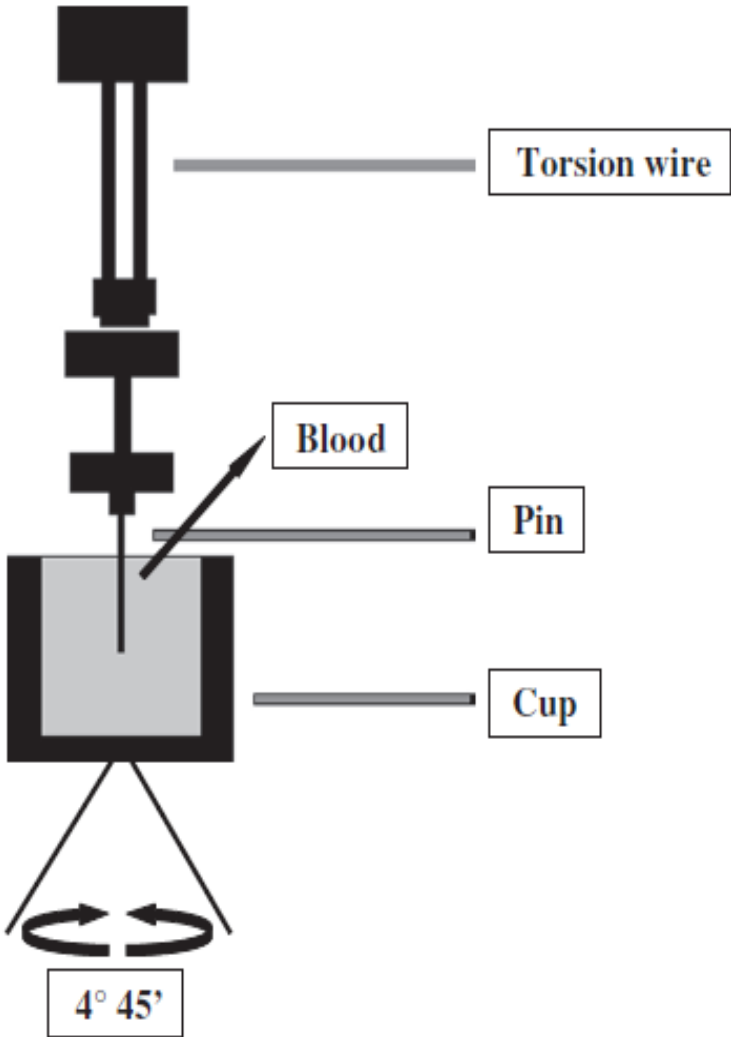


# **The impact of thromboelastography (TEG) on the decision making process of anaesthetists in a non-cardiac surgical setting**

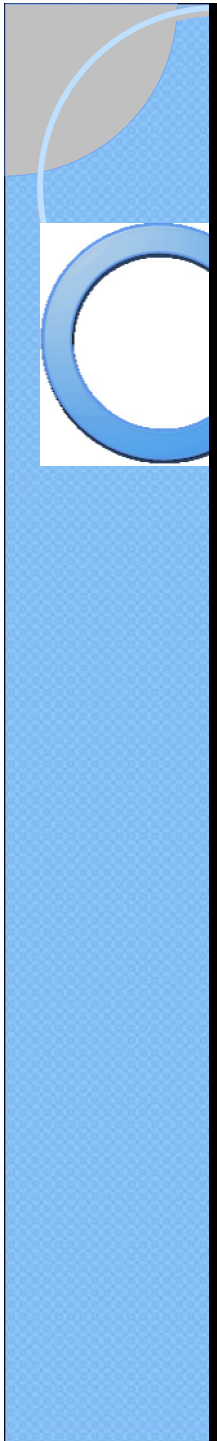
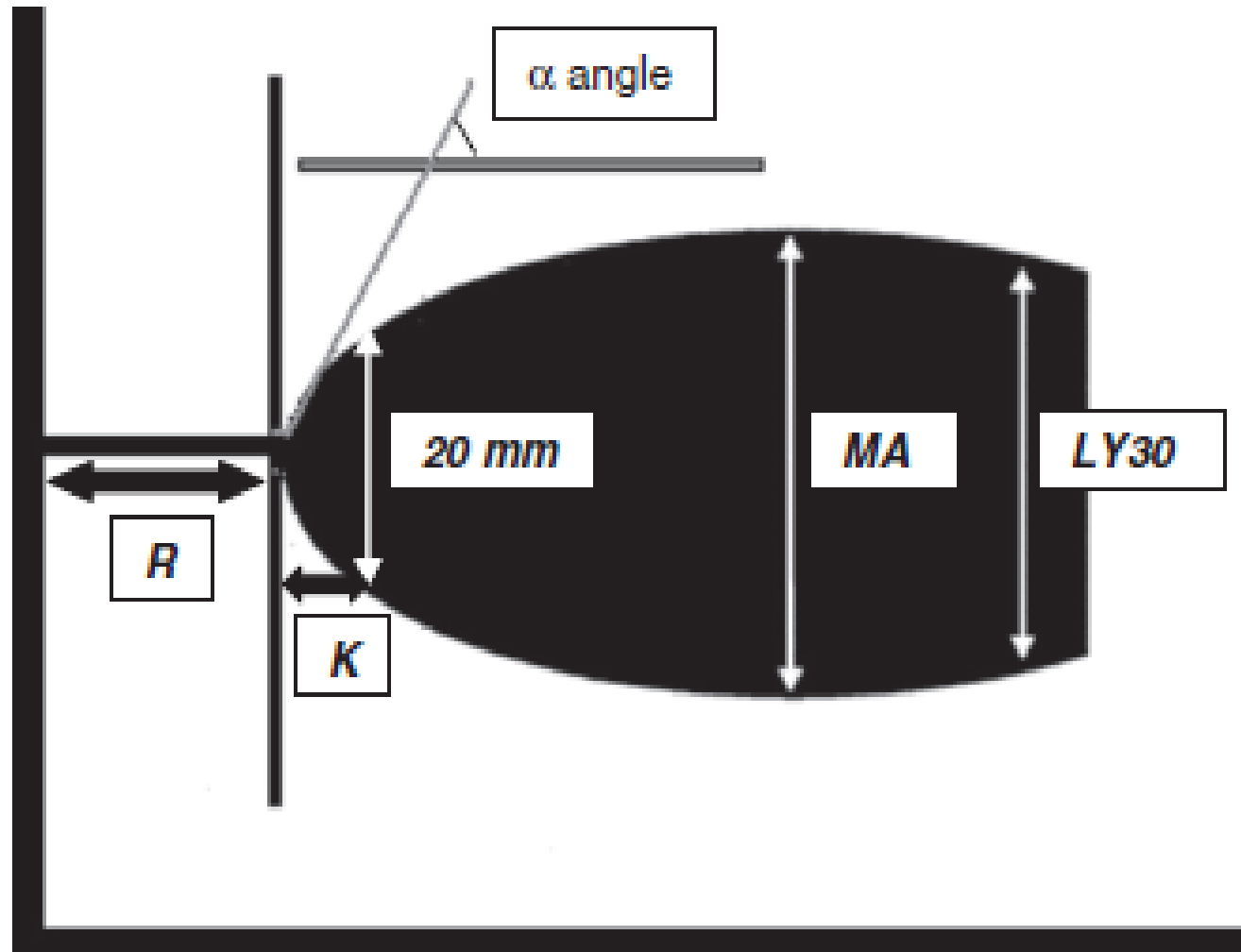
Name of student: Rashitha Wilwera Arachchige

