

# Supplement to the Treatment of Clavicle Fractures Evidence-Based Clinical Practice Guideline

## **e-Appendix 1**

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This supplementary material has been provided by the authors to give readers additional information about their work

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## PICO Questions

PICO Topic	Full Question
1. Timing Of Follow Up Radiographs	In patients with clavicle fracture being treated non-operatively, when should follow up x-rays be performed to detect change in displacement?
2. Immobilization Method	In patients with clavicle fracture undergoing non-operative treatment, does use of Figure of 8 vs sling affect patient outcomes?
3. Physical Therapy for Non-Operatively Treated Patients	In patients with clavicle fracture undergoing non-operative management, does supervised physical therapy improve outcomes?
4. Physical Therapy for Operatively Treated Patients	In patients with clavicle fracture undergoing operative management, does supervised physical therapy improve outcomes?
5. Bone Stimulator	In patients with clavicle fracture, does bone stimulator lead to improved union rates or time to union?
6. Non-Modifiable Risk Factors	In patients undergoing treatment for clavicle fracture, what non-modifiable risk factors are associated with patient outcomes?
7. Modifiable Risk Factors	In patients undergoing treatment for clavicle fracture, what modifiable risk factors are associated with patient outcomes?
8. Operative vs. Non-Operative Treatment for Midshaft Fractures	In patients undergoing treatment for midshaft clavicle fracture, does operative or non-operative treatment lead to better patient outcomes?
9. Operative vs. Non-Operative Treatment for Lateral Fractures	In patients undergoing treatment for lateral clavicle fracture, does operative or non-operative treatment lead to better patient outcomes?
10. Operative vs. Non-Operative Treatment for Medial Fractures	In patients undergoing treatment for medial clavicle fracture, does operative or non-operative treatment lead to better patient outcomes?
11. Dual Plating	In patients undergoing operative treatment of midshaft clavicle fracture (plate(s) and screws), does a dual plating technique lead to better patient outcomes in comparison to single plate?
12. Anterior vs. Superior Plating	In patients undergoing operative treatment of clavicle fracture, does anterior plating vs. Superior plating lead to better patient outcomes?
13. Locking Screws	In patients undergoing operative treatment of midshaft clavicle fracture with a single plate, does use of locking screws lead to better patient outcomes?
14. Nailing vs. Single Plate	In patients undergoing operative treatment of midshaft clavicle fracture, does intramedullary fixation lead to better patient outcomes in comparison to single plate fixation?
15. Pre-Contoured Plate vs. Non-Pre-Contoured Plate	In patients undergoing operative treatment of midshaft clavicle fracture, does use of a pre-contoured plate vs a non-pre-contoured plate lead to better patient outcomes?
16. CC Augmentation/Fixation for Lateral Fracture	In patients with lateral clavicle fracture treated operatively, does CC augmentation or fixation lead to better patient outcomes in comparison to no CC augmentation or fixation?
17. Hook Plate vs. Lateral Locking Plate for Lateral Fracture	In patients undergoing operative treatment of lateral clavicle fracture, does use of hook plate lead to better patient outcomes in comparison to lateral locking plate?
18. Supine vs. Upright Radiograph	Do Upright vs. Supine View X-Rays provide different measurements of maximum displacement, as maximum displacement indicates appropriate treatment pathways?
19. Prediction of Malunion / Nonunion	What radiographic parameters predict symptomatic malunion / nonunion in non-operatively treated clavicle fractures?

## Inclusion Criteria

### Standard Inclusion/Exclusion Criteria for all CPGs

1. Article must be a full article report of a clinical study.
2. Retrospective non-comparative case series, medical records review, meeting abstracts, historical articles, editorials, letters, and commentaries are **excluded**.
  - a. Bibliographies of meta-analyses and systematic reviews will be examined to ensure inclusion of all relevant literature.
3. Confounded studies (i.e., studies that give patients the treatment of interest AND another treatment) are **excluded**.
4. Case series studies that have non-consecutive enrollment of patients are **excluded**.
5. 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**.
6. All studies evaluated as “very low quality” will be **excluded**.
7. Composite measures or outcomes are **excluded** even if they are patient oriented.
8. Study must appear in a peer-reviewed publication
9. 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
10. For any given follow-up time point in any included study, there must be  $\geq 50\%$  patient follow-up
  - a. If the follow-up is  $>50\%$  but  $<80\%$ , the study quality will be downgraded by one Level
11. Study must be of humans
12. Study must be published in English
13. Study results must be quantitatively presented
14. Study must not be an in vitro study
15. Study must not be a biomechanical study
16. Study must not have been performed on cadavers

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

### Work Group Defined Criteria

1. Study must be of a Clavicle Fracture injury or prevention thereof.
2. Study must be published in or after <1985> for surgical treatment, rehabilitation, bracing, prevention and MRI
3. Study must be published in or after <1985> for x rays and nonoperative treatment
4. Study must be published in or after <1985> for all others non specified
5. Study should have 30 or more patients per group
6. For surgical treatment a minimum of (all follow up times) (refer to PICO questions for detailed follow up duration)
7. For nonoperative treatment a minimum of (all follow up times) (refer to PICO questions for detailed follow up duration)
8. For prevention studies a minimum of (all follow up times) (refer to PICO questions for detailed follow up duration)
9. Age Categories – All age categories
  - a. Stratified upon literature findings

## Literature Search Strategy

Database:	MEDLINE
Interface:	Ovid MEDLINE® and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions® 1946 to December 9, 2021
Date of Initial Search:	12/10/2021
Search	Clavicle Fractures
Query #	Search
1	English.lg.
2	(exp Animals/ NOT Humans/) OR exp Cadaver/ OR (animal? OR dog OR dogs OR sheepdog OR canine OR cats OR feline OR horse? OR equine OR mouse OR mice OR murine OR rat OR rats OR rabbit? OR sheep OR porcine OR pig OR pigs OR rodent? OR monkey? OR hen OR hens OR veterinar* OR avian).ti. OR cadaver*.ti,ab. OR in-vitro.ti. OR ((comment OR editorial OR letter OR historical article) NOT clinical trial).pt. OR address.pt. OR news.pt. OR newspaper article.pt. OR pmcbook.af. OR case reports.pt. OR (case report? OR abstracts OR editorial OR reply OR comment? OR commentary OR letter).ti.
3	1 NOT 2
4	limit 3 to yr=1985-Current
5	(clavicle? OR clavica? OR midclavicular OR collarbone? OR collar-bone?).mp. AND (exp Fractures-Bone/ OR fracture?.mp.)
6	4 AND 5
7	limit 6 to ez=20211209-20220404

Database:	Embase
Interface:	Elsevier
Date of Initial Search:	12/10/2021
Search	Clavicle Fractures
Query #	Search
1	[english]/lim
2	abstract-report/de OR book/de OR editorial/de OR editorial:it OR note/de OR note:it OR letter/de OR letter:it OR case-study/de OR case-report/de OR chapter:it OR conference-paper/exp OR conference-paper:it OR conference-abstract:it OR conference-review:it OR (abstracts OR editorial OR reply OR comment\$ OR commentary OR letter):ti OR cadaver/de OR in-vitro-study/exp OR cadaver*.ti,ab OR in-vitro:ti OR animal-experiment/exp OR (animal\$ OR dog OR dogs OR sheepdog OR canine OR cats OR feline OR horse\$ OR equine OR mouse OR mice OR murine OR rat OR rats OR rabbit\$ OR sheep OR

	porcine OR pig OR pigs OR rodent\$ OR monkey\$ OR hen OR hens OR veterinar* OR avian):ti
<b>3</b>	#1 NOT #2 AND [1985-3000]/py
<b>4</b>	(clavicle\$ OR clavicula\$ OR midclavicular OR collarbone\$ OR (collar NEXT/1 bone\$)) AND (fracture/exp OR fracture\$)
<b>5</b>	#3 AND #4
<b>6</b>	#3 AND #4 AND [09-12-2021]/sd NOT [05-04-2022]/sd

Database:	Cochrane Central Register of Controlled Trials (CENTRAL)
Interface:	Wiley ( <a href="https://www.cochranelibrary.com/central">https://www.cochranelibrary.com/central</a> )
Date of Initial Search:	12/10/2021
Search	Clavicle Fractures
Query #	Search
1	(clavicle? OR clavícula? OR midclavicular OR collarbone? OR collar-bone?) AND ([mh "Fractures, Bone"] OR fracture?)
2	"conference abstract":pt OR (abstracts OR editorial OR reply OR comment? OR commentary OR letter):ti OR cadaver*:ti,ab OR "in vitro":ti OR (animal? OR dog OR dogs OR sheepdog OR canine OR cats OR feline OR horse? OR equine OR mouse OR mice OR murine OR rat OR rats OR rabbit? OR sheep OR porcine OR pig OR pigs OR rodent? OR monkey? OR hen OR hens OR veterinar* OR avian):ti
3	#1 NOT #2 with <i>Publication Year from 1985 to 2021, in Trials</i>
4	#1 NOT #2 with <i>Cochrane Library publication date from Dec 2021 to Apr 2022</i>

