

Introduction of tighter APTTr control using a nurse led anti-coagulation algorithm during renal replacement therapy

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Torbay ICU

- New 14 bedded general ICU/HDU
- All ages – adults and paediatrics
- Staff - Varied levels of experience

Renal specifics

- Prismaflex
- ST150 sets only
- Only use Continuous Veno-Venous Hemodiafiltration (CVVHDF)
- Only use prismaSol 4
- VASCATHS - Arrow
- Non- citrate

Aim

- To develop a nurse led anticoagulation algorithm to achieve a tighter APTTr range of 1.5 – 2.0
- To increase nurse autonomy in altering the Heparin rate to achieve this
- To investigate the effect of a tighter APTTr on filter life

Background

- To reduce our current APTTr range from 2.0-2.5 to 1.5-2.0 to avoid the complications associated with over anticoagulation (ICS, 2009; Karakala & Tolwani, 2016)
- Introduction of a new CVVHDF prescription chart

Background cont.

- Increase in volume of patients being filtered
- Use of a generic heparin nomogram
- New consultants interested in citrate

Methodology

- Literature review
- Contacted ICUs within the South West Peninsula
- Identified the most appropriate and adapted it to our specific clinical needs (Ostermann et al, 2010)
- Introduced the algorithm and new prescription to the unit

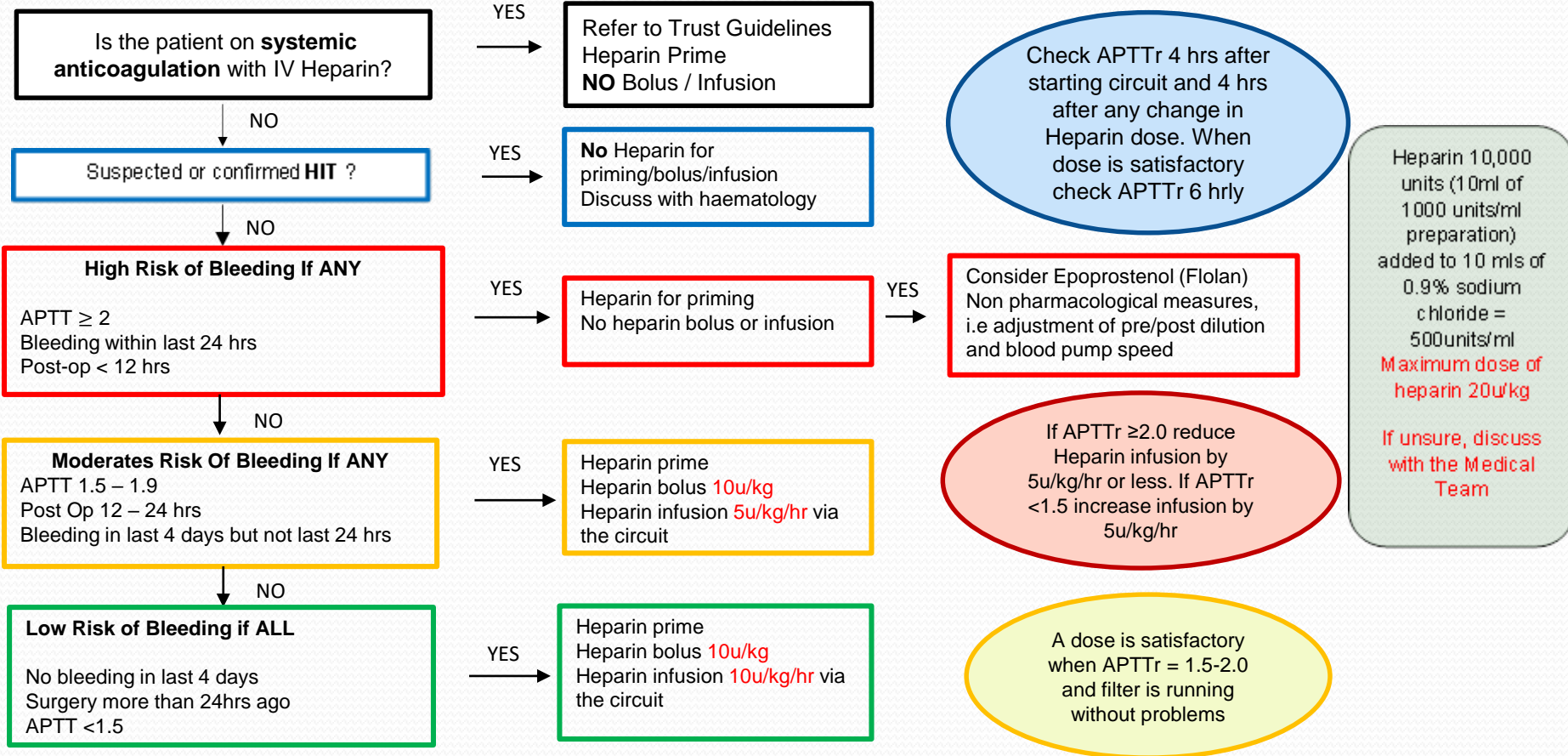
Methodology cont.

