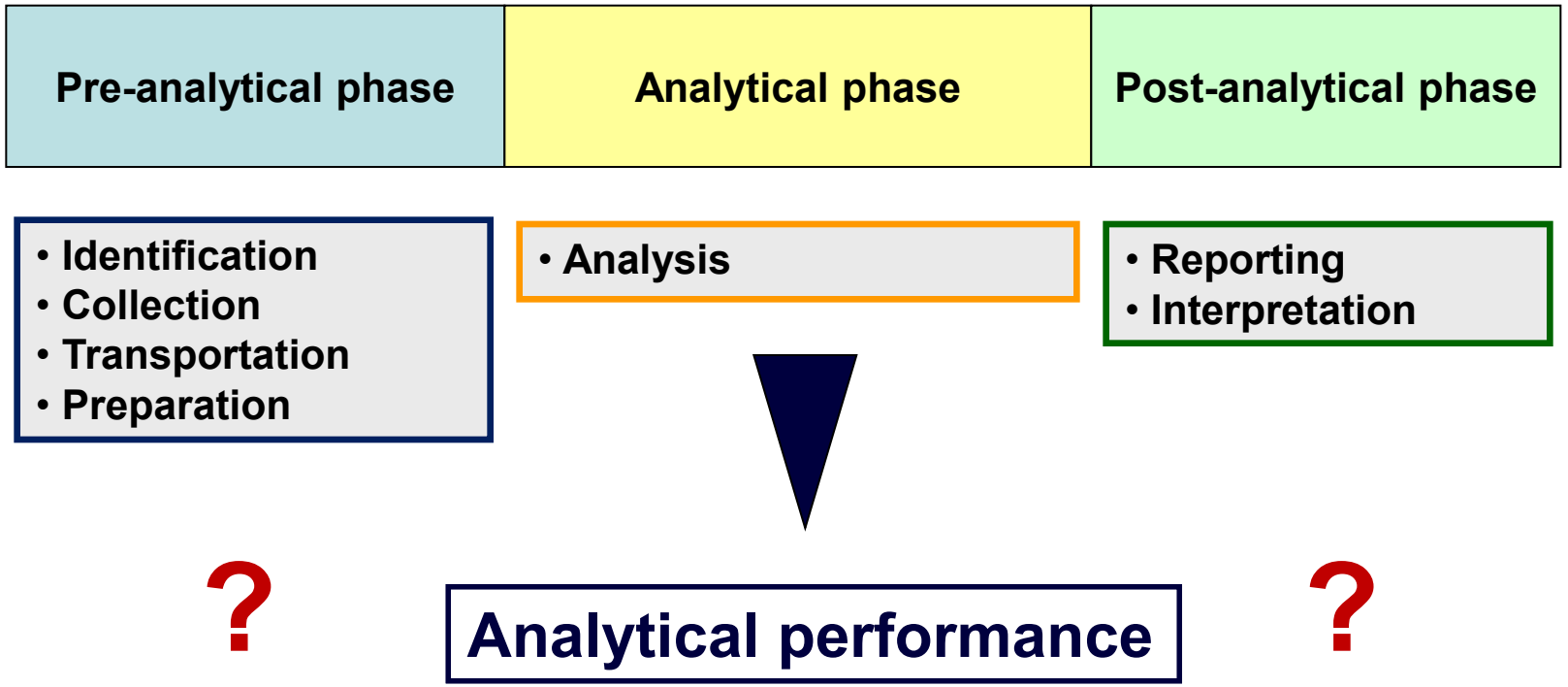
Moving from analytical to diagnostic quality