Name of supervisor: Dr Katherine Pendry

# Thromboelastography (TEG)



## Interpretation of a TEG result



## TEG vs Standard blood tests





## TEG at Manchester Royal Infirmary (MRI)

- 2 TEG machines
  - Cardiac theatres
    - Staff by operating department practitioners (ODPs)
  - Critical care lab
    - Staff by critical care technicians
- Clinical staff
  - Online lectures, courses and training days
- Quality control
- Quality assurance



## Methods – Sampling group

<b>Department/ward</b>	<b>Number of times</b>
<b>Manchester heart centre</b>	201
<b>Critical care/HDU</b>	71
<b>Obstetrics</b>	54
<b>General surgery and vascular ward</b>	23
<b>Elective treatment centre short stay</b>	15
<b>Renal</b>	11
<b>Vascular and orthopaedic ward</b>	9
<b>Emergency department</b>	4
<b>Emergency surgery trauma unit</b>	4
<b>Haematology</b>	3
<b>Gynaecology</b>	3
<b>GI</b>	2
<b>Elective treatment centre day case</b>	2
<b>Urology ward</b>	2
<b>Acute medical unit</b>	2

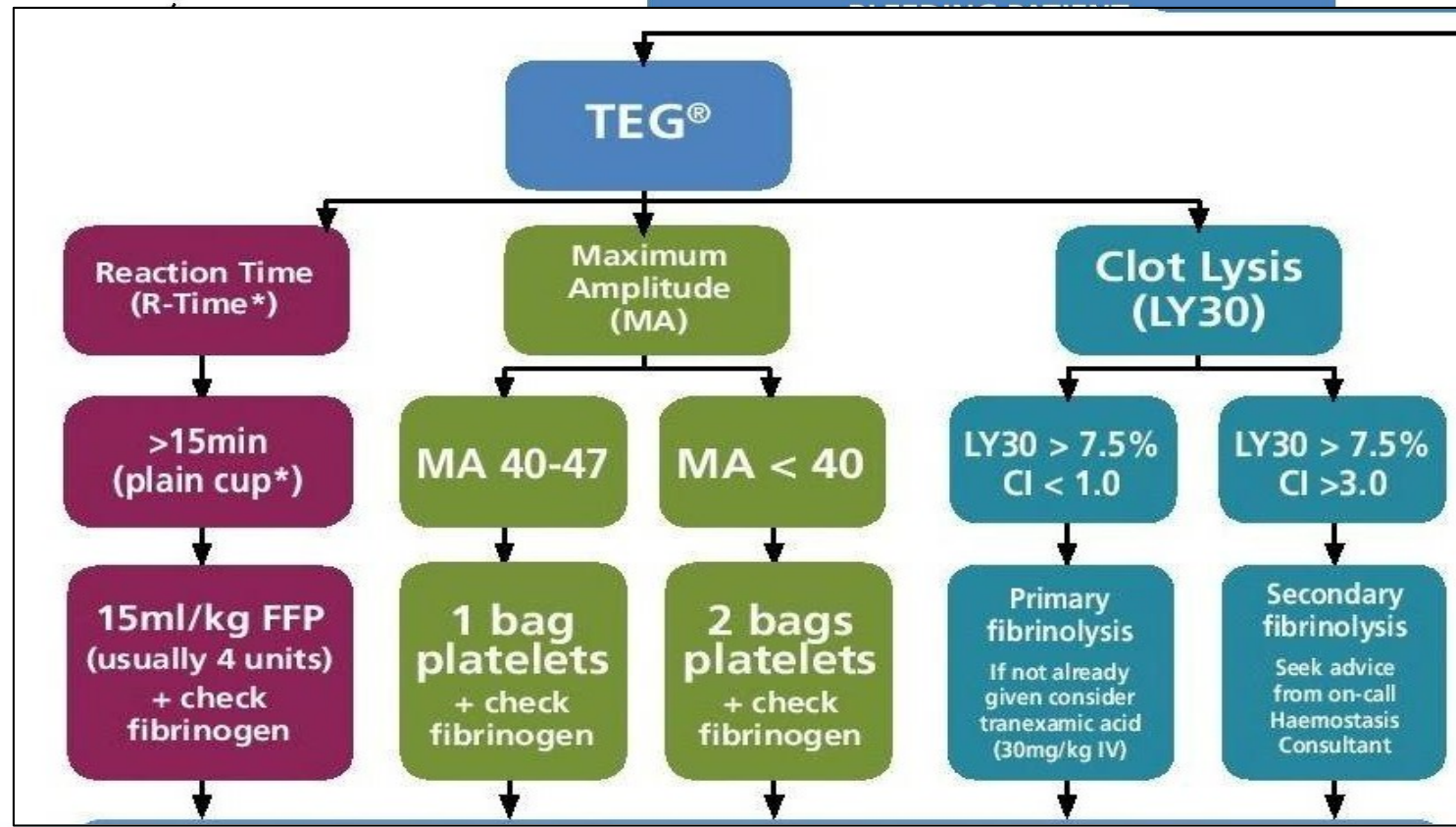


## Methods – Data collection

- Data collection
  - Audit proforma
  - Clinical work station (CWS)
    - Standard coagulation tests
    - Cross matching, LFTs, U&Es
    - Sample processing times
  - Focus group discussion (only anaesthetists)
    - 2 obstetric consultants, 1 cardiac consultant and 1 SpR
- Three types of trust haemostasis protocol
  - General surgical
  - Obstetrics
  - Cardiac

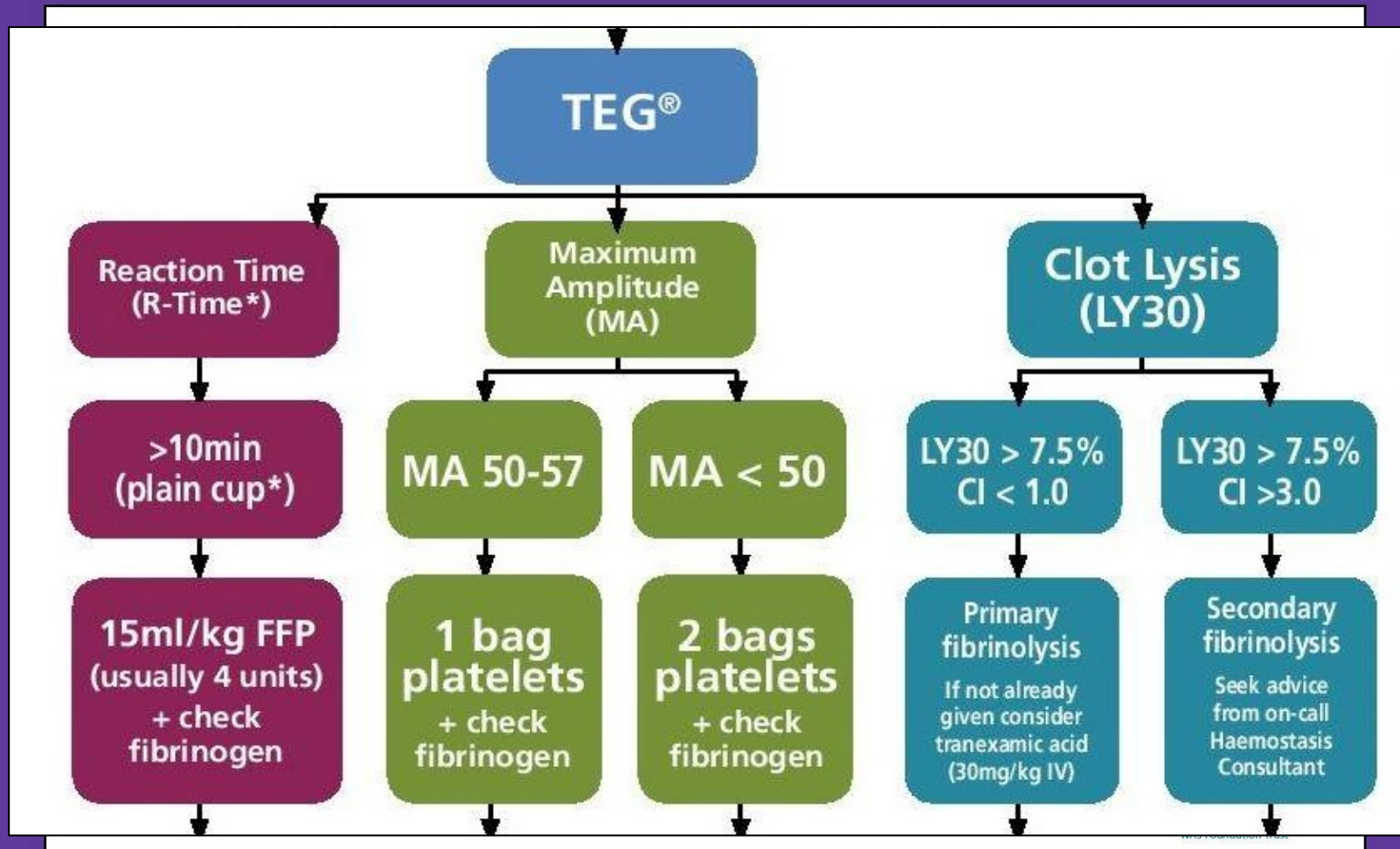
# Methods - Trust haemostasis protocol for general surgical patients

