

# Assessment of Venous Thromboembolism Rates Following Elective Total Knee and Total Hip Arthroplasties in Patients Receiving Prophylactic Twice Daily Aspirin

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## Background

- Patients who undergo high-risk orthopedic procedures including total hip arthroplasty (THA) and total knee arthroplasty (TKA) are at an increased risk of venous thromboembolic (VTE) events.<sup>1,2</sup>
- Both AAOS and ACCP state that aspirin is one of the acceptable medication options for postoperative VTE prophylaxis.<sup>1,2</sup>
  - Reported VTE rate from ACCP: 2.3%; 1.8% for symptomatic DVTs and 0.5% for PEs.<sup>2</sup>
  - Neither group specifies the optimal dosing or duration of aspirin therapy
- 2016 meta-analysis and systematic review analyzed VTE rates from 39 studies with patients who underwent THA or TKA and received aspirin as the sole chemoprophylactic agent.<sup>3</sup>
  - Pooled rate of DVTs from 16 studies to be 1.2% and the pooled rate of PEs from 25 studies to be 0.6%
  - Concluded that aspirin is a suitable therapy for VTE prevention following a TKA or THA

## Methods

**Objective:** Compare the rates of VTEs that occurred within 90 days of elective TKA or THA in patients receiving aspirin 325 mg orally twice daily for 6 weeks to literature-derived rates.

- Retrospective, single-center, observational study
- Study groups: Subjects who received a hospital discharge prescription for aspirin 325 mg by mouth twice daily for 6 weeks for VTE prophylactic therapy following elective THA or TKA
- Subgroups: Type of procedure (THA or TKA) and type of VTE (DVT or PE)

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> <li>• Adults who underwent elective THA or TKA between January 2014 and October 2016</li> <li>• Prescribed aspirin 325 mg PO BID x 6 weeks</li> <li>• Had a Billings Clinic primary care provider</li> </ul>	<ul style="list-style-type: none"> <li>• Patients prescribed other medications at discharge that were efficacious for VTE prophylaxis regardless of indication</li> <li>• Non-elective THAs or TKAs (e.g., trauma)</li> <li>• Pregnant or breast feeding</li> </ul>

## Primary Outcome

- Analyze the percentage of eligible patients who experienced symptomatic VTEs within 90 days of surgery

## Secondary Outcomes

- Rates of symptomatic DVTs or PEs
- Number of days after surgery that the patient experienced a VTE
- Major bleeding within 90 days of surgery
- 90-day all-cause mortality following TKA or THA

## Results

### Baseline Characteristics

Characteristic	All Participants (n=565)	THA (n=214)	TKA (n=351)	P Value
Age, mean years ± SD	65.4 ± 10	64.4 ± 10.7	66 ± 9.6	0.07
Female, n (%)	324 (57)	120 (56)	204 (58)	0.63
Length of stay, mean days ± SD	2.8 ± 1.8	2.7 ± 1	2.8 ± 1.5	0.63

## Primary Outcome

### Comparative VTE and Bleeding Rates

Comparative VTE Rates Post-THA or TKA				
	Treatment	VTE	DVT	PE
2012 ACCP Guidelines <sup>3</sup>	Enoxaparin	1.8%	1.25%	0.55%
	No VTE prophylaxis	4.3%	2.8%	1.5%
2016 Meta-analysis <sup>1</sup>	Aspirin	1.8%	1.2%	0.6%
	Other VTE prophylaxis	--	--	--
This Study	Aspirin	<b>0.9%</b>	<b>0.2%</b>	<b>0.7%</b>
	Other VTE prophylaxis	--	--	--

### VTE Occurrence Rates

Event	All Participants (n=565)	THA (n=214)	TKA (n=351)	P Value
VTE, n (%)	5 (0.9)	1 (0.5)	4 (1.1)	0.41
DVT, n	1	0	1	--
PE, n	4	1	3	--

## Secondary Outcomes

Outcome	All Participants (n=565)	THA (n=214)	TKA (n=351)
VTE occurrence after surgery, mean days $\pm$ SD	13 $\pm$ 6.8	20 $\pm$ 0	13.2 $\pm$ 6.8
Major bleeding, n (%)	1 (0.2)	1 (0.2)	0
90-day all-cause mortality, n (%)	5 (0.9)	1 (0.5)	4 (0.1)

## Discussion

- Lower rates of VTE compared to established literature values
- Majority of VTE occurrences happened in 2016
  - 4/5 were obese
  - 4/5 were women
  - 4/5 were >40 years old
  - None had prior VTEs
- 90 day all-cause mortality
  - One was related to THA complication
  - None from VTE occurrence
  - Occurred average of 47 days after surgery
- Major bleed only occurred in one patient
  - 82 year old male receiving THA, gastrointestinal bleed, required re-hospitalization

## Limitations

- Comparing VTE rates studies with different designs and criteria for inclusion
- Retrospective design
- Patients were excluded if taking other anticoagulants
- Concomitant antiplatelet therapy not assessed
- Quazi-randomization could have missed VTEs
- Did not assess aspirin compliance

## Conclusions

- In this study, subjects undergoing elective TKA or THA who received aspirin 325 mg orally twice daily for 6 weeks had lower rates of VTE occurrence than historically published literature values

## References:

1. American Academy of Orthopaedic Surgeons. Preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty. Evidence based guidelines and evidence report (September 24, 2011). Available at: [http://www.aaos.org/research/guidelines/VTE/VTE\\_full\\_guidelin.pdf](http://www.aaos.org/research/guidelines/VTE/VTE_full_guidelin.pdf). Accessed September 13, 2016.
2. Flack-Yeter Y, Francis C, Johanson N, et al. Prevention of VTE in orthopedic surgery patients: antithrombotic therapy and prevention of thrombosis, 9<sup>th</sup> edition: American College of Chest Physicians evidence-based guidelines. Chest 2012;141:278-325.
3. Vincent VG, Phan K, Levy YD, Warwick JM. Aspirin as thromboprophylaxis in hip and knee arthroplasty: a systematic review and meta-analysis. J Arthroplasty 2016;31:2608-2616.