

Warfarin Reversal in the Hip Fracture Population

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1 Background

- Hip fracture is the most common disabling injury and the **third** cause of death among older adults [3]
- As the elderly population rises, the global number of hip fractures is projected to exceed 7 million over the next 40 to 50 years [4]
- Up to 4% of patients with a hip fracture may be on warfarin at admission [1]
- Surgery for warfarinized patients is delayed considerably compared to their non-warfarinized peers thus extending their overall hospital stay and posing a greater risk for complications
- Clinical guidelines recommend immediate reparative surgery within 24-48 hours from hospital admission [6]

Why time matters?

24-48 hours to surgery is associated with:

- A lower risk of death [7]
- Lower rates of postoperative pneumonia [7]
- Lower rates of pressure sores among elderly patients with hip fractures [7]
- Improved 1 year survival post surgery [5]

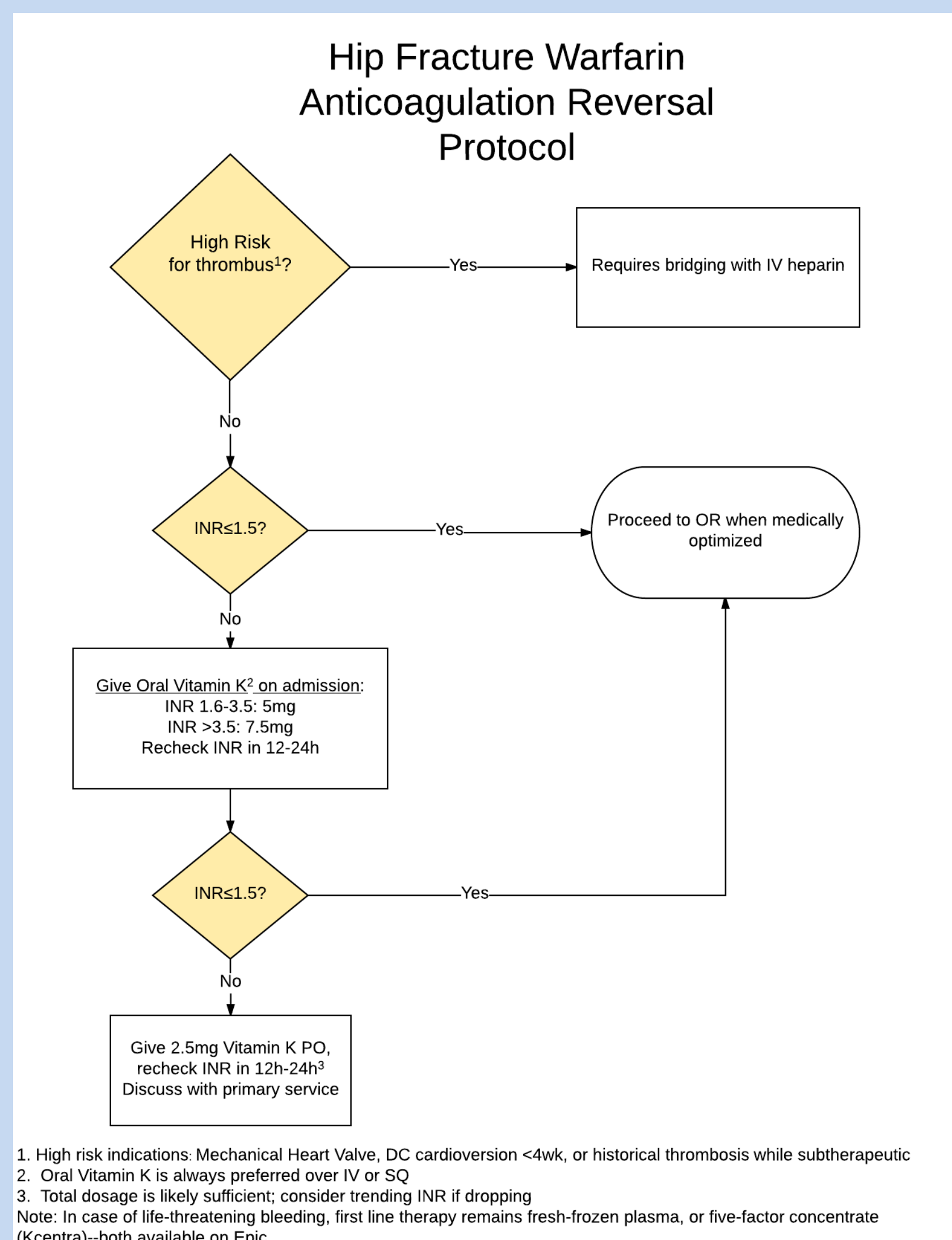
>48 hours to surgery is associated with:

