

Forskningsöversikt traumatologi

Katastrofmedicinskt centrum Linköping
Kunskapscentrum i traumatologi
på uppdrag av Socialstyrelsen

Bevakningsperiod 2 oktober 2022 - 1 oktober 2023



Sammanställt av Katastrofmedicinskt centrum, Linköping, Region Östergötland
Kunskapscentrum i traumatologi på uppdrag av Socialstyrelsen
Författarna svarar för innehåll och slutsatser.

Linköping, 31 oktober 2023

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Introduktion

Denna rapport utgör en forskningsöversikt över kunskapsområdet traumatologi och är en av tre årliga leveranser inom uppdraget som kunskapscentrum i katastrofmedicin genomför på uppdrag av Socialstyrelsen. I upphandlingsdokument (2.7-31938/2019) beskrivs leveransen som följer: Forskningsöversikten ska omfatta en sammanställning av vetenskaplig litteratur (artiklar i vetenskapliga tidskrifter och doktorsavhandlingar) samt presentationer på vetenskapliga möten och konferenser i urval som publicerats och/eller presenterats under föregående år. Baserat på ovanstående underlag ska Kunskapscentrumet identifiera och kortfattat sammanfatta forskningsresultat inom kunskapsområdet som direkt eller indirekt kan stärka den svenska hälso- och sjukvårdens katastrofmedicinska beredskap...Kunskapscentrumet ska även identifiera kunskapsluckor inom kunskapsområdet samt analysera och dra slutsatser gällande behov av framtida forskningsstudier som kan stärka den svenska hälso- och sjukvårdens katastrofmedicinska beredskap.

Metod

Urvalet av artiklar är baserat på det omvärldsbevakningsarbete som pågått under bevakningsperioden: kunskapscentrumet har identifierat källor med utgångspunkt i instruktion i upphandlingsdokument och på basen av publikationpraxis inom det svenska fältet och därutöver kontinuerligt inhämtat publikationer från databasen PubMed. För begränsning i ett brett forskningsfält har sökning i databas koncentrerats på trauma, traumavård och/eller injury och forskning som pågår i eller utgår från Sverige. Bevakning av utvalda tidskrifter inkluderar internationell forskning och riktlinjer från medicinska föreningar och ämnesföreträdare. Manuell bevakning av utvalda tidskrifter och tips från involverat nätverk kompletterar databassökning. Publikationer om akutvård och prehospital vård med inriktning på trauma, kvalitetssäkring och transfusion inkluderades. Specifika skadetyper associerade till ortopedi eller sportmedicin exkluderades. Commentaries och reviews har inkluderats.

PubMed-sökning

Söktermer : Trauma or trauma care or injury and Sweden
Trauma care and Sweden in Swedish

Bevakade tidskrifter

Prehospital and Disaster Medicine
European Journal of Trauma and Emergency Care
American Journal of Emergency Care
Journal of Trauma and Acute Care Surgery
Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine
Academic Emergency Medicine
Prehospital Emergency Care
Journal of American College of Surgeons
World Journal of Surgery
British Journal of Surgery
Annals of Surgery
JAMA Surgery
Resuscitation
Injury
Burns

Resultat

Tematisk indelning av 315 inkluderade artiklar resulterade i 12 kategorier (se bilaga 1 och 2). Utöver de publikationer som inkluderats i omvärldbevakningsarbetet tillkommer publikationer om Rysslands fortsatta fullskaliga invasion av Ukraina. Emfas läggs på psykologiskt trauma och ork hos stridande och civilbefolkningen i Ukraina, men även kartläggningar över typ av attacker och typskador samt case-studier har publicerats. Sekretess och säkerhet är av största vikt under pågående krig och datatillgången är begränsad. Inom det traumatologiska fältet återfinns publikationer om vård av krigsskadade, påverkan på traumavården och exempel på totalförsvarslösningar, så som användning av sjukhuståg för vård och evakuering av skadade. Även applicering av olika system för hantering av skadade så som NATO:s medicinska roller beskrivs.

Salio F, Pirisi A, Bruni E, Court M, Peleg K, Reaiche S, Redmond A, Weinstein E, Hubloue I, Corte FD, Ragazzoni L.

Provision of trauma care in asymmetric warfare: a conceptual framework to support the decision to implement frontline care services. *Confl Health*. 2022 Oct 29;16(1):55.

