

## Falls and Fragility Fracture Audit Programme references library

### Publications based on National Hip Fracture Database (NHFD) work

Almilaji O, Ayis S, Goubar A et al. Frequency, duration, and type of physiotherapy in the week after hip fracture surgery - analysis of implications for discharge home, readmission, survival, and recovery of mobility. *Physiotherapy*. 2023;120:47-59. doi:[10.1016/j.physio.2023.03.002](https://doi.org/10.1016/j.physio.2023.03.002) [Accessed August 2023]

Al-Essah Z, Curlew K, Chan G et al. Comparison of acute outcomes from elective total hip replacements and after fragility femoral neck fractures in nonagenarians. *BMC Musculoskelet Disord*. 2024;25(1):324. doi:[10.1186/s12891-024-07340-1](https://doi.org/10.1186/s12891-024-07340-1) [Accessed July 2025]

Baji P, Patel R, Judge A et al. Organisational factors associated with hospital costs and patient mortality in the 365 days following hip fracture in England and Wales (REDUCE): a record-linkage cohort study. *Lancet Healthy Longev*. 2023;4(8):e386-e398. doi:[10.1016/S2666-7568\(23\)00086-7](https://doi.org/10.1016/S2666-7568(23)00086-7) [Accessed August 2023]

Barker BC, McDonnell S. Hip Fracture Management in a Major Trauma Centre: The Impact of 'Smart Phrase' Integration Into Electronic Clerking on Culture and Adherence to Guidelines. *Cureus*. 2024;16(10):e70630. doi:[10.7759/cureus.70630](https://doi.org/10.7759/cureus.70630) [Accessed July 2025]

Bhimjiyani A, Neuburger J, Jones T et al. The effect of social deprivation on hip fracture incidence in England has not changed over 14 years: an analysis of the English Hospital Episodes Statistics (2001-2015). *Osteoporos Int*. 2018;29(1):115-124. doi:[10.1007/s00198-017-4238-2](https://doi.org/10.1007/s00198-017-4238-2) [Accessed July 2020]

Boulton C, Wakeman R. Lessons from the National Hip Fracture Database. *Orthopaedics and Trauma*. 2016;4,30(2):123–7. doi: [10.1016/j.mporth.2016.03.011](https://doi.org/10.1016/j.mporth.2016.03.011) [Accessed July 2020]

Boulton C, Burgon V, Johansen A et al. Delivering "Best Practice" for patients with hip fracture – Does orthogeriatrician engagement with national clinical audit data improve performance? *Age and Ageing*. 2017;46,Issue suppl\_1, 1,i32–i34. doi: [10.1093/ageing/afx072.121](https://doi.org/10.1093/ageing/afx072.121) [Accessed July 2020]

Eardley WGP; National Hip Fracture Database. Misunderstanding and the trochanteric fracture. *Bone Joint J*. 2024;106-B(5):430-434. doi:[10.1302/0301-620X.106B5.BJJ-2024-0171](https://doi.org/10.1302/0301-620X.106B5.BJJ-2024-0171) [Accessed July 2025]

Eardley W, Johansen. The National Hip Fracture Database: lessons learned and future horizons. *Orthopaedics and Trauma*. 2024;38(2):108-113. doi: [10.1016/j.mporth.2024.01.007](https://doi.org/10.1016/j.mporth.2024.01.007) [Accessed July 2025]

Eardley W, Johansen A. Safety and efficacy in the management of older patients with displaced intracapsular hip fractures. *Injury*. 2024;55(7):111598. doi:[10.1016/j.injury.2024.111598](https://doi.org/10.1016/j.injury.2024.111598) [Accessed July 2025]

Farrow L, Hall AJ, Ablett AD et al. The influence of hospital-level variables on hip fracture outcomes. *Bone Joint J* 2021;103-B(10):1627–1632. doi: [10.1302/0301-620X.103B10.BJJ-2021-](https://doi.org/10.1302/0301-620X.103B10.BJJ-2021-)

[0461.R1](#) [Accessed March 2022]

Fluck B, Yeong K, Lisk R et al. Changes in Characteristics and Outcomes of Patients Undergoing Surgery for Hip Fractures Following the Initiation of Orthogeriatric Service: Temporal Trend Analysis. *Calcif Tissue Int.* 2022;110(2):185-195. doi: [10.1007/s00223-021-00906-4](#) [Accessed March 2022]

Goubar A, Ayis S, Beaupre L et al. The impact of the frequency, duration and type of physiotherapy on discharge after hip fracture surgery: a secondary analysis of UK national linked audit data. *Osteoporos Int.* 2022;33(4):839-850. doi: [10.1007/s00198-021-06195-9](#) [Accessed March 2022]

Goubar A, Martin FC, Potter C et al. The 30-day survival and recovery after hip fracture by timing of mobilization and dementia : a UK database study. *Bone Joint J.* 2021;103-B(7):1317-1324. doi:[10.1302/0301-620X.103B7.BJJ-2020-2349.R1](#) [Accessed August 2021]

Gowers B, Greenhalgh MS, McCabe-Robinson OJ et al. Using Fracture Patterns and Planned Operative Modality to Identify Fractured Neck of Femur Patients at High Risk of Blood Transfusion. *Cureus.* 2021;13(9):e18220. doi:[10.7759/cureus.18220](#) [Accessed March 2022]

Gowers BTV, Greenhalgh MS, Dyson K at al. The importance of perioperative optimisation to facilitate safe regional anaesthesia and their improved outcomes in fracture neck of femur patients. *J Perioper Pract.* 2023;33(3):82-88. doi:[10.1177/17504589211064042](#) [Accessed March 2022]

Gray Stephens CE, Ashaye OJ, Ellenbogen TD et al. Dual Mobility hip replacement in hip fractures offer functional equivalence and a stability advantage - A case-controlled study. *Injury.* 2021;52(10):3017-3021. doi:[10.1016/j.injury.2021.01.027](#) [Accessed March 2022]

