

Conservative enoxaparin dosing for haemodialysis – one shot to get it right

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Background

During haemodialysis anticoagulation is often required to prevent thrombosis in the extracorporeal blood circuit. Historically, the Metro North Kidney Health Service North Lakes Satellite Dialysis Unit has used heparin over enoxaparin. In May 2023, a long-term shortage of heparin 5000units/5mL prompted a need to switch to enoxaparin.

Clexane® product information recommends 1mg/kg for extracorporeal anticoagulation. Due to concerns of bleeding, a conservative dose conversion was used based on the total dose of heparin patients received per dialysis session:

- <3500units heparin per dialysis session → enoxaparin 20mg was prescribed
- >3500units heparin per dialysis session → enoxaparin 0.6mg/kg (rounded to the nearest 10mg) up to a maximum of 100mg was prescribed

Aims

To determine the safety and efficacy of using conservative enoxaparin conversion doses in a dialysis unit.

To compare the cost of using enoxaparin to that of heparin.

To estimate nursing time saved by using enoxaparin in place of heparin.

Methods

Haemodialysis patients prescribed heparin were reviewed and, if appropriate, converted to enoxaparin using the dosing guide provided. Charts were audited three months post-implementation to review changes and any anticoagulation-related complications.

A cost comparison was calculated by estimating the total cost of heparin (based on doses prior to changeover), or enoxaparin required for a single dialysis session.

Nursing time was assessed via direct observation. Staff were timed preparing heparin and enoxaparin for four patients each, and the results extrapolated to estimate the total time required for a single dialysis session.

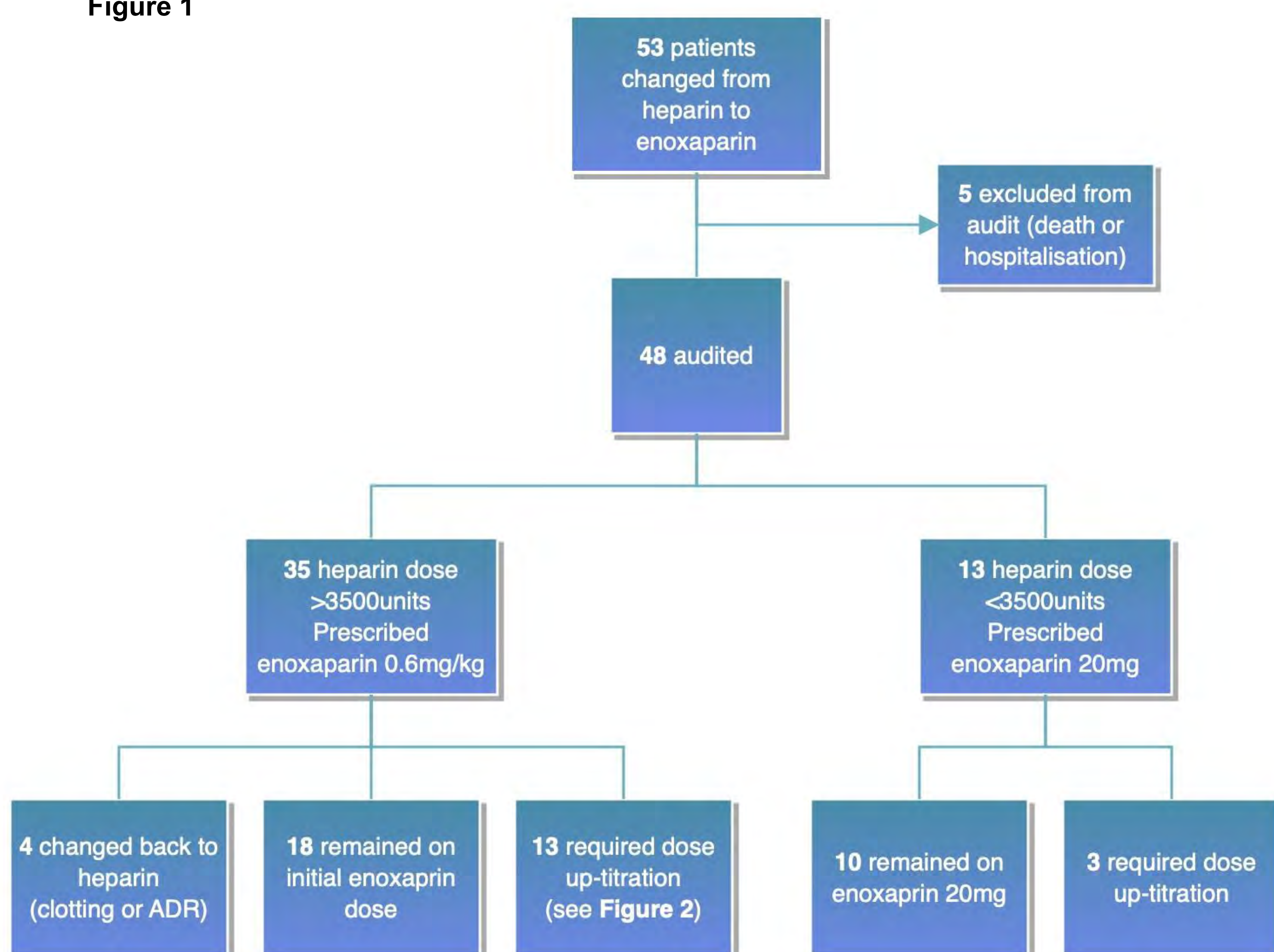
Results

Anticoagulant changeover and dosing

The results of the post-implementation audit are summarised in **Figure 1**.