- Developed an audit tool to look at:
 - average APTTr,
 - filter life
 - number of all blood products used / patient
- Retrospectively audited all patients on CVVHDF for the year prior to the introduction of the algorithm (2015) and post introduction (2016).
- Developed an education programme

Algorithm

Guidelines for Routine Anticoagulation with Heparin During CVVHDF – Target APTT 1.5 – 2.0

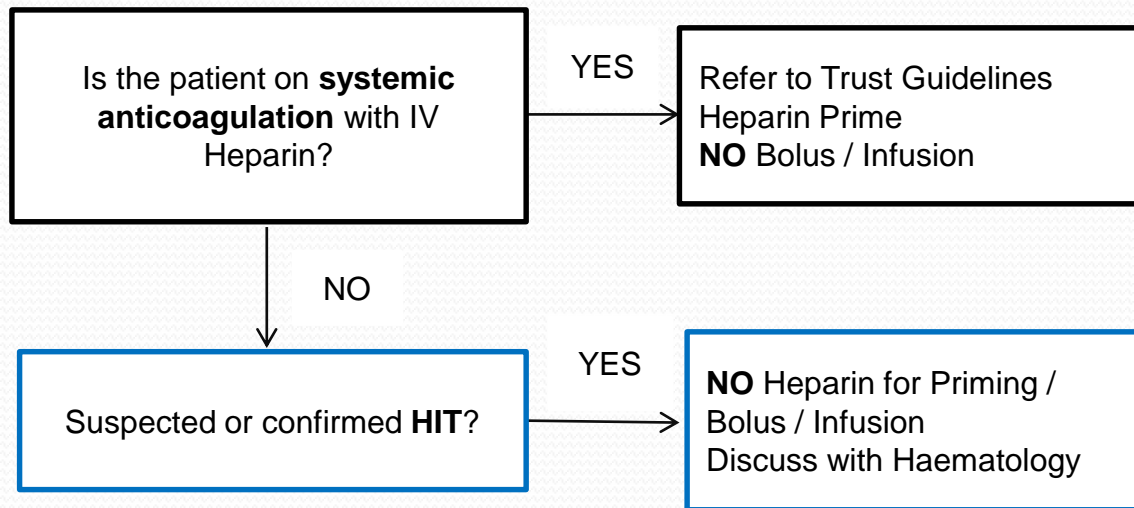
Review Every 24 hrs



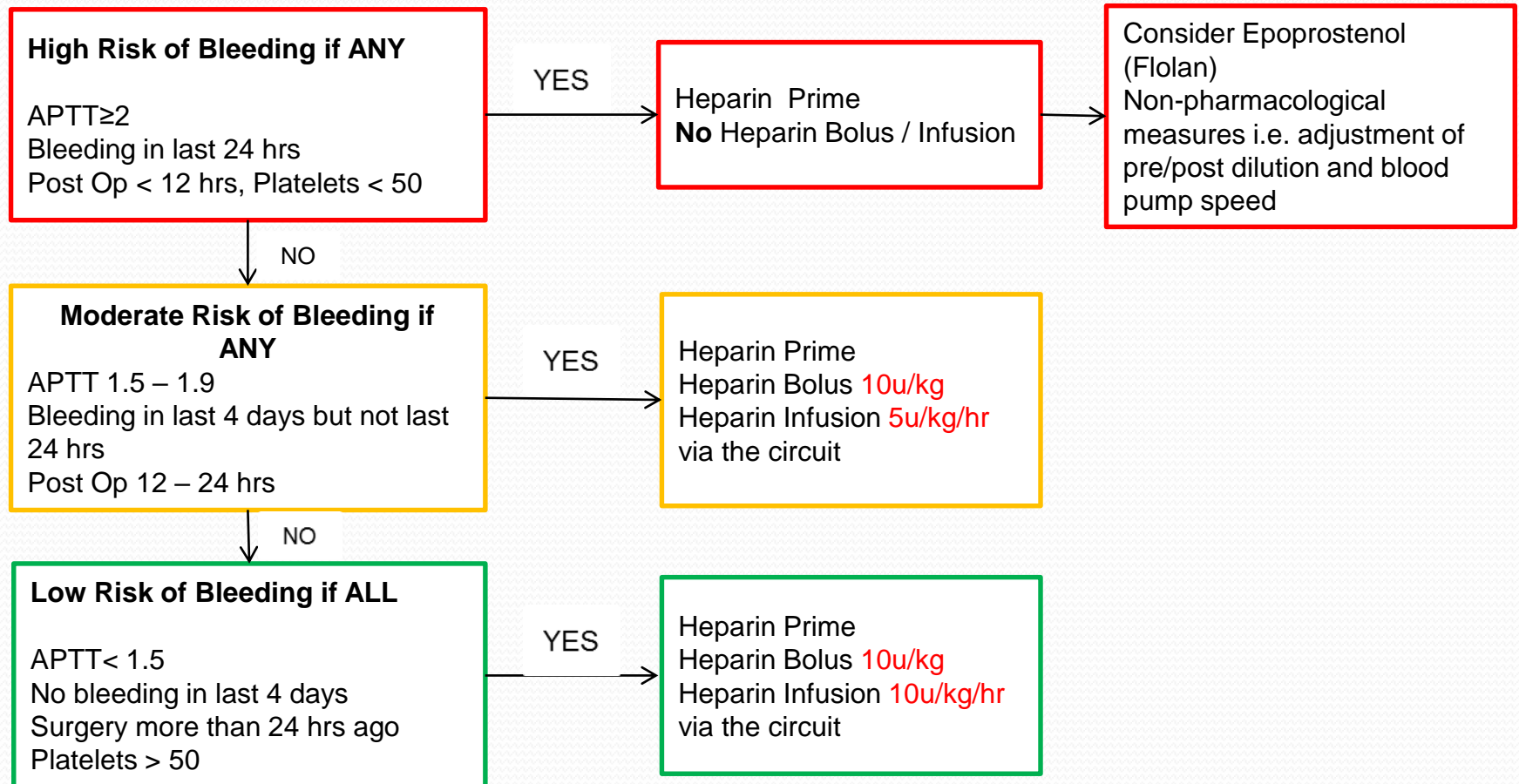
Algorithm

Guidelines for Routine Anticoagulation with Heparin During CVVHDF – Target
APTT 1.5 – 2.0

Review Every 24 hrs



Algorithm



Algorithm

Heparin 10,000 units (10ml of 1000 units/ml preparation) added to 10 mls of 0.9% sodium chloride = 500units/ml **Maximum dose of heparin 20u/kg**

If unsure, discuss with the Medical Team

If APTT ≥ 2.0 reduce heparin infusion by **5u/kg/hr** or less.

If APTT < 1.5 increase infusion by **5u/kg/hr**

Check APTT 4 hrs after starting circuit and 4 hrs after any change in heparin dose.

