

# Innovative after-hours supply of DOAC in ED reduces length of stay whilst improving safety



Northern Health



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## Background

In 2013, direct oral anticoagulants (DOACs) were listed on the Pharmaceutical Benefits Schedule for the treatment of venous thromboembolism. Since then, they have become the treatment of choice given their ease of use compared to warfarin. DOACs have a predictable pharmacokinetic and pharmacodynamic profile and when used in appropriate patients DOACs are non-inferior to warfarin with similar bleeding risks, if not less.<sup>1</sup>

At the Northern Hospital's Emergency Department (ED) the majority of patients with deep vein thrombosis (DVT) present outside pharmacy hours. To establish safe prescribing of DOACs, prevent delay of supply, and maintain a pharmacist's and haematology review, we implemented a "Rivaroxaban after-hours pack" system. These packs contain a 3-day supply of Rivaroxaban 15mg, patient product information booklet and emergency contact details. We utilised *GuidanceMS* to develop a criteria and approval process that ensures safe and appropriate prescribing.



Fig 1. Rivaroxaban after-hours pack

## Aims

1. To review the clinician's compliance to the "Rivaroxaban-after hours pack" system
2. To review the safety and efficacy of the "Rivaroxaban-after hours pack" system
3. To review the impact of the "Rivaroxaban-after hours pack" system on length of stay, compared to the warfarin era

## Methods

This is a retrospective evaluation of all DVT patients presenting to ED who were discharged with a Rivaroxaban after-hours pack from April 2015 to December 2016. Data was collected via the pack register, *GuidanceMS*, and clinical records to include patient demographics, baseline bloods, medication history, potential contraindications and length of stay.

These patients were followed-up for a minimum of 6 months.

## References:

1. The Einstein Investigators, Oral Rivaroxaban for Symptomatic Venous Thromboembolism. *N Engl J Med*, 2010. 363: p. 2499-2510.
2. Lim, H.Y., et al., Venous thromboembolism management in Northeast Melbourne - How does it compare to international guidelines and data? *Intern Med J*, 2017.

## Description of process

Figure 2. shows the "Rivaroxaban after-hours pack" process, from when the decision is made to prescribe rivaroxaban for the management of DVT to ED pharmacist follow up.

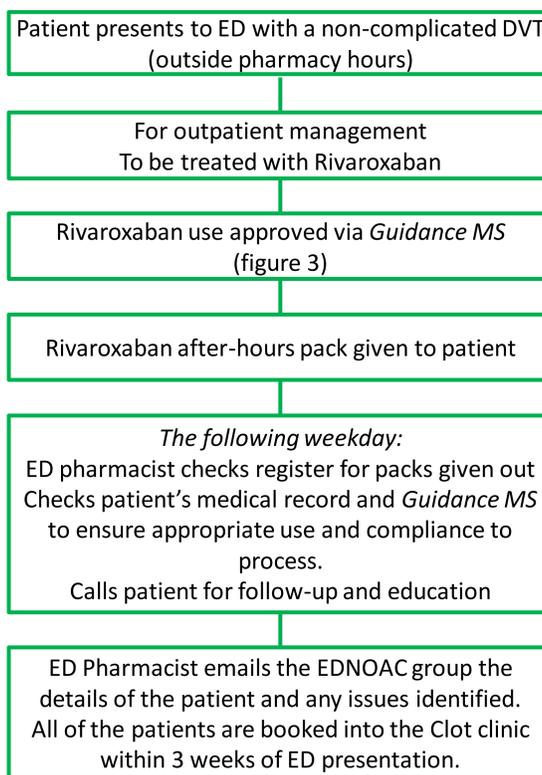


Fig 2. Process for supplying Rivaroxaban after-hours pack

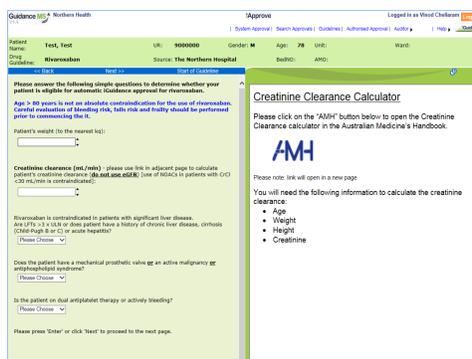


Fig 3. *Guidance MS* criteria for rivaroxaban approval

## Results

**77 patients** with newly diagnosed DVT were discharged with a "Rivaroxaban after-hours pack".

### DEMOGRAPHICS OF PATIENTS

- Median age 52 years (range 22 to 84)
- 98.7% of the patients met the weight criteria (defined as weight 50 to 120kg)
- All patients had eGFR >30 mL/min
- 67 patients (87.0%) had liver function testing done
  - 1 did not meet the criteria

### RELATIVE CONTRAINDICATIONS

- 2 patients (2.6%) had known active malignancy
- No patients had a medical history of mechanical valve or antiphospholipid syndrome

## Results

### PROCESS COMPLIANCE

- 71% of patients had *GuidanceMS* approval done
- All patients received pharmacist follow-up
- All patients were reviewed in Clot Clinic

### OUTCOMES

- **Clinically significant bleeding**
  - 1 patient (1.3%) represented with thigh haematoma
  - 1 patient (1.3%) reported significant menorrhagia requiring change of anticoagulant
- **Recurrent VTE or clot progression**
  - 2 patients (2.6%) had clot extension while on rivaroxaban despite good compliance
- **Length of stay (LOS)** (figure 4)
  - Marked improvement in LOS compared to DVT patients audited during the warfarin era (8.0 hours vs 5.17 days,  $p < 0.001$ )<sup>2</sup>
- **Cost of stay** (figure 4)
  - An improvement in LOS reduces the cost of stay. It costs \$1,500 per day for a medical admission, compared to \$550 per 4 hours in ED. On average, the hospital saves \$6,655 per patient sent home with a rivaroxaban-after hours pack, compared to a warfarin admission.

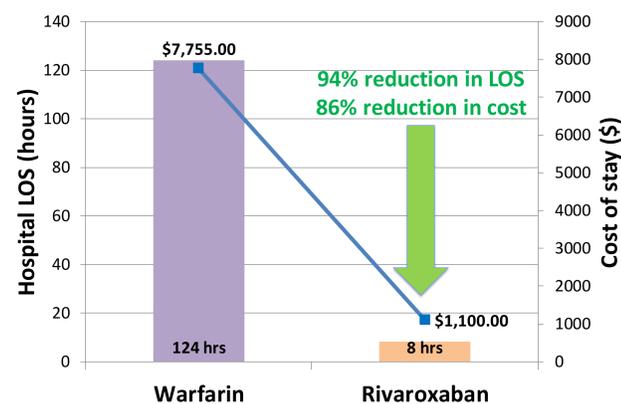


Fig 4. Length of stay and Cost of stay: Rivaroxaban after-hours pack patients vs. Warfarin era

## Conclusion

This innovative method for medication supply ensures that all DVT patients presenting to ED outside pharmacy hours are safely prescribed and given Rivaroxaban, without increased bleeding rates. This system assures safe governance by providing a comprehensive pharmacist and haematology follow up. Physician uptake of the process, especially obtaining *GuidanceMS* approval, can be further improved through ongoing education.

In addition, this system has significantly reduced the length of stay in hospital for DVT patients, thereby significantly saving money and potentially improving overall patient flow and resource allocation.

**This system is safe, efficient and cost-effective.**