

Supplementary Table 1. Search Strategy

Database	Search Strategy	Retrieved result
PubMed	(("Hormone Replacement Therapy"[Mesh] OR "Estrogen Replacement Therapy"[Mesh] OR "Testosterone"[Mesh] OR "Estrogens"[Mesh]) OR(((oestrogen*[tiab] OR estrogen*[tiab] OR hormon*[tiab] OR androgen*[tiab] OR testosterone[tiab]) AND (replac*[tiab] OR treat*[tiab] OR therap*[tiab] OR interven*[tiab] OR supplement*[tiab])) OR "menopausal hormone therapy"[tiab] OR "MHT"[tiab] OR "ERT"[tiab] OR "HRT"[tiab] OR "TRT"[tiab] OR "estradiol"[tiab] OR "tibolone"[tiab] OR "testosterone gel"[tiab] OR "testosterone undecanoate"[tiab])) AND (("Arthroplasty, Replacement"[Mesh] OR "Arthroplasty, Replacement, Hip"[Mesh] OR "Arthroplasty, Replacement, Knee"[Mesh] OR "Arthroplasty, Replacement, Shoulder"[Mesh]) OR ("total joint arthroplasty"[tiab] OR "TJA"[tiab] OR "total joint replacement"[tiab] OR "TJR"[tiab] OR "total hip arthroplasty"[tiab] OR "THA"[tiab] OR "total hip replacement"[tiab] OR "THR"[tiab] OR "total knee arthroplasty"[tiab] OR "TKA"[tiab] OR "total knee replacement"[tiab] OR "TKR"[tiab] OR "total shoulder arthroplasty"[tiab] OR "TSA"[tiab] OR "total shoulder replacement"[tiab] OR "reverse total shoulder arthroplasty"[tiab] OR "RSA"[tiab] OR "total ankle arthroplasty"[tiab] OR "total ankle replacement"[tiab] OR "joint replacement"[tiab] OR "arthroplasty"[tiab] OR "arthroplasties"[tiab] OR "lower limb arthroplasty"[tiab])) AND (("venous thromboembolism"[Mesh] OR "postoperative complications"[Mesh] OR "prosthesis-related infections"[Mesh] OR "reoperation"[Mesh]) OR ("VTE"[tiab] OR "DVT"[tiab] OR "pulmonary embolism"[tiab] OR "PE"[tiab] OR "thrombosis"[tiab] OR	140

	"periprosthetic joint infection"[tiab] OR "PJI"[tiab] OR "revision"[tiab] OR "implant failure"[tiab] OR "postoperative complication"[tiab] OR "fracture"[tiab] OR "aseptic loosening"[tiab]))	
Web of Science	(((oestrogen* OR estrogen* OR hormon* OR androgen* OR testosterone) NEAR/3 (replac* OR treat* OR therap* OR interven* OR supplement*)) OR "menopausal hormone therapy" OR "MHT" OR "ERT" OR "HRT" OR "TRT" OR estradiol OR tibolone OR "testosterone gel" OR "testosterone undecanoate") AND ("total joint arthroplasty" OR "TJA" OR "total joint replacement" OR "TJR" OR "total hip arthroplasty" OR "THA" OR "total hip replacement" OR "THR" OR "total knee arthroplasty" OR "TKA" OR "total knee replacement" OR "TKR" OR "total shoulder arthroplasty" OR "TSA" OR "total shoulder replacement" OR "reverse total shoulder arthroplasty" OR "RSA" OR "total ankle arthroplasty" OR "total ankle replacement" OR "joint replacement" OR "arthroplasty" OR "arthroplasties" OR "lower limb arthroplasty") AND ("VTE" OR "DVT" OR "pulmonary embolism" OR "PE" OR "thrombosis" OR "periprosthetic joint infection" OR "PJI" OR "revision" OR "implant failure" OR "postoperative complication" OR "fracture" OR "aseptic loosening")	135
Cochrane Library	("hormone replacement therapy" OR "estrogen replacement therapy" OR "testosterone" OR "estrogens" OR estrogen OR estrogens OR oestrogen OR oestrogens OR testosterone OR "hormone replacement" OR HRT OR ERT OR TRT OR "menopausal hormone therapy" OR MHT OR estradiol OR tibolone OR "testosterone gel" OR "testosterone undecanoate" OR androgen OR androgens) AND ("total joint arthroplasty" OR TJA OR "total joint replacement" OR TJR OR "total hip arthroplasty" OR THA OR "total hip replacement" OR THR OR "total knee arthroplasty" OR TKA OR "total knee	10