Algorithm for the management of haemostasis and TEG<sup>®</sup> analysis in bleeding general surgical patients





## Methods - Trust haemostasis protocol for obstetric patients



## Methods – Standards of the audit

Standards	Inclusion criteria	Target standard
1. Is the correct patient name and number inputted in to the TEG?	Include all the selected TEG results	95%
2. The proportion of TEGs that did not contain any errors	Include all TEG results even the TEGs that had an error but was corrected.	95%

## Methods – Standards of the audit

Standards	Inclusion criteria	Target standard
3. Did the second step of the trust haemostasis protocol where the other investigations such as FBC, U&Es, PT, aPTT, fibrinogen and cross match were performed along with TEG?	Only if the reason for the TEG was because of haemorrhage  Blood components cross matched at the beginning of the surgery is sufficient to full fill the criteria	85%
4. Once a TEG was done, was the blood components given according to the management protocol for haemostasis	Include all the selected TEG results	80%

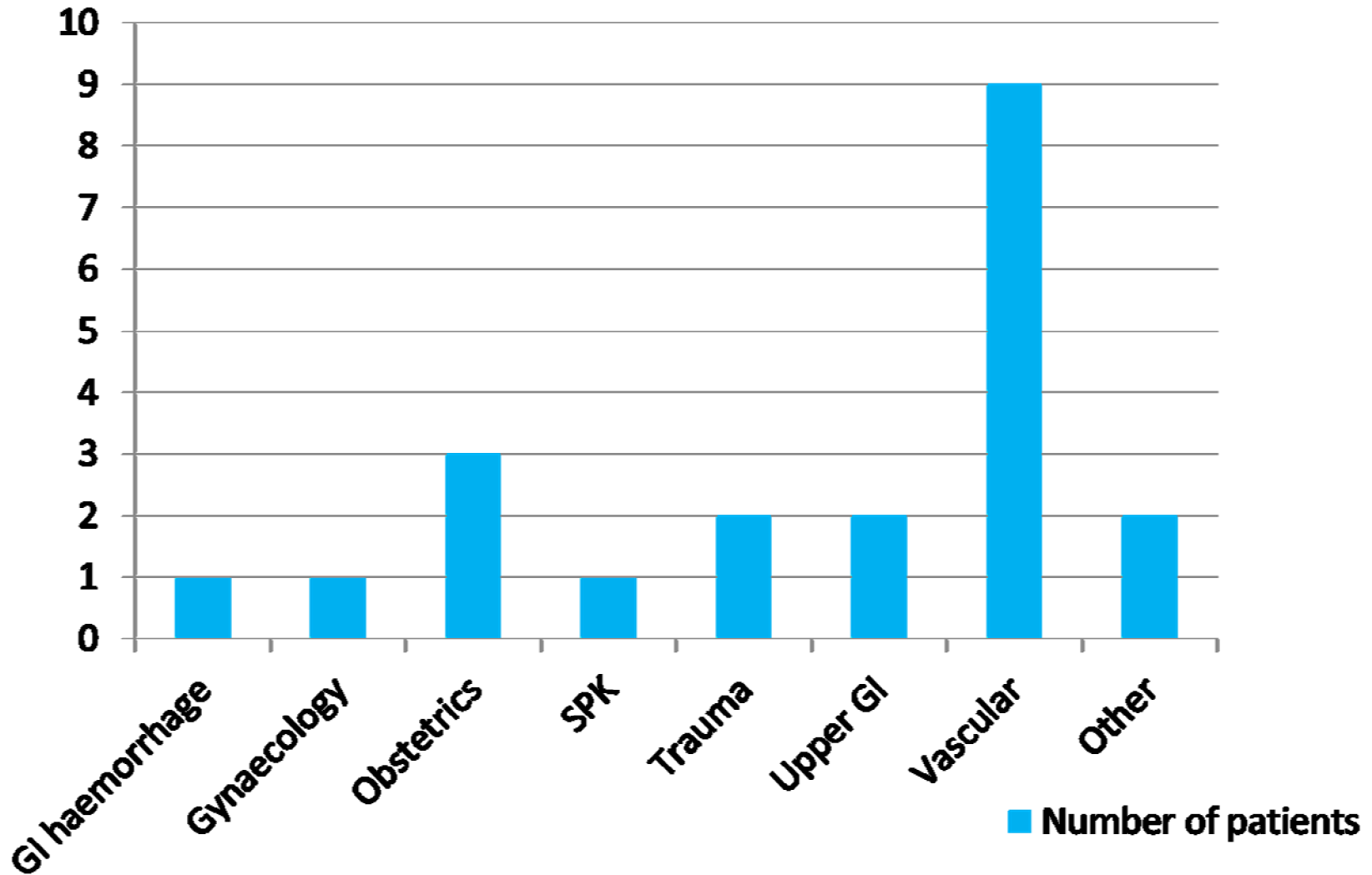


## Methods – Time to taken to obtain a result for Rtime versus the standard coagulation tests

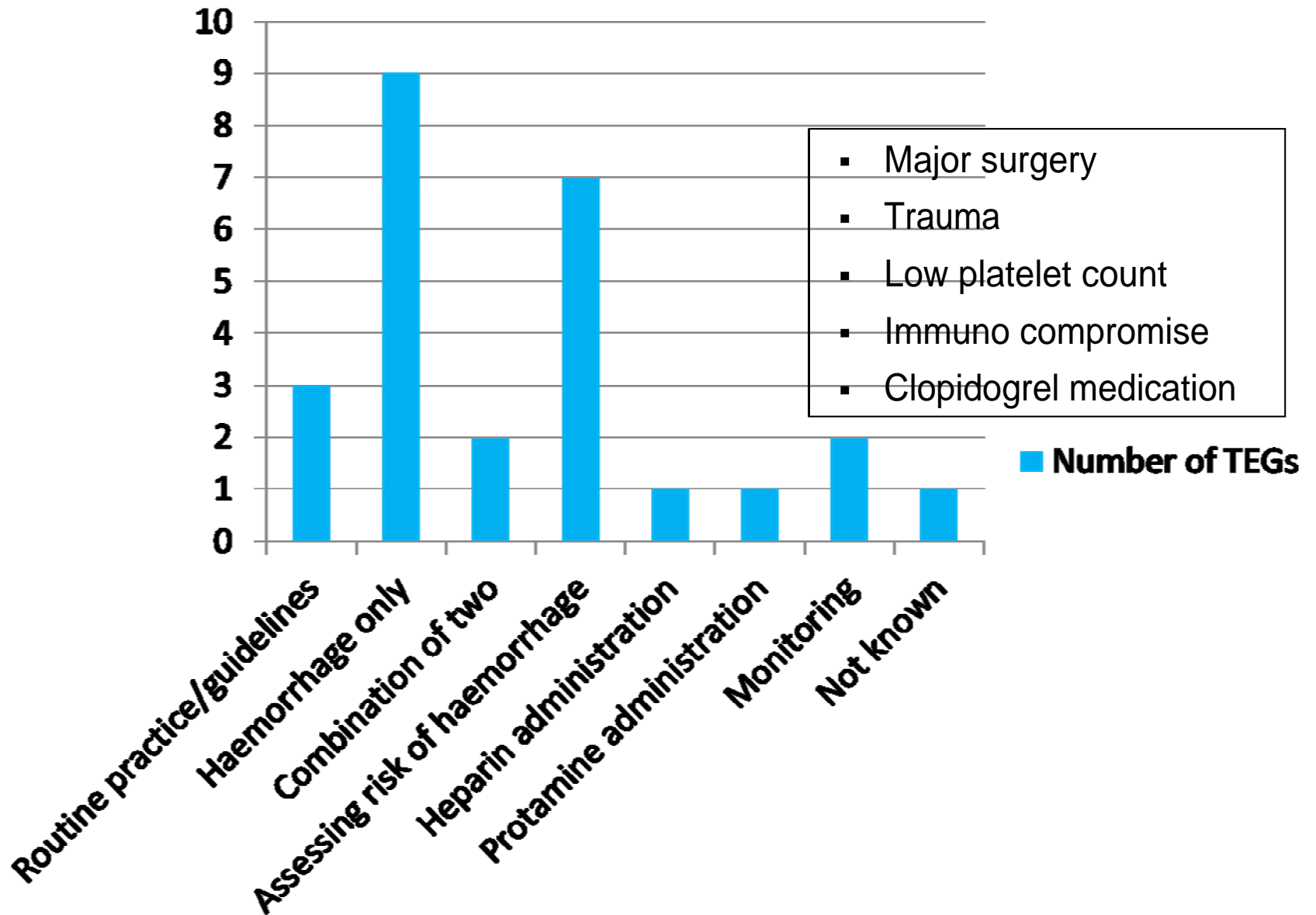
Inclusion criteria	Exclusion criteria
Any preoperative, midoperative and postoperative TEG along with their respective standard coagulation test regardless of when they were taken	Duplicate times of completion If there was any errors in the results

