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**Appendix:**

**1 - Is VTE after elective total joint arthroplasty a "never event"?**

**Search Terms:**

(("incidence"[MeSH Terms] OR ("epidemiology"[MeSH Subheading] OR "epidemiology"[All Fields] OR "incidence"[All Fields] OR "incidence"[MeSH Terms] OR "incidences"[All Fields] OR "incident"[All Fields] OR "incidents"[All Fields]) OR ("medical errors"[MeSH Terms] OR ("medical"[All Fields] AND "errors"[All Fields]) OR "medical errors"[All Fields] OR ("never"[All Fields] AND "event"[All Fields]) OR "never event"[All Fields]) OR ("prevent"[All Fields] OR "preventability"[All Fields] OR "preventable"[All Fields] OR "preventative"[All Fields] OR "preventatively"[All Fields] OR "preventatives"[All Fields] OR "prevented"[All Fields] OR "preventing"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields] OR "preventions"[All Fields] OR "preventive"[All Fields] OR "preventively"[All Fields] OR "prevents"[All Fields])) AND ("venous thromboembolism"[MeSH Terms] OR "venous thrombosis"[MeSH Terms] OR "pulmonary embolism"[MeSH Terms]) OR "pulmonary embolism"[MeSH Terms]) AND ("arthroplasty, replacement, hip"[MeSH Terms] OR ("arthroplasty, replacement, hip"[MeSH Terms] OR ("arthroplasty"[All Fields] AND "replacement"[All Fields] AND "hip"[All Fields]) OR "hip replacement arthroplasty"[All Fields] OR ("hip"[All Fields] AND "replacement"[All Fields]) OR "hip replacement"[All Fields]) OR (("hip"[MeSH Terms] OR "hip"[All Fields]) AND ("arthroplasty"[MeSH Terms] OR "arthroplasty"[All Fields] OR "arthroplasties"[All Fields])) OR ("arthroplasty, replacement, knee"[MeSH Terms] OR ("arthroplasty, replacement, knee"[MeSH Terms] OR ("arthroplasty"[All Fields] AND "replacement"[All Fields] AND "knee"[All Fields]) OR "knee replacement arthroplasty"[All Fields] OR ("knee"[All Fields] AND "replacement"[All Fields]) OR "knee replacement"[All Fields]) OR ("arthroplasty, replacement, knee"[MeSH Terms] OR ("arthroplasty"[All Fields] AND "replacement"[All Fields] AND "knee"[All Fields]) OR "knee replacement arthroplasty"[All Fields] OR ("knee"[All Fields] AND "arthroplasty"[All Fields]) OR "knee arthroplasty"[All Fields]))) AND ("anticoagulants"[MeSH Terms] OR "aspirin"[MeSH Terms] OR "heparin, low molecular weight"[MeSH Terms] OR "dalteparin"[MeSH Terms] OR "enoxaparin"[MeSH Terms] OR ("warfarin"[MeSH Terms] OR "warfarin"[All Fields]) OR ("factor xa inhibitors"[MeSH Terms] OR ("factor"[All Fields] AND "xa"[All Fields] AND "inhibitors"[All Fields]) OR "factor xa inhibitors"[All Fields] OR ("factor"[All Fields] AND "xa"[All Fields] AND "inhibitor"[All Fields]) OR "factor xa inhibitor"[All Fields]) OR (("thrombin"[MeSH Terms] OR "thrombin"[All Fields]) AND ("antagonists and inhibitors"[MeSH Subheading] OR ("antagonists"[All Fields] AND "inhibitors"[All Fields]) OR "antagonists and inhibitors"[All Fields] OR "inhibitors"[All Fields] OR "inhibitor"[All Fields] OR "inhibitor s"[All Fields])) OR ("antithrombins"[Pharmacological Action] OR "antithrombins"[MeSH Terms] OR "antithrombins"[All Fields] OR ("direct"[All Fields] AND "thrombin"[All Fields] AND "inhibitor"[All Fields]) OR "direct thrombin inhibitor"[All Fields]) OR ("factor xa inhibitors"[Pharmacological Action] OR "factor xa inhibitors"[MeSH Terms] OR ("factor"[All Fields] AND "xa"[All Fields] AND "inhibitors"[All Fields]) OR "factor xa inhibitors"[All Fields] OR ("direct"[All Fields] AND "acting"[All Fields] AND "oral"[All Fields] AND "anticoagulants"[All Fields]) OR "direct acting oral anticoagulants"[All Fields]) OR "DOAC"[All Fields] OR "DOACs"[All Fields] OR ("heparin, low molecular weight"[MeSH Terms] OR ("heparin"[All Fields] AND "low molecular weight"[All Fields]) OR "low-molecular-weight heparin"[All Fields] OR "lmwh"[All Fields])))

**Total Results: 1,476 hits.**

***Inclusion Criteria:***

* Primary Research
* Reported Venous Thromboembolism Rates
* Evaluation of at Least One Chemotherapeutic Agent

***Exclusion Criteria:***

* Review Articles
* Revision Total Joint Arthroplasty
* Non-English Literature.

**2 - Is there a difference in VTE risk profile for patients undergoing total hip arthroplasty or total knee arthroplasty?**

**Search Terms:**

(("Venous Thromboembolism"[Mesh]) OR ("Venous Thrombosis"[Mesh]) OR ("pulmonary embolism") OR ("deep vein thrombosis")) AND ((risk score[Text Word]) OR (risk stratification[Text Word]) OR (risk calculator[Text Word]) OR (risk assessment[Text Word]) OR (risk scoring[Text Word]) OR (risk scor\*[Text Word]) OR (patient stratification[Text Word]) OR (risk stratif\*[Text Word]) OR (patient stratific\*[Text Word])) AND ((Arthroplasty, Replacement, Knee[MeSH Terms]) OR (Arthroplasty, Replacement, Knee[Title/Abstract]) OR (Arthroplasty, Replacement, Knee) OR (TKA) OR (Total knee arthroplasty) OR (Arthroplasty, Replacement, Hip[MeSH Terms]) OR (Arthroplasty, Replacement, Hip[Title/Abstract]) OR (Arthroplasty, Replacement, Hip) OR (THA))

**Total Results: 198 hits.**

Which were screened and then evaluated for inclusion. Furthermore, the authors manually reviewed the bibliographies of retrieved articles for additional citations when deemed appropriate.

