# VURDERING AF BLØDNINGSRISIKO FORUD FOR KIRURGI

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**Can doctors predict excessive bleeding (or post-operative death) in patient before surgery? (Quora)**

Ajay Desai paediatric intensive care medicine, Royal Brompton Hospital

” Doctors can’t predict the future!”

**KAN KOAGULATIONSSCREENING???**

# Vurdering af blødningsrisiko før kirurgi Disposition

- Koagulationsscreening
  - Hvilke tests bliver anvendt præ-operativt
    - APTT, PT, Blødnings tid, (ROTEM/TEG, trombocytfunktionstests)
  - Prædiktive værdi af koagulationsscreening tests
- Anamnese
  - Prædiktive værdi
- Blødningsscore
- Procedurer/patienter
  - Høj-risiko: specifikke operative indgreb, co-morbiditet, arvelige blødningsforstyrrelser, antikoagulationsbehandling

# Koagulationsscreening

- Rutine koagulationstest anvendt mange år præ-operativt
- Primært anvendt APTT, PT og blødningstid
- Troet på at konsekvensen af screening
  - Medfører identifikation af erhvervet og kongenit blødningsforstyrrelser
  - Muliggør en afværgelse af øget blødningsrisiko ved kirurgi
  - Dermed nedsætte mortalitet og morbiditet

# Rutine pre-operative tests

- Test baseret på **aktuel klinisk vurdering** af patient og patients-comorbiditet
- **Baseline tests** som udføres for at kunne foretage en opfølgning på forandringer som kan induceres af det operative indgreb
- **Screenings test** som har det formål at afsløre underliggende ikke klinisk mistænkte sygdomme

# Screeningstest

- Non-selektiv testprocedure som kan inducere **mange falsk-positive og falsk-negative** resultater (skade >< gevinst for patienten)
- Risikere at underkende en regelret underliggende patologiske tilstand
- Abnormalitet er måske ikke af betydning for behandling eller outcome

# Koagulationsscreening begrænsninger: APTT og PT (1)

- Udviklet til at detektere mangel på koagulationsfaktorer (abnorme værdier ved faktor mangel < 30%)
- Ikke udviklet som screeningstest til at vurdere øget klinisk risiko for blødning
  - APTT: Intrinsic og common pathway (kontakt akt). Mangel i en af disse pathways
  - PT: Extrinsic og common (TF). Mangel på VII og mangel i common pathway
  - Begge forlænges ved inhibitorer (antikoagulantia), LA, akutte situationer med erhvervet blødningstilstand
- Lav sandsynligheden for at detektere en signifikant arvelig mangel på koagulationsfaktorer i en uselekteret population
  - 17/100.000 mænd og 5/100.000 kvinder (vWF, FVIII- og FIX-mangel)

# Koagulationsscreening begrænsninger (2)

- Andre hyppige årsager til forlænget APTT som ikke øger blødningsrisikoen
  - mild FXII mangel
  - LA (også forlænge PT)
  - Sjældnere HMWK og prekallikrein mangel

- Reference interval baseret analyser på en rask ikke-blødende population og defineres/beregnes ud fra mean ± 2 SD af målinger
  - Per definition vil 2,5% af målingerne blandt raske ikke-blødende være kortere end normalområdet og
  - 2,5% forlængede i forhold til det defineret normalområde

# Koagulationsscreening begrænsninger (3)

- De forlængede værdier kan medføre yderligere analyser (omkostninger), uro hos patienten og udskydelser af OP til gene for patienten

- Normal test udelukker ikke tilstedeværelse af alvorlig blødningsforstyrrelse som eksempelvis
  - vWF-mangel (mild form kan normal FVIII ses)
  - Mild hæmofili A og B overses insensitive assays eller akut fase respons → ↑FVIII
  - FXIII mangel
  - Alpha-2-Antiplasmin mangel
  - Trombocytfunktions forstyrrelser

