AAOS
American Academy of Orthopaedic Surgeons

MANAGEMENT OF ACUTE COMPARTMENT SYNDROME

Evidence-Based Clinical Practice Guideline

Adopted by:
The American Academy of Orthopaedic Surgeons Board of Directors
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Endorsed by:

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Disclaimer

This clinical practice guideline was developed by a physician volunteer clinical practice guideline development group based on a formal systematic review of the available scientific and clinical information and accepted approaches to treatment and/or diagnosis. This clinical practice guideline is not intended to be a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. Clinical patients may not necessarily be the same as those found in a clinical trial. Patient care and treatment should always be based on a clinician's independent medical judgment, given the individual patient's specific clinical circumstances.

Disclosure Requirement
In accordance with AAOS policy, all individuals whose names appear as authors or contributors to this clinical practice guideline filed a disclosure statement as part of the submission process. All panel members provided full disclosure of potential conflicts of interest prior to voting on the recommendations contained within this clinical practice guideline.

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2025 REPORT FOR THE UPDATE OF THE 2018 CLINICAL PRACTICE GUIDELINE ON THE MANAGEMENT OF ACUTE COMPARTMENT SYNDROME

This guideline is greater than 5 years old and is reviewed every five years. New studies have been published since this guideline was developed, however the AAOS has determined that these studies are not sufficient to warrant changing the guideline scope at this time. Due to the paucity of evidence and the relevance of the existing scope, this guideline was approved to be updated via the AAOS Rapid Update Methodology. The 2025 additions to this document are outlined below and reflect additions based on newly available evidence relevant to the original PICO questions and resulting guideline recommendations. Only the recommendations have been updated, and all other information (e.g., the methods, introduction, PICO questions, scope, and work group roster) remains that of the original 2018 guideline. For the full AAOS Clinical Practice Guidelines Rapid Update Methodology please visit: aaos.org/quality

OVERVIEW OF 2025 UPDATES TO THE 2018 ORIGINAL GUIDELINE

1. Updated the strength of recommendation and rationale of the following recommendations based on new evidence:
    a. Associated Fracture (upgraded from Consensus to Limited)
2. Addition of the following supporting evidence:
    a. Akbari Aghdam, H., Sheikhbahaei, E., Hajihashemi, H., Kazemi, D., Andalib, A.. (2019). The impacts of internal versus external fixation for tibial fractures with simultaneous acute compartment syndrome. *European journal of orthopaedic surgery & traumatologie*, *29*(1), 183-187.
    b. Barça, F., Atilla, H. A., Demir, E. B., Çevik, K., Ilgin, B. U., Atli, O. Y., Yüksel, S., Sibar, K., Ünlü, S., Duman, E., Firat, A., Akdogan, M.. (2024). Comparison of single and double incision leg fasciotomy in disaster settings—Experience from 2023 Türkiye earthquakes. *Injury*, *55*(6), . http://dx.doi.org/10.1016/j.injury.2024.111582
    c. Cunningham, D. J., LaRose, M. A., Zhang, G. X., Au, S., MacAlpine, E. M., Paniagua, A. R., Klifto, C. S., Gage, M. J.. (2022). Regional anesthesia reduces inpatient and outpatient perioperative opioid demand in periarticular elbow surgery. Journal of Shoulder and Elbow Surgery, 31(2), e48-e57. http://dx.doi.org/10.1016/j.jse.2021.08.005
    d. Cunningham, D. J., LaRose, M., Zhang, G., Patel, P., Paniagua, A., Gadsden, J., Gage, M. J.. (2022). Regional Anesthesia Associated With Decreased Inpatient and Outpatient Opioid Demand in Tibial Plateau Fracture Surgery. *Anesthesia & Analgesia*, *134*(5), 1072-1081.
    e. Dasgupta, R., Ekka, N. M. P., Das, A., Kumar, V.. (2021). Evaluation of Clinical and Venous Blood Parameters as Surrogate Indicators in Assessing the Need for Fasciotomy in Lower Limb Compartment Syndrome. *International Journal of Lower Extremity Wounds*, *0*(0), 15347346211059027.

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h. Flagstad, I., Albright, P., Pedri, T., Kleinsmith, R. M., Schmidt, A., Alley, M., Westberg, J. R., Moreno, A. F., Henry, G., Tatman, L. M., Obremskey, W. T., Tornetta, P., 3rd, Cunningham, B. P.. (2024). Early Versus Delayed Definitive Fixation Relative to Fasciotomy Closure in High-Energy Tibial Plateau Fractures with Compartment Syndrome. *Journal of Orthopaedic Trauma*, *08*(0), 08.
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SUMMARY OF RECOMMENDATIONS

BIOMARKERS

A. Limited evidence supports that myoglobinuria and serum troponin level may assist in diagnosing acute compartment syndrome in patients with traumatic lower extremity injury.

Strength of Recommendation: Limited 

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

B. Moderate evidence supports that, in patients with acute vascular ischemia, femoral vein lactate concentration sampled during surgical embolectomy may assist in the diagnosis of acute compartment syndrome.

Strength of Recommendation: Moderate 

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

C. Limited evidence supports that myoglobinuria does not assist in diagnosing acute compartment syndrome in patients with electrical injury.

Strength of Recommendation: Limited 

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

SERUM BIOMARKERS IN LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that serum biomarkers do not provide useful information to guide decision making when considering fasciotomy for a presumed late-presentation or missed acute compartment syndrome.

Strength of Recommendation: Consensus 

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

PRESSURE METHODS

A. Moderate evidence supports that intracompartmental pressure monitoring assists in diagnosing acute compartment syndrome.

Strength of Recommendation: Moderate ★★★☆

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

B. Moderate evidence supports the use of repeated/continuous intracompartmental pressure monitoring and a threshold of diastolic blood pressure minus intracompartmental pressure >30 mmHg to assist in ruling out acute compartment syndrome.

Strength of Recommendation: Moderate ★★★☆

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

PRESSURE MONITORING IN LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that compartment pressure monitoring does not provide useful information to guide decision making when considering fasciotomy for an adult patient with evidence of irreversible intracompartmental (neuromuscular/vascular) damage.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

PHYSICAL EXAM (AWAKE)

Limited evidence supports using serial clinical exam findings to assist in ruling in acute compartment syndrome.

Strength of Recommendation: Limited ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

PHYSICAL EXAM (OBTUNDED)

In the absence of reliable evidence, it is the opinion of the work group that without a dependable clinical examination (e.g. in the obtunded patient), repeated or continuous intracompartmental pressure measurements are recommended until acute compartment syndrome is diagnosed or ruled out.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

ALTERNATIVE METHODS OF DIAGNOSIS

In the absence of reliable evidence, it is the opinion of the work group that there are no reported diagnostic modalities, other than direct pressure monitoring or clinical exam findings, that provide useful information to guide decision making when considering fasciotomy for acute compartment syndrome.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

FASCIOTOMY METHODS

In the absence of reliable evidence, it is the opinion of the work group that fasciotomy technique (e.g. one vs two incision, placement of incisions) is less important than achieving complete decompression of the compartments of the affected extremity.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

FASCIOTOMY FOR LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that performing fasciotomy is not indicated in an adult patient with evidence of irreversible intracompartmental (neuromuscular/vascular) damage. Fracture stabilization, if warranted in these patients, should utilize a technique (external fixation/casting) that does not violate the compartment.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

ASSOCIATED FRACTURE

Limited evidence supports that operative fixation (external or internal) be performed for initial stabilization of long bone fractures with concomitant acute compartment syndrome requiring fasciotomy.

Strength of Recommendation: Limited ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for against the intervention or diagnostic or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

WOUND MANAGEMENT

Limited evidence supports use of negative pressure wound therapy for management of fasciotomy wounds with regard to reducing time to wound closure and reducing need for skin grafting.

Strength of Recommendation: Limited ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

PAIN MANAGEMENT EFFECTS ON DIAGNOSIS

In the absence of reliable evidence, it is the opinion of the work group that neuraxial anesthesia may complicate the clinical diagnosis of acute compartment syndrome. If neuraxial anesthesia is administered, frequent physical examination and/or pressure monitoring should be performed.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

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View background material and data summaries via the CPG eAppendix

INTRODUCTION

OVERVIEW/MILITARY APPLICATION

This clinical practice guideline is based on a formal systematic review of published studies with regard to the management of acute compartment syndrome of the upper or lower extremity in adults. In addition to providing clinical practice recommendations, this guideline also highlights limitations of the current literature and areas that require future research. This clinical practice guideline addresses ACS in all settings, however, there are many military applications to these recommendations as well.

As we are in the longest period of continuous warfare in US history, topics germane to Tactical Combat Casualty Care remains a primary concern for Military Medicine. The survival rate of extremity injured casualties is associated with 2 Joint Trauma System interventions - educational programs on tourniquet usage and fasciotomy education prior to deployment. As combat trauma is typically composed of the mechanisms of injury associated with acute compartment syndrome (ACS) but in an austere, remote environment, evidence based guidelines for the rapid treatment and comprehensive management of ACS is vital.

In a sample of 17,166 casualties observed in a 10-year period of high casualties (2001-2010), Kragh et al reported 3,313 fasciotomies for an overall fasciotomy rate of 19%. Male combat casualties were 1.7-fold more likely to undergo fasciotomies vs. their female counterparts. As females are not traditionally involved in ground combat, this sex-based dimorphism in fasciotomy may be a result of lower energy injury. In the same cohort, fasciotomy rates increased from 0% in 2001 to 26% in 2010. However, for the same period, survival rates are V-shaped with a nadir occurring in 2005. The observed reversal is temporally associated with implementation of the formal training programs targeting tourniquet use and fasciotomies.

Since the end of active hostilities in Operations Iraqi Freedom and Enduring Freedom, the number of Coalition casualties has decreased from 711 in 2010 to 10 in 2018. Currently, US Service Members are active in the Overseas Contingency Operations (formerly known as the Global War on Terrorism (GWOT)) in over75 countries to include sub-Saharan Africa. This geographical expansion (>4x the land mass of the Continental US) has necessitated the change in the casualty plan from rapid medical evacuation to prolonged field care with an increase in the number of medical personnel deployed at any given time. The low volume of casualties coupled with increased deployment frequency has increased concerns regarding medical skill degradation and loss of lessons learned. Thus, the importance of Evidence Based Clinical Practice Guidelines and Appropriate Use Criteria as a readily available resource to the junior forward deployed medical personnel as well as repository of institutional knowledge.
This guideline is intended to be used by all qualified and appropriately trained surgeons, physicians and physician extenders involved in the management of extremity trauma. It is also intended to serve as an information resource for decision-makers and developers of clinical practice guidelines and recommendations.

GOALS AND RATIONALE

The purpose of this clinical practice guideline is to guide the clinician's ability to diagnosis and treat acute compartment syndrome by providing evidence-based recommendations for key

decisions that affect the management of patients with extremity trauma. The clinical practice guidelines included in this report are based on the results of a formal systematic review of the available literature regarding acute extremity compartment syndrome that was completed by AAOS staff using a rigorous, standardized process that was conducted between November 2017 and May 2018. A work group consisting of musculoskeletal trauma surgery experts, military surgeons and staff skilled in constructing clinical practice guidelines subsequently agreed upon the following recommendations after determining the diagnostic and therapeutic options informed by good evidence. The work group also reviewed gaps in evidence-based practice and suggested future research directions to improve the management of acute compartment syndrome of the extremities.

Musculoskeletal care is provided in diverse settings by providers of differing backgrounds and experience. This guideline is intended as an educational tool to aid qualified trauma providers' decision making and improve the quality and efficiency of care. This guideline should not be construed as including all proper methods of care or excluding methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific procedure or treatment must be made in light of all circumstances presented by the patient and the needs and resources particular to the locality or institution.

A particular challenge in constructing this particular Clinical Practice Guideline is the fact that there are no standard diagnostic criteria for acute compartment syndrome. Clinicians diagnose compartment syndrome using their clinical judgment and/or results of objective measurements (such as compartment pressure), and once the diagnosis is made, emergent fasciotomy is nearly always performed. The lack of a set of clinical standards for the diagnosis of compartment syndrome contributes to wide variation in how compartment syndrome is diagnosed and how often fasciotomy is done [O'Toole 2009]. The therapeutic performance of decompressive fasciotomy is used in many papers as a surrogate for the diagnosis of acute compartment syndrome, despite the fact that they are not the same thing. This is a potential problem when evaluating the literature, since the underlying diagnosis cannot be confirmed in most cases, and there is certainly a bias towards doing fasciotomy in order to avoid medical and medicolegal complications associated with a missed or delayed diagnosis. In this review, we try to be clear about the distinction between fasciotomy (a treatment) and the diagnosis of acute compartment syndrome, which is largely something that cannot be easily controlled for and represents a significant source for bias.

INTENDED USERS

This guideline is intended for orthopaedic surgeons and other surgical providers who manage acute compartment syndrome resulting from extremity trauma. While orthopaedic surgeons will have completed medical training, a qualified residency, and potentially sub-specialty training, acute compartment syndrome is not a common occurrence. Outside of established trauma centers, even experienced surgeons may have not been faced with the diagnostic and treatment challenges presented by compartment syndrome. Other surgeons, particularly military surgeons who may be called upon to function outside their normal scope of practice, may have little training in managing compartment syndrome outside of recurrent training courses. Emergency medicine providers, paramedics, physician extenders and other healthcare professionals who may treat injured patients in various practice settings also may benefit from this guideline.

The diagnosis and treatment of acute compartment syndrome is based on the assumption that decisions are predicated on the patient and/or the patient's qualified heath care advocate discussing with the treating provider the available treatments and procedures applicable to the individual patient. Once the patient and or their advocate have been informed of available therapies and have discussed these options with his/her physician, an informed decision can be made. Clinician input based on informed medical knowledge, surgical experience and skill increases the probability of identifying patients with acute compartment syndrome and how to best treat them.

This guideline is not intended for use as a benefits determination document.

PATIENT POPULATION

This document addresses the management of acute compartment syndrome of traumatized extremities in adult patients, and the information in this CPG cannot be fully extrapolated to the treatment of children or adolescents. It is not intended to address management of chronic exertional compartment syndrome.

BURDEN OF DISEASE

The economic burden of acute compartment syndrome is unknown. Patients with tibia fractures complicated by acute compartment syndrome have a hospital stay that is more than double and charges that are more 2-3 times greater than tibia fractures without compartment syndrome (Schmidt 2011, Crespo 2015). Multiple factors contribute to patient outcomes and treatment costs after trauma; compartment syndrome contributes to worse patient-reported and functional outcomes, including negative effects on quality-of-life that remain more than a year after injury [Giannoudis 2002]. The significant medicolegal aspects surrounding compartment syndrome diagnosis and treatment also contribute to the burden of this condition on patients, providers and the healthcare system [Bhattacharyya, JBJS 2004].

ETIOLOGY

Acute compartment syndrome is typically associated with high-energy trauma but can be encountered with low-energy mechanisms of injury, electrocution, vascular injury and following ischemia / reperfusion events, such as after prolonged limb compression in patients with altered mental status (such as a drug overdose or intoxication). Regardless of the etiology, an increase in compartment contents from edema or bleeding raises the intracompartment pressure. If the pathophysiologic process continues and the intramuscular pressure becomes high enough, myoneural capillary blood flow ceases and the compartment contents become ischemic.

Depending on the duration of ischemia and the metabolic demands of the affected tissue, permanent tissue injury can occur, which is manifested by ischemic contracture of affected muscles and neural deficits. In some cases, systemic consequences of rhabdomyolysis can occur.

INCIDENCE AND PREVALENCE

The incidence of acute compartment syndrome is difficult to ascertain because concrete diagnostic criteria are elusive and most reports use the incidence of fasciotomy as a surrogate for compartment syndrome. Among patients presenting with acute compartment syndrome in one

report, the most common diagnoses were tibial diaphyseal fracture (36% of cases), soft tissue injury (23%), distal radius fracture (10%), crush injury and diaphyseal radius / ulna fracture (8% each) (McQueen 2000). For specific injuries, the highest rates seem to be in medial knee fracture-dislocations (53%) and bicondylar tibial plateau fractures (18%) as reported by Stark (2009).

RISK FACTORS

Risk factors for acute compartment syndrome of an extremity include fracture (especially of the tibia or forearm), crush injury without fracture, male gender, and age under 35 (McQueen 2000). Bleeding or the use of anticoagulant medications is the cause in 10% of cases of compartment syndrome (McQueen 2000).

EMOTIONAL AND PHYSICAL IMPACT

The quality-of-life after lower leg compartment syndrome was studied by Giannoudis et al. (2002). Thirty patients who were a minimum of one-year post-injury completed the EQ-5D (EuroQol) and were compared to age/ sex-matched patients who had sustained closed tibia fracture without compartment syndrome. Patients with a skin-graft reported more pain and discomfort than patients without a skin-graft. Patients whose wounds were closed faster had significantly better self-rated health status than patients in time to wound closure was longer. Finally, the patients reported significantly more problems on the individual dimensions of the EQ-5D than did the control group; however their overall self-rated health was not statistically different (Giannoudis 2002). Other studies have evaluated the long-term results following fasciotomy, demonstrating that the majority of patients experience problems with the leg, most commonly swelling and decreased endurance (van den Brand 2004).

POTENTIAL BENEFITS, HARMS, AND CONTRAINDICATIONS

All surgical interventions carry the risk of complication and unforeseen consequences. In the case of ACS, it is possible that failure to perform surgery may lead to far greater disability and morbidity. The accurate diagnosis of ACS is the most confounding aspect in treatment and can be affected by patient factors and the experience of the provider. Failure to diagnose ACS can lead to serious systemic illness, limb loss and significant loss of function. With the resultant high index of suspicion maintained by clinicians in the face of ACS, unnecessary surgery may be performed which may result in prolonged treatment, increased risks of infection and soft tissue damage and resultant disability. Even with an accurate diagnosis, improperly performed fasciotomy increases the risk of increased intracompartmental injury and can complicate the reconstruction of traumatic injuries. Patient factors, including the inciting injury and timing of presentation, always must be considered in the face of clinical signs and symptoms and the clinician's experience. Synthesis of all available information will facilitate an informed discussion with the patient/surrogate regarding the presence or absence of ACS and the suggested treatment if ACS is suspected or presumed.

FUTURE RESEARCH

Consideration for future research is provided for each recommendation within this document. Review of the published literature indicates there is significant controversy regarding the accurate diagnosis of ACS. The dearth of information includes both the definition of ACS and the means to reliably and efficiently obtain objective clinical data. While fasciotomy is widely

accepted as the treatment for ACS, it is also commonly done for prophylaxis (in cases of so-called “impending” compartment syndrome), and perhaps even for medicolegal reasons. Since there is no diagnostic standard for ACS, fasciotomy has become a surrogate for the diagnosis of ACS; the substitution of a treatment for a diagnosis represents a significant bias that cannot be easily controlled for in the literature. This is especially true given the strong bias that surgeons have for performing fasciotomy in order to avoid a “missed case”.

Future research should be aimed at defining medical treatments that mitigate the pathophysiologic effects of sustained elevations in compartment pressure so that there are options other than surgical fasciotomy. An important goal would be to develop diagnostic tests that are physiologically-based and provide the clinician with information indicating whether fasciotomy must be done urgently, or whether the patient can be followed with some form of medical management initiated. Finally, methods to tell whether fasciotomy would be beneficial in the late-presenting compartment syndrome would be very significant for the proper management of such patients.

METHODS

The methods used to perform this systematic review were employed to minimize bias and enhance transparency in the selection, appraisal, and analysis of the available evidence. These processes are vital to the development of reliable, transparent, and accurate clinical recommendations for management of acute compartment syndrome. To view the full AAOS clinical practice guideline methodology please visit https://www.aaos.org/quality/research-resources/methodology/

This clinical practice guideline evaluates the effectiveness of treatments for management of acute compartment syndrome The AAOS approach incorporates practicing physicians (clinical experts) and methodologists who are free of potential conflicts of interest relevant to the topic under study, as recommended by clinical practice guideline development experts.[1]

This clinical practice guideline was prepared by the AAOS Management of Acute Compartment Syndrome Clinical Practice Guideline physician development group (clinical experts) with the assistance of the AAOS Clinical Quality and Value (CQV) Unit in the Department of Research, Quality and Scientific Affairs (methodologists) . To develop this clinical practice guideline , the clinical practice guideline development group held an introductory meeting on November 14, 2017 to establish the scope of the clinical practice guideline. As the physician experts, the clinical practice guideline development group defined the scope of the clinical practice guideline by creating PICO Questions (i.e. population, intervention, comparison, and outcome) that directed the literature search. The AAOS Medical Librarian created and executed the search (see Appendix V for search strategy).

BEST EVIDENCE SYNTHESIS

We included only the best available evidence for any given outcome addressing a recommendation. Accordingly, we first included the highest quality evidence for any given outcome if it was available. In the absence of two or more occurrences of an outcome at this quality, we considered outcomes of the next lowest quality until at least two or more occurrences of an outcome had been acquired. For example, if there were two 'moderate' quality occurrences of an outcome that addressed a recommendation, we did not include 'low' quality occurrences of this outcome. A summary of excluded articles can be viewed in the Appendix II. All of the detailed data for each recommendation can be found in the pages following each recommendation.

LITERATURE SEARCHES

The medical librarian conducted a comprehensive search of MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials based on key terms and concepts from the clinical practice guideline development group's PICO questions (Appendix IV). Bibliographies of relevant systematic reviews were hand searched for additional references. All databases were last searched on March 6, 2018 with a limit for English language. The full search strategies are reported in Appendix VI.

DEFINING THE STRENGTH OF THE RECOMMENDATIONS

Judging the strength of evidence is only a stepping stone towards arriving at the strength of a clinical practice guideline recommendation. The strength of recommendation (Table 1) also

takes into account the quality, quantity, and the trade-off between the benefits and harms of a treatment, the magnitude of a treatment's effect, and whether there is data on critical outcomes. Table 2 addresses how to interpret the strength of each recommendation.

VOTING ON THE RECOMMENDATIONS

The recommendations and their strength were voted on by the guideline development group members during the final meeting. If disagreement between the guideline development group occurred, there was further discussion to see whether the disagreement(s) could be resolved. Recommendations were approved and adopted in instances where a simple majority (60%) of the guideline development group voted to approve; however, the guideline development group had consensus (100% approval) when voting on every recommendation for this guideline.

INTERPRETING THE STRENGTH OF EVIDENCE

Table I. Strength of Recommendation Descriptions

Strength	Overall Strength of Evidence	Description of Evidence Quality	Strength Visual
Strong	Strong	Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention.	
Moderate	Moderate	Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.	
Limited	Low or Conflicting Evidence	Evidence from two or more "Low" quality studies with consistent findings **or** evidence from a single "Moderate" quality study recommending for against the intervention or diagnostic or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.	
Consensus*	No Evidence	There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion. Consensus statements are published in a separate, complimentary document.	

Table II. Clinical Applicability: Interpreting the Strength of a Recommendation

Strength of Recommendation	Patient Counseling (Time)	Decision Aids	Impact of Future Research
Strong	Least	Least Important, unless the evidence supports no difference between two alternative interventions	Not likely to change
Moderate	Less	Less Important	Less likely to change
Limited	More	Important	Change possible/anticipated
Consensus	Most	Most Important	Impact unknown

PEER REVIEW

Following the final meeting, the clinical practice guideline draft undergoes a two-week peer review for additional input from external content experts. Written comments are provided via an electronic structured review form. All peer reviewers are required to disclose their conflicts of interest.

PUBLIC COMMENTARY

After modifying the draft in response to peer review, the clinical practice guideline was subjected to a two-week period of "Public Commentary." Commentators consist of members of the Major Extremity Trauma and Rehabilitation Consortium, the AAOS Board of Directors (BOD), members of the Council on Research and Quality (CORQ), members of the Board of Councilors (BOC), and members of the Board of Specialty Societies (BOS). The clinical practice guideline is automatically forwarded to the AAOS BOD and CORQ so that they may review it and provide comment prior to being asked to approve the document. Members of the BOC and BOS are solicited for interest. If they request to see the document, it is forwarded to them for comment. Based on these bodies, over 200 commentators have the opportunity to provide input into this clinical practice guideline. To view comments, visit the ACS CPG Peer Review and Public Comment Report

THE AAOS CLINICAL PRACTICE GUIDELINE APPROVAL PROCESS

This final clinical practice guideline draft must be approved by the Major Extremity Trauma and Rehabilitation Consortium, and subsequently by the AAOS Committee on Evidence Based Quality and Value Committee, the AAOS Council on Research and Quality, and the AAOS Board of Directors. These decision-making bodies are described in the ACS CPG eAppendix. Their charge is to approve or reject its publication by majority vote.

REVISION PLANS

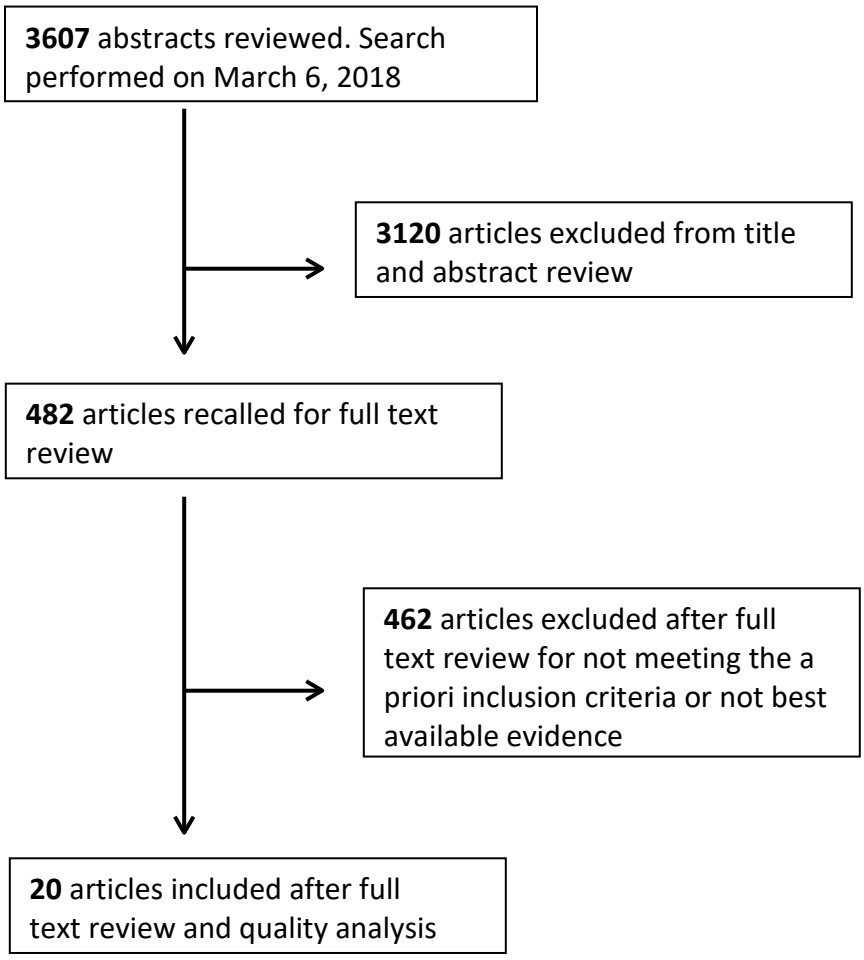
This clinical practice guideline represents a cross-sectional view of current treatment and may become outdated as new evidence becomes available. This clinical practice guideline will be revised in accordance with new evidence, changing practice, rapidly emerging treatment options, and new technology. This clinical practice guideline will be updated or withdrawn in five years in accordance with the standards of the National Guidelines Clearinghouse.

CLINICAL PRACTICE GUIDELINE DISSEMINATION PLANS

The primary purpose of the present document is to provide interested readers with full documentation of the best available evidence for various procedures associated with the topic of this review. Publication of most clinical practice guidelines is announced by an Academy press release, articles authored by the clinical practice guideline development group and published in the Journal of the American Academy of Orthopaedic Surgeons, and articles published in AAOS *Now*. Most clinical practice guidelines are also distributed at the AAOS Annual Meeting in various venues such as on Academy Row and at Committee Scientific Exhibits. The final guideline recommendations and their supporting rationales will be hosted on www.OrthoGuidelines.org.

