

SUPPLEMENTAL MATERIAL

Supplemental Tables 1 to 5 and corresponding references

Supplemental Table 1. Search terms

| Search term | Date | Database |
|---|------------|----------|
| (((((Femoral neck fracture OR FNF)) AND ((Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Dhs OR FNS OR Screw Fixation OR Internal Fixation)) AND ((Complications OR Bleeding OR Reoperation OR Complication OR "length of stay" OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization OR necrosis))) AND (("2012"[Date - Publication] : "3000"[Date - Publication]))) AND ((prospective OR retrospective OR series OR randomized OR registry OR cohort)) AND (patient OR case OR subject) | 10/10/2022 | PubMed |
| ((("Femoral neck fracture" OR "ipsilateral femoral neck fracture") AND (("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR "Dynamic Locking Plate" OR Cannulated OR Sliding Hip Screws OR "Screw Fixation" OR "Internal Fixation" OR Dhs)) AND (Complications OR Bleeding OR Reoperation) NOT (case report)) | 10/10/2022 | PubMed |
| ((Femoral neck fracture OR "ipsilateral femoral neck fracture" OR "Femoral Neck Fractures" OR FNF OR Femoral neck shaft fracture) AND (("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR | 10/10/2022 | PubMed |

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| <p>Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Screw Fixation OR Internal Fixation OR Dhs) AND (FNS OR Femoral neck system)) AND ((Complications OR Bleeding OR Reoperation OR "Operation Time" OR "Operating room time" OR Complication OR length of stay OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization)) NOT (case report))</p> | | |
| <p>((Femoral neck fracture OR Femoral Neck Fractures OR femoral neck shaft fracture OR ipsilateral femoral neck fracture)) AND ((Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR FNS OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws)) AND ((Complications OR Bleeding OR Reoperation OR Operation Time OR Time)) AND ("2019/01/01"[Date - Publication] : "3000"[Date - Publication])</p> | 10/10/2022 | PubMed |
| <p>((Femoral neck fracture OR Femoral Neck Fractures)) AND ((Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws)) AND ((Complications OR Bleeding OR Reoperation OR Operation Time OR Time)) AND ("2019/01/01"[Date - Publication] : "3000"[Date - Publication])</p> | 10/10/2022 | PubMed |
| <p>(Femoral neck fracture OR FNF) AND (Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Dhs OR FNS OR Screw Fixation OR Internal Fixation) AND (Complications OR Bleeding</p> | 10/10/2022 | Cochrane Library |

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|---|-------------------|-------------------------|
| <p>OR Reoperation OR Complication OR "length of stay" OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization OR necrosis) AND (prospective OR retrospective OR series OR randomized OR registry OR cohort) AND (patient OR case OR subject)</p> | | |
| <p>((("Femoral neck fracture" OR "ipsilateral femoral neck fracture") AND (("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR "Dynamic Locking Plate" OR Cannulated OR Sliding Hip Screws OR "Screw Fixation" OR "Internal Fixation" OR Dhs)) AND (Complications OR Bleeding OR Reoperation) NOT (case report))</p> | <p>10/10/2022</p> | <p>Cochrane Library</p> |
| <p>((Femoral neck fracture OR "ipsilateral femoral neck fracture" OR "Femoral Neck Fractures" OR FNF OR Femoral neck shaft fracture) AND (("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Screw Fixation OR Internal Fixation OR Dhs) AND (FNS OR Femoral neck system)) AND ((Complications OR Bleeding OR Reoperation OR "Operation Time" OR "Operating room time" OR Complication OR length of stay OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization)) NOT (case report))</p> | <p>10/10/2022</p> | <p>Cochrane Library</p> |
| <p>((Femoral neck fracture OR Femoral Neck Fractures OR femoral neck shaft fracture OR ipsilateral femoral neck fracture)) AND ((Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR FNS OR Dynamic Locking Plate OR Cannulated OR Sliding Hip</p> | <p>10/10/2022</p> | <p>Cochrane Library</p> |

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| Screws)) AND ((Complications OR Bleeding OR Reoperation OR Operation Time OR Time)) | | |
| ('femoral neck fracture' OR fnf) AND ('dynamic hip screw' OR 'cannulated screw' OR 'sliding hip screw' OR 'femoral neck system' OR 'dynamic locking plate' OR cannulated OR 'sliding hip screws' OR dhs OR fns OR 'screw fixation' OR 'internal fixation') AND (complications OR bleeding OR reoperation OR complication OR 'length of stay' OR postoperative OR 'intraoperative blood loss' OR hospitalization OR necrosis) AND (prospective OR retrospective OR series OR randomized OR registry OR cohort) AND (patient OR case OR subject) AND [humans]/lim AND [english]/lim AND [embase]/lim AND [2012-2022]/py | 10/10/2022 | Embase |
| ('femoral neck fracture' OR fnf) AND ('dynamic hip screw' OR 'cannulated screw' OR 'sliding hip screw' OR 'femoral neck system' OR 'dynamic locking plate' OR cannulated OR 'sliding hip screws' OR dhs OR fns OR 'screw fixation' OR 'internal fixation') AND (complications OR bleeding OR reoperation OR complication OR 'length of stay' OR postoperative OR 'intraoperative blood loss' OR hospitalization OR necrosis) AND (prospective OR retrospective OR series OR randomized OR registry OR cohort) AND (patient OR case OR subject) AND [humans]/lim AND [english]/lim AND [embase]/lim AND [2012-2022]/py | 09/21/2022 | Embase |
| ((Femoral neck fracture OR Femoral Neck Fractures OR femoral neck shaft fracture OR ipsilateral femoral neck fracture)) AND ((Dynamic hip screw OR Cannulated screw | 09/21/2022 | Cochrane Library |

| | | |
|--|-------------------|-------------------------|
| <p>OR Sliding hip screw OR Femoral neck system OR FNS OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws)) AND ((Complications OR Bleeding OR Reoperation OR Operation Time OR Time)) in Title Abstract Keyword</p> | | |
| <p>((Femoral neck fracture OR "ipsilateral femoral neck fracture" OR "Femoral Neck Fractures" OR FNF OR Femoral neck shaft fracture) AND ("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Screw Fixation OR Internal Fixation OR Dhs) AND (FNS OR Femoral neck system)) AND ((Complications OR Bleeding OR Reoperation OR "Operation Time" OR "Operating room time" OR Complication OR length of stay OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization)) NOT (case report))</p> | <p>09/21/2022</p> | <p>Cochrane Library</p> |
| <p>(("Femoral neck fracture" OR "ipsilateral femoral neck fracture") AND ("Dynamic hip screw" OR "Cannulated screw" OR "Sliding hip screw" OR "Dynamic Locking Plate" OR Cannulated OR Sliding Hip Screws OR "Screw Fixation" OR "Internal Fixation" OR Dhs)) AND (Complications OR Bleeding OR Reoperation) NOT (case report)) in Title Abstract Keyword</p> | <p>09/21/2022</p> | <p>Cochrane Library</p> |
| <p>(Femoral neck fracture OR FNF) AND (Dynamic hip screw OR Cannulated screw OR Sliding hip screw OR Femoral neck system OR Dynamic Locking Plate OR Cannulated OR Sliding Hip Screws OR Dhs OR FNS OR Screw Fixation OR Internal Fixation) AND (Complications OR Bleeding</p> | <p>09/21/2022</p> | <p>Cochrane Library</p> |

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| OR Reoperation OR Complication OR "length of stay" OR Postoperative OR "Intraoperative Blood Loss" OR Hospitalization OR necrosis) AND (prospective OR retrospective OR series OR randomized OR registry OR cohort) AND (patient OR case OR subject) in Title Abstract Keyword | | |
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Supplemental Table 2. Criteria for risk of bias ratings

| Risk of Bias Rating | Criteria |
|----------------------------|---|
| Low | Selection: 3-4 stars AND Comparability: 1-2 stars AND Outcomes: 2-3 stars |
| Moderate | Selection: 2 stars AND Comparability: 1-2 stars AND Outcomes: 2-3 |
| Poor | Selection: 0-1 OR Comparability: 0 OR Outcomes: 0-1 |

Supplemental Table 3. Patient baseline characteristics for included studies

| Study | Intervention | N | Age (years) | p value | Garden Classification* | p value | Follow-up (months) | p value |
|------------------------|---------------------|----------|--------------------|--------------------|-------------------------------|----------------------------|---------------------------|----------------|
| He, 2021 ¹³ | Cannulated screw | 36 | 47.58±10.31 | 0.228 [†] | Type I: 5.6% (2/36) | Type I: 0.939 [‡] | 16.91±3.01 (range: 12- | -- |

| | | | | | | | | |
|--------------------------|---------------------|----|------------|--------------------|--|--|-------------|--------------------|
| | | | | | Type II: 25.0% (9/36) Type III: 55.6% (20/36) Type IV: 13.9% (5/36) | Type II: 0.942 [‡] Type III: 0.866 [‡] Type IV: 0.847 [‡] | 24) | |
| | FNS (DePuy Synthes) | 33 | 50.61±10.3 | | Type I: 3.0% (1/33) Type II: 24.2% (8/33) Type III: 57.6% (19/33) Type IV: 15.2% (5/33) | | | |
| Hu, 2021 ¹⁴ | Cannulated screw | 24 | 50.46±9.26 | 0.998 [†] | Type I: 16.7% (4/24) Type II: 25.0% (6/24) Type III: 29.2% (7/24) Type IV: 29.2% (7/24) | -- | Minimum: 12 | |
| | FNS (DePuy Synthes) | 20 | 50.45±8.45 | | Type I: 0.0% (0/20) Type II: 30.0% (6/20) Type III: 40.0% (8/20) Type IV: 30.0% (6/20) | | | |
| Nibe, 2021 ¹⁵ | Cannulated screw | 27 | 77.8±7.3 | 0.11 [†] | -- | -- | 24±27 | 0.056 [†] |
| | FNS (DePuy) | 25 | 81.2±7.9 | | -- | | 13±5 | |

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|-----------------------------|------------------------------|----|-------------------------|--------------------|---|--------------------|-------------------------|----|
| | Synthes) | | | | | | | |
| Tang, 2021 ¹⁹ | Cannulated screw | 45 | 54.8±11.7 | 0.44 [†] | Type I: 0.0% (0/45) Type II: 11.1% (5/45) Type III: 68.9% (31/45) Type IV: 20.0% (9/45) | 0.762 [‡] | Range: 14-24 | -- |
| | FNS (DePuy Synthes) | 47 | 57.4±15 | | Type I: 0.0% (0/47) Type II: 12.8% (6/47) Type III: 61.7% (29/47) Type IV: 25.5% (12/47) | | | |
| Vazquez, 2021 ²⁰ | Cannulated screw | 32 | 85±6.6 (79.8-90) | 0.48 [#] | Type I: 85.7% (54/63) Type II: 14.3% (9/63) | -- | Range: 30 days-6 months | -- |
| | Dynamic or Sliding hip screw | 16 | 83.4±7.3 81 (77.8-88.8) | | | | | |
| | FNS (DePuy Synthes) | 15 | 86.1±4.6 87 (85-88.5) | | | | | |
| Zhang, 2022 ²² | Cannulated screw | 36 | 52.5±10.72 | 0.065 [†] | Type I: 0.0% (0/36) Type II: 33.33% (12/36) Type III: 38.89% (14/36) Type IV: 27.78% (10/36) | 0.689 [‡] | 6 | -- |

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|------------------------------|------------------------------|-----|-------------|--------------------|---|--------------------|------------------------------------|-------------------|
| | FNS (DePuy Synthes) | 33 | 57.61±11.87 | | Type I: 0.00% (0/33) Type II: 30.30% (10/33) Type III: 27.27% (9/33) Type IV: 42.42% (14/33) | | | |
| Zhou, 2021 ²³ | Cannulated screw | 51 | 53.14±7.19 | >0.05 [†] | -- | -- | Range: 10-22 | -- |
| | FNS (DePuy Synthes) | 30 | 54.53±6.71 | | -- | | | |
| Niemann, 2022 ¹⁶ | Dynamic or Sliding hip screw | 19 | 60.47±17 | 0.34 [¶] | Type I: 10.5% (2/19) Type II: 47.4% (9/19) Type III: 21.1% (4/19) Type IV: 21.1% (4/19) | 0.45 [§] | 7.35±3.43 (95% CI: 5.59-9.12) days | 0.94 [¶] |
| | FNS (DePuy Synthes) | 12 | 66.5±10.98 | | Type I: 8.3% (1/12) Type II: 66.7% (8/12) Type III: 16.7% (2/12) Type IV: 8.3% (1/12) | | | |
| Schuetze, 2022 ¹⁷ | Dynamic or Sliding hip screw | 108 | 68.5±15.1 | >0.05 [¶] | Type I: 20.4% (22/108) Type II: 45.4% (49/108) Type III: 26.9% | 0.617 [‡] | 13 | -- |