# Evidence – koagulationsscreening

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COMMON DIAGNOSTIC TESTS
Series Editors: Alan Garber, MD, PhD, and Harold Sox, MD

ACADEMIA AND CLINIC

## Screening for the Risk for Bleeding or Thrombosis

Mark H. Eckman, MD; John K. Erban, MD; Sushil K. Singh, MD; and Grace S. Kao, MD

Background: **Numerous tests are available to assess patient risk for bleeding or thrombosis. Appropriate use of these tests must involve consideration of the clinical setting, disease prevalence, performance characteristics of the tests, cost, and consequences of false-positive and false-negative results.**

Data Extraction: **5 observational studies of routine coagulation testing in nonsurgical hospitalized patients and 12 observational studies of preoperative coagulation testing, from which both sensitivity and specificity could be calculated.**

Data Synthesis: **Test performance characteristics for the partial**
**horrhage were**

bjh guideline

## Guidelines on the assessment of bleedin
## or invasive procedures

British Committee for Standards in Haematology

Y. L. Chee, [1] J. C. Crawford, [2] H. G. Watson[1] and M. Greaves[3]

[1]Department of Haematology, Aberdeen Royal Infirmary, Aberdeen, [2]Department of An
and [3]Department of Medicine and Therapeutics, School of Medicine, University of Abe

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EDITORIAL I

## Routine preoperative coagulation tests: an outdated practice?

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# Prædiktiv værdi af koagulationstests til screening (1)

**Table III.** Predictive value and likelihood ratios for the value of clotting tests or bleeding history in predicting postoperative bleeding and bleeding rate for patients with abnormal and normal coagulation tests.

| | PPV and LR+ of coagulation test for postoperative bleeding (95% CI) | | PPV and LR+ of bleeding history for postoperative bleeding (95% CI) | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reference | PPV | LR+ | PPV | LR+ | Bleeding rate for patients with abnormal coagulation test | Bleeding rate for patients with normal coagulation test | Absolute risk difference for bleeding rate between patients with and without abnormal coagulation test | 95% CI of absolute risk difference for bleeding rate* (upper limit, lower limit) |
| Gabriel *et al* (2000) | 0·16 (0·08–0·28) | 1·65 (0·82–3·30) | 0·23 (0·06–0·54) | 2·64 (0·73–9·48) | 0·174 | 0·100 | 0·074 | −0·014, 0·210 |
| Houry *et al* (1995) | 0·04 (0·03–0·07) | 1·33 (0·91–1·93) | 0·04 (0·03–0·06) | 1·27 (0·99–1·64) | 0·045 | 0·032 | 0·013 | −0·005, 0·036 |
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| Asaf *et al* (2001) | | | | | | | | |
| PT | 0·09 (0·05–0·16) | 0·94 (0·56–1·57) | n/a | n/a | 0·091 | 0·099 | −0·008 | −0·070, 0·069 |
| APTT | 0·11 (0·05–0·23) | 1·18 (0·59–2·40) | n/a | n/a | 0·115 | 0·095 | 0·020 | −0·056, 0·138 |
| Howells *et al* (1997) | 0·03 (0·00–0·15) | 0·95 (0·15–6·00) | 0·13 (0·01–0·53) | 4·7 (0·64–34·68) | 0·026 | 0·027 | −0·001 | −0·043, 0·125 |
| Myssiorek and Alvi (1996) | 0·14 (0·03–0·44) | 5·10 (1·18–21·96) | n/a | n/a | 0·143 | 0·030 | 0·113 | −0·006, 0·408 |
| Kang *et al* (1994) | 0·22 (0·09–0·43) | 4·45 (1·86–10·63) | n/a | n/a | 0·222 | 0·056 | 0·166 | 0·037, 0·372 |
| Manning *et al* (1987) | 0·03 (0·01–0·13) | 0·95 (0·24–3·74) | n/a | n/a | 0·035 | 0·036 | −0·001 | −0·034, 0·094 |
| Suchman and Mushlin (1986) | 0·03 (0·01–0·05) | 2·08 (1·21–3·57) | 0·02 (0·01–0·03) | 5·04 (3·48–7·31) | 0·026 | 0·010 | 0·016† | 0·001, 0·041 |