Selected clinical practice guidelines are disseminated by webinar, an Online Module for the Orthopaedic Knowledge Online website, Radio Media Tours, Media Briefings, and by distributing them at relevant Continuing Medical Education (CME) courses and at the AAOS Resource Center.

STUDY ATTRITION FLOWCHART



RECOMMENDATIONS

BIOMARKERS

A. Limited evidence supports that myoglobinuria and serum troponin level may assist in diagnosing acute compartment syndrome in patients with traumatic lower extremity injury.

Strength of Recommendation: Limited ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

RATIONALE (A)

One moderate quality study (Alamshah, 2016) showed that myoglobinuria had a moderate/strong relationship to the reference standard of fasciotomy, although surgery was performed based on unspecified pressure measurements and clinical criteria. This study also showed troponin levels to be a strong rule-in test (elevated values were associated with fasciotomy) but a poor rule-out test (normal values were not associated with absence of fasciotomy). This paper included 149 patients, of which 82% had trauma and the others had vascular injury. Patients with crush injury were excluded, which is of interest because this is the classic condition that causes myoglobinuria. Fasciotomy was performed in 14 cases, but the indications for fasciotomy are unclear. This paper does not provide enough data to support any specific role for myoglobinuria as a diagnostic indicator for when acute compartment syndrome is present, but suggests that myoglobinuria is more common in patients with leg trauma (but without crush injury) who undergo fasciotomy.

B. Moderate evidence supports that, in patients with acute vascular ischemia, femoral vein lactate concentration sampled during surgical embolectomy may assist in the diagnosis of acute compartment syndrome.

Strength of Recommendation: Moderate ★★★☆

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

RATIONALE (B)

One high quality study (Mitas, 2014) of patients with acute limb ischemia from femoral artery embolism reported serial lactate measurements taken from the femoral vein just before and at several time points following limb revascularization. The results showed a strong relationship between the difference in blood lactate concentration immediately before and after revascularization and the reference standard of fasciotomy (which was performed based on clinical findings of new sensorimotor deficits and/or intracompartment pressure greater than 30 mmHg). This strong relationship to the reference standard held true at any threshold of blood lactate level between 1 and 3 mmol/L. Although the pressure criterion used could be considered an overly conservative indication for fasciotomy, the findings show that compartment syndrome is more likely when a more profound metabolic disturbance is present. It is important to recognize that this diagnostic approach is only applied ACS occurring in non-trauma patients with acute lower limb ischemia from femoral artery embolism.

C. Limited evidence supports that myoglobinuria does not assist in diagnosing acute compartment syndrome in patients with electrical injury.

Strength of Recommendation: 

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

RATIONALE (C)

An uncommon cause of extremity compartment syndrome is high-voltage electrical injury, and the diagnosis of ACS in this group is complicated by the associated eschar and the fact that these patients are most-often intubated and cared for in an intensive care unit setting. Biochemical monitoring is therefore of interest in this subset of patients. One moderate quality study (Cancio, 2005) found a weak/poor association between myoglobinuria and the reference standard of fasciotomy (performed based on "clinically evident extremity compartment syndrome or elevated compartment pressures") for diagnosis of ACS in patients with electrical burn injuries. In relation to this study, neither compartment pressure monitoring nor clinical exam findings have been validated for ACS diagnosis, and treatment standards are biased towards performing fasciotomy/escharotomy. Although there was a weak association between myoglobinuria and performance of fasciotomy in patients with high-voltage electrical injury, the sensitivity and specificity of myoglobinuria are insufficient to recommend it as a diagnostic modality.

FUTURE RESEARCH

Future research examining the sensitivity and specificity of biomarkers compared to an appropriate reference standard (e.g. validated and/or comprehensive clinical and pressure diagnosis) in a population of patients suspected of ACS would be invaluable.

TABLE 1: QUALITY ASSESSMENT - BIOMARKER DIAGNOSIS

Diagnostic Study	Representative Population	Clear Selection Criteria	Detailed Enough to Replicate	Reference Standard Identifies Target Condition	Blinding	Other Bias?	Inclusion	Strength
Alamshah, S. M., 2016	●	◑	◑	●	◑	●	Include	Moderate Quality
Cancio, L. C., 2005	●	◑	●	●	○	●	Include	Moderate Quality
Mitas, P., 2014	●	●	●	●	◑	●	Include	High Quality

TABLE 2: BIOMARKER DIAGNOSIS

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Alamshah, S. M., 2016	Moderate Quality	Lower limbs	Referral to fasciotomy (based on elevated ICP; no clear cut-off)	122 trauma or 27 femoral-tibial thrombo-embolic events	145	Myoglobinuria	0.93|0.85	6.40|0.08	**MODERATE**	**STRONG**
Alamshah, S. M., 2016	Moderate Quality	Lower limbs	Referral to fasciotomy (based on elevated ICP; no clear cut-off)	122 trauma or 27 femoral-tibial thrombo-embolic events	147	Troponin	0.21|0.98	14.25|0.80	**STRONG**	POOR
Mitas, P., 2014	High Quality	Lower limbs	Referral to fasciotomy (intrafascial pressure >30 and/or new sensorimotor deficit; 12hrs injury to diagnosis)	non-trauma; adults with limb ischemia from acute femoral embolism; data same at threshold 1 or 2 mmol/L	55	Blood lactate concentration [>3mmol/L (Preop lactate - post revascularization)]	1.00|1.00	100.00|0.00	**STRONG**	**STRONG**

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Cancio, L. C., 2005	Moderate Quality	Upper/Lower limbs	Referral to fasciotomy (clinical and/or elevated pressure; all done <24hrs post-injury)	(87% >18yrs); 1000+ volt electric injury pts (burn location unclear)	195	Myoglobinuria (presence of gross pigmenturia)(presence of gross pigmenturia)	0.59|0.78	2.73|0.52	WEAK	POOR

SERUM BIOMARKERS IN LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that serum biomarkers do not provide useful information to guide decision making when considering fasciotomy for a presumed late- presentation or missed acute compartment syndrome.

Strength of Recommendation: Consensus 

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

All information available and consideration of the risk of a potentially late fasciotomy should be considered.

POSSIBLE HARMS OF IMPLEMENTATION

As noted in this CPG, the diagnosis of ACS at any time point after injury is difficult, uncertain, and potentially controversial, with significant practice variation present. Laboratory value abnormalities alone do not provide sufficient guidance to indicate when fasciotomy is needed. Presuming a missed ACS based on biomarkers may lead to performing fasciotomy on a necrotic compartment with resultant complications. Surgeons should consider irrigation and debridement of an affected limb when faced with evidence of significant infection in an extremity with a presumed missed ACS.

FUTURE RESEARCH

While reliable diagnostic criteria for ACS may remain elusive, research should be geared towards determining serum markers that differentiate between reversible ischemia caused by ACS and indicators of neuromuscular necrosis that increases the morbidity of fasciotomy.

PRESSURE METHODS

A. Moderate evidence supports that intracompartmental pressure monitoring assists in diagnosing acute compartment syndrome.

Strength of Recommendation: Moderate 

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

B. Moderate evidence supports the use of repeated/continuous intracompartmental pressure monitoring and a threshold of diastolic blood pressure minus intracompartmental pressure >30 mmHg to assist in ruling out acute compartment syndrome.

Strength of Recommendation: Moderate 

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention.

RATIONALE

There are 2 moderate quality studies (McQueen 2013, Janzing 2001) and 3 low quality studies (Sangwan 2003, Murbarak 1978, Dickson 2003) evaluating the sensitivity and specificity of compartment pressure monitoring for diagnosing ACS. Variability in defining ACS, the type and duration of compartment pressure monitoring (single reading vs. continuous vs. intermittent), and the threshold for fasciotomy complicate interpretation of these studies. However, in all of the studies where a differential pressure of 30 mmHg was used as a cutoff (diastolic blood pressure-ICP or mean arterial pressure- ICP), pressure monitoring showed good sensitivity and/or specificity, indicating that, when combined with clinical symptoms, pressure monitoring can be useful in ruling out compartment syndrome. There was not adequate evidence to support a single absolute pressure cutoff to diagnose ACS.

One moderate strength study (McQueen 2013) examined the sensitivity of continuous compartment pressure monitoring with a threshold for fasciotomy of DBP-ICP <30 for >2 consecutive hours. This study also attempted to quantify false positives and false negatives based on intraoperative findings and clinical sequelae, which lends the study practical strength. While this study found DBP-ICP < 30 to have high sensitivity and specificity, another moderate quality study (Janzing 2001) found this threshold to have poorer specificity, indicating that using DBP-ICP < 30 to diagnose compartment syndrome will result in unnecessary fasciotomies (false positives). The three lower quality studies (Sangwan 2003, Murbarak 1978, Dickson 2003) showed that using DBP-ICP < 30 to diagnose compartment syndrome had good specificity, but were variable in their findings as to the sensitivity of the test.

The findings of another low quality study looking at continuous pressure monitoring vs. no pressure monitoring for tibia fractures (McQueen 1996) supports the fact that few compartment syndromes will be missed using DBP-ICP<30 as a cutoff for diagnosing ACS.

POSSIBLE HARMS OF IMPLEMENTATION

Using a threshold of DBP-ICP <30 to diagnose compartment syndrome might lead to overtreatment (fasciotomies for patients without true compartment syndrome). Relying on a single pressure reading as opposed to serial or continuous compartment readings is not a reliable way to diagnose compartment syndrome and may result in missed compartment syndrome. Relying solely on pressure readings should be avoided: clinical suspicion and clinical exam must factor into diagnosis as well.

FUTURE RESEARCH

Further studies examining the sensitivity and specificity of pressure measuring methods, techniques and thresholds vs. reference standards that take into account false negatives and false positives would be beneficial.

2025 UPDATE ADDITIONAL EVIDENCE

1. Dasgupta, R., Ekka, N. M. P., Das, A., Kumar, V.. (2021). Evaluation of Clinical and Venous Blood Parameters as Surrogate Indicators in Assessing the Need for Fasciotomy in Lower Limb Compartment Syndrome. International Journal of Lower Extremity Wounds, 0(0), 15347346211059027.
2. Marmor, M. T., Barker, J. P., Matz, J., Donohoe, E., Herring, M. J.. (2021). A dual-sensor ultrasound based method for detecting elevated muscle compartment pressures: A prospective clinical pilot study. Injury, 52(8), 2166-2172.
3. Schmidt, A. H., Di, J., Zipunnikov, V., Frey, K. P., Scharfstein, D. O., O'Toole, R. V., Bosse, M. J., Obremskey, W. T., Stinner, D. J., Hayda, R., Karunakar, M. A., Hak, D. J., Carroll, E. A., Collins, S. C. J., MacKenzie, E. J.. (2020). Perfusion Pressure Lacks Diagnostic Specificity for the Diagnosis of Acute Compartment Syndrome. Journal of Orthopaedic Trauma, 34(6), 287-293.

TABLE 3: QUALITY ASSESSMENT - PRESSURE TESTING DIAGNOSIS

Diagnostic Study	Representative Population	Clear Selection Criteria	Detailed Enough to Replicate	Reference Standard Identifies Target Condition	Blinding	Other Bias?	Inclusion	Strength
Janzing, H. M., 2001	●	●	●	◑	◑	◑	Include	Moderate Quality
Dickson, K. F., 2003	●	●	◑	○	◑	◑	Include	Low Quality
McQueen, M. M., 2013 (A)	●	●	●	◑	○	◑	Include	Low Quality
McQueen, M. M., 2013 (B)	●	●	●	●	○	◑	Include	Moderate Quality
Mubarak, S. J., 1978	●	●	●	○	◑	◑	Include	Low Quality
Sangwan, S. S., 2003	●	●	●	○	○	◑	Include	Low Quality

Observational Intervention Study	Participant Recruitment	Allocation	Confounding Variables	Follow-Up Length	Other Bias?	Inclusion	Strength
McQueen, M. M., 1996	●	●	◑	◑	◑	Include	Low Quality

Prognostic Study	Representative Population	Reason for Follow Up Loss	Prognostic Factor Measured	Outcome Measurement	Confounders	Appropriate Statistical Analysis	Inclusion	Strength
Park, S., 2009	●	●	●	○	◑	○	Include	Low Quality

TABLE 4A: PRESSURE TESTING DIAGNOSIS

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Repeated monitoring (24hr) ICP (anterior) (>30mmHg)	0.83|0.42	1.43|0.40	POOR	WEAK
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Repeated monitoring (24hr) mean arterial pressure - ICP (anterior) (<30mmHg)	0.39|0.92	5.12|0.66	**MODERATE**	POOR
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Clinical symptoms and repeated monitoring (24hr) diastolic BP - ICP (anterior) (<30mmHg)	0.61|0.97	24.14|0.40	**STRONG**	WEAK

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Clinical symptoms and repeated monitoring (24hr) mean arterial pressure - ICP (anterior) (<30mmHg)	0.28|0.99	21.94|0.73	**STRONG**	POOR
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Repeated monitoring diastolic BP - ICP (anterior 30mmHg) (<30mmHg)	0.89|0.65	2.51|0.17	WEAK	**MODERATE**
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Repeated monitoring (24hr) mean arterial pressure - ICP (anterior for >1hr) (<30mmHg)	0.33|0.99	26.33|0.68	**STRONG**	POOR

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Janzing, H. M., 2001	Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Repeated monitoring (24hr) diastolic BP - ICP (anterior 20mmHg) (<20mmHg)	0.61|0.81	3.22|0.48	WEAK	WEAK
McQueen, M. M., 2013 (A)	Low Quality	Lower limbs	Fasciotomy intra-op assessment or clinical follow-up	12-98yrs; trauma; diaphyseal tibial fractures	850	Continuous pressure monitoring [differential pressure (DP-ICP) <30 for 2+ hrs] (anterior slit catheter)	0.94|0.98	59.82|0.06	**STRONG**	**STRONG**
McQueen, M. M., 2013 (B)	Moderate Quality	Lower limbs	Referral to fasciotomy (based on clinical assessment)	12-98yrs; trauma; diaphyseal tibial fractures	850	Continuous pressure monitoring (vs referral) [differential pressure (Diastolic-ICP) <30 for 2+ hrs] (anterior slit catheter)	0.97|0.99	96.71|0.03	**STRONG**	**STRONG**

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Dickson, K. F., 2003	Low Quality	Upper/Lower limbs	Clinical diagnosis (significant pain and swelling)	5-70yrs; CS but no mention of acute	.	Invasive pressure measurement [(DP-ICP) =< 30mm HG]	0.66|0.96	16.50|0.35	**STRONG**	WEAK
Mubarak, S. J., 1978	Low Quality	Upper/Lower limbs	Continuous pressure monitoring and/or referral to fasciotomy	6pts obtunded; includes tensor/buttock pts	27	Initial ICP by wick catheter (>= 30 mm Hg)	0.64|1.00	63.64|0.36	**STRONG**	WEAK
Mubarak, S. J., 1978	Low Quality	Upper/Lower limbs	Continuous pressure monitoring and/or referral to fasciotomy	6pts obtunded; includes tensor/buttock pts	27	Initial ICP by wick catheter (>=20 mm Hg)	1.00|1.00	100.00|0.00	**STRONG**	**STRONG**
Sangwan, S. S., 2003	Low Quality	Upper/Lower limbs	Continuous pressure monitoring and/or referral to fasciotomy (2-90hr injury to admission range)	Suspected CS of either limb	100	Initial ICP (saline apparatus 30cm saline) [>=30cm saline (approx 22mmHg)]	1.00|0.43	1.75|0.00	POOR	**STRONG**

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Sangwan, S. S., 2003	Low Quality	Upper/Lower limbs	Continuous pressure monitoring and/or referral to fasciotomy (2-90hr injury to admission range)	Suspected CS of either limb	100	Initial ICP (saline apparatus 40cm saline) [>=40cm saline (approx 30mmHg)]	0.83|1.00	82.76|0.17	**STRONG**	**MODERATE**

TABLE 4B: PRESSURE MONITORING INTERVENTION

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
McQueen, M. M., 1996	Low Quality	Complications (Muscle weakness, contracture, infection)	Lower	Avg 28yrs (all >14); trauma; tibial diaphyseal fractures (23 closed, 2 open)	Sigmore early fasciotomy in Tx1; diagnosed by clinical or both clinical/pressure (anterior slit catheter)	Pre-op pressure monitoring and double incision fasciotomy	12	0.00%	Pre-op single/non-monitored pressure test and double incision fasciotomy	11	90.91%	RD	-0.91(-1.08,-0.74)	**Treatment 1 Significant (P-value<0.05)**

TABLE 4C: PRESSURE MONITORING INTERVENTION

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Prognostic Factor	N	Statistic	Model (confounding adjustment)	Result (p-value)	Significance
Park, S., 2009	Low Quality	ACS diagnosis	Lower	Acute tibial fracture pts (adults and children with closed growth plates)	Diaphyseal, proximal, or distal	Mean arterial pressure (on admission)	414	Beta coefficient (pvalue)	Multivariate logistic regression (age, mean arterial pressure, and concomitant injury)	0.0246 (0.108)	MAP is not significantly associated with diagnosis of ACS

PRESSURE MONITORING IN LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that compartment pressure monitoring does not provide useful information to guide decision making when considering fasciotomy for an adult patient with evidence of irreversible intracompartmental (neuromuscular/vascular) damage.

Strength of Recommendation: Consensus ★☆☆☆

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

Determining when ACS has caused irreversible damage to the nerves, vessels and/or muscle in a given compartment is difficult in the absence of a reliable clinical history. There is no convincing clinical data to indicate that multiple compartment pressure checks can help determine when irreversible damage has occurred.

There is also no conclusive clinical data to suggest that elevated compartment pressures in a patient with known irreversible intracompartmental damage are an indication for fasciotomy. Fasciotomy performed on a limb with irreversible intracompartmental damage carries significant morbidity.

POSSIBLE HARMS OF IMPLEMENTATION

The indication for fasciotomy should be based on a reliable clinical history and exam. Assuming the viability of the compartment necrosis can lead to a missed diagnosis while performing fasciotomy on a necrotic compartment may lead to significant morbidity.

FUTURE RESEARCH

Determining reliable compartment pressure measurements that indicate the progression to irreversible ischemia would significantly aid the clinician seeking to avoid the morbidity of fasciotomy in this population.

2025 UPDATE ADDITIONAL EVIDENCE

1. Dasgupta, R., Ekka, N. M. P., Das, A., Kumar, V. (2021). Evaluation of Clinical and Venous Blood Parameters as Surrogate Indicators in Assessing the Need for Fasciotomy in Lower Limb Compartment Syndrome. International Journal of Lower Extremity Wounds, 0(0), 15347346211059027.

PHYSICAL EXAM (AWAKE)

Limited evidence supports using serial clinical exam findings to assist in ruling in acute compartment syndrome.

Strength of Recommendation: ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

RATIONALE

One moderate quality study (Janzing, 2001) showed serial clinical testing (e.g. pain, pallor, pulse, swelling, etc.) to have a moderate association with the performance of fasciotomy for presumed ACS in patients with tibia fractures. Patients were examined and compartment pressures checked hourly for 6 hours then every 3 hours for at least 24 hours. ACS was defined as a patient indicated for fasciotomy or those who suffered a sequelae attributed to ACS, not a specific intracompartmental pressure or operative findings. This study also compared different thresholds for indicating patients for fasciotomy with clinical examination being specific (0.87) for surgery but less sensitive (0.67) than intracompartmental pressure monitoring. Pressure monitoring in symptomatic patients did obviate the need for fasciotomy in some cases, however the authors acknowledge the inability to truly diagnose ACS, using indicated fasciotomy as a surrogate for the diagnosis.

Two other low quality studies (Dickson, 2003; Mubarak, 1978) assessed clinical symptoms for the diagnosis of ACS, but they were deemed relevant only to the pressure testing recommendations (2a and 2b). Mubarak, et al utilized compartment pressure monitoring in patients who presented with clinical symptoms/signs of ACS. These clinical findings were used as the threshold to perform further intracompartmental testing instead of being compared to pressure values. Similarly, Dickson et al identified patients with pain and swelling for inclusion in studying a new device comparing limb hardness to intracompartmental pressure values.

The four included studies included patients without acute trauma and varying definitions for ACS, with dissimilar roles of clinical diagnosis for diagnosing ACS, thus the findings should be interpreted with caution.

POSSIBLE HARMS OF IMPLEMENTATION

Due to the difficulty in accurately diagnosing true compartment syndrome, reliance on clinical examination may lead to both missed diagnosis and, conversely, overtreatment with "unnecessary" fasciotomy. Many clinicians rely on exam findings and the suspicion of ACS should prompt further investigation with serial exams or pressure measurement. Reliance on a single negative exam may result in a missed diagnosis and dependence solely on classic symptoms may lead to overdiagnosis.

FUTURE RESEARCH

The unreliability of clinical examination further supports the need for research into noninvasive compartment pressure/perfusion techniques as well as delineation of clear pressure values that indicate the presence of ACS.

TABLE 5: QUALITY ASSESSMENT - PHYSICAL/CLINICAL DIAGNOSIS

Diagnostic Study	Representative Population	Clear Selection Criteria	Detailed Enough to Replicate	Reference Standard Identifies Target Condition	Blinding	Other Bias?	Inclusion	Strength
Janzing, H. M., 2001	●	●	●	◑	◑	◑	Include	Moderate Quality
Thakur, N. A., 2012	●	◑	●	●	○	◑	Include	Low Quality

TABLE 6: PHYSICAL/CLINICAL DIAGNOSIS

Reference Title		Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	RuleIn Test	Rule Out Test
Thakur, N. A., 2012		Low Quality	Foot	Referral to fasciotomy	Trauma pts; adults and children	18491	Injury severity score (ISS) (severe/very severe 16-75)	0.16|0.78	0.74|1.07	POOR	POOR
Janzing, H. M., 2001		Moderate Quality	Lower leg	Fasciotomy or occurrence of symptoms/functional deficiencies after 12mo	Tibial fractures of 95 children and adults (mostly adults)	97	Serial clinical symptom monitoring (Presence of pain, swelling, pallor, sensibility, movement, pulse, stretch pain)	0.67|0.89	5.85|0.38	**MODERATE**	WEAK

PHYSICAL EXAM (OBTUNDED)

In the absence of reliable evidence, it is the opinion of the work group that without a dependable clinical examination (e.g. in the obtunded patient), repeated or continuous intracompartmental pressure measurements are recommended until acute compartment syndrome is diagnosed or ruled out.

Strength of Recommendation: Consensus 

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

A high suspicion for compartment syndrome should always be maintained in the obtunded patient. In contradistinction to the patient with an unknown clinical timeline leading to compartment syndrome, the timeline of the obtunded patient's clinical course might be more obvious. Mechanism and/or previous surgical interventions (i.e. vascular repair, ORIF) should alert surgeons to the potential for ACS, and we recommend that surgeons closely monitor these patients and ensure that appropriate perfusion is maintained and hypotension avoided. With at-risk patients and equivocal findings of acute compartment syndrome, fasciotomy is less morbid than the consequences of a missed acute compartment syndrome.

POSSIBLE HARMS OF IMPLEMENTATION

In this patient population, there is limited risk in performing serial examination of the affected extremity. Increased risk may be introduced if an inappropriate threshold is used to diagnosis acute compartment syndrome in these patients allowing acute compartment syndrome to evolve into irreversible intracompartmental damage.

FUTURE RESEARCH

Further studies examining the sensitivity and specificity of pressure measuring methods, techniques and thresholds vs. reference standards that take into account false negatives and positives, as done by McQueen 2013, would be beneficial.

ALTERNATIVE METHODS OF DIAGNOSIS

In the absence of reliable evidence, it is the opinion of the work group that there are no reported diagnostic modalities, other than direct pressure monitoring or clinical exam findings, that provide useful information to guide decision making when considering fasciotomy for acute compartment syndrome.

Strength of Recommendation: Consensus

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

Only one low quality study (Dickson, 2003) meeting the inclusion criteria for this CPG was found that addressed any diagnostic modalities other than clinical or pressure testing. This study showed that in patients with a clinical diagnosis suggesting or confirming compartment syndrome, a "hardness ratio" of 2 or more had a weak association to the reference standard of a clinical diagnosis of ACS (as determined by the attending physician's clinical assessment). Hardness measurements were made using an investigational device consisting of a force plate that was applied to the skin. The hardness of the compartment with the highest compartment pressure was comparted to the final clinical assessment, and diagnostic parameters calculated. In particular, this diagnostic method had low specificity, resulting in a significant number of false positive diagnoses, leading the authors not to recommend this as a useful diagnostic modality.

Many other examples of alternative diagnostic modalities have been considered to be of potential value for the diagnosis of ACS, including near-infrared spectroscopy (NIRS), electromyography (EMG), and pH testing. However, at the time of publication of this CPG, these modalities were not supported by any published literature meeting the inclusion criteria for this review. It is the opinion of the panel that this is an area of significant research with potential clinical impact, and readers should continue to review the published literature as new data regarding new diagnostic modalities for ACS become available.

POSSIBLE HARMS OF IMPLEMENTATION

Misdiagnosis could lead irreversible intracompartmental damage.

FUTURE RESEARCH

Studies examining the sensitivity and specificity of various diagnostic modalities (e.g. NIRS, Imaging, NCS, etc.) as compared to an appropriate reference standard (e.g. validated and/or comprehensive clinical and pressure diagnosis) in a population of patients suspected of ACS may have significant impact on clinicians' ability to accurately diagnose acute compartment syndrome in a timely fashion.

TABLE 7: QUALITY ASSESSMENT – ALTERNATIVE METHODS OF DIAGNOSIS

Diagnostic Study	Representative Population	Clear Selection Criteria	Detailed Enough to Replicate	Reference Standard Identifies Target Condition	Blinding	Other Bias?	Inclusion	Strength
Dickson, K. F., 2003	●	●	◑	○	◑	◑	Include	Low Quality

TABLE 8: ALTERNATIVE METHODS OF DIAGNOSIS

Reference Title	Quality	Affected Limbs	Ref Standard	Patient Details	N	Index Test	Sens|Spec	LR+|LR-	Rule In Test	Rule Out Test
Dickson, K. F., 2003	Low Quality	Upper/Lower limbs	Clinical diagnosis (significant pain and swelling)	5-70yrs; CS but no mention of acute	75	Hardness measurements (highest) (hardness ratio => 2)	0.68|0.82	3.78|0.39	WEAK	WEAK

FASCIOTOMY METHODS

In the absence of reliable evidence, it is the opinion of the work group that fasciotomy technique (e.g. one vs two incision, placement of incisions) is less important than achieving complete decompression of the compartments of the affected extremity.

Strength of Recommendation: Consensus

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

Four low quality studies (Bible, 2013; Jang, 2017; Kanj, 2013; Heemskerk, 2003) examined various fasciotomy techniques displaying varying results and inconsistent outcomes, which led to the lack of an evidence-based recommendation for this topic.

Clinicians should consider the soft tissue envelope when determining incision placement as the literature does not clearly suggest an advantage or disadvantage for choosing different techniques. Surgeons should choose the fasciotomy technique deemed best to allow for full decompression of the involved compartments and may be tailored to other considerations such as plans for staged fixation. For the inexperienced clinician, it is recommended that the 2-incision method be used.

POSSIBLE HARMS OF IMPLEMENTATION

Incomplete fasciotomy can have severe consequences. In the war wounded, the need for fasciotomy revision is associated with a 4-fold increase in mortality.

FUTURE RESEARCH

While fasciotomy is not technically challenging, research into the most effective educational tools to improve fasciotomy techniques may be of benefit. A fasciotomy education program, as conducted in the U.S. military, improved survival rates however, the rates of delayed fasciotomy did not change.

2025 UPDATE ADDITIONAL EVIDENCE

1. Barça, F., Atilla, H. A., Demir, E. B., Çevik, K., Ilgin, B. U., Atli, O. Y., Yüksel, S., Sibar, K., Ünlü, S., Duman, E., Firat, A., Akdogan, M.. (2024). Comparison of single and double incision leg fasciotomy in disaster settings—Experience from 2023 Türkiye earthquakes. Injury, 55(6), . http://dx.doi.org/10.1016/j.injury.2024.111582
2. DeKeyser, G., Bunzel, E., O'Neill, D., Nork, S., Haller, J., Barei, D.. (2023). Single-Incision Fasciotomy Decreases Infection Risk Compared with Dual-Incision Fasciotomy in Treatment of Tibial Plateau Fractures With Acute Compartment Syndrome. Journal of Orthopaedic Trauma, 37(10), 519-524.