## Excluded Articles

Authors	Article Title	Year	Reason for Exclusion
Adukia, V.; Al-hubeshy, Z.; Mangwani, J.	Can low intensity pulsed ultrasound (LIPUS) be used as an alternative to revision surgery for patients with non-unions following fracture fixation?	2021	Sample size <30 per group
Ahmed, A. F.; Salameh, M.; AlKhatib, N.; Elmhiregh, A.; Ahmed, G. O.	Open Reduction and Internal Fixation Versus Nonsurgical Treatment in Displaced Midshaft Clavicle Fractures: A Meta-Analysis	2018	meta-analysis, bib review complete
Ai, J.; Kan, S. L.; Li, H. L.; Xu, H.; Liu, Y.; Ning, G. Z.; Feng, S. Q.	Anterior inferior plating versus superior plating for clavicle fracture: a meta-analysis	2017	meta-analysis, bib review complete
Aivo, J.; Kurki, S.; Sumelahti, M. L.; Hanninen, K.; Ruutiainen, J.; Soilu-Hanninen, M.	Risk of osteoporotic fractures in multiple sclerosis patients in southwest Finland	2017	Irrelevant topic: osteoporotic fx risk in MS patients
Akgul Ozmen, C.; Onat, S.; Aycicek, D.	Radiologic findings of thoracic trauma	2017	Irrelevant topic: blunt vs penetrative trauma comparison
Alfrey, E. J.; Tracy, M.; Alfrey, J. R.; Carroll, M.; Aranda-Wikman, E. D.; Arora, T.; Maa, J.; Minnis, J.	Helmet Usage Reduces Serious Head Injury Without Decreasing Concussion After Bicycle Riders Crash	2021	Irrelevant Comparison
Alghazzawi, A. A. A.; Mohammed, E. A.; Elzohairy, M. M.; Abdelrhman, M. I.	Results of intra-medullary fixation of displaced midshaft fracture clavicle in adult	2021	Sample size <30 per group; no comparison group
Alhadhoud, M. A.; Alsiri, N. F.	The epidemiology of traumatic musculoskeletal injuries in Kuwait: Prevalence and associated risk factors	2022	Sample Size too Small (n < 30 per group)
Allis, J. B.; Cheung, E. C.; Farrell, E. D.; Johnson, E. E.; Jeffcoat, D. M.	Dual Versus Single-Plate Fixation of Midshaft Clavicular Fractures: A Retrospective Comparative Study	2020	Sample Size too Small (n < 30 per group)
Altamimi, S. A.; McKee, M. D.; Canadian Orthopaedic Trauma, Society	Nonoperative treatment compared with plate fixation of displaced midshaft clavicular fractures. Surgical technique	2008	Surgical technique describing the article in abstract
Althausen, P. L.; Shannon, S.; Lu, M.; O'Mara, T. J.; Bray, T. J.	Clinical and financial comparison of operative and nonoperative treatment of displaced clavicle fractures	2013	Cost; operative not broken down by mid, lateral, etc.
Alves, K.; Jupiter, J.	Clavicle fractures: Plate versus intramedullary fixation	2014	Surgical technique
Amer, K.; Smith, B.; Thomson, J. E.; Congiusta, D.; Reilly, M. C.; Sirkin, M. S.; Adams, M. R.	Operative Versus Nonoperative Outcomes of Middle-Third Clavicle Fractures: A Systematic Review and Meta-Analysis	2020	systematic review, bib review complete
Andersen, K.; Jensen, P. O.; Lauritzen, J.	Treatment of clavicular fractures. Figure-of-eight bandage versus a simple sling	1987	Sample size <30 per group
Andrade-Silva, F. B.; Kojima, K. E.; Joeris, A.; Santos Silva, J.; Mattar, R., Jr.	Single, superiorly placed reconstruction plate compared with flexible intramedullary nailing for midshaft clavicular fractures: a prospective, randomized controlled trial	2015	Sample size <30 per group
Ankers, T.; Sawalha, S.; Nixon, M.; Kenyon, P.; Webb, M.	Does a skin incision along Langer's lines reduce complications following fixation of displaced middle-third clavicle fractures?	2021	Irrelevant Comparison
Anonymous,	Corrigendum: Open reduction and internal fixation with plating is beneficial in the early recovery stage for displaced midshaft clavicular fractures in patients aged 30-65 years old	2018	Corrigendum
Asadollahi, S.; Bucknill, A.	Hook Plate Fixation for Acute Unstable Distal Clavicle Fracture: A Systematic Review and Meta-analysis	2019	systematic review and meta analysis, bib review complete
Asadollahi, S.; Bucknill, A.	Acute medial clavicle fracture in adults: a systematic review of demographics, clinical features and treatment outcomes in 220 patients	2019	systematic review; bib review complete



Asadollahi, S.; Hau, R. C.; Page, R. S.; Richardson, M.; Edwards, E. R.	Complications associated with operative fixation of acute midshaft clavicle fractures	2016	Sample size <30 per group
Asena, M.; Akelma, H.; Ziyadanogullari, M. O.	The relationship between the location of neonatal clavicular fractures and predisposing factors	2020	Sample Size too Small (n < 30 per group)
Ashman, B. D.; Slobogean, G. P.; Stone, T. B.; Viskontas, D. G.; Moola, F. O.; Perey, B. H.; Boyer, D. S.; McCormack, R. G.	Reoperation following open reduction and plate fixation of displaced mid-shaft clavicle fractures	2014	Very Low Quality
Austin, L. S.; O'Brien, M. J.; Zmistowski, B.; Ricchetti, E. T.; Kraeutler, M. J.; Joshi, A.; Fenlin, J. M., Jr.	Additional x-ray views increase decision to treat clavicular fractures surgically	2012	Irrelevant topic: 2 view vs 4 view xray on inter/intra-observer reliability
Axelrod, D. E.; Ekhtiari, S.; Bozzo, A.; Bhandari, M.; Johal, H.	What Is the Best Evidence for Management of Displaced Midshaft Clavicle Fractures? A Systematic Review and Network Meta-analysis of 22 Randomized Controlled Trials	2020	systematic review, bib review complete
Bakir, M. S.; Merschin, D.; Unterkofler, J.; Guembel, D.; Langenbach, A.; Ekkernkamp, A.; Schulz-Drost, S.	Injuries of the Medial Clavicle: A Cohort Analysis in a Level-I-Trauma-Center. Concomitant Injuries. Management. Classification	2017	Sample Size too Small (n < 30 per group)
Bakir, M. S.; Unterkofler, J.; Haralambiev, L.; Kim, S.; Carbon, R.; Ekkernkamp, A.; Schulz-Drost, S.	Medial injuries of the clavicle: more prevalent than expected? A big data analysis of incidence, age, and gender distribution based on nationwide routine data	2021	No Outcomes of Interest
Ban, I.; Branner, U.; Holck, K.; Krashennikoff, M.; Troelsen, A.	Clavicle fractures may be conservatively treated with acceptable results - a systematic review	2012	systematic review, bib review complete
Barlow, T.; Beazley, J.; Barlow, D.	A systematic review of plate versus intramedullary fixation in the treatment of midshaft clavicle fractures	2013	systematic review, bib review complete
Barlow, T.; Upadhyay, P.; Barlow, D.	External fixators in the treatment of midshaft clavicle non-unions: a systematic review	2014	systematic review, bib review complete
Bokor, D.	Current management of midshaft clavicle fractures	2006	Literature review
Bokor, D.	Management of outer clavicle fractures and acromioclavicular joint dislocations	2009	Literature review
Boonard, M.; Sumanont, S.; Arirachakaran, A.; Sikarinkul, E.; Ratanapongpean, P.; Kanchanatawan, W.; Kongtharvonskul, J.	Fixation method for treatment of unstable distal clavicle fracture: systematic review and network meta-analysis	2018	systematic review, bib review complete
Bot, A. G. J.; Bekkers, S.; Arnstein, P. M.; Smith, R. M.; Ring, D.	Opioid use after fracture surgery correlates with pain intensity and satisfaction with pain relief	2014	Irrelevant topic: Opioid use after fracture
Bravman, J. T.; Vidal, A. F.	Midshaft clavicle fractures: are surgical indications changing?	2009	Review article
Brody, S.; Harris, R. P.; Whitener, B. L.; Krasnov, C.; Lux, L. J.; Sutton, S. F.; Lohr, K. N.	(untitled)	2003	Irrelevant Topic: Gestational Diabetes Mellitus
Calisal, E.; Ugur, L.	Evaluation of the plate location used in clavicle fractures during shoulder abduction and flexion movements: a finite element analysis	2018	Biomechanical Study
Camposchiaro, G.; Tsatsis, C.; Gazzotti, G.; Rebuzzi, M.; Catani, F.	Displaced mid-shaft clavicular fractures: surgical treatment with a pre-contoured angular stability plate	2012	no comparison group
Carley, S.; Mackway-Jones, K.	Collar and cuff or sling after fracture of the clavicle	1999	Case report
Catapano, M.; Hoppe, D.; Henry, P.; Nam, D.; Robinson, L. R.; Wasserstein, D.	Healing, Pain and Function after Midshaft Clavicular Fractures: A Systematic Review of Treatment with Immobilization and Rehabilitation	2019	systematic review, bib review complete
Chalidis, B.; Sachinis, N.; Samoladas, E.; Dimitriou, C.; Christodoulou, A.; Pournaras, J.	Acute management of clavicle fractures. A long term functional outcome study	2008	Sample size <30 for operative tx.
Chan, G.; Korac, Z.; Miletic, M.; Vidovic, D.; Phadnis, J.; Bakota, B.	Plate versus intramedullary fixation of two-part and multifragmentary displaced midshaft clavicle fractures â€” a long-term analysis	2017	Groups broken down into subgroups <30 patients per group

Chen, C. Y.; Yang, S. W.; Lin, K. Y.; Lin, K. C.; Tarnag, Y. W.; Renn, J. H.; Lai, C. H.	Comparison of single coracoclavicular suture fixation and hook plate for the treatment of acute unstable distal clavicle fractures	2014	Sample size <30 per group
Chen, W.; Zhu, Y.; Liu, S.; Hou, Z.; Zhang, X.; Lv, H.; Zhang, Y.	Demographic and socioeconomic factors influencing the incidence of clavicle fractures, a national population-based survey of five hundred and twelve thousand, one hundred and eighty seven individuals	2018	No Outcomes of Interest
Cho, C. H.; Kim, B. S.; Kim, D. H.; Jung, G. H.	Posterior Displacement and Angulation of Displaced Lateral Clavicle Fractures: A 3-Dimensional Analysis	2020	Sample Size too Small (n < 30 per group)
Chutkan, N. B.	Sling compared with plate osteosynthesis for treatment of displaced midshaft clavicular fractures: a randomized clinical trial	2012	Literature review
Clement, N. D.; Goudie, E. B.; Brooksbank, A. J.; Chesser, T. J.; Robinson, C. M.	Smoking status and the Disabilities of the Arm Shoulder and Hand score are early predictors of symptomatic nonunion of displaced midshaft fractures of the clavicle	2016	Sample size <30 per group
Cole, P. A.	Open reduction and plate fixation reduced nonunion after displaced midshaft clavicular fracture	2014	Commentary on article
Compston, J. E.; Flahive, J.; Hosmer, D. W.; Watts, N. B.; Siris, E. S.; Silverman, S.; Saag, K. G.; Roux, C.; Rossini, M.; Pfeilschifter, J.; Nieves, J. W.; Netelenbos, J. C.; March, L.; LaCroix, A. Z.; Hooven, F. H.; Greenspan, S. L.; Gehlbach, S. H.; Diez-Perez, A.; Cooper, C.; Chapurlat, R. D.; Boonen, S.; Anderson, F. A., Jr.; Adami, S.; Adachi, J. D.; Glow Investigators	Relationship of weight, height, and body mass index with fracture risk at different sites in postmenopausal women: the Global Longitudinal study of Osteoporosis in Women (GLOW)	2014	Irrelevant topic: Fx risk, no outcomes of interest captured
Compston, J. E.; Watts, N. B.; Chapurlat, R.; Cooper, C.; Boonen, S.; Greenspan, S.; Pfeilschifter, J.; Silverman, S.; D'Áez-PÁrez, A.; Lindsay, R.; Saag, K. G.; Netelenbos, J. C.; Gehlbach, S.; Hooven, F. H.; Flahive, J.; Adachi, J. D.; Rossini, M.; Lacroix, A. Z.; Roux, C.; Sambrook, P. N.; Siris, E. S.	Obesity is not protective against fracture in postmenopausal women: Glow	2011	Sample size <30 per group with clavicle fractures
Cota, A.; Tarchala, M.; Parent-Harvey, C.; Engel, V.; Berry, G.; Reindl, R.; Harvey, E. J.	Review of 5.5 Years' Experience Using E-mail-Based Telemedicine to Deliver Orthopedic Care to Remote Communities	2017	Irrelevant Topic: Teleorthopedic Service
Court-Brown, C. M.; Duckworth, A. D.; Clement, N. D.; McQueen, M. M.	Fractures in older adults. A view of the future?	2018	No Outcomes of Interest
Court-Brown, C. M.; Duckworth, A. D.; Ralston, S.; McQueen, M. M.	The relationship between obesity and fractures	2019	No Outcomes of Interest
Daniilidis, K.; Raschke, M. J.; Vogt, B.; Herbolt, M.; Schliemann, B.; Gunther, N.; Koesters, C.; Fuchs, T.	Comparison between conservative and surgical treatment of midshaft clavicle fractures: outcome of 151 cases	2013	Very Low Quality
Dehghan, N.; Mitchell, S. M.; Schemitsch, E. H.	Rehabilitation after plate fixation of upper and lower extremity fractures	2018	Literature review
Deng, A. D.; Innocenti, M.; Arora, R.; Gabl, M.; Tang, J. B.	Vascularized Small-Bone Transfers for Fracture Nonunion and Bony Defects	2017	Literature review
Devji, T.; Kleinlugtenbelt, Y.; Evaniew, N.; Ristevski, B.; Khoudigian, S.; Bhandari, M.	Operative versus nonoperative interventions for common fractures of the clavicle: a meta-analysis of randomized controlled trials	2015	systematic review, bib review complete
Doll, J.; Streblov, J.; Weber, M. A.; Schmidmaier, G.; Fischer, C.	The AMANDUS Project PART II-Advanced Microperfusion Assessed Non-Union Diagnostics with Contrast-Enhanced Ultrasound (CEUS): A Reliable Diagnostic Tool for the Management and Pre-operative Detection of Infected Upper-Limb Non-unions	2021	Sample Size too Small (n < 30 per group)
Dombrowsky, A. R.; Boudreau, S.; Quade, J.; Brabston, E. W.; Ponce, B. A.; Momaya, A. M.	Clinical outcomes following conservative and surgical management of floating shoulder injuries: a systematic review	2020	Irrelevant Topic: Floating Shoulder
Drijfhout van Hooff, C. C.; Haverlag, R.; Willems, W. J.	Evaluation of the use of the hook plate in Neer type 2 lateral clavicle fractures and Rockwood types 3-5 acromioclavicular joint dislocations	2013	Sample size <30 per group