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|--------------------------------|------------------------------|-----|-----------|--------------------|---|--------------------|-----------------------------|---------------------|
| | | | | | (29/108) Type IV: 7.4% (8/108) | | | |
| | FNS (DePuy Synthes) | 113 | 70.6±14.9 | | Type I: 14.2% (16/113) Type II: 49.6% (56/113) Type III: 26.5% (30/113) Type IV: 9.7% (11/113) | | | |
| Xu, 2022 ²¹ | Cancellous screw | 51 | 61.6±16.4 | 0.713* * | Type I+II: 70.6% (36/51) Type III+IV: 29.4% (15/51) | 0.110 [‡] | 14 (12-16) | 0.256 ^{††} |
| | Dynamic or Sliding hip screw | 52 | 63.1±13.2 | | Type I+II: 82.7% (43/52) Type III+IV: 17.3% (9/52) | | 14.5 (12-15.75) | |
| | FNS (DePuy Synthes) | 54 | 60.7±15.2 | | Type I+II: 64.8% (35/54) Type III+IV: 35.2% (19/54) | | 12 (10-16) | |
| Cintean, 2021 ¹¹ | FNS (DePuy Synthes) | 29 | 79.57 | 0.767 [†] | Type I: 100% (29/29) | -- | Mean: 3.9 (range: 0-18) | -- |
| | Hemiarthroplasty | 34 | 80.35 | | Type I: 100% (34/34) | | Mean: 12.5 (range: 0-22) | |
| Non-comparative Studies | | | | | | | | |
| Davidson, | FNS (DePuy | 102 | 62.9±16.5 | -- | Type I-II: | -- | Mean: 7 | -- |

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| 2022 ¹² | Synthes) | | | | 73.5% (75/102) Type III-IV: 26.5% (27/102) | | (range: 3-27) | |
| Stassen, 2021 ¹⁸ | FNS (DePuy Synthes) | 34 | 63±8 | -- | Type I: 2.9% (1/34) Type II: 50.0% (17/34) Type III: 35.3% (12/34) Type IV: 11.8% (4/34) | -- | 6 | -- |

Data are expressed as mean±SD, median (IQR), or % (n) unless otherwise indicated. "--" indicates no data reported.

*Garden classification: Type I, incomplete or valgus impacted fracture; Type II, complete fracture without bone displacement; Type III, complete fracture with partial displacement of the fracture fragments; Type IV, complete fracture with total displacement of the fracture fragments.

†Independent-samples *t*-test

‡Chi-squared test of independence

¶Mann-Whitney U test

§Fisher's exact test (Type I + II vs. Type III + IV)

||Logistic regression

#Linear regression

**One-way analysis of variance

††Kruskal-Wallis test

Supplemental Table 4. Patient baseline characteristics for all studies, including those not reporting a femoral neck system

| Study | Intervention | N | Age (years) | Garden Classification* |
|----------------------------------|------------------------------|-----|--------------|--|
| <i>Randomized Control Trials</i> | | | | |
| Bartels, 2022 ¹ | Cannulated Screw | 51 | 64.1 ± 4.3 | -- |
| | Total Hip Arthroplasty | 51 | 63.4 ± 4.0 | -- |
| Chammout, 2012 ² | Cannulated Screw | 57 | 79 (66-90) | -- |
| FAITH ³ | Cancellous Screw | 551 | 72±12.3 | Grade I: 42.4% (277/536) Grade II: 17.2% (92/536) Grade III: 23.9% (128/536) Grade IV: 7.3% (39/536) |
| | Dynamic or Sliding Hip Screw | 557 | 72±12 | Grade I: 48.0% (257/535) Grade II: 18.5% (99/535) Grade III: 22.6% (121/535) Grade IV: 10.8% (58/535) |
| Griffin, 2014 ⁴ | Cannulated Screw | 123 | 83±7.7 | -- |
| | Targon FN System | 51 | 83±7.6 | -- |
| Kumar, 2015 ⁵ | Cancellous Screw | 87 | -- | Grade III: 75.86% (66/87) Grade IV: 24.13% (21/87) |
| Rahman, 2022 ⁶ | Cancellous Screw | 11 | 52.73±9.34 | -- |
| | Cannulated Screw | 11 | 52.82±17.27 | -- |
| Siavashi, 2015 ⁷ | Cannulated Screw | 28 | 28 (18-58) | -- |
| | Dynamic or Sliding Hip Screw | 30 | 30 (18-60) | -- |
| Watson, 2013 ⁸ | Cannulated Screw | 29 | 76.7 (53-93) | -- |
| | Dynamic or Sliding Hip Screw | 31 | 77.9 (53-89) | -- |
| Wei, 2020 ⁹ | Cannulated Screw | 51 | 82.59±9.33 | -- |
| Yin, 2016 ¹⁰ | Cannulated Screw | 64 | 42.44±9.12 | Grade I: 7.8% (5/64) Grade II: 54.7% (35/64) |

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|--|---|------|-------------------|---|
| | | | | Grade III: 37.5% (24/64) |
| Zhang, 2022 ¹¹ | Multiple Cannulated Screw & Plate System | 36 | 40.22±11.76 | Grade I: 0.0% (0/36) Grade II: 22.2% (8/36) Grade III: 44.4% (16/36) Grade IV: 33.3% (12/36) |
| | Cannulated Screw | 41 | 42.24±11.01 | Grade I: 0.0% (0/41) Grade II: 36.6% (15/41) Grade III: 48.8% (20/41) Grade IV: 14.6% (6/41) |
| Zhao, 2022 ¹² | Cannulated Screw | 21 | 59.48 (9.64) | Grade I: 0.0% (0/21) Grade II: 38.1% (8/21) Grade III: 61.9% (13/21) |
| | Bidirectional Pressurized Porous Tantalum Screw | 20 | 60.45 (11.33) | Grade I: 15.0% (3/20) Grade II: 35.0% (7/20) Grade III: 50.0% (10/20) |
| <i>Comparative Study</i> | | | | |
| Borris, 2018 ¹³ | Dynaloc | 22 | -- | -- |
| | Cancellous Screw | 18 | -- | -- |
| Eschler, 2014 ¹⁴ | Dynamic or Sliding Hip Screw | 25 | 67.3 | -- |
| | Targon FN System | 27 | 67.3 | -- |
| <i>Cross-sectional Study</i> | | | | |
| Ahmed, 2022 ¹⁵ | Cannulated Screw | 35 | 32.14±10.20 | -- |
| <i>Prospective Cohort Studies</i> | | | | |
| Alshameeri, 2017 ¹⁶ | Cannulated Screw | 1279 | 78.2 (74.3-82) | -- |
| | Targon FN System | 725 | 77.77 (76.6-78.7) | -- |
| Beder, 2021 ¹⁷ | Dynamic or Sliding Hip Screw | 20 | 38.50 ±11.669 | Grade I: 20.0% (4/20) Grade II: 20.0% (4/20) Grade III: 15.0% (3/20) Grade IV: 45.0% (9/20) |
| Bisaccia, 2018 ¹⁸ | Cannulated Screw | 75 | 67.8 (45-80) | Grade I: 69.3% (52/75) Grade II: 30.7% (23/75) |
| | Dynamic or Sliding | 42 | 67.8 (45-80) | Grade I: 69.0% (29/42) |

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|---------------------------------|------------------------------|------|---------------|---|
| | Hip Screw | | | Grade II: 31.0% (13/42) |
| Dong, 2019 ¹⁹ | Cancellous Screw | 30 | 55.7±7.9 | -- |
| | Cannulated Screw | 30 | 56.3±8.2 | -- |
| Duan, 2019 ²⁰ | Cannulated Screw | 23 | 62.1±4.1 | Grade I: 8.7% (2/23) Grade II: 30.4% (7/23) Grade III: 39.1% (9/23) Grade IV: 21.7% (5/23) |
| Guimarães, 2017 ²¹ | Cancellous Screw | 20 | 38.75 (18-59) | -- |
| Gupta, 2016 ²² | Cannulated Screw | 45 | 39.3 (16-60) | Grade I: 2.2% (1/45) Grade II: 4.4% (2/45) Grade III: 62.2% (28/45) Grade IV: 31.1% (14/45) |
| | Dynamic or Sliding Hip Screw | 40 | 40.7 (16-60) | Grade I: 0.0% (0/40) Grade II: 5.0% (2/40) Grade III: 57.5% (23/40) Grade IV: 37.5% (15/40) |
| Imobi Singh, 2021 ²³ | Cannulated Screw | 47 | 65 (45-85) | Grade I: 4% (2/47) Grade II: 28% (13/47) Grade III: 8% (4/47) Grade IV: 60% (28/47) |
| Lin, 2012 ²⁴ | Cannulated Screw | 41 | 47 (21-65) | Grade I: 7.3% (3/41) Grade II: 22.0% (9/41) Grade III: 43.9% (18/41) Grade IV: 26.8% (11/41) |
| Nyholm, 2018 ²⁵ | Parallel Screws | 1206 | 73 (21-102) | -- |
| Qiu, 2016 ²⁶ | Thread Needles | 32 | (35-42) | -- |
| | Cancellous Screw | 32 | (35-42) | -- |
| Ramadanov, 2020 ²⁷ | Cannulated Screw | 56 | -- | Grade I: 73.2% (41/56) Grade II: 16.1% (9/56) Grade III: 10.7% (6/56) |
| Sami, 2022 ²⁸ | Cannulated Screws | 27 | 37.33±9.84 | Grade I: 7.40% (2/27) Grade II: 3.70% (1/27) Grade III: 70.37% (19/27) |

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|-------------------------------------|------------------------------|--------------|-------------------|--|
| | | | | Grade IV: 18.52% (5/27) |
| Schwartzmann, 2014 ²⁹ | Dynamic or Sliding Hip Screw | 96 | 53±14 (18-70) | Grade I: 0.0% (0/96) Grade II: 13.5% (13/96) Grade III: 26.0% (25/96) Grade IV: 60.4% (58/96) |
| Shu, 2020 ³⁰ | Cannulated Screw | 26 | 67.2±10.2 | Grade I: 7.7% (2/26) Grade II: 26.9% (7/26) Grade III: 65.4% (17/26) |
| | Dynamic or Sliding Hip Screw | 28 | 65.8±10.3 | Grade I: 10.7% (3/28) Grade II: 21.4% (6/28) Grade III: 67.9% (19/28) |
| Viberg, 2022 ³¹ | Cannulated Cancellous Screw | 1731 | -- | -- |
| | Sliding Hip Screw | 867 | -- | -- |
| Wang, 2021 ³² | Cannulated Screw | 60 | -- | Grade I: 18.3% (11/60) Grade II: 81.7% (49/60) |
| Wani, 2014 ³³ | Cannulated Screw | 50 | 65.16 | Grade I: 0.0% (0/50) Grade II: 0.0% (0/50) Grade III: 52.0% (26/50) Grade IV: 48.0% (24/50) |
| Wong, 2022 ³⁴ | Cannulated Screw | 233 | 73.04±12.89 | Grade I/II: 83.6% (195/233) Grade III/IV: 16.3% (38/233) |
| Yu, 2013 ³⁵ | Cannulated Screw | 78 | 28 (16-38) | Grade III: 48.7% (38/78) Grade IV: 51.3% (40/78) |
| <i>Retrospective Studies</i> | | | | |
| Biber, 2014 ³⁶ | Targon FN System | 135 | 71.1±15.3 (26-95) | Grade I: 32.1% (43/134) Grade II: 34.3% (46/134) Grade III: 23.1% (31/134) Grade IV: 10.4% (14/134) |
| Bigoni, 2020 ³⁷ | Cancellous Screw | 244 (246) | 80±19 (60-99) | Grade I: 67.9% (167/246) Grade II: 32.1% (79/246) |