When dose is satisfactory check APTT 6 hrly

A dose is satisfactory when APTT = 1.5 – 2.0
Filter is running without problems



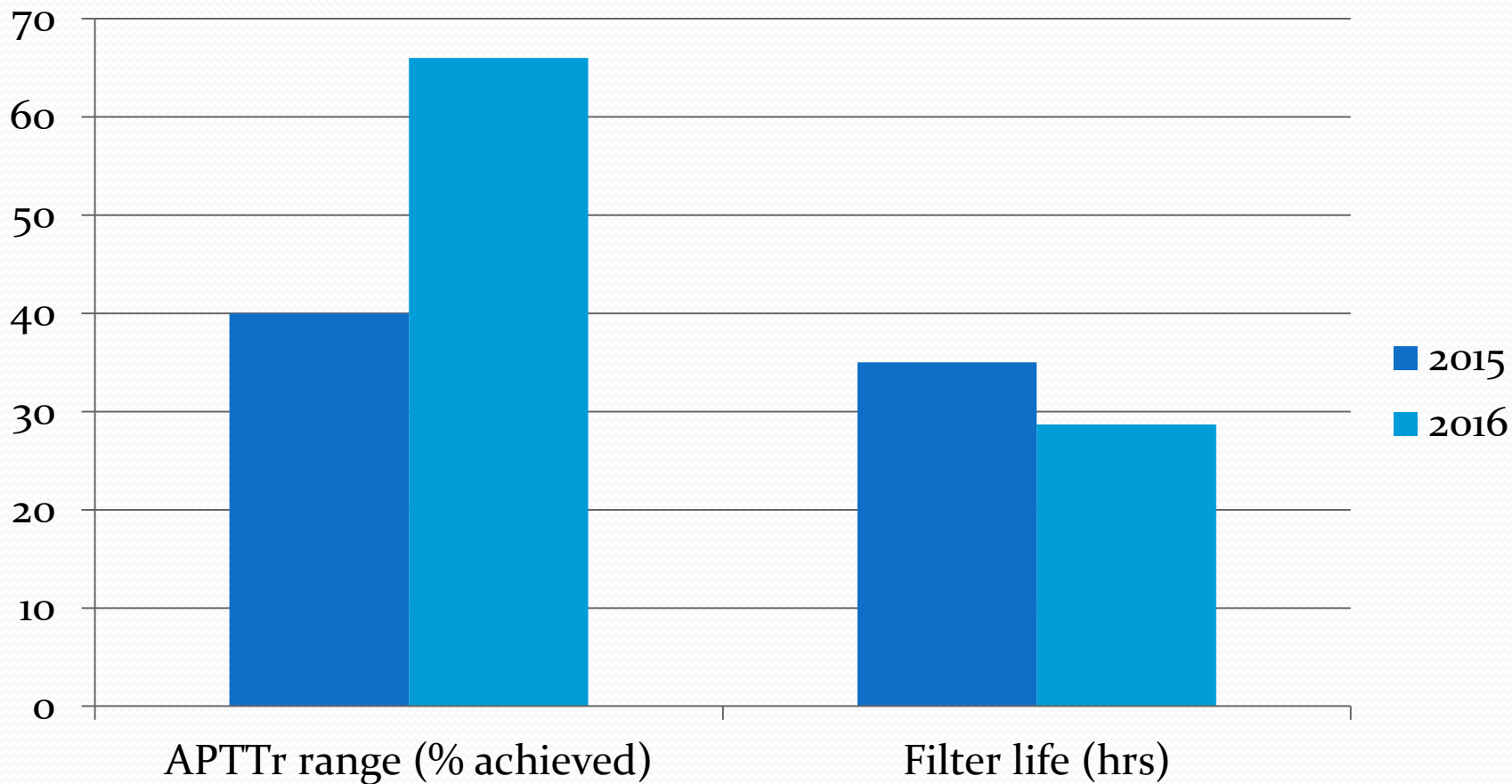
2015 Results

- Pre introduction audit of 60 patients showed :
 - Average APTTr was 2.2,
 - 40% achieved APTTr within the required range
 - Average time on filter 3.2 days
 - Average filter life was 35 hours
 - Average number of all blood products used was 1.1