A study on acquired inhibitors

Disclosures

- Unconditional grant from NOVO Nordisk

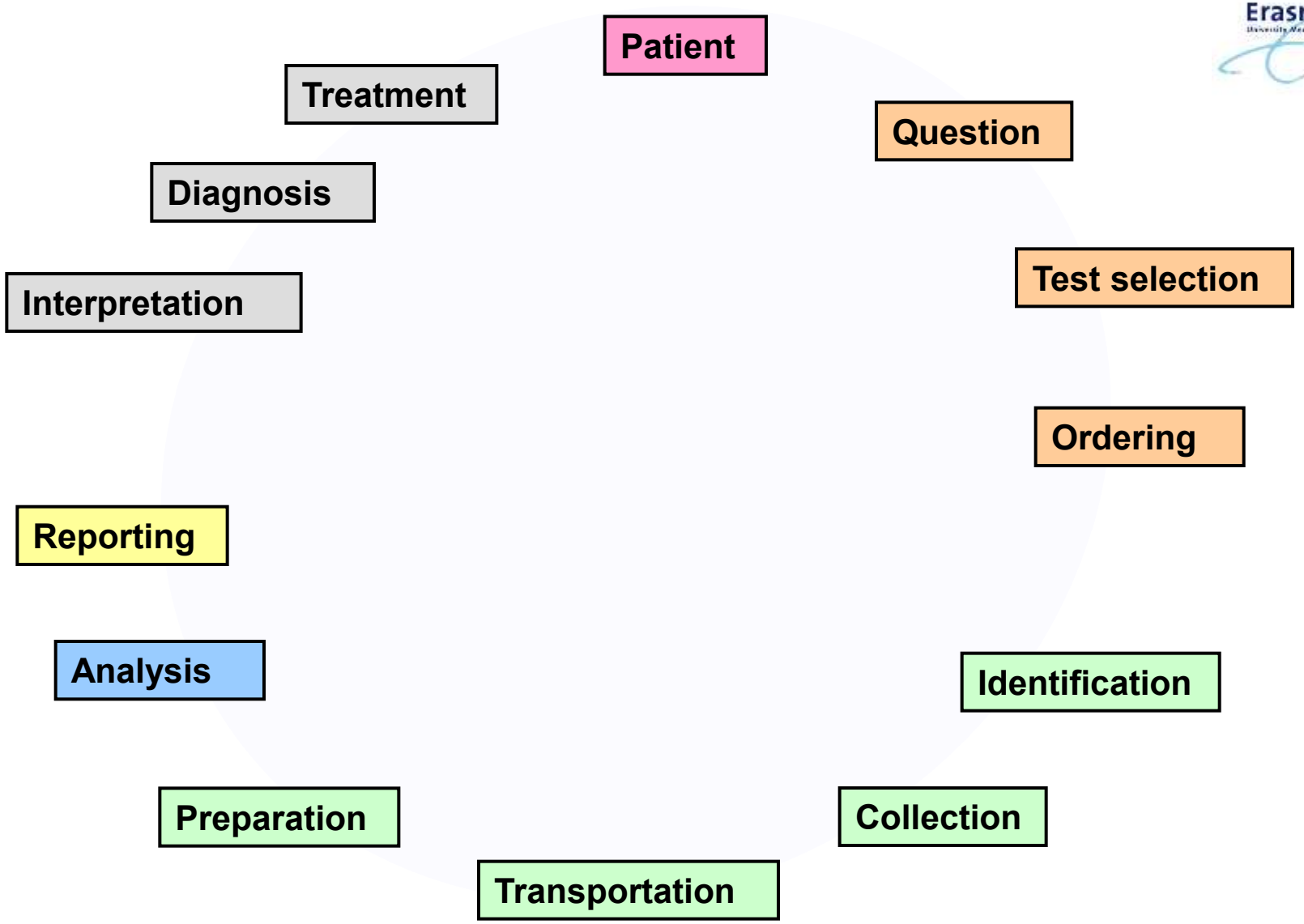
External Quality Assessment

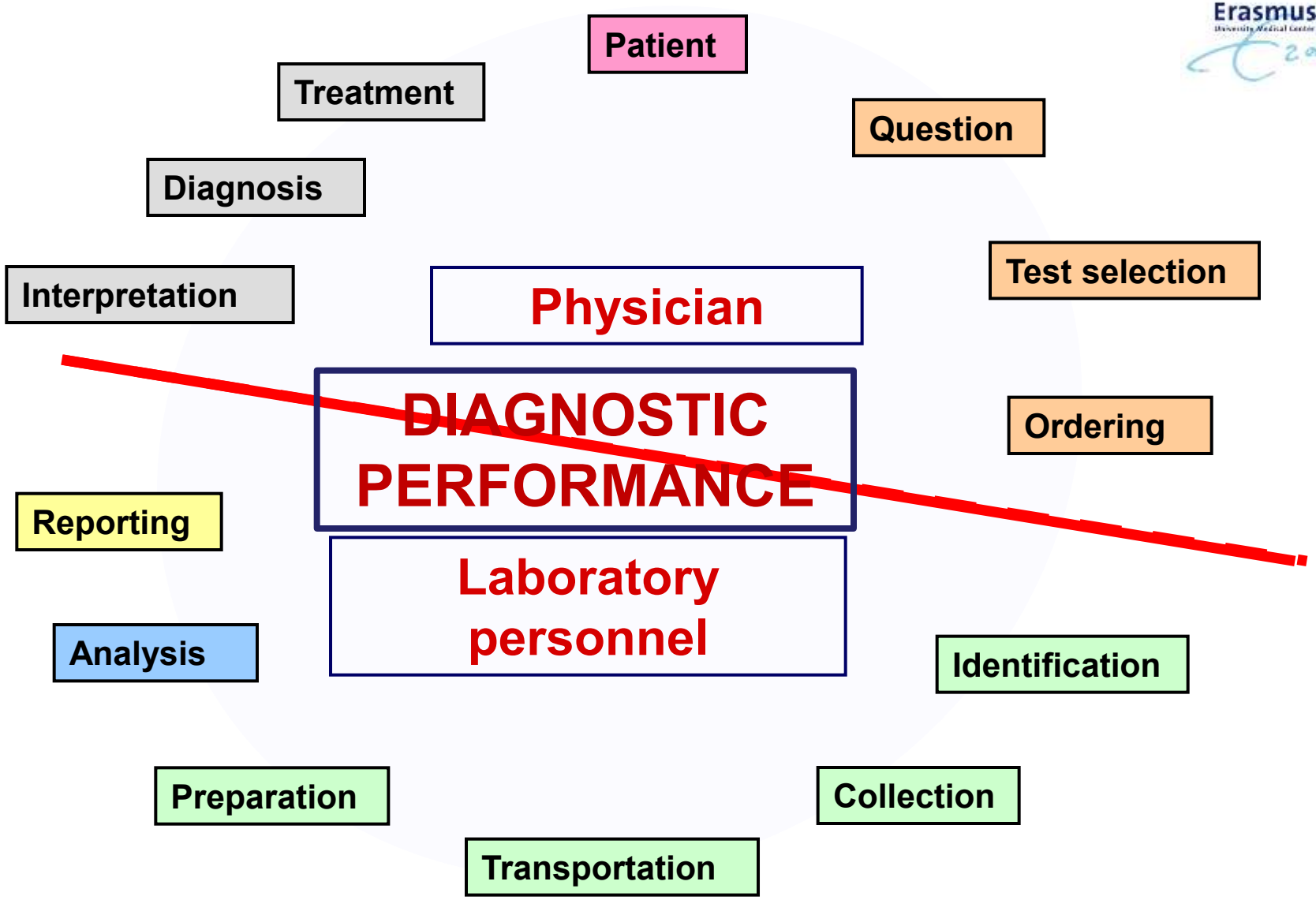


ISO STANDARD 15189

5.6.4 The laboratory shall participate in interlaboratory comparisons such as those organized by external quality assessment schemes. Laboratory management shall monitor the results of external quality assessment and participate in the implementation of corrective actions when control criteria are not furfilled.

External quality assessment programmes should, as far as possible, provide clinically relevant challenges that mimic patient samples and have the effect of checking the entire examination process, including pre- and post-examination procedures.


Patient
Question
Test selection
Ordering
Identification
Collection
Transportation
Preparation
Analysis
Reporting
Interpretation
Diagnosis
Treatment


Patient
Treatment
Question
Diagnosis
Test selection
Interpretation
Physician
DIAGNOSTIC PERFORMANCE
Ordering
Reporting
Laboratory personnel
Analysis
Identification
Preparation
Collection
Transportation

CASE-BASED EQA

Scope of the project:

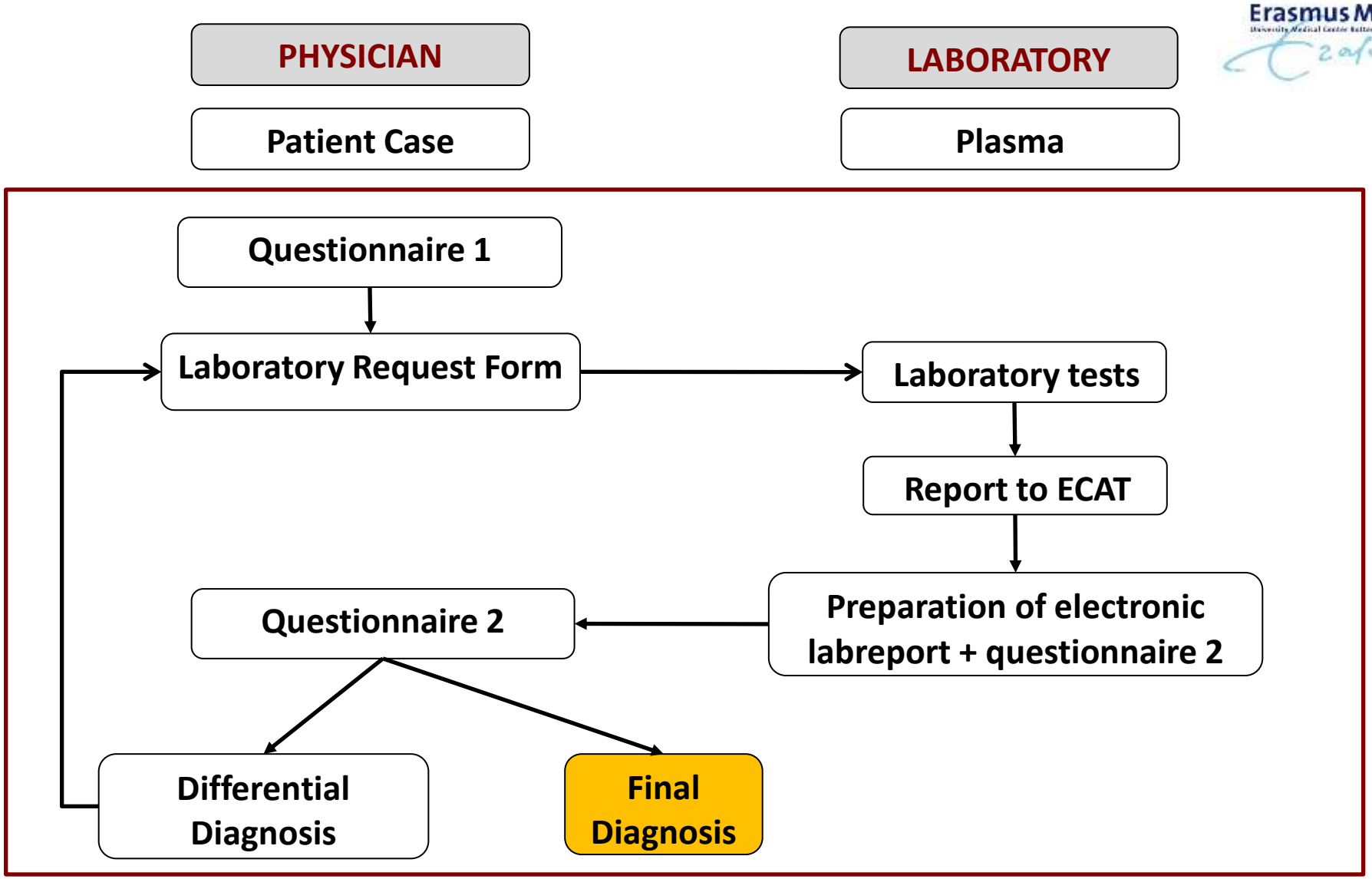
Correct diagnosis based on both clinical information and laboratory data

