

ORIGINAL ARTICLE **HAND**

The 100 most cited articles in hand surgery from 2012–2022: a bibliometric analysis

Anna J Neriamparambil MBBS  0000-0002-3532-6997,^{1,a} Joyce Antony MBBS, PhD
 0000-0002-9871-8496,² Lahann J Wijenayake MBBS, FRACS  0000-0001-6352-3130³

¹ Department of Plastic and Reconstructive Surgery, Middlemore Hospital, Auckland, NEW ZEALAND. ² Department of Neurosurgery, Auckland City Hospital, Auckland, NEW ZEALAND. ³ Department of Orthopaedic Surgery, Queensland Children's Hospital, Brisbane, AUSTRALIA.

Keywords: authorship, pain management, wrist fractures, bibliometrics, orthopedic surgery

Submitted: July 27, 2023 AEST Revised: November 11, 2023 AEST Accepted: February 6, 2024 AEST

DOI: 10.34239/ajops.92973

Australasian Journal of Plastic Surgery

Vol 7, Issue 2, 2024

Abstract

Introduction: There has been an increase in the volume of scientific literature over the last decade in the field of hand surgery. The purpose of this bibliometric analysis was to ascertain the articles that have significantly contributed to advancements in hand surgery.

Methods: The Web of Science database was used to produce a list of the 100 most cited articles from February 2012 to February 2022. The full text of all articles was carefully examined for further descriptive analysis not limited to subject matter, journal of publication, authorship, institution, country and year of publication.

Results: The 100 most cited articles were cited on average 75 times. The most cited article was cited 179 times. Subject matter was not limited to pain management, distal radius fractures and tendon injuries. Source journals were spread across 36 journals, but six prominent journals published 60 per cent of articles.

Conclusion: While the measurement of scientific merit is not solely based on bibliometric analysis, this study provides a good representation of substantial work in the last decade.

Introduction

The last decade has seen an exponential increase in the published scientific literature on hand surgery as demonstrated in **Figure 1**. However, it is difficult to determine which of these articles have made the most impact and advanced the field of hand surgery. While most academics agree that the goal of research is to produce original, high-quality literature; only a small proportion of published literature is genuinely additive to the established knowledge base.

The relevance of publications in a particular field can be determined by the number of citations received from peers. Citations are acknowledgements given by an author to their peers for previous work undertaken in that field of study. The larger the number of citations an article has received, the more impact it is likely to have had in that field of study. Therefore, we performed a bibliometric analysis to identify the 100 most cited articles in hand surgery in the decade from 2012 to 2022 (**Table 1**).

^a Corresponding author: Anna J Neriamparambil MBBS; annajoywork@gmail.com

Table 1. List of 100 most cited articles in hand surgery from 2012–2022

Rank	Reference	Citations	Rank	Reference	Citations
1	Kim and colleagues ²	179	51	Huang and colleagues ⁶⁶	65
2	Johnson and colleagues ¹⁴	161	52	Vujaklija and colleagues ⁶⁸	64
3	Helmerhorst and colleagues ³⁴	150	53	Fowler and colleagues ⁷⁰	64
4	Karl and colleagues ³⁷	146	54	Williksen and colleagues ⁴	64
5	Shores and colleagues ³⁹	145	55	Lin and colleagues ⁷⁴	63
6	Monstrey and colleagues ⁴²	139	56	Wall and colleagues ⁷⁶	61
7	Jain and colleagues ⁴⁵	136	57	Koskinen and colleagues ⁷⁹	61
8	Schneeberger and colleagues ⁴⁷	135	58	Cho and colleagues ⁸²	61
9	Sabatino and colleagues ¹⁵	129	59	Dario and colleagues ⁸⁴	60
10	Stanek and colleagues ⁵¹	120	60	Fufa and colleagues ⁸⁷	60
11	Voskuil and colleagues ⁵²	105	61	Hershman and colleagues ⁹⁰	60
12	Bot and colleagues ¹²	102	62	Lanting and colleagues ⁹²	59
13	Naranje and colleagues ⁵⁶	101	63	Goldhahn and colleagues ⁹⁴	59
14	Ayers and colleagues ⁵⁹	100	64	Peimer and colleagues ⁹⁶	58
15	Wilcke and colleagues ¹⁷	100	65	Shauver and colleagues ⁹⁹	58
16	Karantana and colleagues ²¹	100	66	Saltzman and colleagues ¹⁰²	58
17	Tang ²⁴	100	67	Martin-Ferrero ³²	58
18	Doring and colleagues ⁶⁵	98	68	Alt ⁵	58
19	de Jong and colleagues ²⁵	96	69	Vloemans and colleagues ³⁶	58
20	Wu and colleagues ³⁰	94	70	Moriya and colleagues ²⁶	57
21	Hah and colleagues ¹³	94	71	Bawa and colleagues ⁴¹	57
22	Peimer and colleagues ⁷³	93	72	Kloppenburger and colleagues ⁴⁴	56
23	Tyser and colleagues ⁷⁵	92	73	Starr and colleagues ²⁷	56
24	Peimer and colleagues ⁷⁸	91	74	Wang and colleagues ⁴⁹	56
25	Sayegh and colleagues ⁸¹	87	75	Roh and colleagues ²³	56
26	Dumanian and colleagues ⁸³	85	76	Boeckstyns and colleagues ³	56
27	Schweizer and colleagues ⁸⁶	85	77	Bentohami and colleagues ¹⁸	55
28	Osbaahr and colleagues ⁸⁹	84	78	Pan and colleagues ⁵⁵	55
29	Tang and colleagues ⁹¹	84	79	Reith and colleagues ⁵⁸	54
30	Waljee and colleagues ¹⁶	83	80	del Pinal and colleagues ⁶¹	54
31	Bauermeister and colleagues ⁷	81	81	Chaudhry and colleagues ¹⁹	53
32	Lalonde and colleagues ⁹⁸	77	82	Tang and colleagues ²⁹	53
33	Lalonde ¹⁰¹	74	83	Beckmann and colleagues ⁶⁴	52
34	Ariyan and colleagues ⁶	74	84	Diaz-Siso and colleagues ⁶⁷	52
35	Masquelet ³³	74	85	Graham and colleagues ⁶⁹	52
36	Hop and colleagues ³⁵	72	86	Kirchberger and colleagues ⁷¹	52
37	Menendez and colleagues ³⁸	72	87	Atzei and colleagues ⁷²	52
38	Kitay and colleagues ⁴⁰	71	88	Tang ²⁸	51
39	Spaans and colleagues ⁴³	71	89	Gart and colleagues ⁷⁷	51
40	Lalonde and colleagues ⁴⁶	71	90	Guse and colleagues ⁸⁰	50
41	Kinaci and colleagues ⁴⁸	70	91	Chan and colleagues ⁸	50
42	Lalonde ⁵⁰	70	92	Shibuya and colleagues ⁸⁵	50
43	Lutz and colleagues ²²	70	93	Grodzinsky and colleagues ⁸⁸	49
44	Walenkamp and colleagues ⁵³	69	94	Dwyer and colleagues ¹¹	48
45	Butzelaar and colleagues ⁵⁴	69	95	Rinker and colleagues ⁹³	48
46	Lalonde and colleagues ⁵⁷	68	96	Bain and colleagues ⁹⁵	48
47	Strazar and colleagues ⁶⁰	68	97	Wijk and colleagues ⁹⁷	48
48	Lalonde and colleagues ⁶²	68	98	Boeckstyns and colleagues ¹⁰⁰	48
49	Filardo and colleagues ⁶³	66	99	Roh and colleagues ¹⁰³	47
50	Esenwein and colleagues ²⁰	65	100	Van der Avoort and colleagues ¹⁰⁴	47