The final document included 37 references.

***Inclusion Criteria:***

* Studies comparing risk factors and/or differences for VTE risk in THA and/or TKA
* Studies comparing risk stratification differences between THA and TKA

***Exclusion Criteria:***

* Absence of comparison in risk stratification
* Not THA or TKA surgery.

**3 - What is the most optimal VTE prophylaxis following TKA/THA?**

**Search Terms:**

Software: All statistical analyses were done using R Studio (Version 4.0.2, Vienna, Austria).

MeSH Terms:

|  |
| --- |
| ("Unilateral hip replacement" OR "Unilateral hip arthroplasty" OR "Unilateral hip prosthesis" OR "hip prosthesis" OR "Arthroplasty, Replacement, Hip"[Mesh]) AND (((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract])) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))) AND ("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis") |
| ("Unilateral knee replacement" OR "Unilateral knee arthroplasty" OR "Unilateral knee prosthesis" OR "knee prosthesis" OR "Arthroplasty, Replacement, knee"[Mesh]) AND (((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract])) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))) AND ("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis") |

**Methodology:**

After all appropriate data was extracted and reviewed; studies were compared first with Network Meta-Analyses (NMA). NMAs allowed us to see how the data interacted with each other and the most common occurrences of prophylactic drugs. Consistency testing was performed as well to check that the proper criteria was met. Odds Ratio Forest plots were created to assess the optimal prophylaxis. The reference point was chosen based on which drug presented the best probability odds per breakdown. Subgroup analyses were also performed focusing on RCT studies (Level I) only.

***Inclusion Criteria:***

* Total Hip Arthroplasty, Total Knee Arthroplasty, or Total Joint Arthroplasty
* Direct Comparisons within each study
* Outcomes of VTE, DVT, PE, and Bleeding Events

***Exclusion Criteria:***

* Studies that were not comparative
* Studies that looked placebos
* Studies that did not define the drugs
* Any study that looked at fractures.

**4 - What is the chemoprophylactic agent of choice for patients undergoing simultaneous bilateral total knee arthroplasty (SBTKA)?**

**Search Terms:**

(bilateral) AND ((("Arthroplasty, Replacement, Knee"[Mesh] OR Knee Replacement OR Knee Arthroplasties OR Knee Arthroplasty OR Knee Replacement Arthroplasties OR Knee Replacement Arthroplasty) AND ((((((("Venous Thromboembolism"[Mesh]) OR ("Venous Thrombosis"[Mesh])) OR ("Pulmonary Embolism"[Mesh])) OR (pulmonary embolism OR pulmonary embolus OR pulmonary thromboembolism)) OR (Venous Thrombosis OR Venous Thromboses OR Venous Thromboembolism)) OR (Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis OR Deep Vein Thromboses)) OR (PE OR VTE OR DVT OR Blood Clot OR Blood Clots))) AND ((((((VTE Prophylaxis OR Thromboprophylaxis) OR ("Anticoagulants"[Mesh] OR Anticoagulants OR Anticoagulant OR anticoagulation OR anti-coagulation OR Antithrombins OR Factor Xa Inhibitor OR Factor Xa Inhibitors)) OR (Thrombin Inhibitor OR Thrombin Inhibitors)) OR ("Heparin"[Mesh] OR Heparin OR Dalteparin OR Enoxaparin OR Nadroparin OR Tinzaparin)) OR ("Warfarin"[Mesh] OR Warfarin OR Coumadine OR Coumadin)) OR ("Aspirin"[Mesh] OR Aspirin)))

**Total Results: 146 hits.**

***Inclusion Criteria:***

* Simultaneous Bilateral or Same-Day Bilateral TKA
* At least one chemoprophylactic agent described
* Venous thromboembolism rates reported
* Primary research
* English articles

***Exclusion Criteria:***

* Staged Bilateral TKA, Unicompartmental knee arthroplasty, Revision cases
* Narrative review articles
* Not in English.

**5 - What is the chemoprophylactic agent of choice for patients undergoing simultaneous bilateral total hip arthroplasty (SBTHA)?**

**Search Terms:**

((((((((VTE Prophylaxis OR Thromboprophylaxis) OR ("Anticoagulants"[Mesh] OR Anticoagulants OR Anticoagulant OR anticoagulation OR anti-coagulation OR Antithrombins OR Factor Xa Inhibitor OR Factor Xa Inhibitors)) OR (Thrombin Inhibitor OR Thrombin Inhibitors)) OR ("Heparin"[Mesh] OR Heparin OR Dalteparin OR Enoxaparin OR Nadroparin OR Tinzaparin)) OR ("Warfarin"[Mesh] OR Warfarin OR Coumadine OR Coumadin)) OR ("Aspirin"[Mesh] OR Aspirin)) AND ("Arthroplasty, Replacement, Hip"[Mesh] OR Hip Prosthesis Implantation OR Hip Prosthesis Implantations OR Hip Replacement OR Hip Arthroplasties OR Hip Arthroplasty)) AND ((((((("Venous Thromboembolism"[Mesh]) OR ("Venous Thrombosis"[Mesh])) OR ("Pulmonary Embolism"[Mesh])) OR (pulmonary embolism OR pulmonary embolus OR pulmonary thromboembolism)) OR (Venous Thrombosis OR Venous Thromboses OR Venous Thromboembolism)) OR (Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis OR Deep Vein Thromboses)) OR (PE OR VTE OR DVT OR Blood Clot OR Blood Clots))) AND (bilateral)

**Total Results: 168 hits.**

***Inclusion Criteria:***

* Simultaneous, single-stage, one-stage or same-day bilateral THA
* At least two chemoprophylactic agent described
* Venous thromboembolism rates reported
* Primary research
* English articles

***Exclusion Criteria:***

* Hemiarthroplasty, revision cases
* Unilateral or staged bilateral THA
* Narrative reviews, case reports,
* Not in English.