## Results and discussion – Category of patient

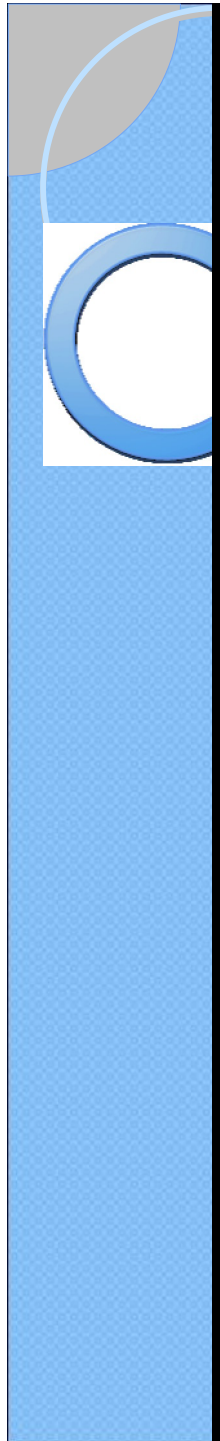
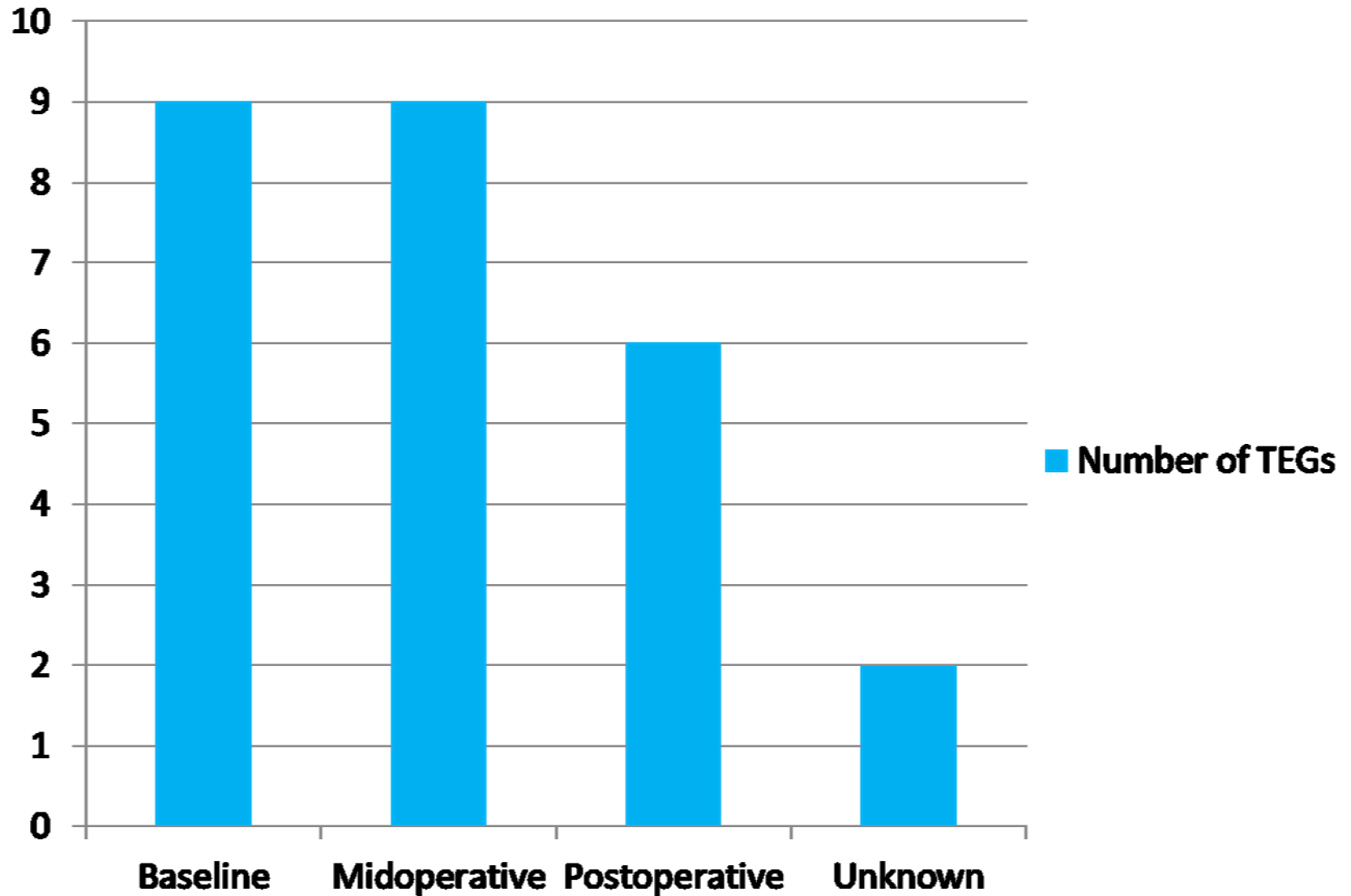
- Audit period – 36 days
- 21 patients and 26 TEGs