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|--------------------------------|------------------------------------|-------|--------------|---|
| | | hips) | | Grade III: 0.0% (0/246) Grade IV: 0.0% (0/246) |
| Biz, 2019 ³⁸ | Cannulated Screw | 259 | 81.44 ± 7.48 | Grade I: 74.5% (193/259) Grade II: 25.5% (66/259) Grade III: 0.0% (0/259) Grade IV: 0.0% (0/259) |
| Campefeldt, 2022 ³⁹ | Cannulated Screw | 58 | 58 | -- |
| Chang, 2022 ⁴⁰ | Dynamic Compression Locking System | 26 | 69.3±11.2 | Grade I: 0.0% (0/26) Grade II: 23.1% (6/26) Grade III: 76.9% (20/26) Grade IV: 0.0% (0/26) |
| | Dynamic or Sliding Hip Screw | 24 | 68.5±11.9 | Grade I: 0.0% (0/24) Grade II: 25.0% (6/24) Grade III: 75.0% (18/24) Grade IV: 0.0% (0/24) |
| Chen, 2017 ⁴¹ | Cannulated Compression Screw | 44 | 56.8±9.3 | Grade I: 0.0% (0/44) Grade II: 45.4% (20/44) Grade III: 36.4% (16/44) Grade IV: 18.2% (8/44) |
| | Dynamic Hip Screw-BLADE | 42 | 58.3±8.6 | Grade I: 0.0% (0/42) Grade II: 57.1% (24/42) Grade III: 31.0% (13/42) Grade IV: 11.9% (5/42) |
| Chen, 2020 ⁴² | Cannulated Screw | 41 | 75.1±2.7 | Grade I: 41.5% (17/41) Grade II: 58.5% (24/41) Grade III: 0.0% (0/41) Grade IV: 0 (0/41) |
| Cintean, 2021 ⁴³ | FNS (DePuy Synthes) | 29 | 79.57 | Grade I: 100% (29/29) Grade II: 0.0% (0/29) Grade III: 0.0% (0/29) Grade IV: 0.0% (0/29) |
| | Hemiarthroplasty | 34 | 80.35 | Grade I: 100% (34/34) |

| | | | | |
|------------------------------|------------------------------|-----|---------------------|--|
| | | | | Grade II: 0.0% (0/34) Grade III: 0.0% (0/34) Grade IV: 0.0% (0/34) |
| Davidson, 2022 ⁴⁴ | FNS (DePuy Synthes) | 102 | 62.9±16.5 | Grade I-II: 73.5% (75/102) Grade III-IV: 26.5% (27/102) |
| Elgeidi, 2017 ⁴⁵ | Dynamic or Sliding Hip Screw | 35 | 37 (20–50) | Grade I: 0.0% (0/35) Grade II: 0.0% (0/35) Grade III: 71.4% (25/35) Grade IV: 28.6% (10/35) |
| Elmi, 2013 ⁴⁶ | Cannulated Screw | 26 | 34.3±12.5 | Grade I: 61.5% (16/26) Grade II: 38.5% (10/26) Grade III: 0.0% (0/26) Grade IV: 0.0% (0/26) |
| Enrietti, 2020 ⁴⁷ | Cannulated Screw | 91 | 52.5 (25–69) | Grade I: 35.2% (32/91) Grade II: 12.1% (11/91) Grade III: 20.9% (19/91) Grade IV: 31.9% (29/91) |
| Galal, 2017 ⁴⁸ | Cannulated Screw | 41 | 41.5 (23-49) | Grade I: 0.0% (0/41) Grade II: 0.0% (0/41) Grade III: 58.5% (24/41) Grade IV: 41.5% (17/41) |
| Gruszka, 2017 ⁴⁹ | Targon FN System | 62 | 56.6±14.8 | Grade I: 24.2% (15/62) Grade II: 16.1% (10/62) Grade III: 35.5% (22/62) Grade IV: 24.2% (15/62) |
| Gumustas, 2018 ⁵⁰ | Cannulated Screw | 31 | 39.51±10.68 (18-60) | Grade I: 12.9% (4/31) Grade II: 25.8% (8/31) Grade III: 19.4% (6/31) Grade IV: 41.9% (13/31) |
| Han, 2022 ⁵¹ | Cannulated Screw | 384 | -- | Grade I/II: 40.6% (156/384) Grade III/IV: 59.4% |

| | | | | |
|------------------------------|--|----|--------------|--|
| | | | | (228/384) |
| He, 2019 ⁵² | Cannulated Screw | 30 | 56.2 (30-84) | Grade I: 33.3% (10/30) Grade II: 23.3% (7/30) Grade III: 36.7% (11/30) Grade IV: 6.7% (2/30) |
| He, 2021 ⁵³ | Cannulated Screw | 36 | 47.58±10.31 | Grade I: 5.6% (2/36) Grade II: 25.0% (9/36) Grade III: 55.6% (20/36) Grade IV: 13.9% (5/36) |
| | FNS (DePuy Synthes) | 33 | 50.61±10.3 | Grade I: 3.0% (1/33) Grade II: 24.2% (8/33) Grade III: 57.6% (19/33) Grade IV: 15.2% (5/33) |
| Hiranaka, 2021 ⁵⁴ | Dynamic or Sliding Hip Screw | 66 | 73.2 | -- |
| Hu, 2021 ⁵⁵ | Cannulated Screw | 24 | 50.46±9.26 | Grade I: 16.7% (4/24) Grade II: 25.0% (6/24) Grade III: 29.2% (7/24) Grade IV: 29.2% (7/24) |
| | FNS (DePuy Synthes) | 20 | 50.45±8.45 | Grade I: 0.0% (0/20) Grade II: 30.0% (6/20) Grade III: 40.0% (8/20) Grade IV: 30.0% (6/20) |
| Huang, 2020 ⁵⁶ | Cannulated Screw | 67 | 48.87±11.77 | Grade I: 28.4% (19/67) Grade II: 26.9% (18/67) Grade III: 20.9% (14/67) Grade IV: 23.9% (16/67) |
| Huang, 2022 ⁵⁷ | Multiple Cannulated Screw & Plate System | 48 | 48.73±6.38 | Grade I: 79% (38/48) Grade II: 19% (9/48) Grade III: 2% (1/48) Grade IV: 0.0% (0/48) |
| | Cannulated Screw | 54 | 48.46±7.26 | Grade I: 31% (17/54) Grade II: 43% (23/54) |

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|------------------------------|--------------------------------|-------|--------------------|--|
| | | | | Grade III: 24% (13/54) Grade IV: 2% (1/54) |
| Jettoo, 2016 ⁵⁸ | Cancellous Screw | 34870 | -- | -- |
| | Dynamic or Sliding Hip Screw | 18014 | -- | -- |
| Jin, 2022 ⁵⁹ | Percutaneous Compression Plate | 51 | 55.96 ± 14.08 | Grade I/II: 49.0% (25/51) Grade III/IV: 51.0% (26/51) |
| Ju, 2020 ⁶⁰ | Cannulated Screw | 73 | 68.22±7.07 (60-85) | Grade I: 0.0% (0/73) Grade II: 47.9% (35/73) Grade III: 32.9% (24/73) Grade IV: 19.2% (14/73) |
| Kain, 2014 ⁶¹ | Cannulated Screw | 120 | 80 (65-100) | -- |
| Kalsbeek, 2018 ⁶² | Dynamic or Sliding Hip Screw | 106 | 52 (23-60) | -- |
| Kang, 2016 ⁶³ | Cannulated Screw | 84 | 55.8 (16-88) | -- |
| Khoo, 2014 ⁶⁴ | Cannulated Screw | 53 | 42.1 (6-91) | -- |
| Kilian, 2018 ⁶⁵ | Targon FN System | 82 | 71.6 (30-90) | Grade I: 20.7% (17/82) Grade II: 30.5% (25/82) Grade III: 20.7% (17/82) Grade IV: 28.0% (23/82) |
| Kim, 2014 ⁶⁶ | Cannulated Screw | 60 | 77.5 (65-96) | Grade I: 48.3% (28/58) Grade II: 51.7% (30/58) Grade III: 0.0% (0/58) Grade IV: 0.0% (0/58) |
| Kim, 2015 ⁶⁷ | Cannulated Screw | 52 | 44.3 (24-60) | Grade I: 11.5% (6/52) Grade II: 25.0% (13/52) Grade III: 57.7% (30/52) Grade IV: 5.8% (3/52) |
| Kosola, 2017 ⁶⁸ | Cannulated Screw | 12 | 54 (29-74) | -- |
| | Dynamic or Sliding Hip Screw | 24 | 61 (46-79) | -- |
| Lin, 2022 ⁶⁹ | Multiple Cannulated | 27 | 34.7 | Grade I: 0.0% (0/27) |

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|---------------------------------|------------------------------|-----|-------------|--|
| | Screw & Plate System | | | Grade II: 0.0% (0/27) Grade III: 66.7% (18/27) Grade IV: 33.3% (9/27) |
| Ma, 2022 ⁷⁰ | Cannulated Screw | 47 | 40.28±12.64 | Grade I: 0.0% (0/47) Grade II: 0.0% (0/47) Grade III: 59.6% (28/47) Grade IV: 40.4% (19/47) |
| Makki, 2013 ⁷¹ | Dynamic or Sliding Hip Screw | 31 | 75 (46-92) | -- |
| Manohara, 2014 ⁷² | Cancellous Screw | 100 | 78 (61-94) | Grade I: 85.0% (85/100) Grade II: 15.0% (15/100) Grade III: 0.0% (0/100) Grade IV: 0.0% (0/100) |
| Mubark, 2021 ⁷³ | Cannulated Screw | 56 | 39.1 | -- |
| Mue, 2013 ⁷⁴ | Dynamic or Sliding Hip Screw | 43 | 65±15 | -- |
| Mukka, 2020 ⁷⁵ | Cannulated Screw | 65 | 83 (61-98) | -- |
| Nibe, 2021 ⁷⁶ | Cannulated Screw | 27 | 77.8±7.3 | -- |
| | FNS (DePuy Synthes) | 25 | 81.2±7.9 | -- |
| Niemann, 2022 ⁷⁷ | Dynamic or Sliding Hip Screw | 19 | 60.47±17 | Grade I: 10.5% (2/19) Grade II: 47.4% (9/19) Grade III: 21.2% (4/19) Grade IV: 21.1% (4/19) |
| | FNS (DePuy Synthes) | 12 | 66.5±10.98 | Grade I: 8.3% (1/12) Grade II: 66.7% (8/12) Grade III: 16.7% (2/12) Grade IV: 8.3% (1/12) |
| Osarumwense, 2015 ⁷⁸ | Targon FN System | 51 | 66 (24-94) | -- |
| Parker, 2013 ⁷⁹ | Targon FN System | 320 | -- | -- |
| Patterson, 2020 ⁸⁰ | Cannulated Screw | 234 | 44.55 | -- |
| Qiu, 2022 ⁸¹ | Cannulated Screw | 190 | 49.96±12.02 | Grade II: 16.3% (31/190) Grade III: 31.6% (60/190) |

| | | | | |
|----------------------------------|------------------------------|------|-------------------|---|
| | | | | Grade IV: 52.1% (99/190) |
| Riaz, 2016 ⁸² | Cannulated Screw | 251 | 77 (60-101) | Grade I: 57.8% (145/251) Grade II: 42.2% (106/251) Grade III: 0.0% (0/251) Grade IV: 0.0% (0/251) |
| Schuetze, 2022 ⁸³ | Dynamic or Sliding hip screw | 108 | 68.5±15.1 | Grade I: 20.4% (22/108) Grade II: 45.4% (49/108) Grade III: 26.9% (29/108) Grade IV: 7.4% (8/108) |
| | FNS (DePuy Synthes) | 113 | 70.6±14.9 | Grade I: 14.2% (16/113) Grade II: 49.6% (56/113) Grade III: 26.5% (30/113) Grade IV: 9.7% (11/113) |
| Schwartzmann, 2018 ⁸⁴ | Dynamic or Sliding Hip Screw | 53 | 41.9±12.8 (18-55) | Grade I: 0.0% (0/53) Grade II: 0.0% (0/53) Grade III: 39.6% (21/53) Grade IV: 60.4% (32/53) |
| Shields, 2014 ⁸⁵ | Cannulated Screw | 119 | 85.1±7.7 | -- |
| Sjöholm, 2021 ⁸⁶ | Cannulated Screw | 1505 | 81±9 (60-108) | -- |
| Stassen, 2021 ⁸⁷ | FNS (DePuy Synthes) | 34 | 63±8 | Grade I: 2.9% (1/34) Grade II: 50.0% (17/34) Grade III: 35.3% (12/34) Grade IV: 11.8% (4/34) |
| Sundkvist, 2022 ⁸⁸ | Cannulated Screw | 93 | 82 | -- |
| Takigawa, 2016 ⁸⁹ | Targon FN System | 84 | 74 (36-100) | -- |
| Tang, 2021 ⁹⁰ | Cannulated Screw | 45 | 54.8±11.7 | Grade I: 0.0% (0/45) Grade II: 11.1% (5/45) Grade III: 68.9% (31/45) Grade IV: 20.0% (9/45) |
| | FNS (DePuy Synthes) | 47 | 57.4±15 | Grade I: 0.0% (0/47) Grade II: 12.8% (6/47) Grade III: 61.7% (29/47) Grade IV: 25.5% (12/47) |