Greenhalgh MS, Gowers BTV, Iyengar KP et al. Blood transfusions and hip fracture mortality - A retrospective cohort study. *J Clin Orthop Trauma.* 2021;21:101506. Published 2021 Jul 19. doi:[10.1016/j.jcot.2021.101506](#) [Accessed March 2022]

Griffiths R, White SM, et al. Safety guideline: reducing the risk from cemented hemiarthroplasty for hip fracture 2015: Association of Anaesthetists of Great Britain and Ireland British Orthopaedic Association British Geriatric Society [published correction appears in *Anaesthesia*. 2018 Feb;73(2):261. doi: [10.1111/anae.14183](#)]. *Anaesthesia*. 2015;70(5):623-626. doi:[10.1111/anae.13036](#) [Accessed July 2020]

Griffin XL, Parsons N, Achten J et al. Recovery of health-related quality of life in a United Kingdom hip fracture population. The Warwick Hip Trauma Evaluation--a prospective cohort study. *Bone Joint J.* 2015;97-B(3):372-382. doi:[10.1302/0301-620X.97B3.35738](#) [Accessed July 2020]

Griffin XL, Achten J, Parsons N, Costa ML; WHiTE collaborators. Does performance-based remuneration improve outcomes in the treatment of hip fracture?. *Bone Joint J.* 2021;103-B(5):881-887. doi:[10.1302/0301-620X.103B5.BJJ-2020-1839.R1](#) [Accessed August 2021].

Hall AJ, Clement ND, MacLulich AMJ et al. IMPACT of COVID-19 on hip fracture services: A global survey by the International Multicentre Project Auditing COVID-19 in Trauma & Orthopaedics. *Surgeon.* 2022;20(4):237-240. doi:[10.1016/j.surge.2021.04.007](#) [Accessed June 2022].

Hussain Z, Bin Sahl A, Hussain A, Collins T, Pillai A. Socioeconomic and Demographic Determinants of Hip Fracture Incidence: A Comprehensive Analysis. *Cureus*. 2024;16(9):e68790. doi:[10.7759/cureus.68790](https://doi.org/10.7759/cureus.68790) [Accessed July 2025]

Iyengar KP, Khatir M, Mohamed MKA et al. Characteristics and clinical outcomes of hip fracture patients during the first lockdown of COVID-19, lessons learnt: A retrospective cohort analysis. *J Perioper Pract*. 2021;31(12):446-453. doi:[10.1177/17504589211026067](https://doi.org/10.1177/17504589211026067) [Accessed March 2022]

Johansen A, Sahota O, Dockery F et al. Call to action: a five nations consensus on the use of intravenous zoledronate after hip fracture [published correction appears in *Age Ageing*. 2024 Jan 2;53(1):afae014. doi: [10.1093/ageing/afae014](https://doi.org/10.1093/ageing/afae014)]. *Age Ageing*. 2023;52(9):afad172. doi:[10.1093/ageing/afad172](https://doi.org/10.1093/ageing/afad172) [Accessed August 2024].

Johansen A, Boulton C, Neuburger J. Diurnal and seasonal patterns in presentations with hip fracture-data from the national hip fracture database. *Age Ageing*. 2016;45(6):883-886. doi:[10.1093/ageing/afw133](https://doi.org/10.1093/ageing/afw133) [Accessed July 2020]

Johansen A, Boulton C. Hip fracture presentations are less frequent at weekends. *Injury*. 2017; 48(12):2885–6. doi: [10.1016/j.injury.2017.10.018](https://doi.org/10.1016/j.injury.2017.10.018) [Accessed July 2020]

Johansen A, Tsang C, Boulton C et al. Understanding mortality rates after hip fracture repair using ASA physical status in the National Hip Fracture Database. *Anaesthesia*. 2017;72(8):961-966. doi: [10.1111/anae.13908](https://doi.org/10.1111/anae.13908) [Accessed July 2020]

Johansen A, Boulton C, Burgon V et al. Using the National Hip Fracture Database (NHFD) to define the impact of physiotherapist assessment on early mobilisation after hip fracture. *Physiotherapy*. 2017;103(1),e85. doi: [10.1016/j.physio.2017.11.053](https://doi.org/10.1016/j.physio.2017.11.053) [Accessed July 2020]

Johansen A, Boulton C, Hertz K et al. The National Hip Fracture Database (NHFD) - Using a national clinical audit to raise standards of nursing care. *Int J Orthop Trauma Nurs*. 2017;26:3-6. doi:[10.1016/j.ijotn.2017.01.001](https://doi.org/10.1016/j.ijotn.2017.01.001) [Accessed July 2020]

Johansen A, Boulton C, Burgon V et al. Avoiding delay in surgery for hip fracture: Using the national hip fracture database (NHFD) to monitor and improve compliance with the national guidelines. *Age and Ageing*. 2017;46,Issue suppl\_1, 1,i32–i34. doi: [10.1093/ageing/afx072.122](https://doi.org/10.1093/ageing/afx072.122) [Accessed July 2020]

Johansen A, Boulton C, Burgon V, Rai S, Wakeman R. Cognitive impairment - Profiling its implications for patients with hip fracture. *Age and Ageing*. 2017;46,suppl\_2, 1:ii1–ii6. doi: [10.1093/ageing/afx115.21](https://doi.org/10.1093/ageing/afx115.21) [Accessed July 2020]

Johansen A, Inman DS. A view of COVID-19 from the perspective of the National Hip Fracture Database. *Bone Joint J*. 2021;103-B(6):1007-1008. doi:[10.1302/0301-620X.103B6.BJJ-2021-0326](https://doi.org/10.1302/0301-620X.103B6.BJJ-2021-0326) [Accessed July 2021]

Jones CS, Eardley WGP, Johansen A et al. Caring for patients with periprosthetic femoral fractures across England and Wales in 2021. *Bone Jt Open*. 2023;4(5):378-384. doi:[10.1302/2633-1462.45.BJO-2023-0011.R1](https://doi.org/10.1302/2633-1462.45.BJO-2023-0011.R1) [Accessed August 2023]

Jozefowski N, Eikani C, Lingampalli N et al. The Impact of National Orthopaedic Fracture Registries: A  
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Systematic Review. *OTA Int.* 2025 Feb 3;8(1):e361. doi: [10.1097/OI9.0000000000000361](https://doi.org/10.1097/OI9.0000000000000361) [Accessed July 2025]