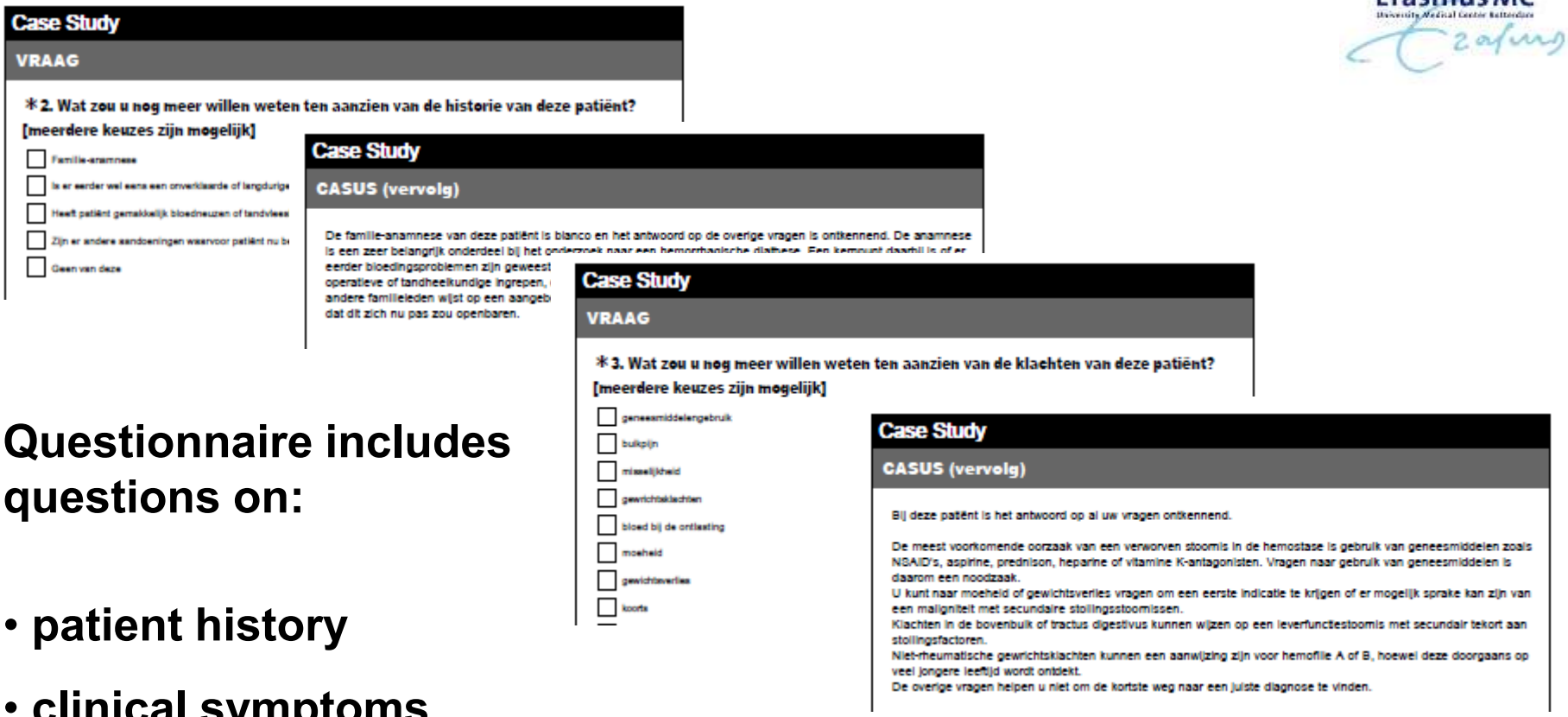
- **Interpretation of clinical information**
- **Evaluation of test request**
- **Test performance**
- **Interpretation of laboratory data**

Pilot: 10 centers
Dutch study: 34 centers

Reference center:
Erasmus MC Rotterdam

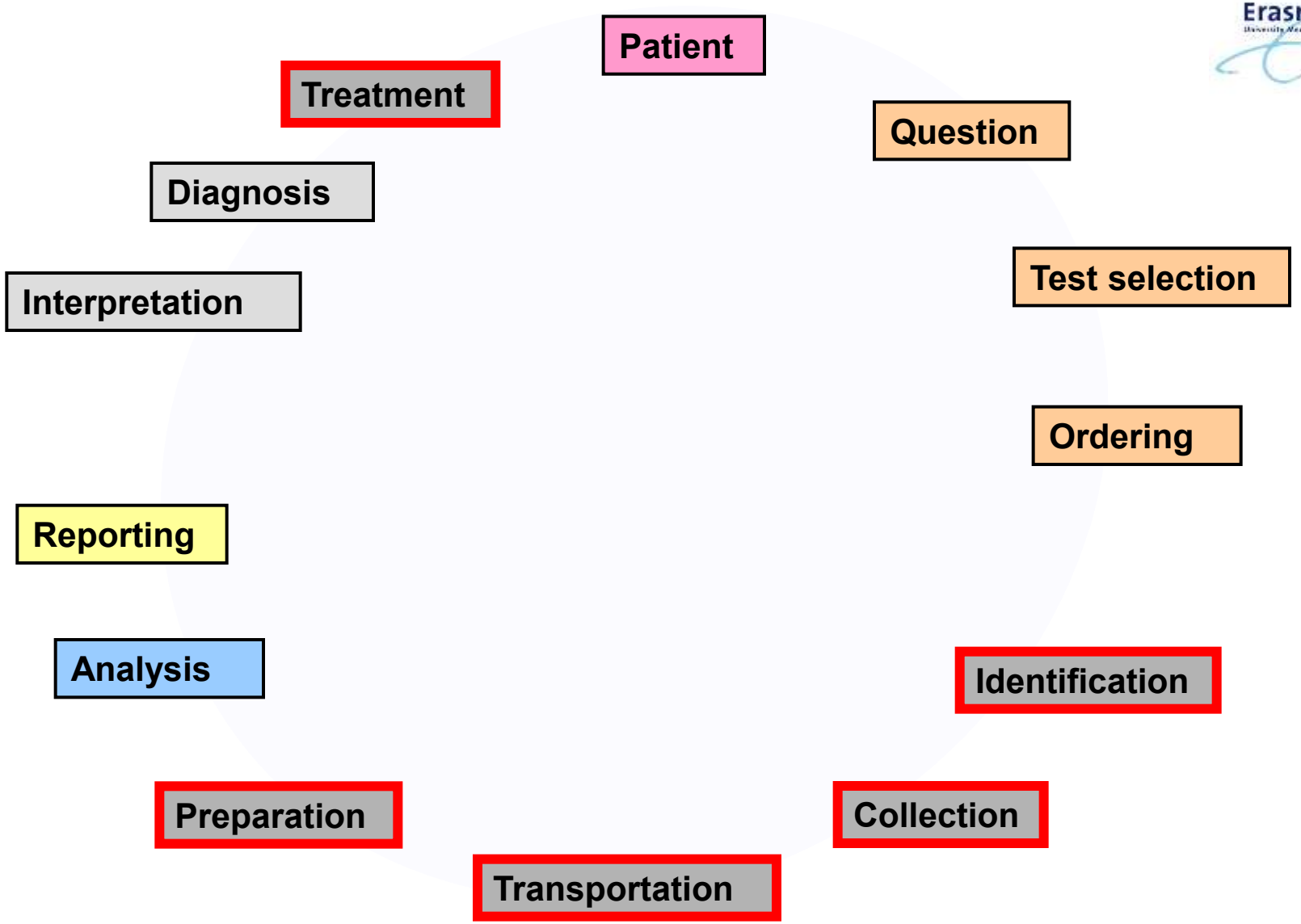
A center could only participate if both the clinicians and clinical chemist participated


PHYSICIAN
LABORATORY
Patient Case
Plasma
Questionnaire 1
Laboratory Request Form
Laboratory tests
Report to ECAT
Preparation of electronic labreport + questionnaire 2
Questionnaire 2
Differential Diagnosis
Final Diagnosis



Questionnaire includes questions on:

- patient history
- clinical symptoms
- physical examination
- potential differential diagnosis


Patient
Question
Test selection
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CASE DESCRIPTION

A general practitioner refers the following patient to you:

An apparently healthy Caucasian man of 67 years old
Increased bruising since a few days. No trauma.
Question: Any coagulation disorder?