Duan, X.; Zhong, G.; Cen, S.; Huang, F.; Xiang, Z.	Plating versus intramedullary pin or conservative treatment for midshaft fracture of clavicle: a meta-analysis of randomized controlled trials	2011	meta-analysis, bib review complete
Eberbach, H.; Lefering, R.; Hager, S.; Schumm, K.; Bode, L.; Jaeger, M.; Maier, D.; Kalbhenn, J.; Hammer, T.; Schmal, H.; Bayer, J.	Influence of surgical stabilization of clavicle fractures in multiply-injured patients with thoracic trauma	2021	No Outcomes of Interest
Edwards, D. J.; Kavanagh, T. G.; Flannery, M. C.	Fractures of the distal clavicle: a case for fixation	1992	Sample size <30 per group
Ekegren, C. L.; Ashe, M. C.; Gabbe, B. J.	Association between Patient-Reported Health Status and Physical Activity Six Months after Upper and Lower Limb Fractures in Working-Aged Adults	2021	Sample size <30 per group
Ellis, H. B.; Li, Y.; Bae, D. S.; Kalish, L. A.; Wilson, P. L.; Pennock, A. T.; Nepple, J. J.; Willimon, S. C.; Spence, D. D.; Pandya, N. K.; Facts Study Group; Kocher, M. S.; Edmonds, E. W.; Farley, F. A.; Gordon, J. E.; Kelly, D. M.; Busch, M. T.; Sabatini, C. S.; Heyworth, B. E.	Descriptive Epidemiology of Adolescent Clavicle Fractures: Results From the FACTS (Function after Adolescent Clavicle Trauma and Surgery) Prospective, Multicenter Cohort Study	2020	No Outcomes of Interest
Eskola, A.; Santavirta, S.; Viljakka, H. T.; Wirta, J.; Partio, T. E.; Hoikka, V.	The results of operative resection of the lateral end of the clavicle	1996	Irrelevant topic: AC joint surgery
Eskola, A.; Vainionpaa, S.; Myllynen, P.; Patiala, H.; Rokkanen, P.	Outcome of clavicular fracture in 89 patients	1986	Sample size <30 per group
Evaniew, N.; Simunovic, N.; McKee, M. D.; Schemitsch, E.	Cochrane in CORR®: Surgical versus conservative interventions for treating fractures of the middle third of the clavicle	2014	Clinical review
Fadell, M.; Miller, A.; Trefan, L.; Weinman, J.; Stewart, J.; Hayes, K.; Maguire, S.	Radiological features of healing in newborn clavicular fractures	2017	No Outcomes of Interest
Faldini, C.; Nanni, M.; Leonetti, D.; Acri, F.; Galante, C.; Luciani, D.; Giannini, S.	Nonoperative treatment of closed displaced midshaft clavicle fractures	2010	no comparison group
FitzGerald, G.; Boonen, S.; Compston, J. E.; Pfeilschifter, J.; LaCroix, A. Z.; Hosmer, D. W., Jr.; Hooven, F. H.; Gehlbach, S. H.; Glow Investigators	Differing risk profiles for individual fracture sites: evidence from the Global Longitudinal Study of Osteoporosis in Women (GLOW)	2012	Irrelevant Comparison
Flavin, R. A.; Fleming, F.; Shanley, L.; Kelly, I. P.	Closed treatment of clavicle fractures results in reduced shoulder strength	2004	Sample Size too Small (n < 30 per group)
Formaini, N.; Taylor, B. C.; Backes, J.; Bramwell, T. J.	Superior versus anteroinferior plating of clavicle fractures	2013	Very Low Quality
Fourman, M. S.	CORR Insights®: Minimal Pain Decrease Between 2 and 4 Weeks after Nonoperative Management of a Displaced Midshaft Clavicle Fracture Is Associated with a High Risk of Symptomatic Nonunion	2020	Sample size <30 per group
Frey, A.; Lambert, C.; Vesselle, B.; Rousseau, R.; Dor, F.; Marquet, L. A.; Toussaint, J. F.; Crema, M. D.	Epidemiology of Judo-Related Injuries in 21 Seasons of Competitions in France: A Prospective Study of Relevant Traumatic Injuries	2019	Irrelevant topic: incidence rates. No outcomes
Frigg, A.; Rillmann, P.; Perren, T.; Gerber, M.; Ryf, C.	Intramedullary nailing of clavicular midshaft fractures with the titanium elastic nail: problems and complications	2009	no comparison group
Fritz, E. M.; Van der Meijden, O. A.; Hussain, Z. B.; Pogorzelski, J.; Millett, P. J.	Intramedullary Fixation of Midshaft Clavicle Fractures	2017	Case Study
Fu, M.; Guo, J.; Zhao, Y.; Zhang, Y.; Zhang, Y.; Wang, Z.; Hou, Z.	Characteristics of fall-related fractures in older adults with cerebrovascular disease: A cross-sectional study	2021	Sample Size too Small (n < 30 per group)
Gao, B.; Dwivedi, S.; Patel, S. A.; Nwizu, C.; Cruz, A. I., Jr.	Operative Versus Nonoperative Management of Displaced Midshaft Clavicle Fractures in Pediatric and Adolescent Patients: A Systematic Review and Meta-Analysis	2019	systematic review, bib review complete
Gao, Y.; Chen, W.; Liu, Y. J.; Li, X.; Wang, H. L.; Chen, Z. Y.	Plating versus intramedullary fixation for mid-shaft clavicle fractures: a systemic review and meta-analysis	2016	systematic review, bib review complete
Gardner, E. C.; Chan, W. W.; Sutton, K. M.; Blaine, T. A.	Shoulder Injuries in Men's Collegiate Lacrosse, 2004-2009	2016	Sample Size too Small (n < 30 per group)

George, D. M.; McKay, B. P.; Jaarsma, R. L.	The long-term outcome of displaced mid-third clavicle fractures on scapular and shoulder function: variations between immediate surgery, delayed surgery, and nonsurgical management	2015	Sample size <30 per group
Gieger, J.; Beeres, F.; Birrer, K.; Babst, R.	Misalignment of the clavicle after intramedullary fixation of a midshaft fracture with a titanium elastic nail results in acute neurovascular thoracic outlet syndrome	2016	Case report
Good, D. W.; Lui, D. F.; Leonard, M.; Morris, S.; McElwain, J. P.	Clavicle hook plate fixation for displaced lateral-third clavicle fractures (Neer type II): a functional outcome study	2012	no comparison group; sample size <30
Goudie, E. B.; Clement, N. D.; Murray, I. R.; Lawrence, C. R.; Wilson, M.; Brooksbank, A. J.; Robinson, C. M.	The Influence of Shortening on Clinical Outcome in Healed Displaced Midshaft Clavicular Fractures After Nonoperative Treatment	2017	Comparing outcomes to Fx shortening-not an outcome of interest in pico 19
Grassi, F. A.; Tajana, M. S.; D'Angelo, F.	Management of midclavicular fractures: comparison between nonoperative treatment and open intramedullary fixation in 80 patients	2001	Very Low Quality
Grossman, J.; Giliberti, B.; Dolitsky, R.; Parker, G.; Kim, B.; Kutzarov, K.; Curatolo, E.	Pediatric Orthopedic Trauma	2020	Literature review
Guerra, E.; Previtali, D.; Tamborini, S.; Filardo, G.; Zaffagnini, S.; Candrian, C.	Midshaft Clavicle Fractures: Surgery Provides Better Results as Compared With Nonoperative Treatment: A Meta-analysis	2019	meta-analysis, bib review complete
Gumina, S.; Carbone, S.; Polizzotti, G.; Paglialunga, C.; Preziosi Standoli, J.; Candela, V.	The Rare Medial-End Clavicle Fractures: Epidemiological Study on Inhabitants of a Suburban Area	2021	Sample Size too Small (n < 30 per group)
Gupta, R.; Cabacungan, E. T.	Neonatal Birth Trauma: Analysis of Yearly Trends, Risk Factors, and Outcomes	2021	Irrelevant Topic: Incidence
Hagstrom, L. S.; Ferrick, M.; Galpin, R.	Outcomes of operative versus nonoperative treatment of displaced pediatric clavicle fractures	2015	insufficient follow up
Hao, K. A.; Kakalecik, J.; Delgado, G. A.; Wright, T. W.; King, J. J.; Wright, J. O.	Current trends in patient-reported outcome measures for clavicle fractures: a focused systematic review of 11 influential orthopaedic journals	2021	systematic review, bib review complete
Herteleer, M.; Hoekstra, H.; Nijs, S.	Diagnosis and treatment of clavicular fractures in Belgium between 2006 and 2015	2018	No Outcomes of Interest
Herteleer, M.; Winckelmans, T.; Hoekstra, H.; Nijs, S.	Epidemiology of clavicle fractures in a level 1 trauma center in Belgium	2018	No Outcomes of Interest
Hill, C. E.	Is intramedullary nailing more effective than non-operative treatment in adults with displaced middle-third clavicle fractures?	2014	systematic review, bib review complete
Hogberg, U.; Fellman, V.; Thiblin, I.; Karlsson, R.; Wester, K.	Difficult birth is the main contributor to birth-related fracture and accidents to other neonatal fractures	2020	No Outcomes of Interest
Hoogervorst, P.; Chopra, A.; Working, Z. M.; El Naga, A. N.; Verdonschot, N.; Hannink, G.	Measurement of midshaft clavicle vertical displacement is not influenced by radiographic projection	2020	Sample Size too Small (n < 30 per group)
Hoogervorst, P.; Hannink, G.; van Geene, A. R.; van Kampen, A.	Reliability of measurements of the fractured clavicle: a systematic review	2017	systematic review; bib review complete
Hoogervorst, P.; van Dam, T.; Verdonschot, N.; Hannink, G.	Functional outcomes and complications of intramedullary fixation devices for Midshaft clavicle fractures: a systematic review and meta-analysis	2020	systematic review; bib review complete
Hoogervorst, P.; van Geene, A.; Gundlach, U.; Wei, A.; Verdonschot, N.; Hannink, G.	Influence of radiographic projection and patient positioning on shortening of the fractured clavicle	2020	Sample Size too Small (n < 30 per group)
Horst, K.; Dienstknecht, T.; Pfeifer, R.; Pishnamaz, M.; Hildebrand, F.; Pape, H. C.	Risk stratification by injury distribution in polytrauma patients - does the clavicular fracture play a role?	2013	Irrelevant Comparison
Horst, K.; Hildebrand, F.; Kobbe, P.; Pfeifer, R.; Lichte, P.; Andruszkow, H.; Lefering, R.; Pape, H. C.	Detecting severe injuries of the upper body in multiple trauma patients	2015	Irrelevant comparison group
Hosseinzadeh, S.; DeAngelis, J. P.; Komaraju, A.; Wu, A. C.; Wu, J. S.	Imaging of Acute Shoulder Trauma	2021	Literature review
Houwert, R. M.; Smeeing, D. P.; Ahmed Ali, U.; Hietbrink, F.; Kruyt, M. C.; van der Meijden, O. A.	Plate fixation or intramedullary fixation for midshaft clavicle fractures: a systematic review and meta-analysis of randomized controlled trials and observational studies	2016	systematic review, bib review complete