TABLE 9: QUALITY ASSESSMENT – FASCIOTOMY METHODS

Observational Intervention Study	Participant Recruitment	Allocation	Confounding Variables	Follow-Up Length	Other Bias? (If retrospective comparative, mark Yes)	Inclusion	Strength
Bible, J. E., 2013	●	●	●	◑	○	Include	Low Quality
Jang, Y. S., 2017	●	●	●	◑	○	Include	Low Quality
Kanj, W. W., 2013	●	●	●	◑	○	Include	Low Quality

Prognostic Study	Representative Population	Reason for Follow Up Loss	Prognostic Factor Measured	Outcome Measurement	Confounders	Appropriate Statistical Analysis	Inclusion	Strength
Heemskerk, J., 2003	●	●	○	●	●	○	Include	Low Quality

TABLE 10A: FASCIOTOMY METHODS

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P 1 (SD1)	Treatment 2 (Details)	N2	Mean2/P 2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Bible, J. E., 2013	Low Quality	Non-union (tibial plateau)	Lower leg	>= 18yrs; tibial plateau fracture (22 open, 38 closed)	Tibial plateau	Double incision fasciotomy; plate fixation	22	18.18%	Single incision fasciotomy; plate fixation	59	11.86%	RR	1.53(0.50,4.73)	Not Significant (P-value>.05)
Bible, J. E., 2013	Low Quality	Deep infection (tibial plateau)	Lower leg	>= 18yrs; tibial plateau fracture (22 open, 38 closed)	Tibial plateau	Double incision fasciotomy; plate fixation	22	22.73%	Single incision fasciotomy; plate fixation	59	25.42%	RR	0.89(0.37,2.17)	Not Significant (P-value>.05)
Bible, J. E., 2013	Low Quality	Non-union (tibial shaft)	Lower leg	>= 18yrs; tibial shaft fracture (22 open, 38 closed)	Tibial shaft	Dual incision fasciotomy; intramedullary nail	24	12.50%	Single incision fasciotomy; intramedullary nail	36	19.44%	RR	0.64(0.18,2.24)	Not Significant (P-value>.05)
Bible, J. E., 2013	Low Quality	Deep infection (tibial shaft)	Lower leg	>= 18yrs; tibial shaft fracture (22 open, 38 closed)	Tibial shaft	Dual incision fasciotomy; intramedullary nail	24	8.33%	Single incision fasciotomy; intramedullary nail	36	2.78%	RR	3.00(0.29,31.28)	Not Significant (P-value>.05)
Jang, Y. S., 2017	Low Quality	Amputation (early vs late)	Upper arm	270 total limbs of adults; high-voltage injury; con done 1996-2002 and mid done 2003-2007	Diagnosed by clinical and US testing	Early (<8hr from injury) straight midline curved incision or conventional fasciotomy (Green's volar-ulnar incision)	154	51.30%	Late (>8hr from injury) straight midline curved incision or conventional fasciotomy (Green's volar-ulnar incision)	114	63.16%	RR	0.81(0.66,1.00)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P1 (SD1)	Treatment 2 (Details)	N2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Jang, Y. S., 2017	Low Quality	Amputation (early con vs late con)	Upper arm	184 total limbs of adults; high-voltage injury; con done 1996-2002 and mid done 2003-2007	Diagnosed by clinical and US testing	Early conventional fasciotomy (<8h after injury; Green's volar-ulnar incision)	100	60.00%	Late conventional fasciotomy (>8h after injury; Green's volar-ulnar incision)	84	69.05%	RR	0.87(0.70,1.08)	Not Significant (P-value>.05)
Jang, Y. S., 2017	Low Quality	Amputation (early con vs early mid)	Upper arm	154 total limbs of adults; high-voltage injury; con done 1996-2002 and mid done 2003-2007	Diagnosed by clinical and US testing	Early conventional fasciotomy (<8h after injury; Green's volar-ulnar incision)	100	60.00%	Early straight midline curved incision fasciotomy (<8h after injury)	54	35.19%	RR	1.71(1.15,2.53)	**Treatment 2 Significant (P-value<.05)**
Jang, Y. S., 2017	Low Quality	Amputation (early mid vs late mid)	Upper arm	86 total limbs of adults; high-voltage injury; con done 1996-2002 and mid done 2003-2007	Diagnosed by clinical and US testing	Early straight midline curved incision (<8h after injury)	54	35.19%	Late straight midline curved incision (>8h after injury)	30	46.67%	RR	0.75(0.45,1.28)	Not Significant (P-value>.05)
Jang, Y. S., 2017	Low Quality	Amputation (late con vs late mid)	Upper arm	114 total limbs of adults; high-voltage injury; con done 1996-2002 and mid done 2003-2007	Diagnosed by clinical and US testing	Late conventional fasciotomy (>8h after injury; Green's volar-ulnar incision)	84	69.05%	Late straight midline curved incision fasciotomy (>8h after injury)	30	46.67%	RR	1.48(0.98,2.23)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P1 (SD1)	Treatment 2 (Details)	N2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kanj, W. W., 2013	Low Quality	Minor permanent change	Upper limbs	Children; trauma/IV infiltration/ infection cause	Diagnosed by clinical and/or pressure tests (>=30mmHg or DP-ICP <30)	Early; =< 24h from injury; single or double fasciotomy	12	25.00%	Late; > 24h from injury; single or double fasciotomy	10	20.00%	RR	1.25(0.26,6.07)	Not Significant (P-value>.05)

TABLE 10B: FASCIOTOMY METHODS

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Prognostic Factor	N	Model (confounding adjustment)	Result	Significance
Heemskerk, J., 2003	Low Quality	Dysfunction, amputation, or death	Lower	Avg age 52 (range 19-91); trauma and non-trauma; all lower leg fasciotomies	40 fasciotomies in limbs total	Age <50	36	Multivariate logistic regression (age, creatinine, acute arterial obstruction, and fracture)	Author Reported	Age <50 is significantly associated with better outcomes of fasciotomy

FASCIOTOMY FOR LATE/MISSED ACS

In the absence of reliable evidence, it is the opinion of the work group that performing fasciotomy is not indicated in an adult patient with evidence of irreversible intracompartmental (neuromuscular/vascular) damage. Fracture stabilization, if warranted in these patients, should utilize a technique (external fixation/casting) that does not violate the compartment.

Strength of Recommendation: Consensus

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

Patients may present with evidence of advanced compartment syndrome of uncertain but likely prolonged duration, as in the case of a patient found obtunded or incapacitated. When evidence of irreversible muscle ischemia and necrosis (rhabdomyolysis) is observed, as indicated by the presence of myoglobinuria, renal failure, and dramatic elevations in creatine phosphokines (CPK), fasciotomy may increase the potential for further reperfusion injury. In addition, exposure of necrotic muscle by performing fasciotomy may necessitate extensive debridement and create large wounds with the potential for soft tissue infection. For these reasons, the panel recommends that fasciotomy not be performed in such circumstances. In such cases where there is an associated fracture, operative fracture care should be approached with caution and fixation methods that do not violate the compartment (external fixation, casting) should be considered.

POSSIBLE HARMS OF IMPLEMENTATION

When presented with the possibility of late ACS, clinicians should be wary of erroneously assuming the patient has an irreversible injury. In the absence of any reliable techniques to accurately determine the timing of the compartment syndrome, the clinician is left with few options. Fasciotomies in an extremity with irreversible compartment syndrome can lead to systemic reperfusion injuries and exposes devitalized muscle potentially increasing the risk of infection. A small incision to determine the presence or absence of devitalized muscle in the compartment may be a reasonable option. If necrotic muscle is found, extension of the incision is not advised. Fracture stabilization is warranted in these extremities in certain situations. In the short term, temporizing stabilization with external fixation or casting is preferred.

FUTURE RESEARCH

Future research to define serum biomarkers or determine imaging modalities that reliably establish the extent of muscle necrosis would be beneficial.

ASSOCIATED FRACTURE

Limited evidence supports that operative fixation (external or internal) be performed for initial stabilization of long bone fractures with concomitant acute compartment syndrome requiring fasciotomy.

Strength of Recommendation: Limited

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for against the intervention or diagnostic or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

RATIONALE

A long-standing knowledge gap in fracture care is in regard to the effect of the timing of definitive fracture fixation on infection rate, fracture healing and other outcomes in patients with fractures complicated by ACS. Four recent studies identified in this Rapid Update, all low methodological quality, examine the influence of the management of an associated fracture on the outcome of acute compartment syndrome (ACS) (Akbari, 2019, Dubina, 2022, Flagstad, 2020, Ull, 2020), in addition to one low quality study from the original CPG (Kim, 2017). Three of the five studies demonstrate decreased infection rates with internal fixation of the fracture at or before the time of fasciotomy closure (although the differences did not always reach statistical significance) (Akbari, 2019, Dubina, 2022, Flagstad, 2020). The other two papers report the infection rate to be unaffected by the timing of fixation (Kim, 2017, Ull 2020). No deep infections occurred in the series reported by Kim et al, and the infection rate was 13% in both early and delayed fixation groups in the study by Ull et al. With respect to other outcomes, Kim et al. found no significant differences in any outcome comparing immediate internal fixation to a staged approach of immediate external fixation and delayed internal fixation in tibial fractures requiring fasciotomy. In contrast, Akbari et al also compared early internal fixation to a staged approach but found several outcomes were worse in the patients that underwent staged management. Specifically, deep infection, malunion, decreased range-of-motion of the knee and ankle, number of surgeries, and duration of hospitalization were all greater in the staged fixation group (Akbari, 2019). Ull et al compared primary (early) to secondary (delayed) internal fixation in patients with ACS complicating a lower leg fracture and found no differences in clinical outcomes but significantly shorter hospital stays and need for significantly fewer surgeries in patients receiving early internal fixation. Dubina et al sought to determine if the risk of fracture-related infection (FRI) in patients with tibial plateau fractures complicated by ACS differed based on the timing of tibial plateau fixation relative to closure of ipsilateral fasciotomy wounds. Although the overall rate of FRI was high (19.6%), Dubina et al concluded that internal fixation at the time of fasciotomy closure has the highest probability of treatment benefit. Finally, the study by Flagstad et al showed improved articular reduction of tibial plateau fractures with fixation performed before or at the same time as fasciotomy closure. These authors acknowledge a selection bias caused by the possibility that more severe fractures were treated by delayed closure and fixation due to soft tissue injury. Taken together, all five of these papers show either benefits or no difference comparing internal fixation at or before the time of fasciotomy closure to either definitive external fixation or later internal fixation, while no outcomes were better in patients treated with delayed fixation. However, in these studies the patient populations, fracture type, protocols for treatment, and other characteristics were not standardized and none of the studies were prospective randomized trials. Although these newer papers suggest that early internal fixation can be safely performed in many patients with fractures and associated ACS with the expectation of equivalent to better outcomes than definitive external fixation or a staged approach using delayed internal fixation, this evidence is not of high enough quality to change

the current consensus recommendation of the workgroup.

POSSIBLE HARMS OF IMPLEMENTATION

While the original workgroup opinion remains that initial operative fixation (external or internal) of associated fractures should be performed in patients with ACS, the literature is still not definitive enough to make a recommendation regarding the timing of fracture fixation or the specific type of fixation. The existing evidence is likely influenced by significant selection bias. Failure to consider all patient characteristics in choosing the timing and type of fixation may lead to increased infection and other complications. The degree of soft tissue injury, fracture location, method of fixation and patient/injury factors should all be considered in determining the best comprehensive treatment plan. Patients with significant soft tissue injury, severely contaminated open fractures and complex periarticular fractures may benefit from staged or delayed internal fixation. In patients with peri- or intra-articular fractures, the potential benefit of improved fracture reduction with early internal fixation must be balanced against the risk with respect to deep infection.

FUTURE RESEARCH

Prospective studies using matched study populations with similar soft tissue and fracture characteristics, definitive protocol-driven fixation type, soft-tissue management, and post-operative rehabilitation will aid in determining optimal timing of fracture fixation with associated fasciotomy. Randomized studies of patients requiring fasciotomy for ACS comparing external fixation and immediate fixation for similar fractures would be beneficial.

2025 UPDATE ADDITIONAL EVIDENCE

1. Akbari Aghdam, H., Sheikhbahaei, E., Hajihashemi, H., Kazemi, D., Andalib, A.. (2019). The impacts of internal versus external fixation for tibial fractures with simultaneous acute compartment syndrome. European journal of orthopaedic surgery & traumatologie, 29(1), 183-187.
2. Dubina, A. G., Morcos, G., O'Hara, N. N., Manzano, G. W., Vallier, H. A., Farooq, H., Natoli, R. M., Adams, D., Obremskey, W. T., Wilkinson, B. G., Hogue, M., Haller, J. M., Marchand, L. S., Hautala, G., Matuszewski, P. E., Pechero, G. R., Jr., Gary, J. L., Doro, C. J., Whiting, P. S., Chen, M. J., DeBaun, M. R., Gardner, M. J., Reynolds, A. W., Altman, G. T., Obey, M. R., Miller, A. N., Haase, D., Wise, B., Wallace, A., Hagen, J., O'Donnell, J., Gage, M., Johnson, N. R., Karunakar, M., Dynako, . (2022). Is the timing of fixation associated with fracture-related infection among tibial plateau fracture patients with compartment syndrome? A multicenter retrospective cohort study of 729 patients. Injury, 53(11), 3814-3819.
3. Flagstad, I., Albright, P., Pedri, T., Kleinsmith, R. M., Schmidt, A., Alley, M., Westberg, J. R., Moreno, A. F., Henry, G., Tatman, L. M., Obremskey, W. T., Tornetta, P., 3rd, Cunningham, B. P.. (2024). Early Versus Delayed Definitive Fixation Relative to Fasciotomy Closure in High-Energy Tibial Plateau Fractures with Compartment Syndrome. Journal of Orthopaedic Trauma, 08(0), 08. Ull, C., Jansen, O., Seybold, D., Konigshausen, M., Schildhauer, T. A., Gessmann, J.. (2020). Differences between primary and secondary definitive osteosynthesis for fractures of the lower leg with concomitant acute compartment syndrome. European Journal of Trauma & Emergency Surgery, 46(5), 1167-1173.
4. Ull, C., Jansen, O., Seybold, D., Konigshausen, M., Schildhauer, T. A., Gessmann, J.. (2020). Differences between primary and secondary definitive osteosynthesis for fractures of the

lower leg with concomitant acute compartment syndrome. European Journal of Trauma & Emergency Surgery, 46(5), 1167-1173.

TABLE 11: QUALITY ASSESSMENT - MANAGEMENT OF ASSOCIATED FRACTURES

Observational Intervention Study	Participant Recruitment	Allocation	Confounding Variables	Follow-Up Length	Other Bias? (If retrospective comparative, mark Yes)	Inclusion	Strength
Kim, T. H., 2017	●	●	●	◑	○	Include	Low Quality

TABLE 12: MANAGEMENT OF ASSOCIATED FRACTURES

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/ P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/ P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kim, T. H., 2017	Low Quality	Complications (Infection, delayed union, nonunion, nerve damage, poor prognosis)	Lower leg	>18yrs ; acute tibial fractur e; ACS	Diagnosed by clinical judgement of attending orthopaedic surgeon; done immediately after fasciotomy ; single/ double 4 compartment fasciotomy with NPWT	Initial internal/ definitive fixation	20	10.00%	Initial external fixation (switched to internal after average of 9.3 days)	15	13.33%	RR	0.75(0.12,4.73)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/ P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/ P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kim, T. H., 2017	Low Quality	LEFS; lower extremity functional scale	Lower leg	>18yrs ; acute tibial fractur e; ACS	Diagnosed by clinical judgement of attending orthopaedic surgeon; done immediately after fasciotomy ; single/ double 4 compartment fasciotomy with NPWT	Initial internal/ definitive fixation	20	74.3(7.4 0)	Initial external fixation (switched to internal after average of 9.3 days)	15	74(8.40)	MeanD if	0.3(- 5.05,5.65)	Not Significant (P- value>.0 5)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/ P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/ P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kim, T. H., 2017	Low Quality	Time to union (months)	Lower leg	>18yrs; acute tibial fracture; ACS	Diagnosed by clinical judgement of attending orthopaedic surgeon; done immediately after fasciotomy; single/ double 4 compartment fasciotomy with NPWT	Initial internal/ definitive fixation	20	5.6(2.10)	Initial external fixation (switched to internal after average of 9.3 days)	15	6.3(2.70)	MeanDif	-0.7(-2.35,0.95)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/ P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/ P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kim, T. H., 2017	Low Quality	Time to wound closure (days)	Lower leg	>18yrs; acute tibial fracture; ACS	Diagnosed by clinical judgement of attending orthopaedic surgeon; done immediately after fasciotomy; single/ double 4 compartment fasciotomy with NPWT	Initial internal/ definitive fixation	20	10.9(3.60)	Initial external fixation (switched to internal after average of 9.3 days)	15	10.4(2.40)	MeanDif	0.5(-1.49,2.49)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N 1	Mean1/ P1 (SD1)	Treatment 2 (Details)	N 2	Mean2/ P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Kim, T. H., 2017	Low Quality	Additional surgery needed	Lower leg	>18yrs ; acute tibial fracture; ACS	Diagnosed by clinical judgement of attending orthopaedic surgeon; done immediately after fasciotomy ; single/ double 4 compartment fasciotomy with NPWT	Initial internal/ definitive fixation	20	10.00%	Initial external fixation (switched to internal after average of 9.3 days)	15	20.00%	RR	0.50(0.10,2.63)	Not Significant (P-value>.05)

Limited evidence supports use of negative pressure wound therapy for management of fasciotomy wounds with regard to reducing time to wound closure and reducing need for skin grafting.

Strength of Recommendation: ★★☆☆

Description: Evidence from two or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention or diagnostic test or the evidence is insufficient or conflicting and does not allow a recommendation for or against the intervention.

RATIONALE

There was one moderate strength (Li, 2015) and three low strength (Zannis, 2009; Mittal, 2017; Krticka, 2016) studies evaluating wound management after fasciotomy. Li et al. found that use of negative pressure wound therapy resulted in a decrease in days to wound closure/coverage (9 days versus 14 days). Zannis et al. found that negative pressure wound therapy resulted in decreased need for split thickness skin graft in both the lower limb (17% versus 44%, RR 0.39) and upper limb (43% versus 66%, RR 0.67).

Of the three studies that reported important but rare outcomes including infection and/or other complications, all were underpowered to adequately assess these rare outcomes (subject sizes: 52 patients in Li et al., 63 patients in Krticka et al. and 50 patients in Mittal et al.). Krticka 2016 compared vacuum- assisted closure with dermatotaxis technique versus dressing fabrics and reported that dressing fabrics resulted in a higher rate of infection that was not statistically significant (9.5% versus 14.3%). For context, based on this rate of infection a study would require 1,478 patients (739 per group) to be adequately powered to detect a statistically significant difference with 80% power, assuming an alpha of 5%.

Mittal et al. compared two specific dermatotaxis techniques to aid wound closure without use of negative pressure wound therapy and found that use of tensioned wires (as opposed to sutures) resulted in higher risk of infection (12% versus 4%, RR 3).

POSSIBLE HARMS OF IMPLEMENTATION

We believe that there is no harm associated with use of negative pressure wound therapy to assist wound management/wound closure of fasciotomy wounds, particularly if used in the short term. However, there may be a relationship between time to wound closure/coverage and risk of infection, particularly in the setting of metallic implants. However, this is not been examined in the literature in this patient population. Furthermore, the risk benefit ratio of dermatotaxis techniques are not yet clear.

FUTURE RESEARCH

Future research is needed to further clarify the relative benefits associated with use of negative pressure wound therapy, with particular consideration for austere environments. This work has important implications for forward surgical teams utilized by the military. However, there may be barriers to performing this work in civilian settings due to the substantial benefits of negative pressure wound therapy in terms of patient care (fewer dressing changes, easier nursing care) as well as theoretical benefits (including reduction in nosocomial contamination due to sterile placement in the

operating room, improved granulation tissue formation to improve skin graft bed). Adequately powered high qualitystudies are needed to explore the relationship between management of fasciotomy wounds and complication such as infection as well as rate of and time to delayed wound closure and/or skin graft. Independent variables important to study include type of wound care method (ie negative pressure wound therapy versus wet to dry guaze), use of dermatotaxis techniques (ie “Jacob’s ladder” or “shoestring” technique versus traditional), time to closure or skin graft, timing for definative fixation/definative hardware. Both hard outcomes as well as functional outcomes and health-related quality of life outcomes are needed to adequately guide decision-making.

2025 UPDATE ADDITIONAL EVIDENCE

Kilicarslan, K., Erdogan, Y., Karaman, Y., Alkan, H., Bicici, V.. (2023). Comparison of dermatotraction and negative pressure wound therapy for closure of cruris fasciotomy after 2023 Kahramanmaras earthquake. Joint Diseases & Related Surgery, 34(2), 497-502.

TABLE 13: QUALITY ASSESSMENT - FASCIOTOMY WOUND MANAGEMENT

Randomized Intervention Study	Random Sequence Generation	Allocation Concealment	Blinding	Incomplete Outcome Data	Selective Reporting	Other Bias	Inclusion	Strength
Li, W., 2015	◑	◑	○	●	●	●	Include	Moderate Quality

Observational Intervention Study	Participant Recruitment	Allocation	Confounding Variables	Follow-Up Length	Other Bias? (If retrospective comparative, mark Yes)	Inclusion	Strength
Krticka, M., 2016	●	●	●	◑	○	Include	Low Quality
Mittal, N., 2017	●	●	◑	◑	◑	Include	Low Quality
Zannis, J., 2009	●	●	◑	●	○	Include	Low Quality

TABLE 14: FASCIOTOMY WOUND MANAGEMENT

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P1 (SD1)	Treatment 2 (Details)	N2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Krticka, M., 2016	Low Quality	Osteomyelitis events	Lower leg	Adults; trauma	Diagnosed by clinical symptoms; Sig more suturing in Tx1; Sig less DE grafting in Tx1; op max 2hrs post diagnosis	NPWT and EDL (day 2); single-incision fasciotomy	42	4.76%	Combined dressing fabrics (COM); single-incision fasciotomy	21	4.76%	RR	1.00(0.10,10.41)	Not Significant (P-value>.05)
Krticka, M., 2016	Low Quality	Necrotic events	Lower leg	Adults; trauma	Diagnosed by clinical symptoms; Sig more suturing in Tx1; Sig less DE grafting in Tx1; op max 2hrs post diagnosis	NPWT and EDL (day 2); single-incision fasciotomy	42	7.14%	Combined dressing fabrics (COM); single-incision fasciotomy	21	28.57%	RR	0.25(0.07,0.90)	**Treatment 1 Significant (P-value<.05)**
Krticka, M., 2016	Low Quality	Infection events	Lower leg	Adults; trauma	Diagnosed by clinical symptoms; Sig more suturing in Tx1; Sig less DE grafting in Tx1; op max 2hrs post diagnosis	NPWT and EDL (day 2); single-incision fasciotomy	42	9.52%	Combined dressing fabrics(COM); single-incision fasciotomy	21	14.29%	RR	0.67(0.16,2.71)	Not Significant (P-value>.05)
Mittal, N., 2017	Low Quality	Infection events	Lower limbs	21 to 60 years old; closed fracture; trauma; lower extremity	Diagnosed by clinical examination	Dermotaxis (two parallel wires passed through dermis and interconnected by compression device)	25	12.00%	Loop suture (involves using corrugated drains and Ethilon (no. 1) suture)	25	4.00%	RR	3.00(0.33,26.92)	Not Significant (P-value>.05)

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P1 (SD1)	Treatment 2 (Details)	N2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Mittal, N., 2017	Low Quality	Excellent (approximation achieved)	Lower limbs	21 to 60 years old; closed fracture; trauma; lower extremity	Diagnosed by clinical examination	Dermotaxis (two parallel wires passed through dermis and interconnected by compression device)	25	60.00%	Loop suture (involves using corrugated drains and Ethilon (no. 1) suture)	25	80.00%	RR	0.75(0.52,1.09)	Not Significant (P-value>.05)
Zannis, J., 2009	Low Quality	Grafting/closure by secondary attempt (lower limb)	Lower limbs	708 wounds; mean age 40.26yrs; causes include MVC, IV infiltration, and trauma	NP device	Vacuum-Assisted Closure device	370	17.30%	Conventional normal saline soaked dressings	196	44.39%	RR	0.39(0.30,0.51)	**Treatment 1 Significant (P-value<.05)**
Zannis, J., 2009	Low Quality	Grafting/closure by secondary attempt (upper limb)	Upper limbs	708 wounds; mean age 40.26yrs; causes include MVC, IV infiltration, and trauma	NP device	Vacuum-Assisted Closure device	68	42.65%	Conventional normal saline soaked dressings	74	63.51%	RR	0.67(0.49,0.93)	**Treatment 1 Significant (P-value<.05)**
Li, W., 2015	Moderate Quality	Complications (Local or systemic)	Upper/ Lower limbs	Osteofascial compartment syndrome; trauma; 27 upper, 25 lower; all adults	Diagnosed by clinical symptoms (pain, swelling, stretch pain, circulation disturbance)	Negative pressure drainage; operative decompression	26	0.00%	Oil gauze and thick dressing; operative decompression	26	0.00%	RD	0.00(0.00,0.00)	Not Significant (P-value>.05)
Li, W., 2015	Moderate Quality	Days in hospital	Upper/ Lower limbs	Osteofascial compartment syndrome; trauma; 27 upper, 25 lower; all adults	Diagnosed by clinical symptoms (pain, swelling, stretch pain, circulation disturbance)	Negative pressure drainage; operative decompression	26	11.8(3.60)	Oil gauze and thick dressing; operative decompression	26	26.2(5.40)	MeanDif	-14.4(-16.89,-11.91)	**Treatment 1 Significant (P-value<.05)**

Reference Title	Quality	Outcome Details	Affected Limbs	Patient Details	Methods	Treatment 1 (Details)	N1	Mean1/P1 (SD1)	Treatment 2 (Details)	N2	Mean2/P2 (SD2)	Effect Measure	Result (95% CI)	Favored Treatment
Li, W., 2015	Moderate Quality	Days until wound closure	Upper/ Lower limbs	Osteofascial compartment syndrome; trauma; 27 upper, 25 lower; all adults	Diagnosed by clinical symptoms (pain, swelling, stretch pain, circulation disturbance)	Negative pressure drainage; operative decompression	26	9(2.20)	Oil gauze and thick dressing; operative decompression	26	14.2(5.00)	MeanDif	-5.2(-7.30,-3.10)	**Treatment 1 Significant (P-value<.05)**

PAIN MANAGEMENT EFFECTS ON DIAGNOSIS

In the absence of reliable evidence, it is the opinion of the work group that neuraxial anesthesia may complicate the clinical diagnosis of acute compartment syndrome. If neuraxial anesthesia is administered, frequent physical examination and/or pressure monitoring should be performed.

Strength of Recommendation: Consensus 

Description: There is no supporting evidence. In the absence of reliable evidence, the clinical practice guideline development group is making a recommendation based on their clinical opinion.

RATIONALE

As there is no objective, gold standard for the diagnosis of acute compartment syndrome, the clinician should seek an aggregate of data points (including physical examination findings, escalating need for pain medication, pain out of proportion of injury, perfusion pressure, absolute pressure). At the present, in the absence of adequate studies, we believe that the risk of neuraxial anesthesia delaying and/or masking signs/symptoms associated with impending compartment syndrome (including physical examination findings, need for pain medication, magnitude of pain) outweighs the potential benefits of this treatment modality in high risk patient populations. We acknowledge that this opinion is made in the setting of only isolated extremely low-quality case reports and case series, none of which meet standards for inclusion in this analysis. The current literature suggests both that regional anesthesia may delay diagnosis of acute compartment syndrome and that regional anesthesia does not mask timely diagnosis. If neuraxial anesthesia is administered, we recommend that more emphasis is placed on intra- compartmental pressure monitoring as well as break through pain despite regional anesthesia.