Hematological parameters: normal
Prothrombin Time: normal

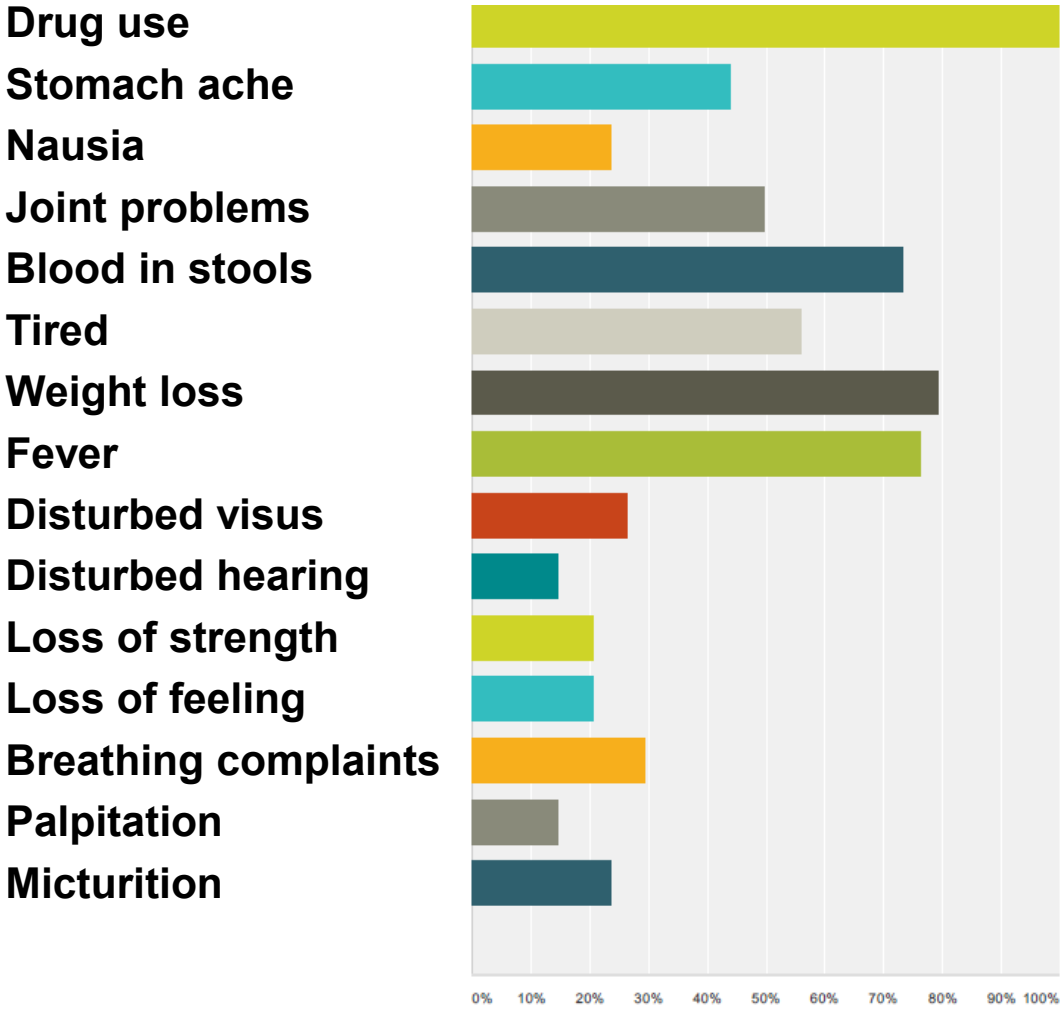
First examination:
At the left-hand side and on the back several purpura and ecchymoses. These came spontaneously approx. 5 days ago. The bruising increases. The largest spot is now 15 cm.
These symptoms were not seen before.

Differential diagnosis

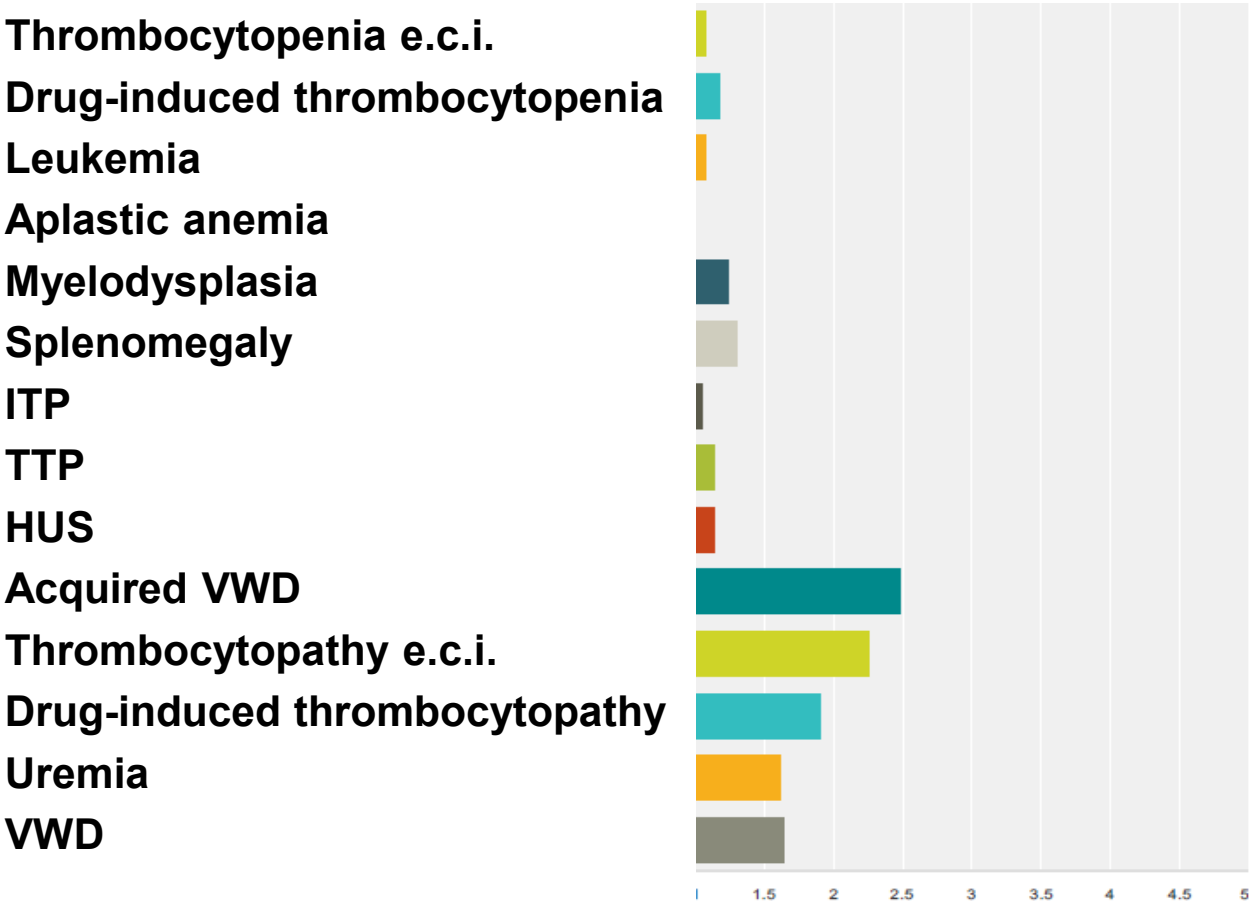
Categories:

- **Trauma**
- **Primary Hemostasis**
- **Secundary Hemostasis**
- **Other reasons**

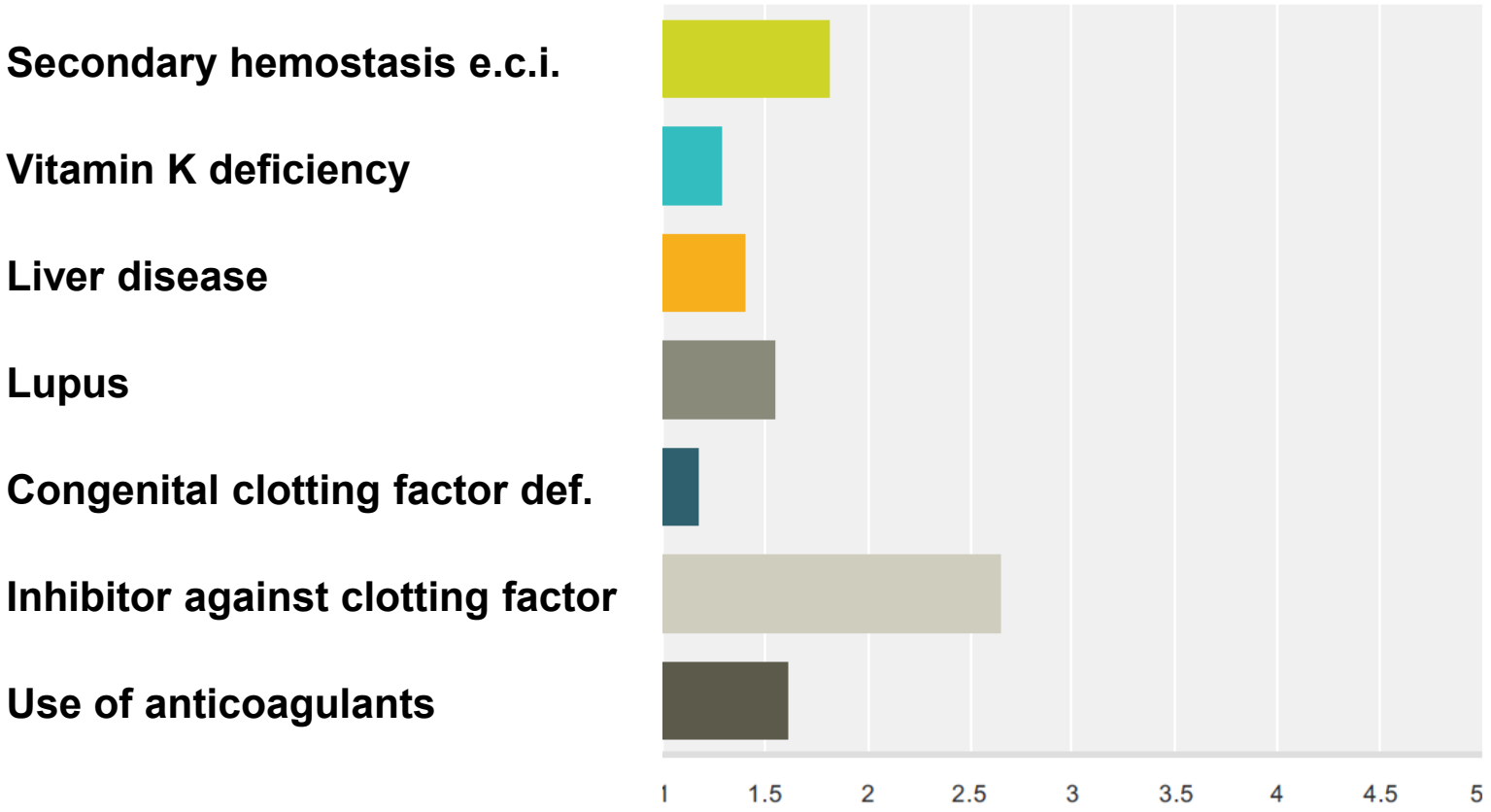
Additional patient information?