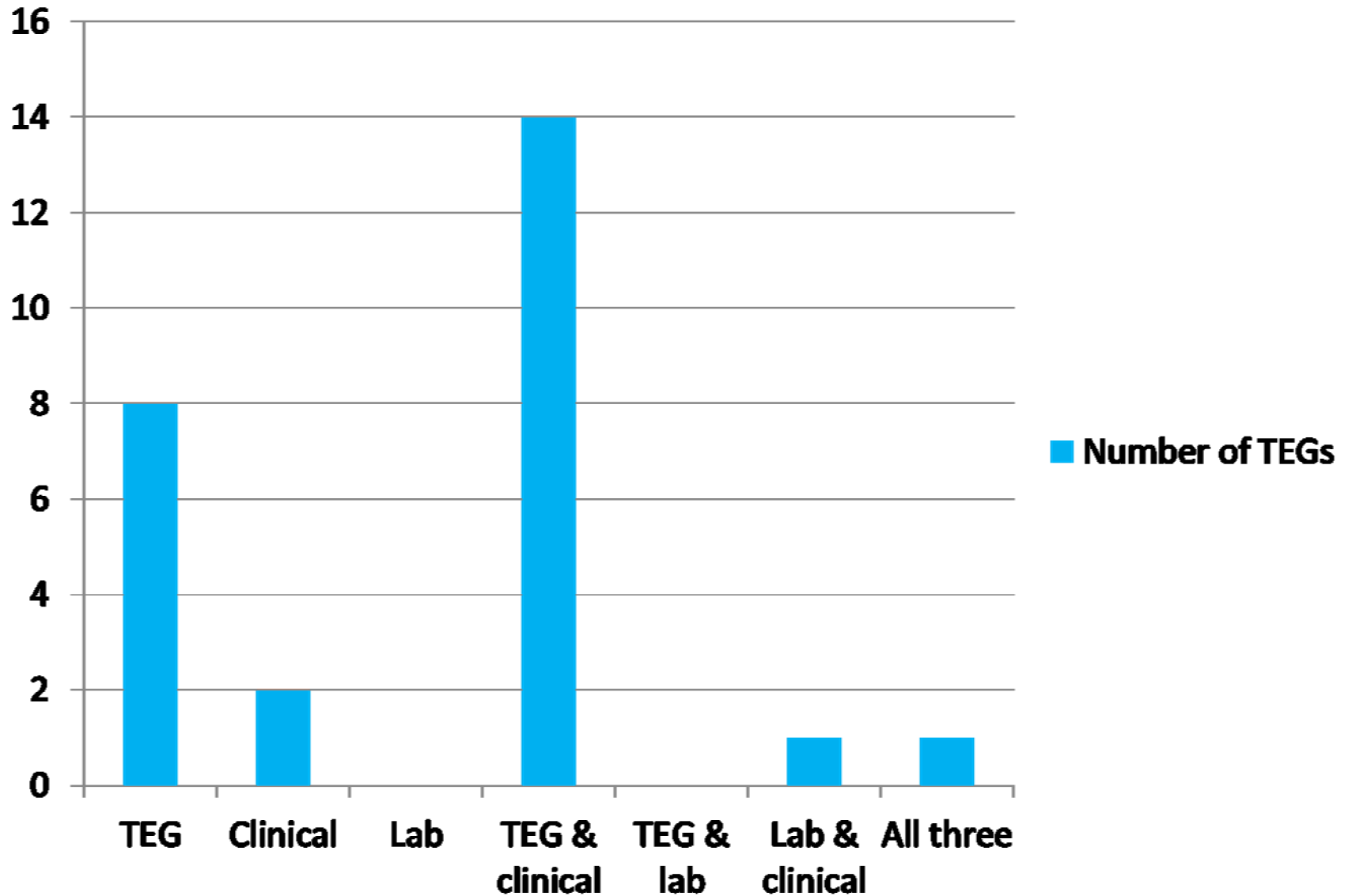
## Results and discussion – Reason for test



Results and discussion – The proportion of baseline, midoperative and postoperative TEGs