PPV, positive predictive value; LR+, likelihood ratio for a positive test; n/a, not available; CI, confidence interval.
*Newcombe (1998) after EB Wilson, 1927 (with continuity correction).
†Significant difference at alpha ≤0·05

Chee et al BJH 2008

# Prædiktiv værdi af koagulationstest til screening (2)



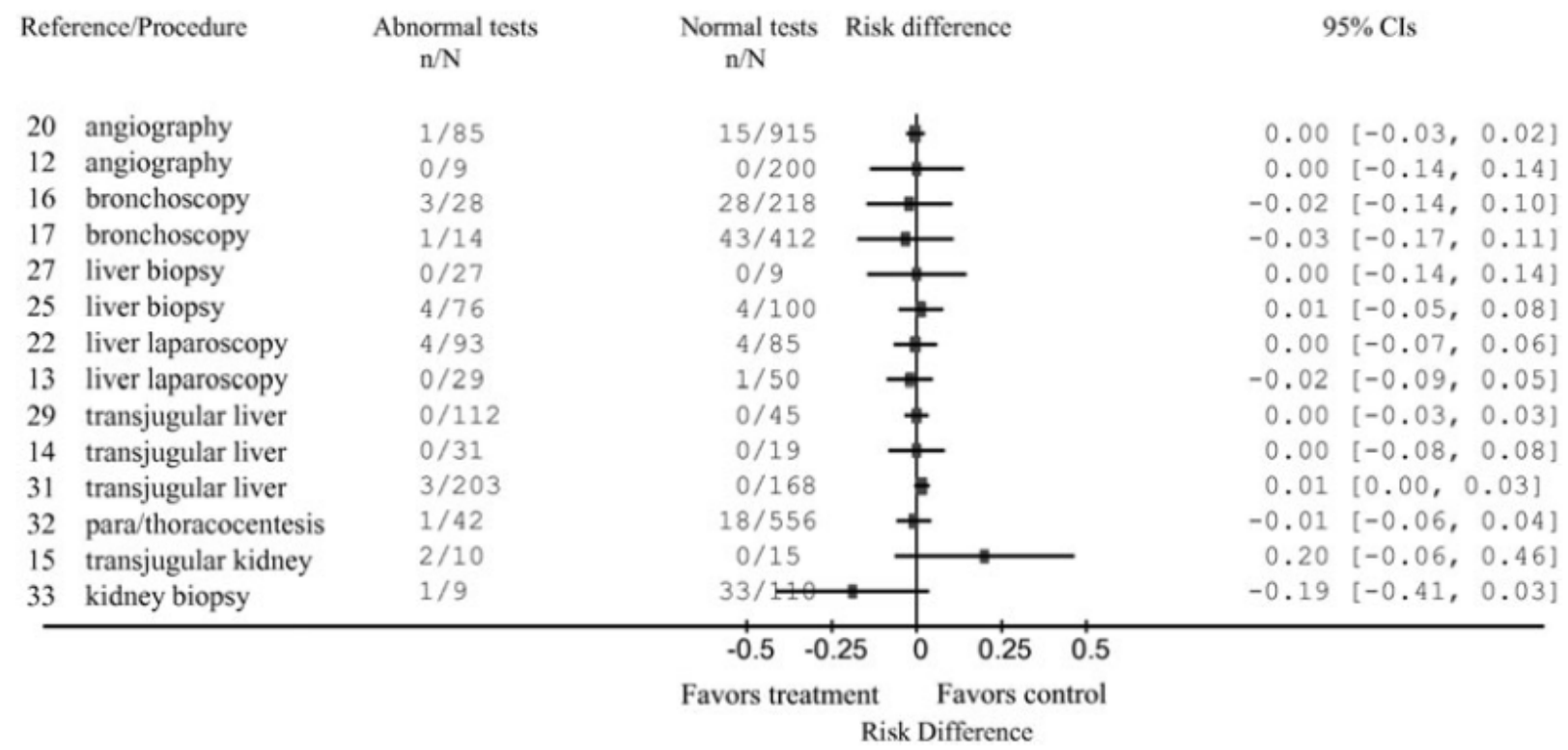


**Fig. 1. Risk differences (and 95 percent CIs) between patients with abnormal and normal coagulation test results.**

Segal et al Transfusion 2005

# Screening for blødningsrisiko

COMMON DIAGNOSTIC TESTS
Series Editors: Alan Garber, MD, PhD, and Harold Sox, MD

ACADEMIA AND CLINIC

## Screening for the Risk for Bleeding or Thrombosis

Mark H. Eckman, MD; John K. Erban, MD; Sushil K. Singh, MD; and Grace S. Kao, MD

Background: Numerous tests are available to assess patient risk for bleeding or thrombosis. Appropriate use of these tests must involve consideration of the clinical setting, disease prevalence, performance characteristics of the tests, cost, and consequences of false-positive and false-negative results.

Purpose: To summarize information about coagulation testing in three common clinical settings: nonsurgical hospitalized patients, surgical patients, and patients having a first venous thromboembolic event.

Data Sources: All English-language studies identified in searches of MEDLINE (1966 to April 2002) and reference lists of key articles.

Study Selection: All published studies of blood coagulation testing as routine diagnostic tests or in the preoperative care of patients reporting postoperative bleeding complications, and all published studies of patients with the factor V Leiden mutation reporting venous thromboembolic outcomes.

Data Extraction: 5 observational studies of routine coagulation testing in nonsurgical hospitalized patients and 12 observational studies of preoperative coagulation testing, from which both sensitivity and specificity could be calculated.