**6 - Which VTE prophylactic agent used in patients undergoing TKA/THA has the highest bleeding rate?**

**Search Terms:**

((("Anticoagulants"[Mesh] OR "Platelet Aggregation Inhibitors"[Mesh] OR "Fibrinolytic Agents"[Mesh]) OR ( "LMWH"[tw] OR "low molecular weight heparin "[tw] OR "aspirin"[tw] OR "antithrombotics"[tw] OR "antiplatelet"[tw] OR " Vitamin K antagonists" [tw] OR "Factor Xa Inhibitors" [tw] OR "Adenosin-diphosphate ADP receptor antagonist"[tw] or "Cyclooxygenase Inhibitor"[tw] or "Prostaglandine"[tw] or "Prostacycline"[tw] or "Glycoprotein IIb/IIIa antagonist"[tw] or "Glycoprotein IIb/IIIa inhibitor"[tw] or "Heparinoids"[tw] or "Fibrinolytic"[tw] or "Thrombin inhibitors"[tw] )) AND ((((hemorrhage[MeSH Terms]) OR (bleeding[MeSH Terms]) OR (intracranial hemorrhage[MeSH Terms]) OR (postoperative hemorrhage[MeSH Terms]) OR (hemorrhage\*[Title/Abstract]) OR (bleeding[Title/Abstract]) OR ("bleeding complication\*"[Title/Abstract]) OR ("bleeding disorder\*"[Title/Abstract]) OR ("major bleeding"[Title/abstract]) OR ("bleeding rate\*"[Title/abstract]) OR ("bleeding frequenc\*"[Title/abstract]))))) AND (("Total hip replacement" OR "total hip arthroplasty" OR "total hip prosthesis" OR "hip prosthesis" OR "Arthroplasty, Replacement, Hip"[Mesh]) AND ("Total knee replacement" OR "total knee arthroplasty" OR "total knee prosthesis" OR "knee prosthesis" OR "Arthroplasty, Replacement, knee"[Mesh]))

**Total Results: 367 PubMed hits.**

61 clinical trials + 34 RCT: total of 61 trials (incl RCT and non-RCT).

43 meta-analysis: total of 49 meta-analysis and SR (6 meta-analysis and SR)

107 reviews +25 systematic reviews: total of 114 reviews (incl SR).

111 results (restricted to CT, MA, SR, RCT).

Extracted 42 papers with relevant information within inclusion/exclusion criteria, and added 5 papers by manual search.

***Inclusion Criteria:***

* TKA/THA
* At least one anticoagulant or antiaggregant compared to a standard
* Major and minor bleeding events reported
* Primary (CT and RCT) or combined research (MA, SR)
* English language articles

***Exclusion Criteria:***

* Staged Bilateral THA/TKA, Unicompartmental knee arthroplasty, Revision cases
* Comparisons with placebo
* Narrative review articles
* Non-English language articles.

**7 - What is the incidence of readmission and re-operation for hematomas secondary to administration of chemoprophylaxis for VTE in patients undergoing total joint arthroplasty?**

**Search Terms:**

General non-ortho: (((Hematoma [MeSH Terms]) OR (Hematoma [Text word])) AND ((postoperative complications [MeSH Terms]) OR (postoperative complication\* [Text word]))) AND (("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis") AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))) AND ((surgery [MeSH Terms]) OR (surger\* [MeSH Terms])) Specific (ortho, no readmission): (((Hematoma [MeSH Terms]) OR (Hematoma [Text word])) AND ((postoperative complications [MeSH Terms]) OR (postoperative complication\* [Text word]))) AND (("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis") AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))) AND ("Total joint replacement"[tw] OR "total joint prosthesis"[tw] OR "joint prosthesis"[tw] OR (joint replacement, total[Mesh]) OR (joint prosthesis[Mesh])) Specific (ortho, readmission, no hematoma): (((reoperation[MeSH Terms]) OR (patient readmission[MeSH Terms]) OR (reoperation[Text word]) OR ("patient readmission"[Text word])) AND ((postoperative complications [MeSH Terms]) OR (postoperative complication\* [Text word]))) AND (("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis") AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))) AND ("Total joint replacement"[tw] OR "total joint prosthesis"[tw] OR "joint prosthesis"[tw] OR (joint replacement, total[Mesh]) OR (joint prosthesis[Mesh])) Specific (VTE agents): (((Hematoma [MeSH Terms]) OR (Hematoma [Text word])) AND ((postoperative complications [MeSH Terms]) OR (postoperative complication\* [Text word]))) AND (("Anticoagulants"[Mesh] OR "Platelet Aggregation Inhibitors"[Mesh] OR "Fibrinolytic Agents"[Mesh]) OR ( "LMWH"[tw] OR "low molecular weight heparin "[tw] OR "aspirin"[tw] OR "antithrombotics"[tw] OR "antiplatelet"[tw] OR " Vitamin K antagonists" [tw] OR "Factor Xa Inhibitors" [tw] OR "Adenosin-diphosphate ADP receptor antagonist"[tw] or "Cyclooxygenase Inhibitor"[tw] or "Prostaglandine"[tw] or "Prostacycline"[tw] or "Glycoprotein IIb/IIIa antagonist"[tw] or "Glycoprotein IIb/IIIa inhibitor"[tw] or "Heparinoids"[tw] or "Fibrinolytic"[tw] or "Thrombin inhibitors"[tw])) AND ("Total joint replacement"[tw] OR "total joint prosthesis"[tw] OR "joint prosthesis"[tw] OR (joint replacement, total[Mesh]) OR (joint prosthesis[Mesh]))