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|-----------------------------|--|-----|----------------------------|---|
| Vazquez, 2021 ⁹¹ | Cannulated Screw | 32 | 85±6.6 (79.8-90) | -- |
| | Dynamic or Sliding hip Screw | 16 | 83.4±7.3 81 (77.8-88.8) | -- |
| | FNS (DePuy Synthes) | 15 | 86.1±4.6 87 (85-88.5) | -- |
| Wan, 2021 ⁹² | Cannulated Screw | 21 | 51.33±4.3 (29-67) | Grade I: 0.0% (0/21) Grade II: 19.0% (4/21) Grade III: 57.1% (12/21) Grade IV: 23.8% (5/21) |
| Wang, 2014 ⁹³ | Cannulated Screw | 146 | 47.5 (18-68) | Grade I: 6.8% (10/146) Grade II: 31.5% (46/146) Grade III: 42.5% (62/146) Grade IV: 19.2% (28/146) |
| Wang, 2015 ⁹⁴ | Cannulated Screw | 209 | 47.08±9.93 | -- |
| Wang, 2018 ⁹⁵ | Cancellous Screw | 34 | 46.02±6.23 | Grade I: 0.0% (0/34) Grade II: 0.0% (0/34) Grade III: 61.8% (21/34) Grade IV: 38.2% (13/34) |
| | Multiple Cancellous Screw & Plate System | 34 | 45.12±5.38 | Grade I: 0.0% (0/34) Grade II: 0.0% (0/34) Grade III: 67.6% (23/34) Grade IV: 32.4% (11/34) |
| Wang, 2019 ⁹⁶ | Cannulated Screw | 65 | 49.8±7.68 | Grade I: 21.5% (14/65) Grade II: 55.4% (36/65) Grade III: 15.4% (10/65) Grade IV: 7.7% (5/65) |
| Wang, 2022 ⁹⁷ | Cannulated Screw | 153 | 10.6±3.7 | -- |
| Wenbo, 2014a ⁹⁸ | Dynamic Hip System Blade | 60 | 66.8±3.2 | Grade II: 11.7% (7/60) Grade III: 76.7% (46/60) Grade IV: 11.7% (7/60) |
| Wenbo, 2014b ⁹⁹ | Dynamic or Sliding Hip Screw | 42 | 68.5 (60-75) | Grade II: 45.2% (19/42) Grade III: 50.0% (21/42) Grade IV: 4.8% (2/42) |

| | | | | |
|--------------------------------|---|-----|-------------------|---|
| Xiao, 2018 ¹⁰⁰ | Dynamic or Sliding Hip Screw | 36 | 65.33±9.3 (53-82) | Grade I: 0.0% (0/36) Grade II: 25.0% (9/36) Grade III: 75% (27/36) Grade IV: 0.0% (0/36) |
| Xu, 2022a ¹⁰¹ | Cancellous Screw | 51 | 61.6±16.4 | Grade I+II: 70.6% (36/51) Grade III+IV: 29.4% (15/51) |
| | Dynamic or Sliding Hip Screw | 52 | 63.1±13.2 | Grade I+II: 82.7% (43/52) Grade III+IV: 17.3% (9/52) |
| | FNS (DePuy Synthes) | 54 | 60.7±15.2 | Grade I+II: 64.8% (35/54) Grade III+IV: 35.2% (19/54) |
| Xu, 2022b ¹⁰² | Sliding Fixation (Three Cannulated Screws) | 60 | 60.9±16.8 | Grade I+II: 73.3% (44/60) Grade III+IV: 26.7% (16/60) |
| | Non-sliding Fixation (Four Cannulated Screws) | 42 | 60.9±18.4 | Grade I+II: 47.6% (20/42) Grade III+IV: 52.4% (22/42) |
| Yang, 2022 ¹⁰³ | Parallel Cannulated Screws | 10 | 67 (61-70) | Grade II: 40.0% (4/10) Grade III: 60.0% (6/10) |
| Ye, 2017 ¹⁰⁴ | Cannulated Screw | 28 | 42.1 (29-57) | -- |
| Yoon, 2021 ¹⁰⁵ | Multiple Cannulated Screws | 6 | -- | -- |
| | Dynamic or Sliding Hip Screw | 2 | -- | -- |
| Yoshikawa, 2022 ¹⁰⁶ | Sliding Hip Screw (TresLock) | 10 | 83.9±5.9 | -- |
| Yuan, 2022 ¹⁰⁷ | Cannulated Screw | 113 | 48.4±13.4 | -- |
| Zhang, 2022 ¹⁰⁸ | Cannulated Screw | 36 | 52.5±10.72 | Grade I: 0.0% (0/36) Grade II: 33.33% (12/36) Grade III: 38.89% (14/36) Grade IV: 27.78% (10/36) |

| | | | | |
|-----------------------------|------------------------------|-----|------------------|--|
| | FNS (DePuy Synthes) | 33 | 57.61±11.87 | Grade I: 0.0% (0/33) Grade II: 30.30% (10/33) Grade III: 27.27% (9/33) Grade IV: 42.42% (14/33) |
| Zhao, 2014a ¹⁰⁹ | Dynamic or Sliding Hip Screw | 42 | 68.5 (60-75) | Grade I: 0.0% (0/42) Grade II: 45.2% (19/42) Grade III: 50.0% (21/42) Grade IV: 4.8% (2/42) |
| Zhao, 2014b ¹¹⁰ | Dynamic or Sliding Hip Screw | 60 | 66.8±3.2 | Grade I: 0.0% (0/60) Grade II: 11.7% (7/60) Grade III: 76.7% (46/60) Grade IV: 11.7% (7/60) |
| Zhao, 2021 ¹¹¹ | Cancellous Screw | 122 | 40.79±19.63 | Grade I: 20.5% (25/122) Grade II: 11.5% (14/122) Grade III: 36.9% (45/122) Grade IV: 31.1% (38/122) |
| Zhou, 2021 ¹¹² | Cannulated Screw | 51 | 53.14±7.19 | -- |
| | FNS (DePuy Synthes) | 30 | 54.53±6.71 | -- |
| Zhu, 2021 ¹¹³ | Cannulated Screw | 83 | 47.7±12.6 | Grade I: 19.3% (16/83) Grade II: 12.0% (10/83) Grade III: 39.8% (33/83) Grade IV: 28.9% (24/83) |
| Zhu, 2022a ¹¹⁴ | Dynamic or Sliding Hip Screw | 68 | 49.67±11.20 | Grade I: 0.0% (0/68) Grade II: 0.0% (0/68) Grade III: 76.5% (52/68) Grade IV: 23.5% (16/68) |
| Zhu, 2022b ¹¹⁵ | Cannulated Screw | 91 | 72.37±7.16 | Grade I: 17.6% (16/91) Grade II: 82.4% (75/91) Grade III: 0.0% (0/91) Grade IV: 0.0% (0/91) |
| Zhuang, 2019 ¹¹⁶ | Cannulated Screw | 26 | 36.5±6.5 (19-44) | Grade I: 0.0% (0/26) Grade II: 0.0% (0/26) Grade III: 46.2% (12/26) |

| | | | | |
|------------------------------|------------------------------|----|------------|-------------------------|
| | | | | Grade IV: 53.8% (14/26) |
| <i>Case Series</i> | | | | |
| Faisham, 2021 ¹¹⁷ | Dynamic or Sliding Hip Screw | 10 | 22 (15-37) | -- |

Data are expressed as mean±SD, median (IQR), or % (n/N) unless otherwise indicated. "--" indicates no data reported.

*Garden classification: Grade I, incomplete or valgus impacted fracture; Grade II, complete fracture without bone displacement; Grade III, complete fracture with partial displacement of the fracture fragments; Grade IV, complete fracture with total displacement of the fracture fragments.

FN, femoral neck; FNS, femoral neck system; DePuy Synthes, Johnson & Johnson.

Supplemental Table 5. Procedure characteristics

| Study | Intervention | N | Length of Operation (minutes) | Intraoperative Blood Loss (mL) | Length of Hospital Stay (days) |
|----------------------------------|------------------------------|----------|--------------------------------------|---------------------------------------|---------------------------------------|
| <i>Randomized Control Trials</i> | | | | | |
| Bartels, 2022 ¹ | Cannulated Screw | 51 | 43.3 ± 28.5 | 119.6 ± 144.4 | -- |
| | Total Hip Arthroplasty | 51 | 107.4 ± 22.9 | 418.8 ± 208.1 | -- |
| Chammout, 2012 ² | Cannulated Screw | 57 | -- | -- | -- |
| FAITH ³ | Cancellous Screw | 551 | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 557 | -- | -- | -- |
| Griffin, 2014 ⁴ | Cannulated Screw | 123 | -- | -- | 22±-- |
| | Targon FN System | 51 | -- | -- | 18±-- |
| Kumar, 2015 ⁵ | Cancellous Screw | 87 | -- | -- | -- |
| Rahman, 2022 ⁶ | Cancellous Screw | 11 | -- | -- | -- |
| | Cannulated Screw | 11 | -- | -- | -- |
| Siavashi, 2015 ⁷ | Cannulated Screw | 28 | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 30 | -- | -- | -- |
| Watson, 2013 ⁸ | Cannulated Screw | 29 | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 31 | -- | -- | -- |

| | | | | | |
|--|---|------|-------------|--------------|------------|
| Wei, 2020 ⁹ | Cannulated Screw | 51 | 23.1±12.2 | 32.2±13.1 | 8.8±8.5 |
| Yin, 2016 ¹⁰ | Cannulated Screw | 64 | -- | -- | -- |
| Zhang, 2022 ¹⁰⁸ | Multiple Cannulated Screw & Plate System | 36 | 53.05±12.77 | 36.66±9.56 | -- |
| | Cannulated Screw | 41 | 47.78±10.04 | 13.29±7.12 | -- |
| Zhao, 2022 ¹² | Cannulated Screw | 21 | 63.38±5.17 | 140.50±31.38 | 11.95±1.72 |
| | Bidirectional Pressurized Porous Tantalum Screw | 20 | 64.40±4.29 | 147.30±32.63 | 12.25±1.37 |
| <i>Comparative Study</i> | | | | | |
| Borris, 2018 ¹³ | Dynaloc | 22 | -- | -- | -- |
| | Cancellous Screw | 18 | -- | -- | -- |
| Eschler, 2014 ¹⁴ | Dynamic or Sliding Hip Screw | 25 | 55.5±23.2 | -- | 9.8±2.9 |
| | Targon FN system | 27 | 56±17.4 | -- | 13.6±4.9 |
| <i>Cross-sectional Study</i> | | | | | |
| Ahmed, 2022 ¹⁵ | Cannulated Screw | 35 | 71.43±7.92 | -- | -- |
| <i>Prospective Cohort Studies</i> | | | | | |
| Alshameeri, 2017 ¹⁶ | Cannulated Screw | 1279 | 33.7±-- | -- | 15.5±-- |
| | Targon FN System | 725 | 47.1±-- | -- | 13.3±-- |
| Beder, 2021 ¹⁷ | Dynamic or Sliding Hip Screw | 20 | -- | -- | -- |
| Bisaccia, 2018 ¹⁸ | Cannulated Screw | 75 | 33±-- | 156±-- | -- |
| | Dynamic or Sliding Hip Screw | 42 | 67±-- | 210±-- | -- |

| | | | | | |
|----------------------------------|------------------------------|------|-----------|-----------|---------|
| Dong, 2019 ¹⁹ | Cancellous Screw | 30 | 46.2±20.9 | 68.6±25.3 | 7.1±2.3 |
| | Cannulated Screw | 30 | 40.9±18.3 | 62.4±32.5 | 7.3±1.4 |
| Duan, 2019 ²⁰ | Cannulated Screw | 23 | 79±9.8 | 41.3±12.4 | -- |
| Guimarães, 2017 ²¹ | Cancellous Screw | 20 | -- | -- | -- |
| Gupta, 2016 ²² | Cannulated Screw | 45 | 61.6±-- | 67.4±-- | -- |
| | Dynamic or Sliding Hip Screw | 40 | 111±-- | 200±-- | -- |
| Imobi Singh, 2021 ²³ | Cannulated Screw | 47 | 92±15.62 | -- | 10±2 |
| Lin, 2012 ²⁴ | Cannulated Screw | 41 | 63.6±-- | 84.2±-- | -- |
| Nyholm, 2018 ²⁵ | Parallel Screws | 1206 | -- | -- | -- |
| Qiu, 2016 ²⁶ | Thread Needles | 32 | 421.3±2.7 | 453.6±2.7 | -- |
| | Cancellous Screw | 32 | 328.5±1.4 | 236.7±2.0 | -- |
| Ramadanov, 2020 ²⁷ | Cannulated Screw | 56 | -- | -- | -- |
| Sami, 2022 ²⁸ | Cannulated Screws | 27 | -- | -- | -- |
| Schwartzmann, 2014 ²⁹ | Dynamic or Sliding Hip Screw | 96 | -- | -- | 9±-- |
| Shu, 2020 ³⁰ | Cannulated Screw | 26 | 59±11.4 | 56.2±9.2 | -- |
| | Dynamic or Sliding hip Screw | 28 | 58.7±9.0 | 56.8±9.5 | -- |
| Viberg, 2022 ³¹ | Cannulated Cancellous Screw | 1731 | -- | -- | -- |
| | Sliding Hip Screw | 867 | -- | -- | -- |
| Wang, 2021 ³² | Cannulated Screw | 60 | -- | -- | -- |