Houwert, R. M.; Wijdicks, F. J.; Steins Bisschop, C.; Verleisdonk, E. J.; Kruyt, M.	Plate fixation versus intramedullary fixation for displaced mid-shaft clavicle fractures: a systematic review	2012	systematic review, bib review complete
Huang, H.; Yang, M.; Zhou, H.; Lin, C.; Li, X.; Zhang, H.	Method of shoulder delivery and neonatal outcomes: A meta-analysis of prospective controlled studies	2018	meta-analysis, bib review complete
Huang, J. I.; Toogood, P.; Chen, M. R.; Wilber, J. H.; Cooperman, D. R.	Clavicular anatomy and the applicability of precontoured plates	2007	cadaver clavicle specimens
Huang, S. G.; Chen, B.; Lv, D.; Zhang, Y.; Nie, F. F.; Li, W.; Lv, Y.; Zhao, H. L.; Liu, H. M.	Evaluation of shoulder function in clavicular fracture patients after six surgical procedures based on a network meta-analysis	2017	meta-analysis, bib review complete
Hughes, K.; Kimpton, J.; Wei, R.; Williamson, M.; Yeo, A.; Arnander, M.; Gelfer, Y.	Clavicle fracture nonunion in the paediatric population: a systematic review of the literature	2018	systematic review, bib review complete
Hughes, P. J.; Bolton-Maggs, B.	Fractures of the clavicle in adults	2002	Literature review
Hulsmans, M. H.; van Heijl, M.; Houwert, R. M.; Timmers, T. K.; van Olden, G.; Verleisdonk, E. J.	Anteroinferior versus superior plating of clavicular fractures	2016	Very Low Quality
Hurley, R.; Moloney, D.; Morrissey, D.	Compression bone grafting in clavicle nonunion surgery	2021	Surgical technique
Hussain, N.; Sermer, C.; Prusick, P. J.; Banfield, L.; Atrey, A.; Bhandari, M.	Intramedullary Nailing Versus Plate Fixation for the Treatment Displaced Midshaft Clavicular Fractures: A Systematic Review and Meta-Analysis	2016	systematic review and meta analysis, bib review complete
Huttunen, T. T.; Launonen, A. P.; Berg, H. E.; Lepola, V.; Fellander-Tsai, L.; Mattila, V. M.	Trends in the Incidence of Clavicle Fractures and Surgical Repair in Sweden: 2001-2012	2016	No Outcomes of Interest
Jack, R. A., 2nd; Sochacki, K. R.; Navarro, S. M.; McCulloch, P. C.; Lintner, D. M.; Harris, J. D.	Performance and Return to Sport After Nonoperative Treatment of Clavicle Fractures in National Football League Players	2017	Sample Size too Small (n < 30 per group)
Jarvis, N. E.; Halliday, L.; Sinnott, M.; Mackenzie, T.; Funk, L.; Monga, P.	Surgery for the fractured clavicle: factors predicting nonunion	2018	no comparison group
Jenkins, P. J.; Brooksbank, A. J.	Regarding "Surgical treatment of displaced middle-third clavicular fractures: a prospective, randomized trial in a working compensation population"	2015	Letter to the editor
Jiang, H.; Qu, W.	Operative treatment of clavicle midshaft fractures using a locking compression plate: comparison between mini-invasive plate osteosynthesis (MIPPO) technique and conventional open reduction	2012	Both operative groups
Jiang, W.; Wang, H.; Li, Y. S.; Zhou, T. J.; Hu, X. J.	Meta-analysis of differences in Constant-Murley scores for three mid-shaft clavicular fracture treatments	2017	meta-analysis, bib review complete
Jorgensen, A.; Troelsen, A.; Ban, I.	Predictors associated with nonunion and symptomatic malunion following non-operative treatment of displaced midshaft clavicle fractures--a systematic review of the literature	2014	systematic review, bib review complete
Jørgensen, A.; Troelsen, A.; Ban, I.	Predictors associated with nonunion and symptomatic malunion following non-operative treatment of displaced midshaft clavicle fractures—a systematic review of the literature	2014	systematic review, bib review complete
Ju, W. N.; Cheng, S.; Qiao, W. S.; Qi, B. C.	Functional outcomes and adverse effects following three interventions for displaced midshaft clavicular fractures: A Bayesian network meta-analysis of randomized controlled trials	2021	meta-analysis, bib review complete
Ju, W.; Mohamed, S. O.; Qi, B.	Comparison of plate fixation vs. intramedullary fixation for the management of mid-shaft clavicle fractures: A systematic review and meta-analysis of randomised controlled trials	2020	systematic review; bib review complete
Kanat Pektas, M.; Koyuncu, H.; Kundak, A. A.	Long bone fractures in neonatal intensive care units of Afyonkarahisar: Five-year's experience	2019	Irrelevant topic: Long bone fx incidence in neonates
Kariya, A. D.; Jain, P. A.; Patond, K.	Middle third clavicular fractures fixed with precontoured locking compression plate or reconstruction plate: Comparison of outcomes and complications	2019	Very Low Quality
Kask, G.; Raittio, L.; Mattila, V. M.; Launonen, A. P.	Cost-Effectiveness of Operative Versus Non-Operative Treatment for Clavicle Fracture: a Systematic Literature Review	2020	systematic review, cost analysis; bib review complete
Kekki, M.; Salonen, A.; Tihtonen, K.; Mattila, V. M.; Gissler, M.; Huttunen, T. T.	The incidence of birth injuries decreased in Finland between 1997 and 2017: A nationwide register study	2020	No Outcomes of Interest

Kelley, M. E.; Talton, J. W.; Weaver, A. A.; Usoro, A. O.; Barnard, E. R.; Miller, A. N.	Associations between upper extremity injury patterns in side impact motor vehicle collisions with occupant and crash characteristics	2019	Irrelevant Topic: Incidence
Khorami, M.; Fakour, M.; Mokarrami, H.; Arti, H. R.; Nasab, A. M.; Shahriyar, F.	The Comparison of Results of Treatment of Midshaft Clavicle Fracture between Operative Treatment with Plate and Non-Operative Treatment	2014	Very Low Quality
Kihlstrom, C.; Hailer, N. P.; Wolf, O.	Surgical Versus Nonsurgical Treatment of Lateral Clavicle Fractures: A Short-Term Follow-Up of Treatment and Complications in 122 Patients	2021	Sample Size too Small (n < 30 per group)
Kihlstrom, C.; Moller, M.; Lonn, K.; Wolf, O.	Clavicle fractures: epidemiology, classification and treatment of 2 422 fractures in the Swedish Fracture Register; an observational study	2017	No Outcomes of Interest
Kong, L.; Zhang, Y.; Shen, Y.	Operative versus nonoperative treatment for displaced midshaft clavicular fractures: a meta-analysis of randomized clinical trials	2014	systematic review, bib review complete
Korner, D.; Gonser, C. E.; Bahrs, C.; Hemmann, P.	Change in paediatric upper extremity fracture incidences in German hospitals from 2002 to 2017: an epidemiological study	2020	No Outcomes of Interest
Kornguth, P. J.; Salazar, A. M.	The apical oblique view of the shoulder: its usefulness in acute trauma	1987	Sample size <30 per group; no malunion/nonunion outcomes
Kotekar, M. F.; Pai, S.; Yogesh, K.; Kumar, M. A.; Shetty, M. S.	Anatomy of clavicle in the Indian population and its applicability in pre-contoured plating	2020	No Outcomes of Interest
Kotelnicki, J. J.; Bote, H. O.; Mitts, K. G.	The management of clavicle fractures	2006	Literature review
Kugelman, D.; Paoli, A.; Mai, D.; Konda, S.; Egol, K.	Urban Cycling Expansion is Associated with an Increased Number of Clavicle Fractures	2020	No Outcomes of Interest
Kwak-Lee, Juliann; Ahlmann, Elke R.; Wang, Lingjun; Itamura, John M.	Analysis of Contoured Anatomic Plate Fixation versus Intramedullary Rod Fixation for Acute Midshaft Clavicle Fractures	2014	Irrelevant topic: pin/rod vs plate
Lantry, J. M.; Roberts, C. S.; Giannoudis, P. V.	Operative treatment of scapular fractures: a systematic review	2008	Irrelevant Topic: Scapula Fracture
Lea, M. A.; Makaram, N.; Srinivasan, M. S.	Complex shoulder girdle injuries following mountain bike accidents and a review of the literature	2016	Case Review: 5 cases
Lee, H. J.; Park, Y. B.; Shim, C. H.; Noh, Y. M.	Does cerclage wiring interfere with fracture healing of osteosynthesis in comminuted midshaft clavicle fractures? A multicenter study	2021	No Outcomes of Interest
Lee, S. K.; Lee, J. W.; Song, D. G.; Choy, W. S.	Precontoured locking plate fixation for displaced lateral clavicle fractures	2013	no comparison group
Lee, Y. S.; Huang, H. L.; Lo, T. Y.; Hsieh, Y. F.; Huang, C. R.	Surgical treatment of midclavicular fractures: a prospective comparison of Knowles pinning and plate fixation	2008	Irrelevant topic: Knowles pin
Lee, Y. S.; Lin, C. C.; Huang, C. R.; Chen, C. N.; Liao, W. Y.	Operative treatment of midclavicular fractures in 62 elderly patients: knowles pin versus plate	2007	Irrelevant topic: Knowles pin
Lemkin, D. L.; Bond, M. C.; Brady, W. J.	The orthopedic literature 2011	2012	Literature review
Lenza, M.; Belloti, J. C.; Andriolo, R. B.; Dos Santos, J. B. G.; Faloppa, F.	Conservative interventions for treating middle third clavicle fractures in adolescents and adults	2009	systematic review, bib review complete
Lenza, M.; Belloti, J. C.; Andriolo, R. B.; Faloppa, F.	Conservative interventions for treating middle third clavicle fractures in adolescents and adults	2014	systematic review, bib review complete
Lenza, M.; Belloti, J. C.; Andriolo, R. B.; Gomes Dos Santos, J. B.; Faloppa, F.	Conservative interventions for treating middle third clavicle fractures in adolescents and adults	2008	systematic review (protocol), bib review complete
Lenza, M.; Buchbinder, R.; Johnston, R. V.; Belloti, J. C.; Faloppa, F.	Surgical versus conservative interventions for treating fractures of the middle third of the clavicle	2013	systematic review, bib review complete
Lenza, M.; Buchbinder, R.; Johnston, R. V.; Ferrari, B. A.; Faloppa, F.	Surgical versus conservative interventions for treating fractures of the middle third of the clavicle	2019	systematic review; bib review complete
Lenza, M.; Faloppa, F.	Surgical interventions for treating acute fractures or non-union of the middle third of the clavicle	2015	systematic review, bib review complete
Lenza, M.; Faloppa, F.	Conservative interventions for treating middle third clavicle fractures in adolescents and adults	2016	systematic review, bib review complete