Furthermore, we believe that clinicians should be attentive to quantity of narcotic pain medications administered to patients as an indicator of impending acute compartment syndrome.

POSSIBLE HARMS OF IMPLEMENTATION

Both delayed diagnosis of acute compartment syndrome and the increased utilization of narcotic pain medication increase risk for adverse outcomes. Excessive and prolonged narcotic use can lead to substantial patient harm however, there may be a role for neuraxial anesthesia to decrease acute narcotic use and, potentially, subsequent dependence. In patients with severe cardiopulmonary disease general anesthesia may carry substantially increased risk of anesthesia- associated complication – in this setting clinicians and patients must carefully weigh the risk/benefit ratio of neuraxial anesthesia versus general anesthesia.

FUTURE RESEARCH

High quality studies are needed to assess the ability to diagnose acute compartment syndrome in the setting of regional anesthesia. Similar to the obtunded patient, patients who may benefit from neuraxial anesthesia would benefit from improved monitoring for compartment syndrome. Further studies are also needed evaluate the relationship between regional anesthesia and the development of chronic pain/chronic opioid use.

2025 UPDATE ADDITIONAL EVIDENCE

1. Cunningham, D. J., LaRose, M. A., Zhang, G. X., Au, S., MacAlpine, E. M., Paniagua, A. R., Klifto, C. S., Gage, M. J.. (2022). Regional anesthesia reduces inpatient and outpatient perioperative opioid demand in periarticular elbow surgery. Journal of Shoulder and Elbow Surgery, 31(2), e48-e57. http://dx.doi.org/10.1016/j.jse.2021.08.005
2. Cunningham, D. J., LaRose, M., Zhang, G., Patel, P., Paniagua, A., Gadsden, J., Gage, M. J.. (2022). Regional Anesthesia Associated With Decreased Inpatient and Outpatient Opioid Demand in Tibial Plateau Fracture Surgery. Anesthesia & Analgesia, 134(5), 1072-1081.
3. Kellam, P. J., Dekeyser, G. J., Marchand, L. S., Rothberg, D. L., Higgins, T. F., Haller, J. M.. (2022). Periarticular multimodal analgesia in decreasing perioperative pain in tibial plateau fractures: A double blind randomized controlled pilot study. Injury, 53(12), 4123-4128. http://dx.doi.org/10.1016/j.injury.2022.09.053

APPENDICES

APPENDIX I – REFERENCES FOR INCLUDED LITERATURE

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7. Cunningham, D. J., LaRose, M., Zhang, G., Patel, P., Paniagua, A., Gadsden, J., Gage, M. J.. (2022). Regional Anesthesia Associated With Decreased Inpatient and Outpatient Opioid Demand in Tibial Plateau Fracture Surgery. Anesthesia & Analgesia, 134(5), 1072-1081.
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13. Heemskerk, J., Kitslaar, P. Acute compartment syndrome of the lower leg: retrospective study on prevalence, technique, and outcome of fasciotomies. World Journal of Surgery 2003; 6: 744-7
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APPENDIX II – EXCLUDED LITERATURE

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Driscoll, E. B. S.; Maleki, A. H.; Jahromi, L.; Hermecz, B. N.; Nelson, L. E.; Vetter, I. L.; Evenhuis, S.; Riesenberg, L. A.	Regional anesthesia or patient-controlled analgesia and compartment syndrome in orthopedic surgical procedures: A systematic review	2016	Local and Regional Anesthesia	PICO 1: Serum Biomarkers	systematic review
Goaley, T. J., Jr.; Wyrzykowski, A. D.; MacLeod, J. B.; Wise, K. B.; Dente, C. J.; Salomone, J. P.; Nicholas, J. M.; Vercruysse, G. A.; Ingram, W. L.; Rozycki, G. S.; Feliciano, D. V.	Can secondary extremity compartment syndrome be diagnosed earlier?	2007	American Journal of Surgery	PICO 1: Serum Biomarkers	insufficient data for target comparison; 17 ACS pts
Hayakawa, H.; Aldington, D. J.; Moore, R. A.	Acute traumatic compartment syndrome: A systematic review of results of fasciotomy	2009	Trauma	PICO 1: Serum Biomarkers	systematic review
Hsueh, Y. Y.; Chen, C. L.; Pan, S. C.	Analysis of factors influencing limb amputation in high-voltage electrically injured patients	2011	Burns	PICO 1: Serum Biomarkers	Insufficient data for target condition; 4 CS
Ihedioha, U.; Sinha, S.; Campbell, A. C.	Do creatine kinase (CK) levels influence the diagnosis or outcome in patients with compartment syndrome?	2005	Scottish Medical Journal	PICO 1: Serum Biomarkers	<20 patients; n15
Koubar, S. H.; Estrella, M. M.; Warrier, R.; Moore, R. D.; Lucas, G. M.; Atta, M. G.; Fine, D. M.	Rhabdomyolysis in an HIV cohort: Epidemiology, causes and outcomes	2017	BMC Nephrology	PICO 1: Serum Biomarkers	pico not answered
Lai, D. T. M.; Ingvar, C.; Thompson, J. F.	The value of monitoring serum creatine phosphokinase following	1993	Regional Cancer Treatment	PICO 1: Serum Biomarkers	insufficient data for target condition; 5 fasciotomies

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
	hyperthermic isolated limb perfusion for melanoma				
O'Connor, A. D.; Padilla-Jones, A.; Gerkin, R. D.; Levine, M.	Prevalence of Rhabdomyolysis in Sympathomimetic Toxicity: a Comparison of Stimulants	2015	Journal of Medical Toxicology: Official Journal of the American College of Medical Toxicology	PICO 1: Serum Biomarkers	pico not answered; CS outcome
Ulmer, T.	The clinical diagnosis of compartment syndrome of the lower leg: are clinical findings predictive of the disorder?	2002	Journal of Orthopaedic Trauma	PICO 1: Serum Biomarkers	systematic review
Valdez, C.; Schroeder, E.; Amdur, R.; Pascual, J.; Sarani, B.	Serum creatine kinase levels are associated with extremity compartment syndrome	2013	The Journal of Trauma and Acute Care Surgery	PICO 1: Serum Biomarkers	not best available evidence
Vrouenraets, B. C.; Kroon, B. B.; Klaase, J. M.; Bonfrer, J. M.; Nieweg, O. E.; van Slooten, G. W.; van Dongen, J. A.	Value of laboratory tests in monitoring acute regional toxicity after isolated limb perfusion	1997	Annals of Surgical Oncology	PICO 1: Serum Biomarkers	insufficient data for target comparison; n6 ACS pts
de Franciscis, S.; De Caridi, G.; Massara, M.; Spinelli, F.; Gallelli, L.; Buffone, G.; Calio, F. G.; Butrico, L.; Grande, R.; Serra, R.	Biomarkers in post-reperfusion syndrome after acute lower limb ischaemia	2016	International Wound Journal	PICO 1: Serum Biomarkers; PICO 10: Fasciotomy Methods	insufficient data for target condition; 7 CS
Hsu, C. P.; Chuang, J. F.; Hsu, Y. P.; Wang, S. Y.; Fu, C. Y.; Yuan, K. C.; Chen, C. H.; Kang, S. C.; Liao, C. H.	Predictors of the development of post-snakebite compartment syndrome	2015	Scandinavian Journal of Trauma, Resuscitation & Emergency Medicine	PICO 1: Serum Biomarkers; PICO 13: Associative Fracture	pico not answered; snakebite risk
Lang, E. K.	Streptokinase therapy: Complications of intra-arterial use	1985	Radiology	PICO 1: Serum Biomarkers; PICO 13: Associative Fracture	insufficient data for target condition; 9 fasciotomies

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
NystrÃ¶m Wendt, A.; Mattsson, J.; Olofsson Bagge, R.	Myoglobin does not predict local toxicity in isolated limb perfusion	2017	International Journal of Hyperthermia	PICO 1: Serum Biomarkers; PICO 8: Physical Exam Awake	Insufficient data for target condition
Tsai, W. H.; Huang, S. T.; Liu, W. C.; Chen, L. W.; Yang, K. C.; Hsu, K. C.; Lin, C. T.; Ho, Y. Y.	High risk of rhabdomyolysis and acute kidney injury after traumatic limb compartment syndrome	2015	Annals of Plastic Surgery	PICO 3: Fasciotomy Missed ACS	risk assessment; no tx
Adeyeye, A. I.; Esan, O.; Ikem, I. C.	Assessment of normal forearm compartment pressures in a Nigerian population	2017	European Journal of Trauma & Emergency Surgery	PICO 4: Pressure Monitoring	Insufficient data for target condition; no ACS
Al-Dadah, O. Q.; Darrah, C.; Cooper, A.; Donell, S. T.; Patel, A. D.	Continuous compartment pressure monitoring vs. clinical monitoring in tibial diaphyseal fractures	2008	Injury	PICO 4: Pressure Monitoring	not best available evidence
Allen, M. J.; Stirling, A. J.; Crawshaw, C. V.; Barnes, M. R.	Intracompartmental pressure monitoring of leg injuries. An aid to management	1985	Journal of Bone and Joint Surgery - Series B	PICO 4: Pressure Monitoring	insufficient data for target condition
Amendola, A.; Faber, K.; Willits, K.; Miniaci, A.; Labib, S.; Fowler, P.	Compartment pressure monitoring during anterior cruciate ligament reconstruction	1999	Arthroscopy	PICO 4: Pressure Monitoring	insufficient data for target condition; no ACS
Ashton, H.	The effect of increased tissue pressure on blood flow	1975	Clinical Orthopaedics & Related Research	PICO 4: Pressure Monitoring	review
Brooker, A. F., Jr.; Pezeshki, C.	Tissue pressure to evaluate compartmental syndrome	1979	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring	insufficient data for target condition; 5 fasciotomies
Carbonell, P. G.; Prats, F. L.; Fernandez, P. D.; Valiente Valero, J. M.; Sastre, S.	Monitoring antebrachial compartmental pressure in displaced supracondylar elbow fractures in children	2004	Journal of Pediatric Orthopaedics, Part B	PICO 4: Pressure Monitoring	insufficient data; 1 CS pt
Clasbrummel, B.; Muhr, G.; MÃ¶llenhoff, G.	Pressure sensors for the monitoring of diseases in surgical care	2004	Minimally Invasive Therapy and Allied Technologies	PICO 4: Pressure Monitoring	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Donahue, P.; Wheeler, W. E.	A method for rapid intracompartmental pressure measurement	1992	West Virginia Medical Journal	PICO 4: Pressure Monitoring	review
Dragas, M.; Davidovic, L.; Kostic, D.; Markovic, M.; Pejkic, S.; Ille, T.; Ilic, N.; Koncar, I.	Upper extremity arterial injuries: Factors influencing treatment outcome	2009	Injury	PICO 4: Pressure Monitoring	Insufficient data for target comparison
Dresing, K.; Peterson, T.; Schmit-Neuerburg, K. P.	Compartment pressure in the carpal tunnel in distal fractures of the radius. A prospective study	1994	Archives of Orthopaedic & Trauma Surgery	PICO 4: Pressure Monitoring	insufficient data; 2 CS pts
Gelberman, R. H.; Szabo, R. M.; Williamson, R. V.; Hargens, A. R.; Yaru, N. C.; Minteer-Convery, M. A.	Tissue pressure threshold for peripheral nerve viability	1983	Clinical Orthopaedics & Related Research	PICO 4: Pressure Monitoring	all healthy pts
Harris, I. A.; Kadir, A.; Donald, G.	Continuous compartment pressure monitoring for tibia fractures: does it influence outcome?	2006	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring	insufficient data for condition; 6 CS pts
Harris, Ia; Kadir, A; Donald, G	Continuous compartment pressure monitoring for tibia fractures: does it influence outcome?	2006	Journal of trauma	PICO 4: Pressure Monitoring	insufficient data for target condition; 5 CS
Hoffmann, M.; Zimmermann, M.; Meyer, R.; Laubert, T.; Begum, N.; Keck, T.; Kujath, P.; Schloericke, E.	Spontaneous and non-spontaneous bleeding complications in patients with oral vitamin K antagonist therapy	2014	Langenbecks Archives of Surgery	PICO 4: Pressure Monitoring	insufficient data for target comparison
Jerosch, J.; Castro, W. H.; Geske, B.	Intracompartmental pressure in the lower extremity after arthroscopic surgery	1991	Acta Orthopaedica Belgica	PICO 4: Pressure Monitoring	irrelevant topic; pressure no ACS
Kiaer, T.; Kristensen, K. D.	Intracompartmental pressure, PO2, PCO2 and blood flow in the human skeletal muscle	1988	Archives of Orthopaedic & Traumatic Surgery	PICO 4: Pressure Monitoring	<20 patients; 10 healthy

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Kierzynka, G.; Grala, P.	Compartment syndrome of the foot after calcaneal fractures	2008	Ortopedia Traumatologia Rehabilitacja	PICO 4: Pressure Monitoring	case control; 13 pts with control limbs
Larson, M.; Leigh, J.; Wilson, L. R.	Detecting compartmental syndrome using continuous pressure monitoring	1986	Focus on Critical Care	PICO 4: Pressure Monitoring	review
Luks, F. I.	An easy approach to the slit catheter technique in intracompartmental pressure measurement	1988	Surgery, Gynecology & Obstetrics	PICO 4: Pressure Monitoring	review
Lynch, J. E.; Lynch, J. K.; Cole, S. L.; Carter, J. A.; Hargens, A. R.	Noninvasive monitoring of elevated intramuscular pressure in a model compartment syndrome via quantitative fascial motion	2009	Journal of Orthopaedic Research	PICO 4: Pressure Monitoring	all healthy pts; no pressure thresholds
Matsen, F. A., 3rd; Mayo, K. A.; Krugmire, R. B., Jr.; Sheridan, G. W.; Kraft, G. H.	A model compartmental syndrome in man with particular reference to the quantification of nerve function	1977	Journal of Bone & Joint Surgery - American Volume	PICO 4: Pressure Monitoring	model study
McDermott, A. G.; Marble, A. E.; Yabsley, R. H.	Monitoring acute compartment pressures with the S.T.I.C. catheter	1984	Clinical Orthopaedics & Related Research	PICO 4: Pressure Monitoring	Non-human and healthy volunteers
McDougall, C. G.; Johnston, G. H.	A new technique of catheter placement for measurement of forearm compartment pressures	1991	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring	review
Moehring, H. D.; Voigtlander, J. P.	Compartment pressure monitoring during intramedullary fixation of tibial fractures	1995	Orthopedics	PICO 4: Pressure Monitoring	Insufficient data for target condition; 9 CS
Mok, J. M.; Hansen, E. N.; Kang, H.; Kandemir, U.	Diagnosis of acute compartment syndrome: Direct measurement of tissue oxygenation	2012	Techniques in Orthopaedics	PICO 4: Pressure Monitoring	<20 patients; n16

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Mubarak, S. J.; Hargens, A. R.; Owen, C. A.; Garetto, L. P.; Akeson, W. H.	The wick catheter technique for measurement of intramuscular pressure. A new research and clinical tool	1976	Journal of Bone & Joint Surgery - American Volume	PICO 4: Pressure Monitoring	animal study; dog
Myerson, M. S.; Juliano, P. J.; Koman, J. D.	The use of a pneumatic intermittent impulse compression device in the treatment of calcaneus fractures	2000	Military Medicine	PICO 4: Pressure Monitoring	insufficient data; 0 CS pts
Ogunlusi, J. D.; Oginni, L. M.; Ikem, I. C.	Normal leg compartment pressures in adult Nigerians using the Whitesides method	2005	Iowa Orthopaedic Journal	PICO 4: Pressure Monitoring	pico questions not answered; no ACS
Ogunlusi, J. D.; Oginni, L. M.; Ikem, I. C.	Compartmental pressure in adults with tibial fracture.[Erratum appears in Int Orthop. 2005 Jun;29(3):199]	2005	International Orthopaedics	PICO 4: Pressure Monitoring	insufficient data; 3 CS pts
Ogunlusi, J. D.; Oginni, L. M.; Ikem, I. C.	Compartmental pressure in adults with tibial fracture	2005	International Orthopaedics	PICO 4: Pressure Monitoring	insufficient data; 3 CS pts
Olivecrona, C.; Lapidus, L. J.; Benson, L.; Blomfeldt, R.	Tourniquet time affects postoperative complications after knee arthroplasty	2013	International Orthopaedics	PICO 4: Pressure Monitoring	insufficient data; 2 CS pts
O'Toole, R. V.; Whitney, A.; Merchant, N.; Hui, E.; Higgins, J.; Kim, T. T.; Sagebien, C.	Variation in diagnosis of compartment syndrome by surgeons treating tibial shaft fractures	2009	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring	insufficient data for target comparison
Paletta, C. E.; Dehghan, K.	Compartment syndrome in children	1994	Annals of Plastic Surgery	PICO 4: Pressure Monitoring	Insufficient data for target comparison
Petrisor, B.; Anderson, S.; Court-Brown, C. M.	Infection after reamed intramedullary nailing of the tibia: A case series review	2005	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring	Insufficient data for target comparison
Pradka, L.	Use of the wick catheter for diagnosing and monitoring compartment syndrome	1985	Orthopaedic Nursing	PICO 4: Pressure Monitoring	review

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Ramprasath, D. R.; Thirunarayanan, V.; David, J.; Anbazhagan, S.	Effectiveness of Serial Measurement of Differential Pressure in Closed Tibial Diaphyseal Fractures in Diagnosing Acute Compartment Syndrome using Whiteside's Technique	2016	Malaysian Orthopaedic Journal	PICO 4: Pressure Monitoring	Insufficient data for target condition; 2 ACS
Russell, W. L.; Apyan, P. M.	Use of wick catheter compartment measurements in the vascular trauma patient	1985	Journal of the Tennessee Medical Association	PICO 4: Pressure Monitoring	case reports
Russell, W. L.; Apyan, P. M.; Burns, R. P.	An electronic technique for compartment pressure measurement using the wick catheter	1985	Surgery, Gynecology & Obstetrics	PICO 4: Pressure Monitoring	summary
Russell, W. L.; Apyan, P. M.; Burns, R. P.	Utilization and wide clinical implementation using the wick catheter for compartment pressure measurement	1985	Surgery, Gynecology & Obstetrics	PICO 4: Pressure Monitoring	confounded population for diagnostic comparison
Shadgan, B.; Menon, M.; O'Brien, P. J.; Reid, W. D.	Diagnostic techniques in acute compartment syndrome of the leg	2008	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring	review
Shah, D. M.; Bock, D. E.; Darling, R. C., 3rd; Chang, B. B.; Kupinski, A. M.; Leather, R. P.	Beneficial effects of hypertonic mannitol in acute ischemia--reperfusion injuries in humans	1996	Cardiovascular Surgery	PICO 4: Pressure Monitoring	insufficient data for target condition
Shakespeare, D. T.; Henderson, N. J.	Compartmental pressure changes during calcaneal traction in tibial fractures	1982	Journal of Bone & Joint Surgery - British Volume	PICO 4: Pressure Monitoring	<20 patients; n5
Shuler, M. S.; Reisman, W. M.; Kinsey, T. L.; Whitesides, T. E., Jr.; Hammerberg, E. M.; Davila, M. G.; Moore, T. J.	Correlation between muscle oxygenation and compartment pressures in acute compartment syndrome of the leg	2010	Journal of Bone & Joint Surgery - American Volume	PICO 4: Pressure Monitoring	case control; 14 pts with control limbs

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Steinberg, B.; Riel, R.; Armitage, M.; Berrey, H.	Quantitative muscle hardness as a noninvasive means for detecting patients at risk of compartment syndromes	2011	Physiological Measurement	PICO 4: Pressure Monitoring	healthy participants
Tharakan, S. J.; Subotic, U.; Kalisch, M.; Staubli, G.; Weber, D. M.	Compartment Pressures in Children With Normal and Fractured Forearms: A Preliminary Report	2016	Journal of Pediatric Orthopedics	PICO 4: Pressure Monitoring	pico not answered; no CS
Tian, S.; Lu, Y.; Liu, J.; Zhu, Y.; Cui, Y.; Lu, J.	Comparison of 2 available methods with Bland-Altman analysis for measuring intracompartmental pressure	2016	American Journal of Emergency Medicine	PICO 4: Pressure Monitoring	animal study; rabbits vs healthy humans
Triffitt, P. D.; Konig, D.; Harper, W. M.; Barnes, M. R.; Allen, M. J.; Gregg, P. J.	Compartment pressures after closed tibial shaft fracture. Their relation to functional outcome	1992	Journal of Bone and Joint Surgery - Series B	PICO 4: Pressure Monitoring	insufficient data; 0 CS pts
Turnbull, D.; Farid, A.; Hutchinson, S.; Shorthouse, A.; Mills, G. H.	Calf compartment pressures in the Lloyd-Davies position: a cause for concern?	2002	Anaesthesia	PICO 4: Pressure Monitoring	pico not answered; no CS
Uppal, G. S.; Smith, R. C.; Sherk, H. H.; Mooar, P.	Accurate compartment pressure measurement using the Intervenous Alarm Control (IVAC) Pump. Report of a technique	1992	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring	insufficient data for diagnostic comparison
Vaillancourt, C.; Shrier, I.; Vandal, A.; Falk, M.; Rossignol, M.; Vernec, A.; Somogyi, D.	Acute compartment syndrome: how long before muscle necrosis occurs?.[Erratum appears in CJEM. 2004 July;6(4):239]	2004	CJEM Canadian Journal of Emergency Medical Care	PICO 4: Pressure Monitoring	Insufficient data for target comparison
White, T. O.; Howell, G. E.; Will, E. M.; Court-Brown, C. M.; McQueen, M. M.	Elevated intramuscular compartment pressures do not influence outcome after tibial fracture	2003	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring	insufficient data for target comparison
Whitesides Jr, T. E.; Haney, T. C.; Harada, H.	A simple method for tissue pressure determination	1975	Archives of Surgery	PICO 4: Pressure Monitoring	case report

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Whitney, A.; O'Toole, R. V.; Hui, E.; Sciadini, M. F.; Pollak, A. N.; Manson, T. T.; Eglseder, W. A.; Andersen, R. C.; Lebrun, C.; Doro, C.; Nascone, J. W.	Do one-time intracompartmental pressure measurements have a high false-positive rate in diagnosing compartment syndrome?	2014	The Journal of Trauma and Acute Care Surgery	PICO 4: Pressure Monitoring	no ACS pts
Wilson, S. C.; Vrahas, M. S.; Berson, L.; Paul, E. M.	A simple method to measure compartment pressures using an intravenous catheter	1997	Orthopedics	PICO 4: Pressure Monitoring	no mention of patients
Wind, T. C.; Saunders, S. M.; Barfield, W. R.; Mooney, J. F., 3rd; Hartsock, L. A.	Compartment syndrome after low-energy tibia fractures sustained during athletic competition	2012	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring	insufficient data for target comparison
Acklin, Y. P.; Potocnik, P.; Sommer, C.	Compartment syndrome in dislocation and non-dislocation type proximal tibia fractures: analysis of 356 consecutive cases	2012	Archives of Orthopaedic & Trauma Surgery	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	insufficient data for target comparison outcome
Fukuda, I.; Chiyoya, M.; Taniguchi, S.; Fukuda, W.	Acute limb ischemia: contemporary approach	2015	General Thoracic and Cardiovascular Surgery	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	review
Goyal, S.; Naik, M. A.; Tripathy, S. K.; Rao, S. K.	Functional outcome of tibial fracture with acute compartment syndrome and correlation to deep posterior compartment pressure	2017	World Journal of Orthopedics	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	insufficient data for target outcomes
Koman, L. A.; Hardaker, W. T., Jr.; Goldner, J. L.	Wick catheter in evaluating and treating compartment syndromes	1981	Southern Medical Journal	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	Insufficient data for diagnostic comparison
Mars, M.; Hadley, G. P.	Raised compartmental pressure in children: a basis for management	1998	Injury	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	Insufficient data for target condition; n9

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Matsen, F. A., 3rd	Compartmental syndrome. An unified concept	1975	Clinical Orthopaedics & Related Research	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	review
Sullivan, C. M.; Mubarak, S. J.	Diagnosis and treatment of upper extremity compartment syndrome	1989	Techniques in Orthopaedics	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods	review
Frink, M.; Klaus, A. K.; Kuther, G.; Probst, C.; Gosling, T.; Kobbe, P.; Hildebrand, F.; Richter, M.; Giannoudis, P. V.; Krettek, C.; Pape, H. C.	Long term results of compartment syndrome of the lower limb in polytraumatised patients	2007	Injury	PICO 4: Pressure Monitoring; PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture; PICO 12: Wound Management	insufficient data for target comparison
Matsen, F. A., 3rd; Mayo, K. A.; Sheridan, G. W.; Krugmire, R. B., Jr.	Continuous monitoring of intramuscular pressure and its application to clinical compartmental syndromes	1977	Bibliotheca Anatomica	PICO 4: Pressure Monitoring; PICO 11: Pre-op Adjunctive Therapy	animal study
Turkmen, A.; Temel, M.	Algorithmic approach to the prevention of unnecessary fasciotomy in extremity snake bite	2016	Injury	PICO 4: Pressure Monitoring; PICO 11: Pre-op Adjunctive Therapy	insufficient data for target condition; 3 ACS
Halpern, A. A.; Nagel, D. A.	Anterior compartment pressures in patients with tibial fractures	1980	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring; PICO 13: Associative Fracture	no diagnosis of ACS
Kinner, B.; Tietz, S.; MÃ¼ller, F.; Prantl, L.; Nerlich, M.; Roll, C.	Outcome after complex trauma of the foot	2011	Journal of Trauma - Injury, Infection and Critical Care	PICO 4: Pressure Monitoring; PICO 13: Associative Fracture	Insufficient data for target comparison
Ozkayin, N.; Aktuglu, K.	Absolute compartment pressure versus differential pressure for the diagnosis of compartment syndrome in tibial fractures	2005	International Orthopaedics	PICO 4: Pressure Monitoring; PICO 13: Associative Fracture	insufficient data for target condition

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Kosir, R.; Moore, F. A.; Selby, J. H.; Cocanour, C. S.; Kozar, R. A.; Gonzalez, E. A.; Todd, S. R.	Acute lower extremity compartment syndrome (ALECS) screening protocol in critically ill trauma patients	2007	Journal of Trauma-Injury Infection & Critical Care	PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake	Insufficient data for target condition; 9 ACS
Tornetta, P., 3rd; Puskas, B. L.; Wang, K.	Compartment Syndrome of the Leg Associated With Fracture: An Algorithm to Avoid Releasing the Posterior Compartments	2016	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake	<10 pts per comparison group
Willey, R. F.; Corall, R. J.; French, E. B.	Non-invasive method for the measurement of anterior tibial compartment pressure	1982	Lancet	PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake	<20 patients; n7
Livingston, K.; Glotzbecker, M.; Miller, P. E.; Hresko, M. T.; Hedequist, D.; Shore, B. J.	Pediatric Nonfracture Acute Compartment Syndrome: A Review of 39 Cases	2016	Journal of Pediatric Orthopedics	PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake; PICO 10: Fasciotomy Methods	Insufficient data for target condition;
McQueen, M. M.; Duckworth, A. D.; Aitken, S. A.; Sharma, R. A.; Court-Brown, C. M.	Predictors of Compartment Syndrome After Tibial Fracture	2015	Journal of Orthopaedic Trauma	PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake; PICO 13: Associative Fracture	not best available evidence
Collinge, C.; Kuper, M.	Comparison of three methods for measuring intracompartmental pressure in injured limbs of trauma patients	2010	Journal of Orthopaedic Trauma	PICO 6: Pressure Methods	insufficient data for diagnostic comparison
Hammerberg, E. M.; Whitesides Jr, T. E.; Seiler, Iii J. G.	The reliability of measurement of tissue pressure in compartment syndrome	2012	Journal of Orthopaedic Trauma	PICO 6: Pressure Methods	Non-human; bovine model
Staudt, J. M.; Smeulders, M. J.; van der Horst, C. M.	Normal compartment pressures of the lower leg in children	2008	Journal of Bone & Joint Surgery - British Volume	PICO 6: Pressure Methods	all healthy pts