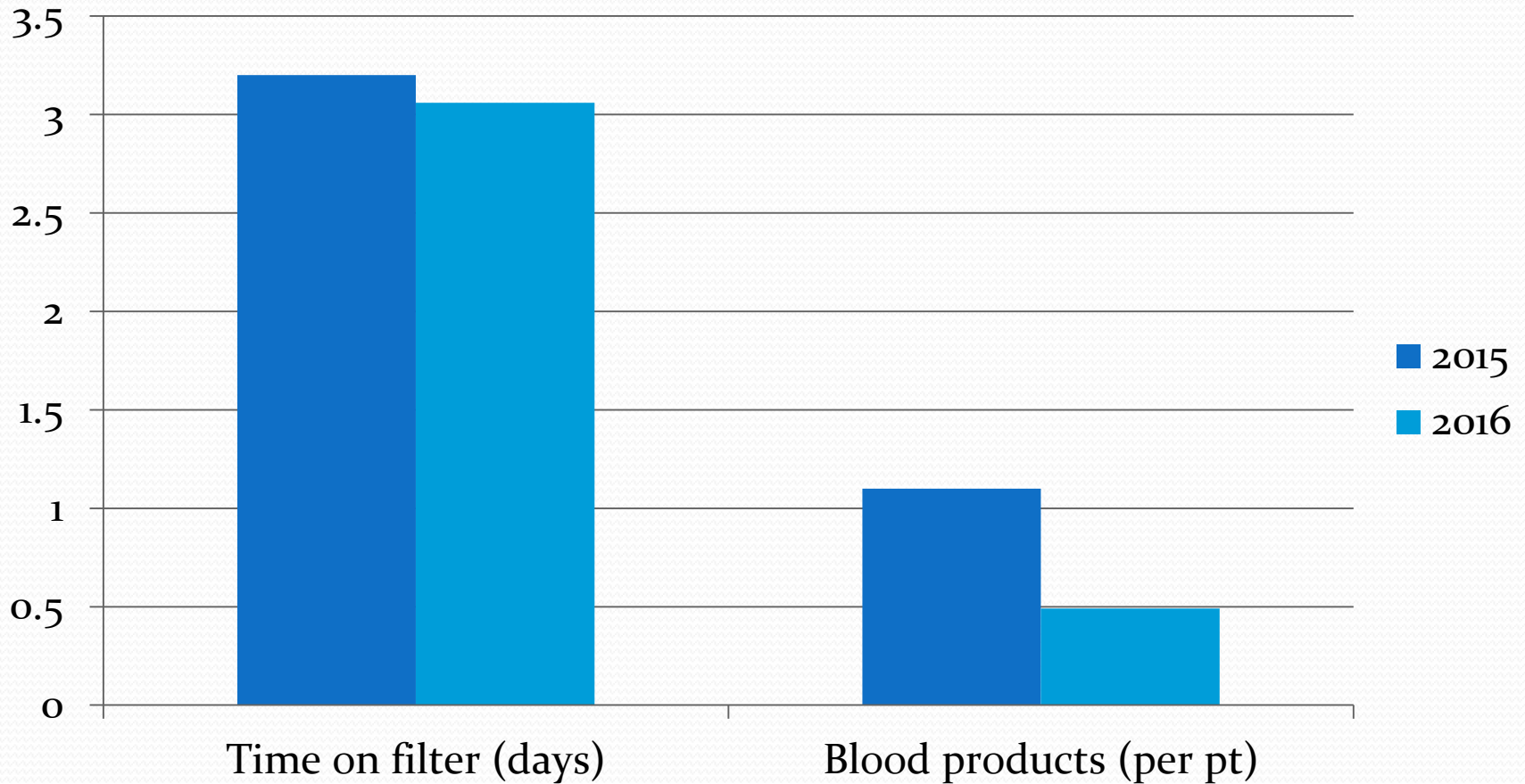
2016 Results

- Post introduction audit of 84 patients showed
 - Average APTTr 1.8
 - 66% achieved APTTr within the required range
 - Average time on filter 3.06 days
 - Average filter life 28.7 hours
 - Average number of all blood products used was 0.49

Pre & post intervention - 1



Pre & post-intervention - 2



Results

- Improvement in achieving APTTr in the desired range from 40% to 66%
- The introduction of the algorithm has empowered the nursing staff to be more independent during RRT
- Staff knowledge and confidence in using the algorithm has led to the desired aim of an APTTr range between 1.5 – 2.0

Limitations of Audit

- We did not identify why filters stopped
- Availability of some patient notes and poor documentation
- Patient death before an APTTr was taken
- No APTTr recorded in some cases

Conclusions

- On completion of the audit, we have achieved the aim of the APTTr range of 1.5 – 2.0 (average 1.8)
- We have had positive feedback to show that nurse confidence and knowledge has greatly improved
- A lower APTTr has affected filter life

Recommendations

- Continuing education
- Reviewing algorithm in light of new data
- Further audits, focusing on
 - Specific causes of filter failure
 - Flow settings

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References

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Any Questions



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