

## Randomized Control Trials

A: Allocation concealment

B: Blinding of outcome assessors

C: Blinding of participants and personnel

D: Incomplete outcome data

E: Other sources of bias

F: Selective outcome reporting

G: Sequence Generation

Study	THA	TKA	GA	NA	Patients	A	B	C	D	E	F	G
Aksoy 2014 <sup>1</sup>	THA				70	Unclear	Low	High	Low	Low	Low	Low
Amundson 2017 <sup>2</sup>		TKA	GA	NA	157	Low	Low	Low	Low	Low	Low	Low
Andersen 2012 <sup>3</sup>		TKA		NA	40	Low	Low	Low	Low	Low	Low	Low
Angers 2019 <sup>4</sup>		TKA	GA		90	Low	Low	Low	Low	Low	Low	Low
Ashraf 2013 <sup>5</sup>		TKA		NA	40	Low	Low	Low	Low	Low	Low	Unclear
Bali 2016 <sup>6</sup>		TKA	GA		68	Low	Low	High	Low	Low	Low	Low
Baranovi 2011 <sup>7</sup>		TKA		NA	71	Unclear	Unclear	Unclear	High	Low	Low	Low
Barrington 2005 <sup>8</sup>		TKA		NA	108	Low	High	High	Low	Low	Low	Low
Beausang 2016 <sup>9</sup>		TKA		NA	96	Unclear	High	High	Low	Low	Low	Unclear
Biswas 2018 <sup>10</sup>		TKA		NA	130	Low	Low	Low	Unclear	Low	Low	Low
Bogoch 2002 <sup>11</sup>	THA	TKA	GA		115	Low	Low	Low	Low	Low	Low	Unclear
Bron 2018 <sup>12</sup>	THA			NA	162	Low	Low	Low	Low	Low	Low	Unclear
Campbell 2008 <sup>13</sup>		TKA		NA	56	Unclear	Low	Unclear	High	Low	Low	Low
Chan 2013 <sup>14</sup>		TKA	GA	NA	135	Low	Low	High	Unclear	Low	Low	Low
Chan 2014 <sup>15</sup>		TKA			135	Unclear	Low	Unclear	Low	Low	Low	Unclear
Chaumeron 2013 <sup>16</sup>		TKA		NA	59	Low	Low	Low	Low	Low	Low	Low
Chelly 2001 <sup>17</sup>		TKA	GA	NA	92	High	Unclear	High	Low	Low	Low	Unclear