Primary hemostasis defects (round 1)



Secondary hemostasis defects (round 1)



Other reasons (round 1)

Vascular e.c.i.

Vitamin C deficiency

Henoch-Schönlein purpura

Amyloïdosis

Ehlers-Danlos syndrome

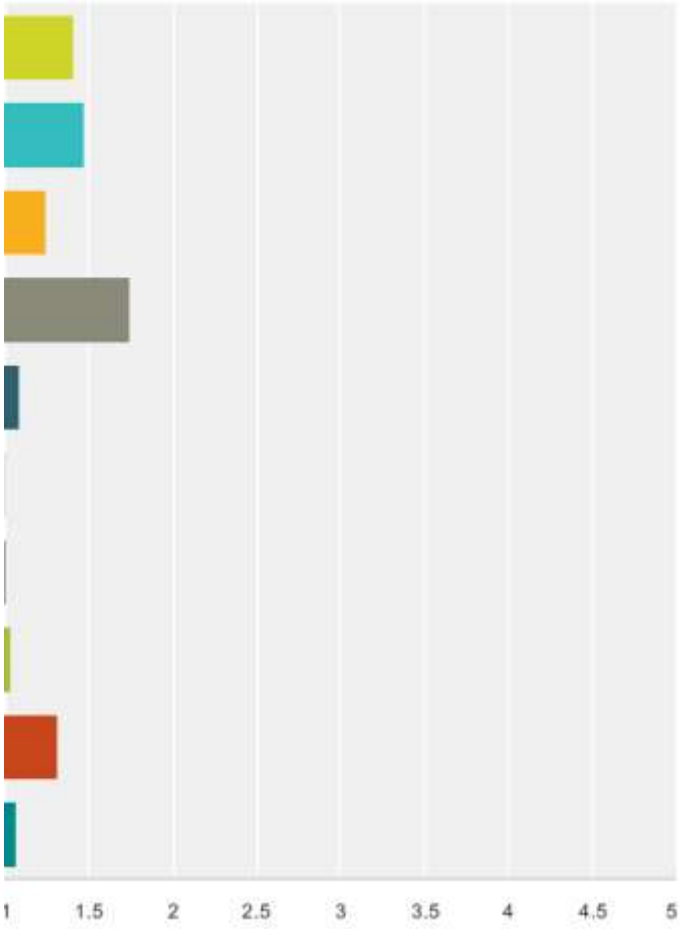
Osteogenesis imperfecta

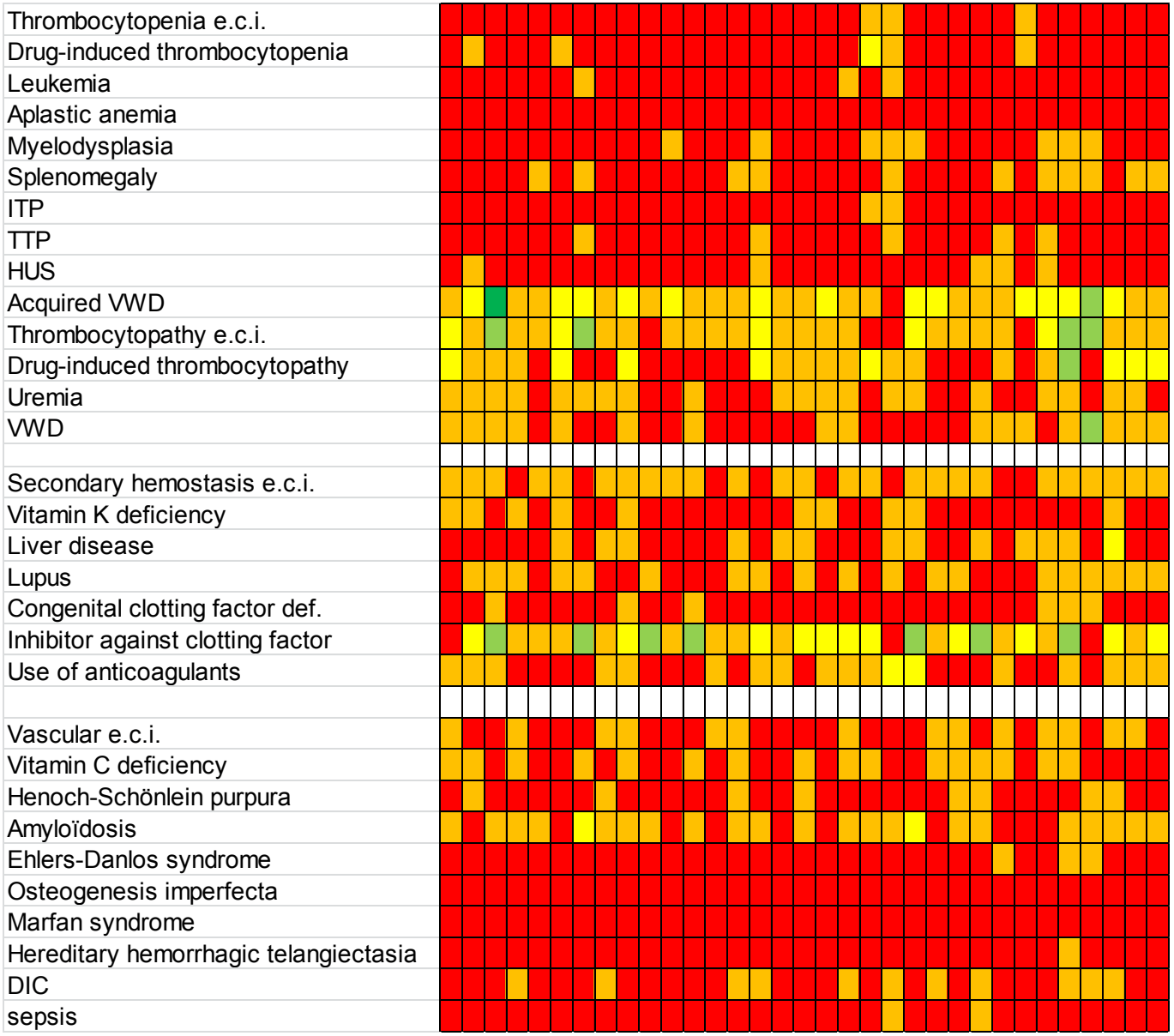
Marfan syndrome

Hereditary hemorrhagic telangiectasia

DIC

sepsis



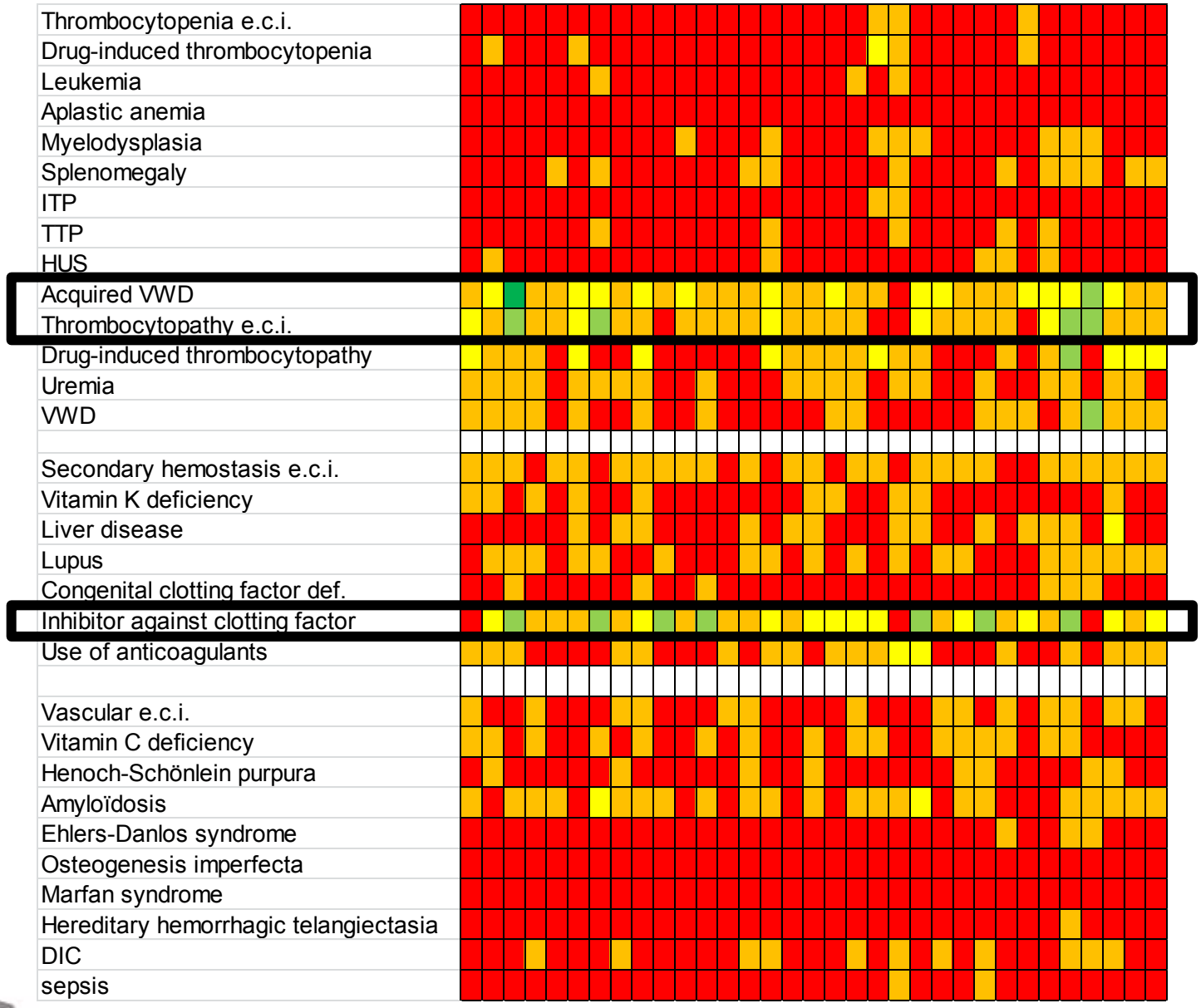


Erasmus MC
University Medical Center Rotterdam