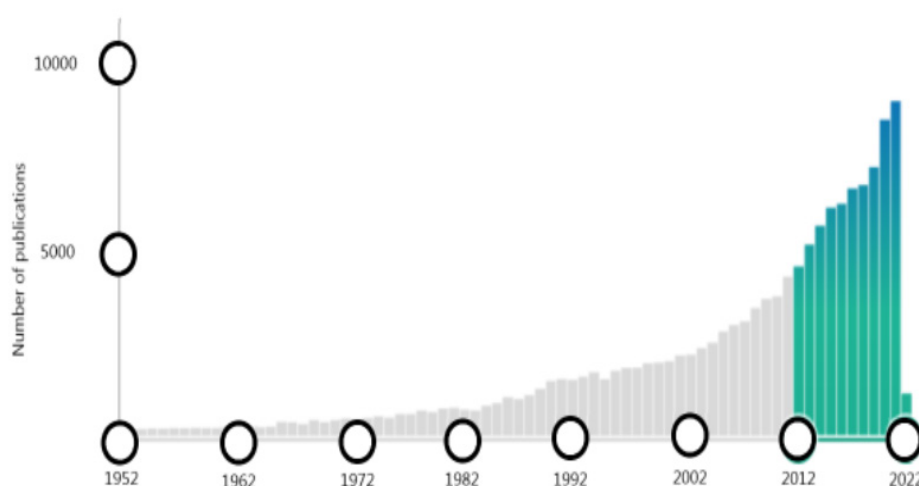


Fig 1. The number of articles found on PubMed using the search term 'hand surgery', showing an increase from 2012–2022 compared with the previous 40 years

Methods

The comprehensive citation database of the Web of Science (Clarivate, Philadelphia, USA) was used to identify the 100 most cited articles in the field of hand surgery from February 2012 to February 2022. The first and second authors independently searched all publications in English language literature using the key words 'hand' and 'surgery'. The full text of all articles was carefully reviewed and lists were collated of articles deemed relevant to the field. A summative list of articles was created incorporating those that featured in the lists of both authors. A conference was held to determine if articles featured on a single list should be incorporated in the final list of 100 most cited articles and a decision was reached by consensus. Using the method previously described by Joyce and colleagues,¹ we further analysed each article not limited to the subject matter, journal of publication, authorship, institution, country and year of publication.

This study was undertaken in accordance with the Declaration of Helsinki and adhered to Good Clinical Practice guidelines.

Results

The 100 most cited articles in hand surgery in the last decade (**Table 1**) were on average cited 75 times with a standard deviation of 28 citations. The most cited article had 179 citations and the least cited article had 47 citations.

In total, 36 journals contributed to the 100 most cited articles in hand surgery from 2012 to 2022. **Table 2** highlights the six prominent journals (impact factor ranging from 1.907 to 5.284) that published 60 per cent of these articles. Further analysis revealed that 20 per cent of these were 'review articles'.

Eight authors contributed to 35 per cent of the 100 most cited articles in hand surgery in the last decade (**Table 3**). Authorship demonstrated a gender predilection with only 17 per cent contributed by female authors. North American authors contributed to 70 per cent of these articles as demonstrated in **Figure 2**. Authors from countries in the Asia-Pacific region contributed to 12 per cent of these articles with most contributions from the People's Republic of China. Plastic

Table 2. Journals that contributed most frequently to the 100 most cited articles in hand surgery from 2012–2022

Journal	Impact factor	Number of articles
<i>Journal of Hand Surgery (American Volume)</i>	2.230	21
<i>Journal of Bone and Joint Surgery (American Volume)</i>	5.284	10
<i>Journal of Hand Surgery (European Volume)</i>	2.648	9
<i>Plastic and Reconstructive Surgery</i>	4.763	8
<i>Clinical Orthopaedics and Related Research</i>	4.176	6
<i>Hand Clinics</i>	1.907	5

Table 3. Authors who contributed most frequently to the 100 most cited articles in hand surgery from 2012–2022

Author	Gender	Department	Institution	Country	Number of articles
Lalonde D	M	Plastic and reconstructive surgery	Saint John Regional Hospital; Dalhousie University	Canada	7
Ring DC	M	Orthopaedic surgery	Massachusetts General Hospital	USA	7
Tang JB	M	Orthopaedic surgery	Affiliated Hospital of Nantong University	China	5
Chung KC	M	Plastic and reconstructive surgery	University of Michigan	USA	4
Middelkoop E	F	Plastic, reconstructive and hand surgery	Vrije Universiteit Amsterdam	Netherlands	3
MacDermid JC	F	Physical therapy	University of Western Ontario	Canada	3
Goslings J	M	Trauma surgery	Academic Medical Centre; University of Amsterdam	Netherlands	3
Peimer CA	M	Orthopaedic surgery	UP Health System—Marquette; Michigan State University	USA	3