- Bedsores [6]
- Pneumonia [8]
- Urinary tract infections [8]
- Pulmonary embolism [8]
- Delirium [2]

- These findings indicate that reducing delays to surgery may minimize mortality and complications for hip fractured patients on warfarin.

2 Objectives

- 1) Streamline the process of acute hip fracture surgery for patients on Warfarin.
- 2) Decrease time to operating room by 50% → **GOAL TIME = <48 hours.**



3 Methods

The first aspect of our study is the development of a physiologically sound protocol for warfarin reversal in acute hip fracture. The aim of this protocol is to accelerate time to surgery for our population by beginning oral Vitamin K upon admission to the emergency department (ED) to correct patients' INR (international normalized ratio) levels. INR is the measurement of the time it takes blood to clot. An INR of **<1.5** is required before surgery can proceed safely. The next step is to provide educational workshops to ED staff at Johns Hopkins Bay View Medical Center on how to use the warfarin reversal protocol in order to standardize the identification of these cases. Once the protocol is implemented in the ED, we will then begin tracking the outcomes in a pre-post study fashion, as a quality improvement study. Our goal sample size is N= 50-70. This study will run for at least one year and up to two years.

4 Expected Conclusions

We anticipate our findings to demonstrate that warfarinized individuals with acute hip fractures who were operated on within 24-48 hours of admission to the ED, would have better outcomes and less complications compared to warfarinized individuals whose surgery time after admission was greater than 48 hours.

5 Future Directions

- 1) Record any post-operative complications between timely surgeries vs delayed surgeries
- 2) Implement protocol at other hospitals to generate a greater sample size

6 References

1. Ahmed, I., Khan, M. A., Nayak, V., & Mohsen, A. (2014). An evidence-based warfarin management protocol reduces surgical delay in hip fracture patients. *Journal of Orthopaedics and Traumatology*, 15(1), 21-27.
2. Chow, W. B., Rosenthal, R. A., Merkow, R. P., Ko, C. Y., & Esnaola, N. F. (2012). Optimal preoperative assessment of the geriatric surgical patient: A best practices guideline from the American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society. *Journal of the American College of Surgeons*, 215(4), 453-466.
3. de Palma, L., Torcianti, M., Meco, L., Catalani, A., & Marinelli, M. (2014). Operative delay and mortality in elderly patients with hip fracture: An observational study. *European Journal of Orthopaedic Surgery & Traumatology*, 24(5), 783-788.
4. Parker, M., & Johansen, A. (2006). Hip fracture. *BMJ: British Medical Journal*, 333(7557), 27.
5. Gdalevich, M., Cohen, D., Yosef, D., & Tauber, C. (2004). Morbidity and mortality after hip fracture: The impact of operative delay. *Archives of Orthopaedic and Trauma Surgery*, 124(5), 334-340.
6. Moja, L., Piatti, A., Pecoraro, V., Ricci, C., Virgili, G., Salanti, G., Germagnoli, L., Liberati, A. and Banfi, G. (2012). Timing matters in hip fracture surgery: Patients operated within 48 hours have better outcomes. A meta-analysis and meta-regression of over 190,000 patients. *PLoS one*, 7(10), p.e46175.
7. Simunovic, N., Devereaux, P. J., Sprague, S., Guyatt, G. H., Schemitsch, E., DeBeer, J., & Bhandari, M. (2010). Effect of early surgery after hip fracture on mortality and complications: Systematic review and meta-analysis. *Canadian Medical Association Journal*, 182(15), 1609-1616.
8. Sircar, P., Godkar, D., Mahgerefteh, S., Chambers, K., Niranjan, S., & Cucco, R. (2007). Morbidity and mortality among patients with hip fractures surgically repaired within and after 48 hours. *American Journal of Therapeutics*, 14(6), 508-513

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