unlikely
possible
likely
very likely
certain

ECAT FOUNDATION
External quality Control of diagnostic Assays and Tests
with a focus on Thrombosis and Haemostasis

ECAT 14.11.2014
Moving from analytical to diagnostic quality



Erasmus MC
University Medical Center Rotterdam

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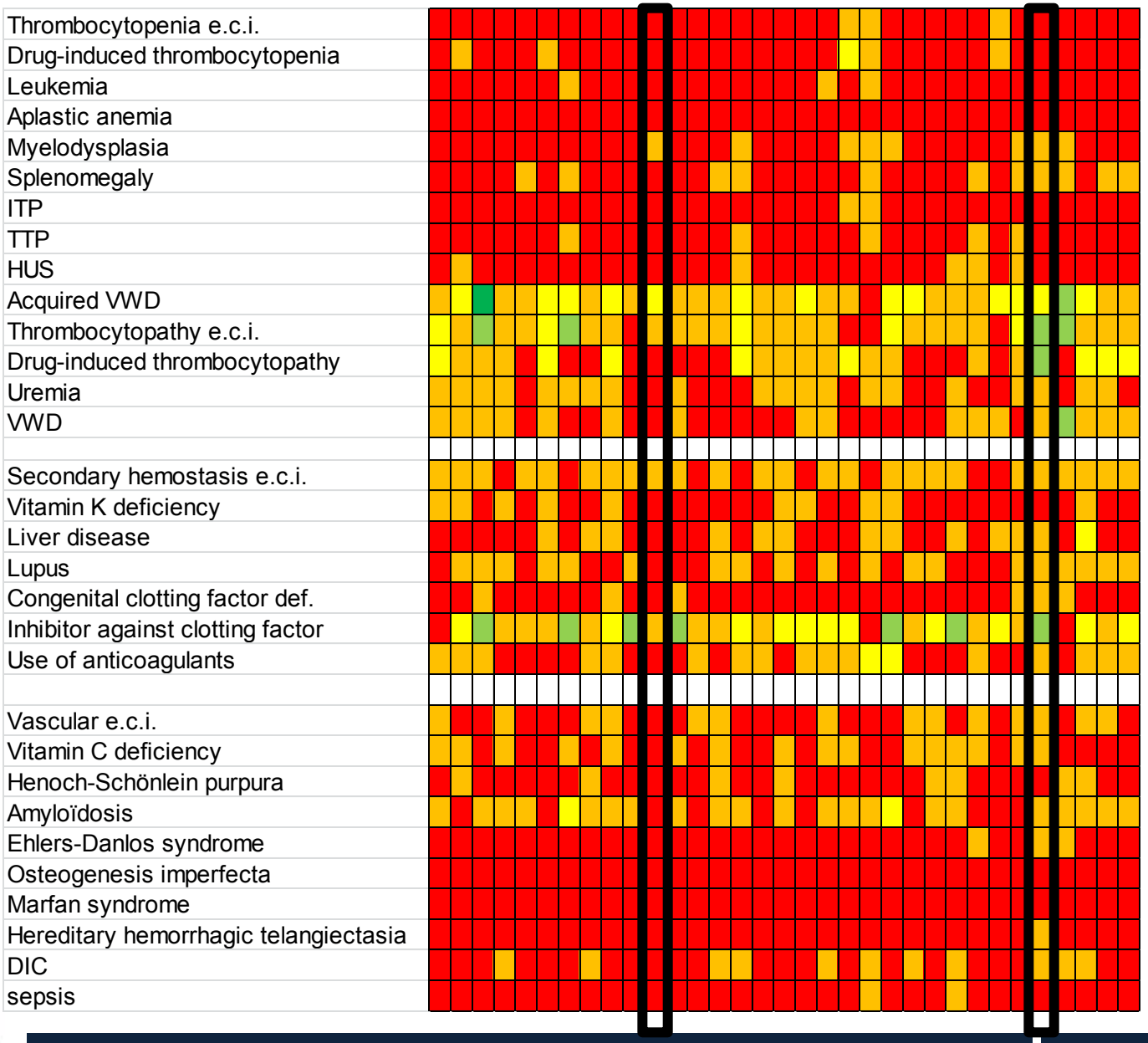

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with a focus on Thrombosis and Haemostasis

