadie, 2024; Peters et al., 2020). Reviewers will extract information on the following themes from original studies: setting (country, year, funding), population (type of injury, gender, age group, ethnocultural group, socioeconomic status, and history of chronic pain, opioid use, including their generic names and dose in MEDD, and/or mental disorders) and study design. Data on the characteristics of follow-up interventions will also be charted according to the “Template for Intervention Description and Replication” (i.e., content, mode of delivery, who provided the intervention and where, timing and duration, intervention fidelity, tailoring to patients’ needs) (Hoffmann et al., 2014), comparator(s), as well as outcome measures at different time points (pain, opioid, economical) and between-group differences. Any disagreements will be resolved through discussion between the reviewers and, if necessary, consultation with a senior member of the research team (MB). If important information is missing or unclear, the first, second and last authors will be contacted up to three times.

#### **STEP 5: COLLATING, SUMMARIZING, AND REPORTING THE RESULTS**

A descriptive map of the characteristics of studies and interventions, focusing on the nature and extent of evidence rather than statistical evaluation of effectiveness or quality appraisal, aligning with scoping review methodology (Peters et al., 2022; Pollock et al., 2022), will be realized. For each included study, the direction of the reported impacts on pain, opioid use, and cost outcomes, like positive, mixed, and negative, without emphasizing statistical significance to avoid meta-analytic implications, will be described. It will include the study level of evidence according to an adaptation of the Oxford Center for Evidence-based Medicine (Centre for Evidence-Based Medicine, 2009) (randomized controlled trial – I; quasi-experimental studies – II; cohort studies-III; case-control studies and case series studies – IV) (Moore et al., 2019). If there are enough studies, subgroup analyses based on the type of trauma, social determinants of health (e.g., gender, age group, ethnocultural group, socioeconomic status, history of chronic pain, opioid use and/or mental disorders), intervention characteristics (e.g., type of content, healthcare professionals providing the intervention, mode of delivery, timing, duration), and study level of evidence will be performed. Results will be synthesized using narrative summaries, tables (e.g., frequencies and proportions of intervention types and studies by impact category and level of evidence, according to pain, opioid, and cost outcomes assessed), and figures (e.g., charts illustrating the distribution of populations and studies by level of evidence), to ensure coherence with the scoping review objectives (Pollock et al., 2023).

#### **STEP 6: CONSULTING INTERESTED PARTIES**

An advisory committee will be consulted throughout the scoping review process. Although considered as an optional step in the JBI guidelines (Peters et al., 2022; Pollock et al., 2022), this consultation process will enhance the relevance of the review and facilitate knowledge uptake (Canadian Institutes of Health Research, 2012). The advisory committee includes researchers and healthcare professionals representing the various

disciplines involved in the trauma care trajectory (trauma centers, rehabilitation centers, and community services). It also involves a health economist, as well as two patient partners (individuals with prior traumatic injuries, chronic pain and persistent opioid use) collaborating regularly with the research team, and decision/policy-makers from the *Institut National d'Excellence en Santé et en Services Sociaux* (a public body of the Quebec government) and the Trauma Association of Canada. The consultation process, which will occur through virtual meetings, will aim to 1) identify any additional references to consider, 2) obtain feedback on the items to include, as well as presentation and interpretation of results, and 3) suggest opportunities for knowledge translation.

## DISCUSSION AND RESEARCH SPIN-OFFS

---

This scoping review aims to map the evidence on follow-up interventions to optimize pain management or opioid use and their associated costs in trauma patients after hospital discharge. This is an important and timely topic, given the large number of patients who have survived traumatic injuries who develop chronic pain and persistent opioid use (Fabricant et al., 2013; Kolstadbraaten et al., 2019; Mauck, Schwenk, et al., 2024; Moreno et al., 2018; Rosenbloom et al., 2013), which may lead to opioid use disorder (Bedson et al., 2019; Bell et al., 2022; Beyer et al., 2021; von Oelreich et al., 2020). Following traumatic injury, inadequate pain management and prolonged or inappropriate opioid prescribing may contribute to persistent opioid use and associated adverse outcomes for patients, families, communities, and healthcare systems. Therefore, it is a need to identify research gaps and implementation challenges regarding cost-effective follow-up interventions for trauma patients to prevent the transition from acute to chronic pain and the development of opioid use disorder. The results of this scoping review will provide a comprehensive overview of the current state of knowledge, as well as highlight the strengths, weaknesses, and opportunities for innovative research in this area.