Data Synthesis: Test performance characteristics for the partial thromboplastin time in predicting postoperative hemorrhage were pooled by type of surgery. Likelihood ratios for positive and negative results were calculated for each group; 95% confidence intervals were calculated. Patients with prolonged partial thromboplastin times did not have a statistically significantly increased risk for postoperative complications.

Conclusion: For nonsurgical and surgical patients without synthetic liver dysfunction or a history of oral anticoagulant use, routine testing has no benefit in assessment of bleeding risk. Routine testing after a first episode of venous thromboembolism is not recommended for most patients.

*Ann Intern Med.* 2003;138:W15-W24. www.annals.org
For author affiliations, see end of text.

Eckman Ann Intern Med 2003

# Rationel preoperativ vurdering i patient population med  høj comorbiditet

**Table II** Summary of laboratory, X-ray and electrocardiogram results

| *Test* | *Number ordered* | *%* | *Number abnormal* | *%* | *Abnormal results changing therapy* | *%* |
|---|---|---|---|---|---|---|
| Complete blood count | 199 | (99.5) | 121 | (60.8) | 18 | (9.0) |
| White cell differential count | 155 | (57.5) | 54 | (34.8) | 8 | (5.1) |
| SMA7† | 117 | (58.5) | 77 | (65.8) | 24 | (20.5) |
| SMA20† | 108 | (54.0) | 88 | (81.4) | 9 | (8.3) |
| Urinalysis | 174 | (87.0) | 39 | (22.4) | 9 | (2.6) |
| Prothrombin time | 128 | (64.0) | 5 | (3.9) | 0 | (0.0) |
| Partial thromboplastin time | 126 | (63.0) | 5 | (3.9) | 0 | (0.0) |
| Electrocardiogram | 145 | (72.5) | 53 | (36.5) | 2 | (1.3) |
| Chest X-ray | 119 | (59.5) | 35 | (29.4) | 6 | (5.0) |

†See Table III; SMA = sequential multiple analysis.