F = female; M = male

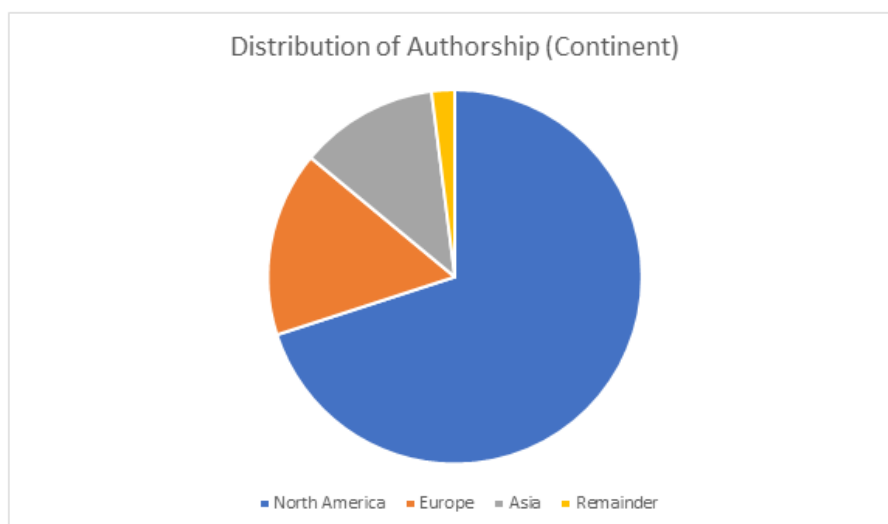


Fig 2. Distribution by continent of authors contributing to the 100 most cited articles in hand surgery from 2012–2022

and reconstructive surgeons and orthopaedic surgeons contributed equally to this literature on hand surgery. Additional contributors were not limited to trauma surgeons, neurosurgeons, rehabilitation physicians and academics in the field of basic science and physical therapy.

The most cited (179 citations) article is a prospective evaluation of postoperative opioid consumption in 1416 patients undergoing outpatient upper-extremity procedures over a six-month period performed at the Rothman Institute, Thomas Jefferson University, Philadelphia.² It demonstrated that patients are being prescribed three times greater opioid medications than required and therefore proposed prescribing

guidelines based on anatomical locations and procedure types to customise opioid prescription.

Discussion

This bibliometric analysis lists the 100 most cited articles in hand surgery over the last decade in English language literature to provide junior hand surgeons and academics with valuable sight into profound advancements. This list features some landmark trials, review papers and consensus guidelines that should form part of the armamentarium of knowledge of the hand surgeon.^{3–8}

The number of times an article was cited by peers was used as a surrogate to determine the articles that have most significantly impacted

this field and therefore its scientific merit. Each citation reflects an assessment by the author as to which article is interesting and relevant to their study. The average number of citations per article was 75 (range 47–179). In comparison, the average number of citations per article was 274 (range 165–1007) in plastic and reconstructive surgery and 405 (range 278–1013) in general surgery.^{9,10} It should be noted that articles published from 2020 to 2022 did not feature in this list, because of the inherent flaw of bibliometric analysis using citations, as these articles did not have enough time to accumulate adequate citations.

This study is a continuation of the initial work by Joyce and colleagues that examined the 100 most cited classic papers in hand surgery from 1945 to 2013.¹ While historically, the prominent publications were limited to three source journals namely the *Journal of Hand Surgery* (American Volume), *Journal of Hand Surgery* (European Volume) and *Hand Clinics*; in the decade from 2012–2022 source journals also included but were not limited to the *Journal of Bone and Joint Surgery* (American Volume), *Plastic and Reconstructive Surgery* and *Clinical Orthopaedics and Related Research*.¹ This spread of prominent articles across more source journals might be due to the increase in the number of journals, digitalisation of content, ease of access and the open-source movement.

Pain management was a central theme that featured in 18 of these 100 articles, particularly focused on reduction of opioid prescription.^{11–16} This demonstrates a paradigm shift in research focus from anatomical or cadaveric studies and examination of reliability of clinical and radiological investigations that featured prior to 2012.¹

Distal radius fractures and management was another major area of focus. The most cited (100 citations) article in this theme examined the Swedish (Stockholm) registry data of 42,583 patients to perform a descriptive analysis of the incidence and demographics of distal radius fractures and described the shift in surgical management from external fixation to open reduction and fixation with plating.¹⁷ Other articles in this theme examined various modalities of management (non-surgical, external fixators, percutaneous Kirschner-wires, palmar and volar plates) of distal radius fractures and described their respective complications.^{18–23}

Another major area of research was tendon injuries and repair. The most cited (100 citations) article in this theme was a review article that examined reports of outcomes of flexor tendon repair and elaborated on the problems associated

with such surgeries.²⁴ Other articles in this theme investigated the incidence of tendon injuries, various surgical techniques for repair and rehabilitation protocols.^{25–30} The interest in these areas of research appears similar to that in the period prior to 2012.¹

The impact factor of the source journals does not appear to predict the number of articles they contributed to the 100 most cited list. The impact factor helps gauge the quality of academic journals and is calculated by dividing the number of article citations from a journal by the number of articles in that journal over a two-year period.³¹ This metric has a significant limitation in that it ascribes undue significance to work in fields with a larger readership. The *Journal of Bone and Joint Surgery* (American Volume) (5.284), *Plastic and Reconstructive Surgery* (4.763) and *Clinical Orthopaedics and Related Research* (4.176) appeal to the wider population of orthopaedic and plastic and reconstructive surgeons, while the *Journal of Hand Surgery* (American Volume) (2.230), *Journal of Hand Surgery* (European Volume) (2.648) and *Hand Clinics* (1.907) have a smaller audience of hand surgeons.

The purpose of bibliometric analysis is to transform something intangible, scientific quality, into a tangible entity. Patent analysis is another method to assess scientific merit as it quantifies materialisation of technologies. However, this is limited by undue emphasis on industry-funded research. Alternative metrics such as altmetrics focus on online activity to examine exchange and discussion both within the academic community and beyond. Altmetrics is a more recent tool and attention can be positive or negative. Scientific merit can also be assessed by research accolades and conference presentations. Due to the inherent biases in these techniques, they were not incorporated in this study.

This study has limitations inherent to all bibliometric analyses. The use of citations to gauge the significance and impact of articles is subject to citation bias. Some authors preferentially cite their own work or that of their colleagues to improve their bibliometrics. Moreover, non-English language publications have a smaller audience, limiting their exposure and ability to acquire more citations. The phenomenon of ‘incomplete citing’ refers to the practice of referencing in order to persuade the reader rather than to acknowledge substantial pre-existing work in the field.^{1,31} Despite these biases, the top 100 most-cited articles in hand surgery are a good representation of substantial work in the last decade.

Conflict of interest

The authors have no conflicts of interest to disclose.

Funding declaration

The authors received no financial support for the research, authorship, and/or publication of this article.