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Willy, C.; Gerngross, H.; Sterk, J.	Measurement of intracompartmental pressure with use of a new electronic transducer-tipped catheter system	1999	Journal of Bone & Joint Surgery - American Volume	PICO 6: Pressure Methods	not best available evidence
Ziv, I.; Zeligowski, A. A.; Elyashuv, O.; Mosheiff, R.; Lilling, M.; Segal, D.	Immediate care of crush injuries and compartment syndromes with the split-thickness skin excision	1990	Clinical Orthopaedics & Related Research	PICO 6: Pressure Methods	insufficient data for target comparison
Ball, C. G.; Kirkpatrick, A. W.; Yilmaz, S.; Monroy, M.; Nicolaou, S.; Salazar, A.	Renal allograft compartment syndrome: an underappreciated postoperative complication	2006	American Journal of Surgery	PICO 7: Alternative Diagnosis	Non-extremity; abdomen
Barrow, A. E.; Sheean, A. J.; Burns, T. C.	Return to duty following combat-related multi-ligamentous knee injury	2017	Injury	PICO 7: Alternative Diagnosis	Insufficient data for target condition
Feldberg, M. A.; Koehler, P. R.; van Waes, P. F.	Psoas compartment disease studied by computed tomography. Analysis of 50 cases and subject review	1983	Radiology	PICO 7: Alternative Diagnosis	irrelevant topic; abscesses
Giannotti, G.; Cohn, S. M.; Brown, M.; Varela, J. E.; McKenney, M. G.; Wiseberg, J. A.	Utility of near-infrared spectroscopy in the diagnosis of lower extremity compartment syndrome	2000	Journal of Trauma-Injury Infection & Critical Care	PICO 7: Alternative Diagnosis	insufficient data for target outcomes; 9 CS
Haaverstad, R.; Nilsen, G.; Myhre, H. O.; Saether, O. D.; Rinck, P. A.	The use of MRI in the investigation of leg oedema	1992	European Journal of Vascular Surgery	PICO 7: Alternative Diagnosis	insufficient data for target condition; 2 CS
Kim, D. J.; Cho, Y. J.; Park, S. H.; Lim, C.; Park, K. H.; Jheon, S. H.; Kim, J. S.	Near-Infrared Spectroscopy Monitoring for Early Detection of Limb Ischemia in Patients on Veno-Arterial Extracorporeal Membrane Oxygenation	2017	ASAIO Journal	PICO 7: Alternative Diagnosis	Insufficient data for target condition; 5 CS

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Leaming, D. B.; Casey, J. H.	Anterior tibial syndrome following aortography and associated with septicaemia	1963	Medical Journal of Australia	PICO 7: Alternative Diagnosis	case report
Pineton De Chambrun, M.; Luyt, C. E.; Beloncle, F.; Gousseff, M.; Mauhin, W.; Argaud, L.; Ledochowski, S.; Moreau, A. S.; Sonneville, R.; VerdiÃ¨re, B.; Merceron, S.; Zappella, N.; Landais, M.; Contou, D.; Demoule, A.; Paulus, S.; Souweine, B.; Lecomte, B.; Vieillard-Baron, A.; Terzi, N.; Azoulay, E.; Friolet, R.; Puidupin, M.; Devaquet, J.; Mazou, J. M.; Fedun, Y.; Mira, J. P.; Raphalen, J. H.; Combes, A.; Amoura, Z.	The Clinical Picture of Severe Systemic Capillary-Leak Syndrome Episodes Requiring ICU Admission	2017	Critical Care Medicine	PICO 7: Alternative Diagnosis	Insufficient data for target comparison; CS outcome
Schmidt, A.	Acute compartment syndrome: A promising future for its diagnosis and management	2012	Techniques in Orthopaedics	PICO 7: Alternative Diagnosis	review
Shuler, M. S.; Reisman, W. M.; Whitesides, T. E., Jr.; Kinsey, T. L.; Hammerberg, E. M.; Davila, M. G.; Moore, T. J.	Near-infrared spectroscopy in lower extremity trauma	2009	Journal of Bone & Joint Surgery - American Volume	PICO 7: Alternative Diagnosis	pico not answered; no CS
Sutter, M. E.; Turnipseed, S. D.; Diercks, D. B.; Samuel, P.; White, R. H.	Venous Ultrasound Testing for Suspected Thrombosis: Incidence of Significant Non-Thrombotic findings	2009	Journal of Emergency Medicine	PICO 7: Alternative Diagnosis	Insufficient data for target condition; 1 CS

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Topal, A. E.; Eren, M. N.; Celik, Y.	Management of non-traumatic acute limb ischemia and predictors of outcome in 270 thrombembolectomy cases	2011	International Angiology	PICO 7: Alternative Diagnosis	Insufficient data for target comparison
Totapally, B. R.	Epidemiology and Outcomes of Hospitalized Children with Necrotizing Soft-Tissue Infections	2017	Pediatric Infectious Disease Journal	PICO 7: Alternative Diagnosis	insufficient data for target comparison
Uzun, N.; Kiziltan, M. E.; Savrun, F. K.	1999 Marmara eartquake; peripheral nerve injuries - Electrophysiologic evaluation	2005	Electromyography and Clinical Neurophysiology	PICO 7: Alternative Diagnosis	insufficient data for target comparison
van Gruting, I. M. A.; Stankiewicz, A.; Thakar, R.; Inthout, J.; Santoro, G. A.; Sultan, A. H.	Imaging modalities for the detection of posterior compartment disorders in women with obstructed defaecation syndrome	2015	Cochrane Database of Systematic Reviews	PICO 7: Alternative Diagnosis	irrelevant topic; systematic review
Wen, T.; Deibert, C. M.; Siringo, F. S.; Spencer, B. A.	Positioning-related complications of minimally invasive radical prostatectomies	2014	Journal of Endourology	PICO 7: Alternative Diagnosis	Insufficient data for target condition
Zohn, D. A.; Leach, R. E.	The Role of the Electromyogram in the Diagnosis and Management of Anterior Tibial Compartment Syndrome	1964	Archives of Physical Medicine & Rehabilitation	PICO 7: Alternative Diagnosis	case reports
Schmidt, A. H.; Bosse, M. J.; Frey, K. P.; O'Toole, R. V.; Stinner, D. J.; Scharfstein, D. O.; Zipunnikov, V.; MacKenzie, E. J.; Metrc,	Predicting Acute Compartment Syndrome (PACS): The Role of Continuous Monitoring	2017	Journal of Orthopaedic Trauma	PICO 7: Alternative Diagnosis; PICO 1: Serum Biomarkers; PICO 4: Pressure Monitoring; PICO 8: Physical Exam Awake	insufficient data for target comparison
Reisman, W. M.; Shuler, M. S.; Roskosky, M.; Kinsey, T. L.; Freedman, B. A.	Use of Near-Infrared Spectroscopy to Detect Sustained Hyperaemia Following Lower Extremity Trauma	2016	Military Medicine	PICO 7: Alternative Diagnosis; PICO 13: Associative Fracture	insufficient data for target condition; no CS

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Roskosky, M.; Robinson, G.; Reisman, W.; Ziran, B.; Shuler, M. S.; Freedman, B.	Subcutaneous depth in a traumatized lower extremity	2014	The Journal of Trauma and Acute Care Surgery	PICO 7: Alternative Diagnosis; PICO 13: Associative Fracture	no patient had ACS
Wang, S. H.; Lin, K. Y.; Yang, J. J.; Chang, J. H.; Huang, G. S.; Lin, L. C.	The thickness of the anterior compartment does not indicate compartment syndrome in acutely traumatised legs?	2014	Injury	PICO 7: Alternative Diagnosis; PICO 4: Pressure Monitoring; PICO 6: Pressure Methods	Insufficient data for target condition; no cs
Jones, W. G., 2nd; Perry, M. O.; Bush, H. L., Jr.	Changes in tibial venous blood flow in the evolving compartment syndrome	1989	Archives of Surgery	PICO 7: Alternative Diagnosis; PICO 6: Pressure Methods	Insufficient data for target condition; 9 CS of 26
Leach, R. E.; Zohn, D. A.; Stryker, W. S.	Anterior Tibial Compartment Syndrome. Clinical and Electromyographic Aspects	1964	Archives of Surgery	PICO 7: Alternative Diagnosis; PICO 8: Physical Exam Awake	review; case report
Aita, D. J.; Kvamme, P.; Rice, J. C.; Kerstein, M. D.	Venous insufficiency: a late sequelae of four-compartment fasciotomy in the lower extremity?	1993	American Surgeon	PICO 8: Physical Exam Awake	Insufficient data for target comparison
Andrews, L. W.	Neurovascular assessment	1990	Advancing Clinical Care	PICO 8: Physical Exam Awake	review
Ashurst, J.; Cannon, R.	Approach and management of venomous snake bites: A guide for the primary care physician	2012	Osteopathic Family Physician	PICO 8: Physical Exam Awake	review
Baquie, P.; Brukner, P.	Injuries presenting to an Australian sports medicine centre: A 12-month study	1997	Clinical Journal of Sport Medicine	PICO 8: Physical Exam Awake	incidence study

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Bogdan, Y.; Tornetta, Iii P.; Leighton, R.; Dahn, U.; Sagi, H.; Nalley, C.; Sanders, D.; Siegel, J.; Mullis, B.; Bemenderfer, T.; Vallier, H.; Boyd, A.; Schmidt, A.; Westberg, J. R.; Egol, K. A.; Kottmeier, S.; Collinge, C.	Treatment and complications in orthopaedic trauma patients with symptomatic pulmonary embolism	2014	Journal of Orthopaedic Trauma	PICO 8: Physical Exam Awake	Insufficient data for target condition; 2 CS
Brukner, P.	Pain in the lower leg	1997	Australian Family Physician	PICO 8: Physical Exam Awake	review
Brumback, R. J.	Compartment syndrome in the polytrauma patient	1997	Techniques in Orthopaedics	PICO 8: Physical Exam Awake	review
Cambon-Binder, A.; Jehanno, P.; Tribout, L.; Valenti, P.; Simon, A. L.; Ilharreborde, B.; Mazda, K.	Pulseless supracondylar humeral fractures in children: vascular complications in a ten year series	2017	International Orthopaedics	PICO 8: Physical Exam Awake	insufficient data for target condition; 1 CS
Cascio, B. M.; Wilckens, J. H.; Ain, M. C.; Toulson, C.; Frassica, F. J.	Documentation of acute compartment syndrome at an academic health-care center	2005	Journal of Bone & Joint Surgery - American Volume	PICO 8: Physical Exam Awake	insufficient data for target comparison
Cestero, R. F.; Plurad, D.; Green, D.; Inaba, K.; Putty, B.; Benfield, R.; Lam, L.; Talving, P.; Demetriades, D.	Iliac artery injuries and pelvic fractures: A national trauma database analysis of associated injuries and outcomes	2009	Journal of Trauma - Injury, Infection and Critical Care	PICO 8: Physical Exam Awake	Insufficient data for target comparison
Fields, C. E.; Latifi, R.; Ivatury, R. R.	Brachial and forearm vessel injuries	2002	Surgical Clinics of North America	PICO 8: Physical Exam Awake	review
Gamulin, A.; Armenter-Duran, J.; Assal, M.; Hagon, O.; Dayer, R.	Conditions found among pediatric survivors during the early response to natural disaster: A prospective case study	2012	Journal of Pediatric Orthopaedics	PICO 8: Physical Exam Awake	Insufficient data for target condition; 4 CS

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Giri, S.; Risnes, K.; Uleberg, O.; Rogne, T.; Shrestha, S. K.; Nygaard Ã?, P.; Koju, R.; SolligÃ¥rd, E.	Impact of 2015 earthquakes on a local hospital in Nepal: A prospective hospital-based study	2018	PLoS ONE	PICO 8: Physical Exam Awake	insufficient data for target condition; 18 CS
Guerrero, A.; Gibson, K.; Kralovich, K. A.; Pipinos, I.; Agnostopolous, P.; Carter, Y.; Bulger, E.; Meissner, M.; Karmy-Jones, R.	Limb loss following lower extremity arterial trauma: what can be done proactively?	2002	Injury	PICO 8: Physical Exam Awake	insufficient data for diagnostic comparison
Hargens, A. R.; Akeson, W. H.; Mubarak, S. J.; Owen, C. A.; Garetto, L. P.	Tissue fluid states in compartment syndromes	1977	Bibliotheca Anatomica	PICO 8: Physical Exam Awake	<20 patients; n16
Holden, C. E.	Compartmental syndromes following trauma	1975	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake	review
Hungerford, D. S.	Pathogenetic considerations in ischemic necrosis of bone	1981	Canadian Journal of Surgery	PICO 8: Physical Exam Awake	review
Katz, L. M.; Nauriyal, V.; Nagaraj, S.; Finch, A.; Pearlstein, K.; Szymanowski, A.; Sproule, C.; Rich, P. B.; Guenther, B. D.; Pearlstein, R. D.	Infrared imaging of trauma patients for detection of acute compartment syndrome of the leg	2008	Critical Care Medicine	PICO 8: Physical Exam Awake	confounded patient population
Kikuchi, S.; Hasue, M.; Watanabe, M.	Ischemic contracture in the lower limb	1978	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake	insufficient data for target condition; 1 CS
Koskinen, E. V.; Nummi, J.	Traumatic ischaemia causing the anterior tibial compartment syndrome	1967	Annales Chirurgiae et Gynaecologiae Fenniae	PICO 8: Physical Exam Awake	insufficient data for target condition
Kumta, S. M.; Nehete, R.; Jain, L.	Challenges Posed by Delayed Presentation of Mutilating Hand Injuries	2016	Hand Clinics	PICO 8: Physical Exam Awake	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Lunceford, E. M., Jr.	The Peroneal Compartment Syndrome	1965	Southern Medical Journal	PICO 8: Physical Exam Awake	case report
Lupu, C. M.; Davis, B.	Tibial nailing causes compartment syndrome compared with external fixation in acute closed tibial fractures	2014	Techniques in Orthopaedics	PICO 8: Physical Exam Awake	Insufficient data for diagnostic comparison
Mehrez, M.	Complications of Fractures	1963	Journal of the Egyptian Medical Association	PICO 8: Physical Exam Awake	review
Meskey, T.; Hardcastle, J.; O'Toole, R. V.	Are certain fractures at increased risk for compartment syndrome after civilian ballistic injury?	2011	Journal of Trauma-Injury Infection & Critical Care	PICO 8: Physical Exam Awake	insufficient data for target comparison
Nelson, K. J.	Complicated fractures of the forearm	2004	Trauma	PICO 8: Physical Exam Awake	review
Prasarn, M. L.; Ouellette, E. A.	Acute compartment syndrome of the upper extremity	2011	Journal of the American Academy of Orthopaedic Surgeons	PICO 8: Physical Exam Awake	review
Ragland, R., 3rd; Moukoko, D.; Ezaki, M.; Carter, P. R.; Mills, J.	Forearm compartment syndrome in the newborn: report of 24 cases	2005	Journal of Hand Surgery - American Volume	PICO 8: Physical Exam Awake	retrospective case series
Rorabeck, C. H.; Macnab, I.	The pathophysiology of the anterior tibial compartmental syndrome	1975	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake	review
Sagban, T. A.; Duran, M.; Schelzig, H.; Lichtenberg, A.; Albert, A.; Antakyali, F.; Dalyanoglu, H.	Outcomes after complication of femoral cannulation for cardiac support	2015	Italian Journal of Vascular and Endovascular Surgery	PICO 8: Physical Exam Awake	insufficient data for target comparison
Sanderson, R. A.; Foley, R. K.; McIvor, G. W.; Kirkaldy-Willis, W. H.	Histological response on skeletal muscle to ischemia	1975	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake	review

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Schaffzin, J. K.; Prichard, H.; Bisig, J.; Gainor, P.; Wolfe, K.; Solan, L. G.; Webster, L.; McCarthy, J. J.	A collaborative system to improve compartment syndrome recognition	2013	Pediatrics	PICO 8: Physical Exam Awake	pico not answered; education/awareness intervention
Smith, R. M.; Dyer, G. S. M.; Antonangeli, K.; Arredondo, N.; Bedlion, H.; Dalal, A.; Deveny, G. M.; Joseph, G.; Lauria, D.; Lockhart, S. H.; Lucien, S.; Marsh, S.; Rogers, S. O.; Salzarulo, H.; Shah, S.; Toussaint, R. J.; Wagoner, J.	Disaster triage after the Haitian earthquake	2012	Injury	PICO 8: Physical Exam Awake	insufficient data for target comparison
Stark, E.; Stucken, C.; Trainer, G.; Tornetta, P., 3rd	Compartment syndrome in Schatzker type VI plateau fractures and medial condylar fracture-dislocations treated with temporary external fixation	2009	Journal of Orthopaedic Trauma	PICO 8: Physical Exam Awake	insufficient data for target condition
Su, H. Y.; Li, Y. H.; Tang, C. N.; Su, C. I.; Tsai, M. J.	Can surgery in patient with Protobothrops mucrosquamatus envenomation be predicted in emergency department?	2016	Hong Kong Journal of Emergency Medicine	PICO 8: Physical Exam Awake	Insufficient data for target condition; 5 CS
Tanaka, D.; Hirose, H.; Cavarocchi, N.; Entwistle, J. W. C.	The Impact of Vascular Complications on Survival of Patients on Venoarterial Extracorporeal Membrane Oxygenation	2016	Annals of Thoracic Surgery	PICO 8: Physical Exam Awake	Insufficient data for diagnostic comparison
Tekin, R.; Sula, B.; Cakir, G.; Aktar, F.; Deveci, Ã?; Yolbas, I.; Ã?elen, M. K.; Bekcibasi, M.; Palanci, Y.; Dogan, E.	Comparison of snakebite cases in children and adults	2015	European Review for Medical and Pharmacological Sciences	PICO 8: Physical Exam Awake	insufficient data for target condition; 5 fasciotomies

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Ziran, B. H.; Becher, S. J.	Radiographic predictors of compartment syndrome in tibial plateau fractures	2013	Journal of Orthopaedic Trauma	PICO 8: Physical Exam Awake	pico not answered; CS outcome
Zuchelli, D.; Divaris, N.; McCormack, J. E.; Huang, E. C.; Chaudhary, N. D.; Vosswinkel, J. A.; Jawa, R. S.	Extremity compartment syndrome following blunt trauma: a level I trauma center's 5-year experience	2017	Journal of Surgical Research	PICO 8: Physical Exam Awake	insufficient data for target comparison; CS outcome
Cascio, B. M.; Pateder, D. B.; Wilckens, J. H.; Frassica, F. J.	Compartment syndrome: time from diagnosis to fasciotomy	2005	Journal of Surgical Orthopaedic Advances	PICO 8: Physical Exam Awake; PICO 10: Fasciotomy Methods	insufficient data for target comparison
Mao, Y. C.; Liu, P. Y.; Chiang, L. C.; Lai, C. S.; Lai, K. L.; Ho, C. H.; Wang, T. H.; Yang, C. C.	Naja atra snakebite in Taiwan	2017	Clinical Toxicology: The Official Journal of the American Academy of Clinical Toxicology & European Association of Poisons Centres & Clinical Toxicologists	PICO 8: Physical Exam Awake; PICO 10: Fasciotomy Methods	insufficient data for target comparison
Martinez, S. F.; Steingard, M. A.; Steingard, P. M.	Thigh Compartment Syndrome	1993	Physician & Sportsmedicine	PICO 8: Physical Exam Awake; PICO 10: Fasciotomy Methods	Review; case report
Chang, Y. H.; Tu, Y. K.; Yeh, W. L.; Hsu, R. W.	Tibial plateau fracture with compartment syndrome: a complication of higher incidence in Taiwan	2000	Chang Gung Medical Journal	PICO 8: Physical Exam Awake; PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture; PICO 6: Pressure Methods	insufficient data for target comparison
Kim, J. Y.; Schierle, C. F.; Subramanian, V. S.; Birman, M. V.; Kloeters, O.; Forte, A. J.; Basu, C.	A prognostic model for the risk of development of upper extremity compartment syndrome in the setting of brachial artery injury	2009	Annals of Plastic Surgery	PICO 8: Physical Exam Awake; PICO 12: Wound Management	Insufficient data for target comparison; risk of CS

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B.; Wall, M. J., Jr.; Epstein, M.					
Gerdin, M.; Wladis, A.; Von Schreeb, J.	Surgical management of closed crush injury-induced compartment syndrome after earthquakes in resource-scarce settings	2012	Journal of Trauma and Acute Care Surgery	PICO 8: Physical Exam Awake; PICO 13: Associative Fracture	systematic review
Kurt, N.; KÃ¼Ã§Ã¼k, H. F.; Demirhan, R.; Altaca, G.	Crush injury in two earthquake disasters within a 3-month period	2003	European Journal of Trauma	PICO 8: Physical Exam Awake; PICO 13: Associative Fracture	insufficient data for target comparison
Mithofer, K.; Lhowe, D. W.; Vrahas, M. S.; Altman, D. T.; Altman, G. T.	Clinical spectrum of acute compartment syndrome of the thigh and its relation to associated injuries	2004	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake; PICO 13: Associative Fracture	insufficient data for target comparison; <10 per ACS group
Gelberman, R. H.; Garfin, S. R.; Hergenroeder, P. T.; Mubarak, S. J.; Menon, J.	Compartment syndromes of the forearm: diagnosis and treatment	1981	Clinical Orthopaedics & Related Research	PICO 8: Physical Exam Awake; PICO 6: Pressure Methods	insufficient data for target comparison
Phillips, J. H.; Mackinnon, S. E.; Beatty, S. E.	Vibratory sensory testing in acute compartment syndromes: A clinical and experimental study	1987	Plastic and Reconstructive Surgery	PICO 8: Physical Exam Awake; PICO 6: Pressure Methods	<20 patients; n11
Aars, H.	The anterior tibial syndrome	1961	Journal of the Oslo City Hospitals	PICO 10: Fasciotomy Methods	case reports
Abene, A. J.; Esterhai, J. L., Jr.	Soft tissue management of compartment syndrome fasciotomy and Gustilo and Anderson Type IIIb open fracture wounds	1997	Techniques in Orthopaedics	PICO 10: Fasciotomy Methods	review

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Andro, C.; Dubrana, F.; Marcillaud, G.; Rouvillain, J. L.; Gunepin, F. X.; Dewerpe, P.; Guilbert, S.; Wessely, L.; Buisson, P.; Chicault, P.; Nguyen-Khanh, J. P.; Brune, T.; Dhenain, M.; Maugars, Y.	Painful medial knee compartment syndrome in over-45 year-olds: I--medical or surgical management: a series of 174 patients	2011	Orthopaedics & traumatology, surgery & research	PICO 10: Fasciotomy Methods	pico not answered; no CS
Anonymous,	Erratum for "acute pediatric leg compartment syndrome in chronic myeloid leukemia".[Erratum for Orthopedics. 2014 Nov;37(11):e1036-9 Note: Trunzter, Jeremy [corrected to Truntzer, Jeremy]; PMID: 25361367]	2015	Orthopedics	PICO 10: Fasciotomy Methods	not a clinical study
Asgari, M. M.; Spinelli, H. M.	The vessel loop shoelace technique for closure of fasciotomy wounds	2000	Annals of Plastic Surgery	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Auld, T. S.; Hwang, J. S.; Stekas, N.; Gibson, P. D.; Sirkin, M. S.; Reilly, M. C.; Adams, M. R.	The correlation between the OTA/AO classification system and compartment syndrome in both bone forearm fractures	2017	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Bernhard, W. N.; Tarantino, D. P.; Gerold, K. B.	Critical care management of the trauma patient	1993	International Anesthesiology Clinics	PICO 10: Fasciotomy Methods	incidence and review
Blick, S. S.; Brumback, R. J.; Poka, A.; Burgess, A. R.; Ebraheim, N. A.	Compartment syndrome in open tibial fractures	1986	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods	insufficient data; ACS as outcome
Bradley, E. L., 3rd	The anterior tibial compartment syndrome	1973	Surgery, Gynecology & Obstetrics	PICO 10: Fasciotomy Methods	review

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Branco, B. C.; Inaba, K.; Barmparas, G.; Schnuriger, B.; Lustenberger, T.; Talving, P.; Lam, L.; Demetriades, D.	Incidence and predictors for the need for fasciotomy after extremity trauma: a 10-year review in a mature level I trauma centre	2011	Injury	PICO 10: Fasciotomy Methods	insufficient data for target condition
Broom, A.; Schur, M. D.; Arkader, A.; Flynn, J.; Gornitzky, A.; Choi, P. D.	Compartment syndrome in infants and toddlers	2016	Journal of Childrens Orthopaedics	PICO 10: Fasciotomy Methods	<20 patients; n15
Brown, C. M.; Vitale, G. C.; Evers, B. M.; Richardson, J. D.	Compartment syndromes and the use of fasciotomy	1987	Journal of the Kentucky Medical Association	PICO 10: Fasciotomy Methods	review
Brown, R. L.; Greenhalgh, D. G.; Kagan, R. J.; Warden, G. D.	The adequacy of limb escharotomies-fasciotomies after referral to a major burn center	1994	Journal of Trauma-Injury Infection & Critical Care	PICO 10: Fasciotomy Methods	insufficient data for target condition
Burg, M. E.	Compartment syndrome	1983	Critical Care Quarterly	PICO 10: Fasciotomy Methods	review
Chenevey, B.; Sexton-Stone, K.	Lower limb ischemia: an iatrogenic complication of IABP	1985	DCCN - Dimensions of Critical Care Nursing	PICO 10: Fasciotomy Methods	Irrelevant topic; ischemia
Christoffersen, J. K.; Hove, L. D.; Mikkelsen, K. L.; Krogsgaard, M. R.	Well Leg Compartment Syndrome After Abdominal Surgery	2017	World Journal of Surgery	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Cohen, M. S.; Garfin, S. R.; Hargens, A. R.; Mubarak, S. J.	Acute compartment syndrome. Effect of dermotomy on fascial decompression in the leg	1991	Journal of Bone & Joint Surgery - British Volume	PICO 10: Fasciotomy Methods	<20 patients; n8
Cui, S.; Bauer, J. M.; Mir, H.; Cannada, L. K.	Bilateral tibial shaft fractures: A multicenter analysis	2017	Current Orthopaedic Practice	PICO 10: Fasciotomy Methods	insufficient data for target condition; CS outcome
Darracq, M. A.; Cantrell, F. L.; Klauk, B.; Thornton, S. L.	A chance to cut is not always a chance to cure- fasciotomy in the treatment of rattlesnake envenomation: A	2015	Toxicon	PICO 10: Fasciotomy Methods	Insufficient data for target condition

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	retrospective poison center study				
Dente, C. J.; Feliciano, D. V.; Rozycki, G. S.; Cava, R. A.; Ingram, W. L.; Salomone, J. P.; Nicholas, J. M.; Kanakasundaram, D.; Ansley, J. P.	A review of upper extremity fasciotomies in a level I trauma center	2004	American Surgeon	PICO 10: Fasciotomy Methods	insufficient data for target comparison; no comparison grps
Diwan, A.	Lower leg fasciotomy: 2-Incision technique	2012	Techniques in Orthopaedics	PICO 10: Fasciotomy Methods	review
Dombrowski, R. M.	Compartment syndromes	1998	Trauma	PICO 10: Fasciotomy Methods	review
Doukas, W. C.; Hayda, R. A.; Frisch, H. M.; Andersen, R. C.; Mazurek, M. T.; Ficke, J. R.; Keeling, J. J.; Pasquina, P. F.; Wain, H. J.; Carlini, A. R.; MacKenzie, E. J.	The Military Extremity Trauma Amputation/Limb Salvage (METALS) study: Outcomes of amputation versus limb salvage following major lower-extremity Trauma	2013	Journal of Bone and Joint Surgery - Series A	PICO 10: Fasciotomy Methods	insufficient data for target condition
du Plessis, H. J.; Marais, T. J.; van Wyk, F. A.; Mieny, C. J.	Compartment syndrome and fasciotomy	1983	South African Journal of Surgery	PICO 10: Fasciotomy Methods	Insufficient data for target condition; 1 CS
Dulhunty, J. M.; Boots, R. J.; Rudd, M. J.; Muller, M. J.; Lipman, J.	Increased fluid resuscitation can lead to adverse outcomes in major-burn injured patients, but low mortality is achievable	2008	Burns	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Eaton, R. G.	Hand problems in children. A timetable for management	1967	Pediatric Clinics of North America	PICO 10: Fasciotomy Methods	review
Ebraheim, N. A.; Siddiqui, S.; Raberding, C.	A Single-Incision Fasciotomy for Compartment Syndrome of the Lower Leg	2016	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods	no comparison group