## STRENGTHS AND LIMITATIONS

This scoping review focuses on highlighting solutions to address two major social and public health issues. It will be carried out using a comprehensive search strategy and a rigorous method of data selection and extraction, increasing the likelihood of finding the relevant studies. In addition, interested parties will be engaged throughout the review process and in the subsequent steps to improve follow-up care of patients with traumatic injuries.

As a scoping review, the objective is to provide a broad overview of the available evidence. Accordingly, and in line with methodological recommendations (Peters et al., 2022) no formal assessment of study quality or risk of bias will be performed. Similarly, no meta-analysis will be conducted, and the strength of the body of evidence will not be assessed. As a result, this review will not allow conclusions regarding the effectiveness of follow-up interventions. Furthermore, the components of follow-up interventions may not be explicitly described, and there may be variability in how clinical outcomes are assessed. These limitations may affect the ability to fully characterize interventions that can optimize pain management and opioid use, as well as their costs after discharge from a trauma center.

---

**Authors' contribution:** Funding acquisition: MB. Project administration: MB, MKM. Conceptualization: MB, MKM, CC. Literature search: MB, MKM, MAG. Writing – original draft: MKM, MB. Writing – review & editing: MKM, MB, CC, LA, EB, BH, KK, MV, LG, JG, LD, KP, MOM, BC, VT. Validation: MKM, MB, CC, LA, EB, BH, KK, MV, LG, JG, LD, KP, MOM, BC, VT.

**Acknowledgments:** We would like to thank Marie-Claude Laferrière who validated the search strategy for this scoping review.

**Funding:** This project is funded by the Canadian Institute for Health Research (grant number: 451722).

**Statement of conflict of interest:** The authors declare no conflict of interest.

**Generative Artificial Intelligence (AI) and AI-assisted technologies statement:** The authors declare that no generative AI tools and AI-assisted technologies were used to create this article.

**Ethics certificate number:** An ethics certificate is not required for a synthesis of existing literature, as it does not involve human participants or primary data collection.