Khawar H, Jones C, Eardley W et al. The burden of periprosthetic femoral fractures in England and Wales: Insights from the first two years of data collection in the National Hip Fracture Database and regional variation in care. *Injury.* 2024;55(7):111609. doi:[10.1016/j.injury.2024.111609](https://doi.org/10.1016/j.injury.2024.111609) [Accessed July 2025]

Kolhe S.N., Holleyman R, Chaplin A et al. Association between markers of inflammation and outcomes after hip fracture surgery: analysis of routinely collected electronic healthcare data. *BMC Geriatr.* 2025;25(1), 274. doi: [10.1186/s12877-025-05939-0](https://doi.org/10.1186/s12877-025-05939-0) [Accessed July 2025]

Lewandowski DA, Badurudeen A, Matthews T. The Impact of Concomitant Neck of Femur Fractures and Upper Limb Fractures on Length of Stay and Key Performance Indicators: A Single-Centre Study. *Cureus.* 2024;16(5):e60862. doi:[10.7759/cureus.60862](https://doi.org/10.7759/cureus.60862) [Accessed July 2025]

Maher M, Ward A, Ward K et al. Minimizing the Risk of Surgical Site Infection Following Hip Fracture Operation. *Surg Infect (Larchmt).* 2024;25(8):574-579. doi:[10.1089/sur.2024.019](https://doi.org/10.1089/sur.2024.019) [Accessed July 2025]

Malik-Tabassum K, Robertson A, Tadros BJ et al. The effect of the COVID-19 lockdown on the epidemiology of hip fractures in the elderly: a multicentre cohort study. *Ann R Coll Surg Engl.* 2021;103(5):337-344. doi: [10.1308/rcsann.2020.7071](https://doi.org/10.1308/rcsann.2020.7071) [Accessed March 2022]

Maling LC, Gray-Stephens CE, Malik-Tabassum K et al. The National Hip Fracture Database is only as good as the data we feed it - significant inaccuracy demonstrated and how to improve it. *Injury.* 2021;52(4):894-897. doi: [10.1016/j.injury.2020.10.079](https://doi.org/10.1016/j.injury.2020.10.079) [Accessed July 2021]

McCormack P, Scally A, Radcliffe G. Mortality in hip fractures: Stratifying the risk of operative delay and quantifying the benefit of early mobilisation. *Injury.* 2021;52(4):910-913. doi: [10.1016/j.injury.2020.10.071](https://doi.org/10.1016/j.injury.2020.10.071) [Accessed March 2022]

McGovern PD, Albrecht M G, Belani K et al. Forced-air warming and ultra-clean ventilation do not mix: an investigation of theatre ventilation, patient warming and joint replacement infection in orthopaedics. *J Bone Joint Surg BR.* 2011; 93(11), pp.1537-1544. doi: [10.1302/0301-620X.93B11.27124](https://doi.org/10.1302/0301-620X.93B11.27124) [Accessed July 2020]

McKee M, Bray B, Buckingham R, Boulton C. The weekend effect: now you see it, now you don't (letter). *BMJ.* 2016;353:i2750. doi: [10.1136/bmj.i2750](https://doi.org/10.1136/bmj.i2750) [Accessed July 2020]

Menakaya CU, Shah M, Ingoe H, et al. Modern cemented Furlong hemiarthroplasty: Are dislocations rates better? *J Perioper Pract.* 2023;33(1-2):24-29. doi:[10.1177/17504589211020674](https://doi.org/10.1177/17504589211020674) [Accessed March 2022]

Milton-Cole R, Goubar A, Ayis S et al. The role of depression in the association between mobilisation timing and live discharge after hip fracture surgery: Secondary analysis of the UK National Hip Fracture Database. *PLoS One.* 2024;19(4):e0298804. doi:[10.1371/journal.pone.0298804](https://doi.org/10.1371/journal.pone.0298804) [Accessed July 2025]

Murphy T, Culliford DJ, Hawley S, et al. Hip fracture projections up to the year 2060: an analysis based on data from the National Hip Fracture Database (NHFD) for England, Wales, and Northern Ireland. *Injury*. 2024;55(11):111863. doi:[10.1016/j.injury.2024.111863](https://doi.org/10.1016/j.injury.2024.111863) [Accessed July 2025]

Neuburger J, Currie C, Wakeman R et al. The impact of a national clinician-led audit initiative on care and mortality after hip fracture in England: an external evaluation using time trends in non audit data. *Med Care* 2015; 53:686–91. [www.ncbi.nlm.nih.gov/pubmed/26172938](https://www.ncbi.nlm.nih.gov/pubmed/26172938) [Accessed July 2020]

Neuburger J, Currie C, Wakeman R et al. The impact of a national clinician-led audit initiative on care and mortality after hip fracture in England: an external evaluation using time trends in non-audit data. *Med Care*. 2015;53(8):686-691. doi:[10.1097/MLR.0000000000000383](https://doi.org/10.1097/MLR.0000000000000383) [Accessed July 2020]

Neuburger J, Currie C, Wakeman R et al. Safe working in a 7-day service. Experience of hip fracture care as documented by the UK National Hip Fracture Database. *Age and Ageing*. 2018;47(5):741–5. doi: [10.1093/ageing/afy074](https://doi.org/10.1093/ageing/afy074) [Accessed July 2020]

Nisar S, Lamb J, Johansen A et al. The impact of ethnicity on care and outcome after hip fracture in England and Wales [published correction appears in *Bone Joint J*. 2024;106-B(12):1494. doi: [10.1302/0301-620X.106B12.BJJ-2024-00052](https://doi.org/10.1302/0301-620X.106B12.BJJ-2024-00052)]. *Bone Joint J*. 2024;106-B(10):1182-1189. doi:[10.1302/0301-620X.106B10.BJJ-2024-0217.R1](https://doi.org/10.1302/0301-620X.106B10.BJJ-2024-0217.R1) [Accessed July 2025]