	replacement" OR TKR OR "total shoulder arthroplasty" OR TSA OR "total shoulder replacement" OR "reverse total shoulder arthroplasty" OR RSA OR "total ankle arthroplasty" OR "total ankle replacement" OR "joint replacement" OR arthroplasty OR arthroplasties OR "lower limb arthroplasty") AND (VTE OR DVT OR "pulmonary embolism" OR PE OR thrombosis OR "periprosthetic joint infection" OR PJI OR revision OR "implant failure" OR "postoperative complication" OR fracture OR "aseptic loosening")	
Embase	((('hormone replacement therapy'/exp OR 'estrogen replacement therapy'/exp OR 'testosterone'/exp OR 'estrogen'/exp) OR (((oestrogen* OR estrogen* OR hormon* OR androgen* OR testosterone) NEAR/3 (replac* OR treat* OR therap* OR interven* OR supplement*)):ab,ti OR 'menopausal hormone therapy':ab,ti OR 'MHT':ab,ti OR 'ERT':ab,ti OR 'HRT':ab,ti OR 'TRT':ab,ti OR 'estradiol':ab,ti OR 'tibolone':ab,ti OR 'testosterone gel':ab,ti OR 'testosterone undecanoate':ab,ti)) AND (('arthroplasty'/exp OR 'hip arthroplasty'/exp OR 'knee arthroplasty'/exp OR 'shoulder arthroplasty'/exp) OR ('total joint arthroplasty':ab,ti OR 'TJA':ab,ti OR 'total joint replacement':ab,ti OR 'TJR':ab,ti OR 'total hip arthroplasty':ab,ti OR 'THA':ab,ti OR 'total hip replacement':ab,ti OR 'THR':ab,ti OR 'total knee arthroplasty':ab,ti OR 'TKA':ab,ti OR 'total knee replacement':ab,ti OR 'TKR':ab,ti OR 'total shoulder arthroplasty':ab,ti OR 'TSA':ab,ti OR 'total shoulder replacement':ab,ti OR 'reverse total shoulder arthroplasty':ab,ti OR 'RSA':ab,ti OR 'total ankle arthroplasty':ab,ti OR 'total ankle replacement':ab,ti OR 'joint replacement':ab,ti OR 'arthroplasty':ab,ti OR 'arthroplasties':ab,ti OR 'lower limb arthroplasty':ab,ti)) AND ((('venous thromboembolism'/exp OR 'postoperative complication'/exp OR 'prosthesis infection'/exp OR 'reoperation'/exp) OR ('VTE':ab,ti	249

	OR 'DVT':ab,ti OR 'pulmonary embolism':ab,ti OR 'PE':ab,ti OR 'thrombosis':ab,ti OR 'periprosthetic joint infection':ab,ti OR 'PJI':ab,ti OR 'revision':ab,ti OR 'implant failure':ab,ti OR 'postoperative complication':ab,ti OR 'fracture':ab,ti OR 'aseptic loosening':ab,ti))	
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Supplementary Table 2. Risk of bias assessment for included studies

Study	NOS Quality Assessment Scale (Cohort Study)				Risk of bias summary
	Selection	Comparability	Outcome	All	
Coden 2025	☆☆☆	☆	☆	5	Moderate
Jing 2025	☆	☆	☆	3	High
Ayala-Ortiz 2025	☆☆☆	☆	☆	5	Moderate
Prieto-Alhambra 2015	☆	☆	☆	3	High
Parmar 2025	☆☆☆	☆	☆	5	Moderate
Ni 2025	☆☆	☆	☆	4	Moderate
Zhao 2025	☆☆☆	☆☆	☆☆	7	Low
Corban 2026	☆☆☆	☆☆	☆	6	Moderate
Su 2023	☆☆☆	☆	☆	5	Moderate
Omurzakov 2025	☆☆☆	☆	☆	5	Moderate
White 2026	☆☆☆	☆	☆	5	Moderate
Collins 2023	☆☆☆	☆☆	☆☆	7	Low
McCormick 2023	☆☆☆	☆☆	☆	6	Moderate
Mousavi 2025	☆☆	☆☆	☆	5	Moderate

Study	NOS Quality Assessment Scale (Case-Control Study)				Risk of bias summary
	Selection	Comparability	Exposure	All	
Hurbanek 2004	☆	☆	☆	3	High