**Reçu/Received:** 07 Déc/Dec 2025 **Publié/Published:** 24 Mars/March 2026

## REFERENCES

---

- Anthony, C. A., Rojas, E. O., Keffala, V., Glass, N. A., Shah, A. S., Miller, B. J., Hogue, M., Willey, M. C., Karam, M., & Marsh, J. L. (2020). Acceptance and Commitment Therapy Delivered via a Mobile Phone Messaging Robot to Decrease Postoperative Opioid Use in Patients With Orthopedic Trauma: Randomized Controlled Trial. *Journal of Medical Internet Research*, *22*(7), e17750. <https://doi.org/10.2196/17750>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Bedson, J., Chen, Y., Ashworth, J., Hayward, R. A., Dunn, K. M., & Jordan, K. P. (2019). Risk of adverse events in patients prescribed long-term opioids: A cohort study in the UK Clinical Practice Research Datalink. *European journal of pain (London, England)*, *23*(5), 908–922. <https://doi.org/10.1002/ejp.1357>
- Bell, T. M., Raymond, J., Vektor, A., Mongalo, A., Adams, Z., Rouse, T., & Carroll, A. (2019). Long-term prescription opioid utilization, substance use disorders, and opioid overdoses after adolescent trauma. *The Journal of Trauma & Acute Care Surgery*, *87*(4), 836–840. <https://doi.org/10.1097/ta.0000000000002261>
- Bell, T. M., Raymond, J. L., Mongalo, A. C., Adams, Z. W., Rouse, T. M., Hatcher, L., Russell, K., & Carroll, A. E. (2022). Outpatient Opioid Prescriptions are Associated With Future Substance Use Disorders and Overdose Following Adolescent Trauma. *Annals of Surgery*, *276*(6), e955–e960. <https://doi.org/10.1097/sla.0000000000004769>
- Bérubé, M., Choinière, M., Laflamme, Y. G., & Gélinas, C. (2016). Acute to chronic pain transition in extremity trauma: A narrative review for future preventive interventions (part 1). *International Journal of Orthopaedic Trauma Nursing*, *23*, 47–59. <https://doi.org/10.1016/j.ijotn.2016.04.002>
- Bérubé, M., Dupuis, S., Leduc, S., Roy, I., Turcotte, V., Côté, C., Grzelak, S., Clairoux, S., Panic, S., & Lauzier, F. (2022). Tapering Opioid Prescription Program for High-Risk Trauma Patients: A Pilot Randomized Controlled Trial. *Pain management nursing : official journal of the American Society of Pain Management Nurses*, *23*(2), 142–150. <https://doi.org/10.1016/j.pmn.2021.08.001>
- Bérubé, M., Gélinas, C., Feeley, N., Martorella, G., Côté, J., Laflamme, G. Y., Rouleau, D. M., & Choinière, M. (2019). Feasibility of a Hybrid Web-Based and In-Person Self-management Intervention Aimed at Preventing Acute to Chronic Pain Transition After Major Lower Extremity Trauma (iPACT-E-Trauma): A Pilot Randomized Controlled Trial. *Pain Medicine (Malden, Mass.)*, *20*(10), 2018–2032. <https://doi.org/10.1093/pm/pnz008>
- Bérubé, M., Verret, M., Bourque, L., Côté, C., Guénette, L., Richard-Denis, A., Ouellet, S., Singer, L. N., Gauthier, L., Gagnon, M. P., Gagnon, M. A., & Martorella, G. (2024). Educational needs and preferences of adult patients with acute pain: a mixed-methods systematic review. *Pain*, *165*(12), e162–e183. <https://doi.org/10.1097/j.pain.0000000000003288>
- Beyer, C. A., Poltavskiy, E., Walker, L. E., Pettey, W., Suo, Y., Redd, A., Rittel, A. G., Kazanis, W. H., Dunham, J. R., Zarzabal, L. A., Rutter, W. C., Sim, A., Watrous, J. R., Howard, J. T., Janak, J. C., Stewart, I. J., & Gundlapalli, A. (2021). Persistent Opioid Use After Combat Injury and Subsequent Long-term Risk of Abuse: A Retrospective Cohort Study. *Annals of Surgery*, *274*(6), e957–e965. <https://doi.org/10.1097/sla.0000000000003658>
- Brat, G. A., Agniel, D., Beam, A., Yorkgitis, B., Bicket, M., Homer, M., Fox, K. P., Knecht, D. B., McMahill-Walraven, C. N., Palmer, N., & Kohane, I. (2018). Postsurgical prescriptions for opioid naive patients and association with overdose and misuse: retrospective cohort study. *BMJ (Clinical research ed.)*, *360*, j5790. <https://doi.org/10.1136/bmj.j5790>
- Cáceres-Matos, R., Gil-García, E., Barrientos-Trigo, S., Porcel-Gálvez, A. M., & Cabrera-León, A. (2020). Consequences of Chronic Non-Cancer Pain in adulthood. Scoping Review. *Revista Saude Publica*, *54*, 39. <https://doi.org/10.11606/s1518-8787.2020054001675>
- Canadian Institutes of Health Research (2012). *Guide to Knowledge Translation Planning at CIHR: Integrated and End-of-Grant Approaches*. Government of Canada. [https://cihr-irsc.gc.ca/e/documents/kt\\_lm\\_ktplan-en.pdf](https://cihr-irsc.gc.ca/e/documents/kt_lm_ktplan-en.pdf)
- Centre for Evidence-Based Medicine (2009). *Oxford Centre for Evidence-Based Medicine: Levels of Evidence (March 2009)*. <https://www.cebm.ox.ac.uk/resources/levels-of-evidence/oxford-centre-for-evidence-based-medicine-levels-of-evidence-march-2009>
- Chapman, C. R., & Vierck, C. J. (2017). The Transition of Acute Postoperative Pain to Chronic Pain: An Integrative Overview of Research on Mechanisms. *The Journal of Pain*, *18*(4), 359.e351–359.e338. <https://doi.org/10.1016/j.jpain.2016.11.004>
- Christie, N., Beckett, K., Earthy, S., Kellezi, B., Sleney, J., Barnes, J., Jones, T., & Kendrick, D. (2016). Seeking support after hospitalisation for injury: a nested qualitative study of the role of primary care. *The British journal of general*