Ojeda-Thies C, Rojo-Carpintero A, Soria-Perdomo F et al. Implant-associated infection after hip fracture surgery in elderly patients: Risk factors and mortality. *Injury*. 2024;55 Suppl 5:111756. doi: [10.1016/j.injury.2024.111756](https://doi.org/10.1016/j.injury.2024.111756) [Accessed July 2025]

Okereke IC, Abdelmonem M. Fascia Iliaca Compartment Block for Hip Fractures: Improving Clinical Practice by Audit. *Cureus*. 2021;13(9):e17836. doi: [10.7759/cureus.17836](https://doi.org/10.7759/cureus.17836) [Accessed March 2022]

Park C, Sugand K, Aframian A et al. Impact of COVID-19 pandemic on hip fractures: the central London experience COVID-related urgent geriatric hip trauma (COUGH) study COVERT (COvid Emergency-Related Trauma and orthopaedics) collaborative. *Ir J Med Sci*.2021;1-8. doi: [10.1007/s11845-021-02687-z](https://doi.org/10.1007/s11845-021-02687-z) [Accessed March 2022]

Patel R, Drew S, Johansen A et al. REDucing unwarranted variation in the Delivery of high qUality hip fraCture services in England and Wales (REDUCE): protocol for a mixed-methods study. *BMJ Open*. 2021;11(5):e049763. doi: [10.1136/bmjopen-2021-049763](https://doi.org/10.1136/bmjopen-2021-049763) [Accessed March 2022]

Patel R, Bhimjiyani A, Ben-Shlomo Y, Gregson CL. Social deprivation predicts adverse health outcomes after hospital admission with hip fracture in England. *Osteoporos Int*. 2021;32(6):1129-1141. doi:[10.1007/s00198-020-05768-4](https://doi.org/10.1007/s00198-020-05768-4) [Accessed March 2022]

Patel R, Judge A, Johansen A et al. Multiple hospital organisational factors are associated with adverse patient outcomes post-hip fracture in England and Wales: the REDUCE record-linkage cohort study. *Age and Ageing*. 2022; 51(8). doi: [10.1093/ageing/afac183](https://doi.org/10.1093/ageing/afac183) [Accessed August 2023]

Patel R, Judge A, Johansen A et al. Following hip fracture, hospital organizational factors associated with prescription of anti-osteoporosis medication on discharge, to address imminent refracture risk: a record-linkage study. *J Bone Miner Res*. 2024;39(8):1071-1082. doi:[10.1093/jbmr/zjae100](https://doi.org/10.1093/jbmr/zjae100) [Accessed July 2025]

Perry DC, Metcalfe D, Griffin XL, Costa ML. Inequalities in use of total hip arthroplasty for hip fracture: population based study. *BMJ* 2016; 353:i2021. doi: [10.1136/bmj.i2021](https://doi.org/10.1136/bmj.i2021) [Accessed July 2020]

Pradhan A, Aboelmagd T, Richardson L et al. Outcomes for non-operatively managed fracture neck of femur patients: A single-institution study. *Injury*. 2022;53(2):626-630. doi: [10.1016/j.injury.2021.11.007](https://doi.org/10.1016/j.injury.2021.11.007) [Accessed March 2022]

Rajeev A, Hunter C, Krishnan S, Ullah A, Koshy G; Gateshead Health Foundation NHS Trust. The prevalence and outcomes of pre-admission vitamin D levels in the management of proximal femur fractures. *Aging Med (Milton)*. 2024;7(6):699-704. doi:[10.1002/agm2.12375](https://doi.org/10.1002/agm2.12375) [Accessed July 2025]

Sayers A, Whitehouse MR, Berstock JR et al. The association between the day of the week of milestones in the care pathway of patients with hip fracture and 30-day mortality: findings from a prospective national registry – The National Hip Fracture Database of England and Wales. *BMC Med*. 2017;15:62. doi: [10.1186/s12916-017-0825-5](https://doi.org/10.1186/s12916-017-0825-5) [Accessed July 2020]

Shabani F, Tsinaslanidis G, Thimmaiah R et al. Effect of institution volume on mortality and outcomes in osteoporotic hip fracture care [published correction appears in *Osteoporos Int*. 2022;33(11):2293. doi: [10.1007/s00198-022-06323-z](https://doi.org/10.1007/s00198-022-06323-z).] [published correction appears in *Osteoporos Int*. 2022;33(11):2295. doi: [10.1007/s00198-022-06440-9](https://doi.org/10.1007/s00198-022-06440-9).] *Osteoporos Int*. 2022;33(11):2287-2292. doi:[10.1007/s00198-021-06249-y](https://doi.org/10.1007/s00198-021-06249-y)

Shah A, Matharu GS, Inman D et al. Variation in timely surgery for hip fracture by day and time of presentation: a nationwide prospective cohort study from the National Hip Fracture Database for England, Wales and Northern Ireland. *BMJ Qual Saf*. 2021;30(7):559-566. doi: [10.1136/bmjqs-2020-011196](https://doi.org/10.1136/bmjqs-2020-011196) [Accessed March 2022]

Shah A, Hawley S, Inman DS et al. Geographical variation in surgical care and mortality following hip fracture in England: a cohort study using the National Hip Fracture Database (NHFD). *Osteoporos Int*. 2021;32(10):1989-1998. doi: [10.1007/s00198-021-05922-6](https://doi.org/10.1007/s00198-021-05922-6) [Accessed March 2022]

Sheehan KJ, Goubar A, Martin FC et al. Discharge after hip fracture surgery in relation to mobilisation timing by patient characteristics: linked secondary analysis of the UK National Hip Fracture Database. *BMC Geriatr*. 2021;21(1):694. doi: [10.1186/s12877-021-02624-w](https://doi.org/10.1186/s12877-021-02624-w) [Accessed March 2022]

Sheehan KJ, Goubar A, Almilaji O et al. Discharge after hip fracture surgery by mobilisation timing: secondary analysis of the UK National Hip Fracture Database. *Age Ageing*. 2021;50(2):415-422. doi: [10.1093/ageing/afaa204](https://doi.org/10.1093/ageing/afaa204) [Accessed November 2021]