Chen 2017 <sup>18</sup>	THA	TKA	GA	90	Low	Low	Unclear	Low	Low	Low	Low
Fahs 2018 <sup>19</sup>	THA		GA	99	Low	Low	Unclear	Low	Low	Low	Low
Fan 2016 <sup>20</sup>		TKA	GA	157	Low	Low	Low	Low	Low	Low	Low
Fan 2017 <sup>21</sup>		TKA	GA	65	Unclear	Unclear	Unclear	Low	Low	Low	Unclear
Fenten 2018 <sup>22</sup>		TKA	NA	80	Low	Low	Low	Low	Low	Low	Low
Gasanova 2019 <sup>23</sup>	THA		GA	60	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Gmez 2017 <sup>24</sup>		TKA	NA	574	Unclear	Unclear	Unclear	Low	Low	Low	Unclear
Good 2007 <sup>25</sup>		TKA		42	Low	Low	Low	Low	Low	Low	Unclear
Goytizolo 2016 <sup>26</sup>	THA		NA	90	Low	Low	Low	Low	Unclear	Low	Low
Goytizolo 2020 <sup>27</sup>		TKA	NA	111	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Grosso 2018 <sup>28</sup>		TKA	NA	102	Low	Low	Low	Unclear	Low	Low	Low
Hua 2017 <sup>29</sup>	THA		GA	60	Unclear	Unclear	Unclear	High	Low	Low	Low
Johnson 2017 <sup>30</sup>	THA		GA NA	159	Low	Low	High	Low	Low	Low	Low
Kadic 2009 <sup>31</sup>		TKA	NA	53	Low	Low	Unclear	Low	Low	Low	Low
Kampitak 2018 <sup>32</sup>		TKA	NA	57	Low	Low	Low	Low	Low	Low	Low
Kardash 2007 <sup>33</sup>		TKA	NA	40	Unclear	Low	Low	Low	Low	Low	Unclear
Kayupov 2018 <sup>34</sup>		TKA	GA NA	91	Low	High	High	High	Unclear	Low	Low
Kearns 2016 <sup>35</sup>	THA		NA	108	Low	Low	Low	Low	Low	Low	Low
Kendrii 2017 <sup>36</sup>	THA		GA NA	30	Unclear	Unclear	Unclear	Low	Low	Low	Unclear
Kovalak 2015 <sup>37</sup>		TKA	NA	60	Low	Unclear	Unclear	Low	Low	Low	Low
Kratz 2015 <sup>38</sup>	THA		GA	52	Low	Low	High	High	Low	Low	Low
Kuchlik 2017 <sup>39</sup>	THA		NA	56	Low	Low	Low	Low	Low	Low	Low
Kulkarni 2019 <sup>40</sup>		TKA	NA	100	Low	Low	Low	Low	Low	Low	Low
Lee 2011 <sup>41</sup>		TKA	NA	78	Low	Low	Low	Low	Low	Low	Low
Lee 2012 <sup>42</sup>		TKA	GA	40	Unclear	Unclear	Unclear	Low	Low	Low	Unclear
Leung 2018 <sup>43</sup>		TKA	NA	70	Low	Low	Low	Low	Low	Low	Low
Li 2017 <sup>44</sup>		TKA		53	Low	Low	Low	Low	Low	Low	Low
Long 2006 <sup>45</sup>		TKA	NA	70	Unclear	Unclear	Unclear	High	Low	Unclear	Unclear
Lu 2017 <sup>46</sup>		TKA	GA NA	57	Unclear	Low	High	Low	Low	Low	Low
Luezner 2020 <sup>47</sup>		TKA		139	Low	Low	Low	Low	Low	Low	Low
Ivarez 2017 <sup>48</sup>		TKA	NA	39	High	High	High	Low	Low	Low	Low