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Farahvash, M. R.; Yegane, R. A.; Bashashati, M.; Ahmadi, M.; Tabrizi, N.	Surgical approach to hydrocarbon injection in upper extremities: case series	2009	International Journal Of Surgery	PICO 10: Fasciotomy Methods	pico not answered; CS outcome
Farber, A.; Tan, T. W.; Hamburg, N. M.; Kalish, J. A.; Joglar, F.; Onigman, T.; Rybin, D.; Doros, G.; Eberhardt, R. T.	Early fasciotomy in patients with extremity vascular injury is associated with decreased risk of adverse limb outcomes: a review of the National Trauma Data Bank	2012	Injury	PICO 10: Fasciotomy Methods	insufficient data for target condition
Feliciano, D. V.; Cruse, P. A.; Spjut-Patrinely, V.; Burch, J. M.; Mattox, K. L.	Fasciotomy after trauma to the extremities	1988	American Journal of Surgery	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Field, C. K.; Senkowsky, J.; Hollier, L. H.; Kvamme, P.; Saroyan, R. M.; Rice, J. C.; Rush, D. S.; Kerstein, M. D.	Fasciotomy in vascular trauma: is it too much, too often?	1994	American Surgeon	PICO 10: Fasciotomy Methods	insufficient data for target condition
Fitzgerald, A. M.; Gaston, P.; Wilson, Y.; Quaba, A.; McQueen, M. M.	Long-term sequelae of fasciotomy wounds	2000	British Journal of Plastic Surgery	PICO 10: Fasciotomy Methods	Insufficient data for target comparison
Fowler, P. J.; Willis, R. B.	Vascular compartment syndromes	1975	Canadian Journal of Surgery	PICO 10: Fasciotomy Methods	case reports
Frangides, C. Y.; Koulouras, V.; Kouni, S. N.; Tzortzatos, G. V.; Nikolaou, A.; Pneumaticos, J.; Pierrakeas, C.; Niarchos, C.; Kounis, N. G.; Koutsojannis, C. M.	Snake venom poisoning in Greece. Experiences with 147 cases	2006	European Journal of Internal Medicine	PICO 10: Fasciotomy Methods	insufficient data for target condition; 2 CS
Gee, W.	Compartment compression syndrome	1988	Emergency Care Quarterly	PICO 10: Fasciotomy Methods	review

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George, S. M.; Hsu, J. R.; Kragh, J.; Stinner, D. J.	Documentation of acute compartment syndrome during medical evacuation	2015	Journal of Surgical Orthopaedic Advances	PICO 10: Fasciotomy Methods	Insufficient data for target comparison
Giannoudis, P. V.; Harwood, P. J.; Kontakis, G.; Allami, M.; Macdonald, D.; Kay, S. P.; Kind, P.	Long-term quality of life in trauma patients following the full spectrum of tibial injury (fasciotomy, closed fracture, grade IIIB/IIIC open fracture and amputation)	2009	Injury	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Girard-Martel, C.; Gagnon, M.	Acute Bilateral Compartment Syndrome Secondary to Polydipsia-Induced Severe Hyponatremia	2015	Clinical Schizophrenia & Related Psychoses	PICO 10: Fasciotomy Methods	case report
Glancy, G. L.	Compartment syndromes	1976	ONA Journal	PICO 10: Fasciotomy Methods	review
Godfrey, B. W.; Martin, A.; Chestovich, P. J.; Lee, G. H.; Ingalls, N. K.; Saldanha, V.	Patients with multiple traumatic amputations: An analysis of operation enduring freedom joint theatre trauma registry data	2017	Injury	PICO 10: Fasciotomy Methods	Insufficient data for target conditions; 4 CS
Gresh, M.	Compartment syndrome in the pediatric patient	2017	Pediatrics in Review	PICO 10: Fasciotomy Methods	review
Hak, D. J.; Lee, M.; Gotham, D. R.	Influence of prior fasciotomy on infection after open reduction and internal fixation of tibial plateau fractures	2010	Journal of Trauma-Injury Infection & Critical Care	PICO 10: Fasciotomy Methods	<10 pts per comparison group
Harrah, J.; Gates, R.; Carl, J.; Harrah, J. D.	A simpler, less expensive technique for delayed primary closure of fasciotomies	2000	American Journal of Surgery	PICO 10: Fasciotomy Methods	review; 6 pts
Hughes, C. W.; Lineberger, E. C.; Bowers, W. F.	Anterior tibial compartment syndrome: a plea for early surgical treatment	1961	Military Medicine	PICO 10: Fasciotomy Methods	case reports
Iyem, H.; Eren, M. N.	Should embolectomy be performed in late acute lower extremity arterial occlusions?	2009	Vascular Health & Risk Management	PICO 10: Fasciotomy Methods	pico not answered; CS outcome

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Janzing, H. M.	Epidemiology, Etiology, Pathophysiology and Diagnosis of the Acute Compartment Syndrome of the Extremity	2007	European Journal of Trauma & Emergency Surgery	PICO 10: Fasciotomy Methods	systematic review
Jauregui, J. J.; Yarmis, S. J.; Tsai, J.; Onuoha, K. O.; Illical, E.; Paulino, C. B.	Fasciotomy closure techniques	2017	Journal of Orthopaedic Surgery	PICO 10: Fasciotomy Methods	systematic review
Jensen, S. L.; Sandermann, J.	Compartment syndrome and fasciotomy in vascular surgery. A review of 57 cases	1997	European Journal of Vascular & Endovascular Surgery	PICO 10: Fasciotomy Methods	not best available evidence
Johnson, S. B.; Weaver, F. A.; Yellin, A. E.; Kelly, R.; Bauer, M.	Clinical results of decompressive dermotomy-fasciotomy	1992	American Journal of Surgery	PICO 10: Fasciotomy Methods	no comparison group
Kalb, R. L.	Preventing the sequelae of compartment syndrome	1999	Hospital practice (1995) Hospital practice	PICO 10: Fasciotomy Methods	review
Kalish, J.; Nguyen, T.; Hamburg, N.; Eberhardt, R.; Rybin, D.; Doros, G.; Farber, A.	Associated venous injury significantly complicates presentation, management, and outcomes of axillosubclavian arterial trauma	2012	International Journal of Angiology	PICO 10: Fasciotomy Methods	pico not answered; CS outcome
Kashuk, J. L.; Moore, E. E.; Pinski, S.; Johnson, J. L.; Moore, J. B.; Morgan, S.; Cothren, C. C.; Smith, W.	Lower extremity compartment syndrome in the acute care surgery paradigm: safety lessons learned	2009	Patient Safety in Surgery [Electronic Resource]	PICO 10: Fasciotomy Methods	no comparison group
Khalil, I.	Pitfalls in the management of compartmental syndromes	1986	Problems in General Surgery	PICO 10: Fasciotomy Methods	review
Khan, M. I.; Nadeem, I. A.	Revascularization Of Late-Presenting Acute Limb Ischaemia And Limb Salvage	2016	Journal of Ayub Medical College, Abbottabad: JAMC	PICO 10: Fasciotomy Methods	insufficient data for target condition and outcomes

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Kistler, J. M.; Ilyas, A. M.; Thoder, J. J.	Forearm Compartment Syndrome: Evaluation and Management	2018	Hand Clinics	PICO 10: Fasciotomy Methods	review
Kochhar, V. L.; Saxena, A. K.	Anterior tibial compartment syndrome	1986	Journal of the Indian Medical Association	PICO 10: Fasciotomy Methods	case report
Kragh, J. F., Jr.; Dubick, M. A.; Aden, J. K., 3rd; McKeague, A. L.; Rasmussen, T. E.; Baer, D. G.; Blackbourne, L. H.	U.S. Military Experience From 2001 to 2010 With Extremity Fasciotomy in War Surgery	2016	Military Medicine	PICO 10: Fasciotomy Methods	insufficient data for target condition
Kragh, J. F., Jr.; San Antonio, J.; Simmons, J. W.; Mace, J. E.; Stinner, D. J.; White, C. E.; Fang, R.; Aden, J. K.; Hsu, J. R.; Eastridge, B. J.; Jenkins, D. H.; Ritchie, J. D.; Hardin, M. O.; Ritenour, A. E.; Wade, C. E.; Blackbourne, L. H.	Compartment syndrome performance improvement project is associated with increased combat casualty survival	2013	The Journal of Trauma and Acute Care Surgery	PICO 10: Fasciotomy Methods	not best available evidence
Kragh, J. F., Jr.; Wade, C. E.; Baer, D. G.; Jones, J. A.; Walters, T. J.; Hsu, J. R.; Wenke, J. C.; Blackbourne, L. H.; Holcomb, J. B.	Fasciotomy rates in operations enduring freedom and iraqi freedom: association with injury severity and tourniquet use	2011	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods	incidence rates for fasciotomy
Kricun, M. E.	Wrist arthrography	1984	Clinical Orthopaedics & Related Research	PICO 10: Fasciotomy Methods	review
Kunkel, M. G.; Lynn, R. B.	The anterior tibial compartment syndrome	1958	Canadian Journal of Surgery	PICO 10: Fasciotomy Methods	review
Lagerstrom, C. F.; Reed, R. L., 2nd; Rowlands, B. J.; Fischer, R. P.	Early fasciotomy for acute clinically evident posttraumatic compartment syndrome	1989	American Journal of Surgery	PICO 10: Fasciotomy Methods	Insufficient data for target comparison

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Lintz, F.; Colombier, J. A.; Letenneur, J.; Gouin, F.	Management of long-term sequelae of compartment syndrome involving the foot and ankle	2009	Foot & Ankle Internation al	PICO 10: Fasciotomy Methods	<20 patients; n10
Lisle, D. K.; Tucker, J. B.	Exertional compartment syndrome in an equestrian does inadequate staffing compromise healthcare?	2004	Physician & Sportsmedicine	PICO 10: Fasciotomy Methods	case study
Low, E. E.; Inkellis, E.; Morshed, S.	Complications and revision amputation following trauma-related lower limb loss	2017	Injury	PICO 10: Fasciotomy Methods	insufficient data for target condition
MÃ¤rdian, S.; Schaser, K. D.; Wichlas, F.; Jakobs, C.; Kraphol, B.; Schwabe, P.	Lower limb salvage: Indication and decision making for replantation, revascularisation and amputation	2014	Acta Chirurgiae Orthopaedicae et Traumatologiae Cechoslovaca	PICO 10: Fasciotomy Methods	systematic review
Maheshwari, R.; Taitsman, L. A.; Barei, D. P.	Single-incision fasciotomy for compartmental syndrome of the leg in patients with diaphyseal tibial fractures	2008	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Malik, A. A.; Khan, W. S.; Chaudhry, A.; Ihsan, M.; Cullen, N. P.	Acute compartment syndrome--a life and limb threatening surgical emergency	2009	Journal of Perioperative Practice	PICO 10: Fasciotomy Methods	review
Mann, R.; Gibran, N.; Engrav, L.; Heimbach, D.	Is immediate decompression of high voltage electrical injuries to the upper extremity always necessary?	1996	Journal of Trauma- Injury Infection & Critical Care	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Marchesi, M.; Marchesi, A.; Calori, G. M.; Cireni, L. V.; Sileo, G.; Merzagora, I.; Zoia, R.; Vaienti, L.; Morini, O.	A sneaky surgical emergency: Acute compartment syndrome. Retrospective analysis of 66 closed claims, medico-legal pitfalls and damages evaluation	2014	Injury	PICO 10: Fasciotomy Methods	insufficient data for target outcomes; legal assessment
Masini, B. D.; Racusin, A. W.; Wenke, J. C.;	Acute compartment syndrome of the thigh in combat casualties	2013	Journal of Surgical Orthopaedic Advances	PICO 10: Fasciotomy Methods	insufficient data for target comparison

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Gerlinger, T. L.; Hsu, J. R.					
Matsen, F. A., 3rd	Compartmental syndromes	1980	Hospital Practice	PICO 10: Fasciotomy Methods	review
McKeag, D. B.; Dolan, C.	Overuse syndromes of the lower extremity	1989	Physician and Sportsmedicine	PICO 10: Fasciotomy Methods	review
McKenney, M. G.; Nir, I.; Fee, T.; Martin, L.; Lentz, K.	A simple device for closure of fasciotomy wounds	1996	American Journal of Surgery	PICO 10: Fasciotomy Methods	<20 patients; n13
Modrall, J. G.; Sadjadi, J.; Ali, A. T.; Anthony, T.; Welborn, M. B., 3rd; Valentine, R. J.; Hynan, L. S.; Clagett, G. P.	Deep vein harvest: predicting need for fasciotomy	2004	Journal of Vascular Surgery	PICO 10: Fasciotomy Methods	insufficient data; 0 CS pts
Montgomery, W. S.	The anterior tibial syndrome	1960	North Carolina Medical Journal	PICO 10: Fasciotomy Methods	case report
Mravic, P. J.; Massey, D. M.	Compartment syndrome	1992	Journal of Vascular Nursing	PICO 10: Fasciotomy Methods	review
Mubarak, S. J.; Owen, C. A.	Double-incision fasciotomy of the leg for decompression in compartment syndromes	1977	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods	case series; cadavers included
Naidu, S. I.; Bergquist, V. F.	Compartment syndromes in the leg: a surgical emergency	1977	American Surgeon	PICO 10: Fasciotomy Methods	case reports
Palm, K.; Apodaca, A.; Spencer, D.; Costanzo, G.; Bailey, J.; Fortuna, G.; Blackbourne, L. H.; Spott, M. A.; Eastridge, B. J.	Evaluation of military trauma system practices related to complications after injury	2012	The Journal of Trauma and Acute Care Surgery	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Papalambros, E. L.; Panayiotopoulos, Y. P.; Bastounis, E.; Zavos, G.; Balas, P.	Prophylactic fasciotomy of the legs following acute arterial occlusion procedures	1989	International Angiology	PICO 10: Fasciotomy Methods	insufficient target outcomes

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Patman, R. D.	Compartmental syndromes in peripheral vascular surgery	1975	Clinical Orthopaedics & Related Research	PICO 10: Fasciotomy Methods	review
Paton, D. F.	The anterior/tibial/syndrome	1981	Practitioner	PICO 10: Fasciotomy Methods	review
Pattinson, J. P.; Kong, V. Y.; Bruce, J. L.; Oosthuizen, G. V.; Bekker, W.; Laing, G. L.; Wood, D.; Brysiewicz, P.; Clarke, D. L.	Defining the need for surgical intervention following a snakebite still relies heavily on clinical assessment: The experience in pietermaritzburg, South Africa	2017	South African Medical Journal	PICO 10: Fasciotomy Methods	insufficient data for target condition; 14 CS
Pinkowski, J. L.; Weiner, D. S.	Complications in proximal tibial osteotomies in children with presentation of technique	1995	Journal of Pediatric Orthopaedics	PICO 10: Fasciotomy Methods	Insufficient data for target condition; no CS
Pourzand, A.; Fakhri, B. A.; Azhough, R.; Hassanzadeh, M. A.; Hashemzadeh, S.; Bayat, A. M.	Management of high-risk popliteal vascular blunt trauma: Clinical experience with 62 cases	2010	Vascular Health and Risk Management	PICO 10: Fasciotomy Methods	insufficient data for target condition
Proehl, J. A.	Compartment syndrome.[Erratum appears in J Emerg Nurs 1989 Jan-Feb;15(1):7]	1988	Journal of Emergency Nursing	PICO 10: Fasciotomy Methods	review
Proehl, J. A.	Compartment syndrome	1988	Journal of emergency nursing: JEN : official publication of the Emergency Department Nurses Association	PICO 10: Fasciotomy Methods	review

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Rajan, D. K.; Patel, N. H.; Valji, K.; Cardella, J. F.; Brown, D. B.; Brountzos, E. N.; Clark, T. W. I.; Grassi, C. J.; Meranze, S. G.; Miller, D. L.; Neithamer, C. D.; Rholl, K.; Roberts, A.; Schwartzberg, M. S.; Swan, T. T.; Thorpe, P. E.; Towbin, R. B.; Sacks, D.	Quality Improvement Guidelines for Percutaneous Management of Acute Limb Ischemia	2009	Journal of Vascular and Interventional Radiology	PICO 10: Fasciotomy Methods	systematic review
Rammelt, S.; Zwipp, H.	Calcaneus fractures	2006	Trauma	PICO 10: Fasciotomy Methods	review
Ritenour, A. E.; Dorlac, W. C.; Fang, R.; Woods, T.; Jenkins, D. H.; Flaherty, S. F.; Wade, C. E.; Holcomb, J. B.	Complications after fasciotomy revision and delayed compartment release in combat patients	2008	Journal of Trauma-Injury Infection & Critical Care	PICO 10: Fasciotomy Methods	not best available evidence
Roberts, A. J.; Krishnasamy, P.; Quayle, J. M.; Houghton, J. M.	Outcomes of surgery for chronic exertional compartment syndrome in a military population	2015	Journal of the Royal Army Medical Corps	PICO 10: Fasciotomy Methods	chronic
Rodriguez-Merchan, E. C.	Musculo-skeletal manifestations of haemophilia	2016	Blood Reviews	PICO 10: Fasciotomy Methods	review
Rollins, D. L.; Bernhard, V. M.; Towne, J. B.	Fasciotomy: an appraisal of controversial issues	1981	Archives of Surgery	PICO 10: Fasciotomy Methods	confounded patients and treatments
Rorabeck, C. H.; Macnab, L.	Anterior tibial-compartment syndrome complicating fractures of the shaft of the tibia	1976	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods	insufficient data for target condition; 6 CS pts

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Rosales-Varo, A. P.; Roda-Murillo, O.; Prados-Olleta, N.; Garcia-Espona, M. A.	Coronal patellar osteotomy of the external facet combined with the release of the lateral retinaculum improves the clinical outcomes of isolated lateral release in lateral knee compartment syndrome	2016	Revista Espanola de Cirugia Ortopedica y Traumatologia	PICO 10: Fasciotomy Methods	Insufficient data for target comparison; not acute
Rubinstein, A. J.; Ahmed, I. H.; Vosbikian, M. M.	Hand Compartment Syndrome	2018	Hand Clinics	PICO 10: Fasciotomy Methods	review
Rush, D. S.; Frame, S. B.; Bell, R. M.; Berg, E. E.; Kerstein, M. D.; Haynes, J. L.	Does open fasciotomy contribute to morbidity and mortality after acute lower extremity ischemia and revascularization?	1989	Journal of Vascular Surgery	PICO 10: Fasciotomy Methods	Insufficient data for target outcomes
Sandzen Jr, S. C.	Crush injuries of the upper extremity	1990	American Family Physician	PICO 10: Fasciotomy Methods	review
Schmidt, C. A.; Rancic, Z.; Lachat, M. L.; Mayer, D. O.; Veith, F. J.; Wilhelm, M. J.	Hypothermic, initially oxygen-free, controlled limb reperfusion for acute limb ischemia	2015	Annals of Vascular Surgery	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Schonholtz, G. J.	Traumatic anterior tibial artery syndrome	1972	Southern Medical Journal	PICO 10: Fasciotomy Methods	review
Shelton, W. R.; Canale, S. T.	Fractures of the tibia through the proximal tibial epiphyseal cartilage	1979	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods	insufficient data; 1 CS outcome
Sher, M. H.	Principles in the management of arterial injuries associated with fracture/dislocations	1975	Annals of Surgery	PICO 10: Fasciotomy Methods	<20 patients; n10
Sheridan, G. W.; Matsen, F. A., 3rd	Fasciotomy in the treatment of the acute compartment syndrome	1976	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods	not best available evidence
Singer, A.	Surgical pros and cons. Compartmental syndromes	1979	Surgery, Gynecology & Obstetrics	PICO 10: Fasciotomy Methods	review

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Singh, A.; Ali, S.; Srivastava, R. N.	Evaluation of acute compartment syndrome of extremities in emergency room: A case series of 32 children	2015	Internet Journal of Medical Update	PICO 10: Fasciotomy Methods	not best available evidence
Skaggs, D. L.; Roy, A. K.; Vitale, M. G.; Pfiefer, C.; Baird, G.; Femino, D.; Kay, R. M.	Quality of evaluation and management of children requiring timely orthopaedic surgery before admission to a tertiary pediatric facility	2002	Journal of Pediatric Orthopedics	PICO 10: Fasciotomy Methods	insufficient data for target condition; 1 CS
Subotnick, S. I.	Compartment syndromes in the lower extremities	1975	Journal of the American Podiatry Association	PICO 10: Fasciotomy Methods	review
Trainor, T.	Knee dislocation	2000	Trauma	PICO 10: Fasciotomy Methods	review
Vaillancourt, C.; Shrier, I.; Falk, M.; Rossignol, M.; Vernec, A.; Somogyi, D.	Quantifying delays in the recognition and management of acute compartment syndrome	2001	CJEM Canadian Journal of Emergency Medical Care	PICO 10: Fasciotomy Methods	Insufficient data for target outcomes
Van Den Brand, J. G. H.; Sosef, N. L.; Verleisdonk, E. J. M. M.; Van Der Werken, C.	Acute Compartment Syndrome after Lower Leg Fracture: Long-Term Results of Prophylactic and Therapeutic Fasciotomy	2004	European Journal of Trauma	PICO 10: Fasciotomy Methods	not best available evidence
Velmahos, G. C.; Theodorou, D.; Demetriades, D.; Chan, L.; Berne, T. V.; Asensio, J.; Cornwell, Iii E. E.; Beizberg, H.; Stewart, B. M.	Complications and nonclosure rates of fasciotomy for trauma and related risk factors	1997	World Journal of Surgery	PICO 10: Fasciotomy Methods	not best available evidence
Verwiebe, E. G.; Kanlic, E. M.; Saller, J.; Abdelgawad, A.	Thigh compartment syndrome, presentation and complications	2009	Bosnian Journal of Basic Medical Sciences	PICO 10: Fasciotomy Methods	<20 patients; n9

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Vitale, G. C.; Richardson, J. D.; George, S. M., Jr.; Miller, F. B.	Fasciotomy for severe, blunt and penetrating trauma of the extremity	1988	Surgery, Gynecology & Obstetrics	PICO 10: Fasciotomy Methods	insufficient data for target comparison
Walker, M.; Gaston, S.	The effectiveness of different fasciotomy wound management treatment options following acute compartment syndrome: A systematic review protocol	2011	JBI Library of Systematic Reviewis	PICO 10: Fasciotomy Methods	systematic review
Warner, M. E.; LaMaster, L. M.; Thoeming, A. K.; Marienau, M. E.; Warner, M. A.	Compartment syndrome in surgical patients	2001	Anesthesiology	PICO 10: Fasciotomy Methods	prevalence study
Weaver, M. J.; Owen, T. M.; Morgan, J. H.; Harris, M. B.	Delayed Primary Closure of Fasciotomy Incisions in the Lower Leg: Do We Need to Change Our Strategy?	2015	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods	insufficient data for target outcomes
Webber, J.	Management of upper extremity injury: the first hour	1988	Emergency Care Quarterly	PICO 10: Fasciotomy Methods	review
Weinik, M. M.; Falco, F. J.	Acute and chronic compartment syndromes of the lower leg	1992	Journal of Back & Musculoskeletal Rehabilitation	PICO 10: Fasciotomy Methods	review
Winkes, M. B.; van Zantvoort, A. P.; de Bruijn, J. A.; Smeets, S. J.; van der Cruijsen-Raaijmakers, M.; Hoogeveen, A. R.; Scheltinga, M. R.	Fasciotomy for Deep Posterior Compartment Syndrome in the Lower Leg: A Prospective Study	2016	The American journal of sports medicine	PICO 10: Fasciotomy Methods	case series; no comparison grp
Wood, D. I.; Bruce, A. S. W.	Damage control orthopaedics	2015	Surgery (United Kingdom)	PICO 10: Fasciotomy Methods	review
Yang, C. C.; Chang, D. S.; Webb, L. X.	Vacuum-assisted closure for fasciotomy wounds following	2006	Journal of Surgical Orthopaedic Advances	PICO 10: Fasciotomy Methods	not best available evidence

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	compartment syndrome of the leg				
Yau, J.; Reach Jr, J. S.	Pediatric foot fractures: Metatarsal fractures	2009	Techniques in Orthopaedics	PICO 10: Fasciotomy Methods	review
Ziolkowski, N. I.; Zive, L.; Ho, E. S.; Zuker, R. M.	Timing of Presentation of Pediatric Compartment Syndrome and Its Microsurgical Implication: A Retrospective Review	2017	Plastic & Reconstructive Surgery	PICO 10: Fasciotomy Methods	not best available evidence
Zorrilla, P.; Marin, A.; Gomez, L. A.; Salido, J. A.	Shoelace technique for gradual closure of fasciotomy wounds	2005	Journal of Trauma-Injury Infection & Critical Care	PICO 10: Fasciotomy Methods	insufficient data for target comparison; no comparison grps
Lollo, L.; Grabinsky, A.	Clinical and functional outcomes of acute lower extremity compartment syndrome at a Major Trauma Hospital	2016	International Journal of Critical Illness and Injury Science	PICO 10: Fasciotomy Methods; PICO 11: Pre-op Adjunctive Therapy	Insufficient data for target condition
Flynn, J. M.; Bashyal, R. K.; Yeger-McKeever, M.; Garner, M. R.; Launay, F.; Sponseller, P. D.	Acute traumatic compartment syndrome of the leg in children: diagnosis and outcome	2011	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods; PICO 11: Pre-op Adjunctive Therapy; PICO 3: Fasciotomy Missed ACS	not best available evidence
Bae, D. S.; Kadiyala, R. K.; Waters, P. M.	Acute compartment syndrome in children: contemporary diagnosis, treatment, and outcome	2001	Journal of Pediatric Orthopedics	PICO 10: Fasciotomy Methods; PICO 12: Wound Management	not best available evidence
Duckworth, A. D.; Mitchell, S. E.; Molyneux, S. G.; White, T. O.; Court-Brown, C. M.; McQueen, M. M.	Acute compartment syndrome of the forearm	2012	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods; PICO 12: Wound Management	not best available evidence
Agarwal, N.; Shah, P. M.; Clauss, R. H.; Reynolds, B. M.; Stahl, W. M.	Experience with 115 civilian venous injuries	1982	Journal of Trauma-Injury Infection & Critical Care	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target condition

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Besch, L.; Waldschmidt, J. S.; Daniels-Wredenhagen, M.; Varoga, D.; Mueller, M.; Hilgert, R. E.; Mathiak, G.; Oestern, S.; Lippross, S.; Seekamp, A.	The treatment of intra-articular calcaneus fractures with severe soft tissue damage with a hinged external fixator or internal stabilization: long-term results	2010	Journal of Foot & Ankle Surgery	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target condition; no CS values
Branco, B. C.; Linnebur, M.; Boutrous, M. L.; Leake, S. S.; Inaba, K.; Charlton-Ouw, K. M.; Azizzadeh, A.; Fortuna, G.; DuBose, J. J.	The predictive value of multidetector CTA on outcomes in patients with below-the-knee vascular injury	2015	Injury	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target comparison
Dellon, A. L.	Clinical use of vibratory stimuli to evaluate peripheral nerve injury and compression neuropathy	1980	Plastic & Reconstructive Surgery	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target comparison
Gall, W. E.; Burr, J. W.; Wright, C. B.	Noninvasive evaluation and correlation of hemodynamics in "compartment syndrome"	1978	Surgical forum	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	animal study
Garrett, R. C.; Kerstein, M. D.	Compartment syndrome in the newborn	1987	Southern Medical Journal	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	case report
Gonzalez, R. P.; Scott, W.; Wright, A.; Phelan, H. A.; Rodning, C. B.	Anatomic location of penetrating lower-extremity trauma predicts compartment syndrome development	2009	American Journal of Surgery	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	incidence rates
Hope, M. J.; McQueen, M. M.	Acute compartment syndrome in the absence of fracture	2004	Journal of Orthopaedic Trauma	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target comparison
Partanen, T. A.; Vikatmaa, P.; Tukiainen, E.; Lepantalo, M.; Vuola, J.	Outcome after injections of crushed tablets in intravenous drug abusers in the Helsinki University Central Hospital	2009	European Journal of Vascular & Endovascular Surgery	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	insufficient data for target condition