References

- Joyce CW, Kelly JC, Carroll SM. The 100 top-cited classic papers in hand surgery. *J Plast Surg Hand Surg*. 2014;48(4):227–33. <https://doi.org/10.3109/2000656X.2013.840640>
- Kim N, Matzon JL, Abboudi J, Jones C, Kirkpatrick W, Leinberry CF, Liss FE, Lutsky KF, Wang ML, Maltenfort M, Ilyas AM. A prospective evaluation of opioid utilization after upper-extremity surgical procedures: identifying consumption patterns and determining prescribing guidelines. *J Bone Joint Surg Am*. 2016;98(20):e89. <https://doi.org/10.2106/JBJS.15.00614>
- Boeckstyns ME, Sorensen AI, Viñeta JF, Rosen B, Navarro X, Archibald SJ, Valss-Sole J, Moldovan M, Krarup C. Collagen conduit versus microsurgical neuroorrhaphy: 2-year follow-up of a prospective, blinded clinical and electrophysiological multicenter randomized, controlled trial. *J Hand Surg Am*. 2013;38(12):2405–411. <https://doi.org/10.1016/j.jhsa.2013.09.038>
- Williksen JH, Frihagen F, Hellund JC, Kvernmo HD, Husby T. Volar locking plates versus external fixation and adjuvant pin fixation in unstable distal radius fractures: a randomized, controlled study. *J Hand Surg Am*. 2013;38(8):1469–476. <https://doi.org/10.1016/j.jhsa.2013.04.039>
- Alt V. Antimicrobial coated implants in trauma and orthopaedics—a clinical review and risk-benefit analysis. *Injury*. 2017;48(3):599–607. <https://doi.org/10.1016/j.injury.2016.12.011>
- Ariyan S, Martin J, Lal A, Cheng D, Borah GL, Chung KC, Conly J, Havlik R, Lee WPA, McGrath MH, Pribaz J, Young VL. Antibiotic prophylaxis for preventing surgical-site infection in plastic surgery: an evidence-based consensus conference statement from the American Association of Plastic Surgeons. *Plast Reconstr Surg*. 2015;135(6):1723–739. <https://doi.org/10.1097/PRS.0000000000001265>
- Bauermeister AJ, Zuriarrain A, Newman MI. Three-dimensional printing in plastic and reconstructive surgery: a systematic review. *Ann Plast Surg*. 2016;77(5):569–76. <https://doi.org/10.1097/SAP.0000000000000671>
- Chan K, Ayeni O, McKnight L, Ignacy TA, Farrokhyar F, Thoma A. Pyrocarbon versus silicone proximal interphalangeal joint arthroplasty: a systematic review. *Plast Reconstr Surg*. 2013;131(1):114–24. <https://doi.org/10.1097/PRS.0b013e3182729f27>
- Zhang WJ, Li YF, Zhang JL, Xu M, Yan RL, Jiang H. Classic citations in main plastic and reconstructive surgery journals. *Ann Plast Surg*. 2013;71(1):103–08. <https://doi.org/10.1097/SAP.0b013e31824189ba>
- Paladugu R, Schein M, Gardezi S, Wise L. One hundred citation classics in general surgical journals. *World J Surg*. 2002;26(9):1099–105. <https://doi.org/10.1007/s00268-002-6376-7>
- Dwyer CL, Soong M, Hunter A, Dashe J, Tolo E, Kasparyan NG. Prospective evaluation of an opioid reduction protocol in hand surgery. *J Hand Surg Am*. 2018;43(6):516–22.e1. <https://doi.org/10.1016/j.jhsa.2018.01.021>
- Bot AG, Bekkers S, Arnstein PM, Smith RM, Ring D. Opioid use after fracture surgery correlates with pain intensity and satisfaction with pain relief. *Clin Orthop Relat Res*. 2014;472(8):2542–549. <https://doi.org/10.1007/s11999-014-3660-4>
- Hah J, Mackey SC, Schmidt P, McCue R, Humphreys K, Trafton J, Efron B, Clay D, Sharifzadeh Y, Ruchelli G, Goodman S, Huddleston J, Maloney WJ, Dirbas FM, Shrager J, Costouros JG, Curtin C, Carroll I. Effect of perioperative gabapentin on postoperative pain resolution and opioid cessation in a mixed surgical cohort: a randomized clinical trial. *JAMA Surg*. 2018;153(4):303–11. <https://doi.org/10.1001/jamasurg.2017.4915>
- Johnson SP, Chung KC, Zhong L, Shauver MJ, Engelsbe MJ, Brummett C, Waljee JF. Risk of prolonged opioid use among opioid-naïve patients following common hand surgery procedures. *J Hand Surg Am*. 2016;41(10):947–57.e3. <https://doi.org/10.1016/j.jhsa.2016.07.113>
- Sabatino MJ, Kunkel ST, Ramkumar DB, Keeney BJ, Jevsevar DS. Excess opioid medication and variation in prescribing patterns following common orthopaedic procedures. *J Bone Joint Surg Am*. 2018;100(3):180–88. <https://doi.org/10.2106/JBJS.17.00672>
- Waljee JF, Zhong L, Hou H, Sears E, Brummett C, Chung KC. The use of opioid analgesics following common upper extremity surgical procedures: a national, population-based study. *Plast Reconstr Surg*. 2016;137(2):355e–64e. <https://doi.org/10.1097/01.prs.0000475788.52446.7b>
- Wilcke MK, Hammarberg H, Adolphson PY. Epidemiology and changed surgical treatment methods for fractures of the distal radius: a registry analysis of 42,583 patients in Stockholm County, Sweden, 2004–2010. *Acta Orthop*. 2013;84(3):292–96. <https://doi.org/10.3109/17453674.2013.792035>
- Bentohami A, de Burlet K, de Korte N, van den Bekerom MP, Goslings JC, Schep NW. Complications following volar locking plate fixation for distal radial fractures: a systematic review. *J Hand Surg Eur Vol*. 2014;39(7):745–54. <https://doi.org/10.1177/1753193413511936>
- Chaudhry H, Kleinlugtenbelt YV, Mundi R, Ristevski B, Goslings JC, Bhandari M. Are volar locking plates superior to percutaneous k-wires for distal radius fractures? A meta-analysis. *Clin Orthop Relat Res*. 2015;473(9):3017–027. <https://doi.org/10.1007/s11999-015-4347-1>



CC-BY-4. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC-BY-4) which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited. View this license's legal deed at <http://creativecommons.org/licenses/by/4.0> and legal code at <http://creativecommons.org/licenses/by/4.0/legalcode> for more information.