Leroux, T.; Wasserstein, D.; Henry, P.; Khoshbin, A.; Dwyer, T.; Ogilvie-Harris, D.; Mahomed, N.; Veillette, C.	Rate of and Risk Factors for Reoperations After Open Reduction and Internal Fixation of Midshaft Clavicle Fractures: A Population-Based Study in Ontario, Canada	2014	No outcomes of interest
Li, G.; Liao, J.; Su, W.	Open reduction and plate fixation versus sling in treatment of midshaft fractures of clavicle: A prospective randomized study protocol	2021	Study has not occurred yet.
Li, L.; Li, T. Y.; Jiang, P.; Lin, G.; Wu, H.; Han, X.; Yu, X.	Clavicle hook plate versus distal clavicle locking plate for Neer type II distal clavicle fractures	2019	meta-analysis; bib review complete
Li, L.; Yang, X.; Xing, F.; Jiang, J.; Tang, X.	Plate fixation versus intramedullary nail or Knowles pin fixation for displaced midshaft clavicle fractures: A meta-analysis of randomized controlled trials	2020	meta-analysis; bib review complete
Liu, G. D.; Tong, S. L.; Ou, S.; Zhou, L. S.; Fei, J.; Nan, G. X.; Gu, J. W.	Operative versus non-operative treatment for clavicle fracture: a meta-analysis	2013	systematic review, bib review complete
Liu, H. T.; Rau, C. S.; Wu, S. C.; Chen, Y. C.; Hsu, S. Y.; Hsieh, H. Y.; Hsieh, C. H.	Obese motorcycle riders have a different injury pattern and longer hospital length of stay than the normal-weight patients	2016	Irrelevant Topic: Incidence
Liu, S.; Liu, B.; Chang, H.; Chen, W.; Zhu, Y.; Zhang, Y.	Age- and gender-specific characteristics of the clavicular fractures, data from 83 hospitals in China	2017	Irrelevant Comparison
Longo, U. G.; Banerjee, S.; Barber, J.; Chambler, A.; Cobiella, C.; Corbett, S.; Crowther, M.; Drew, S.; Francis, A.; Lee, M.; Garlick, N.; Packham, I.; Pearse, Y.; Richards, A.; Roberts, C.; Tennent, D.; Tims, E.; Ahrens, P. M.	Conservative management versus open reduction and internal fixation for mid-shaft clavicle fractures in adults--the Clavicle Trial: study protocol for a multicentre randomized controlled trial	2011	study is in progress
Lu, M.; Qiu, H.; Zhou, X.; Lee, C. S.; Jiang, D.; Dong, J.; Quan, Z.	Superior versus anteroinferior plating of displaced midshaft clavicular fracture in patients older than 60 years	2017	Sample Size too Small (n < 30 per group)
Lurie, S.; Wand, S.; Golan, A.; Sadan, O.	Risk factors for fractured clavicle in the newborn	2011	Irrelevant topic: Identifying risk factors; no outcomes
MacDermid, J. C.; McClure, J. A.; Richard, L.; Faber, K. J.; Jaglal, S.	Fracture profiles of a 4-year cohort of 266,324 first incident upper extremity fractures from population health data in Ontario	2021	No Outcomes of Interest
Madhukar, K. T.; Sateesh, G. S.	A comparative study of clavicle fractures by conservative and operative management	2015	Operative group broken down to <30 patients per surgical type
Malik, S. S.; Tahir, M.; Jordan, R. W.; Malik, S. S.; Saithna, A.	Is shortening of displaced midshaft clavicle fractures associated with inferior clinical outcomes following nonoperative management? A systematic review	2019	systematic review, bib review complete
Malik, S. S.; Tahir, M.; Malik, S.; Kwapisz, A.; Jordan, R. W.	Arthroscopically Assisted Coraco-Clavicular Ligament Reconstruction in Treatment of Acute Displaced Distal Clavicle Fractures Provides Good to Excellent Shoulder Function Despite Low Union Rates and High Complication Rates: A Systematic Review	2021	systematic review, bib review complete
Martetschlager, F.; Gaskill, T. R.; Millett, P. J.	Management of clavicle nonunion and malunion	2013	Narrative review
Martin, J. R.; Saunders, P. E.; Phillips, M.; Mitchell, S. M.; McKee, M. D.; Schemitsch, E. H.; Dehghan, N.	Comparative effectiveness of treatment options for displaced midshaft clavicle fractures : a systematic review and network meta-analysis	2021	systematic review, bib review complete
McCarthy, M. M.; Bihl, J. H.; Frank, R. M.; Salem, H. S.; McCarty, E. C.; Comstock, R. D.	Epidemiology of Clavicle Fractures Among US High School Athletes, 2008-2009 Through 2016-2017	2019	No Outcomes of Interest
McKee, M. D.; Pedersen, E. M.; Jones, C.; Stephen, D. J.; Kreder, H. J.; Schemitsch, E. H.; Wild, L. M.; Potter, J.	Deficits following nonoperative treatment of displaced midshaft clavicular fractures	2006	no comparison group; 30 patients total
McKee, R. C.; Whelan, D. B.; Schemitsch, E. H.; McKee, M. D.	Operative versus nonoperative care of displaced midshaft clavicular fractures: a meta-analysis of randomized clinical trials	2012	meta-analysis, bib review complete
McKerrow, M.; North, J.	Clavicle fracture management: A comparison of a tertiary hospital and rural telehealth sites	2017	Irrelevant Comparison
Meselhy, M. A.; Shosha, A. M.; Essawy, O. M.; Eltrigy, S. A. E.	Management of Clavicular Fracture in Adults by Plating: a Systematic Review	2021	systematic review, bib review complete

Micheloni, G. M.; Tarallo, L.; Porcellini, G.; Catani, F.	Comparison between conservative treatment and plate fixation for displaced middle third clavicle fracture: clinical outcomes and complications	2019	Very Low Quality
Minasov, B. S.; Yakupov, S. F.; Yakupov, R. R.; Bilyalov, A. R.; Valeev, M. M.; Minasov, ? B.; Mavlyutov, ? R.; Nagimov, M. I.; Garipov, I. I.	Strength Characteristics of the Bone-Implant-Bone System in Midshaft Clavicular Fracture Osteosynthesis	2019	Surgical technique on cadaver specimens described
Moretti, B.; Spacca, G.; Pesce, V.; Lo Bianco, G.; Patella, V.; Simone, C.	Correlations between the cause and origin of clavicle fractures in rugby players and their treatment	1995	no comparison group
Mouzopoulos, G.; Morakis, E.; Stamatakos, M.; Tzurbakis, M.	Complications associated with clavicular fracture	2009	Literature review
Mukhtar, I. A.; Yagmour, K. M.; Ahmed, A. F.; Ibrahim, T.	Flexible intramedullary nailing versus nonoperative treatment for paediatric displaced midshaft clavicle fractures	2018	Sample size <30 per group
Mumtaz Hashmi, H.; Shamim, N.; Kumar, V.; Anjum, N.; Ahmad, K.	Clavicular Fractures in Newborns: What Happens to One of the Commonly Injured Bones at Birth?	2021	No Outcomes of Interest
Murray, L.; Fickenscher, K.; Moffatt, M.; Frazier, T.; Jackson, J.; Anderst, J.	Fractures Presumed to Be Low Risk for Abuse in Young Mobile Children: Association With Concomitant Suspicious Injuries	2020	No Outcomes of Interest
Ng, N.; Nicholson, J. A.; Chen, P.; Yapp, L. Z.; Gaston, M. S.; Robinson, C. M.	Adolescent mid-shaft clavicular fracture displacement does not predict nonunion or inferior functional outcome at long-term follow-up	2021	Sample Size too Small (n < 30 per group)
Nicholson, J. A.; Fox, B.; Dhir, R.; Simpson, A.; Robinson, C. M.	The accuracy of computed tomography for clavicle non-union evaluation	2021	Sample Size too Small (n < 30 per group)
Nourian, A.; Dhaliwal, S.; Vangala, S.; Vezeridis, P. S.	Midshaft Fractures of the Clavicle: A Meta-analysis Comparing Surgical Fixation Using Anteroinferior Plating Versus Superior Plating	2017	meta-analysis, bib review complete
Nowak, J.; Holgersson, M.; Larsson, S.	Can we predict long-term sequelae after fractures of the clavicle based on initial findings? A prospective study with nine to ten years of follow-up	2004	No outcomes of interest
Nowak, J.; Mallmin, H.; Larsson, S.	The aetiology and epidemiology of clavicular fractures. A prospective study during a two-year period in Uppsala, Sweden	2000	Irrelevant topic: outcomes not of interest to PICO
Nunn, D.; Taylor, G. J.; Heatley, F. W.	Fractures and dislocations of the clavicle	1989	Literature review
O'Neill, B. J.; Hirpara, K. M.; O'Briain, D.; McGarr, C.; Kaar, T. K.	Clavicle fractures: a comparison of five classification systems and their relationship to treatment outcomes	2011	Irrelevant topic: classification systems comparisons
Ochen, Y.; Frima, H.; Houwert, R. M.; Heng, M.; van Heijl, M.; Verleisdonk, E.; van der Velde, D.	Surgical treatment of Neer type II and type V lateral clavicular fractures: comparison of hook plate versus superior plate with lateral extension: a retrospective cohort study	2019	Sample Size too Small (n < 30 per group)
Oh, J. H.; Kim, S. H.; Lee, J. H.; Shin, S. H.; Gong, H. S.	Treatment of distal clavicle fracture: a systematic review of treatment modalities in 425 fractures	2011	systematic review, bib review complete
Omid, R.; Kidd, C.; Yi, A.; Villacis, D.; White, E.	Measurement of Clavicle Fracture Shortening Using Computed Tomography and Chest Radiography	2016	Sample size <30 per group
Ong, T.; Sahota, O.; Tan, W.; Marshall, L.	A United Kingdom perspective on the relationship between body mass index (BMI) and bone health: A cross sectional analysis of data from the Nottingham Fracture Liaison Service	2014	Irrelevant topic: bone health and BMI
Orlandi, T. V.; Rogers, N. S.; Burger, M. C.; King, P. R.; Lamberts, R. P.	A prospective randomized controlled trial comparing plating augmented with coracoclavicular fixation and hook plate fixation of displaced distal third clavicle fractures	2022	Sample Size too Small (n < 30 per group)
Ostergaard, P. J.; Hall, M. J.; Xiong, G.; Zhang, D.; Earp, B. E.	Risk Factors for Implant Removal After Surgical Fixation of Midshaft Clavicle Fractures	2022	No Outcomes of Interest
Otis, S.; Cox, D.	Saving grace	2007	Case review
Paladini, P.; Pellegrini, A.; Merolla, G.; Campi, F.; Porcellini, G.	Treatment of clavicle fractures	2012	systematic review; bib review complete
Palarcik, J.	Clavicular fractures (group of patients treated in the Traumatological Research Institute in 1986-1989)	1991	Sample size <30 per group
Pandya, N. K.; Hosalkar, H. S.; Babatunde, O. M.; Huffman, G. R.	Distal third clavicular fracture fixation: A new arthroscopically-assisted technique	2009	Surgical technique
Pang, E. Q.; Zhang, S.; Harris, A. H. S.; Kamal, R. N.	Treatment Trends in Older Adults With Midshaft Clavicle Fractures	2017	No Outcomes of Interest