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Stiles, Z. E.; Sparks, D. A.	Acute Extremity Compartment Syndrome Secondary to Statin-Induced Myopathy	2017	American Surgeon	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	review
Streubel, P. N.; Gardner, M. J.; Ricci, W. M.	Management of femur shaft fractures in obese patients	2011	Orthopedic Clinics of North America	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	review
Waterman, B. R.; Laughlin, M.; Kilcoyne, K.; Cameron, K. L.; Owens, B. D.	Surgical treatment of chronic exertional compartment syndrome of the leg: failure rates and postoperative disability in an active patient population	2013	Journal of Bone & Joint Surgery - American Volume	PICO 10: Fasciotomy Methods; PICO 13: Associative Fracture	chronic
Han, F.; Daruwalla, Z. J.; Shen, L.; Kumar, V. P.	A prospective study of surgical outcomes and quality of life in severe foot trauma and associated compartment syndrome after fasciotomy	2015	Journal of Foot & Ankle Surgery	PICO 10: Fasciotomy Methods; PICO 14: Foot ACS	<20 patients; n14
Ebraheim, N. A.; Abdelgawad, A. A.; Ebraheim, M. A.; Alla, S. R.	Bedside fasciotomy under local anesthesia for acute compartment syndrome: a feasible and reliable procedure in selected cases	2012	Journal of Orthopaedics & Traumatology	PICO 10: Fasciotomy Methods; PICO 15: Pain Management	insufficient data for target outcomes
Airaksinen, O.; Kolari, P. J.; Heiskanen, J.; Rantanen, P.	Intracompartmental pressure among patients suffering from overuse symptoms in the upper extremity. Effect of intermittent pneumatic compression	1991	Journal of Rehabilitation Sciences	PICO 11: Pre-op Adjunctive Therapy	<20 patients; n16
Brink, F.; Bachmann, S.; Lechler, P.; Frink, M.	Mechanism of injury and treatment of trauma-associated acute compartment syndrome of the foot	2014	European Journal of Trauma & Emergency Surgery	PICO 11: Pre-op Adjunctive Therapy	insufficient data for target outcomes

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Chamogeorgakis, T.; Lima, B.; Shafii, A. E.; Nagpal, D.; Pokersnik, J. A.; Navia, J. L.; Mason, D.; Gonzalez-Stawinski, G. V.	Outcomes of axillary artery side graft cannulation for extracorporeal membrane oxygenation	2013	Journal of Thoracic and Cardiovascular Surgery	PICO 11: Pre-op Adjunctive Therapy	insufficient data for target condition; 4 CS
Clarke, W. T.	Volkmann's ischemic contracture	1945	University of Toronto Medical Journal	PICO 11: Pre-op Adjunctive Therapy	case reports
Clarke, W. T.	Volkmann's ischaemic contracture	1946	Canadian Medical Association Journal	PICO 11: Pre-op Adjunctive Therapy	case reports
Karch, M. M.	Managing intra-articular fractures of the os calcis and associated injuries	2001	Trauma	PICO 11: Pre-op Adjunctive Therapy	review
Kent, M. L.; Buckenmaier, C. C.	Battlefield regional anesthesia: Evolution and future concepts	2012	Techniques in Regional Anesthesia and Pain Management	PICO 11: Pre-op Adjunctive Therapy	review
Korambayil, P. M.; Ambookan, P. V.; Abraham, S. V.; Ambalakat, A.	A multidisciplinary approach with hyperbaric oxygen therapy improve outcome in snake bite injuries	2015	Toxicology International	PICO 11: Pre-op Adjunctive Therapy	insufficient data for target condition; no fasciotomy
Lavery, G. G.; Bhavsar, M.	Critical care after major trauma: We need to think beyond the unit	2009	British Journal of Intensive Care	PICO 11: Pre-op Adjunctive Therapy	review
Leonard, J.; Zietlow, J.; Morris, D.; Berns, K.; Eyer, S.; Martinson, K.; Jenkins, D.; Zietlow, S.	A multi-institutional study of hemostatic gauze and tourniquets in rural civilian trauma	2016	Journal of Trauma and Acute Care Surgery	PICO 11: Pre-op Adjunctive Therapy	Insufficient data for target condition; 0 CS
Passos, E.; Dingley, B.; Smith, A.; Engels, P. T.; Ball, C. G.; Faidi, S.; Nathens, A.; Tien, H.	Tourniquet use for peripheral vascular injuries in the civilian setting	2014	Injury	PICO 11: Pre-op Adjunctive Therapy	Insufficient data for target condition
Radonic, V.; Baric, D.; Petricevic, A.; Kovacevic,	War injuries of the crural arteries	1995	British Journal of Surgery	PICO 11: Pre-op Adjunctive Therapy	not best available evidence

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H.; Sapunar, D.; Glavina-Durdov, M.					
Tay, A. K. L.; MacDonald, P. B.	Complications associated with treatment of multiple ligament injured (Dislocated) knee	2011	Sports Medicine and Arthroscopy Review	PICO 11: Pre-op Adjunctive Therapy	review
Fowler, J. R.; Kleiner, M. T.; Das, R.; Gaughan, J. P.; Rehman, S.	Assisted closure of fasciotomy wounds: A descriptive series and caution in patients with vascular injury	2012	Bone Joint Res	PICO 12: Wound Management	insufficient data for target comparison
Giannoudis, P. V.; Nicolopoulos, C.; Dinopoulos, H.; Ng, A.; Adedapo, S.; Kind, P.	The impact of lower leg compartment syndrome on health related quality of life	2002	Injury	PICO 12: Wound Management	Insufficient data for target condition
Govaert, G. A.; van Helden, S.	Ty-raps in trauma: a novel closing technique of extremity fasciotomy wounds	2010	Journal of Trauma-Injury Infection & Critical Care	PICO 12: Wound Management	insufficient data for target comparison; no comparison grps
Hake, M. E.; Etscheidt, J.; Chadayammuri, V. P.; Kirsch, J. M.; Mauffrey, C.	Age and dressing type as independent predictors of post-operative infection in patients with acute compartment syndrome of the lower leg	2017	International Orthopaedics	PICO 12: Wound Management	Confounded treatment
Kim, J. Y.; Buck, D. W., 2nd; Forte, A. J.; Subramanian, V. S.; Birman, M. V.; Schierle, C. F.; Kloeters, O.; Mattox, K. L.; Wall, M. J.; Epstein, M. J.	Risk factors for compartment syndrome in traumatic brachial artery injuries: an institutional experience in 139 patients	2009	Journal of Trauma-Injury Infection & Critical Care	PICO 12: Wound Management	insufficient data for target comparison
Labler, L.; Rancan, M.; Mica, L.; Harter, L.; Mihic-Probst, D.; Keel, M.	Vacuum-assisted closure therapy increases local interleukin-8 and vascular endothelial growth factor levels in traumatic wounds	2009	J Trauma	PICO 12: Wound Management	insufficient data for target condition

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Matsen, F. A., 3rd; Veith, R. G.	Compartmental syndromes in children	1981	Journal of Pediatric Orthopedics	PICO 12: Wound Management	Insufficient data for target comparison
Matt, S. E.; Johnson, L. S.; Shupp, J. W.; Kheirbek, T.; Sava, J. A.	Management of fasciotomy wounds--does the dressing matter?	2011	Am Surg	PICO 12: Wound Management	not best available evidence
Price, G.; Hodgins, N.; Fogarty, B.	A comparison of fasciotomy wound closure methods following extremity compartment syndrome at a regional trauma centre	2016	European Journal of Plastic Surgery	PICO 12: Wound Management	not best available evidence
Ris, H. B.; Furrer, M.; Stronsky, S.; Walpoth, B.; Nachbur, B.	Four-compartment fasciotomy and venous calf-pump function: long-term results	1993	Surgery	PICO 12: Wound Management	not best available evidence
Walker, M.; Kralik, D.; Porritt, K.	Fasciotomy wounds associated with acute compartment syndrome: A systematic review of effective treatment	2014	JBI Database of Systematic Reviews and Implementation Reports	PICO 12: Wound Management	systematic review
Walker, T.; Gruler, M.; Ziemer, G.; Bail, D. H.	The use of a silicon sheet for gradual wound closure after fasciotomy	2012	Journal of Vascular Surgery	PICO 12: Wound Management	insufficient data for target comparison
Yoon, P.	Late reconstruction for sequelae of compartment syndrome	2012	Techniques in Orthopaedics	PICO 12: Wound Management	review
Allmon, C.; Greenwell, P.; Paryavi, E.; Dubina, A.; O'Toole, R. V.	Radiographic Predictors of Compartment Syndrome Occurring After Tibial Fracture	2016	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	insufficient data for target condition
Arnander, M. W. T.; Newman, K. J. H.	Forearm fractures	2006	Surgery	PICO 13: Associative Fracture	review
Banderker, M. A.; Navsaria, P. H.; Edu, S.; Bekker, W.; Nicol, A. J.; Naidoo, N.	Civilian popliteal artery injuries	2012	South African Journal of Surgery	PICO 13: Associative Fracture	Insufficient data for target comparison
Bartle, D.; Keating, J.	Femoral and tibial fractures	2013	Surgery (United Kingdom)	PICO 13: Associative Fracture	review

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Beebe, M. J.; Auston, D.; Quade, J.; Serrano-Riera, R.; Shah, A.; Watson, D.; Sanders, R.; Mir, H.	OTA Classification is Highly Predictive of Acute Compartment Syndrome Following Tibia Fracture: A Cohort of 2885 Fractures	2017	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	Insufficient data for target comparison
Benns, M.; Miller, K.; Harbrecht, B.; Bozeman, M.; Nash, N.	Heroin-related compartment syndrome: An increasing problem for acute care surgeons	2017	American Surgeon	PICO 13: Associative Fracture	insufficient data for target comparison
Berg, R. J.; Okoye, O.; Inaba, K.; Konstantinidis, A.; Branco, B.; Meisel, E.; Barmparas, G.; Demetriades, D.	Extremity firearm trauma: The impact of injury pattern on clinical outcomes	2012	American Surgeon	PICO 13: Associative Fracture	Insufficient data for target comparison
Bhandari, M.	Fluid lavage of open wounds (FLOW): Design and rationale for a large, multicenter collaborative 2 Ã? 3 factorial trial of irrigating pressures and solutions in patients with open fractures	2010	BMC Musculoskeletal Disorders	PICO 13: Associative Fracture	pico not answered; no CS
Blackman, A. J.; Wall, L. B.; Keeler, K. A.; Schoenecker, P. L.; Luhmann, S. J.; O'Donnell, J. C.; Gordon, J. E.	Acute compartment syndrome after intramedullary nailing of isolated radius and ulna fractures in children	2014	Journal of Pediatric Orthopedics	PICO 13: Associative Fracture	insufficient data for target condition; 3CS
Blair, J. A.; Stoops, T. K.; Doarn, M. C.; Kemper, D.; Erdogan, M.; Griffing, R.; Sagi, H. C.	Infection and Nonunion After Fasciotomy for Compartment Syndrome Associated With Tibia Fractures: A Matched Cohort Comparison	2016	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	not best available evidence
Brandenburg, M. A.; Hawkins, L.; Quick, G.	Hand injuries, part 2: When nerves, vasculature, tendons, or ligaments are traumatized	2005	Consultant	PICO 13: Associative Fracture	review

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Browne, H. S.	Ischemic necrosis of muscle (acute anterior compartment syndrome) following repair of anterior compartment muscle hernias	1968	Rhode Island Medical Journal	PICO 13: Associative Fracture	case reports
Buckley, S. L.; Smith, G.; Sponseller, P. D.; Thompson, J. D.; Griffin, P. P.	Open fractures of the tibia in children	1990	Journal of Bone & Joint Surgery - American Volume	PICO 13: Associative Fracture	insufficient data; 2 CS pts
Busch, T.; SÃ®rbu, H.; Zenker, D.; Dalichau, H.	Vascular complications related to intraaortic balloon counterpulsation: An analysis of ten years experience	1997	Thoracic and Cardiovascular Surgeon	PICO 13: Associative Fracture	Insufficient data for target comparison; CS outcome
Court-Brown, C. M.; Byrnes, T.; McLaughlin, G.	Intramedullary nailing of tibial diaphyseal fractures in adolescents with open physes	2003	Injury	PICO 13: Associative Fracture	Insufficient data for target condition; 3 CS
Court-Brown, C.; McQueen, M.	Compartment syndrome delays tibial union	1987	Acta Orthopaedica Scandinavica	PICO 13: Associative Fracture	insufficient data for target condition; fracture fixation for ACS vs. non-ACS
Crespo, A. M.; Manoli, A., 3rd; Konda, S. R.; Egol, K. A.	Development of Compartment Syndrome Negatively Impacts Length of Stay and Cost After Tibia Fracture	2015	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	cost analysis; incidence study
De Brito, D.; Challoner, K. R.; Sehgal, A.; Mallon, W.	The injury pattern of a new law enforcement weapon: The police bean bag	2001	Annals of Emergency Medicine	PICO 13: Associative Fracture	insufficient data for target condition; 2 CS
Dellon, A. L.	Clinical use of vibratory stimuli to evaluate peripheral nerve injury and decompression neuropathy	1980	Plastic and Reconstructive Surgery	PICO 13: Associative Fracture	insufficient data for target condition; 9 ACS
Donnan, L. T.; Saleh, M.; Rigby, A. S.	Acute correction of lower limb deformity and simultaneous lengthening with a monolateral fixator	2003	Journal of Bone and Joint Surgery - Series B	PICO 13: Associative Fracture	pico not answered; no CS

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Dua, A.; Patel, B.; Desai, S. S.; Holcomb, J. B.; Wade, C. E.; Coogan, S.; Fox, C. J.	Comparison of military and civilian popliteal artery trauma outcomes	2014	Journal of Vascular Surgery	PICO 13: Associative Fracture	insufficient data for target comparison
Dubina, A. G.; Paryavi, E.; Manson, T. T.; Allmon, C.; O'Toole, R. V.	Surgical site infection in tibial plateau fractures with ipsilateral compartment syndrome	2017	Injury	PICO 13: Associative Fracture	insufficient data for target comparison
Dunkel, N.; Pittet, D.; Tovmirzaeva, L.; SuvÃ , D.; Bernard, L.; Lew, D.; Hoffmeyer, P.; UÃ§kay, I.	Short duration of antibiotic prophylaxis in open fractures does not enhance risk of subsequent infection	2013	Bone and Joint Journal	PICO 13: Associative Fracture	insufficient data for target condition
Egol, K. A.; Tejwani, N. C.; Capla, E. L.; Wolinsky, P. L.; Koval, K. J.	Staged management of high-energy proximal tibia fractures (OTA types 41): the results of a prospective, standardized protocol	2005	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	insufficient data for target comparison
Ferlic, P. W.; Singer, G.; Kraus, T.; Eberl, R.	The acute compartment syndrome following fractures of the lower leg in children	2012	Injury	PICO 13: Associative Fracture	not best available evidence
Firoozabadi, R.; Schneidkraut, J.; Beingessner, D.; Dunbar, R.; Barei, D.	Hyperextension Varus Bicondylar Tibial Plateau Fracture Pattern: Diagnosis and Treatment Strategies	2016	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	Insufficient data for target comparison
Fletcher, N. D.; Schiller, J. R.; Garg, S.; Weller, A.; Larson, A. N.; Kwon, M.; Browne, R.; Copley, L.; Ho, C.	Increased severity of type III supracondylar humerus fractures in the preteen population	2012	Journal of Pediatric Orthopaedics	PICO 13: Associative Fracture	Insufficient data for target condition
Flynn, J. M.; Jones, K. J.; Garner, M. R.; Goebel, J.	Eleven years experience in the operative management of pediatric forearm fractures	2010	Journal of Pediatric Orthopaedics	PICO 13: Associative Fracture	Insufficient data for target condition; 3 CS
Fogerty, S. J.; Giannoudis, P. V.	Fractures of the femoral shaft	2007	Surgery	PICO 13: Associative Fracture	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Gaebler, C.; Berger, U.; Schandelmaier, P.; Greitbauer, M.; Schauwecker, H. H.; Applegate, B.; Zych, G.; VÃ©csei, V.	Rates and odds ratios for complications in closed and open tibial fractures treated with unreamed, small diameter tibial nails: A multicenter analysis of 467 cases	2001	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	insufficient data for target condition
Gamulin, A.; Lubbeke, A.; Belinga, P.; Hoffmeyer, P.; Perneger, T. V.; Zingg, M.; Cunningham, G.	Clinical and radiographic predictors of acute compartment syndrome in the treatment of tibial plateau fractures: a retrospective cohort study	2017	BMC Musculoskeletal Disorders	PICO 13: Associative Fracture	insufficient data for target comparison
Gershuni, D. H.; Mubarak, S. J.; Yaru, N. C.; Lee, Y. F.	Fracture of the tibia complicated by acute compartment syndrome	1987	Clinical Orthopaedics & Related Research	PICO 13: Associative Fracture	insufficient data for target comparison
Gibson, M. J.; Barnes, M. R.; Allen, M. J.; Chan, R. N.	Weakness of foot dorsiflexion and changes in compartment pressures after tibial osteotomy	1986	Journal of Bone & Joint Surgery - British Volume	PICO 13: Associative Fracture	insufficient data for target condition
Gitlitz, G. F.	The Anterior Tibial Compartment Syndrome: A Complication of a Femoropopliteal Bypass Procedure	1965	Vascular Diseases	PICO 13: Associative Fracture	review; case reports
Gonzalez, A.; SuvÃ , D.; Dunkel, N.; NicodÃ¨me, J. D.; Lomessy, A.; Lauper, N.; Rohner, P.; Hoffmeyer, P.; UÃ§kay, I.	Are there clinical variables determining antibiotic prophylaxis-susceptible versus resistant infection in open fractures?	2014	International Orthopaedics	PICO 13: Associative Fracture	insufficient data for target comparison
Grottkau, B. E.; Epps, H. R.; Di Scala, C.	Compartment syndrome in children and adolescents	2005	Journal of Pediatric Surgery	PICO 13: Associative Fracture	Insufficient data for target comparison; incidence data
Hahn, M.; Strauss, E.; Yang, E. C.	Gunshot wounds to the forearm	1995	Orthopedic Clinics of North America	PICO 13: Associative Fracture	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Hall, M. M.	Pros and cons of medical antishock trousers	1985	Journal of Emergency Nursing	PICO 13: Associative Fracture	review
Haller, J. M.; Githens, M.; Scolaro, J.; Firoozabadi, R.	Does Provisional Plating of Closed Tibia Fractures Have Higher Complication Rates?	2017	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	Insufficient data for target condition; 11 CS
Haller, J. M.; Holt, D.; Rothberg, D. L.; Kubiak, E. N.; Higgins, T. F.	Does Early versus Delayed Spanning External Fixation Impact Complication Rates for High-energy Tibial Plateau and Plafond Fractures?	2016	Clinical Orthopaedics & Related Research	PICO 13: Associative Fracture	insufficient data for target comparison; <10 per ACS group
Heir, T.	Musculoskeletal injuries in officer training: One-year follow-up	1998	Military Medicine	PICO 13: Associative Fracture	incidence study
Henrikson, B.	Supracondylar fracture of the humerus in children. A late review of end-results with special reference to the cause of deformity, disability and complications	1966	Acta Chirurgica Scandinavica - Supplementum	PICO 13: Associative Fracture	Irrelevant topic; fracture no ACS
Herzog, G. A.; Serrano-Riera, R.; Sagi, H. C.	Traumatic Proximal Tibiofibular Dislocation: A Marker of Severely Traumatized Extremities	2015	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	insufficient data; 7 CS pts
Holliman, C. J.; Saffle, J. R.; Kravitz, M.; Warden, G. D.	Early surgical decompression in the management of electrical injuries	1982	American Journal of Surgery	PICO 13: Associative Fracture	Insufficient data for target comparison
Hopton, B. P.; Harris, N. J.	Fractures of the foot and ankle	2007	Surgery	PICO 13: Associative Fracture	review
Hopton, B. P.; Harris, N. J.	Fractures of the foot and ankle	2010	Surgery	PICO 13: Associative Fracture	review
Hunter, J. G.; Baumhauer, J. F.	A Comparative Analysis of the Most Common Complications for Patients Undergoing Traumatic Foot and Ankle Surgery	2017	Techniques in Foot and Ankle Surgery	PICO 13: Associative Fracture	Insufficient data for target comparison

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Hwang, R. W.; de Witte, P. B.; Ring, D.	Compartment syndrome associated with distal radial fracture and ipsilateral elbow injury	2009	Journal of Bone & Joint Surgery - American Volume	PICO 13: Associative Fracture	pico not answered; risk assessment
Jacob, J. E.	Vascular injuries in Vietnam. With special reference to compartment syndrome	1972	International Surgery	PICO 13: Associative Fracture	Insufficient data for target condition; 3 fasciotomy
Kakar, S.; Firoozabadi, R.; McKean, J.; Tornetta, P., 3rd	Diastolic blood pressure in patients with tibia fractures under anaesthesia: implications for the diagnosis of compartment syndrome	2007	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	Insufficient data for target condition; no ACS
Kakar, S.; Tornetta, Iii P.	Segmental tibia fractures: A prospective evaluation	2007	Clinical Orthopaedics and Related Research	PICO 13: Associative Fracture	Insufficient data for target condition; 6 CS
KaradaÅ?, S.; GÃ¶nÃ¼llÃ¼, H.; Ã?ncÃ¼, M. R.; lÅ?ik, D.; Canbaz, Y.	The effects on complications and myopathy of different voltages in electrical injuries	2011	Ulusal Travma ve Acil Cerrahi Dergisi	PICO 13: Associative Fracture	foreign language; risk assessment
Kasotakis, G.; Sideris, A.; Yang, Y.; de Moya, M.; Alam, H.; King, D. R.; Tompkins, R.; Velmahos, G.; Inflammation,; Host Response to Injury, Investigators	Aggressive early crystalloid resuscitation adversely affects outcomes in adult blunt trauma patients: an analysis of the Glue Grant database	2013	The Journal of Trauma and Acute Care Surgery	PICO 13: Associative Fracture	pico not answered; risk assessment
Kim, J. W.; Oh, C. W.; Oh, J. K.; Kyung, H. S.; Park, K. H.; Kim, H. J.; Jung, J. W.; Jung, Y. S.	Staged minimally invasive plate osteosynthesis of proximal tibial fractures with acute compartment syndrome	2017	Injury	PICO 13: Associative Fracture	Insufficient data for target comparison
Knapp, M. E.	Late treatment of fractures and complications. 2	1966	Postgraduate Medicine	PICO 13: Associative Fracture	review
Kugelman, D.; Qatu, A.; Haglin, J.; Leucht, P.; Konda, S.; Egol, K.	Complications and unplanned outcomes following operative treatment of tibial plateau fractures	2017	Injury	PICO 13: Associative Fracture	Insufficient data for target condition; 6 CS

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
LÃ¸kse Nilssen, G. A.; Svendsen, D.; Singh, K.; Nordhus, K.; SÃ¸rlie, D.	Results of catheter-directed endovascular thrombolytic treatment of acute ischaemia of the leg	2011	European Journal of Vascular and Endovascular Surgery	PICO 13: Associative Fracture	pico not answered; CS outcome
Lakhwani, M. N.; Gooi, B. H.; Barras, C. D. J.	Vascular trauma in Penang and Kuala Lumpur Hospitals	2002	Medical Journal of Malaysia	PICO 13: Associative Fracture	insufficient data for target comparison
Lancourt, J. E.; Gilbert, M. S.; Posner, M. A.	Management of bleeding and associated complications of hemophilia in the hand and forearm	1977	Journal of Bone & Joint Surgery - American Volume	PICO 13: Associative Fracture	irrelevant topic; hemophilia
Liu, L.; Tang, X.; Pei, F. X.; Tu, C. Q.; Song, Y. M.; Huang, F. G.; Yang, T. F.; Wang, G. L.; Fang, Y.; Zhang, H.; Zhong, G.	Treatment for 332 cases of lower leg fracture in "5.12" Wenchuan earthquake	2010	Chinese Journal of Traumatology	PICO 13: Associative Fracture	pico not answered; CS outcome
Lowe, G.; Tait, C.	Limb pain and swelling	2009	Medicine	PICO 13: Associative Fracture	review
McQueen, M.	Acute compartment syndrome	1998	Acta Chirurgica Belgica	PICO 13: Associative Fracture	review
McQueen, M. M.	Intramedullary reaming and compartment pressure	1996	Techniques in Orthopaedics	PICO 13: Associative Fracture	review
McQueen, M. M.; Gaston, P.; Court-Brown, C. M.	Acute compartment syndrome. Who is at risk?	2000	Journal of Bone & Joint Surgery - British Volume	PICO 13: Associative Fracture	prevalence study; various causes
Min, L.; Burruss, S.; Morley, E.; Mody, L.; Hiatt, J. R.; Cryer, H.; Ha, J. K.; Tillou, A.	A simple clinical risk nomogram to predict mortality-associated geriatric complications in severely injured geriatric patients	2013	Journal of Trauma and Acute Care Surgery	PICO 13: Associative Fracture	pico not answered; risk assessment
Mishwani, A. H.; Ghaffar, A.; Janjua, S.	Combat related vascular trauma	2012	Journal of the College of Physicians and Surgeons Pakistan	PICO 13: Associative Fracture	insufficient data for target condition; 2 CS