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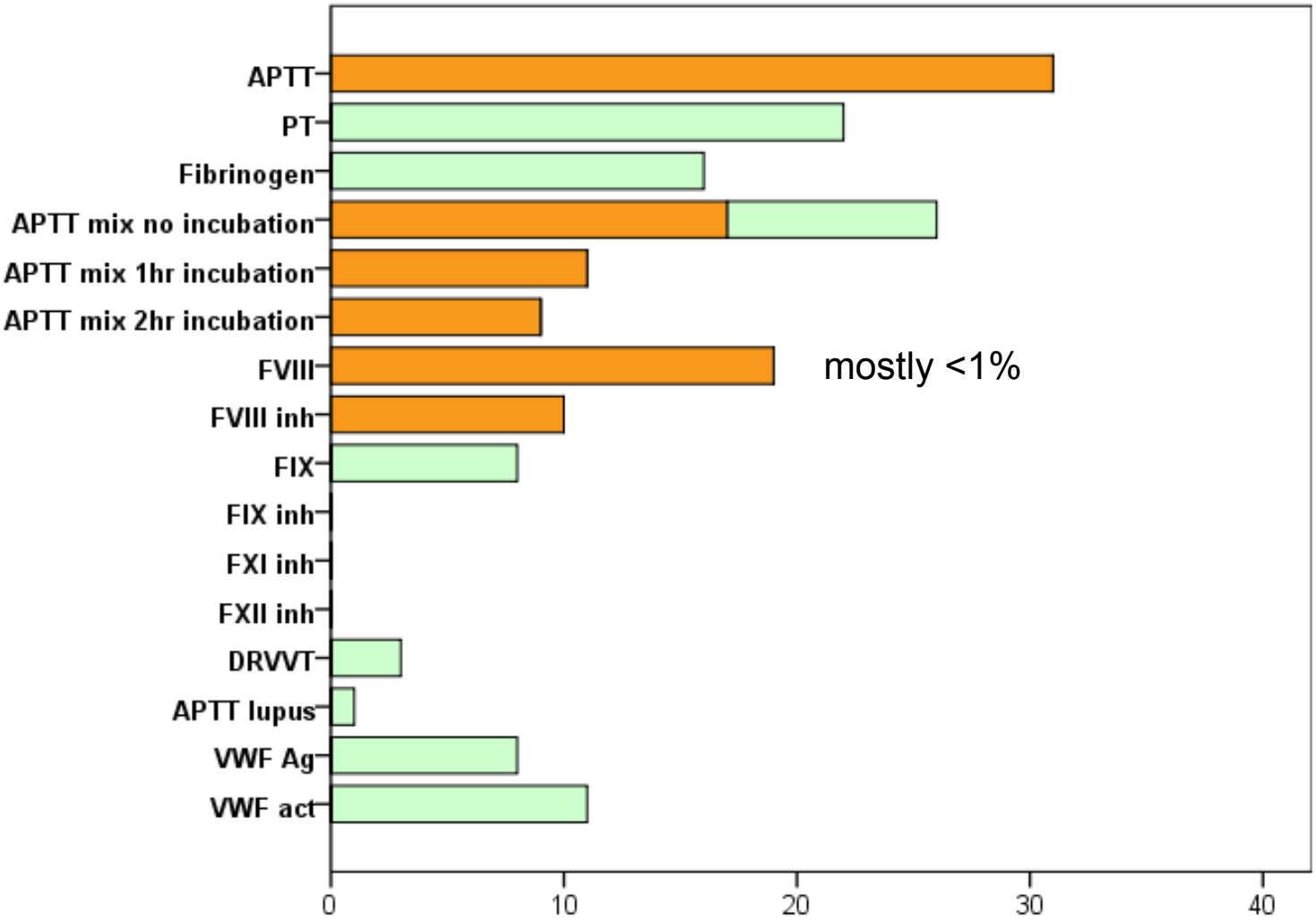
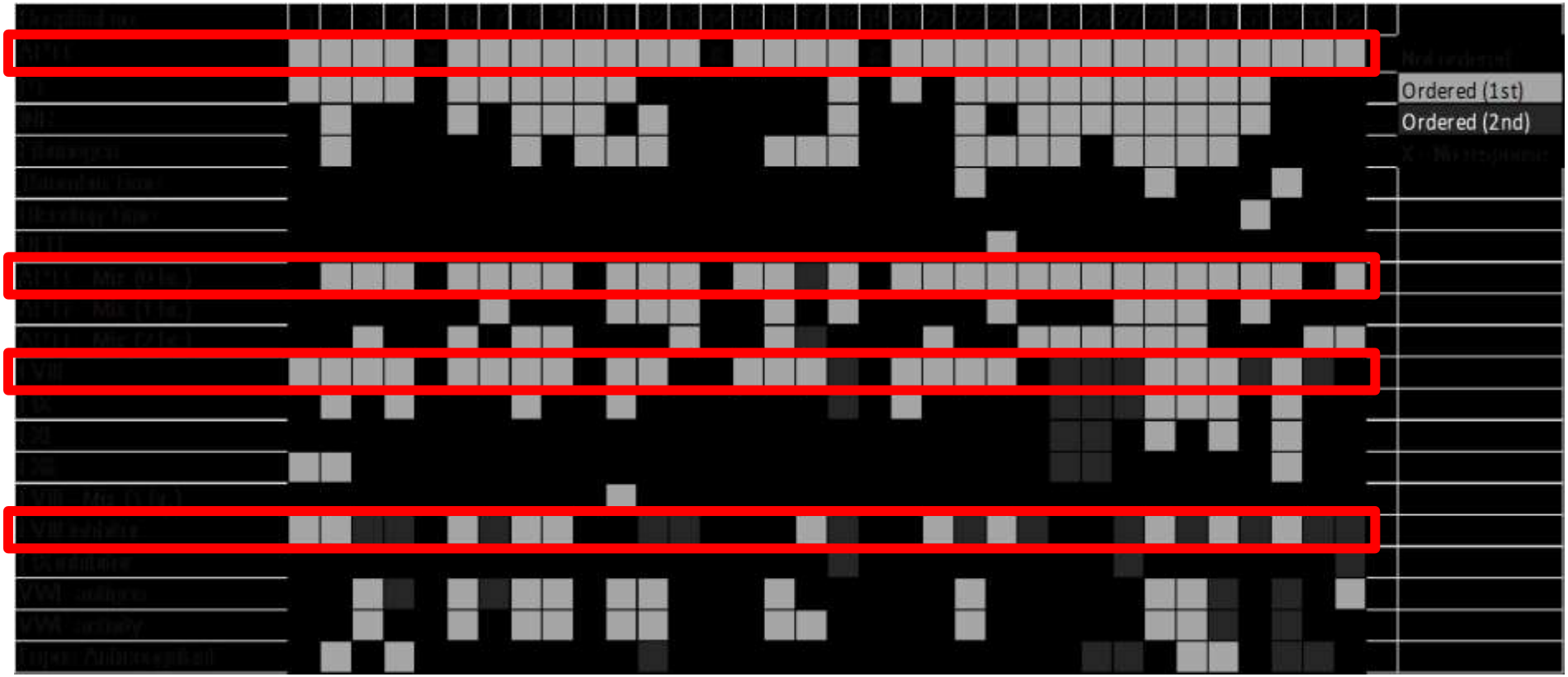
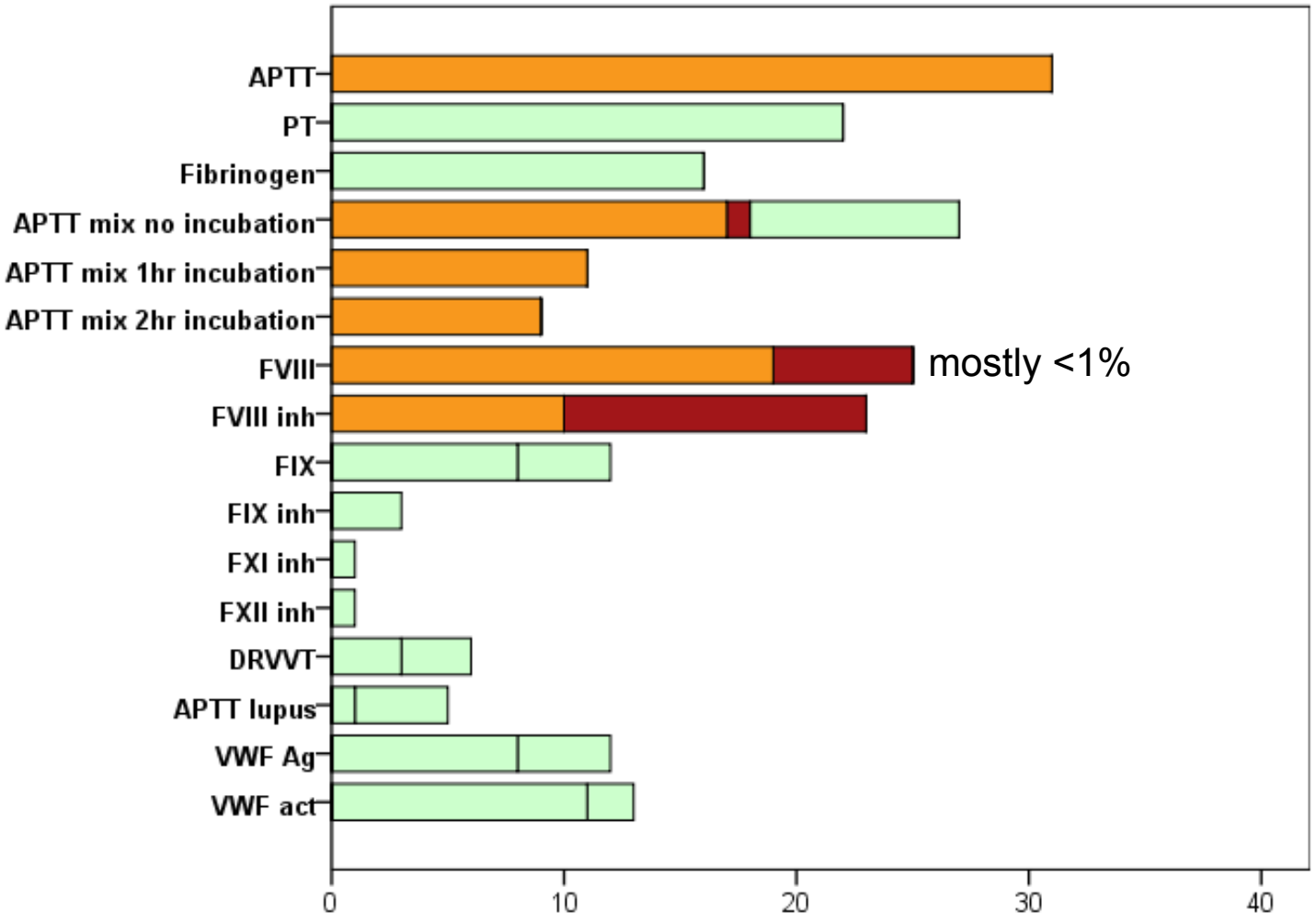
Laboratory results (round 1)