- 20 Esenwein P, Sonderegger J, Gruenert J, Ellenrieder B, Tawfik J, Jakubietz M. Complications following palmar plate fixation of distal radius fractures: a review of 665 cases. *Arch Orthop Trauma Surg.* 2013;133(8):1155–162. <https://doi.org/10.1007/s00402-013-1766-x>
- 21 Karantana A, Downing ND, Forward DP, Hatton M, Taylor AM, Scammell BE, Moran CG, Davis TRC. Surgical treatment of distal radial fractures with a volar locking plate versus conventional percutaneous methods: a randomized controlled trial. *J Bone Joint Surg Am.* 2013;95(19):1737–744. <https://doi.org/10.2106/JBJS.L.00232>
- 22 Lutz K, Yeoh KM, MacDermid JC, Symonette C, Grewal R. Complications associated with operative versus nonsurgical treatment of distal radius fractures in patients aged 65 years and older. *J Hand Surg Am.* 2014;39(7):1280–286. <https://doi.org/10.1016/j.jhsa.2014.04.018>
- 23 Roh YH, Lee BK, Baek JR, Noh JH, Gong HS, Baek GH. A randomized comparison of volar plate and external fixation for intra-articular distal radius fractures. *J Hand Surg Am.* 2015;40(1):34–41. <https://doi.org/10.1016/j.jhsa.2014.09.025>
- 24 Tang JB. Outcomes and evaluation of flexor tendon repair. *Hand Clin.* 2013;29(2):251–59. <https://doi.org/10.1016/j.hcl.2013.02.007>
- 25 de Jong JP, Nguyen JT, Sonnem AJ, Nguyen EC, Amadio PC, Moran SL. The incidence of acute traumatic tendon injuries in the hand and wrist: a 10-year population-based study. *Clin Orthop Surg.* 2014;6(2):196–202. <https://doi.org/10.4055/cios.2014.6.2.196>
- 26 Moriya K, Yoshizu T, Maki Y, Tsubokawa N, Narisawa H, Endo N. Clinical outcomes of early active mobilization following flexor tendon repair using the six-strand technique: short- and long-term evaluations. *J Hand Surg Eur Vol.* 2015;40(3):250–58. <https://doi.org/10.1177/1753193414551682>
- 27 Starr HM, Snoddy M, Hammond KE, Seiler JG, 3rd. Flexor tendon repair rehabilitation protocols: a systematic review. *J Hand Surg Am.* 2013;38(9):1712–717.e14. <https://doi.org/10.1016/j.jhsa.2013.06.025>
- 28 Tang JB. New developments are improving flexor tendon repair. *Plast Reconstr Surg.* 2018;141(6):1427–437. <https://doi.org/10.1097/PRS.0000000000004416>
- 29 Tang JB, Amadio PC, Boyer MI, Savage R, Zhao C, Sandow M, Lee SK, Wolfe SW. Current practice of primary flexor tendon repair: a global view. *Hand Clin.* 2013;29(2):179–89. <https://doi.org/10.1016/j.hcl.2013.02.003>
- 30 Wu YF, Tang JB. Recent developments in flexor tendon repair techniques and factors influencing strength of the tendon repair. *J Hand Surg Eur Vol.* 2014;39(1):6–19. <https://doi.org/10.1177/1753193413492914>
- 31 Roldan-Valadez E, Salazar-Ruiz SY, Ibarra-Contreras R, Rios C. Current concepts on bibliometrics: a brief review about impact factor, Eigenfactor score, CiteScore, SCImago Journal Rank, Source-Normalised Impact per Paper, H-index, and alternative metrics. *Ir J Med Sci.* 2019;188(3):939–51. <https://doi.org/10.1007/s11845-018-1936-5>
- 32 Martin-Ferrero M. Ten-year long-term results of total joint arthroplasties with ARPE(R) implant in the treatment of trapeziometacarpal osteoarthritis. *J Hand Surg Eur Vol.* 2014;39(8):826–32. <https://doi.org/10.1177/1753193413516244>
- 33 Masquelet AC. Induced membrane technique: pearls and pitfalls. *J Orthop Trauma.* 2017;31(Suppl 5):S36–S8. <https://doi.org/10.1097/BOT.0000000000000979>
- 34 Helmerhorst GT, Vranceanu AM, Vrahas M, Smith M, Ring D. Risk factors for continued opioid use one to two months after surgery for musculoskeletal trauma. *J Bone Joint Surg Am.* 2014;96(6):495–99. <https://doi.org/10.2106/JBJS.L.01406>
- 35 Hop MJ, Polinder S, van der Vlies CH, Middelkoop E, van Baar ME. Costs of burn care: a systematic review. *Wound Repair Regen.* 2014;22(4):436–50. <https://doi.org/10.1111/wrr.12189>
- 36 Vloemans AF, Hermans MH, van der Wal MB, Liebrechts J, Middelkoop E. Optimal treatment of partial thickness burns in children: a systematic review. *Burns.* 2014;40(2):177–90. <https://doi.org/10.1016/j.burns.2013.09.016>
- 37 Karl JW, Olson PR, Rosenwasser MP. The epidemiology of upper extremity fractures in the United States, 2009. *J Orthop Trauma.* 2015;29(8):e242–44. <https://doi.org/10.1097/BOT.0000000000000312>
- 38 Menendez ME, Chen NC, Mudgal CS, Jupiter JB, Ring D. Physician empathy as a driver of hand surgery patient satisfaction. *J Hand Surg Am.* 2015;40(9):1860–865 e2. <https://doi.org/10.1016/j.jhsa.2015.06.105>
- 39 Shores JT, Brandacher G, Lee WPA. Hand and upper extremity transplantation: an update of outcomes in the worldwide experience. *Plast Reconstr Surg.* 2015;135(2):351e–60e. <https://doi.org/10.1097/PRS.0000000000000892>
- 40 Kitay A, Swanstrom M, Schreiber JJ, Carlson MG, Nguyen JT, Weiland AJ, Daluiski A. Volar plate position and flexor tendon rupture following distal radius fracture fixation. *J Hand Surg Am.* 2013;38(6):1091–096. <https://doi.org/10.1016/j.jhsa.2013.03.011>
- 41 Bawa HS, Weick J, Dirschl DR. Anti-osteoporotic therapy after fragility fracture lowers rate of subsequent fracture: analysis of a large population sample. *J Bone Joint Surg Am.* 2015;97(19):1555–562. <https://doi.org/10.2106/JBJS.N.01275>
- 42 Monstrey S, Middelkoop E, Vranckx JJ, Bassetto F, Ziegler UE, Meaume S, Teot L. Updated scar management practical guidelines: non-invasive and invasive measures. *J Plast Reconstr Aes.* 2014;67(8):1017–025. <https://doi.org/10.1016/j.bjps.2014.04.011>
- 43 Spaans AJ, van Minnen LP, Kon M, Schuurman AH, Schreuders AR, Vermeulen GM. Conservative treatment of thumb base osteoarthritis: a systematic review. *J Hand Surg Am.* 2015;40(1):16–21 e1–6. <https://doi.org/10.1016/j.jhsa.2014.08.047>
- 44 Kloppenburg M, Maheu E, Kraus VB, Cicuttini F, Doherty M, Dreiser RL, Henrotin Y, Jiang GL, Mandl L, Martel-Pelletier J, Nelson AE, Neogi T, Pelletier JP, Punzi L, Ramonda R, Simon LS, Wang S. OARS clinical trials recommendations: design and conduct of clinical trials for hand osteoarthritis. *Osteoarthritis Cartilage.* 2015;23(5):772–86. <https://doi.org/10.1016/j.joca.2015.03.007>
- 45 Jain NB, Higgins LD, Losina E, Collins J, Blazar PE, Katz JN. Epidemiology of musculoskeletal upper extremity ambulatory surgery in the United States. *BMC Musculoskelet Disord.* 2014;15:4. <https://doi.org/10.1186/1471-2474-15-4>