| | | | | | |
|-------------------------------------|------------------------------------|-----|-----------|-----------|----------|
| Wani, 2014 ³³ | Cannulated Screw | 50 | 45±-- | 700±-- | 4.8±-- |
| Wong, 2022 ³⁴ | Cannulated Screw | 233 | 41.1±11.2 | -- | 9.1±5.7 |
| Yu, 2013 ³⁵ | Cannulated Screw | 78 | -- | -- | -- |
| <i>Retrospective Studies</i> | | | | | |
| Biber, 2014 ³⁶ | Targon FN system | 135 | 60.4±-- | -- | 10±-- |
| Bigoni, 2020 ³⁷ | Cancellous Screw | 244 | -- | -- | -- |
| Biz, 2019 ³⁸ | Cannulated Screw | 259 | -- | -- | -- |
| Campenfeldt, 2022 ³⁹ | Cannulated Screw | 58 | 58 | -- | |
| Chang, 2022 ⁴⁰ | Dynamic Compression Locking System | 26 | 59.7±9.2 | 51.1±7.4 | 15.3±4.2 |
| | Dynamic or Sliding Hip Screw | 24 | 78.3±10.1 | 66.4±18.0 | 15.0±4.2 |
| Chen, 2017 ⁴¹ | Dynamic Compression Locking System | 44 | 47.2±18.6 | 32.4±24.7 | 5.6±2.8 |
| | Dynamic Hip Screw | 42 | 43.4±20.3 | 87.2±46.6 | 6.1±2.2 |
| Chen, 2020 ⁴² | Cannulated Screw | 41 | 31.6±6.9 | 40.5±15.7 | 9.3±1.1 |
| Cintean, 2021 ⁴³ | FNS (DePuy Synthes) | 29 | -- | -- | 9.8±3.8 |
| | Hemiarthroplasty | 34 | -- | -- | 15.1±5.1 |
| Davidson, 2022 ⁴⁴ | FNS (DePuy Synthes) | 102 | 44±14 | 51±47 | 5.7±3.9 |
| Elgeidi, 2017 ⁴⁵ | Dynamic or Sliding Hip Screw | 35 | 90–120 | -- | -- |
| Elmi, 2013 ⁴⁶ | Cannulated Screw | 26 | -- | -- | -- |
| Enrietti, 2020 ⁴⁷ | Cannulated Screw | 91 | -- | -- | -- |

| | | | | | |
|------------------------------|--|-------|-------------|--------------|-----------|
| Galal, 2017 ⁴⁸ | Cannulated Screw | 41 | 45±-- | -- | -- |
| Gruszka, 2017 ⁴⁹ | Targon FN System | 62 | 96±-- | -- | 9.2±4.8 |
| Gumustas, 2018 ⁵⁰ | Cannulated Screw | 31 | -- | -- | -- |
| Han, 2022 ⁵¹ | Cannulated Screw | 384 | 48.27±-- | 88.8±-- | 5.67±-- |
| He, 2019 ⁵² | Cannulated Screw | 30 | 38±-- | -- | -- |
| He, 2021 ⁵³ | Cannulated Screw | 36 | 56.1±12.5 | -- | 4.8±1.6 |
| | FNS (DePuy Synthes) | 33 | 49.9±14.5 | -- | 5.1±1.9 |
| Hiranaka, 2021 ⁵⁴ | Dynamic or Sliding Hip Screw | 66 | -- | -- | -- |
| Hu, 2021 ⁵⁵ | Cannulated Screw | 24 | 64.6±18.6 | 23.7±28.1 | -- |
| | FNS (DePuy Synthes) | 20 | 79.8±26.4 | 69.5±50.5 | -- |
| Huang, 2020 ⁵⁶ | Cannulated Screw | 67 | 38.3±-- | -- | -- |
| Huang, 2022 ⁵⁷ | Multiple Cannulated Screw & Plate System | 48 | 75.35±27.67 | 153.45±64.27 | 6.23±2.38 |
| | Cannulated Screw | 54 | 36.87±15.39 | 21.86±18.19 | 5.16±1.45 |
| Jattoo, 2016 ⁵⁸ | Cancellous Screw | 34870 | -- | -- | 15±19 |
| | Dynamic or Sliding Hip Screw | 18014 | -- | -- | 13±18 |
| Jin, 2022 ⁵⁹ | Percutaneous Compression Plate | 51 | 109.6±62.6 | -- | 13.1±4.0 |
| Ju, 2020 ⁶⁰ | Cannulated Screw | 73 | 60±10.2 | 15±-- | -- |

| | | | | | |
|------------------------------|--|-----|--------------|-------------|---------|
| Kain, 2014 ⁶¹ | Cannulated SScrew | 120 | -- | -- | -- |
| Kalsbeek, 2018 ⁶² | Dynamic or Sliding Hip Screw | 106 | 44±-- | -- | -- |
| Kang, 2016 ⁶³ | Cannulated Screw | 84 | -- | -- | -- |
| Khoo, 2014 ⁶⁴ | Cannulated Screw | 53 | -- | -- | -- |
| Kilian, 2018 ⁶⁵ | Targon FN System | 82 | 55.8±16.8 | -- | -- |
| Kim, 2014 ⁶⁶ | Cannulated Screw | 60 | 46±-- | -- | 14.7±-- |
| Kim, 2015 ⁶⁷ | Cannulated Screw | 52 | -- | -- | -- |
| Kosola, 2017 ⁶⁸ | Cannulated Screw | 12 | -- | -- | -- |
| | Dynamic or Sliding hip Screw | 24 | -- | -- | -- |
| Lin, 2022 ⁶⁹ | Multiple Cannulated Screw & Plate System | 27 | 89.4 | 134.4 | -- |
| Ma, 2022 ⁷⁰ | Cannulated Screw | 47 | 52.17± 11.57 | 51.81±19.21 | -- |
| Makki, 2013 ⁷¹ | Dynamic or Sliding Hip Screw | 31 | 44.5 | -- | -- |
| Manohara, 2014 ⁷² | Cancellous Screw | 100 | 53±-- | -- | 12±-- |
| Mubark, 2021 ⁷³ | Cannulated Screw | 56 | 54±-- | 98.1±-- | -- |
| Mue, 2013 ⁷⁴ | Dynamic or Sliding Hip Screw | 43 | 109±29 | 341±122 | 15±4 |
| Mukka, 2020 ⁷⁵ | Cannulated Screw | 65 | -- | -- | -- |
| Nibe, 2021 ⁷⁶ | Cannulated Screw | 27 | 53±21 | 41±40 | -- |

| | | | | | |
|----------------------------------|------------------------------|------|------------------------------|------------------------------|-----------|
| | FNS (DePuy Synthes) | 25 | 42±13 | 36±25 | -- |
| Niemann, 2022 ⁷⁷ | Dynamic or Sliding Hip Screw | 19 | 91.68±23.96 | -- | 7.35±3.43 |
| | FNS (DePuy Synthes) | 12 | 54±26.1 | -- | 8±5.27 |
| Osarumwense, 2015 ⁷⁸ | Targon FN System | 51 | 67±-- | -- | -- |
| Parker, 2013 ⁷⁹ | Targon FN System | 320 | 48±-- | -- | 13±-- |
| Patterson, 2020 ⁸⁰ | Cannulated Screw | 234 | -- | -- | -- |
| Qiu, 2022 ⁸¹ | Cannulated Screw | 190 | -- | -- | -- |
| Riaz, 2016 ⁸² | Cannulated Screw | 251 | -- | -- | -- |
| Schuetze, 2022 ⁸³ | Dynamic or Sliding hip screw | 108 | 54.7±17.4 | -- | 11.3±6.8 |
| | FNS (DePuy Synthes) | 113 | 36.3±11.6 | -- | 8.9±4.3 |
| Schwartzmann, 2018 ⁸⁴ | Dynamic or Sliding Hip Screw | 53 | -- | -- | -- |
| Shields, 2014 ⁸⁵ | Cannulated Screw | 119 | -- | -- | 3.8±3.2 |
| Sjöholm, 2021 ⁸⁶ | Cannulated Screw | 1505 | -- | -- | -- |
| Stassen, 2021 ⁸⁷ | FNS (DePuy Synthes) | 34 | Mean: 33 (95% CI: 29.3-36.9) | Mean: 34 (95% CI: 24.7-44.6) | 4±2.8 |
| Sundkvist, 2022 ⁸⁸ | Cannulated Screw | 93 | -- | -- | -- |
| Takigawa, 2016 ⁸⁹ | Targon FN System | 84 | 44.6±-- | -- | -- |
| Tang, 2021 ⁹⁰ | Cannulated Screw | 45 | 42±11.9 | 47.3±9.3 | 4.8±1.4 |

| | | | | | |
|-----------------------------|--|-----|---------------|------------|-------------|
| | FNS(DePuy Synthes) | 47 | 52.4±11.0 | 50.6±10.6 | 5.5±1.3 |
| Vazquez, 2021 ⁹¹ | Cannulated Screw | 32 | 66.9±25.4 | -- | 12.2±6.2 |
| | Dynamic or Sliding Hip Screw | 16 | 70.7±20.0 | -- | 12.4±5.3 |
| | FNS (DePuy Synthes) | 15 | 43.3±10.1 | -- | 10.3±6.0 |
| Wan, 2021 ⁹² | Cannulated Screw | 21 | 88.3±14.3 | 76.9±8.3 | -- |
| Wang, 2014 ⁹³ | Cannulated Screw | 146 | -- | -- | -- |
| Wang, 2015 ⁹⁴ | Cannulated Screw | 209 | -- | -- | -- |
| Wang, 2018 ⁹⁵ | Cancellous Screw | 34 | -- | -- | -- |
| | Multiple Cancellous Screw & Plate System | 34 | -- | -- | -- |
| Wang, 2019 ⁹⁶ | Cannulated Screw | 65 | 73.7±9.8 | 25.5±7.0 | -- |
| Wang, 2022 ⁹⁷ | Cannulated Screw | 153 | -- | -- | -- |
| Wenbo, 2014a ⁹⁸ | Dynamic Hip System Blade | 60 | -- | -- | -- |
| Wenbo, 2014b ⁹⁹ | Dynamic or Sliding Hip Screw | 42 | 55 (50-70) | 60 (55-80) | 11.2 (7-21) |
| Xiao, 2018 ¹⁰⁰ | Dynamic or Sliding Hip Screw | 36 | 50.3±11.8 | 61.7±12.3 | 15.3±3.7 |
| Xu, 2022a ¹⁰¹ | Cancellous Screw | 51 | 49 (38-61) | 30 (20-45) | 3 (2-4) |
| | Dynamic or Sliding Hip Screw | 52 | 72 (55-88.75) | 50 (30-50) | 3.5 (3-6) |

| | | | | | |
|--------------------------------|---|-----|----------------|--------------|-----------|
| | FNS (DePuy Synthes) | 54 | 45 (40-59) | 30 (20-50) | 2 (2-4) |
| Xu, 2022b ¹⁰² | Sliding Fixation (Three Cannulated Screws) | 60 | 46 (33-61) | 27.5 (20-30) | 3 (2-4) |
| | Non-sliding Fixation (Four Cannulated Screws) | 42 | 43 (38.8-60.8) | 30 (20-30) | 2 (2-3.3) |
| Yang, 2022 ¹⁰³ | Parallel Cannulated Screws | 10 | 32 (25-51) | -- | -- |
| Ye, 2017 ¹⁰⁴ | Cannulated Screw | 28 | 71.4±-- | 270±-- | -- |
| Yoon, 2021 ¹⁰⁵ | Multiple Cannulated Screws | 6 | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 2 | -- | -- | -- |
| Yoshikawa, 2022 ¹⁰⁶ | Sliding Hip Screw (TresLock) | 10 | -- | -- | -- |
| Yuan, 2022 ¹⁰⁷ | Cannulated Screw | 113 | -- | -- | -- |
| Zhang, 2022 ¹⁰⁸ | Cannulated Screw | 36 | 76.81±13.1 | -- | 8.5±1.95 |
| | FNS (DePuy Synthes) | 33 | 60.00±12.44 | -- | 7.57±2.39 |
| Zhao, 2014a ¹⁰⁹ | Dynamic or Sliding Hip Screw | 42 | 55±-- | 60±-- | 11.2±-- |
| Zhao, 2014b ¹¹⁰ | Dynamic or Sliding Hip Screw | 60 | -- | -- | -- |
| Zhao, 2021 ¹¹¹ | Cancellous Screw | 122 | -- | -- | |
| Zhou, 2021 ¹¹² | Cannulated Screw | 51 | 40.9±5.2 | 30.3±9.0 | 5.3±1.5 |
| | FNS (DePuy Synthes) | 30 | 42.8±4.7 | 99.7±4.7 | 5.1±1.3 |

| | | | | | |
|------------------------------|------------------------------|----|--------------|-------------|------------|
| Zhu, 2021 ¹¹³ | Cannulated Screw | 83 | 44.1±14.8 | 51.6±40.4 | 11.1±3.4 |
| Zhu, 2022a ¹¹⁴ | Dynamic or Sliding Hip Screw | 68 | 131.25±32.72 | -- | -- |
| Zhu, 2022b ¹¹⁵ | Cannulated Screw | 91 | 83.85±27.24 | 68.68±28.18 | 10.53±5.02 |
| Zhuang, 2019 ¹¹⁶ | Cannulated Screw | 26 | 100±20.5 | 205±45.8 | -- |
| <i>Case Series</i> | | | | | |
| Faisham, 2021 ¹¹⁷ | Dynamic or Sliding Hip Screw | 10 | -- | -- | -- |

Data are expressed as mean±SD unless otherwise noted.