Kazmirchuk A, Yarmoliuk Y, Lurin I, Gybalo R, Burianov O, Derkach S, Karpenko K. Ukraine's Experience with Management of Combat Casualties Using NATO's Four-Tier "Changing as Needed" Healthcare System. *World J Surg*. 2022 Dec;46(12):2858-2862.

Walravens S, Zharkova A, De Weggheleire A, Burton M, Cabrol J, Lee JS. Characteristics of Medical Evacuation by Train in Ukraine, 2022. *JAMA Netw Open*. 2023;6(6):e2319726.

Quinn J, Panasenکو SI, Leshchenko Y, Gumeniuk K, Onderková A, Stewart D, Gimpelson AJ, Buriachyk M, Martinez M, Parnell TA, Brain L, Sciulli L, Holcomb JB. Prehospital Lessons From the War in Ukraine: Damage Control Resuscitation and Surgery Experiences From Point of Injury to Role 2. *Mil Med*. 2023 Aug 30:usad253.

Torelli C.

Patterns of Explosive Violence Harm in Ukraine: Comparing Patterns of Harm Associated With Explosive Weapons in Ukraine From 2014 to February 2022, and After February 2022. *Disaster Med Public Health Prep*. 2023 Jun 15;17:e408.

Skjutningar, mortalitet

Under bevakningsperioden har förekomsten av skjutvapensskador varit fortsatt hög och skador och dödsfall på grund av skottskada är ett ämne som behandlats inom fältet under bevakningsperioden. Vi lyfter utkomna studier om omhändertagande och epidemiologi av skottrelaterade skador baserat på svenska traumaregistret SweTrau, samt review av litteratur om vaskulära skador vid massskjutningar.

Nyberger, K., Caragounis, EC., Djerf, P. et al. Management and outcomes of firearm-related vascular injuries. *Scand J Trauma Resusc Emerg Med* 31, 35 (2023).

Nationell retrospektiv studie som inkluderade alla patienter med skjutvapenskada registrerade i SweTrau från 1 januari 2011 till 31 december 2019. Under perioden identifierades 1010 patienter som skottskadade (1,4 procent) och 162 patienter med åtminstone en vaskulär skada orsakad av skjutvapenvåld. Totalt var antalet registrerade vaskulära skador 238 stycken. Demografiskt var patientgruppen till 96,6 procent män med medianåldern 26 år. I 37,7 procent av fallen var systoliska blodtrycket under 90 mmHg eller avsaknad av palpabel radialispuls. Anatomiskt var vaskulär skada mest förekommande på nedre extremitet (41,7 procent), buk (18,9 procent) och bröst (18,9 procent). Vanligast var skada på lårbensartär och höftartär. 156 fall av vaskulär kirurgi har registrerats under studieperioden. 30-dagarsmortalitet var 29,9 procent, och 79,6 procent av dödsfallen skedde inom 24 timmar efter skada. Specifik skada på thorakalaorta eller lårbensartär var associerat med 24-timmars mortalitet. Skottskador har hög mortalitet och morbiditet, och författarna ser att

tidiga blödningskontrollerande strategier är av vikt för att öka överlevnad hos patientgruppen.

Nyberger, K., Strömmer, L. & Wahlgren, CM. A systematic review of hemorrhage and vascular injuries in civilian public mass shootings. *Scand J Trauma Resusc Emerg Med* 31, 30 (2023).

Systematisk reviewstudie av arbeten om vaskulär skada i samband med massskjutningar i publik miljö publicerade mellan 1 januari 1968 och 22 februari 2021 (Medline, Embase, Web of Science). 34 studier inkluderades där massskjutning definierades som ≥ 3 skjutna. De 34 studierna inkluderade 45 händelser med respons på massskjutning för 2039 sjukhusvårdade patienter, med en medianmortalitet på 36 procent per händelse. 38 procent av studierna rapporterade vaskulära skador. Mest rapporterade anatomiska lokaliseringen per händelse var extremitet följt av buk och bröst. Median på antal operationer och antal patienter som behövt kirurgisk vård per händelse var 22 och 10,5. I studier som utförligt beskrev skadade och opererade patienter behövde 47,1 procent av inlagda patienter kirurgiskt ingrepp. Vaskulära skador var involverat i 8,3 till 10 procent av dödsfallen. Enligt en inkluderad studie beskrivande 232 obduktionsfall var mest förekommande anatomiska lokaliseringen för vaskulär skada thorakalaorta (18 procent), karotis (6 procent), bukaorta (5 procent), subklaviala artären (3 procent), vena cava (2 procent var för inferiora och superiora).