Ordered laboratory tests



Laboratory results (round 2)



Main laboratory results

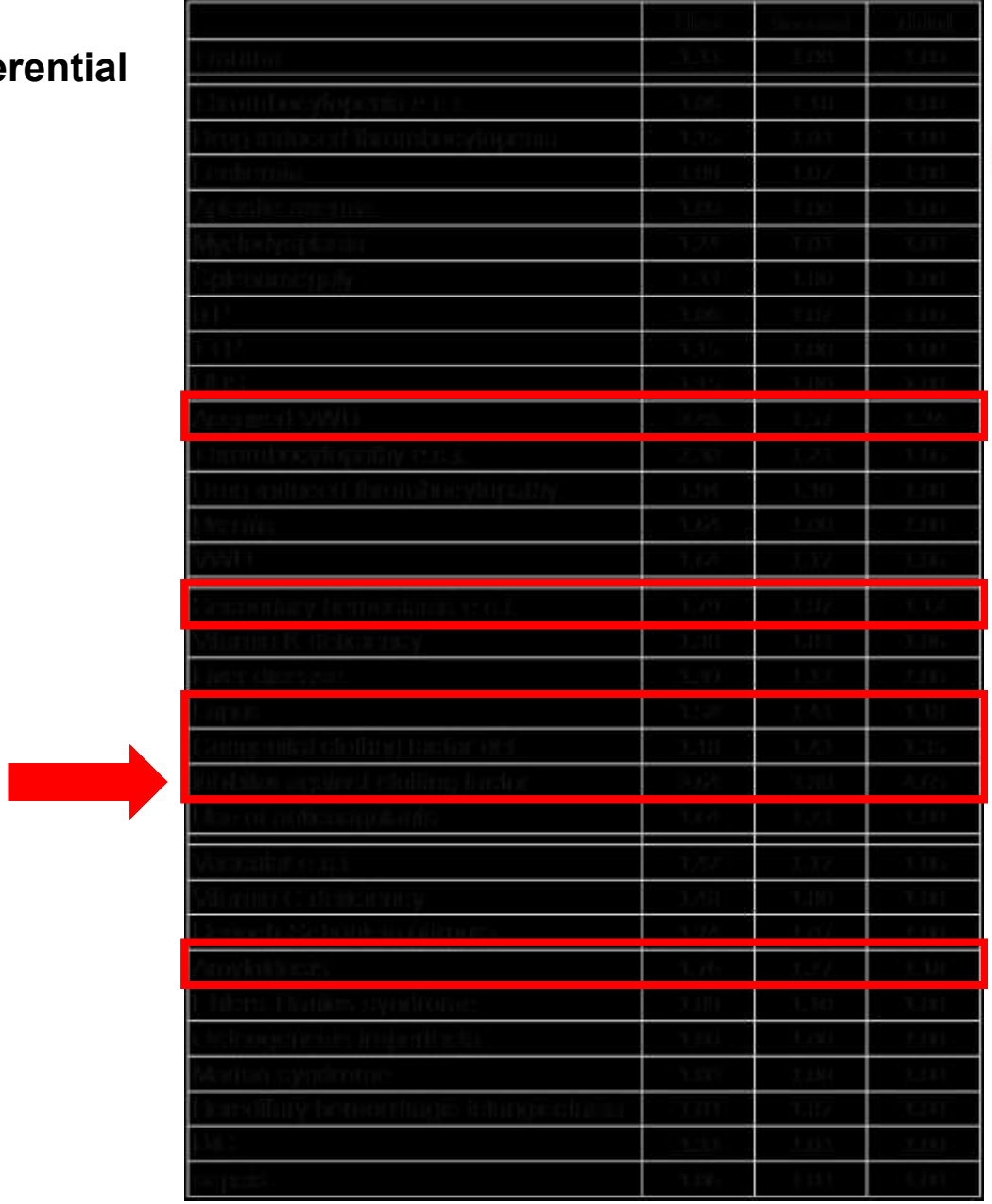
Parameter	Mean test result	Range
APTT ratio	2.52	2.09 – 3.25
APTT – mix (0 hr.)	1.15	0.83 – 1.35
APTT – mix (1 hr.)	1.35	1.02 – 1.53
APTT – mix (2 hr.)	1.63	1.09 – 2.68
Factor VIII	n.a.	< 1 – 4%
Factor IX	113%	94 – 132%
FVIII Inhibitor	4.4 BU/mL	0.6 – 8.5 BU/mL
Lupus Anticoagulant	Negative	
VWF antigen	150%	128 – 172%
VWF activity	120%	100 – 128%

Central Laboratory characteristics

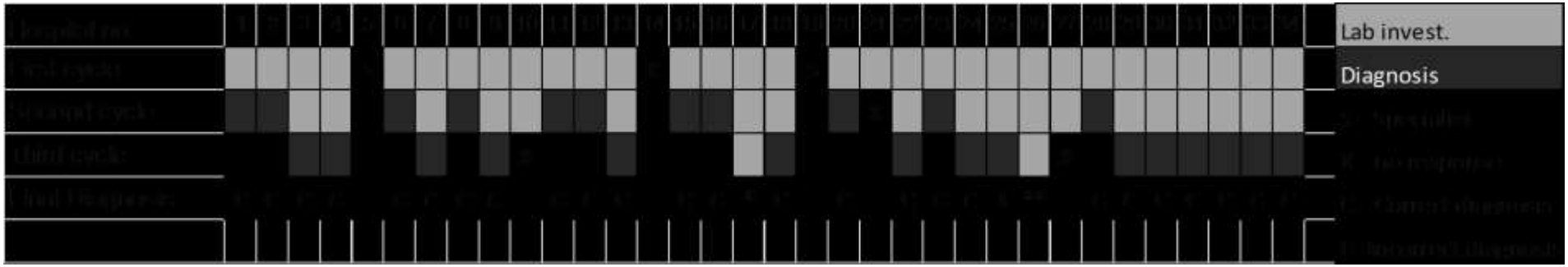
Parameter	Test result	Reference Range
APTT		
APTT ratio		
PT		
INR		
Fibrinogen		
Thrombin Time (10 IE)		
APTT – mix (0 hr.)		
APTT – mix (1 hr.)		
APTT – mix (2 hr.)		
Factor VIII		
Factor IX		
Factor XI		
FVIII – mix (0 hr.)		
FVIII – mix (0.5 hr.)		
FVIII – mix (1 hr.)		
FVIII Inhibitor		
Lupus Anticoagulant		
VWF antigen		
VWF activity		

Mean likelihood of the differential diagnosis per cycle.

(cycle 1: n=33)
(cycle 2: n=32)
(cycle 3: n=17)



Conclusion after each cycle



CASE-BASED EQA

Strenghts:

- Focus on the entire diagnostic process.
- Both the physician and the laboratory is included.
- EQA challenge is based on a real clinical scenario

Weaknessess:

- Not all aspects of the total testing process can be included (e.g. sample collection and preparation).
- The physician is guided by an electronic questionnaire and not completely "self-supporting".
- Potential selection of participating physician.

FUTURE DEVELOPMENTS

Based on the experiences so far we will further develop this type of EQA.

- **Further optimizing the flow of the survey, e.g. cross-talk between physician and laboratory.**
- **Other type of disorders.**
- **Developing electronic interactive tools**

CONCLUSION

Diagnostic EQA, based on real case scenario's and focussing on the entire diagnostic process, may be an important addition to the current EQA approaches which mainly focus on analytical quality or separate parts of the pre- and post-analytical phase.

Acknowledgement

- Participating hematologists and laboratories

- Piet Meijer (ECAT Foundation)
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THANK YOU FOR YOUR ATTENTION