- practice : the journal of the Royal College of General Practitioners*, 66(642), e24–e31. <https://doi.org/10.3399/bjgp15X688141>
- Cleeland, C. S. (2009). *The Brief Pain Inventory. User Guide*. The University of Texas, M.D. Anderson Cancer Center. [https://www.mdanderson.org/documents/Departments-and-Divisions/Symptom-Research/BPI\\_UserGuide.pdf](https://www.mdanderson.org/documents/Departments-and-Divisions/Symptom-Research/BPI_UserGuide.pdf)
- Cochran, G., Pacella, M. L., Ringwald, W., Repine, M., Hruschak, V., Beaugard, C., Sewall, C., Rosen, D., Alarcon, L. H., Tarkin, I. S., Moloney, G. B., & Corcos, A. (2020). Opioid use patterns and risk characteristics among injured patients. *Substance Abuse*, 41(1), 24–28. <https://doi.org/10.1080/08897077.2019.1635065>
- Desai, R., Hong, Y. R., & Huo, J. (2019). Utilization of pain medications and its effect on quality of life, health care utilization and associated costs in individuals with chronic back pain. *Journal of Pain Research*, 12, 557–569. <https://doi.org/10.2147/jpr.S187144>
- Deyo, R. A., Smith, D. H. M., Johnson, E. S., Donovan, M., Tillotson, C. J., Yang, X., Petrik, A. F., & Dobscha, S. K. (2011). Opioids for Back Pain Patients: Primary Care Prescribing Patterns and Use of Services. *The Journal of the American Board of Family Medicine: JABFM*, 24(6), 717–727. <https://doi.org/10.3122/jabfm.2011.06.100232>
- Drummond, M. F., Sculpher, M. J., Claxton, K., Stoddart, G. L., & Torrance, G. W. (2015). *Methods for the Economic Evaluation of Health Care Programmes*. Oxford University Press. <https://books.google.ca/books?id=yZSCwAAQBAJ>
- Dueñas, M., Ojeda, B., Salazar, A., Mico, J. A., & Failde, I. (2016). A review of chronic pain impact on patients, their social environment and the health care system. *Journal of Pain Research*, 9, 457–467. <https://doi.org/10.2147/jpr.S105892>
- Dueñas, M., Salazar, A., de Sola, H., & Failde, I. (2020). Limitations in Activities of Daily Living in People With Chronic Pain: Identification of Groups Using Clusters Analysis. *Pain practice : the official journal of World Institute of Pain*, 20(2), 179–187. <https://doi.org/10.1111/papr.12842>
- El Moheb, M., Herrera-Escobar, J. P., Maurer, L. R., Langeveld, K. M. C., Kapoen, C., Heyman, A., Garvey, S., Gebran, A., Breen, K., Sanchez, S. E., Salim, A., Velmahos, G. C., Nehra, D., & Kaafarani, H. M. A. (2022). The variation of opioid prescription after injury and its association with long-term chronic pain: A multicenter cohort study. *Surgery*, 172(6), 1844–1850. <https://doi.org/10.1016/j.surg.2022.08.005>
- Fabricant, L., Ham, B., Mullins, R., & Mayberry, J. (2013). Prolonged pain and disability are common after rib fractures. *American Journal of Surgery*, 205(5), 515–516. <https://doi.org/10.1016/j.amjsurg.2012.12.007>