N.A.G. Hakkenbrak, E.R. Bakkum, W.P. Zuidema, J.A. Halm, T. Dorn, U.J.L. Reijnders and G.F. Giannakopoulos. Characteristics of fatal penetrating injury; data from a retrospective cohort study in three urban regions in the Netherlands. *Injury*, 2023-01-01, Volume 54, Issue 1, Pages 256-260.

En registerstudie från Nederländerna som behandlar fatala penetrerande skador, skott- och knivskada. Uppsamlingsområdet för forensiska undersökningarna som inkluderats i studien utgjorde 22 procent av den nederländska befolkningen. Avlidna på grund av penetrerande skada mellan 1 juli 2013 och 1 juli 2019 inkluderades. 283 patienter hade avlidit på grund av penetrerande skada och skador kategoriserades enligt olycka, självförvållade och överfall. Över 60 procent var överfall, 35 procent självförvållade. Mortalitet var främst på grund av blödning (skada till bröst i 27 procent av fallen, multipla ställen på

kroppen 17 procent, hals 9 procent och extremitet 8 procent) och traumatisk hjärnskada (21 procent). 71 procent av knivhuggna patienterna och 73 procent av skottskadade patienterna avled på skadeplats. Författarna identifierar blödning i extremitet som orsak till förebyggbara dödsfall, där 8 procent kan ha räddats med blödningskontrollerande första hjälpen, samt suicidprevention.

Jennifer Moriatis Wolf, Laurent Mathieu, Scott Tintle, Kenneth Wilson, Shai Luria, Stephanie Vandentorren, Marie Boussaud, Jason Strelzow. A global perspective on gun violence injuries. *Injury*, Volume 54, issue 7, 110763, July 2023.

Ett arbete av JM Wolf et al. från april 2023 i *Injury* beskriver resultat från en konferens om skottskador i civila sammanhang med deltagare från USA, Frankrike, Storbritannien, Israel och amerikanska Navy Seals. Skottskador är prevalent förekommande i USA i den civila befolkningen, och 2019 gick skjutning om trafikolycka som främsta dödsorsak för barn (0-19 åringar) i USA. Vägledning och erfarenheter från militära sammanhang identifieras som grundläggande men samtidigt som det existerar ett kunskaps-gap om överföring till civilkontext. Arbetet identifierar "actions points" inom områden som prehospital vård, akutvård av ballistisk skada, definitiv vård och rehabilitering. Inom prehospital vård refereras det till militära publikationer om användning av tourniquet med erfarenheter från Afghanistan och Irak. Stoppa blödning anges som ett av actions points, där prehospitala protokoll globalt bör revideras så att de reflekterar ordning av omhändertagande med blödningskontroll före luftväg (enligt nuvarande militär praxis). Även protokoll för tidigt omhändertagande vid skelettskador på grund av skjutning efterfrågas, vilket inkluderar evidensbaserad dos och typ av antibiotika. Etikfrågor kring prioritering vid massskjutningar diskuteras, och ett globalt angreppssätt för forskning för den bästa vården för skottskadade civila föreslås.

Blödningskontroll, helblod

Holcomb JB, Dorlac WC, Drew BG, Butler FK, Gurney JM, Montgomery HR, Shackelford SA, Bank E, Kerby JD, Kragh JF Jr, Person MA, Patterson JL, Levchuk O, Andrievsky M, Bitiukov G, Danyljuk O, Linchevskyy O.

Rethinking Limb Tourniquet Conversion in the Pre-Hospital Environment.

J Trauma Acute Care Surg. 2023 Sep 19.

Reguljär tillåten tid att ha en tourniquet är två timmar men kriget i Ukraina har påvisat att evakueringstider och tiden till vård är kraftigt förlängd. Författarna diskuterar tourniquetkonvertering eller omplacering och vem som kan utföra sådana åtgärder i väntan på evakuering, samt utbildningsbehov i och med att förväntad tid med applicerad tourniquet förlängs i konflikt. Aktuella riktlinjer inom till exempel Stop the Bleed-konceptet anger att endast medicinskt utbildade ska genomföra konvertering. Problem uppstår då erfarenheter från Ukraina visar på väntetider på över 6 timmar. Tidigare erfarenheter och tvåtimmarsregeln baseras på kriget i Irak och Afghanistan, där militärsjukvården var effektiv och ofta kunde erbjuda högre vårdnivå väl inom två timmar. Författarna förespråkar utbildningsinsatser i indikation för tourniquet och att både militär och civil personal ska tränas i konvertering och omplacering. I Ukraina tillämpades tillstånd för tränad person (inte enbart medicinskt utbildad) i juli 2023, där med telemedicinskt stöd ska tillämpas om möjligt. Författarna påpekar att alla tre komponenter är lika viktiga att lära ut: 1) indikation för tourniquet, 2) applicering av tourniquet och 3) konvertering eller omplacering. Artikeln avslutas med hälsning från ukrainsk medförfattare att träna militären medan tid finns. Författarna Holcomb och Shackelford är framstående forskare inom Stop the Bleed och Joint Trauma System.