**Total Results: 316 hits.**

***Inclusion Criteria:***

* TKA/THA
* At least one anticoagulant or antiaggregant compared to a standard
* Hematoma
* English language articles

***Exclusion Criteria:***

* Narrative review articles
* Non-English language articles.

**8 - Does the type of VTE prophylaxis influence the risk of subsequent surgical site infection (SSI) in patients undergoing orthopaedic procedures?**

**Search Terms:**

**Pubmed – Medline:**

("Orthopedic Procedures/surgery"[Mesh] OR "Orthopedic Procedures"[Mesh] OR "orthopaedic surgery" OR "orthopedic surgery" OR "orthopaedic surgeries" OR "orthopedic surgeries") AND

("antithrombotic prophylaxis" OR heparin OR "Heparin, Low‐Molecular‐Weight" [MESH Terms] OR Anticoagulants [MESH Terms] OR thromboprophylaxis OR enoxaparin OR dalteparin OR bemiparin OR nadroparin OR reviparin OR pamaparin OR certoparin OR tinzaparin OR aspirin OR warfarin OR rivaroxaban OR edoxaban OR betrixaban OR dabigratran OR apixaban OR fondaparinux) AND ("Surgical Wound Infection"[Mesh] OR infection)

**Web of Science:**

TS=(("Orthopedic Procedure" OR "Orthopedic Procedures" OR "orthopaedic surgery" OR "orthopedic surgery" OR "orthopaedic surgeries" OR "orthopedic surgeries") AND ("antithrombotic prophylaxis" OR heparin OR Anticoagulants OR thromboprophylaxis OR enoxaparin OR dalteparin OR bemiparin OR nadroparin OR reviparin OR pamaparin OR certoparin OR tinzaparin OR aspirin OR warfarin OR rivaroxaban OR edoxaban OR betrixaban OR dabigratran OR apixaban OR fondaparinux) AND ("Surgical Wound Infection" OR infection))

**EMBASE:**

(("Orthopedic Procedure" or "Orthopedic Procedures" or "orthopaedic surgery" or "orthopedic surgery" or "orthopaedic surgeries" or "orthopedic surgeries") and ("antithrombotic prophylaxis" or heparin or Anticoagulants or thromboprophylaxis or enoxaparin or dalteparin or bemiparin or nadroparin or reviparin or pamaparin or certoparin or tinzaparin or aspirin or warfarin or rivaroxaban or edoxaban or betrixaban or dabigratran or apixaban or fondaparinux)).mp. and ("Surgical Wound Infection" or infection).af. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]

**Total results: 524 hits.**

Of those, 46 were duplicated, leaving 478 results to evaluate. Furthermore, the authors manually reviewed the bibliographies of retrieved articles for additional citations. The final document included 46 references.

***Inclusion Criteria:***

* Compared perioperative prophylactic anticoagulation with warfarin, aspirin, DOAC, heparin and/or LMWH with regard to rates of surgical site infection in patients undergoing orthopaedic surgery of any kind.

***Exclusion Criteria:***

* Compared those agents in patients undergoing anticoagulation treatment or if surgeries performed were not orthopaedic surgeries.

**9 - Does the type of VTE prophylaxis influence the risk of subsequent periprosthetic joint infection in patients undergoing joint arthroplasty?**

**Search Terms:**

(PJI OR periprosthetic joint infection OR prosthetic joint infection) AND (anticoagulants OR thrombosis prophylaxis OR venous thrombosis prophylaxis OR vitamin K antagonists OR DOAC OR heparin OR low molecular weight heparin OR acetylsalicylic acid).

**Total Results: 107 hits.**

Final number of articles included: 23.

***Inclusion Criteria:***

* English language
* Patient population: primary and revision arthroplasties
* Article type: retrospective and prospective observational studies, randomized controlled trials, cross-over designs.
* Studies that compared at least two different types of VTE prophylaxis and reported on the infection rate. The latter was chosen since in most studies PJI is not defined.

***Exclusion Criteria:***

* Article type: narrative reviews and systematic reviews, in vitro studies, animal studies.
* Patient population: patients treated with tranexamic acid.
* Clinical articles published prior to 1991 unless RCT.

**10 - Should the method for VTE prophylaxis be altered in patients undergoing revision for infection?**

**Search Terms:**

(("Reoperation"[Mesh] OR revision surgery OR Surgical Revision OR Repeat Surgery OR joint revision OR revision) AND ("Infections"[Mesh] OR "Prosthesis-Related Infections"[Mesh] OR infection OR infections)) AND (((((((("Venous Thromboembolism"[Mesh]) OR ("Venous Thrombosis"[Mesh])) OR ("Pulmonary Embolism"[Mesh])) OR (pulmonary embolism OR pulmonary embolus OR pulmonary thromboembolism)) OR (Venous Thrombosis OR Venous Thromboses OR Venous Thromboembolism)) OR (Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis OR Deep Vein Thromboses)) OR (PE OR VTE OR DVT OR Blood Clot OR Blood Clots)) AND ((((((VTE Prophylaxis OR Thromboprophylaxis) OR ("Anticoagulants"[Mesh] OR Anticoagulants OR Anticoagulant OR anticoagulation OR anti-coagulation OR Antithrombins OR Factor Xa Inhibitor OR Factor Xa Inhibitors)) OR (Thrombin Inhibitor OR Thrombin Inhibitors)) OR ("Heparin"[Mesh] OR Heparin OR Dalteparin OR Enoxaparin OR Nadroparin OR Tinzaparin)) OR ("Warfarin"[Mesh] OR Warfarin OR Coumadine OR Coumadin)) OR ("Aspirin"[Mesh] OR Aspirin)))

Total Results: 227 hits.