- Finstad, J., Røise, O., Rosseland, L. A., Clausen, T., & Havnes, I. A. (2021). Discharge from the trauma centre: exposure to opioids, unmet information needs and lack of follow up—a qualitative study among physical trauma survivors. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 29(1), 121. <https://doi.org/10.1186/s13049-021-00938-7>
- Gaines-Dillard N. (2015). Nurse led telephone follow-up improves satisfaction in motorcycle trauma patients. *Journal of trauma nursing : the official journal of the Society of Trauma Nurses*, 22(2), 71–77. <https://doi.org/10.1097/JTN.0000000000000110>
- Gewandter, J. S., Dworkin, R. H., Turk, D. C., Farrar, J. T., Fillingim, R. B., Gilron, I., Markman, J. D., Oaklander, A. L., Polydefkis, M. J., Raja, S. N., Robinson, J. P., Woolf, C. J., Ziegler, D., Ashburn, M. A., Burke, L. B., Cowan, P., George, S. Z., Goli, V., Graff, O. X.,...Walco, G. A. (2015). Research design considerations for chronic pain prevention clinical trials: IMMPACT recommendations. *Pain*, 156(7), 1184–1197. <https://doi.org/10.1097/j.pain.0000000000000191>
- Gewandter, J. S., Smith, S. M., Dworkin, R. H., Turk, D. C., Gan, T. J., Gilron, I., Hertz, S., Katz, N. P., Markman, J. D., Raja, S. N., Rowbotham, M. C., Stacey, B. R., Strain, E. C., Ward, D. S., Farrar, J. T., Kroenke, K., Rathmell, J. P., Rauck, R., Brown, C.,...Wentworth, K. (2021). Research approaches for evaluating opioid sparing in clinical trials of acute and chronic pain treatments: Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials recommendations. *Pain*, 162(11), 2669–2681. <https://doi.org/10.1097/j.pain.0000000000002283>
- Government of Canada (2021, May 12). *Canadian Pain Task Force: March 2021*. <https://www.canada.ca/en/health-canada/corporate/about-health-canada/public-engagement/external-advisory-bodies/canadian-pain-task-force/report-2021.html>
- Grzelak, S., Bérubé, M., Gagnon, M.-A., Côté, C., Turcotte, V., Pelet, S., & Belzile, É. (2022). Pain Management Strategies After Orthopaedic Trauma: A Mixed-Methods Study with a View to Optimizing Practices. *Journal of Pain Research*, 15, 385–402. <https://doi.org/10.2147/JPR.S342627>
- Guy, W. (1976). *ECDEU assessment manual for psychopharmacology*. United States Department of Health, Education, and Welfare. <https://ia600200.us.archive.org/19/items/ecdeuassessmentm1933guyw/ecdeuassessmentm1933guyw.pdf>
- Hadi, M. A., McHugh, G. A., & Closs, S. J. (2019). Impact of Chronic Pain on Patients' Quality of Life: A Comparative Mixed-Methods Study. *Journal of Patient Experiences*, 6(2), 133–141. <https://doi.org/10.1177/2374373518786013>
- Hadie, S. N. H. (2024). ABC of a Scoping Review: A Simplified JBI Scoping Review Guideline. *Education in Medicine Journal*, 16(2), 185–197. <https://doi.org/10.21315/eimj2024.16.2.14>
- Hahn, Y., Tiernan, G., & Berecki-Gisolf, J. (2018). The impact of opioid analgesic prescription uptake on the costs of recovery from injury: Evidence from compensable orthopaedic road trauma patients. *Accident; Analalys and Prevention*, 117, 32–39. <https://doi.org/10.1016/j.aap.2018.03.032>