AVN, avascular necrosis of the femoral head; DVT, deep vein thrombosis; FN, femoral neck; FNS, femoral neck system; DePuy Synthes, Johnson & Johnson.

Supplemental Table 6. Patient outcomes

| Study | Intervention | N | Perioperative Complications | Postoperative Complications | Non-union | Internal Fixture Loosening | Reoperation | Mortality |
|----------------------------------|------------------------------|-----|-----------------------------|---|---------------|----------------------------|-----------------|----------------|
| <i>Randomized Control Trials</i> | | | | | | | | |
| Bartels, 2022 ¹ | Cannulated Screw | 51 | -- | DVT: 2.0% (1/51) | -- | 31.4% (16/51) | 66.7% (34/51) | -- |
| | Total Hip Arthroplasty | 51 | -- | DVT: 0% (0/51) | -- | -- | 3.9% (2/51) | -- |
| Chammout, 2012 ² | Cannulated Screw | 57 | -- | AVN: 29.8% (17/57) Surgical Site Infection: 3.5% (2/57) | 24.6% (14/57) | 1.7% (1/57) | 52.6% (30/57) | 86.0% (49/57) |
| FAITH ³ | Cancellous Screw | 551 | DVT: 1.5% (8/537) | AVN: 9.3% (50/537) Surgical Site Infection: 1.7% (9/537) | 6.1% (33/537) | 8.4% (45/537) | 21.8% (117/537) | 15.5% (83/537) |
| | Dynamic or Sliding Hip Screw | 557 | DVT: 1.1% (6/542) | AVN: 5.2% (28/542) Surgical Site Infection: 1.8% (10/542) | 6.1% (33/542) | 7.7% (42/542) | 19.7% (107/542) | 13.5% (73/542) |
| Griffin, 2014 ⁴ | Cannulated Screw | 123 | DVT: 1.6% (2/123) | AVN: 0.8% (1/123) Surgical Site Infection: 4.1% (5/123) Deep infection: 2.0% (1/51) | 1.6% (2/123) | -- | 36.4% (36/99) | 21.1% (26/123) |

| | | | | | | | | |
|-----------------------------|------------------------------|----|------------------|---|---------------|--------------|---------------|---------------|
| | Targon FN System | 51 | DVT: 2.0% (1/51) | AVN: 2.0% (1/51) Surgical Site Infection: 7.8% (4/51) | 2.0% (1/51) | -- | 31.7% (13/41) | 27.5% (14/51) |
| Kumar, 2015 ⁵ | Cancellous Screw | 87 | -- | AVN: 5.7% (5/87) | 12.6% (11/87) | -- | -- | -- |
| Rahman, 2022 ⁶ | Cancellous Screw | 11 | -- | AVN: 9.1% (1/11) Femoral Neck Shortening: 9.1% (1/11) Wound Infection: 0.0% (0/11) DVT: 0% (0/11) | 0.0% (0/11) | -- | -- | -- |
| | Cannulated Screw | 11 | -- | AVN: 0.0% (0/11) Femoral Neck Shortening: 18.2% (2/11) Wound Infection: 0.0% (0/11) DVT: 0% (0/11) | 9.1% (1/11) | -- | -- | -- |
| Siavashi, 2015 ⁷ | Cannulated Screw | 28 | -- | AVN: 10.7% (3/28) | -- | 17.9% (5/28) | 10.7% (3/28) | -- |
| | Dynamic or Sliding Hip Screw | 30 | -- | AVN: 6.7% (2/30) | -- | 0.0% (0/30) | 6.7% (2/30) | -- |
| Watson, 2013 ⁸ | Cannulated | 29 | -- | -- | 6.9% (2/29) | -- | 10.3% (3/29) | 20.7% |

| | | | | | | | | |
|----------------------------|---|----|-----------------------|---|--------------|-------------|---------------|---------------|
| | Screw | | | | | | | (6/29) |
| | Dynamic or Sliding Hip Screw | 31 | -- | AVN: 3.2% (1/31) | -- | -- | 3.2% (1/31) | 19.4% (6/31) |
| Wei, 2020 ⁹ | Cannulated Screw | 51 | DVT: 0.0% (0/51) | AVN: 3.9% (2/51) Surgical Site Infection: 0.0% (0/51) | 9.8% (5/51) | -- | 11.8% (6/51) | 51.0% (26/51) |
| Yin, 2016 ¹⁰ | Cannulated Screw | 64 | -- | -- | 0% (0/64) | -- | -- | -- |
| Zhang, 2022 ¹¹ | Multiple Cannulated Screw & Plate System | 36 | -- | AVN: 0.0% (0/36) | 2.8% (1/36) | 2.8% (1/36) | -- | -- |
| | Cannulated Screw | 41 | -- | AVN: 4.9% (2/41) | 7.3% (3/41) | 9.8% (4/41) | -- | -- |
| Zhao, 2022 ¹² | Cannulated Screw | 21 | -- | AVN: 19.1% (4/21) | 4.76% (1/21) | -- | 23.81% (5/21) | -- |
| | Bidirectional Pressurized Porous Tantalum Screw | 20 | -- | AVN: 0.0% (0/20) | 0% (0/20) | -- | -- | -- |
| Comparative Study | | | | | | | | |
| Borris, 2018 ¹³ | Dynaloc | 22 | Hematoma: 4.5% (1/22) | Wound Infection: 4.5% (1/22) Femoral Head Necrosis: 18.2% (4/22) | -- | -- | 50.0% (11/22) | 9.1% (2/22) |
| | Cancellous Screw | 18 | -- | -- | -- | -- | 50.0% (9/18) | 5.6% (1/18) |
| Eschler, | Dynamic or | 25 | -- | -- | 12.0% (3/25) | 40.0% | 32.0% (8/25) | -- |

| | | | | | | | | |
|--|------------------------------|------|------------------------------|--|-------------------|-----------------|-------------------|-----------------|
| 2014 ¹⁴ | Sliding Hip Screw | | | | | (10/25) | | |
| | Targon FNS | 27 | -- | AVN: 3.7% (1/27) Femoral Neck Shortening: 7.4% (2/27) | 3.7% (1/27) | 18.5% (5/27) | 14.8% (4/27) | -- |
| <i>Cross-sectional Study</i> | | | | | | | | |
| Ahmed, 2022 ¹⁵ | Cannulated Screw | 35 | Wound Infection: 8.6% (3/35) | AVN: 5.7% (2/35) | 2.9% (1/35) | -- | -- | -- |
| <i>Prospective Cohort Studies</i> | | | | | | | | |
| Alshameeri, 2017 ¹⁶ | Cannulated Screw | 1279 | -- | AVN: 5.6% (71/1,279) | 19.6% (251/1,279) | 0.8% (10/1,279) | 28.5% (364/1,279) | 5.5% (70/1,279) |
| | Targon FN System | 725 | -- | AVN: 7.0% (51/725) | 9.7% (70/725) | 0.6% (4/725) | 17.7% (128/725) | 2.2% (16/725) |
| Beder, 2021 ¹⁷ | Dynamic or Sliding Hip Screw | 20 | | -- | 5.0% (1/20) | -- | -- | -- |
| Bisaccia, 2018 ¹⁸ | Cannulated Screw | 75 | -- | AVN: 26.7% (20/75) | 5.3% (4/75) | -- | -- | -- |
| | Dynamic or Sliding hip Screw | 42 | -- | AVN: 28.6% (12/42) | 7.1% (3/42) | -- | -- | -- |
| Campenfeldt, 2022 ³⁹ | Cannulated Screw | 58 | -- | AVN: 6.9% (4/58) | -- | -- | 63.8% (37/58) | -- |
| Dong, 2019 ¹⁹ | Cancellous Screw | 30 | -- | AVN: 3.3% (1/30) | 6.7% (2/30) | -- | -- | -- |
| | Cannulated Screw | 30 | -- | AVN: 10.0% (3/30) | 10.0% (3/30) | 3.3% (1/30) | -- | -- |
| Duan, 2019 ²⁰ | Cannulated Screw | 23 | -- | -- | -- | -- | -- | -- |
| Guimarães, | Cancellous | 20 | -- | AVN: 10.0% | 10.0% (2/20) | -- | -- | -- |

| | | | | | | | | |
|---------------------------------|------------------------------|------|----|--|--------------|---------------|-------------------|-------------------|
| 2017 ²¹ | Screw | | | (2/20) | | | | |
| Gupta, 2016 ²² | Cannulated Screw | 45 | -- | AVN: 6.7% (3/45) Surgical Site Infection: 0.0% (0/45) | 17.8% (8/45) | 8.9% (4/45) | -- | -- |
| | Dynamic or Sliding Hip Screw | 40 | -- | AVN: 7.5% (3/40) Surgical Site Infection: 5.0% (2/40) | 12.5% (5/40) | 12.5% (5/40) | -- | -- |
| Imobi Singh, 2021 ²³ | Cannulated Screw | 47 | -- | DVT: 2.1% (1/47) Wound Infection: 4.3% (2/47) AVN: 6.4% (3/47) | 17.0% (8/47) | -- | -- | -- |
| Lin, 2012 ²⁴ | Cannulated Screw | 41 | -- | AVN: 9.8% (4/41) | 4.9% (2/41) | -- | 4.9% (2/41) | -- |
| Nyholm, 2018 ²⁵ | Parallel Screws | 1206 | -- | Surgical Site Infection: 0.4% (5/1,206) | -- | -- | 13.0% (157/1,206) | 18.9% (228/1,206) |
| Qiu, 2016 ²⁶ | Thread Needles | 32 | -- | -- | -- | -- | -- | -- |
| | Cancellous Screw | 32 | -- | | -- | -- | -- | -- |
| Ramadanov, 2020 ²⁷ | Cannulated Screw | 56 | -- | AVN: 5.4% (3/56) | 5.4% (3/56) | 33.9% (19/56) | 17.9% (10/56) | -- |
| Sami, 2022 ²⁸ | Cannulated Screws | 27 | -- | Femoral Neck Shortening: 14.8% (4/27) AVN: 11.1% (3/27) | 7.41% (2/27) | -- | -- | -- |

| | | | | | | | | |
|----------------------------------|------------------------------|------|------------------|---|--------------|--------------|--|--|
| Schwartzmann, 2014 ²⁹ | Dynamic or Sliding Hip Screw | 96 | -- | AVN: 16.7% (16/96) | 3.1% (3/96) | -- | 3.1% (3/96) | -- |
| Shu, 2020 ³⁰ | Cannulated Screw | 26 | DVT: 0.0% (0/26) | AVN: 3.8% (1/26) Femoral Neck Shortening: 8.9±2.3 | 7.7% (2/26) | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 28 | DVT: 0.0% (0/28) | AVN: 0.0% (0/28) Femoral Neck Shortening: 6.8±2.3 | 7.1% (2/28) | -- | -- | -- |
| Viberg, 2022 ³¹ | Cannulated Cancellous Screw | 1731 | -- | -- | -- | -- | 1Y: 15.0% (261/1731) 2Y: 17.4% (301/1731) | 30D: 6.8% (118/1731) 1Y: 22.7% (393/1731) |
| | Sliding Hip Screw | 867 | -- | -- | -- | -- | 1Y: 13.1% (114/867) 2Y: 15.0% (130/867) | 30D: 8.7% (75/867) 1Y: 23.9% (207/867) |
| Wang, 2021 ³² | Cannulated Screw | 60 | -- | AVN: 11.7% (7/60) | -- | -- | -- | -- |
| Wani, 2014 ³³ | Cannulated Screw | 50 | -- | AVN: 12.0% (6/50) Surgical Site Infection: 4.0% (2/50) | 8.0% (4/50) | -- | 20.0% (10/50) | 0.0% (0/50) |
| Wong, 2022 ³⁴ | Cannulated Screw | 233 | -- | AVN: 16.3% (38/233) Infection: 0.0% (0/233) | 2.6% (6/233) | 2.6% (6/233) | 10.7% (25/233) | 20.2% (47/233) |