Despite the fact that 35.5% of the 1271 tests performed displayed some abnormality, only 76, or 5.9%, of the tests actually affected the care of the patient before operation. Of the 76 tests affecting care, only 5 were unsuspected on the basis of clinical history and physical examination.

The remaining 71 tests which resulted in clinical decisions were predictable from the presenting history and physical examination.

blood counts in healthy subjects. Robbins & Rose (1979) found no unpredicted partial thromboplastin times in 1025 studies. Eisenberg *et al.* (1982) found one patient in 480 who may have benefited from routine prothrombin and partial thromboplastin screening.

Muskett et al Postgrad Med J 1986

# Konsekvens?

Anaesthesia, 2002, **57**, pages 914–917

FORUM

## Routine pre-operative blood testing: is it necessary?

**R. K. Johnson[1] and A. J. Mortimer[2]**

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**Summary**

In order to determine the value of routine pre-operative screening investigations, the medical notes of 100 patients undergoing elective surgical procedures under general anaesthesia were subject to prospective audit. Pre-operative screening investigations (full blood count, urea and electrolytes and random glucose) were analysed in terms of frequency of abnormalities and whether or not the peri-operative management was changed when the result was abnormal. The frequency of results being present in the note at the time of operation and the costing of the tests was also examined. A total of 773 tests was performed of which 70 (9.1%) were abnormal. Peri-operative management was altered as a result of only two abnormal results (0.2%). Eight complications arose, none of which could have been predicted by the pre-operative screening tests. In only 57% of cases were the results present in the medical notes at the time of surgery. It is conservatively estimated that a saving of £50 000 per year could be made in our hospital alone by selective ordering of tests.

**Keywords** *Investigations*: pre-operative.

# Konsekvens?

**Table 1** Blood investigations, whether action was taken as a result of abnormalities, and the number of complications in patients with normal or abnormal results.

| Test | No. of tests per 100 patients | No. of abnormal results | Abnormal test result | | No. of patients with complications | |
|---|---|---|---|---|---|---|
| | | | Action | No action | Normal result | Abnormal result |
| Haemoglobin | 100 | 12 | 0 | 12 | 7 | 1 |
| White cells | 100 | 7 | 0 | 7 | 8 | 0 |
| Platelets | 100 | 6 | 0 | 6 | 8 | 0 |
| Sodium | 100 | 0 | 0 | 0 | 8 | 0 |
| Potassium | 100 | 6 | 0 | 6 | 8 | 0 |
| Urea | 100 | 17 | 0 | 17 | 7 | 1 |
| Creatinine | 100 | 14 | 0 | 14 | 7 | 1 |
| Glucose | 73 | 8 | 2 | 6 | 7 | 1 |
| Total | 773 | 70 | 2 | 68 | 60 | 4 |

investigated [4]. We believe that, before ordering investigations, the doctor making the request should ask him/herself the following questions:

1 Will this investigation yield more information not revealed by physical examination?

2 Will the results of the investigation alter the management of the patient?

These two questions are of paramount importance if the burden of work on biochemistry and haematology services is to be reduced and if patients are not to be subjected to further investigations on the basis of a borderline abnormal result.

Johnson et al Anaesthesia 2002

# Hvorfor fortsat koagulationsscreening?

- Nemmere at ”måle noget” end spørge patienten
- Man er ”sikker” når man måler og får et svar, som man kan relatere til et referenceinterval, så er alt ”normalt” og risikoen lav
- Har man målt og værdien var ok, så kan ingen komme efter mig (patienten og styrelser)
- Kan jeg stole på patienten – (eller er patienten så vant til blødninger, at man ikke formår at få det frem i anamnesen)?
- Ingen tidligere traumer/operationer – ingen udfordret hæmostase

# Blødningstid

- Uden anamnese for blødning er blødningstid ikke anvendelig som prædiktor for perioperativ blødning i forbindelse med kirurgi
- En normal blødningstid ekskludere ikke patienter med øget risiko for blødning i forbindelse med kirurgi
- Patienter med abnormal blødningstid havde i flere studier ikke en højere blødningsrisiko end patienter med normal blødningstid
- Blødningstiden detekterede ikke pålideligt patienterne med højere blødningsrisiko (eks ASA eller NSAID-behandlede patienter, trombocytdefekter)