Parsons, M.; Blitzer, C. M.	Small-incision, intramedullary compression osteosynthesis of acute and non-united midshaft clavicle fractures	2005	Literature review
Pasco, J. A.; Lane, S. E.; Brennan-Olsen, S. L.; Holloway, K. L.; Timney, E. N.; Bucki-Smith, G.; Morse, A. G.; Dobbins, A. G.; Williams, L. J.; Hyde, N. K.; Kotowicz, M. A.	The Epidemiology of Incident Fracture from Cradle to Senescence	2015	Irrelevant topic: incidence rates. No outcomes of interest
Pennock, A. T.; Heyworth, B. E.; Bastrom, T.; Bae, D. S.; Boutelle, K. E.; Busch, M. T.; Edmonds, E. W.; Ellis, H. B.; Hergott, K.; Kocher, M. S.; Li, Y.; Liotta, E. S.; Pandya, N. K.; Perkins, C.; Sabatini, C. S.; Spence, D. D.; Willimon, S. C.; Wilson, P. L.; Facts Study Group; Nepple, J. J.	Changes in superior displacement, angulation, and shortening in the early phase of healing for completely displaced midshaft clavicle fractures in adolescents: results from a prospective, multicenter study	2021	No Outcomes of Interest
Peters, M. D.	Surgical versus conservative interventions for treating broken collarbones in adolescents and adults	2014	Cochrane review summary
Pill, S. G.; Rush, L.; Arvesen, J.; Shanley, E.; Thigpen, C. A.; Glomset, J. L.; Longstaffe, R.; Kissenberth, M. J.	Systematic review of the treatment of acromioclavicular joint disruption comparing number of tunnels and graft type	2020	Irrelevant Topic: Acromioclavicular Joint Disruption
Postacchini, F.; Gumina, S.; De Santis, P.; Albo, F.	Epidemiology of clavicle fractures	2002	No outcomes of interest; incidence
Postacchini, R.; Gumina, S.; Farsetti, P.; Postacchini, F.	Long-term results of conservative management of midshaft clavicle fracture	2010	Outcomes broken down into subgroups Ia, Ib and Ic.
Psarakis, S. A.; Savvidou, O. D.; Voyaki, S. M.; Beltsios, M.; Kouvaras, J. N.	A rare injury of ipsilateral mid-third clavicle fracture with acromioclavicular joint dislocation	2011	Case Study
Qin, M.; Zhao, S.; Guo, W.; Tang, L.; Li, H.; Wang, X.; Zhu, Z.; Sun, T.	Open reduction and plate fixation compared with non-surgical treatment for displaced midshaft clavicle fracture: A meta-analysis of randomized clinical trials	2019	systematic review; bib review complete
Quiroz, H. J.; Yoo, J. J.; Casey, L. C.; Willobee, B. A.; Ferrantella, A. R.; Thorson, C. M.; Perez, E. A.; Sola, J. E.	Can we increase detection? A nationwide analysis of age-related fractures in child abuse	2021	No Outcomes of Interest
Qvist, A. H.; Vaesel, M. T.; Moss, C.; Jakobsen, T.; Jensen, S. L.	No need to use both Disabilities of the Arm, Shoulder and Hand and Constant-Murley score in studies of midshaft clavicular fractures	2020	Irrelevant topic: Comparison of Dash vs CMS
Ranalletta, M.	CORR Insights®: High Irritation and Removal Rates After Plate or Nail Fixation in Patients With Displaced Midshaft Clavicle Fractures	2017	Commentary on article
Rasmussen, J. V.; Jensen, S. L.; Petersen, J. B.; Falstie-Jensen, T.; Lausten, G.; Olsen, B. S.	A retrospective study of the association between shortening of the clavicle after fracture and the clinical outcome in 136 patients	2011	Very Low Quality
Rasmussen, N. H.; Sarodnik, C.; Bours, S. P. G.; Schaper, N. C.; Souverein, P. C.; Jensen, M. H.; Driessen, J. H. M.; van den Bergh, J. P. W.; Vestergaard, P.	The pattern of incident fractures according to fracture site in people with T1D	2021	No Outcomes of Interest
Rehm, A.; Promod, P.; Ogilvy-Stuart, A.	Neonatal birth fractures: a retrospective tertiary maternity hospital review	2020	Sample Size too Small (n < 30 per group)
Rehm, K. E.; Andermahr, J.; Jubel, A.	Intramedullary nailing of midclavicular fractures with an elastic titanium nail	2004	no comparison group
Rehn, C. H.; Kirkegaard, M.; Viberg, B.; Larsen, M. S.	Operative versus nonoperative treatment of displaced midshaft clavicle fractures in adults: a systematic review	2014	systematic review, bib review complete
Reito, A.; Launonen, A.; Paloneva, J.	Factors explaining heterogeneity in studies comparing surgical and nonsurgical treatment of midshaft clavicle fractures: a meta-regression analysis of randomized controlled trials and high-quality observational studies	2020	meta-regression-analysis, bib review complete
Renger, R. J.; Roukema, G. R.; Reurings, J. C.; Raams, P. M.; Font, J.; Verleisdonk, E. J.	The clavicle hook plate for Neer type II lateral clavicle fractures	2009	no comparison group; sample size <30
Restrepo, R.; Cervantes, L. F.; Zahrah, D.; Schoenleber, S.; Lee, E. Y.	Pediatric Musculoskeletal Trauma: Upper Limb	2021	Literature review

Ricci, W. M.	Use of locking plates in orthopaedic trauma surgery	2015	Literature review
Riemer, B. L.; Butterfield, S. L.; Daffner, R. H.; O'Keefe, R. M., Jr.	The abduction lordotic view of the clavicle: a new technique for radiographic visualization	1991	Radiographic technique
Robertson, G. A. J.; Aitken, S. A.; Wood, A. M.	Management of sport-related fractures: operative versus non-operative management	2018	Sample size <30 per group
Robertson, G. A.; Wood, A. M.	Return to sport following clavicle fractures: a systematic review	2016	systematic review, bib review complete
Robinson, C. M.	Fractures of the clavicle in the adult. Epidemiology and classification	1998	Risk factors did not have comparisons
Rogers, E. K.; Bolger, S.; Paul, S. P.	Managing neonates with clavicle fractures	2015	Literature review
Rooney, D.; Sarriegui, I.; Heron, N.	'As easy as riding a bike': a systematic review of injuries and illness in road cycling	2020	systematic review; bib review complete
Rosendahl, K.; Myklebust, R.; Ulriksen, K. F.; Nottveit, A.; Eide, P.; Djuve, A.; Brudvik, C.	Incidence, pattern and mechanisms of injuries and fractures in children under two years of age	2021	Irrelevant Topic: Incidence
Rouleau, D. M.; Hebert-Davies, J.	Incidence of associated injury in posterior shoulder dislocation: Systematic review of the literature	2012	Irrelevant Topic: Shoulder Dislocation
Rowland, D.; Baird, E.	Common upper limb injuries in childhood	2014	Literature review
Rubin, G.; Peleg, K.; Givon, A.; Israel Trauma, Group; Rozen, N.	Upper extremity fractures among hospitalized pediatric road traffic accident victims	2015	Irrelevant topic: incidence rates. No outcomes of interest
Rubin, G.; Peleg, K.; Givon, A.; Rozen, N.	Upper extremity open fractures in hospitalized road traffic accident patients: adult versus pediatric cases	2017	No Outcomes of Interest
Rupp, M.; Walter, N.; Pfeifer, C.; Lang, S.; Kerschbaum, M.; Krutsch, W.; Baumann, F.; Alt, V.	The Incidence of Fractures Among the Adult Population of Germany - and Analysis From 2009 through 2019	2021	No Outcomes of Interest
Russo, R.; Visconti, V.; Lorini, S.; Lombardi, L. V.	Displaced comminuted midshaft clavicle fractures: use of Mennen plate fixation system	2007	no comparison group; sample size <30
Sandler, A. B.; Scaliato, J. P.; Raiciulescu, S.; Nesti, L.; Dunn, J. C.	Bone Morphogenic Protein for Upper Extremity Fractures: A Systematic Review	2021	Irrelevant Topic: Biomarkers
Schimpf, M.; Neira, C.; McFarland, E. G.	The deceptive nature of clavicle fractures in young patients	1999	Case review
Scott, M. L.; Baldwin, K. D.; Mistovich, R. J.	Operative Versus Nonoperative Treatment of Pediatric and Adolescent Clavicular Fractures: A Systematic Review and Critical Analysis	2019	systematic review, bib review complete
Serban, A. O.; ObadĂ, B.	Locking or non-locking hook plate in treatment of unstable lateral clavicle fracture	2015	Sample size <30 per group
Shannon, E. G.; Hart, E. S.; Grottkau, B. E.	Clavicle fractures in children: the essentials	2009	Literature review
Shannon, S. F.; Hernandez, N. M.; Sems, S. A.; Larson, A. N.; Milbrandt, T. A.	High-energy Pediatric Scapula Fractures and Their Associated Injuries	2019	Irrelevant Topic: Scapula Fracture
Sharr, J. R.; Mohammed, K. D.	Optimizing the radiographic technique in clavicular fractures	2003	Skeletal clavicle comparison used
Shen, J. W.; Tong, P. J.; Qu, H. B.	A three-dimensional reconstruction plate for displaced midshaft fractures of the clavicle	2008	Irrelevant topic: 3D plate vs superior plate
Sherry, E.	Radiology of skiing injuries	1985	no comparison group
Shetty, S. K.; Chandran, R.; Ballal, A.; Mathias, L. J.; Hegde, A.; Shetty, A.	To Operate or not to Operate the Mid-Shaft Fractures of the Clavicle: A Comparative Study of Functional Outcomes of the Two Methods of Management	2017	Sample size <30 per group
Shukla, A.; Sinha, S.; Yadav, G.; Beniwal, S.	Comparison of treatment of fracture midshaft clavicle in adults by external fixator with conservative treatment	2014	Sample size <30 per group
Sillen, K.; Wallenius, V.	Rates and types of injuries during the three consecutive years 2016 to 2018 of the Vatternrundan-One of the world's largest and longest bicycle races	2019	Irrelevant Topic: Incidence