Användning av helblod och tidig blödningskontroll vid traumatisk blödning har fortsatt vara ett aktuellt tema. En studie som retrospektivt inkluderar 2785 amerikanska och kanadensiska patienter med massiv blödning publicerades i JAMA (Journal of the American Medical Association) Surgery i januari 2023. Studien jämför association av massivt transfusionsprotokoll med blodkomponenter och helblod med överlevnad. Helblod gavs som ett tillägg i det konventionella transfusionsprotokollet. Två grupper studerades; patienter med massiv blödning som

fick transfusion enligt 1:1:1-protokoll (lika delar erytrocyter, plasma och trombocyter) och patienter som fick tillägg av helblod i samma protokoll under de första 24 timmarna efter ankomst till akutklinik. Resultaten visar på högre överlevnad med kombinerat protokoll vid 24 timmar (37 procent lägre risk för mortalitet) och fortsatt vid 30 dagar, med en observerad effekt efter fem timmar efter ankomst till sjukhus. En inbjuden kommentar på artikeln hänvisar vidare till liknande studier, och efterfrågar prospektiva randomiserade studier om helblod i resuscitering.

Torres CM, Kent A, Scantling D, Joseph B, Haut ER, Sakran JV.

Association of Whole Blood With Survival Among Patients Presenting With Severe Hemorrhage in US and Canadian Adult Civilian Trauma Centers.

JAMA Surg. 2023;158(5):532–540.

Invited commentary: Sperry JL, Brown JB. Whole-Blood Resuscitation Following Traumatic Injury and Hemorrhagic Shock—Should It Be Standard Care? JAMA Surg. 2023;158(5):540.

Triage

Kunskapscentrum i katastrofmedicin vid Katastrofmedicinskt centrum (KMC) i Linköping fick i uppdrag av Socialstyrelsen att bidra till underlag för regeringsuppdrag om masskadeplanering, och specifikt masskadetriage. Arbetet om prehospital triage vid masskadehändelse identifierade förankring av val av masskadetriagesystem hos aktörerna som en särskilt viktig del i införande av ett nationellt system och i augusti 2023 genomfördes en konsensusworkshop med representanter från 19 regioner, specialistföreningar, Polisen, FOI och Röda korset. Rapporteringar inom regeringsuppdraget, konsensusrapport och rekommendationer finns tillgängliga på KMC:s forskningshemsida (katastrofmedicin.se). Konsensusworkshopen och resultat beskrivs även mer i detalj i senast utkomna omvärldsanalys.

Publikationer baserade på svensk registerdata

Lundin A, Akram S, Berg L, et al.

Thoracic injuries in trauma patients: epidemiology and its influence on mortality.

Scand J Trauma Resusc Emerg Med. 2022 Dec 12;30(1):69. doi: 10.1186/s13049-022-01058-6.

Registerstudie om thoraxskada hos traumapatienter baserad på traumaregistret för traumaenheten på Karolinska sjukhuset. 32 procent av inkluderade patientfall hade thoraxskada och regressionsanalys genomfördes för att undersöka faktorerna ålder, kön, ASA-klassificering, GSC-score och NISS och thoraxskada, och association till 30-dagars mortalitet. 71 procent av patienterna var män, och patienter över 60 år hade större förekomst av revbensfrakturer och yngre hade mer skador på inre organ. 30-dagars mortalitet var 11 procent hos patienter med thoraxskada jämfört med 4,3 procent hos patienter utan. Ålder över 60 år, ASA-klassificering 3-4, GCS 1-8 och NISS över 15 var också associerade med högre mortalitet.

Renberg, M., Dahlberg, M., Gellerfors, M. et al. Prehospital transportation of severe penetrating trauma victims in Sweden during the past decade: a police business?

Scand J Trauma Resusc Emerg Med 31, 45 (2023).