***Inclusion Criteria:***

* Venous thromboembolism rates reported
* Prosthetic joint infections
* Primary research
* English articles

***Exclusion Criteria:***

* Case studies
* Narrative review articles
* Studies not in English.

**11 - What is the optimal choice for VTE prophylaxis following two-stage or resection arthroplasty for treatment of knee and hip periprosthetic joint infection?**

**Search Terms:**

General string: ((("Total knee replacement" OR "total knee arthroplasty" OR "total knee prosthesis" OR "knee prosthesis" OR "Arthroplasty, Replacement, knee"[Mesh]) OR ("Total hip replacement" OR "total hip arthroplasty" OR "total hip prosthesis" OR "hip prosthesis" OR "Arthroplasty, Replacement, Hip"[Mesh]) AND (infection\*))) AND (((("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis")) AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw])))) Drug specific string: ((("Anticoagulants"[Mesh] OR "Platelet Aggregation Inhibitors"[Mesh] OR "Fibrinolytic Agents"[Mesh]) OR ( "LMWH"[tw] OR "low molecular weight heparin "[tw] OR "aspirin"[tw] OR "antithrombotics"[tw] OR "antiplatelet"[tw] OR " Vitamin K antagonists" [tw] OR "Factor Xa Inhibitors" [tw] OR "Adenosin-diphosphate ADP receptor antagonist"[tw] or "Cyclooxygenase Inhibitor"[tw] or "Prostaglandine"[tw] or "Prostacycline"[tw] or "Glycoprotein IIb/IIIa antagonist"[tw] or "Glycoprotein IIb/IIIa inhibitor"[tw] or "Heparinoids"[tw] or "Fibrinolytic"[tw] or "Thrombin inhibitors"[tw] )) AND (("Total hip replacement" OR "total hip arthroplasty" OR "total hip prosthesis" OR "hip prosthesis" OR "Arthroplasty, Replacement, Hip"[Mesh]) OR ("Total knee replacement" OR "total knee arthroplasty" OR "total knee prosthesis" OR "knee prosthesis" OR "Arthroplasty, Replacement, knee"[Mesh]) AND (infection\*)))

**Total Results: 319 hits.**

***Inclusion Criteria:***

* Venous thromboembolism rates reported
* Prosthetic joint infections
* Primary research
* English articles

***Exclusion Criteria:***

* Case studies
* Narrative review articles
* Studies not in English.

**12 - Should the use of lower extremity tourniquet be avoided in patients at a high risk of VTE?**

**Search Terms:**

(((tourniquet[MeSH Terms]) OR (tourniquets[MeSH Terms]) OR (tourniquet\*[Title/abstract]) OR ("lower extremity tourniquet\*"[Title/abstract]) OR (hemosta\*[Title/abstract]) OR (Clamping [Title/abstract]) OR (bandage\*[Title/abstract]) OR ("Compression stocking"[Title/abstract])) AND ("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis")) AND ((((((orthopedic procedure[MeSH Terms]) OR (orthopedic procedures[MeSH Terms])) OR (orthopedic procedure)) OR (orthopedic procedures)) OR (orthopaedic procedures)) OR (orthopaedic procedure))

**Total Results: 216 hits.**

***Inclusion Criteria:***

* Primary TKA
* Use of tourniquet reported
* Venous thromboembolism rates reported
* Primary research
* English articles

***Exclusion Criteria:***

* Revision TKA
* Use of tourniquet not reported
* Narrative review articles
* Not in English.

**13 - Considering the trend to ambulatory hip and knee arthroplasty, is there a role for the use of pneumatic compression devices?**

**Search Terms:**

"Knee arthroplasty"[Mesh] OR “Arthroplasties, Knee replacement” OR “Arthroplasties, Replacement, knee” OR “Arthroplasty, Replacement, Partial Knee” OR “Knee Arthroplasty, Total” OR “Knee Replacement Arthroplasties” OR “Knee Replacement Arthroplasty” OR “Knee Replacement, Total” OR “Partial Knee Arthroplasty” OR “Partial Knee OR “Replacement, Total Knee: OR “Total Knee Replacement” OR “Unicompartmental Knee Arthroplasty” OR “Unicompartmental Knee Replacement” OR “Unicondylar Knee Arthroplasty” OR “Unicondylar Knee Replacement” AND "Hip Arthroplasty"[Mesh] OR “Arthroplasties, Hip Replacement” OR “Arthroplasties, Replacement, Hip” OR “Arthroplasty, Hip Replacement” OR “Hip Prosthesis Implantation” OR “Hip Replacement Arthroplasties” OR “Hip Replacement Arthroplasty” OR “Hip Replacement, Total” OR “Replacement Arthroplasties, Hip” OR “Replacement Arthroplasty, Hip” OR “Replacement, Total Hip” OR “Total Hip Arthroplasty” OR “Total Hip Replacement” AND “Compression Devices, Intermittent Pneumatic” OR “Intermittent Pneumatic Compression Device” OR “Pneumatic Compression Hose” OR “Pneumatic Compression Stocking” OR “Pneumatic Compression Stockings” OR “Pneumatic Hose” OR “Pneumatic Intermittent Impulse Device”

**Total Results: 143 hits.**

***Inclusion Criteria:***

* Patients underwent knee arthroplasty (simultaneous, sequential, staged)
* Patients underwent total hip arthroplasty (simultaneous, sequential, staged)
* Use of Pneumatic compression devices after hip and knee arthroplasty

***Exclusion Criteria:***

* Patient having prior thromboembolic disease
* Revision hip and knee arthroplasties
* Conference papers; proceedings; editorials; commentaries; reviews; guidelines and book chapters; technical papers; image quality-, and phantom studies; and unavailable full-text manuscripts.
* Review articles
* Sample size less than 20.