Sheikh HQ, Alnahhal A, Aqil A et al. Length of hospital stay following hip fracture and risk of 30 and 90 day mortality in a United Kingdom cohort. *Acta Orthop Belg.* 2021;87(4):607-617. doi: [10.52628/87.4.05](https://doi.org/10.52628/87.4.05) [Accessed March 2022]

Sims A L, Parsons N, Achten J et al. A randomized controlled trial comparing the Thompson hemiarthroplasty with the Exeter polished tapered stem and Unitrax modular head in the treatment of displaced intracapsular fractures of the hip: the WHiTE 3: HEMI Trial. *Bone Joint J.* 2018;100-B(3):352-360. doi: [10.1302/0301-620X.100B3.BJJ-2017-0872.R2](https://doi.org/10.1302/0301-620X.100B3.BJJ-2017-0872.R2) [Accessed July 2020]

Stewart K, Bray B, Buckingham R, Boulton C. The weekend effect: now you see it, now you don't. Variations in care quality occur across the whole week, not just at weekends. *BMJ.* 2016; 353:i3151. doi: [10.1136/bmj.i3151](https://doi.org/10.1136/bmj.i3151) [Accessed July 2020]

Studnicka KJ, Kumar G. Total hip replacement for displaced intracapsular neck of femur fracture. Are current guidelines appropriate for all patients? Five-year retrospective analysis of 315 cases. *Injury.* 2021;52(10):3011-3016. doi: [10.1016/j.injury.2021.01.041](https://doi.org/10.1016/j.injury.2021.01.041) Accessed June 2022]

Taranu R, Redclift C, Williams P et al. Use of anticoagulants remains a significant threat to timely hip fracture surgery. *Geriatr Orthop Surg Rehabil.* 2018;9:2151459318764150. Published 2018 Mar 22. doi: [10.1177/2151459318764150](https://doi.org/10.1177/2151459318764150) [Accessed July 2020]

Thorne K, Johansen A, Akbari A et al. The impact of social deprivation on mortality following hip fracture in England and Wales: a record linkage study. *Osteoporos Int.* 2016;27(9):2727-2737. doi: [10.1007/s00198-016-3608-5](https://doi.org/10.1007/s00198-016-3608-5) [Accessed July 2020]

Tsang C, Boulton C, Burgon V et al. Predicting 30-day mortality after hip fracture surgery evaluation of the National Hip Fracture Database case-mix adjustment model. *Bone Joint Res.* 2017;6(9):550-556. doi: [10.1302/2046-3758.69.BJR-2017-0020.R1](https://doi.org/10.1302/2046-3758.69.BJR-2017-0020.R1) [Accessed July 2020]

Tyas B, Lukic J, Harrison J et al. A comparative study of hip fracture care and outcomes in major trauma centres versus trauma units. *Injury.* 2022;53(4):1455-1458. doi: [10.1016/j.injury.2022.02.018](https://doi.org/10.1016/j.injury.2022.02.018) [Accessed March 2022]

Tyas B, Wilkinson M, Singiseti K. Effect of Covid-19 on best practice care of hip fracture patients: An analysis from the National Hip Fracture Database (NHFD). *Surgeon.* 2021;19(5):e298-e303. doi: [10.1016/j.surge.2021.01.003](https://doi.org/10.1016/j.surge.2021.01.003) [Accessed March 2022]

Uzoigwe CE, Bin Qadir RMA, Daoub A. Ambient pollution at hip fracture units and impact on mortality and post-operative delirium: A hormetic effect?. *PLoS One.* 2024;19(12):e0315824. doi: [10.1371/journal.pone.0315824](https://doi.org/10.1371/journal.pone.0315824) [Accessed July 2025]

Walshaw TW, Morris TM, Fouweather M et al. ORTHOPOD: Linking ambulatory future trauma injury distribution from fragility proximal femur fracture caseload. *Injury.* 2024;55(6):111527. doi: [10.1016/j.injury.2024.111527](https://doi.org/10.1016/j.injury.2024.111527) [Accessed July 2025]

Waterman JL, Jayaraju U, Nadimi JK et al. Impact of COVID-19 on Key Performance Indicators of the National Hip Fracture Database and the Management of Hip Fracture Patients. *Cureus.* 2021;13(12):e20575. Published 2021 Dec 21. doi: [10.7759/cureus.20575](https://doi.org/10.7759/cureus.20575) [Accessed March 2022]

Webster J, Goldacre R, Lane JCE et al. Facilitating clinical trials in hip fracture in the UK : the role and potential of the National Hip Fracture Database and routinely collected data. *Bone Joint J.* 2025;107-B(2):229-238. doi:[10.1302/0301-620X.107B2.BJJ-2024-0846.R1](https://doi.org/10.1302/0301-620X.107B2.BJJ-2024-0846.R1) [Accessed July 2025]

Whitehouse MR, Berstock JR, Kelly MB et al. Higher 30-day mortality associated with the use of intramedullary nails compared with sliding hip screws for the treatment of trochanteric hip fractures: a prospective national registry study. *Bone Joint J.* 2019;101-B(1):83-91. doi:[10.1302/0301-620X.101B1.BJJ-2018-0601.R2](https://doi.org/10.1302/0301-620X.101B1.BJJ-2018-0601.R2) [Accessed July 2020]

Wilson H, Boulton C, Burgon V et al. Using the national hip fracture database to develop a classification of models of orthogeriatric care. *Age Ageing.* 2017;46,Issue suppl\_1, 1,i1–i22 [https://academic.oup.com/ageing/article/46/suppl\\_1/i1/3828842](https://academic.oup.com/ageing/article/46/suppl_1/i1/3828842) [Accessed July 2020]

**Publications based on Fracture Liaison Service Database (FLS-DB) work**

Hawley S, Javaid M K, Prieto-Alhambra D, Lippett J, Sheard S, Arden N K, Cooper C, Judge A, The REFRESH study group. Clinical effectiveness of orthogeriatric and fracture liaison service models of care for hip fracture patients: population-based longitudinal study. *Age and Ageing* 2016 March;45(2):236–42. <https://academic.oup.com/ageing/article/45/2/236/2195354?searchresult=1> [Accessed July 2020]