Gewirtz et al Arch Patol Lab Med 1996, Rodgers et al TH 1990, Peterson et al Arch surg 1998

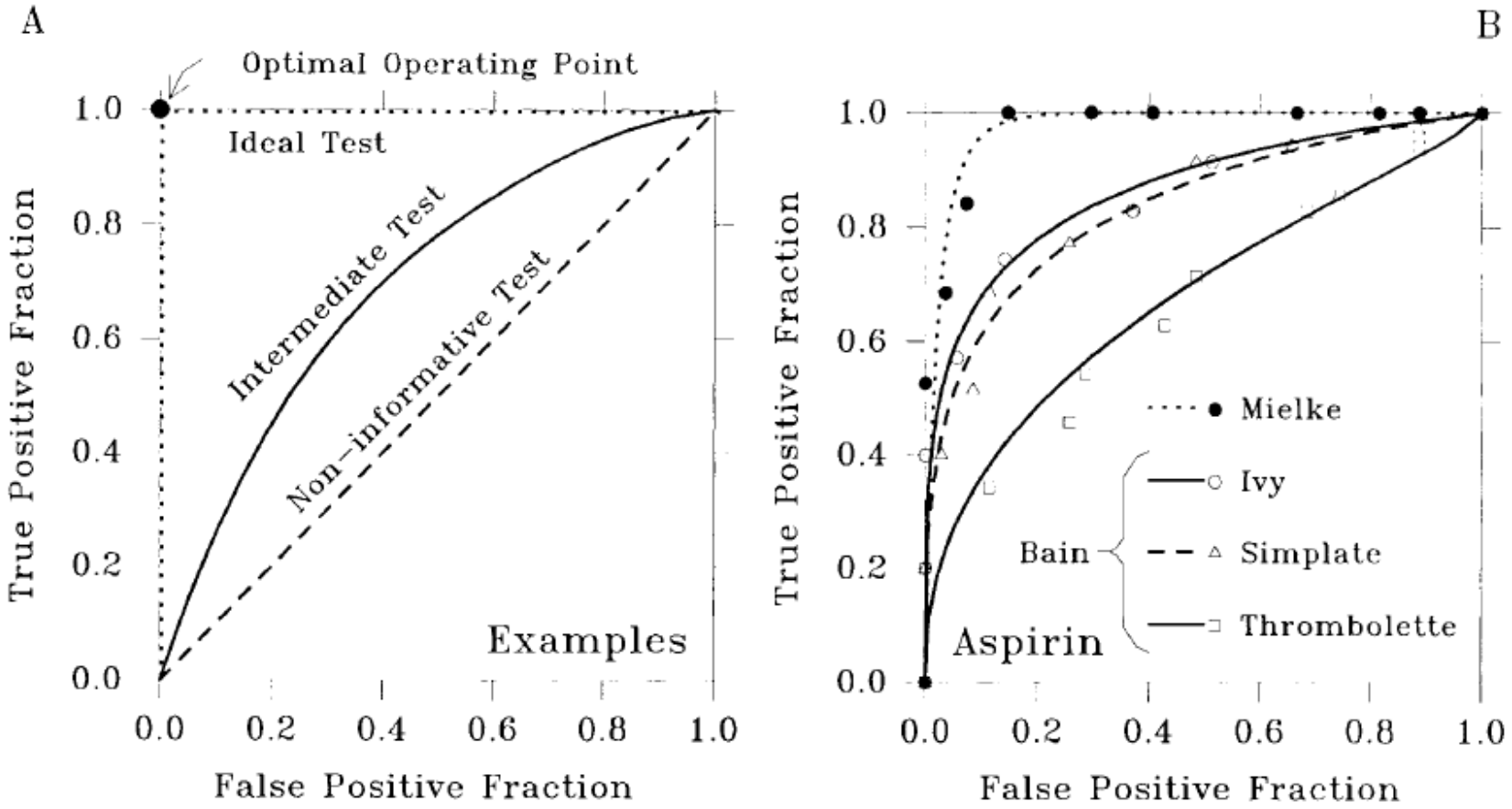
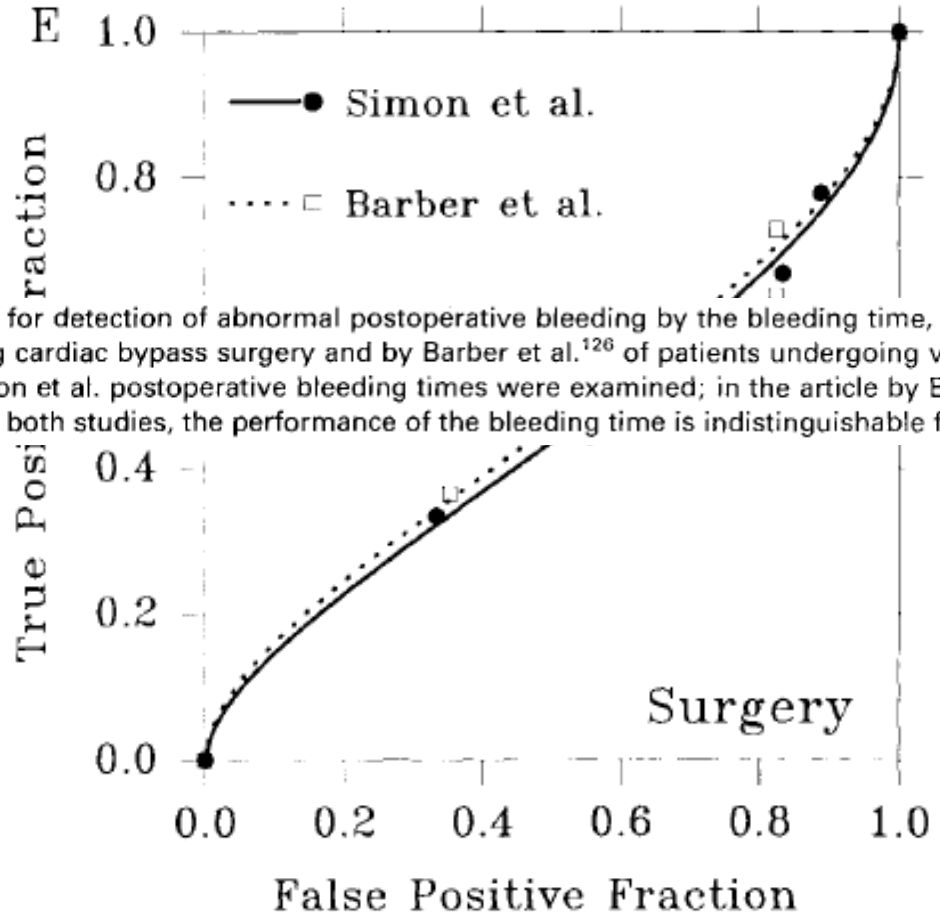