- 46 Lalonde DH, Wong A. Dosage of local anesthesia in wide awake hand surgery. *J Hand Surg Am.* 2013;38(10):2025–028. <https://doi.org/10.1016/j.jhsa.2013.07.017>
- 47 Schneeberger S, Gorantla VS, Brandacher G, Zeevi A, Demetris AJ, Lunz JG, Metes DM, Donnenberg AD, Shores JT, Dimartini AF, Kiss JE, Imbriglia JE, Azari K, Goitz RJ, Manders EK, Nguyen VT, Cooney DS, Wachtman GS, Keith JD, Fletcher DR, Macedo C, Planinsic R, Losee JE, Shapiro R, Starzl TE, Lee WPA. Upper-extremity transplantation using a cell-based protocol to minimize immunosuppression. *Ann Surg.* 2013;257(2):345–51. <https://doi.org/10.1097/SLA.0b013e31826d90bb>
- 48 Kinaci A, Neuhaus V, Ring DC. Trends in bone graft use in the United States. *Orthopedics.* 2014;37(9):e783–88. <https://doi.org/10.3928/01477447-20140825-54>
- 49 Wang SF, Li PC, Xue YH, Yiu HW, Li YC, Wang HH. Contralateral C7 nerve transfer with direct coaptation to restore lower trunk function after traumatic brachial plexus avulsion. *J Bone Joint Surg Am.* 2013;95(9):821–27, S1–2. <https://doi.org/10.2106/JBJS.L.00039>
- 50 Lalonde D. Minimally invasive anesthesia in wide awake hand surgery. *Hand Clin.* 2014;30(1):1–6. <https://doi.org/10.1016/j.hcl.2013.08.015>
- 51 Stanek JJ, Renslow MA, Kalliainen LK. The effect of an educational program on opioid prescription patterns in hand surgery: a quality improvement program. *J Hand Surg Am.* 2015;40(2):341–46. <https://doi.org/10.1016/j.jhsa.2014.10.054>
- 52 Voskuil T, Hageman M, Ring D. Higher Charlson Comorbidity Index scores are associated with readmission after orthopaedic surgery. *Clin Orthop Relat Res.* 2014;472(5):1638–644. <https://doi.org/10.1007/s11999-013-3394-8>
- 53 Walenkamp MM, de Muinck Keizer RJ, Goslings JC, Vos LM, Rosenwasser MP, Schep NW. The minimum clinically important difference of the patient-rated wrist evaluation score for patients with distal radius fractures. *Clin Orthop Relat Res.* 2015;473(10):3235–41. <https://doi.org/10.1007/s11999-015-4376-9>
- 54 Butzelaar L, Ulrich MM, Mink van der Molen AB, Niessen FB, Beelen RH. Currently known risk factors for hypertrophic skin scarring: a review. *J Plast Reconstr Aest.* 2016;69(2):163–69. <https://doi.org/10.1016/j.bjps.2015.11.015>
- 55 Pan Y, Wang S, Zheng D, Tian W, Tian G, Ho PC, Cheng HS, Zhong Y. Hourglass-like constrictions of peripheral nerve in the upper extremity: a clinical review and pathological study. *Neurosurgery.* 2014;75(1):10–22. <https://doi.org/10.1227/NEU.0000000000000350>
- 56 Naranje SM, Erali RA, Warner WC, Jr., Sawyer JR, Kelly DM. Epidemiology of pediatric fractures presenting to emergency departments in the United States. *J Pediatr Orthop.* 2016;36(4):e45–e48. <https://doi.org/10.1097/BPO.0000000000000595>
- 57 Lalonde D, Martin A. Tumescence local anesthesia for hand surgery: improved results, cost effectiveness, and wide-awake patient satisfaction. *Arch Plast Surg.* 2014;41(4):312–16. <https://doi.org/10.5999/aps.2014.41.4.312>
- 58 Reith G, Schmitz-Greven V, Hensel KO, Schneider MM, Tinschmann T, Bouillon B, Probst C. Metal implant removal: benefits and drawbacks—a patient survey. *BMC Surg.* 2015;15:96. <https://doi.org/10.1186/s12893-015-0081-6>
- 59 Ayers DC, Franklin PD, Ring DC. The role of emotional health in functional outcomes after orthopaedic surgery: extending the biopsychosocial model to orthopaedics: AOA critical issues. *J Bone Joint Surg Am.* 2013;95(21):e165. <https://doi.org/10.2106/JBJS.L.00799>
- 60 Strazar AR, Leynes PG, Lalonde DH. Minimizing the pain of local anesthesia injection. *Plast Reconstr Surg.* 2013;132(3):675–84. <https://doi.org/10.1097/PRS.0b013e31829ad1e2>
- 61 del Pinal F, Moraleda E, Ruas JS, de Piero GH, Cereza L. Minimally invasive fixation of fractures of the phalanges and metacarpals with intramedullary cannulated headless compression screws. *J Hand Surg Am.* 2015;40(4):692–700. <https://doi.org/10.1016/j.jhsa.2014.11.023>
- 62 Lalonde DH, Martin AL. Wide-awake flexor tendon repair and early tendon mobilization in zones 1 and 2. *Hand Clin.* 2013;29(2):207–13. <https://doi.org/10.1016/j.hcl.2013.02.009>
- 63 Filardo G, Perdida F, Roffi A, Marcacci M, Kon E. Stem cells in articular cartilage regeneration. *J Orthop Surg Res.* 2016;11:42. <https://doi.org/10.1186/s13018-016-0378-x>
- 64 Beckmann JT, Hung M, Voss MW, Crum AB, Bounsanga J, Tyser AR. Evaluation of the Patient-Reported Outcomes Measurement Information System Upper Extremity Computer Adaptive Test. *J Hand Surg Am.* 2016;41(7):739–44.e4. <https://doi.org/10.1016/j.jhsa.2016.04.025>
- 65 Doring AC, Nota SP, Hageman MG, Ring DC. Measurement of upper extremity disability using the Patient-Reported Outcomes Measurement Information System. *J Hand Surg Am.* 2014;39(6):1160–165. <https://doi.org/10.1016/j.jhsa.2014.03.013>
- 66 Huang K, Hollevoet N, Giddins G. Thumb carpometacarpal joint total arthroplasty: a systematic review. *J Hand Surg Eur Vol.* 2015;40(4):338–50. <https://doi.org/10.1177/1753193414563243>
- 67 Diaz-Siso JR, Bueno EM, Sisk GC, Marty FM, Pomahac B, Tullius SG. Vascularized composite tissue allotransplantation—state of the art. *Clin Transplant.* 2013;27(3):330–37. <https://doi.org/10.1111/ctr.12117>
- 68 Vujaklija I, Farina D, Aszmann OC. New developments in prosthetic arm systems. *Orthop Res Rev.* 2016;8:31–39. <https://doi.org/10.2147/ORR.S71468>
- 69 Graham B, Peljovich AE, Afra R, Cho MS, Gray R, Stephenson J, Gurman A, MacDermid J, Mlady G, Patel AT, Rempel D, Rozental TD, Salajegheh MK, Keith MW, Jevsevar DS, Shea KG, Bozic KJ, Adams J, Evans JM, Lubahn J, Ray WZ, Spinner R, Thomson G, Shaffer WO, Cummins DS, Murray JN, Mohiuddin M, Mullen K, Shores P, Woznica A, Linskey E, Martinez Y, Sevarino K. The American Academy of Orthopaedic Surgeons evidence-based clinical practice guideline on: management of carpal tunnel syndrome. *J Bone Joint Surg Am.* 2016;98(20):1750–754. <https://doi.org/10.2106/JBJS.16.00719>
- 70 Fowler JR, Munsch M, Tosti R, Hagberg WC, Imbriglia JE. Comparison of ultrasound and electrodiagnostic testing for diagnosis of carpal tunnel syndrome: study using a validated clinical tool as the reference standard. *J Bone Joint Surg Am.* 2014;96(17):e148. <https://doi.org/10.2106/JBJS.M.01250>
- 71 Kirchberger MC, Unglaub F, Muhlendorfer-Fodor M, Pillukat T, Hahn P, Muller LP, Spies CK. Update TFCC:

- histology and pathology, classification, examination and diagnostics. *Arch Orthop Trauma Surg.* 2015;135(3):427–37. <https://doi.org/10.1007/s00402-015-2153-6>
- 72 Atzei A, Luchetti R, Braidotti F. Arthroscopic foveal repair of the triangular fibrocartilage complex. *J Wrist Surg.* 2015;4(1):22–30. <https://doi.org/10.1055/s-0035-1544226>
 - 73 Peimer CA, Blazar P, Coleman S, Kaplan FT, Smith T, Lindau T. Dupuytren contracture recurrence following treatment with collagenase clostridium histolyticum (CORDLESS [Collagenase Option for Reduction of Dupuytren Long-Term Evaluation of Safety Study]): 5-year data. *J Hand Surg Am.* 2015;40(8):1597–605. <https://doi.org/10.1016/j.jhsa.2015.04.036>
 - 74 Lin MY, Manzano G, Gupta R. Nerve allografts and conduits in peripheral nerve repair. *Hand Clin.* 2013;29(3):331–48. <https://doi.org/10.1016/j.hcl.2013.04.003>
 - 75 Tyser AR, Beckmann J, Franklin JD, Cheng C, Hon SD, Wang A, Hung M. Evaluation of the PROMIS physical function computer adaptive test in the upper extremity. *J Hand Surg Am.* 2014;39(10):2047–051.e4. <https://doi.org/10.1016/j.jhsa.2014.06.130>
 - 76 Wall LB, Didonna ML, Kiefhaber TR, Stern PJ. Proximal row carpectomy: minimum 20-year follow-up. *J Hand Surg Am.* 2013;38(8):1498–504. <https://doi.org/10.1016/j.jhsa.2013.04.028>
 - 77 Gart MS, Souza JM, Dumanian GA. Targeted muscle reinnervation in the upper extremity amputee: a technical roadmap. *J Hand Surg Am.* 2015;40(9):1877–888. <https://doi.org/10.1016/j.jhsa.2015.06.119>
 - 78 Peimer CA, Blazar P, Coleman S, Kaplan FT, Smith T, Tursi JP, Cohen B, Kaufman GJ, Lindau T. Dupuytren contracture recurrence following treatment with collagenase clostridium histolyticum (CORDLESS study): 3-year data. *J Hand Surg Am.* 2013;38(1):12–22. <https://doi.org/10.1016/j.jhsa.2012.09.028>
 - 79 Koskinen SK, Haapamaki VV, Salo J, Lindfors NC, Kortessniemi M, Seppala L, Mattila KT. CT arthrography of the wrist using a novel, mobile, dedicated extremity cone-beam CT (CBCT). *Skeletal Radiol.* 2013;42(5):649–57. <https://doi.org/10.1007/s00256-012-1516-0>
 - 80 Guse DM, Moran SL. Outcomes of the surgical treatment of peripheral neuromas of the hand and forearm: a 25-year comparative outcome study. *Ann Plast Surg.* 2013;71(6):654–58. <https://doi.org/10.1097/SAP.0b013e3182583cf9>
 - 81 Sayegh ET, Strauch RJ. Open versus endoscopic carpal tunnel release: a meta-analysis of randomized controlled trials. *Clin Orthop Relat Res.* 2015;473(3):1120–132. <https://doi.org/10.1007/s11999-014-3835-z>
 - 82 Cho HJ, Morey V, Kang JY, Kim KW, Kim TK. Prevalence and risk factors of spine, shoulder, hand, hip, and knee osteoarthritis in community-dwelling Koreans older than age 65 years. *Clin Orthop Relat Res.* 2015;473(10):3307–314. <https://doi.org/10.1007/s11999-015-4450-3>
 - 83 Dumanian GA, Potter BK, Mioton LM, Ko JH, Cheesborough JE, Souza JM, Ertl WJ, Tintle SM, Nanos GP, Valerio IL, Kuiken TA, Apkarian AV, Porter K, Jordan SW. Targeted muscle reinnervation treats neuroma and phantom pain in major limb amputees: a randomized clinical trial. *Ann Surg.* 2019;270(2):238–46. <https://doi.org/10.1097/SLA.0000000000003088>
 - 84 Dario P, Matteo G, Carolina C, Marco G, Cristina D, Daniele F, Andrea F. Is it really necessary to restore radial anatomic parameters after distal radius fractures? *Injury.* 2014;45 Suppl 6:S21–6. <https://doi.org/10.1016/j.injury.2014.10.018>
 - 85 Shibuya N, Humphers JM, Agarwal MR, Jupiter DC. Efficacy and safety of high-dose vitamin C on complex regional pain syndrome in extremity trauma and surgery—systematic review and meta-analysis. *J Foot Ankle Surg.* 2013;52(1):62–66. <https://doi.org/10.1053/j.jfas.2012.08.003>
 - 86 Schweizer A, Furnstahl P, Nagy L. Three-dimensional correction of distal radius intra-articular malunions using patient-specific drill guides. *J Hand Surg Am.* 2013;38(12):2339–347. <https://doi.org/10.1016/j.jhsa.2013.09.023>
 - 87 Fufa D, Calfee R, Wall L, Zeng W, Goldfarb C. Digit replantation: experience of two U.S. academic level-I trauma centers. *J Bone Joint Surg Am.* 2013;95(23):2127–134. <https://doi.org/10.2106/JBJS.L.01219>
 - 88 Grodzinsky AJ, Wang Y, Kakar S, Vrahas MS, Evans CH. Intra-articular dexamethasone to inhibit the development of post-traumatic osteoarthritis. *J Orthop Res.* 2017;35(3):406–11. <https://doi.org/10.1002/jor.23295>
 - 89 Osbahr DC, Cain EL, Jr., Raines BT, Fortenbaugh D, Dugas JR, Andrews JR. Long-term outcomes after ulnar collateral ligament reconstruction in competitive baseball players: minimum 10-year follow-up. *Am J Sports Med.* 2014;42(6):1333–342. <https://doi.org/10.1177/0363546514528870>
 - 90 Hershman SH, Immerman I, Bechtel C, Lekic N, Paksima N, Egol KA. The effects of pronator quadratus repair on outcomes after volar plating of distal radius fractures. *J Orthop Trauma.* 2013;27(3):130–33. <https://doi.org/10.1097/BOT.0b013e3182539333>
 - 91 Tang JB, Elliot D, Adani R, Saint-Cyr M, Stang F. Repair and reconstruction of thumb and finger tip injuries: a global view. *Clin Plast Surg.* 2014;41(3):325–59. <https://doi.org/10.1016/j.cps.2014.04.004>
 - 92 Lanting R, Broekstra DC, Werker PMN, van den Heuvel ER. A systematic review and meta-analysis on the prevalence of Dupuytren disease in the general population of Western countries. *Plast Reconstr Surg.* 2014;133(3):593–603. <https://doi.org/10.1097/01.prs.0000438455.37604.0f>
 - 93 Rinker B, Zoldos J, Weber RV, Ko J, Thayer W, Greenberg J, Leversedge FJ, Safa B, Buncke G. Use of processed nerve allografts to repair nerve injuries greater than 25 mm in the hand. *Ann Plast Surg.* 2017;78(6S Suppl 5):S292–95. <https://doi.org/10.1097/SAP.0000000000001037>
 - 94 Goldhahn J, Beaton D, Ladd A, Macdermid J, Hoang-Kim A, Distal Radius Working Group of the International Society for Fracture Repair (ISFR), International Osteoporosis Foundation (IOF). Recommendation for measuring clinical outcome in distal radius fractures: a core set of domains for standardized reporting in clinical practice and research. *Arch Orthop Trauma Surg.* 2014;134(2):197–205. <https://doi.org/10.1007/s00402-013-1767-9>
 - 95 Bain GI, Polites N, Higgs BG, Heptinstall RJ, McGrath AM. The functional range of motion of the finger joints. *J Hand Surg Eur Vol.* 2015;40(4):406–11. <https://doi.org/10.1177/1753193414533754>