Judge A, Javaid M K, Leal J, Hawley S, Drew S, Sheard S, Prieto-Alhambra D, Gooberman-Hill R, Lippett J, Farmer A, Arden N, Gray A, Goldacre M, Delmestri A, Cooper C. Models of care for the delivery of secondary fracture prevention after hip fracture: a health service cost, clinical outcomes and cost-effectiveness study within a region of England. *Health Services and Delivery Research*. 2016 Sep; 4:28. <https://www.ncbi.nlm.nih.gov/books/NBK385615/> [Accessed July 2020]

Leal J, Gray AM, Hawley S, Prieto-Alhambra D, Delmestri A, Arden NK, Cooper C, Javaid MK, Judge A; and the REFRESH Study Group. Cost-Effectiveness of Orthogeriatric and Fracture Liaison Service Models of Care for Hip Fracture Patients: A Population-Based Study. *Journal of Bone and Mineral Research*. 2017 Feb; 32(2):203–11. <https://www.ncbi.nlm.nih.gov/pubmed/27632945> [Accessed July 2020]

**Publications based on National Audit of Inpatient Falls (NAIF) work**

Buttery AK, Husk J, Lowe D, Trembl J, Vasilakis N, Riglin J. Older people's experiences of therapeutic exercise as part of a falls prevention service: survey findings from England, Wales and Northern Ireland. *Age and Ageing* 2014 May; 43(3):369–74. <https://www.ncbi.nlm.nih.gov/pubmed/24292239> [Accessed July 2020]

Morris R, O'Riordan S. Prevention of falls in hospital. *Clin Med* 2017 Jul;17(4):360–62. <https://www.ncbi.nlm.nih.gov/pubmed/28765417> [Accessed July 2020]

O'Riordan S, Vasilakis N, Hussain L, Schoo R1, Whitney J, Windsor J, Horton K, Martin F. Measurement of lying and standing blood pressure in hospital. *Nursing Older People* 2017 Sep; 29;29(8):20–6. <https://www.ncbi.nlm.nih.gov/pubmed/29124913> [Accessed July 2020]

## External papers referenced in FFFAP publications

### NHFD

Abbey J, Piller N, Bellis AD et al. The Abbey pain scale: a 1-minute numerical indicator for people with end-stage dementia. *Int J Palliat Nurs* 2004;10(1):6–13.

<https://www.ncbi.nlm.nih.gov/pubmed/14966439> [Accessed July 2020]

Accelerated surgery versus standard care in hip fracture (HIP ATTACK): an international, randomised, controlled trial. *Lancet* 2020; 395: i10225:698-708.

[www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30058-1/fulltext#%20](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30058-1/fulltext#%20) [Accessed July 2020]

Anthony C, Malaj M, Lokanathan P, Murgatroyd J, O'Connor P. Crossing quartiles: Improving time to theatre for patients with hip fractures in a large UK district general hospital; A quality improvement report. *Injury* 2021 Nov;52(11):3415-3419.

<https://www.sciencedirect.com/science/article/abs/pii/S0020138321006938> [Accessed March 2022]

Barodawala S, Kesavan S, Young J. A survey of physiotherapy and occupational therapy provision in UK nursing homes. *Clin Rehabil* 2001;15(6):607–10. <https://doi.org/10.1191/0269215501cr454oa> [Accessed July 2020]

Bellelli et al. Validation of the 4AT, a new instrument for rapid delirium screening: a study in 234 hospitalised older people. *Age Ageing* 2014;43(4):496-502.

<https://doi.org/10.1093/ageing/afu181> [Accessed July 2020]

Bommireddy L, Leow TW, Gogna R, Clark DI. Should Femoral Shaft fractures in Patients Age Over 60 Years be Managed Using a Hip Fracture Pathway? *Injury* 2021 Jun;52(6):1517-1521.

<https://www.sciencedirect.com/science/article/abs/pii/S0020138320307944> [Accessed March 2022]

Bottle, A., Griffiths, R., White, S., Wynn-Jones, H., Aylin, P., Moppett, I., Chowdhury, E., Wilson, H. & Davies, B. M. 2020. Periprosthetic fractures: the next fragility fracture epidemic? A national observational study. *BMJ Open*, 10, e042371.)

<https://bmjopen.bmj.com/content/bmjopen/10/12/e042371.full.pdf> [Accessed July 2021]

COVID BOAST - Management of patients with urgent orthopaedic conditions and trauma during the coronavirus pandemic. Last updated January 2021.

<https://www.boa.ac.uk/uploads/assets/782e0b20-f9ce-4fc9-819f943740161405/201ebd61-5828-4c81-b45a8b80ac47fd50/COVID-19-BOASTs-Combined-v3FINAL.pdf> [Accessed July 2021]

Diamant et al. “Early trigger” intravenous vitamin K: optimizing target-driven care in warfarinised patients with hip fracture. *Geriatric Orthopaedic Surgery & Rehabilitation* 2015; (6):263-268.

<https://journals.sagepub.com/doi/10.1177/2151458515595669> [Accessed July 2020]

Duncan DG, Beck SJ, Hood K, Johansen A. Using dietetic assistants to improve the outcome of hip fracture: a randomised controlled trial of nutritional support in an acute trauma ward. *Age Ageing*. 2006 Mar;35(2):148-53. <https://pubmed.ncbi.nlm.nih.gov/16354710/> [accessed August 2024]

Farrow L, Ablett AD, Sargeant HW, Smith TO, Johnston AT. Does early surgery improve outcomes for periprosthetic fractures of the hip and knee? A systematic review and meta-analysis. *Archives of Orthopaedic and Trauma Surgery*. 2021 Aug;141(8):1393-1400.

<https://link.springer.com/article/10.1007/s00402-020-03739-2> [Accessed July 2021]

Getting It Right First Time: Orthopaedic hemiarthroplasty products and Primary Femoral component dataset

Supplied exclusively to the National Hip Fracture Database - HQIP/RCP Falls & Fragility Fracture Audit Programme (FFFAP).