- Herdman, M., Gudex, C., Lloyd, A., Janssen, M., Kind, P., Parkin, D., Bonse, G., & Badia, X. (2011). Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation*, 20(10), 1727–1736. <https://doi.org/10.1007/s11136-011-9903-x>
- Higgins J. P. T., Chandler J., Cumpston M., Li T., Page M. J., & Welch V. A. (2023). *Cochrane Handbook for Systematic Reviews of Interventions version 6.4 (updated August 2023)*. <https://www.cochrane.org/authors/handbooks-and-manuals/handbook>
- Hill, K. G., Woodward, D., Woelfel, T., Hawkins, J. D., & Green, S. (2016). Planning for Long-Term Follow-Up: Strategies Learned from Longitudinal Studies. *Prevention science : the official journal of the Society for Prevention Research*, 17(7), 806–818. <https://doi.org/10.1007/s11121-015-0610-7>
- Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., Altman, D. G., Barbour, V., Macdonald, H., Johnston, M., Lamb, S. E., Dixon-Woods, M., McCulloch, P., Wyatt, J. C., Chan, A. W., & Michie, S. (2014). Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ (Clinical research ed.)*, 348, g1687. <https://doi.org/10.1136/bmj.g1687>
- Jensen, M. P., Karoly, P., & Braver, S. (1986). The measurement of clinical pain intensity: a comparison of six methods. *Pain*, 27(1), 117–126. [https://doi.org/10.1016/0304-3959\(86\)90228-9](https://doi.org/10.1016/0304-3959(86)90228-9)
- Johnston, J. P., LaPietra, A. M., Elsayy, O. A., Wang, A., Richards, L. M., Yee, S., Foran, L. A., Hlayhel, A. F., Fahey, R., & Nerenberg, S. F. (2023). Opioid Prescribing at Discharge in Opioid-Naïve Trauma Patients. *The American Surgeon*, 89(1), 113–119. <https://doi.org/10.1177/00031348211011105>
- Joiner, A. P., Tupetz, A., Peter, T. A., Raymond, J., Macha, V. G., Vissoci, J. R. N., & Staton, C. (2022). Barriers to accessing follow up care in post-hospitalized trauma patients in Moshi, Tanzania: A mixed methods study. *PLOS global public health*, 2(6), e0000277. <https://doi.org/10.1371/journal.pgph.0000277>
- Kolstadbraaten, K. M., Spreng, U. J., Wisloff-Aase, K., Gaarder, C., Naess, P. A., & Raeder, J. (2019). Incidence of chronic pain 6 y after major trauma. *Acta Anaesthesiologica Scandinavica*, 63(8), 1074–1078. <https://doi.org/10.1111/aas.13380>
- Lapierre, A., Bérubé, M., Giroux, M., Tardif, P.-A., Turcotte, V., Mercier, E., Richard-Denis, A., Williamson, D., & Moore, L. (2024). Interprofessional interventions that impact collaboration and quality of care across inpatient trauma care continuum: A scoping review. *Injury*, 55(11), 111873. <https://doi.org/10.1016/j.injury.2024.111873>
- Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation science : IS*, 5, 69. <https://doi.org/10.1186/1748-5908-5-69>
- Mauck, M. C., Schwenk, E. S., & Gupta, R. K. (2024). Incidence of persistent opioid use following traumatic injury: an infographic. *Regional anesthesia and pain medicine*, 49(2), 87. <https://doi.org/10.1136/rapm-2023-104812>
- Mauck, M. C., Zhao, Y., Goetzinger, A. M., Tungate, A. S., Spencer, A. B., Lal, A., Barton, C. E., Beaudoin, F., & McLean, S. A. (2024). Incidence of persistent opioid use following traumatic injury. *Regional Anesthesia & Pain Medicine*, 49(2), 79–86. <https://doi.org/10.1136/rapm-2022-103662>
- McGowan, J., Sampson, M., Salzweid, D. M., Cogo, E., Foerster, V., & Lefebvre, C. (2016). PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *Journal of Clinical Epidemiology*, 75, 40–46. <https://doi.org/10.1016/j.jclinepi.2016.01.021>
- McLaughlin, S., Speakman, S., Johns, J., McGuinness, M., Swanson, C., Muller, L., Muwanga-Magoye, T., & Harmston, C. (2025). Opioid prescribing patterns in trauma patients: assessing the impact of injury and treatment factors. *ANZ Journal of Surgery*, 95(6), 1236–1241. <https://doi.org/10.1111/ans.70111>
- Melzack, R. (1975). The McGill Pain Questionnaire: major properties and scoring methods. *Pain*, 1(3), 277–299. [https://doi.org/10.1016/0304-3959\(75\)90044-5](https://doi.org/10.1016/0304-3959(75)90044-5)
- Moore, L., Lauzier, F., Tardif, P. A., Boukar, K. M., Farhat, I., Archambault, P., Mercier, É., Lamontagne, F., Chassé, M., Stelfox, H. T., Berthelot, S., Gabbe, B., Lecky, F., Yanchar, N., Champion, H., Kortbeek, J., Cameron, P., Bonaventure, P. L., Paquet, J., Truchon, C., ... Canadian Traumatic brain injury Research Consortium (2019). Low-value clinical practices in injury care: A scoping review and expert consultation survey. *The journal of trauma and acute care surgery*, 86(6), 983–993. <https://doi.org/10.1097/TA.0000000000002246>
- Moreno, P., Von Allmen, M., Haltmeier, T., Candinas, D., & Schnüriger, B. (2018). Long-Term Follow-Up After Non-operative Management of Blunt Splenic and Liver Injuries: A Questionnaire-Based Survey. *World Journal of Surgery*, 42(5), 1358–1363. <https://doi.org/10.1007/s00268-017-4336-5>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., ... Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ (Clinical research ed.)*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Parachute. (2026, January 8). *Cost of Injury in Canada 2022*. <https://parachute.ca/en/professionalresource/cost-of-injury-in-canada/>