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Moed, B. R.; Fakhouri, A. J.	Compartment syndrome after low-velocity gunshot wounds to the forearm	1991	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	Insufficient data for target condition; 13 CS
Mohammad Naghi, T.; Kambiz, K.; Shahriar, J. M.; Afshin, T.; Kamrani Reza, S.; Behnam, P.; Harandi Bahador, A.	Musculoskeletal injuries associated with earthquake: A report of injuries of Iran's December 26, 2003 Bam earthquake casualties managed in tertiary referral centers	2005	Injury	PICO 13: Associative Fracture	duplicate of PMID 15589909
Mohler, L. R.; Pedowitz, R. A.; Byrne, T. P.; Gershuni, D. H.	Pressure generation beneath a new thermoplastic cast	1996	Clinical Orthopaedics & Related Research	PICO 13: Associative Fracture	healthy participants
Naidu, S. H.; Capo, J.	Upper extremity compartment syndromes	1997	Techniques in Orthopaedics	PICO 13: Associative Fracture	review
Pandya, N. K.; Edmonds, E. W.	Immediate intramedullary flexible nailing of open pediatric tibial shaft fractures	2012	Journal of Pediatric Orthopaedics	PICO 13: Associative Fracture	Insufficient data for target condition; 4 CS
Pridgeon, S.; Bishop, C. V.; Adshead, J.	Lower limb compartment syndrome as a complication of robot-assisted radical prostatectomy: the UK experience	2013	BJU International	PICO 13: Associative Fracture	pico not answered; CS outcome
Radonic, V.; Budimir, D.; Bradaric, N.; Luksic, B.; Sapunar, D.; Vilovic, K.	Envenomation by the horned viper (Vipera ammodytes L.)	1997	Military Medicine	PICO 13: Associative Fracture	CS outcome; <10 ACS
Robertson, P.; Karol, L. A.; Rab, G. T.	Open fractures of the tibia and femur in children	1996	Journal of Pediatric Orthopedics	PICO 13: Associative Fracture	insufficient data; <10 CS pts
Rosenfield, A. L.; McQueen, D. A.; Lucas, G. L.	Orthopedic injuries from the Andover, Kansas, Tornado	1994	Journal of Trauma	PICO 13: Associative Fracture	Incidence rates and case reports
Ruoff, G.	Trigger point injections: A primary care intervention	2003	Consultant	PICO 13: Associative Fracture	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Sanford, A.; Gamelli, R. L.	Lightning and thermal injuries	2014		PICO 13: Associative Fracture	review
Scerbo, M. H.; Mumm, J. P.; Gates, K.; Love, J. D.; Wade, C. E.; Holcomb, J. B.; Cotton, B. A.	Safety and Appropriateness of Tourniquets in 105 Civilians	2016	Prehospital Emergency Care	PICO 13: Associative Fracture	insufficient data; 2 CS pts
Scheel, A. K.; Toepfer, M.; Kunkel, M.; Finkenstaedt, M.; Reimers, C. D.	Ultrasonographic Assessment of the Prevalence of Fasciculations in Lesions of the Peripheral Nervous System	1997	Journal of Neuroimaging	PICO 13: Associative Fracture	insufficient data for target condition; 3 CS
Shadgan, B.; Pereira, G.; Menon, M.; Jafari, S.; Darlene Reid, W.; O'Brien, P. J.	Risk factors for acute compartment syndrome of the leg associated with tibial diaphyseal fractures in adults	2015	Journal of Orthopaedics & Traumatology	PICO 13: Associative Fracture	insufficient data for target comparison
Shore, B. J.; Glotzbecker, M. P.; Zurakowski, D.; Gelbard, E.; Hedequist, D. J.; Matheney, T. H.	Acute compartment syndrome in children and teenagers with tibial shaft fractures: incidence and multivariable risk factors	2013	Journal of Orthopaedic Trauma	PICO 13: Associative Fracture	insufficient data for target comparison
Stanish, W. D.	Lower leg, foot, and ankle injuries in young athletes	1995	Clinics in Sports Medicine	PICO 13: Associative Fracture	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Tahmasebi, M. N.; Kiani, K.; Mazlouman, S. J.; Taheri, A.; Kamrani, R. S.; Panjavi, B.; Harandi, B. A.	Musculoskeletal injuries associated with earthquake. A report of injuries of Iran's December 26, 2003 Bam earthquake casualties managed in tertiary referral centers.[Erratum appears in Injury. 2005 Jun;36(6):810 Note: Mohammad Naghi, Tahmasebi [corrected to Tahmasebi, Mohammad Naghi]; Kambiz, Kiani [corrected to Kiani, Kambiz]; Shahriar, Jalali Mazlouman [corrected to Mazlouman, Shahriar Jalali]; Afshin, Taheri [corrected to Taheri, Afshin]; Kamrani Reza, Shahriar [corrected to Kamrani, Reza Sha	2005	Injury	PICO 13: Associative Fracture	Insufficient data for target comparison
Tao, X.; Chen, N.; Pan, F.; Cheng, B.	External fixation combined with delayed internal fixation in treatment of tibial plateau fractures with dislocation	2017	Medicine (United States)	PICO 13: Associative Fracture	insufficient data for target condition; 2 CS
Thabet, A. M.; Simson, J. E.; Gerzina, C.; Dabash, S.; Adler, A.; Abdelgawad, A. A.	The impact of acute compartment syndrome on the outcome of tibia plateau fracture	2017	European journal of orthopaedic surgery & traumatologie	PICO 13: Associative Fracture	Insufficient data for target comparison
Topal, A. E.; Eren, M. N.; Celik, Y.	Lower extremity arterial injuries over a six-year period: Outcomes, risk factors, and management	2010	Vascular Health and Risk Management	PICO 13: Associative Fracture	pico not answered; risk assessment
Tremblay, L. N.; Feliciano, D. V.; Rozycki, G. S.	Secondary extremity compartment syndrome	2002	Journal of Trauma-Injury Infection & Critical Care	PICO 13: Associative Fracture	Insufficient data for target comparison

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Turen, C. H.; Burgess, A. R.; Vanco, B.	Skeletal stabilization for tibial fractures associated with acute compartment syndrome	1995	Clinical Orthopaedics & Related Research	PICO 13: Associative Fracture	not best available evidence
Tytherleigh-Strong, G. M.; Keating, J. F.; Court-Brown, C. M.	Extra-articular fractures of the proximal tibial diaphysis: Their epidemiology, management and outcome	1997	Journal of the Royal College of Surgeons of Edinburgh	PICO 13: Associative Fracture	Insufficient data for target condition; 2 ACS
Vrouenraets, B. C.; Eggermont, A. M. M.; Hart, A. A. M.; Klaase, J. M.; Van Geel, A. N.; Nieweg, O. E.; Kroon, B. B. R.	Regional toxicity after isolated limb perfusion with melphalan and tumour necrosis factor-Î± versus toxicity after melphalan alone	2001	European Journal of Surgical Oncology	PICO 13: Associative Fracture	insufficient data for target condition
Wang, E.; Inaba, K.; Cho, J.; Byerly, S.; Rowe, V.; Benjamin, E.; Lam, L.; Demetriades, D.	Do antiplatelet and anticoagulation agents matter after repair of traumatic arterial injuries?	2016	American Surgeon	PICO 13: Associative Fracture	Insufficient data for target condition; 4 CS
Wolpert, L. M.; Dittrich, K. P.; Windels, M. H.; Drezner, A. D.	Vascular problems in the intensive care unit	2000	Problems in General Surgery	PICO 13: Associative Fracture	review
Yusof, N. M.; Oh, C. W.; Oh, J. K.; Kim, J. W.; Min, W. K.; Park, I. H.; Kim, H. J.	Percutaneous plating in paediatric tibial fractures	2009	Injury	PICO 13: Associative Fracture	<20 patients; n16
Zachary, L. M.; Lee, R. C.; Gottlieb, L. J.	Evolving clinical and scientific concepts of upper extremity electrical trauma	1990	Hand Clinics	PICO 13: Associative Fracture	review
Zorrilla, S. de Neira J.; Prada-CaÃ±izares, A.; Marti-Ciruelos, R.; Pretell-Mazzini, J.	Supracondylar humeral fractures in children: current concepts for management and prognosis	2015	International Orthopaedics	PICO 13: Associative Fracture	review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Zura, R. D.; Adams, S. B., Jr.; Jeray, K. J.; Obremskey, W. T.; Stinnett, S. S.; Olson, S. A.; Southeastern Fracture Consortium, Foundation	Timing of definitive fixation of severe tibial plateau fractures with compartment syndrome does not have an effect on the rate of infection	2010	Journal of Trauma-Injury Infection & Critical Care	PICO 13: Associative Fracture	not best available evidence
Matsen, F. A., 3rd; Mayo, K. A.; Sheridan, G. W.; Krugmire, R. B., Jr.	Monitoring of intramuscular pressure	1976	Surgery	PICO 13: Associative Fracture; PICO 11: Pre-op Adjunctive Therapy	review
Rosenthal, R.; Tenenbaum, S.; Thein, R.; Steinberg, E. L.; Luger, E.; Chechik, O.	Sequelae of underdiagnosed foot compartment syndrome after calcaneal fractures	2013	Journal of Foot & Ankle Surgery	PICO 13: Associative Fracture; PICO 14: Foot ACS	Insufficient data for target condition; 5 CS
Mabee, J. R.; Shean, C.; Orlinsky, M.; Androy, L.; Carter, V.	The effects of simulated Bier block IVRA on intracompartmental tissue pressure	1997	Acta Anaesthesiologica Scandinavica	PICO 13: Associative Fracture; PICO 15: Pain Management	<20 patients; n7 healthy
Wang, X.; Ma, X.; Zhang, C.; Huang, J. Z.; Gu, X. J.; Jiang, J. Y.	Ankle fusion with a retrograde locked intramedullary nail for sequela of lower extremity compartment syndrome	2012	Chinese Journal of Traumatology	PICO 13: Associative Fracture; PICO 3: Fasciotomy Missed ACS	pico not answered; tx of post CS ankle deformity
Woll, T. S.; Duwelius, P. J.	The segmental tibial fracture	1992	Clinical Orthopaedics & Related Research	PICO 13: Associative Fracture; PICO 6: Pressure Methods	insufficient data for target comparison
David, A.; Lewandrowski, K. U.; Josten, C.; Ekkernkamp, A.; Clasbrummel, B.; Muhr, G.	Surgical correction of talipes equinovarus following foot and leg compartment syndrome	1996	Foot & Ankle International	PICO 14: Foot ACS	Insufficient data for target condition
Smith, G. H.	Measurement of the intracompartmental pressures of the foot	1990	Journal of Foot Surgery	PICO 14: Foot ACS	<20 patients; n10

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Wei, N.; Yuwen, P.; Liu, W.; Zhu, Y.; Chang, W.; Feng, C.; Chen, W.	Operative versus nonoperative treatment of displaced intra-articular calcaneal fractures: A meta-analysis of current evidence base	2017	Medicine (United States)	PICO 14: Foot ACS	systematic review
Yoon, P.	Compartment syndrome of the foot	2012	Techniques in Orthopaedics	PICO 14: Foot ACS	review
Auroy, Y.; Narchi, P.; Messiah, A.; Litt, L.; Rouvier, B.; Samii, K.	Serious complications related to regional anesthesia: results of a prospective survey in France	1997	Anesthesiology	PICO 15: Pain Management	irrelevant topic; regional anesthesia
Black, K. J.; Bevan, C. A.; Murphy, N. G.; Howard, J. J.	Nerve blocks for initial pain management of femoral fractures in children	2013	Cochrane Database of Systematic Reviews	PICO 15: Pain Management	systematic review; no ACS
Bratt, H. D.; Eyres, R. L.; Cole, W. G.	Randomized double-blind trial of low- and moderate-dose lidocaine regional anesthesia for forearm fractures in childhood	1996	J Pediatr Orthop	PICO 15: Pain Management	irrelevant topic; forearm fracture
Ganapathy, S.	Continuous nerve blocks for orthopedic injuries	2002	Techniques in Regional Anesthesia and Pain Management	PICO 15: Pain Management	systematic review
Guay, J.	Adverse events associated with intravenous regional anesthesia (Bier block): a systematic review of complications	2009	Journal of Clinical Anesthesia	PICO 15: Pain Management	systematic review
Lonnqvist, P. A.; Ecoffey, C.; Bosenberg, A.; Suresh, S.; Ivani, G.	The European society of regional anesthesia and pain therapy and the American society of regional anesthesia and pain medicine joint committee practice advisory on controversial topics in	2017	Current Opinion in Anaesthesiology	PICO 15: Pain Management	systematic review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
	pediatric regional anesthesia I and II: what do they tell us?				
Maletis, G. B.; Watson, R. C.; Scott, S.	Compartment syndrome. A complication of intravenous regional anesthesia in the reduction of lower leg shaft fractures	1989	Orthopedics	PICO 15: Pain Management	insufficient data for target condition
Soni, S.; Johannson, H.	Does regional anaesthesia in trauma patients lead to delayed recognition of compartment syndrome?	2013	British Journal of Hospital Medicine	PICO 15: Pain Management	review
Boezeman, R. P.; Moll, F. L.; Unlu, C.; de Vries, J. P.	Systematic review of clinical applications of monitoring muscle tissue oxygenation with near-infrared spectroscopy in vascular disease	2016	Microvascular Research	Systematic Reviews	systematic review
Garcia-Covarrubias, L.; McSwain, N. E., Jr.; Van Meter, K.; Bell, R. M.	Adjuvant hyperbaric oxygen therapy in the management of crush injury and traumatic ischemia: an evidence-based approach	2005	American Surgeon	Systematic Reviews	systematic review
Glass, G. E.; Staruch, R. M.; Simmons, J.; Lawton, G.; Nanchahal, J.; Jain, A.; Hettiaratchy, S. P.	Managing missed lower extremity compartment syndrome in the physiologically stable patient: A systematic review and lessons from a Level I trauma center	2016	The Journal of Trauma and Acute Care Surgery	Systematic Reviews	systematic review

Authors	Article Title	Year	Expanded Periodical Title	Recommendations	Reason for Exclusion
Kakagia, D.	How to Close a Limb Fasciotomy Wound: An Overview of Current Techniques	2015	International Journal of Lower Extremity Wounds	Systematic Reviews	systematic review
Kalyani, B. S.; Fisher, B. E.; Roberts, C. S.; Giannoudis, P. V.	Compartment syndrome of the forearm: a systematic review	2011	Journal of Hand Surgery - American Volume	Systematic Reviews	systematic review
Mar, G. J.; Barrington, M. J.; McGuirk, B. R.	Acute compartment syndrome of the lower limb and the effect of postoperative analgesia on diagnosis	2009	British Journal of Anaesthesia	Systematic Reviews	systematic review
Ojike, N. I.; Roberts, C. S.; Giannoudis, P. V.	Foot compartment syndrome: a systematic review of the literature	2009	Acta Orthopaedica Belgica	Systematic Reviews	systematic review
Ojike, N. I.; Roberts, C. S.; Giannoudis, P. V.	Compartment syndrome of the thigh: a systematic review	2010	Injury	Systematic Reviews	systematic review
Tiwari, A.; Haq, A. I.; Myint, F.; Hamilton, G.	Acute compartment syndromes	2002	British Journal of Surgery	Systematic Reviews	systematic review
Wall, C. J.; Lynch, J.; Harris, I. A.; Richardson, M. D.; Brand, C.; Lowe, A. J.; Sugrue, M.; Liverpool,; Royal Melbourne, Hospitals	Clinical practice guidelines for the management of acute limb compartment syndrome following trauma	2010	ANZ Journal of Surgery	Systematic Reviews	systematic review

APPENDIX III - GUIDELINE DEVELOPMENT GROUP DISCLOSURES

Prior to the development of this clinical practice guideline, clinical practice guideline development group members disclose conflicts of interest (COI). They disclose COIs in writing to the American Academy of Orthopaedic Surgeons via a private on-line reporting database and also verbally at the recommendation approval meeting.

Disclosure Items: (n) = Respondent answered 'No' to all items indicating no conflicts. 1 = Royalties from a company or supplier; 2 = Speakers bureau/paid presentations for a company or supplier; 3A = Paid employee for a company or supplier; 3B = Paid consultant for a company or supplier; 3C = Unpaid consultant for a company or supplier; 4 = Stock or stock options in a company or supplier; 5 = Research support from a company or supplier as a PI; 6 = Other financial or material support from a company or supplier; 7 = Royalties, financial or material support from publishers; 8 = Medical/Orthopaedic publications editorial/governing board; 9 = Board member/committee appointments for a society.

VOTING MEMBERS' AND NON-VOTING OVERSIGHT CHAIRS' DISCLOSURES

Work Group – Voting Members

Anthony E Johnson, MD Submitted on: 08/15/2017
AAOS: Board or committee member ($0) Multiple Committees(Self)
Arthroscopy: Editorial or governing board ($0) N/A(Self)
Chief Editor, Medscape Orthopedics - Drugs & Diseases: Editorial or governing board ($250) N/A(Self)
Clinical Orthopaedics and Related Research: Editorial or governing board ($0) N/A(Self)
Consultant, Orthopaedic Devices Panel, US Food & Drug Administration: Paid consultant ($1,200) Reim bursed for Travel and Housing for panel meetings(Self)
Foot and Ankle International: Editorial or governing board ($0) N/A(Self)
Journal of Bone and Joint Surgery - British: Editorial or governing board ($0) N/A(Self)
Journal of Surgery: Editorial or governing board ($0) N/A(Self)
Pfizer: Stock or stock Options Number of Shares: 2,060 Stocks and Mutual Funds for General Investment. Will not have affect on CPG Working Group. Did not affect OA CPG Working Group for DoD/VA which just published. (Both)
Society of Military Orthopaedic Surgeons: Board or committee member ($0) Immediate Past President & Member, Board of Directors (Self)

Patrick M Osborn, MD Submitted on: 11/10/2017
AAOS: Board or committee member
American Orthopaedic Association: Board or committee member Perspectives in Medical Education: Editorial or governing board SAMMC Alumni Association: Board or committee member

Andrew H Schmidt, MD Submitted on: 10/07/2017
ActivOrtho: Stock or stock Options Number of Shares: 0
Acumed, LLC: Paid consultant ($0)
Conventus Orthopaedics: Stock or stock Options Number of Shares: 0
Conventus Orthopedics: Paid consultant ($0)
Epien: Stock or stock Options Number of Shares: 0 Epix

VAN: Stock or stock Options Number of Shares: 0
JBJS Essential Surgical Techniques: Editorial or governing board ($0)
Journal of Knee Surgery: Editorial or governing board ($0)
Journal of Orthopaedic Trauma: Editorial or governing board ($0)
Smith & Nephew: IP royalties ($4,000) Design Proximal Femoral Plates(Self)
St. Jude Medical: Paid consultant ($0)
Thieme, Inc.: Publishing royalties, financial or material support ($0)
Twin Star Medical: Stock or stock Options Number of Shares: 0

Luke H Balsamo, MD (This individual reported nothing to disclose); Submitted on: 10/17/2017

Marcus Philip Coe, MD Submitted on: 04/07/2017
Ferring Pharmaceuticals: Research support ($0)
footeducation.com: Editorial or governing board
($0)

I. Leah Gitajn, MD (This individual reported nothing to disclose); Submitted on: 10/10/2017

Renee Greer, RN, BSN (This individual reported nothing to disclose); Submitted on: 11/13/2017

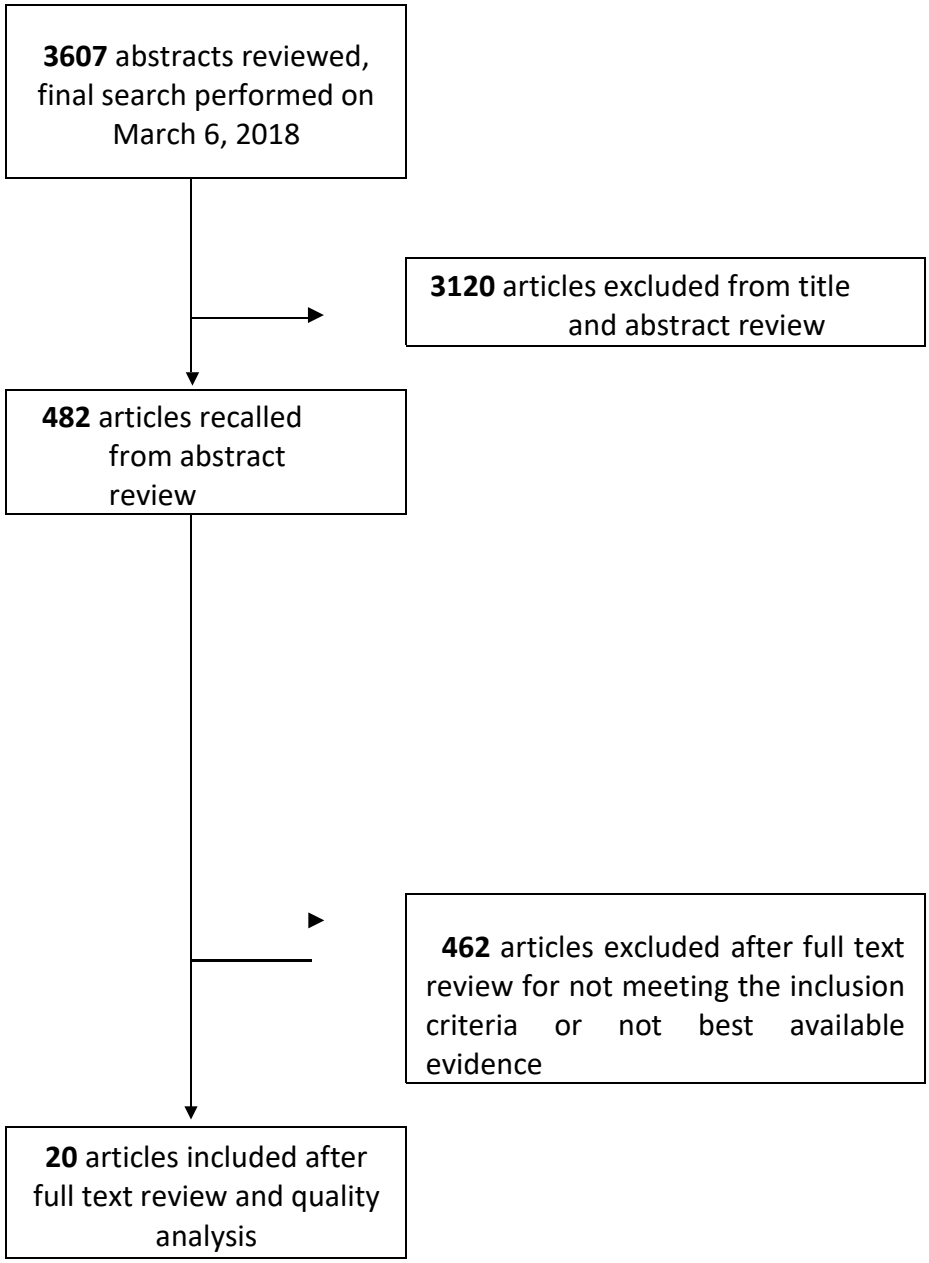
Moderators – Non-Voting Members
Julie B Samora, MD Submitted on: 10/06/2017
AAOS: Board or committee member ($0)
American Society for Surgery of the Hand: Board or committee member ($0)
Ruth Jackson Orthopaedic Society: Board or committee member ($0)

David S Jevsevar, MD, MBA Submitted on: 10/03/2018
American Association of Hip and Knee Surgeons: Board or committee member ($0) EBPC(Self)
DePuy, A Johnson & Johnson Company: Research support ($110,000) Institutional support clinical resear ch protocl(Self)
MedScape: Paid presenter or speaker ($2,500) Number of Presentations: 1 MedScape(Self)

APPENDIX IV – PICO QUESTIONS USED TO DEFINE LITERATURE SEARCH

1. For patients with suspected extremity compartment syndrome, are there biomarkers (single or combined) which assist in diagnosing acute compartment syndrome?
2. For patients with missed/late extremity compartment syndrome, can biomarkers determine relative need/timing of fasciotomy?
3. For patients with missed/late extremity compartment syndrome, what is the benefit/harm to performing a fasciotomy?
4. For patients with suspected extremity compartment syndrome, does intramuscular pressure monitoring assist in diagnosing (precision, timing of surgery) acute compartment syndrome?
5. For patients with missed/late extremity compartment syndrome, can pressure monitoring determine relative need/timing of fasciotomy?
6. What is optimum method to measure compartment pressure?
7. For patients with suspected extremity compartment syndrome, are there alternative diagnostic modalities which assist in diagnosing acute compartment syndrome?
8. For awake patients with suspected extremity compartment syndrome, are there individual and/or combined physical exam findings which assist in diagnosing acute compartment syndrome?
9. For obtunded patients with suspected extremity compartment syndrome, are there individual and/or combined physical exam findings which assist in diagnosing acute compartment syndrome?
10. For patients with acute compartment syndrome, which fasciotomy methods best optimize patient outcomes?
11. For patients with suspected acute compartment syndrome, which adjunctive therapies show effectiveness in stabilizing patients prior to fasciotomy?
12. For patients who undergo fasciotomy for acute compartment syndrome, which wound management techniques result in improved patient outcomes?
13. For patients with acute compartment syndrome and an associative fracture, which fracture management techniques result in improved outcomes?
14. Should fasciotomy be done in foot? If so, which compartments should be checked/released?
15. Does method of pain management affect clinical diagnosis?

APPENDIX V – STUDY ATTRITION FLOW CHART



APPENDIX VI – LITERATURE SEARCH STRATEGY

Database: MEDLINE In-Process & Other Non-Indexed Citations, MEDLINE Daily and MEDLINE (1946 to Present)
Interface: Ovid
Date searched: March 6, 2018

LINE	SEARCH SYNTAX
#1	compartment syndromes/ or exp anterior compartment syndrome/ or exp ischemic contracture/
#2	(acute adj3 compartment syndrome?).ab,ti.
#3	(animals not humans).sh.
#4	cadaver.sh. or cadaver*.ti.
#5	(comment or editorial or letter or historical article or addresses or news or newspaper article or case reports).pt or case report.ti.
#6	3 or 4 or 5
#7	1 or 2
#8	7 not 6
#9	limit 8 to English language

Database: Embase
Interface: Embase.com (Elsevier)
Date searched: March 6, 2018

LINE	SEARCH SYNTAX
#1	((acute NEAR/3 compartment):ab,ti) AND ((compartment NEXT/2 syndrome*):ab,ti)
#2	'acute compartment syndrome'/exp OR 'compartment syndrome'/de
#3	'cadaver'/de OR 'in vitro study'/exp OR 'animal experiment'/de OR 'animal model'/de OR 'nonhuman'/de OR 'abstract report'/de OR 'book'/de OR 'editorial'/de OR 'note'/de OR 'letter'/de OR 'case study'/de OR 'case report'/de OR 'conference abstract'/it OR 'chapter'/it OR 'medical record review'/de OR 'conference paper'/it OR 'conference review'/it OR 'editorial'/it OR 'letter'/it OR 'note'/it
#4	(#1 OR #2) NOT #3 AND [English]/lim

Database: Cochrane Central Register of Controlled Trials (CENTRAL)
Interface: Wiley
Date searched: March 6, 2018

SEARCH	QUERY
#1	MeSH descriptor: [Compartment Syndromes] this term only
#2	MeSH descriptor: [Anterior Compartment Syndrome] explode all trees
#3	MeSH descriptor: [Ischemic Contracture] explode all trees
#4	"compartment syndrome":ti,ab and "acute":ti,ab
#5	"conference abstract":pt
#6	(#1 or #2 or #3 or #4) not #5 *in Cochrane Reviews (Reviews and Protocols) and Trials*

INCLUSION CRITERIA

- Study must be of monitoring or diagnosis of acute compartment syndrome– Are there any exceptions (e.g. Are we concerned with treatment?)
- Study must be published in or after **<Minimum: Look at all>**
- Study should have 10 or more patients per group *(Work group may further define sample size)*
- For surgical treatment a minimum of (no limit) 0 month follow up duration.
- For *non-operative treatment* a minimum of (no limit) 0 month follow-up.

STANDARD CRITERIA FOR ALL CPGS

- Article must be a full article report of a clinical study (studies using registry data can be included in a guideline if it is published in a peer-reviewed journal and meets all other inclusion criteria/quality standards).
- Retrospective non-comparative case series, medical records review, meeting abstracts, historical articles, editorials, letters, and commentaries are ***excluded***.
- Confounded studies (i.e. studies that give patients the treatment of interest AND another treatment) are ***excluded***.
- Case series studies that have non-consecutive enrollment of patients are ***excluded***.
- Controlled trials in which patients were not stochastically assigned to groups AND in which there was either a difference in patient characteristics or outcomes at baseline AND where the authors did not statistically adjust for these differences when analyzing the results are ***excluded***.
- All studies of "Very Weak" strength of evidence are ***excluded***.
- All studies evaluated as Level V will be ***excluded***.
- Composite measures or outcomes are ***excluded*** even if they are patient-oriented.
- Study must appear in a peer-reviewed publication
- For any included study that uses "paper-and-pencil" outcome measures (e.g., SF-36), only those outcome measures that have been validated will be included
- For any given follow-up time point in any included study, there must be ≥ 50% patient follow-up (if the follow-up is >50% but <80%, the study quality will be downgraded by one Level)
- Study must be of humans
- Study must be published in English
- Study results must be quantitatively presented
- Study must not be an in vitro study
- Study must not be a biomechanical study
- Study must not have been performed on cadavers

We will only evaluate surrogate outcomes when no patient-oriented outcomes are available.

Best Available Evidence

When examining primary studies, we will analyze the best available evidence regardless of study design. We will first consider randomized controlled trials identified by the search strategy. In the absence of two or more RCTs, we will sequentially search for prospective controlled trials, prospective comparative studies, retrospective comparative studies, and prospective case-series studies. Only studies of the highest level of available evidence are included, assuming that there were 2 or more studies of that higher level. For example, if there are two high quality studies that address the recommendation, moderate and low studies addressing the same procedure and outcomes are not included.

APPENDIX VII – PARTICIPATING PEER REVIEW ORGANIZATIONS

- Orthopaedic Trauma Association (OTA)
- American Orthopaedic Foot and Ankle Society (AOFAS)
- American College of Surgeons (ACS)