Retrospektiv, deskriptiv studie över alla patienter med penetrerande trauma och injury severity scores (ISSs) ≥ 15 som registrerats i SweTrau mellan 13 juni 2011 31 december 2019. Hypotesen var att transport till sjukhus genomförts av polis och privata bilar, och att det påverkat mortalitet. 675 patienter inkluderades. Icke-ambulanstransport till sjukhus förekom men med låg incidens och utan att påverka mortalitet. Skottskada var vanligt förekommande att transporteras med polisbil, och drabbade hade lägre Glasgow coma scale scores när de anlände till akuten jämfört med drabbade som anlant med ambulans eller privat bil (11,5 för polisbilar jämfört med 15 hos andra de transportformerna).

Nyberger, K., Caragounis, EC., Djerf, P. et al. Management and outcomes of firearm-related vascular injuries.

Scand J Trauma Resusc Emerg Med 31, 35 (2023).

Se ovan under rubrik "Skjutningar, mortalitet".

Holmberg L, Frick Bergström M, Mani K, Wanhainen A, Andréasson H, Linder F. Validation of the Swedish Trauma Registry (SweTrau).

Eur J Trauma Emerg Surg. 2023 Aug;49(4):1627-1637. doi: 10.1007/s00068-023-02244-6.

Validering av det svenska traumaregistret SweTrau har genomförts genom bedömning av precision, korrekthet, korrelation, datafullständighet, fullständiga fallbeskrivningar, effektivitet och jämförbarhet för registret. Återregistrering av 120 slumpartat valda fall från 2018 genomfördes. Demografin för studiepopulationen och fall registrerade under 2018 överensstämde väl. Valideringen visar god precision (85,8 procent), korrekthet (89,7 procent) och datafullständighet (88,5 procent) samt stark eller mycket stark korrelation (87,5 procent). Tillförlitlighet för data i SweTrau är jämförbar med andra register som använder sig av Utstein Template of Trauma för registrering. Förbättringsområden innefattar aktualitet och hur fullständiga registrerade fall är.

Pågående registerforskning

Registeruttag från SweTrau enligt årsrapport 2022:

2023

Fredrik Linder, Uppsala:

Penetrerande leverskador - epidemiologi, behandling och utfall; en jämförande studie mellan Sverige och Sydafrika.

Rebecka Rubenson-Wahlin, Stockholm:

Triagering och handläggning av geriatriska traumapatienter på sjukhus.

2022

Anna Schandl, Stockholm:

Initialt traumaomhändertagande - aspekter på triage och outcome.

What you need to know-serien

Journal of Trauma and Acute Care Surgery (JTACS) har lanserat en artikelserie med utbildningsinriktning på det gemensamma temat "What you need to know". Artiklarna är författade av ämnesexperter och sammanfattar forskningsläge och behandlingsriktlinjer för valt ämne. Fram till den 1 oktober 2023 fanns tre artiklar publicerade i serien:

Cardenas, Jessica C.; Dong, Jing Fei; Kozar, Rosemary Ann.
Injury-induced endotheliopathy: What you need to know.
Journal of Trauma and Acute Care Surgery 95(4):p 454-463, October 2023.

Lammers, Danny T.; Holcomb, John B. MD.
Damage control resuscitation in adult trauma patients: What you need to know.
Journal of Trauma and Acute Care Surgery 95(4):p 464-471, October 2023.

Russell, Robert T.; Leeper, Christine M.; Spinella, Philip C.
Damage-control resuscitation in pediatric trauma: What you need to know.
Journal of Trauma and Acute Care Surgery 95(4):p 472-480, October 2023.

Artikelserien går att hitta under "Collections" på JTACS hemsida.

Riktlinjer

Rossaint R, Afshari A, Bouillon B, et al.
The European guideline on management of major bleeding and coagulopathy following trauma: sixth edition.
Crit Care. 2023 Mar 1;27(1):80. doi: 10.1186/s13054-023-04327-7.

Wyckoff, M et al.
2022 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation, and Teams; and First Aid Task Forces.
Resuscitation 2022 Dec 20;146(25):e483-e557.

Rizzo, Anne; Martin, Matthew; Inaba, Kenji et al.
Pregnancy in trauma—A Western Trauma Association algorithm.
Journal of Trauma and Acute Care Surgery: October 2022 - Volume 93 - Issue 4 - p e139-e142

Russell, Robert T.; Esparaz, Joseph R.; Beckwith, Michael A. et al.
Pediatric traumatic hemorrhagic shock consensus conference recommendations.
Journal of Trauma and Acute Care Surgery 94(1S):p S2-S10, January 2023.