**14 - Should mechanical compressive devices be used routinely in patients undergoing total hip arthroplasty or total knee arthroplasty?**

**Search Terms:**

(Arthroplasty OR Replacement OR Knee OR Hip OR Total Joint OR Knee Replacement OR Knee Arthroplasties OR Knee Arthroplasty OR Knee Replacement Arthroplasties OR Knee Replacement Arthroplasty OR Hip Replacement OR Hip Arthroplasties OR Hip Arthroplasty OR Hip Replacement Arthroplasties OR Hip Replacement Arthroplasty OR Total Joint Replacement OR Total Joint Arthroplasties OR Total Joint Arthroplasty OR Total Joint Replacement Arthroplasties OR Total Joint Replacement Arthroplasty) AND (((pulmonary embolism OR pulmonary embolus OR pulmonary thromboembolism) OR (Venous Thrombosis OR Venous Thromboses OR Venous Thromboembolism)) OR (Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis OR Deep Vein Thromboses)) OR (PE OR VTE OR DVT OR Blood Clot OR Blood Clots))) AND ((VTE Prophylaxis OR Thromboprophylaxis) OR (Mechanical Compressive OR Mechanical Compression Mechanical Compressive Device OR Mechanical Compression Device OR Pneumatic Compressive OR Pneumatic Compression OR Pneumatic Compressive Device OR Pneumatic Compression Device OR Sequential Compressive OR Sequential Compression OR Sequential Compressive Device OR Sequential Compression Device OR Mechanical Pump OR Mechanical Pump Device OR Pneumatic Pump OR Pneumatic Pump Device OR Sequential Pump OR Sequential Pump Device))

**Total Results: 35 hits.**

A literature search of PubMed, EMBASE, and the Cochrane Library was performed to identify studies evaluating the effect of mechanical compressive devices on venous thromboembolic (VTE) prophylaxis in patients undergoing total hip or knee arthroplasties. An exhaustive review of the literature was further generated by looking at the reference list of the found articles. The main Orthopaedic Guidelines released in 2011 (1) and the Chest Physician Guidelines released in 2012 (2) were examined and this led to 15 additional references (29–40). The search yielded a total of 35 references (1–22,29–41).

***Inclusion Criteria:***

* At least one mechanical compressive device described
* Venous thromboembolism rates reported
* Primary research
* English articles

***Exclusion Criteria:***

* Unicompartmental knee arthroplasty, revision cases
* Narrative review articles
* Not in English.

**15 - Should pneumatic compression devices (PCD) routinely be co-administered to patients receiving aspirin for VTE prophylaxis?**

**Search Terms:**

(((((((((((intermittent pneumatic compression devices[MeSH Terms])) OR (compression device\*[Title/Abstract])) OR ("intermittent compression"[Title/Abstract])) OR ("IPCD"[Title/Abstract])) OR ("IPC device\*"[Title/Abstract])) OR (pneumatic compressor[Title/Abstract])) OR ("pneumatic pump"[Title/Abstract])) OR (gravity suit[MeSH Terms])) OR (pressure suit\*[Title/Abstract])) AND (((aspirin[MeSH Terms]) OR (aspirin[Title/Abstract])) OR ("Acetylsalicylic Acid"[Title/Abstract]))) AND (("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis" OR ("VTE") OR ("venous thromboembolism prophylaxis") OR ("VTE prophylaxis") OR ("venous thromboembolism prevention") OR ("VTE prevention"))) AND (((orthopedics[MeSH Terms]) OR (orthopedic procedure[MeSH Terms]) OR (orthopedic procedure\*) OR (orthopaedic procedure\*) OR (orthopedic surger\*) OR (orthopaedic surger\*)))

**Total Results: 71 hits.**

**16 - Does the use of Continuous Passive Machine (CPM) reduce the risk of VTE following knee surgery?**

**Search Terms:**

(((((((Motion Therapy, Continuous Passive[MeSH Terms]) OR (Continuous Passive Machine[Title/Abstract])) OR ("CPM"[Title/Abstract])) OR ("CPM therap\*"[Title/Abstract])) OR ("Passive Motion Therap\*"[Title/Abstract])) OR ("continuous passive motion machine\*"[Title/Abstract])) AND (((((((Arthroplasty, Replacement, Knee[MeSH Terms]) OR ("Knee Replacement Arthroplas\*"[Title/Abstract])) OR ("Knee Arthroplast\*"[Title/Abstract])) OR ("Knee Replacement"[Title/Abstract])) OR ("knee prosthesis"[Title/Abstract])) OR ("knee surger\*"[Title/Abstract])) OR ("knee procedure\*"[Title/Abstract]))) AND ((("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism"[Title/Abstract] OR "deep vein thrombosis"[Title/Abstract] OR ("VTE"[Title/Abstract])) ) OR ("VTE risk"[Title/Abstract]))

**Total Results: 14 hits.**

**17 - Does the "enhanced recovery" concept, which includes early ambulation, reduce the risk of VTE in patients undergoing primary total hip or knee arthroplasty?**

**Search Terms:**

Strategy: See Table A-1, and Flowchart A-1 below.