Ghobrial M, Vaidya A, Thahir A, Krkovic M. Diagnostic value of full-length femur radiographs in patients with neck of femur fracture and co-existing malignancy. *Eur J Orthop Surg Traumatol* 2022 Jan 27. <https://link.springer.com/article/10.1007/s00590-021-03190-y> [Accessed March 2022]

Ghosh S, Thomas B, D'sa P, John A, Amico GD, Williams R, et al. Patients With Un-Displaced Or Displaced Intra Capsular Proximal Femur Fractures Do Not Represent A Different Patient Group And Have Similar Short And Long Term Mortality. *Injury* 2022 Apr;53(4):1490-1495. <https://www.sciencedirect.com/science/article/abs/pii/S002013832200016X> [Accessed March 2022]

Hamid M, Chikhliya A, Gogna A. Improving Secondary Bone Protection Prescription in Patients Admitted With a Femoral Neck Fracture. *Cureus* 2021 Oct 19;13(10):e18883. <https://www.cureus.com/articles/72301-improving-secondary-bone-protection-prescription-in-patients-admitted-with-a-femoral-neck-fracture> [Accessed March 2022]

Hip Fracture Evaluation with Alternatives of Total Hip Arthroplasty versus Hemi-Arthroplasty (HEALTH) Investigators. Total hip arthroplasty or hemiarthroplasty for hip fracture. *New England Journal of Medicine* 381.23 (2019): 2199-2208. [Accessed July 2021]

Jones S, Johansen A, Brennan JA, et al. The effect of socioeconomic deprivation on fracture incidence in the United Kingdom. *Osteoporos Int* 2004;15:520–524. DOI 10.1007/s00198-003-1564-3. <https://link.springer.com/article/10.1007/s00198-003-1564-3> [Accessed March 2022]

Judge A, Metcalfe D, Whitehouse MR, et al. How should the HEALTH trial inform clinical guidelines and surgical decision-making? *Bone and Joint Journal* 2020; 102-b (6) <https://online.boneandjoint.org.uk/doi/abs/10.1302/0301-620X.102B6.BJJ-2020-0101.R1> [Accessed July 2020]

Key T, Reid G, Vannet N, et al 'Golden Patient': A quality improvement project aiming to improve trauma theatre efficiency in the Royal Gwent Hospital. *BMJ Open Quality* 2019;8:e000515. doi: [10.1136/bmjopen-2018-000515](https://doi.org/10.1136/bmjopen-2018-000515) [Accessed August 2023]

Leal J, Gray AM, Javaid MK et al. Impact of hip fracture on hospital care costs: a population-based study. *Osteoporos Int* 2016;27:549–58. <https://link.springer.com/article/10.1007/s00198-015-3277-9> [Accessed July 2020]

Lisk et al. Associations of 4AT with mobility, length of stay and mortality in hospital and discharge destination among patients admitted with hip fractures. *Age Ageing* 2020; 49: i3:411-417 <https://pubmed.ncbi.nlm.nih.gov/31813951/> [Accessed July 2020]

Marcantonio ER, Flacker JM, Wright RJ. et al. Reducing delirium after hip fracture: a randomized trial. *J AM Geriatr Soc.*2001; 49(5):516-22 <https://doi.org/10.1046/j.1532-5415.2001.49108.x> [Accessed July 2020]

Melling AC, Ali B, Scott EM and Leaper DJ, 2001. Effects of preoperative warming on the incidence of wound infection after clean surgery: a randomised controlled trial. *The Lancet*, 358(9285), pp.876-880. <https://www.ncbi.nlm.nih.gov/pubmed/11567703> [Accessed July 2020]

Neuburger J, Currie C, Wakeman R, et al. Increased orthogeriatrician involvement in hip fracture care and its impact on mortality in England. *Age and Ageing* 2017;46(2):187–192.

<https://doi.org/10.1093/ageing/afw201> [Accessed July 2021]

NICE National Institute for Health and Care Excellence. Clinical guideline CG124. Hip fracture: management. London: NICE, 2017. [www.nice.org.uk/Guidance/CG124](http://www.nice.org.uk/Guidance/CG124) [Accessed July 2020]

NICE National Institute for Health and Care Excellence. Quality Standard QS16. Hip fracture in adults. London: NICE, 2017. [www.nice.org.uk/Guidance/QS16](http://www.nice.org.uk/Guidance/QS16) [Accessed July 2020]

NHS England and NHS Improvement. Ref: 2017/18 and 2018/19 National Tariff Payment System: a consultation notice. Annex B6 Guidance on Best Practice Tariffs. London: NHS Improvement, 2016. <https://improvement.nhs.uk/resources/national-tariff-1920-consultation/> [Accessed July 2020]

Papanicolas I, Riley K, Abiona O et al. Differences in health outcomes for high-need high-cost patients across high-income countries. *Health Serv Res.* 2021; 56( Suppl. 3): 1347- 1357.

<https://onlinelibrary.wiley.com/doi/full/10.1111/1475-6773.13735> [Accessed March 2022]

Royal College of Physicians, British Geriatrics Society and British Pain Society. The assessment of pain in older people: national guidelines. Concise guidance to good practice series, No 8. London: RCP, 2007.

[https://www.britishpainsociety.org/static/uploads/resources/files/book\\_pain\\_older\\_people.pdf](https://www.britishpainsociety.org/static/uploads/resources/files/book_pain_older_people.pdf)

[Accessed July 2020]

Salkeld G, Ameratunga SN, Cameron ID et al. Quality of life related to fear of falling and hip fracture in older women: a time trade off study. *BMJ* 2000; 320(7231):341–6.

<https://www.ncbi.nlm.nih.gov/pubmed/10657327> [Accessed July 2020]

Studnicka KJ, Kumar G. Total hip replacement for displaced intracapsular neck of femur fracture.

Are current guidelines appropriate for all patients? Five-year retrospective analysis of 315 cases.