Sivasundaram, L.; Trivedi, N. N.; Gatta, J.; Ning, A. Y.; Kim, C. Y.; Mistovich, R. J.	Demographics and Risk Factors for Non-Accidental Orthopedic Trauma	2019	Irrelevant topic; no outcomes of interest
Skinner, E.; Conboy, V.	Management of common upper limb fractures in adults	2019	Literature review
Skou, S. T.; Juhl, C. B.; Hare, K. B.; Lohmander, L. S.; Roos, E. M.	Surgical or non-surgical treatment of traumatic skeletal fractures in adults: systematic review and meta-analysis of benefits and harms	2020	systematic review; bib review complete
Smeeing, D. P. J.; van der Ven, D. J. C.; Hietbrink, F.; Timmers, T. K.; van Heijl, M.; Kruijt, M. C.; Groenwold, R. H. H.; van der Meijden, O. A. J.; Houwert, R. M.	Surgical Versus Nonsurgical Treatment for Midshaft Clavicle Fractures in Patients Aged 16 Years and Older: A Systematic Review, Meta-analysis, and Comparison of Randomized Controlled Trials and Observational Studies	2017	systematic review and meta analysis, bib review complete
Smith, J. R.; Kitzen, J.; Buckley, R.	Midshaft clavicle fracture - Nonoperative versus operative care	2021	Case Study
Stanley, D.; Norris, S. H.	Recovery following fractures of the clavicle treated conservatively	1988	No Outcomes of Interest
Stegeman, S. A.; de Jong, M.; Sier, C. F.; Krijnen, P.; Duijff, J. W.; van Thiel, T. P.; de Rijke, P. A.; Soesman, N. M.; Hagens, T.; Boekhoudt, F. D.; de Vries, M. R.; Roukema, G. R.; Tanka, A. F.; van den Bremer, J.; van der Meulen, H. G.; Bronkhorst, M. W.; van Dijkman, B. A.; van Zutphen, S. W.; Vos, D. I.; Schep, N. W.; Eversdijk, M. G.; van Olden, G. D.; van den Brand, J. G.; Hillen, R. J.; Frolke, J. P.; Schipper, I. B.	Displaced midshaft fractures of the clavicle: non-operative treatment versus plate fixation (Sleutel-TRIAL). A multicentre randomised controlled trial	2011	Study has not occurred yet.
Stegeman, S. A.; Nacak, H.; Huvenaars, K. H.; Stijnen, T.; Krijnen, P.; Schipper, I. B.	Surgical treatment of Neer type-II fractures of the distal clavicle: a meta-analysis	2013	systematic review, bib review complete
Stegeman, S. A.; Roeloffs, C. W.; van den Bremer, J.; Krijnen, P.; Schipper, I. B.	The relationship between trauma mechanism, fracture type, and treatment of midshaft clavicular fractures	2013	Irrelevant topic: outcomes not of interest to PICO
Subramanyam, K. N.; Mundargi, A. V.; Gopakumar, K. U.; Bharath, T.; Prabhu, M. V.; Khanchandani, P.	Displaced midshaft clavicle fractures in adults - is non-operative management enough?	2021	Sample Size too Small (n < 30 per group)
Sun, Y.; Dai, J. Z.; Shen, L. X.	Plating versus intramedullary fixation for acute displaced mid-shaft clavicle fractures: A meta-analysis	2016	meta-analysis, bib review complete
Sweet, A. A. R.; Beks, R. B.; I. Jpma FFA; de Jong, M. B.; Beeres, F. J. P.; Leenen, L. P. H.; Houwert, R. M.; van Baal, Mcpm	Epidemiology of combined clavicle and rib fractures: a systematic review	2021	systematic review; bib review complete
Tarng, Y. W.; Yang, S. W.; Fang, Y. P.; Hsu, C. J.	Surgical management of uncomplicated midshaft clavicle fractures: a comparison between titanium elastic nails and small reconstruction plates	2012	Sample size <30 per group
Tepolt, F.; Carry, P. M.; Heyn, P. C.; Miller, N. H.	Posterior sternoclavicular joint injuries in the adolescent population: a meta-analysis	2014	Irrelevant Topic: Posterior Sternoclavicular Joint Injuries
Thompson, D. J.	Clavicle fracture and its complications	2005	Literature review
Tinney, A.; Moaveni, A. K.; Kimmel, L. A.; Gabbe, B. J.	Predictors of clavicle fixation in multiply injured patients	2020	Irrelevant Topic: Surgical Management Decision
Toogood, P.; Horst, P.; Samagh, S.; Feeley, B. T.	Clavicle fractures: a review of the literature and update on treatment	2011	Literature review
Tseng, C. H.; Hsieh, C. Y.; Choi, W. M.; Ko, L. W.	The impact and outcome of elderly drivers involved in road traffic accidents: Experience in Hsinchu Regional hospital	2021	No Clavicle Fractures
Tucek, M.; Chochola, A.; Klika, D.; Bartonicek, J.	Epidemiology of scapular fractures	2017	Irrelevant Topic: Scapula Fracture
Uittenbogaard, S. J.; van Es, L. J. M.; den Haan, C.; van Deurzen, D. F. P.; van den Bekerom, M. P. J.	Outcomes, Union Rate, and Complications After Operative and Nonoperative Treatments of Neer Type II Distal Clavicle Fractures: A Systematic Review and Meta-analysis of 2284 Patients	2021	systematic review, bib review complete

van de Wall, B. J. M.; Beeres, F. J. P.; Knoke, M.; Link, B. C.; Babst, R.	Minimally invasive plate osteosynthesis: An update of practise	2021	Literature review
van der Velde, R. Y.; Wyers, C. E.; Curtis, E. M.; Geusens, Pmm; van den Bergh, J. P. W.; de Vries, F.; Cooper, C.; van Staa, T. P.; Harvey, N. C.	Secular trends in fracture incidence in the UK between 1990 and 2012	2016	No Outcomes of Interest
van der Ven Denise, J. C.; Timmers, T. K.; Flikweert, P. E.; Van Ijsseldijk, A. L.; van Olden, G. D.	Plate fixation versus conservative treatment of displaced midshaft clavicle fractures: Functional outcome and patients' satisfaction during a mean follow-up of 5 years	2015	Very Low Quality
VanBeek, C.; Boselli, K. J.; Cadet, E. R.; Ahmad, C. S.; Levine, W. N.	Precontoured plating of clavicle fractures: decreased hardware-related complications?	2011	Sample size <30 per group
Vannabouathong, C.; Chiu, J.; Patel, R.; Sreeraman, S.; Mohamed, E.; Bhandari, M.; Koval, K.; McKee, M. D.	An evaluation of treatment options for medial, midshaft, and distal clavicle fractures: a systematic review and meta-analysis	2020	systematic review; bib review complete
Vautrin, M.; Kaminski, G.; Barimani, B.; Elmers, J.; Philippe, V.; Cherix, S.; Thein, E.; Borens, O.; Vauclair, F.	Does candidate for plate fixation selection improve the functional outcome after midshaft clavicle fracture? A systematic review of 1348 patients	2019	systematic review, bib review complete
Virgin, H. W.	Football injuries to the skeletal system	1985	Irrelevant topic: review of football injuries
Virtanen, K. J.; Malmivaara, A. O.; Remes, V. M.; Paavola, M. P.	Operative and nonoperative treatment of clavicle fractures in adults	2012	systematic review, bib review complete
Virtanen, K. J.; Remes, V.; Pajarinen, J.; Savolainen, V.; Bjorkenheim, J. M.; Paavola, M.	Sling compared with plate osteosynthesis for treatment of displaced midshaft clavicular fractures: a randomized clinical trial	2012	Sample size <30 per group
Virtanen, Kaisa; Remes, Ville; Malmivaara, Antti; Paavola, Mika	Treatment of clavicle fractures: systematic review	2009	systematic review, bib review complete
Vitner, D.; Hirsch, L.; Ashwal, E.; Nassie, D.; Yogev, Y.; Aviram, A.	Outcomes of vacuum-assisted vaginal deliveries of mothers with gestational diabetes mellitus	2019	Irrelevant topic: gestational diabetes comparison
Walia, B. S.; Dugg, P.; Sharma, S.	Clinical Features, Management, and Outcomes of Chest Trauma at a Tertiary-Care Centre in India: A Retrospective Observational Study	2021	Sample Size too Small (n < 30 per group)
Wang, J.; Meng, X. H.; Guo, Z. M.; Wu, Y. H.; Zhao, J. G.	Interventions for treating displaced midshaft clavicular fractures: a Bayesian network meta-analysis of randomized controlled trials	2015	meta-analysis, bib review complete
Wang, X. H.; Cheng, L.; Guo, W. J.; Li, A. B.; Cheng, G. J.; Lei, T.; Zhao, Y. M.	Plate Versus Intramedullary Fixation Care of Displaced Midshaft Clavicular Fractures: A Meta-Analysis of Prospective Randomized Controlled Trials	2015	meta-analysis, bib review complete
Wang, X. H.; Guo, W. J.; Li, A. B.; Cheng, G. J.; Lei, T.; Zhao, Y. M.	Operative versus nonoperative treatment for displaced midshaft clavicle fractures: a meta-analysis based on current evidence	2015	meta-analysis, bib review complete
Weaver, A. A.; Talton, J. W.; Barnard, R. T.; Schoell, S. L.; Swett, K. R.; Stitzel, J. D.	Estimated injury risk for specific injuries and body regions in frontal motor vehicle crashes	2015	Injury risk curves for belted vs unbelted MVCs
Weinberg, D. S.; Napora, J. K.; West, W. H.; Grimberg, D. C.; Vallier, H. A.	Factors Associated With Narcotic Use After Clavicle Fractures	2016	Irrelevant topic: no outcomes of interest captured
Weninger, J. J., Jr.; Dannenbaum, J. H.; Branstetter, J. G.; Arrington, E. D.	Comparison of complication rates of intramedullary pin fixation versus plating of midshaft clavicle fractures in an active duty military population	2013	Irrelevant topic: pin vs plate
Wijdicks, F. J.; Houwert, R. M.; Dijkgraaf, M. G.; De Lange, D. H.; Meylaerts, S. A.; Verhofstad, M. H.; Verleisdonk, E. J.	Rationale and design of the plate or pin (POP) study for dislocated midshaft clavicular fractures: study protocol for a randomised controlled trial	2011	study protocol
Wijdicks, F. J.; Houwert, R. M.; Millett, P. J.; Verleisdonk, E. J.; Van der Meijden, O. A.	Systematic review of complications after intramedullary fixation for displaced midshaft clavicle fractures	2013	systematic review, bib review complete
Wijdicks, F. J.; Van der Meijden, O. A.; Millett, P. J.; Verleisdonk, E. J.; Houwert, R. M.	Systematic review of the complications of plate fixation of clavicle fractures	2012	systematic review, bib review complete
Wolf, S.; Chitnis, A. S.; Manoranjith, A.; Vanderkarr, M.; Plaza, J. Q.; Gador,	Surgical treatment, complications, reoperations, and healthcare costs among patients with clavicle fracture in England	2022	Very Low Quality