Yanchar, Natalie; Tardif, Pier-Alexandre; Freire, Gabrielle et al.
Clinical practice guideline recommendations for pediatric solid organ injury care: A Systematic Review.
Journal of Trauma and Acute Care Surgery 95(3):p 442-450, September 2023.

Al Lulla, Angela Lumba-Brown, Annette M. Totten
Prehospital Guidelines for the Management of Traumatic Brain Injury – 3rd Edition
Prehospital Emergency Care, online: 20 Apr 2023

Bilaga 1

Kategoriindelning av totalt 315 inkluderade publikationer.

Identifierad kategori	Antal inkluderade publikationer
Prediktion, scoring, diagnostik	45
Epidemiologi, skadetyper	39
Behandling, uppföljning	38
Pediatrik och äldre patientgrupp	37
Blödning, blodprodukter, koagulopati	36
Traumatisk hjärnskada- TBI	30
Prehospitalt	27
Triage, masskadehändelse	15
Övning, simulering	15
Traumaregister, riktlinjer	13
Tactical medicine	11
Traumateam och system	9

Bilaga 2 Inkluderade publikationer enligt kategori

Traumaregister, riktlinjer

Rossaint R, Afshari A, Bouillon B, et al.	The European guideline on management of major bleeding and coagulopathy following trauma: sixth edition.	Crit Care. 2023 Mar 1;27(1):80. doi: 10.1186/s13054-023-04327-7.
Tatebe, Leah C.; Kaufman, Elinore J.; Nappi, Tina et al.	Walk the line: An ethical framework for interactions with law enforcement in trauma care environments.	Journal of Trauma and Acute Care Surgery 94(2):p e20-e22, February 2023.
Hoepelman, R.J., Driessen, M.L.S., de Jongh, M.A.C. et al.	Concepts, utilization, and perspectives on the Dutch Nationwide Trauma registry: a position paper.	Eur J Trauma Emerg Surg Aug;49(4):1619-1626 (2023).
Holmberg, L., Frick Bergström, M., Mani, K. et al.	Validation of the Swedish Trauma Registry (SweTrau).	Eur J Trauma Emerg Surg 2023 Aug;49(4):1627-1637 (2023).
Fischer, A., Fitzgerald, M., Curtis, K. et al.	The Australian Trauma Registry (ATR): a leading clinical quality registry.	Eur J Trauma Emerg Surg 49, 1639–1645 (2023).
Civil, I., Isles, S., Campbell, A. et al.	The New Zealand National Trauma Registry: an essential tool for trauma quality improvement.	Eur J Trauma Emerg Surg 49, 1613–1617 (2023).
Naberezhneva, N., Uleberg, O., Dahlhaug, M. et al.	Excellent agreement of Norwegian trauma registry data compared to corresponding data in electronic patient records.	Scand J Trauma Resusc Emerg Med 31, 50 (2023).
Wyckoff, M et al.	2022 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation, and Teams; and First Aid Task Forces	Resuscitation 2022 Dec 20;146(25):e483-e557.
Christian Martin-Gill, Kathleen M. Brown, Rebecca E. Cash. ... & for the Prehospital Guidelines Consortium	2022 Systematic Review of Evidence-Based Guidelines for Prehospital Care	Prehospital Emergency Care, online Dec 1, 2022
Rizzo, Anne; Martin, Matthew; Inaba, Kenji et al.	Pregnancy in trauma—A Western Trauma Association algorithm.	Journal of Trauma and Acute Care Surgery: October 2022 - Volume 93 - Issue 4 - p e139-e142
Russell, Robert T.; Esparaz, Joseph R.; Beckwith, Michael A. et al	Pediatric traumatic hemorrhagic shock consensus conference recommendations.	Journal of Trauma and Acute Care Surgery 94(1S):p S2-S10, January 2023.
Yanchar, Natalie; Tardif, Pier-Alexandre; Freire, Gabrielle et al.	Clinical practice guideline recommendations for pediatric solid organ injury care: A Systematic Review.	Journal of Trauma and Acute Care Surgery 95(3):p 442-450, September 2023.

Al Lulla, Angela Lumba-Brown, Annette M. Totten	Prehospital Guidelines for the Management of Traumatic Brain Injury – 3rd Edition	Prehospital Emergency Care, online: 20 Apr 2023
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Epidemiologi, skadetyper

Alfa-Wali, M et al.	Deliberate self-harm and trauma – A descriptive analysis from a London major trauma centre	Injury VOLUME 54, ISSUE 1, P232-237, JANUARY 01, 2023
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