*Injury* 2021 Oct;52(10):3011-3016. <https://pubmed.ncbi.nlm.nih.gov/33612253/> [Accessed March 2022]

Tsang C, Boulton C, Burgon V et al. Predicting 30-day mortality after hip fracture surgery evaluation of the National Hip Fracture Database case-mix adjustment model. *Bone & Joint Research* 2017; 6 (9): 550–6.

<https://online.boneandjoint.org.uk/doi/full/10.1302/2046-3758.69.BJR-2017-0020.R1>

[Accessed July 2020]

Total Hip Arthroplasty or Hemiarthroplasty for Hip Fracture. *N Engl J Med* 2019; 381:2199-2208.

<https://www.nejm.org/doi/full/10.1056/NEJMoa1906190> [Accessed July 2021]

Whitehouse MR, Berstock JR, Kelly MB et al. Higher 30-day mortality associated with the use of intramedullary nails compared with sliding hip screws for the treatment of trochanteric hip fractures: a prospective national registry study. *Bone Joint Journal* 2019; 101(1): 83-91.

<https://www.ncbi.nlm.nih.gov/pubmed/30601043> [Accessed July 2020]

World Hip Trauma Evaluation - FRUITI: Fix or Replace Undisplaced Intracapsular fractures Trial of Interventions (WHITE 11 – FRUITI) <https://www.ndorms.ox.ac.uk/clinical-trials/current-trials-and-studies/fruiti> [Accessed July 2021]

**NAIF**

National Institute for Health and Care Excellence. Falls in older people: assessing risk and prevention. NICE clinical guideline (CG161). Manchester: NICE, 2013. [www.nice.org.uk/guidance/cg161](http://www.nice.org.uk/guidance/cg161) [Accessed July 2020]

National Patient Safety Agency. The 'How to' Guide for Reducing harm from falls. London: NPSA, 2009. <https://webarchive.nationalarchives.gov.uk/20150505150051/http://www.patientsafetyfirst.nhs.uk/ashx/Asset.ashx?path=/Intervention-support/FALLSHow-to%20Guide%20v4.pdf> [Accessed July 2020]

National Institute for Health and Care Excellence. Falls in older people. NICE quality standard (QS86). Manchester: NICE, 2017. [www.nice.org.uk/guidance/qs86](http://www.nice.org.uk/guidance/qs86) [Accessed July 2020]

National Institute for Health and Clinical Excellence. Delirium: prevention, diagnosis and management. NICE clinical guideline (CG103). Manchester: NICE, 2010. [www.nice.org.uk/guidance/cg103](http://www.nice.org.uk/guidance/cg103) [Accessed July 2020]

National Patient Safety Agency. Slips trips and falls in hospital. London: NPSA, 2007. [www.nrls.npsa.nhs.uk/resources/?entryid45=59821](http://www.nrls.npsa.nhs.uk/resources/?entryid45=59821) [Accessed July 2020]

National Patient Safety Agency. Using bedrails safely and effectively. London: NPSA, 2007. [www.nrls.npsa.nhs.uk/resources/?EntryId45=59815](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=59815) [Accessed July 2020]

NHS Improvement. The incidence and costs of inpatient falls in hospitals. London: NHSI, 2017. <https://improvement.nhs.uk/resources/incidence-and-costs-inpatient-falls-hospitals/> [Accessed July 2020]

NHS Improvement. Supporting NHS providers to deliver the right staff, with the right skills, in the right place at the right time. NHSI, 2019. <https://improvement.nhs.uk/resources/supporting-nhs-providers-right-skills-staff-place-time/> [Accessed July 2020]

**FLS-DB**

British Orthopaedic Association/British Geriatrics Society. The care of patients with fragility fracture. London: BOA, 2007. <https://www.bgs.org.uk/resources/care-of-patients-with-fragility-fracture-blue-book> [Accessed July 2020]

Li L, Roddam A, Gitlin M et al. Persistence with osteoporosis medications among postmenopausal women in the UK General Practice Research Database. Menopause 2012;19:33–40. [https://journals.lww.com/menopausejournal/Abstract/2012/01000/Persistence\\_with\\_osteoporosis\\_medications\\_among.8.aspx](https://journals.lww.com/menopausejournal/Abstract/2012/01000/Persistence_with_osteoporosis_medications_among.8.aspx) [Accessed July 2020]

National Osteoporosis Guideline Group. NOGG 2017: Clinical guideline for the prevention and treatment of osteoporosis. Sheffield: NOGG, 2017 [www.sheffield.ac.uk/NOGG/](http://www.sheffield.ac.uk/NOGG/) [Accessed July 2020]

National Institute for Health and Care Excellence. Falls in older people: assessing risk and prevention. NICE clinical guideline (CG161). Manchester: NICE, 2013. [www.nice.org.uk/guidance/cg161](http://www.nice.org.uk/guidance/cg161) [Accessed July 2020].

National Institute for Health and Care Excellence. Falls in older people. NICE quality standard (QS86). Manchester: NICE, 2015. [www.nice.org.uk/guidance/qs86](http://www.nice.org.uk/guidance/qs86) [Accessed July 2020].

National Institute for Health and Care Excellence. Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. NICE technology appraisal (TA161). Manchester: NICE, 2008. [www.nice.org.uk/guidance/ta161](http://www.nice.org.uk/guidance/ta161) [Accessed July 2020].

National Institute for Health and Care Excellence. Osteoporosis. NICE quality standard (QS149). Manchester: NICE, 2017. [www.nice.org.uk/guidance/qs149](http://www.nice.org.uk/guidance/qs149) [Accessed July 2020].

Quality and Outcomes Framework. Achievement, prevalence and exceptions data, 2012/13. [www.hscic.gov.uk/catalogue/PUB12262](http://www.hscic.gov.uk/catalogue/PUB12262) [Accessed July 2020].

Royal Osteoporosis Society. Benefits calculator 2016. Bath: ROS, 2016. <https://benefits.theros.org.uk/> [Accessed July 2020]

Royal Osteoporosis Society. Effective secondary prevention of fragility fractures: clinical standards for fracture liaison services. Bath: ROS, 2015. <https://theros.org.uk/media/1776/clinical-standards-report.pdf> [Accessed July 2020].