L. V.; Holy, C. E.; Sparks, C.; Lambert, S. M.			
Woltz, S.; Krijnen, P.; Schipper, I. B.	Plate Fixation Versus Nonoperative Treatment for Displaced Midshaft Clavicular Fractures: A Meta-Analysis of Randomized Controlled Trials	2017	meta-analysis, bib review complete
Woltz, S.; Sengab, A.; Krijnen, P.; Schipper, I. B.	Does clavicular shortening after nonoperative treatment of midshaft fractures affect shoulder function? A systematic review	2017	systematic review, bib review complete
Woltz, S.; Stegeman, S. A.; Krijnen, P.; van Dijkman, B. A.; van Thiel, T. P.; Schep, N. W.; de Rijcke, P. A.; Frolke, J. P.; Schipper, I. B.	Plate Fixation Compared with Nonoperative Treatment for Displaced Midshaft Clavicular Fractures: A Multicenter Randomized Controlled Trial	2017	Repeat of AAOS ID 5028
Woltz, Sarah; Krijnen, Pieta; Schipper, Inger B.	Plate Fixation Versus Nonoperative Treatment for Displaced Midshaft Clavicular Fractures: A Meta-Analysis of Randomized Controlled Trials	2017	meta-analysis, bib review complete
Wu, C. L.; Chang, H. C.; Lu, K. H.	Risk factors for nonunion in 337 displaced midshaft clavicular fractures treated with Knowles pin fixation	2013	Irrelevant topic: Knowles pin
Xiao, H.; Gao, H.; Zheng, T.; Zhao, J.; Tian, Y.	Plate fixation versus intramedullary fixation for midshaft clavicle fractures: Meta-analysis of complications and functional outcomes	2016	meta-analysis, bib review complete
Xie, L.; Zhao, Z.; Zhang, S.; Hu, Y.	Intramedullary fixation versus plate fixation for displaced mid-shaft clavicle fractures: A systematic review of overlapping meta-analyses	2018	systematic review, bib review complete
Xie, L.; Zhao, Z.; Zhang, S.; Hu, Y.	Intramedullary fixation versus plate fixation for displaced mid-shaft clavicle fractures	2018	systematic review, bib review complete
Xu, B.; Lin, Y.; Wang, Z.; Cao, J.; Yang, Y.; Xia, H.; Zhang, Y.	Is intramedullary fixation of displaced midshaft clavicle fracture superior to plate fixation? Evidence from a systematic review of discordant meta-analyses	2017	meta-analysis, bib review complete
Xu, C. P.; Li, X.; Cui, Z.; Diao, X. C.; Yu, B.	Should displaced midshaft clavicular fractures be treated surgically? A meta-analysis based on current evidence	2013	systematic review, bib review complete
Xu, J.; Xu, L.; Xu, W.; Gu, Y.; Xu, J.	Operative versus nonoperative treatment in the management of midshaft clavicular fractures: a meta-analysis of randomized controlled trials	2014	systematic review, bib review complete
Yagnik, G. P.; Seiler, J. R.; Vargas, L. A.; Saxena, A.; Narvel, R. I.; Hassan, R.	Outcomes of Arthroscopic Fixation of Unstable Distal Clavicle Fractures: A Systematic Review	2021	systematic review; bib review complete
Yakar, S.; Baykan, N.; Ānal, Ā-; Durukan, P.	Retrospective analysis of patients with sternal fracture	2021	Sample Size too Small (n < 30 per group)
Yang, H.; Wang, H.; Cao, C.; Lu, H.; Zhao, Y.; Zeng, G.; Li, C.; Zhou, Y.; Ou, L.; Liu, J.; Xiang, L.	Incidence patterns of traumatic upper limb fractures in children and adolescents: Data from medical university-affiliated hospitals in Chongqing, China	2019	No Outcomes of Interest
Yang, M.; Guo, M.; Zhang, P.; Jiang, B.	Using suture and locking anatomical bridging plate to fix comminuted mid-shaft clavicle fractures with intramedullary nail assistance in reduction	2015	Sample size <30 per group
Yang, S.; Zhang, R.; Zhu, Q.; Wang, G.; Ding, X.; Wang, J.	Evaluation of surgical and non-surgical interventions for clavicle fractures	2014	systematic review, bib review complete
Yenigul, A. E.; Yenigul, N. N.; Baser, E.; Ozelci, R.	A retrospective analysis of risk factors for clavicle fractures in newborns with shoulder dystocia and brachial plexus injury: A single-center experience	2020	Sample Size too Small (n < 30 per group)
Yoganandan, N.; Stadter, G. W.; Halloway, D. E.; Pintar, F. A.	Injury patterns to other body regions and load vectors in nearside impact occupants with and without shoulder injuries	2013	No Outcomes of Interest
You, D. Z.; Krzyzaniak, H.; Kendal, J. K.; Martin, C. R.; Schneider, P. S.	Outcomes and complications after dual plate vs. single plate fixation of displaced mid-shaft clavicle fractures: A systematic review and meta-analysis	2021	systematic review; bib review complete
You, D. Z.; Leighton, J. L.; Schneider, P. S.	Current Concepts in Rehabilitation Protocols to Optimize Patient Function Following Musculoskeletal Trauma	2020	Literature review
Zhang, B.; Zhu, Y.; Zhang, F.; Chen, W.; Tian, Y.; Zhang, Y.	Meta-analysis of plate fixation versus intramedullary fixation for the treatment of mid-shaft clavicle fractures	2015	systematic review, bib review complete
Zhang, C.; Huang, J.; Luo, Y.; Sun, H.	Comparison of the efficacy of a distal clavicular locking plate versus a clavicular hook plate in the treatment of unstable distal clavicle fractures and a systematic literature review	2014	systematic review, bib review complete

Zhang, D.; Dyer, G. S. M.; Earp, B. E.	Factors Associated With Surgical Treatment of Isolated, Displaced Midshaft Clavicle Fractures	2021	No Outcomes of Interest
Zhang, X.; Geng, T.; Xue, H.; Zhang, W.; Yin, Y.; Jiang, Z.; Hu, Z.; Luo, T.; Zhang, G.; Xu, Y.	Intramedullary devices fixation versus plate fixation for adult displaced mid-shaft clavicle fractures: An update meta-analysis	2017	meta-analysis, bib review complete
Zhao, B.; Zhao, W.; Assan, I.; Bi, R.	Conoid tubercle angle: attention should be paid to supraclavicular plate fixation	2022	No Outcomes of Interest
Zhao, J. G.; Wang, J.; Long, L.	Surgical Versus Conservative Treatments for Displaced Midshaft Clavicular Fractures: A Systematic Review of Overlapping Meta-Analyses	2015	systematic review, bib review complete
Zheng, J.; Chen, J.; Chen, L.; Ni, Y.; Lin, Z.	A novel hybrid fixation (coracoclavicular screw supplemented with K-wire) for the treatment of acute acromioclavicular joint dislocation: A prospective study	2018	Irrelevant Comparison
Zhou, Q.; Chen, B.; Zho, Y.; Chen, H.; Wang, Z.; Liu, J.	Comparisons of shoulder function after treatment of floating shoulder injuries with different methods	2017	Sample size <30 per group
Zhou, X.; Li, J.; Yang, H.; Li, D.; Zhang, J.; Zhang, Y.; Huang, Y.; Xu, N.	Comparison of 2 Different Fixation Implants for Operative Treatment of Mid-Shaft Clavicle Fractures: A Retrospective Study	2019	Irrelevant Comparison
Zhu, Y.; Tian, Y.; Dong, T.; Chen, W.; Zhang, F.; Zhang, Y.	Management of the mid-shaft clavicle fractures using plate fixation versus intramedullary fixation: an updated meta-analysis	2015	meta-analysis, bib review complete
Zlowodzki, M.; Zelle, B. A.; Cole, P. A.; Jeray, K.; McKee, M. D.; Evidence-Based Orthopaedic Trauma Working Group	Treatment of acute midshaft clavicle fractures: systematic review of 2144 fractures: on behalf of the Evidence-Based Orthopaedic Trauma Working Group	2005	systematic review, bib review complete

## **AAOS Approval Bodies**

### **Committee on Evidence Based Quality and Value**

The committee on Evidence Based Quality and Value (EBQV) consists of twenty-three AAOS members who implement evidence-based quality initiatives such as clinical practice guidelines (CPGs), systematic literature reviews (SRs) and appropriate use criteria (AUCs). They also oversee the dissemination of related educational materials and promote the utilization of orthopaedic value products by the Academy's leadership and its members.

### **Research and Quality Council**

The Research and Quality Council promotes ethically and scientifically sound clinical and translational research to sustain patient care in musculoskeletal disorders. The Council also serves as the primary resource for educating its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics, regulatory pathways and standards development, patient safety, and other related important research and quality areas. The Council is comprised of the chairs of the committees on Devices, Biologics, and Technology, Patient Safety, Research Development, U.S. and chair and section leaders of the Evidence Based Quality and Value committee. Also, on the Council are the second vice-president, three members at large, and representatives of the Diversity Advisory Board, Women's Health Issues Advisory Board, Board of Specialty Societies (BOS), Board of Councilors (BOC), Communications Cabinet, Orthopaedic Research Society (ORS), Orthopedic Research and Education Foundation (OREF).

### **Board of Directors**

The 18-member Board of Directors manage the affairs of the AAOS, set policy, and oversee the Strategic Plan

## **Review Organizations**

Review of the clinical practice guideline is completed by interested external organizations. The AAOS solicits reviewers for each clinical practice guideline. They consist of experts in the topic area and represent professional societies other than AAOS. Review organizations are nominated by the clinical practice guideline development group at the introductory meeting. Review responses are available on [www.aaos.org/quality](http://www.aaos.org/quality).

Participation in the AAOS systematic literature review peer review process does not constitute an endorsement, nor does it imply that the reviewer supports this document.

**Letters of Endorsement from External Organizations**





**American  
Society of  
Shoulder &  
Elbow  
Therapists**

403 W St Charles, Ste B  
Lombard, IL 60148  
[www.asset-usa.org](http://www.asset-usa.org)

To:  
Kaitlyn S. Sevarino,  
Director,  
Department of Clinical Quality and Value

Dear Ms. Sevarino,

The American Society of Shoulder and Elbow Therapists (ASSET) has voted to endorse the AAOS Clinical Practice Guideline for the Treatment of Clavicle Fractures. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document.

Sincerely,

Rebecca Dickinson  
ASSET Board President

## Krause, Barbara

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**From:** Anna Quintanilla <aquintanilla@ases-assn.org>  
**Sent:** Friday, January 13, 2023 3:19 PM  
**To:** Krause, Barbara  
**Subject:** RE: AAOS Clinical Practice Guideline for the Treatment of Clavicle Fractures

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**Caution - External**

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Hello Barb,

ASES will formally endorse the CPG. Thank you for this opportunity.

Best regards,

Anna

**Anna K. Quintanilla, MA, CAE**  
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ASES 2023 SPECIALTY DAY  TUESDAY, MARCH 7<sup>TH</sup>, 2023



The Venetian Resort and Convention Center, Las Vegas, Nevada

Kaitlyn S. Sevarino, MBA, CAE  
Director,  
Department of Clinical Quality and Value

Dear Ms. Sevarino,

The Orthopaedic Trauma Association has voted to endorse the AAOS Clinical Practice Guideline for the Treatment of Clavicle Fractures. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document.

Sincerely,

A handwritten signature in black ink that reads "Brendan M. Patterson" with a horizontal line extending to the right.

Brendan M. Patterson, MD, OTA President

A handwritten signature in black ink consisting of stylized initials "CS" with a horizontal line extending to the right.

Clay Spitler, MD, OTA EBQVS Committee Chair