- Peters, M. D. J., Godfrey, C., McInerney, P., Khalil, H., Larsen, P., Marnie, C., Pollock, D., Tricco, A. C., & Munn, Z. (2022). Best practice guidance and reporting items for the development of scoping review protocols. *JBI Evidence Synthesis*, 20(4), 953–968. <https://doi.org/10.11124/jbies-21-00242>
- Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis*, 18(10), 2119–2126. <https://doi.org/10.11124/jbies-20-00167>
- Pollock, D., Alexander, L., Munn, Z., Peters, M. D. J., Khalil, H., Godfrey, C. M., McInerney, P., Synnot, A., & Tricco, A. C. (2022). Moving from consultation to co-creation with knowledge users in scoping reviews: guidance from the JBI Scoping Review Methodology Group. *JBI Evidence Synthesis*, 20(4), 969–979. <https://doi.org/10.11124/jbies-21-00416>
- Pollock, D., Peters, M. D. J., Khalil, H., McInerney, P., Alexander, L., Tricco, A. C., Evans, C., de Moraes, É. B., Godfrey, C. M., Pieper, D., Saran, A., Stern, C., & Munn, Z. (2023). Recommendations for the extraction, analysis, and presentation of results in scoping reviews. *JBI evidence synthesis*, 21(3), 520–532. <https://doi.org/10.11124/JBIES-22-00123>
- Powelson, E. B., Mills, B., Henderson-Drager, W., Boyd, M., Vavilala, M. S., & Curatolo, M. (2019). Predicting chronic pain after major traumatic injury. *Scandinavian Journal of Pain*, 19(3), 453–464. <https://doi.org/10.1515/sjpain-2019-0040>
- Rosenbloom, B. N., Katz, J., Chin, K. Y. W., Haslam, L., Canzian, S., Kreder, H. J., & McCartney, C. J. L. (2016). Predicting pain outcomes after traumatic musculoskeletal injury. *Pain*, 157(8), 1733–1743. <https://doi.org/10.1097/j.pain.0000000000000580>
- Rosenbloom, B. N., Khan, S., McCartney, C., & Katz, J. (2013). Systematic review of persistent pain and psychological outcomes following traumatic musculoskeletal injury. *Journal of Pain Research*, 6, 39–51. <https://doi.org/10.2147/jpr.S38878>
- Schaffer, S., Bayat, D., Biffl, W. L., Smith, J., Schaffer, K. B., Dandan, T. H., Wang, J., Snyder, D., Nalick, C., Dandan, I. S., Tominaga, G. T., & Castelo, M. R. (2022). Pain management on a trauma service: a crisis reveals opportunities. *Trauma Surgery and Acute Care Open*, 7(1), e000862. <https://doi.org/10.1136/tsaco-2021-000862>
- Stark, P. A., Myles, P. S., & Burke, J. A. (2013). Development and psychometric evaluation of a postoperative quality of recovery score: the QoR-15. *Anesthesiology*, 118(6), 1332–1340. <https://doi.org/10.1097/ALN.0b013e318289b84b>
- Takakusagi, Y., Oike, T., Shirai, K., Sato, H., Kano, K., Shima, S., Tsuchida, K., Mizoguchi, N., Serizawa, I., Yoshida, D., Kamada, T., & Katoh, H. (2021). Validation of the Reliability of Machine Translation for a Medical Article From Japanese to English Using DeepL Translator. *Cureus*, 13(9), e17778. <https://doi.org/10.7759/cureus.17778>
- Torp, H. A., Skurtveit, S. O., Gustavsen, I., Gran, J. M., & Rosseland, L. A. (2025). Post-injury use of opioid analgesics in patients with traumatic injury: A registry-based study. *European journal of pain (London, England)*, 29(3), e4743. <https://doi.org/10.1002/ejp.4743>
- Trevino, C. M., deRoos-Cassini, T., & Brasel, K. (2013). Does opiate use in traumatically injured individuals worsen pain and psychological outcomes? *The Journal of Pain*, 14(4), 424–430. <https://doi.org/10.1016/j.jpain.2012.12.016>
- Truchon, C., Moore, L., Belcaid, A., Clément, J., Trudelle, N., Ulysse, M. A., Grolleau, B., Clusiau, J., Lévesque, D., & de Guise, M. (2017). Shaping Quality Through Vision, Structure, and Monitorint of Performance and Quality Indicators: Impact Story from the Quebec Trauma Network. *International Journal of Technology Assessement in Health Care*, 33(4), 415–419. <https://doi.org/10.1017/s0266462317000198>
- United States Congress. (1990). *Trauma Care Systems Planning and Development Act of 1990 (Pub.L. 101-590) - Section 6*. U.S. Government. <https://www.govinfo.gov/content/pkg/COMPS-1788/pdf/COMPS-1788.pdf>
- Üstün, T.B., Kostanjsek, N., Chatterji, S., Rehm, J., & World Health Organization (2010). Measuring Health and Disability: Manual for WHO Disability Assessment Schedule WHODAS 2.0. World Health Organization. <https://iris.who.int/server/api/core/bitstreams/13c8676c-bdd5-41e9-beae-30343a96d4f0/content>
- van Breugel, J. M. M., Niemeyer, M. J. S., Houwert, R. M., Groenwold, R. H. H., Leenen, L. P. H., & van Wessem, K. J. P. (2020). Global changes in mortality rates in polytrauma patients admitted to the ICU—a systematic review. *World journal of emergency surgery : WJES*, 15(1), 55. <https://doi.org/10.1186/s13017-020-00330-3>
- von Oelreich, E., Eriksson, M., Brattström, O., Sjölund, K. F., Discacciati, A., Larsson, E., & Oldner, A. (2020). Risk factors and outcomes of chronic opioid use following trauma. *The British journal of surgery*, 107(4), 413–421. <https://doi.org/10.1002/bjs.11507>
- Vranceanu, A.-M., Jacobs, C., Lin, A., Greenberg, J., Funes, C. J., Harris, M. B., Heng, M. M., Macklin, E. A., & Ring, D. (2019). Results of a feasibility randomized controlled trial (RCT) of the Toolkit for Optimal Recovery (TOR): a live video program to prevent chronic pain in at-risk adults with orthopedic injuries. *Pilot and Feasibility Studies*, 5, 30. <https://doi.org/10.1186/s40814-019-0416-7>
- Wake, E., Ranse, J., & Marshall, A. P. (2022). Scoping review of the literature to ascertain how follow-up care is provided to major trauma patients post discharge from acute care. *BMJ Open*, 12(9), e060902. <https://doi.org/10.1136/bmjopen-2022-060902>
- Zemedikun, D. T., Kigozi, J., Wynne-Jones, G., Guariglia, A., & Roberts, T. (2021). Methodological considerations in the assessment of direct and indirect costs of back pain: A systematic scoping review. *PLoS one*, 16(5), e0251406. <https://doi.org/10.1371/journal.pone.0251406>