Marino 2009 <sup>49</sup>	THA		NA	150	Low	High	Unclear	Low	Low	Low	Low
Mei 2017 <sup>50</sup>	THA		GA	132	Low	Low	Unclear	Low	Low	Unclear	Low
Moghtadaei 2014 <sup>51</sup>	TKA		NA	36	Low	Low	Low	Unclear	Low	Low	Low
Nader 2012 <sup>52</sup>	TKA		NA	62	Low	Unclear	Unclear	Low	Low	Low	Low
Ng 2001 <sup>53</sup>	TKA		GA	48	Low	Low	Low	Low	Low	Low	Low
Ng 2012 <sup>54</sup>	TKA		GA	32	Low	Low	Low	Low	Low	Low	Low
Nishio 2014 <sup>55</sup>	THA		GA NA	19	Low	Unclear	Unclear	Low	Low	Low	Low
Niskanen 2005 <sup>56</sup>	TKA		NA	50	Unclear	High	High	Low	Low	Low	Unclear
Peng 2014 <sup>57</sup>	TKA		GA	280	Low	Unclear	High	Low	Low	Low	Low
Reinhardt 2014 <sup>58</sup>	TKA		NA	94	Low	Low	Low	Low	Low	Low	Low
Rizk 2017 <sup>59</sup>	TKA		GA	75	Low	Unclear	Unclear	Low	Low	Low	Low
Safa 2014 <sup>60</sup>	TKA		NA	68	Low	Low	Low	Low	Low	Low	Low
Sahin 2014 <sup>61</sup>	TKA		NA	104	Low	Low	Low	Low	Low	Low	Low
Saine 2018 <sup>62</sup>	TKA		NA	60	Low	Low	Low	Low	Low	Low	Low
Seet 2006 <sup>63</sup>	TKA		NA	37	Low	Unclear	Unclear	Low	Low	Low	Unclear
Siddiqui 2007 <sup>64</sup>	THA		GA	34	Low	High	High	Low	Low	Low	Low
Singelyn 1998 <sup>65</sup>	TKA		GA NA	30	Low	Unclear	Unclear	Low	Low	Low	Low
Sites 2004 <sup>66</sup>	TKA		NA	40	Low	Unclear	Unclear	Low	Low	Low	Low
Sogbein 2017 <sup>67</sup>	TKA		NA	70	Low	Low	Low	Low	Low	Low	Low
Spangehl 2015 <sup>68</sup>	TKA		GA	160	Low	High	High	Low	Low	Low	Low
Stathellis 2017 <sup>69</sup>	TKA		GA	50	Low	Unclear	Unclear	Low	Low	Low	Low
Stevens 2000 <sup>70</sup>	THA		GA	60	Unclear	Unclear	Low	Low	Low	Low	Unclear
Sundarathiti 2009 <sup>71</sup>	TKA		NA	61	Unclear	Unclear	Unclear	Low	Low	Low	Unclear
Thybo 2016 <sup>72</sup>	THA		NA	100	Low	Low	Low	Unclear	Low	Low	Low
Toftdahl 2007 <sup>73</sup>	TKA		NA	77	Low	Unclear	Unclear	Low	Low	Low	Low
Tong 2019 <sup>74</sup>	TKA		NA	40	Low	Low	Low	Low	Low	Low	Low
Twyman 1990 <sup>75</sup>	THA		GA	20	Unclear	Unclear	Unclear	Low	High	Low	Unclear
Wall 2017 <sup>76</sup>	TKA		GA NA	257	Low	Low	Unclear	Unclear	Low	Unclear	Low
Wang 2019 <sup>77</sup>	TKA			90	Low	Low	Low	Low	Low	Low	Low
Widmer 2012 <sup>78</sup>	TKA		GA	55	Low	Low	Low	Low	Low	Low	Low
Wu 2014 <sup>79</sup>	TKA		NA	79	Low	High	High	Unclear	Low	Low	Low

Yamamoto 2019 <sup>80</sup>	THA		NA	53	Low	Low	Low	Low	Low	Low	Low
Zhou 2018 <sup>81</sup>		TKA	GA	40	Low	Low	Low	Low	Low	Low	Low
Zinkus 2017 <sup>82</sup>		TKA		NA	54	Low	Low	Low	Low	Low	Low

## Observational Studies

A: Failure to adequately control for confounding

B: Failure to develop and apply appropriate eligibility criteria

C: Flawed measurement of exposure or outcome

D: Incomplete follow-up

Study	Study Design	THA	TKA	GA	NA	Patients	A	B	C	D
Akkaya 2014 <sup>83</sup>	Case-control study		TKA		NA	27	High	Low	Low	High
Alsheik 2020 <sup>84</sup>	Retrospective cohort study		TKA	GA	NA	80	Unclear	Low	Low	Low
Antoni 2014 <sup>85</sup>	Retrospective cohort study		TKA	GA		98	High	High	Low	Low
Asakura 2011 <sup>86</sup>	Retrospective cohort study		TKA	GA		40	High	Low	Low	Low
Beaupre 2012 <sup>87</sup>	Prospective cohort study		TKA	GA	NA	39	High	Low	Low	Low
Cien 2015 <sup>88</sup>	Retrospective cohort study		TKA			122	Low	Low	Low	Low
Danninger 2014 <sup>89</sup>	Retrospective cohort study	THA	TKA	GA	NA	530,089	Unclear	Low	Unclear	Low
DeRuyter 2006 <sup>90</sup>	Prospective cohort study		TKA	GA	NA	50	High	Low	Unclear	Low
Duncan 2013 <sup>91</sup>	Retrospective cohort study		TKA	GA	NA	108	High	Unclear	Low	Low
Fetherston 2011 <sup>92</sup>	Prospective cohort study	THA	TKA			52	Unclear	Low	Low	Unclear
Fukuda 2020 <sup>93</sup>	Retrospective cohort study		TKA	GA		5,094	Low	Low	Low	Low
Green 2018 <sup>94</sup>	Retrospective cohort study	THA		GA		20	Unclear	Low	Low	Low
Gwam 2018 <sup>95</sup>	Retrospective cohort study		TKA			110	Unclear	Low	Low	Low
Henson 2019 <sup>96</sup>	Retrospective cohort study		TKA			144	Unclear	Low	Low	Low
Horn 2015 <sup>97</sup>	Retrospective cohort study		TKA			32	Unclear	Low	Low	High
Jacob 2011 <sup>98</sup>	Retrospective cohort study		TKA	GA	NA	8,590	Unclear	Low	Low	Low
Jacob 2011a <sup>99</sup>	Retrospective cohort study	THA				9,844	Unclear	Unclear	Low	Low
Kim 2012 <sup>100</sup>	Retrospective cohort study		TKA		NA	80	High	Low	Low	Low