**Table A-1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **PubMed/MEDLINE** | **Embase** | **Cochrane/CENTRAL** | **Scopus** |
| 1 | Enhanced Recovery After Surgery [Mesh Terms] | 'enhanced recovery after surgery'/exp OR 'enhanced recovery after surgery' | MeSH descriptor: [Enhanced Recovery After Surgery] explode all trees | TITLE-ABS-KEY("Enhanced Recovery After Surgery") |
| 2 | enhanced recovery | 'enhanced recovery'/exp OR 'enhanced recovery' | enhanced recovery | TITLE-ABS-KEY("Early Ambulation") |
| 3 | fast track | 'fast track' | fast track | TITLE-ABS-KEY("Enhanced recovery") |
| 4 | rapid recovery | 'rapid recovery' | rapid recovery | TITLE-ABS-KEY("Fast track") |
| 5 | Early Ambulation [Mesh Terms] | 'mobilization'/exp OR 'mobilization' | MeSH descriptor: [Early Ambulation] explode all trees | TITLE-ABS-KEY("Rapid Recovery") |
| 6 | early mobili\* | 'early mobili\*' | early mobili\* | TITLE-ABS-KEY("Early mobili\*") |
| 7 | early ambulation | 'early ambulation' OR 'early ambulation'/exp | early ambulation | TITLE-ABS-KEY("Early ambulation") |
| 8 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 |
| 9 | Arthroplasty, Replacement, Knee [Mesh Terms] | 'total knee replacement' OR 'total knee replacement'/exp | MeSH descriptor: [Arthroplasty, Replacement, Knee] explode all trees | TITLE-ABS-KEY("Total hip replacement") |
| 10 | Arthroplasty, Replacement, Hip [Mesh Terms] | 'knee replacement'/exp OR 'knee replacement' | MeSH descriptor: [Arthroplasty, Replacement, Hip] explode all trees | TITLE-ABS-KEY("hip replacement") |
| 11 | Hip Prosthesis [Mesh Terms] | 'total hip replacement' OR 'total hip replacement'/exp | MeSH descriptor: [Hip Prosthesis] explode all trees | TITLE-ABS-KEY("hip arthroplasty") |
| 12 | Knee Prosthesis [Mesh Terms] | 'hip replacement' OR 'hip replacement'/exp | MeSH descriptor: [Knee Prosthesis] explode all trees | TITLE-ABS-KEY("hip prosthesis") |
| 13 | hip replacement | 'hip prosthesis' OR 'hip prosthesis'/exp | hip replacement | TITLE-ABS-KEY("total knee replacement") |
| 14 | knee replacement | 'knee prosthesis' OR 'knee prosthesis'/exp | knee replacement | TITLE-ABS-KEY("knee replacement") |
| 15 | hip arthroplasty | 'hip arthroplasty' OR 'hip arthroplasty'/exp | hip arthroplasty | TITLE-ABS-KEY("knee arthroplasty") |
| 16 | knee arthroplasty | 'knee arthroplasty' OR 'knee arthroplasty'/exp | knee arthroplasty | TITLE-ABS-KEY("knee prosthesis") |
| 17 | TKR or THR or TKA or THA | tkr OR thr OR tka OR tha | TKR or THR or TKA or THA | TITLE-ABS-KEY("total hip arthroplasty") |
| 18 | #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 | #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 | #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 | TITLE-ABS-KEY("total knee arthroplasty") |
| 19 | Venous Thromboembolism [Mesh Terms] | 'venous thromboembolism' OR 'venous thromboembolism'/exp | MeSH descriptor: [Venous Thromboembolism] explode all trees | TITLE-ABS-KEY(TKR OR THR OR TKA OR THA) |
| 20 | Pulmonary Embolism [Mesh Terms] | 'lung embolism' OR 'lung embolism'/exp | MeSH descriptor: [Pulmonary Embolism] explode all trees | #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 |
| 21 | Thromboembolism [Mesh Terms] | 'thromboembolism' OR 'thromboembolism'/exp | MeSH descriptor: [Thromboembolism] explode all trees | TITLE-ABS-KEY("Venous thromboembolism") |
| 22 | Venous Thrombosis [Mesh Terms] | 'vein thrombosis' OR 'vein thrombosis'/exp | MeSH descriptor: [Venous Thrombosis] explode all trees | TITLE-ABS-KEY("Pulmonary embolism") |
| 23 | Thrombosis [Mesh Terms] | 'thrombosis' OR 'thrombosis'/exp | MeSH descriptor: [Thrombosis] explode all trees | TITLE-ABS-KEY("Thromboembolism") |
| 24 | deep vein thromb\* | 'deep vein thromb\*' | deep vein thromb\* | TITLE-ABS-KEY("Venous thrombosis") |
| 25 | deep venous thromb\* | 'deep venous thromb\*' | deep venous thromb\* | TITLE-ABS-KEY(Thrombosis) |
| 26 | pulmonary embol\* | 'pulmonary embol\*' | pulmonary embol\* | TITLE-ABS-KEY("deep vein thromb\*") |
| 27 | thromboemb\* | 'thromboemb\*' | thromboemb\* | TITLE-ABS-KEY("deep venous thromb\*") |
| 28 | PE or DVT or VTE | pe OR dvt OR vte | PE or DVT or VTE | TITLE-ABS-KEY("pulmonary embol\*") |
| 29 | #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 | #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 | #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 | TITLE-ABS-KEY("thromboemb\*") |
| 30 | #8 AND #18 AND #29 | #8 AND #18 AND #29 | #8 AND #18 AND #29 | TITLE-ABS-KEY(PE OR DVT OR VTE) |
| 31 |  |  |  | #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 |
| 32 |  |  |  | #8 AND #20 AND #31 |

**Total Results: 1204 hits.**

**Flowchart A-1**



***Inclusion Criteria:***

* Articles analyzing early mobilization or ERAS program as a whole
* Venous thromboembolism rates reported
* Primary research, systematic review, meta-analysis
* English articles

***Exclusion Criteria:***

* Studies analyzing individual components of ERAS exclusively
* Single-stage bilateral TJA, Unicompartmental knee arthroplasty, Revision cases, Trauma cases
* Narrative review articles, case reports
* Articles not in English.