**Table 1***Medline (Ovid) Search Strategy*

Concepts	Keywords	Research
Trauma (controlled vocabulary)	exp "Wounds and Injuries"/	#1
Trauma (injuries) (free text)	"injure" OR "injured" OR "injures" OR "injuries" OR "injury" OR "Wounds" OR "Wound" OR Trauma*	#2
Total trauma	#1 OR #2	#3
Pain/opioids (controlled vocabulary)	Pain/ OR Pain Management/ OR Acute Pain/ OR Chronic Pain/ OR Narcotics/ OR exp Analgesics, Opioid/ OR Opioid-Related Disorders/	#4
Pain/opioids (free text)	"pain" OR "Narcotic*" OR "Analgesic*" OR "Opioid*" OR "opiate"	#5
Total pain/opioids	#4 OR #5	#6
Follow-up (controlled vocabulary)	Aftercare/ OR exp Survivorship/ OR Continuity of Patient Care/ OR exp Distance Counseling/ OR exp Counseling/ OR exp Patient Discharge/ OR exp Case Management/ OR Disease Management/ OR Telemedicine/ OR Telenursing/ or Remote Consultation/ OR Drug Tapering/ OR Deprescribing/	#7
(free text)	"survivorship" OR "aftercare" OR "after care" OR "after treatment" OR "counseling" OR "case management" OR "disease management" OR "e-health" OR "e health" OR "teleconsultation" OR "telephone" OR "virtual" OR "email" OR "phone" or (("opiod") adj3 ("taper*" OR "wean*" OR "withdraw*" OR "reduc*" OR "stewardship*" OR "discontin*")) OR (("follow up" OR "discharge") Adj3 (appointment* OR consultation* OR clinic or clinics or program* OR strateg* OR service? OR care)) OR ((discharge*) Adj2 (patient*))	#8
Total follow-up	#7 OR #8	#9
Total	#3 AND #6 AND #9	#10

**Table 2**

*Data Extraction Form on Study Design and Population Characteristics*

First author, (year), country	Study design	Sample size	Type of injury	Age, mean (SD, range)	Sex (women), n (%)	Ethnicity, n (%)	Annual income, mean (SD, range)	History of opioid use, mean MEDD, (SD, range)	History of chronic pain, mean duration (SD, range)	History of mental disorder(s) <sup>†</sup>
Study 1										
Study 2										
(...)										

Notes. <sup>†</sup>Yes or no, and type(s) of mental disorder; MEDD: morphine equivalent daily dose; SD: Standard deviation.

**Table 3**

*Data Extraction Form on Intervention and Outcomes*

First author, (year)	Intervention				Comparator	Outcome and results (positive, negative, neutral)
	Content, delivery mode and duration	Setting and when after the injury	Duration	Tailoring procedures		
Study 1						
Study 2						
(...)						