| | | | | | | | | |
|------------------------------|------------------------------------|-----|----|---|--------------|---------------|----------------|-----------------|
| Yu, 2013 ³⁵ | Cannulated Screw | 78 | -- | AVN: 12.8% (10/78) Infection: 1.3% (1/78) DVT: 0.0% (0/78) Hip Varus: 2.6% (2/78) Femoral Neck Shortening: 10.3% (8/78) | 2.6% (2/78) | -- | -- | -- |
| Retrospective Studies | | | | | | | | |
| Biber, 2014 ³⁶ | Targon FN System | 135 | -- | Surgical Site Infection: 0.0% (0/135) | 2.2% (3/135) | 9.6% (13/135) | 17.8% (24/135) | 2.2% (3/135) |
| Bigoni, 2020 ³⁷ | Cancellous Screw | 244 | -- | AVN: 5.7% (14/244) Surgical Site Infection: 0.41% (1/244) | 0.4% (1/244) | 1.6% (4/244) | -- | 50.0% (122/244) |
| Biz, 2019 ³⁸ | Cannulated Screw | 259 | -- | AVN: 4.2% (11/259) | 0% (0/259) | 5.4% (14/259) | 9.7% (25/259) | 12.0% (31/259) |
| Chang, 2022 ⁴⁰ | Dynamic Compression Locking System | 26 | -- | Femoral Neck Shortening: 6.9±1.4 Femoral Head Necrosis: 3.8% (1/26) | 3.8% (1/26) | -- | 7.7% (2/26) | -- |
| | Dynamic or Sliding Hip Screw | 24 | -- | Femoral Neck Shortening: 8.6±2.0 Femoral Head Necrosis: | 4.2% (1/24) | -- | 16.7% (4/24) | -- |

| | | | | | | | | |
|------------------------------|------------------------------|-----|--|--|--------------|---------------|---------------------------------|---------------|
| | | | | 12.5% (3/24) | | | | |
| Chen, 2017 ⁴¹ | Cannulated Compression Screw | 44 | DVT: 0.0% (0/44) Surgical Site Infection: 0.0% (0/44) | AVN: 9.1% (4/44) Femoral Neck Shortening: 15.9% (7/44) | 4.5% (2/44) | 22.7% (10/44) | -- | -- |
| | Dynamic Hip Screw-BLADE | 42 | DVT: 0.0% (0/42) Surgical Site Infection: 0.0% (0/42) | AVN: 7.1% (3/42) Femoral Neck Shortening: 2.4% (1/42) | 0.0% (0/42) | 4.8 (2/42) | -- | -- |
| Chen, 2020 ⁴² | Cannulated Screw | 41 | -- | AVN: 17.1% (7/41) Surgical Site Infection: 2.4% (1/41) | 9.8% (4/41) | 4.9% (2/41) | 31.7% (13/41) | 34.1% (14/41) |
| Cintean, 2021 ⁴³ | FNS (DePuy Synthes) | 29 | -- | AVN: 0.0% (0/21) Femoral Neck Shortening: 3.3±4.5 (21/29) | -- | -- | 13.8% (4/29) | 6.9% (2/29) |
| | Hemiarthroplasty | 34 | -- | -- | -- | -- | 8.8% (3/34) | 8.8% (3/34) |
| Davidson, 2022 ⁴⁴ | FNS (DePuy Synthes) | 102 | -- | AVN: 2.9% (3/102) | 1.0% (1/102) | 1.0% (1/102) | Conversion to THA: 8.8% (9/102) | 0.0% (0/102) |
| Elgeidi, 2017 ⁴⁵ | Dynamic or Sliding Hip Screw | 35 | Overall: 0.0% (0/35) | AVN: 0.0% (0/35) Deep Infection: 2.3% (1/35) | -- | -- | 2.3% (1/35) | -- |
| Elmi, 2013 ⁴⁶ | Cannulated Screw | 26 | DVT: 0.08% (2/26) | AVN: 38.5% (10/26) | 11.5% (3/26) | -- | -- | -- |

| | | | | | | | | |
|------------------------------|------------------------------|-----|---|--|---------------|---------------|---------------|---------------|
| | | | | Surgical Site Infection: 3.9% (1/26) | | | | |
| Enrietti, 2020 ⁴⁷ | Cannulated Screw | 91 | -- | AVN: 6.6% (6/91) | -- | -- | -- | -- |
| Galal, 2017 ⁴⁸ | Cannulated Screw | 41 | -- | AVN: 2.4% (1/41) Surgical Site Infection: 2.4% (1/41) | 4.9% (2/41) | -- | -- | -- |
| Gruszka, 2017 ⁴⁹ | Targon FN System | 62 | -- | -- | -- | -- | -- | -- |
| Gumustas, 2018 ⁵⁰ | Cannulated Screw | 31 | Surgical Site Infection: 0.0% (0/31) | AVN: 6.5% (2/31) Surgical Site Infection: 0.0% (0/31) | 16.1% (5/31) | -- | 19.4% (6/31) | -- |
| Han, 2022 ⁵¹ | Cannulated Screw | 384 | -- | AVN: 7.6% (29/384) Femoral Neck Shortening: 18.0% (69/384) | 4.9% (19/384) | 6.3% (24/384) | -- | -- |
| He, 2019 ⁵² | Cannulated Screw | 30 | -- | AVN: 10.0% (3/30) | 3.3% (1/30) | 10.0% (3/30) | -- | -- |
| He, 2021 ⁵³ | Cannulated Screw | 36 | -- | -- | 5.6% (2/36) | 8.3% (3/36) | -- | -- |
| | FNS (DePuy Synthes) | 33 | -- | -- | 0.0% (0/33) | 3.0% (1/33) | -- | -- |
| Hiranaka, 2021 ⁵⁴ | Dynamic or Sliding Hip Screw | 66 | -- | AVN: 9.1% (6/66) | 6.1% (4/66) | 4.5% (3/66) | 22.7% (15/66) | 36.4% (24/66) |
| Hu, 2021 ⁵⁵ | Cannulated | 24 | -- | AVN: 12.5% | 12.5% (3/24) | -- | -- | -- |

| | | | | | | | | |
|----------------------------|--|-------|--------------------------------------|---|-------------------|----|---------------------|----------------------|
| | Screw | | | (3/24) | | | | |
| | FNS (DePuy Synthes) | 20 | -- | AVN: 5.0% (1/20) | 10.0% (2/20) | -- | -- | -- |
| Huang, 2020 ⁵⁶ | Cannulated Screw | 67 | Surgical Site Infection: 0.0% (0/67) | AVN: 20.9% (14/67) Surgical Site Infection: 0.0% (0/67) | 0.0% (0/67) | -- | -- | -- |
| Huang, 2022 ⁵⁷ | Multiple Cannulated Screw & Plate System | 48 | | Femoral Neck Shortening: 1.40±1.73 (18.8% [9/48]) AVN: 4.2% (2/48) | 6.3% (3/48) | -- | -- | -- |
| | Cannulated Screw | 54 | | Femoral Neck Shortening: 4.33±3.32 (44.4% [24/54]) AVN: 11.1% (6/54) | 9.3% (5/54) | -- | -- | -- |
| Jettoo, 2016 ⁵⁸ | Cancellous Screw | 34870 | DVT: 0.01% (258/34,870) | AVN: 0.1% (22/34,870) Surgical Site Infection: 0.4% (135/34,870) | 1.6% (557/34,870) | -- | 8.3% (2,905/34,870) | 8.6% (2,999/34,870) |
| | Dynamic or Sliding Hip Screw | 18014 | DVT: 0.01% (165/18,014) | AVN: 0.1% (18/18,014) Surgical Site Infection: 0.4% (80/18,014) | 1.1% (211/18,014) | -- | 5.5% (984/18,014) | 10.4% (1,873/18,014) |

| | | | | | | | | |
|------------------------------|--------------------------------|-----|--|--|--------------|---------------|----------------|----------------|
| Jin, 2022 ⁵⁹ | Percutaneous Compression Plate | 51 | -- | AVN: 9.8% (5/51) DVT: 2.0% (1/51) Infection: 2.0% (1/51) | 2.0% (1/51) | -- | 7.8% (4/51) | -- |
| Ju, 2020 ⁶⁰ | Cannulated Screw | 73 | -- | AVN: 9.6% (7/73) | 1.4% (1/73) | -- | 5.5% (4/73) | -- |
| Kain, 2014 ⁶¹ | Cannulated Screw | 120 | -- | -- | 5.0% (6/120) | -- | 13.3% (16/120) | 42.5% (51/120) |
| Kalsbeek, 2018 ⁶² | Dynamic or Sliding Hip Screw | 106 | Surgical Site Infection: 0.01% (1/106) | AVN: 10.4% (11/106) Surgical Site Infection: 0.9% (1/106) | 5.7% (6/106) | -- | 13.2% (14/106) | 0.0% (0/106) |
| Kang, 2016 ⁶³ | Cannulated Screw | 84 | -- | AVN: 10.7% (9/84) | 7.1% (6/84) | 10.7% (9/84) | -- | -- |
| Khoo, 2014 ⁶⁴ | Cannulated Screw | 53 | -- | AVN: 17.0% (9/53) | 1.9% (1/53) | -- | 5.7% (3/53) | -- |
| Kilian, 2018 ⁶⁵ | Targon FN System | 82 | -- | AVN: 6.1% (5/82) | 2.4% (2/82) | 13.4% (11/82) | 17.1% (14/82) | -- |
| Kim, 2014 ⁶⁶ | Cannulated Screw | 60 | -- | AVN: 6.7% (4/60) | -- | 1.7% (1/60) | 7.4% (4/54) | 6.7% (4/60) |
| Kim, 2015 ⁶⁷ | Cannulated Screw | 52 | -- | AVN: 2.3% (12/52) | 9.6% (5/52) | -- | 30.8% (16/52) | -- |
| Kosola, 2017 ⁶⁸ | Cannulated Screw | 12 | -- | Surgical Site Infection: 0.0% (0/12) | -- | 58.3% (7/12) | 58.3% (7/12) | -- |
| | Dynamic or Sliding Hip Screw | 24 | -- | Surgical Site Infection: 0.0% (0/24) | -- | 12.5% (3/24) | 12.5% (3/24) | -- |
| Lin, 2022 ⁶⁹ | Multiple Cannulated | 27 | -- | AVN: 0.0% (0/27) | 7.4% (2/27) | 3.7% (1/27) | 7.4% (2/27) | -- |

| | | | | | | | | |
|------------------------------|------------------------------|-----|--------------------------------------|--|--------------|--------------|--------------|----------------|
| | Screw & Plate System | | | | | | | |
| Ma, 2022 ⁷⁰ | Cannulated Screw | 47 | Surgical Site Infection: 0.0% (0/47) | AVN: 2.1% (1/47) Surgical Site Infection: 0.0% (0/47) | 10.6% (5/47) | 10.6% (5/47) | -- | -- |
| Makki, 2013 ⁷¹ | Dynamic or Sliding Hip Screw | 31 | Surgical Site Infection: 0.0% (0/31) | AVN: 6.5% (2/31) Surgical Site Infection: 0.0% (0/31) | 3.2% (1/31) | -- | -- | 12.9% (4/31) |
| Manohara, 2014 ⁷² | Cancellous Screw | 100 | DVT: 0.04% (4/96) | AVN: 5.2% (5/96) Hematoma: 0.01% (1/100) | 3.1% (3/96) | -- | 8.0% (8/100) | 18.0% (18/100) |
| Mubark, 2021 ⁷³ | Cannulated Screw | 56 | -- | -- | 5.4% (3/56) | 1.8% (1/56) | 5.4% (3/56) | -- |
| Mue, 2013 ⁷⁴ | Dynamic or Sliding Hip Screw | 43 | -- | Surgical Site Infection: 9.3% (4/43) | -- | -- | 9.3% (4/43) | 2.3% (1/43) |
| Mukka, 2020 ⁷⁵ | Cannulated Screw | 65 | -- | Surgical Site Infection: 0.0% (0/65) | 9.2% (6/65) | -- | 13.8% (9/65) | 30.8% (20/65) |
| Nibe, 2021 ⁷⁶ | Cannulated Screw | 27 | -- | -- | 18.5% (5/27) | 7.4% (2/27) | 22.2% (6/27) | -- |
| | FNS (DePuy Synthes) | 25 | -- | -- | 0.0% (0/25) | -- | 0.0% (0/25) | -- |
| Niemann, 2022 ⁷⁷ | Dynamic or Sliding Hip Screw | 19 | -- | AVN: 0.0% (0/19) Femoral Neck Shortening: 0.0% (0/19) | -- | -- | -- | -- |