No bleeding complications or dose reductions were reported.

Figure 1

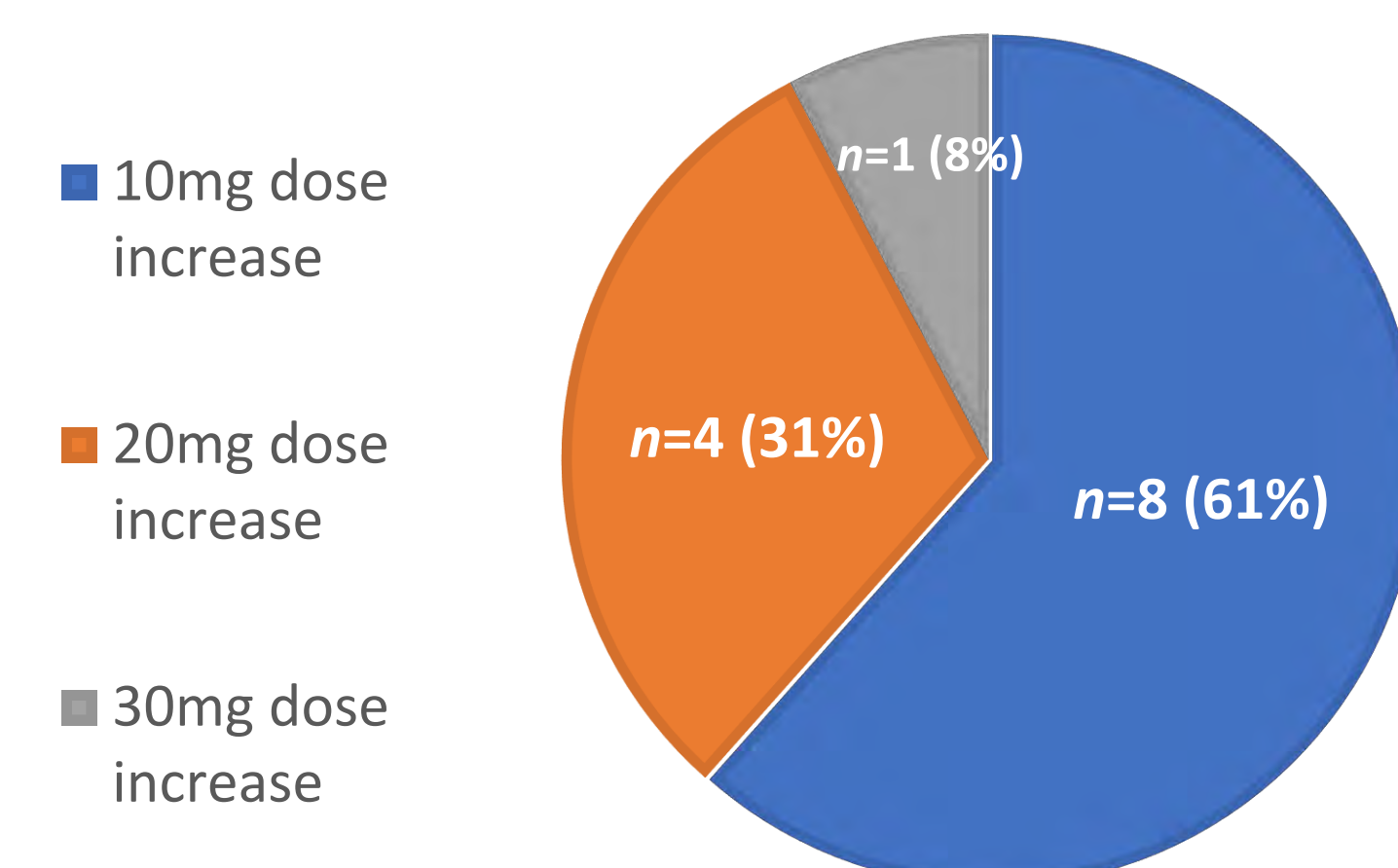


Nursing time saved

Nurses required 3.5 to 4min per patient to prepare heparin and less than 1min for enoxaparin. **Table 2** provides a conservative estimate of the total time saved.

Figure 2

Weight-based enoxaparin dose up-titration



Cost comparison

The cost comparison of heparin compared to enoxaparin is shown in **Table 1**.

Table 1

Clexane® strength	Number of syringes required	Cost per syringe	Total cost
20mg	10	\$3.35	\$33.50
40mg	9	\$3.75	\$33.75
60mg	14	\$6.49	\$90.86
80mg	10	\$6.90	\$69.00
100mg	1	\$9.16	\$9.16
			\$236.27

Estimated total amount of heparin	Number of 5000units/5mL vials	Cost per vial	Total cost
244,625units	49	\$2.83	\$138.67

Table 2

Anticoagulant	Time per patient	Number of patients	Total time
Heparin	3.5min	44	154min
Enoxaparin	1min	44	44min
	Nursing time saved		110min

Conclusion

Our unit used a conservative dosing conversion from heparin to enoxaparin and this approach was appropriate based on our audit findings. There were no bleeding complications or dose reductions, and only 4 patients needed to change back to heparin.

Most of the weight-based dosing group who required dose up-titration only needed an increase of 10mg. For all these patients, the need for a dose increase would have been avoided had we rounded up to the nearest 20mg.

While enoxaparin costs more, it offers significant time saving for nursing staff allowing more time for direct patient care.