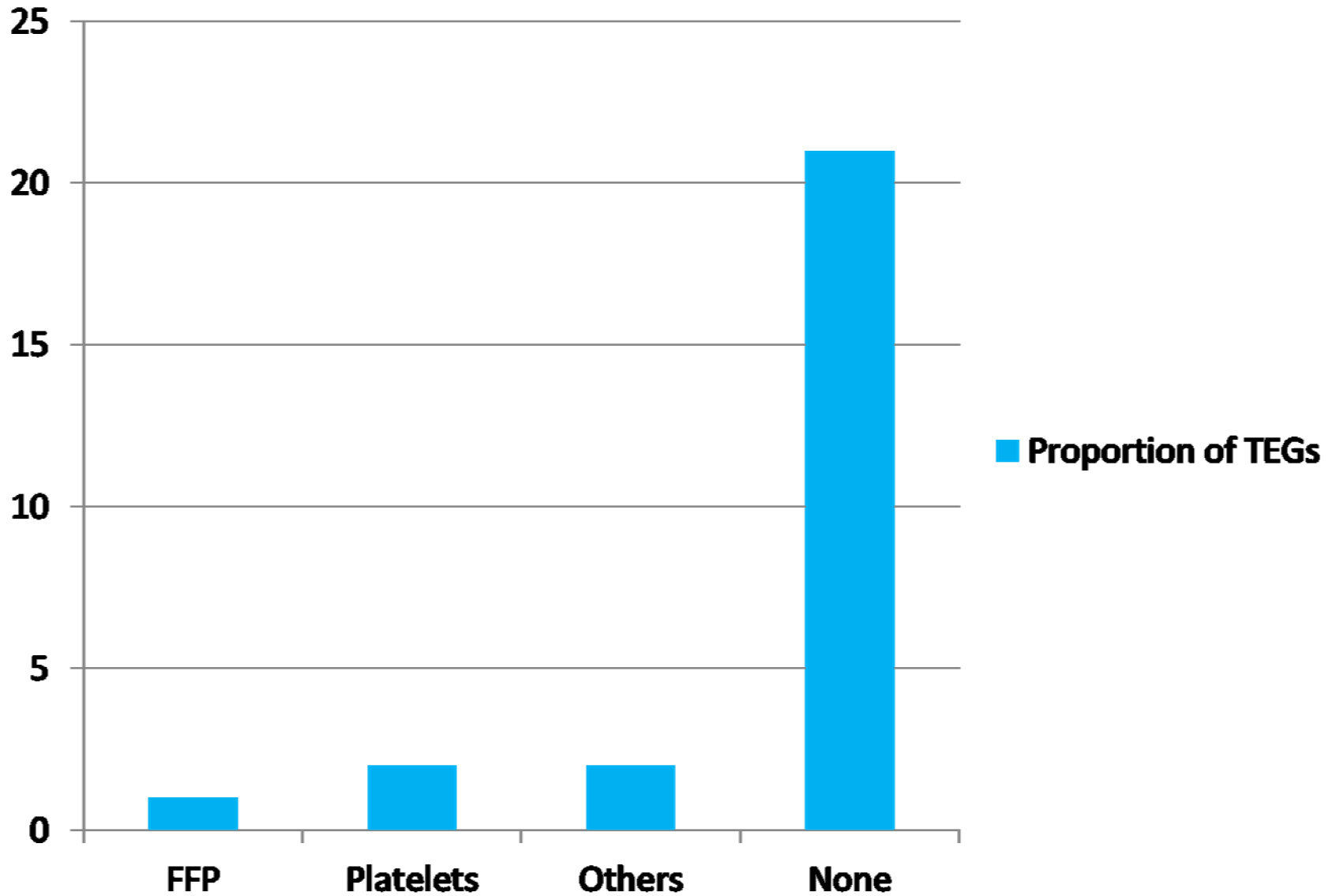


## Results and discussion – Decision whether to give blood products based on TEG/clinical/lab





Results and discussion - A summary of the action taken after taking into consideration the TEG/clinical/lab





## Results and discussion – Time to taken to obtain a result for Rtime versus standard coagulation test

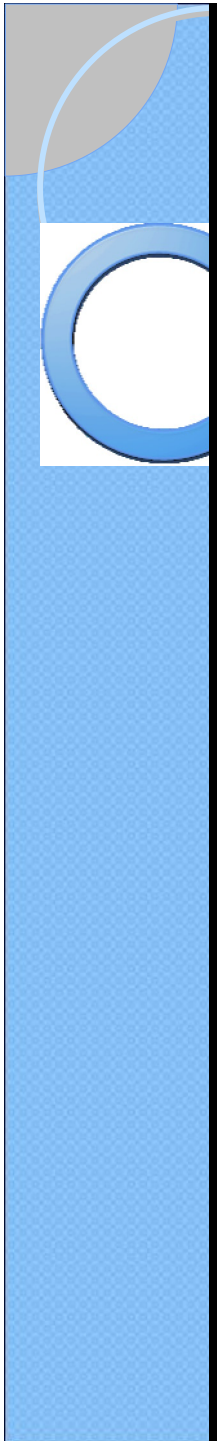
Test	Time taken for	Minimum value/mins	Maximum value/mins	Average/mins	Median/mins
TEG	R time	2.1	19	7.1	7.4
Standard coagulation Tests	To process sample in the lab	23.0	115.0	53.9	48.0

## Results and discussion – Standards of the audit

Standards	Inclusion criteria	Target standard	Level of standard achieved
1. Is the correct patient name and hospital number inputted in to the TEG?	Include all the selected TEG results	95%	85%
2. The proportion of TEGs that did not contain any errors	Include all TEG results even the TEGs that had an error but was corrected.	95%	88%

## Results and discussion – Standards of the audit

Standards	Inclusion criteria	Target standard	Level of standard achieved
3. Did the second step of the trust haemostasis protocol where the other investigations such as FBC, U&Es, PT, aPTT, fibrinogen and cross match were performed along with TEG?	<p>Only if the reason for the TEG was because of haemorrhage</p> <p>Blood products cross matched at the beginning of the surgery is sufficient to full fill the criteria</p>	85%	9%
4. Once a TEG was done, was the blood products given according to the trust management protocol for haemostasis	Include all the selected TEG results	80%	73%



## Results and discussion: Focus group

- Positives/benefits
- Drawbacks/barriers



## Limitations

- Prospective audit but the information is collected retrospectively (within 3-4 days) from the anaesthetists
- Some of the surgical patients will be transferred to the intensive care unit or the high dependency unit (HDU) and if a TEG was ordered from there, it would technically come under the sample group of this audit
- This audit is biased in assuming that the majority of the decisions to give blood components is based on the TEG as this audit is specifically targeting this group



## Conclusion

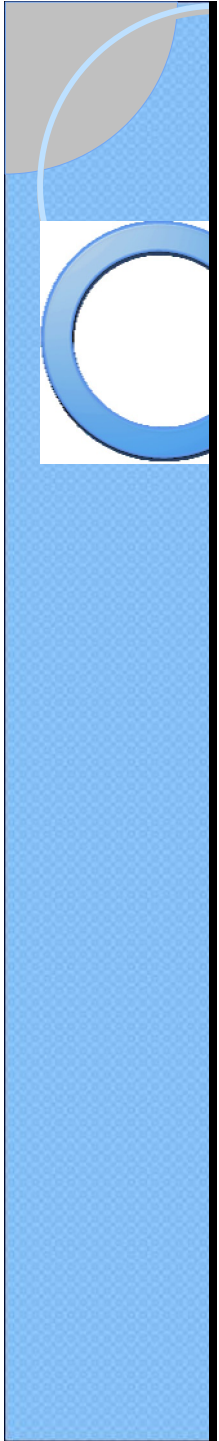
- The TEG is used predominantly in vascular and obstetrics surgery
- It is mainly requested to assess the risk of haemorrhage or the reason for the haemorrhage
- The TEG played a central role in the decision making process of the anaesthetist in the administration of blood component
- A faster result can be obtained using the TEG compared to standard coagulation tests.



## Action plan

- To create a training programme that includes
  - Highlighting the importance of recording correct patient information
  - Minimising technical/human errors when running a TEG
  - Addressing deficits in the clinical knowledge of the TEG
  - Recording TEG results and subsequent management in the patient notes/electronically like any other tests
  - Raising awareness of the haemostasis protocol
  - Raising awareness of further additions to the TEG repertoire:
    - Platelet mapping
    - Functional fibrinogen





Thank you