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|---------------------------------|------------------------------|-----|----|---|----------------|----------------|--|-----------------|
| | FNS (DePuy Synthes) | 12 | -- | AVN: 0.0% (0/12) Femoral Neck Shortening: 0.0% (0/12) | -- | -- | -- | -- |
| Osarumwense, 2015 ⁷⁸ | Targon FN System | 51 | -- | AVN: 0.1% (3/51) | 2.0% (1/51) | -- | 7.8% (4/51) | -- |
| Parker, 2013 ⁷⁹ | Targon FN System | 320 | -- | AVN: 8.8% (28/320) Surgical Site Infection: 0.9% (3/320) | 10.9% (35/320) | -- | 20.0% (64/320) | 34.1% (109/320) |
| Patterson, 2020 ⁸⁰ | Cannulated Screw | 234 | -- | Surgical Site Infection: 2.6% (6/234) | 9.8% (23/234) | 6.4% (15/234) | 26.9% (63/234) | -- |
| Qiu, 2022 ⁸¹ | Cannulated Screw | 190 | -- | -- | -- | -- | 17.4% (33/190) | -- |
| Riaz, 2016 ⁸² | Cannulated Screw | 251 | -- | AVN: 4.0% (10/251) | 4.8% (12/251) | 6.0% (15/251) | 12.0% (30/251) | -- |
| Schuetze, 2022 ⁸³ | Dynamic or Sliding hip screw | 108 | | Femoral Neck Shortening: 4.8±2.1 mm 27.7% (30/108) Hematoma: 5.6% (6/108) Surgical Site Infection: 2.8% (3/108) | -- | 10.2% (11/108) | Conversion to THA: 8.3% (9/108) Implant removal: 1.9% (2/108) | 0.9% (1/108) |
| | FNS (DePuy Synthes) | 113 | | Femoral Neck Shortening: 5.3±1.9 mm 27.4% (31/113) Hematoma: 0.9% (1/113) | -- | 12.4% (14/113) | Conversion to THA: 11.5% (13/113) Implant removal: 0.9% (1/113) | 3.5% (4/113) |

| | | | | | | | | |
|----------------------------------|------------------------------|------|----|---------------------------------------|-----------------|--------------|---|-------------------|
| | | | | Surgical Site Infection: 0.0% (0/113) | | | | |
| Schwartzmann, 2018 ⁸⁴ | Dynamic or Sliding Hip Screw | 53 | -- | AVN: 25.3% (13/53) | 1.9% (1/53) | -- | -- | -- |
| Shields, 2014 ⁸⁵ | Cannulated Screw | 119 | -- | -- | -- | -- | 13.4% (16/119) | 30.3% (36/119) |
| Sjöholm, 2021 ⁸⁶ | Cannulated Screw | 1505 | -- | AVN: 7.6% (115/1,505) | 3.7% (56/1,505) | -- | 16.7% (251/1,505) | 34.0% (512/1,505) |
| Stassen, 2021 ⁸⁷ | FNS (DePuy Synthes) | 34 | -- | AVN: 11.8% (4/34) | -- | 5.9% (2/34) | Conversion to THA: 17.6% (6/34) Implant removal: 5.9% (2/34) | 0.0% (0/34) |
| Sundkvist, 2022 ⁸⁸ | Cannulated Screw | 93 | -- | AVN: 1.1% (1/93) | 1.1% (1/93) | 2.2% (2/93) | 6.5% (6/93) | 20.4% (19/93) |
| Takigawa, 2016 ⁸⁹ | Targon FN System | 84 | -- | AVN: 8.3% (7/84) | 1.2% (1/84) | -- | 29.8% (25/84) | 38.1% (/84) |
| Tang, 2021 ⁹⁰ | Cannulated Screw | 45 | -- | AVN: 6.7% (3/45) | 8.9% (4/45) | 4.4% (2/45) | -- | -- |
| | FNS (DePuy Synthes) | 47 | -- | AVN: 2.1% (1/47) | 4.3% (2/47) | 6.4% (3/47) | -- | -- |
| Vazquez, 2021 ⁹¹ | Cannulated Screw | 32 | -- | -- | -- | -- | -- | 9.4% (3/32) |
| | Dynamic or Sliding Hip Screw | 16 | -- | -- | -- | -- | -- | 12.5% (2/16) |
| | FNS (DePuy Synthes) | 15 | -- | -- | -- | -- | -- | 0.0% (0/15) |
| Wan, 2021 ⁹² | Cannulated Screw | 21 | -- | AVN: 0.0% (0/21) | -- | 14.3% (3/21) | -- | -- |

| | | | | | | | | |
|----------------------------|--|-----|---|--|------------------|----------------|-------------------|----|
| Wang, 2014 ⁹³ | Cannulated Screw | 146 | -- | AVN: 14.4% (21/146) | -- | -- | 47.3% (69/146) | -- |
| Wang, 2015 ⁹⁴ | Cannulated Screw | 209 | -- | AVN: 11.5% (24/209) | 7.2% (15/209) | -- | -- | -- |
| Wang, 2018 ⁹⁵ | Cancellous Screw | 34 | -- | -- | 23.5% (8/34) | 2.9% (1/34) | 26.5% (9/34) | -- |
| | Multiple Cancellous Screw & Plate System | 34 | -- | -- | 5.9% (2/34) | 8.8% (3/34) | 8.8% (3/34) | -- |
| Wang, 2019 ⁹⁶ | Cannulated Screw | 65 | Surgical Site Infection: 0.0% (0/65) | AVN: 1.5% (1/65) Surgical Site Infection: 0.0% (0/65) | -- | 3.1% (2/65) | -- | -- |
| Wang, 2022 ⁹⁷ | Cannulated Screw | 153 | -- | AVN: 24.8% (38/153) | -- | -- | -- | -- |
| Wenbo, 2014a ⁹⁸ | Dynamic Hip System Blade | 60 | -- | AVN: 0.0% (0/60) Femoral Neck Shortening: 0.0% (0/60) | 1.7% (1/60) | 0% (0/60) | -- | -- |
| Wenbo, 2014b ⁹⁹ | Dynamic or Sliding Hip Screw | 42 | -- | DVT: 0.0% (0/42) | -- | 7.1% (3/42) | -- | -- |
| Xiao, 2018 ¹⁰⁰ | Dynamic or Sliding Hip Screw | 36 | -- | -- | -- | -- | 0.0% (0/36) | -- |
| Xu, 2022a ¹⁰¹ | Cancellous Screw | 51 | -- | AVN: 0.0% (0/51) DVT: 0.0% (0/51) Femoral Neck | -- | 3.9% (2/51) | -- | -- |

| | | | | | | | | |
|---------------------------|---|----|--|---|--------------|--------------|----|----|
| | | | | Shortening: 1.9 mm (0.2-3.5) | | | | |
| | Dynamic or Sliding Hip Screw | 52 | -- | AVN: 0.0% (0/52) DVT: 0.0% (0/52) Femoral Neck Shortening: 2.0 mm (0.2-4.8) | -- | 3.8% (2/52) | -- | -- |
| | FNS (DePuy Synthes) | 54 | -- | AVN: 0.0% (0/54) DVT: 0.0% (0/54) Femoral Neck Shortening: 2.2 mm (0.4-4.1) | -- | 5.6% (3/54) | -- | -- |
| Xu, 2022b ¹⁰² | Sliding Fixation (Three Cannulated Screws) | 60 | Wound Infection: 0.0% (0/60) DVT: 0.0% (0/60) | AVN: 0.0% (0/60) Femoral Neck Shortening: 26.7% (16/60) | -- | 5.0% (3/60) | -- | -- |
| | Non-sliding Fixation (Four Cannulated Screws) | 42 | Wound Infection: 0.0% (0/42) DVT: 0.0% (0/42) | AVN: 0.0% (0/42) Femoral Neck Shortening: 21.4% (9/42) | -- | 4.8% (2/42) | -- | -- |
| Yang, 2022 ¹⁰³ | Parallel Cannulated Screws | 10 | Infection: 0.0% (0/10) | -- | 0% (0/10) | -- | -- | -- |
| Ye, 2017 ¹⁰⁴ | Cannulated Screw | 28 | -- | AVN: 0.0% (0/28) Surgical Site Infection: | 10.7% (3/28) | 10.7% (3/28) | -- | -- |

| | | | | | | | | |
|--------------------------------|------------------------------|-----|----|--|----------------|---------------|----------------|----|
| | | | | 0.0% (0/28) | | | | |
| Yoon, 2021 ¹⁰⁵ | Multiple Cannulated Screws | 6 | -- | AVN: 0.0% (0/6) | 0% (0/6) | -- | -- | -- |
| | Dynamic or Sliding Hip Screw | 2 | -- | AVN: 0.0% (0/2) | 0% (0/2) | -- | -- | -- |
| Yoshikawa, 2022 ¹⁰⁶ | Sliding Hip Screw (TresLock) | 10 | -- | -- | 10% (1/10) | -- | 10% (1/10) | -- |
| Yuan, 2022 ¹⁰⁷ | Cannulated Screw | 113 | -- | Osteonecrosis: 22.1% (25/113) | 15.9% (18/113) | 8.8% (10/113) | 24.8% (28/113) | -- |
| Zhang, 2022 ¹⁰⁸ | Cannulated Screw | 36 | -- | Femoral Neck Shortening: 13.89% (5/36) | -- | 13.89% (5/36) | 0.0% (0/36) | |
| | FNS (DePuy Synthes) | 33 | -- | Femoral Neck Shortening: 6.06% (2/33) | -- | 0.0% (0/33) | 0.0% (0/33) | |
| Zhao, 2014a ¹⁰⁹ | Dynamic or Sliding Hip Screw | 42 | -- | -- | -- | 7.1% (3/42) | -- | -- |
| Zhao, 2014b ¹¹⁰ | Dynamic or Sliding Hip Screw | 60 | -- | -- | 1.7% (1/60) | 0.0% (0/60) | -- | -- |
| Zhao, 2021 ¹¹¹ | Cancellous Screw | 122 | -- | -- | 12.3% (15/122) | -- | -- | -- |
| Zhou, 2021 ¹¹² | Cannulated Screw | 51 | -- | -- | -- | -- | -- | -- |
| | FNS (DePuy Synthes) | 30 | -- | -- | -- | -- | -- | -- |
| Zhu, 2021 ¹¹³ | Cannulated Screw | 83 | -- | AVN: 24.1% (20/83) | 7.2% (6/83) | -- | -- | -- |

| | | | | | | | | |
|------------------------------|------------------------------|----|---|-------------------|-------------|-------------|-------------|-----|
| Zhu, 2022a ¹¹⁴ | Dynamic or Sliding Hip Screw | 68 | -- | AVN: 8.8% (6/68) | 2.9% (2/68) | 5.9% (4/68) | -- | -- |
| Zhu, 2022b ¹¹⁵ | Cannulated Screw | 91 | Infection: 0.0% (0/91) Cortical Perforation: 0.0% (0/91) | AVN: 6.6% (6/91) | 5.5% (5/91) | 7.7% (7/91) | 6.6% (6/91) | --* |
| Zhuang, 2019 ¹¹⁶ | Cannulated Screw | 26 | -- | AVN: 7.7% (2/26) | 0.0% (0/26) | -- | -- | -- |
| Case Series | | | | | | | | |
| Faisham, 2021 ¹¹⁷ | Dynamic or Sliding Hip Screw | 10 | -- | AVN: 20.0% (2/10) | 0.0% (0/10) | -- | -- | -- |

Data are expressed as mean±SD, median (IQR), or % (n) unless otherwise indicated. "--" indicates no data reported.

AVN, avascular necrosis of the femoral head; DVT, deep vein thrombosis; FN, femoral neck; FNS, femoral neck system; DePuy Synthes, Johnson & Johnson.

*Of the initial 112 patients reviewed, 8 died and were excluded from the study analysis.

Supplemental Table 7. Risk of bias assessment results for included studies

| Study | Selection | | | | Comparability | Outcome | | | Overall | |
|-----------------------------|--|-------------------------------------|---------------------------|--|---|-----------------------|---|----------------------------------|-------------|---|
| | Representativeness of the exposed cohort | Selection of the non-exposed cohort | Ascertainment of exposure | Demonstration that outcome of interest was not present at start of study | Comparability of cohorts on the basis of the design or analysis | Assessment of outcome | Was follow-up long enough for outcomes to occur | Adequacy of follow-up of cohorts | Total Score | How well was the study done to minimize bias? |
| Cintean, 2021 ⁴³ | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 5 | High risk |

| | | | | | | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|---------------|
| He, 2021 ⁵³ | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 7 | Moderate risk |
| Hu, 2021 ⁵⁵ | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 6 | High risk |
| Nibe, 2021 ⁷⁶ | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 5 | High risk |
| Niemann, 2022 ⁷⁷ | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 5 | Moderate risk |
| Schuetze, 2022 ¹¹⁸ | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 5 | High risk |
| Tang, 2021 ⁹⁰ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | Low risk |
| Vazquez, 2021 ⁹¹ | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 6 | High risk |
| Xu, 2022 ¹⁰¹ | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 3 | High risk |
| Zhang, 2022 ¹⁰⁸ | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 3 | High risk |
| Zhou, 2021 ¹¹² | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 7 | Low risk |

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