- 96 Peimer CA, Wilbrand S, Gerber RA, Chapman D, Szczypa PP. Safety and tolerability of collagenase *Clostridium histolyticum* and fasciectomy for Dupuytren's contracture. *J Hand Surg Eur Vol.* 2015;40(2):141–49. <https://doi.org/10.1177/1753193414528843>
- 97 Wijk U, Carlsson I. Forearm amputees' views of prosthesis use and sensory feedback. *J Hand Ther.* 2015;28(3):269–77; quiz 78. <https://doi.org/10.1016/j.jht.2015.01.013>
- 98 Lalonde D, Martin A. Epinephrine in local anesthesia in finger and hand surgery: the case for wide-awake anesthesia. *J Am Acad Orthop Surg.* 2013;21(8):443–47. <https://doi.org/10.5435/JAAOS-21-08-443>
- 99 Shauver MJ, Chung KC. The Michigan hand outcomes questionnaire after 15 years of field trial. *Plast Reconstr Surg.* 2013;131(5):779e–87e. <https://doi.org/10.1097/PRS.0b013e3182865d83>
- 100 Boeckstyns ME, Herzberg G, Merser S. Favorable results after total wrist arthroplasty: 65 wrists in 60 patients followed for 5–9 years. *Acta Orthop.* 2013;84(4):415–19. <https://doi.org/10.3109/17453674.2013.823588>
- 101 Lalonde DH. Conceptual origins, current practice, and views of wide awake hand surgery. *J Hand Surg Eur Vol.* 2017;42(9):886–95. <https://doi.org/10.1177/1753193417728427>
- 102 Saltzman BM, Frank JM, Slikker W, Fernandez JJ, Cohen MS, Wysocki RW. Clinical outcomes of proximal row carpectomy versus four-corner arthrodesis for post-traumatic wrist arthropathy: a systematic review. *J Hand Surg Eur Vol.* 2015;40(5):450–57. <https://doi.org/10.1177/1753193414554359>
- 103 Roh YH, Lee BK, Noh JH, Baek JR, Oh JH, Gong HS, Baek GH. Factors associated with complex regional pain syndrome type I in patients with surgically treated distal radius fracture. *Arch Orthop Trauma Surg.* 2014;134(12):1775–781. <https://doi.org/10.1007/s00402-014-2094-5>
- 104 van der Avoort DJ, Hovius SE, Selles RW, van Neck JW, Coert JH. The incidence of symptomatic neuroma in amputation and neurorrhaphy patients. *J Plast Reconstr Aes.* 2013;66(10):1330–334. <https://doi.org/10.1016/j.bjps.2013.06.019>