**FIG. 1. Receiver operating characteristic (ROC) curves are plots of the true-positive fraction (sensitivity) versus the false-positive fraction (1-specificity) as the decision limit for a diagnostic or prognostic procedure is varied.** ROC curves summarize the unavoidable tradeoff between sensitivity and specificity provided by such procedures. A: Examples of ROCs for: (1) an ideal test (the dotted line along the left and upper borders of the plot, including the optimal operating point corresponding to perfect sensitivity and specificity); (2) a noninformative test (the dashed 45° line); and (3) the intermediate curvilinear relationship that is observed for an informative but imperfect test (solid curve) B: ROCs for use of the bleeding time to detect aspirin usage, from a study by Mielke[118] of hemophiliacs (dotted line connecting closed circles) and from a study by Bain *et al*[118] of hemophiliacs (dotted line connecting closed circles) and from a study by Bain *et al*[120] of normal persons, using three different techniques (solid and dashed lines connecting open symbols). The Mielke study and the Thrombolette data of Bain are the extremes that were observed in the computation of 27 ROCs from studies of the effects of aspirin, and they demonstrate wide variability in the ability of the bleeding time to detect aspirin utilization in the highly controlled conditions of the studies (which used well-defined populations, standardized doses, and constant time intervals between drug ingestion and testing). (Continued on next page.)