**18 - Do patients undergoing elective pelvic and/or femoral osteotomy require routine VTE prophylaxis?**

**Search Terms:**

Femoral osteotomy related string:

(((((osteotomy[MeSH Terms]) OR (osteotomies[MeSH Terms])) AND (femur[MeSH Terms])) OR ("femoral osteotom\*"[Title/abstract]) OR ("femoral surger\*"[Title/abstract]) OR ("periacetabular osteotom\*"[Title/abstract]) OR ("hip surger\*"[Title/abstract])) AND ((orthopedic procedure[MeSH Terms]) OR (orthopedic procedures[MeSH Terms]) OR (orthopedic procedure) OR (orthopedic procedures) OR (orthopaedic procedures) OR (orthopaedic procedure))) AND (((("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis")) AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))))

Pelvic osteotomy related string:

((((((osteotomy[MeSH Terms]) OR (osteotomies[MeSH Terms])) AND (pelvis[MeSH Terms])) OR ("pelvic osteotom\*"[Title/abstract]) OR ("pelvic surger\*"[Title/abstract]) OR ("periacetabular osteotom\*"[Title/abstract]) OR ("hip surger\*"[Title/abstract])) AND ((orthopedic procedure[MeSH Terms]) OR (orthopedic procedures[MeSH Terms]) OR (orthopedic procedure) OR (orthopedic procedures) OR (orthopaedic procedures) OR (orthopaedic procedure)))) AND (((("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism" OR "deep vein thrombosis")) AND ((Prevention and Control[MeSH Subheading]) OR (prevention[Title/Abstract]) OR (prevent\*[Title/Abstract]) OR (prophylaxis[tw]))))

**Total Results: 145 hits.**

***Inclusion Criteria:***

* Description of prophylaxis method (including mechanical and chemical)
* Venous thromboembolism rates reported
* Periacetabular osteotomies with or without femoral osteotomy
* Primary research
* English

***Exclusion Criteria***

* Elective total joint arthroplasty and revision joint arthroplasty
* Not in English.

**19 - What are the indications for Doppler ultrasound of the lower extremity to confirm or rule out DVT?**

**Search Terms:**

(("Ultrasonography, Doppler"[Mesh] OR Doppler Ultrasound OR Doppler Ultrasounds OR Doppler Ultrasonography OR Doppler Ultrasound Imaging OR Doppler Ultrasound Imagings) AND ("Lower Extremity"[Mesh] OR Lower extremity OR Lower extremities OR Lower Limb OR Ankle OR Hip OR Knee OR Leg OR Foot)) AND ("Venous Thrombosis"[Mesh] OR Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis OR Deep Vein Thromboses OR DVT) AND (indications OR indicators).

**PICO Terms List Worksheet:**

**Databases Searched:** PubMed, Cochrane Library, Scopus

**Filters:**

Language: English

Species: Human

***Inclusion Criteria:***

* Both clinical and preclinical studies with any level of evidence
* Published in peer-reviewed journals in English,
* Doppler ultrasound performed in the first 6 weeks following a lower limb total joint arthroplasty (TJA) or other lower limb surgery.

***Exclusion Criteria:***

* Data was not accessible or missing,
* Those without an available full-text article
* Duplicates
* Studies with poor scientific methodology as per risk of bias assessment.

**20 - Should the presence of a distal DVT in an extremity mandate repeat imaging of proximal veins?**

**Search Terms:**

(((distal) AND ("Diagnostic Imaging"[Mesh] OR diagnostic imaging OR "Veins/diagnostic imaging"[Mesh)) AND ("Venous Thrombosis"[Mesh] OR Deep Venous Thrombosis OR Deep Venous Thromboses OR Deep Vein Thrombosis Or Deep Vein Thromboses or DVT)) AND (proximal DVT OR proximal veins OR proximal vein)

**Total Results: 362 hits.**

***Inclusion Criteria:***

* Primary research
* English articles

***Exclusion Criteria:***

* Not discussing distal DVT
* Narrative review articles
* Not in English.

**21 - Do patients undergoing UKA, including patellofemoral joint arthroplasty, have a different VTE risk profile compared to TKA?**

**Search Terms:**

("Venous Thromboembolism"[Mesh] OR "Venous Thrombosis"[Mesh] OR "pulmonary embolism"[Title/Abstract] OR "deep vein thrombosis"[Title/Abstract] OR ("VTE"[Title/Abstract])) ) OR ("VTE risk"[Title/Abstract])) AND ((((((Arthroplasty, Replacement, Knee[MeSH Terms]) OR ("unicompartmental knee arthroplasty"[Title/Abstract]) OR ("partial knee arthroplasty"[Title/Abstract])) OR ("UKA"[Title/Abstract])) OR (patellofemoral arthroplasty[Title/Abstract])) OR ("Unicompartmental Knee Replacement"[Title/Abstract])) OR ("Unicondylar Knee Arthroplasty"[Title/Abstract])

**Total Results: 87 hits.**

***Inclusion Criteria:***

* Original studies and meta-analysis
* Reported number, incidence or risk of VTE after knee arthroplasty surgery
* Unicompartmental knee arthroplasty including medial, lateral or patellofemoral

***Exclusion Criteria:***

* Case series
* Narrative review articles.