Kinjo 2012 <sup>101</sup>	Prospective cohort study	TKA	GA	NA	81	Unclear	Low	Low	High	
Kirkness 2017 <sup>102</sup>	Retrospective cohort study	TKA	GA	NA	268	Low	Low	Low	Low	
Kukreja 2019 <sup>103</sup>	Retrospective cohort study	THA		NA	71	Low	Low	Low	Low	
Liu 2015 <sup>104</sup>	Retrospective cohort study	TKA		NA	1,768	Unclear	Low	Low	Low	
Lovald 2015 <sup>105</sup>	Retrospective cohort study	TKA	GA	NA	35,642	High	Low	Unclear	Unclear	
Mclsaac 2017 <sup>106</sup>	Retrospective cohort study	TKA	GA	NA	178,214	Low	Low	Low	Low	
Memtsoudis 2016 <sup>107</sup>	Retrospective cohort study	TKA	GA	NA	719,426	Low	Low	Low	Low	
Memtsoudis 2016 <sup>107</sup>	Retrospective cohort study	THA		GA	NA	342,726	Low	Low	Low	
Peters 2006 <sup>108</sup>	Retrospective cohort study	THA	TKA	GA	NA	100	High	High	Low	High
Pope 2015 <sup>109</sup>	Retrospective cohort study	TKA	GA	NA	294	High	Low	Low	Low	
Raimer 2007 <sup>110</sup>	Prospective cohort study	TKA	GA	NA	42	Unclear	Low	Low	High	
Rajeev 2016 <sup>111</sup>	Prospective cohort study	TKA	GA	NA	114	High	High	Low	Low	
Rames 2019 <sup>112</sup>	Retrospective cohort study	TKA			693	Low	Low	Low	Low	
Roberts 2019 <sup>113</sup>	Retrospective cohort study	TKA			236	Low	Low	Low	Low	
Schmidt 2009 <sup>114</sup>	Retrospective cohort study	TKA	GA	NA	200	Unclear	Unclear	Low	Low	
Schwab 2019 <sup>115</sup>	Retrospective cohort study	TKA			224	Unclear	Low	Low	Low	
Simonsen 2011 <sup>116</sup>	Prospective cohort study	TKA		NA	67	Unclear	High	Low	Low	
Singelyn 1999 <sup>117</sup>	Prospective cohort study	THA		GA	NA	1,274	High	Low	Low	Low
Sporer 2016 <sup>118</sup>	Retrospective cohort study	TKA		NA	597	Unclear	Low	Low	Low	
Sugar 2011 <sup>119</sup>	Prospective cohort study	TKA		NA	28	Unclear	Low	Low	Low	
Suthersan 2015 <sup>120</sup>	Prospective cohort study	TKA	GA	NA	46	Unclear	Low	Low	Low	
Tetsunaga 2016 <sup>121</sup>	Retrospective cohort study	THA		GA		62	High	High	Low	Low
Willett 2019 <sup>122</sup>	Retrospective cohort study	TKA			151	High	Low	Low	Low	

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