# Blødningstid




(p = 0.05). E: ROCs for detection of abnormal postoperative bleeding by the bleeding time, from studies by Simon et al.[125] of patients undergoing cardiac bypass surgery and by Barber et al.[126] of patients undergoing various major surgical procedures. In the study of Simon et al. postoperative bleeding times were examined; in the article by Barber et al. preoperative bleeding times were used. In both studies, the performance of the bleeding time is indistinguishable from that of a noninformative test.

# Trombocyttal/funktion

- Trombocyttallet
  - Reproducerbar, stabil analyse
  - Inkomplet svar i forhold til blødning
  - Misvisende resultat
- Trombocytfunktions undersøgelser
  - Stor variabilitet (inter- og intra-assay)
  - Medikament monitorering

# Trombocytfunktionstest

- Trombocytfunktiontest hvis
  - Positiv blødningshistorie
  - Trombocythæmmende medicinsk behandling
- Anvendelsen af trombocytfunktionstest som preoperativ screening af primær hæmostasedefekter afventer fortsat afklaring

# ROTEM/TEG?

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journal homepage: www.jcvaonline.com

Original Article

## Prediction of Postoperative Blood Loss Using Thromboelastometry in Adult Cardiac Surgery: Cohort Study and Systematic Review

Michael I. Meesters, MSc, MD[*,1], David Burtman, MSc, MD[*], Peter M. van de Ven, MSc, PhD[†], Christa Boer, MSc, PhD[*]

[*]Department of Anaesthesiology, VU University Medical Centre, Amsterdam, The Netherlands
[†]Department of Epidemiology and Biostatistics, VU University Medical Centre, Amsterdam, The Netherlands

*Objective:* The aim was to evaluate the predictive value of thromboelastometry for postoperative blood loss in adult cardiac surgery with cardiopulmonary bypass.
*Design:* Retrospective cohort study and systematic review of the literature.
*Setting:* A tertiary university hospital.
*Participants:* 202 patients undergoing elective cardiac surgery.
*Interventions:* Thromboelastometry was performed before cardiopulmonary bypass and 3 minutes after protamine administration.
*Measurements and Main Results:* The cohort study showed that the preoperative and postoperative thromboelastometric positive predicting value was poor (0%-22%); however, the negative predicting value was high (89%-94%). The systematic review of the literature to evaluate the predictive value of thromboelastometry for major postoperative bleeding in cardiac surgery resulted in 1,311 articles, 11 of which were eligible (n = 1,765; PubMed and Embase, until June 2016). Two studies found a good predictive value, whereas the other 9 studies showed a poor predictability for major postoperative bleeding after cardiac surgery. The overall negative predicting value was high.
*Conclusions:* Thromboelastometry does not predict which patients are at risk for major postoperative bleeding.

# Blødningsanamnese

*5.1.4.1 Standardised bleeding history and clinical evaluation*

**Recommendation**

*We recommend the use of a structured patient interview or questionnaire before surgery or invasive procedures, which considers clinical and family bleeding history and detailed information on the patient's medication.* 1C

are indications that a structured approach may be predictive. Therefore there is insufficient evidence to conclude that the bleeding history has no PV for postoperative bleeding. A bleeding history, including family history, evidence of excessive post-traumatic or postsurgical bleeding and use of antithrombotic drugs should be taken in all patients prior to surgery or invasive procedures. (Grade C, Level IV).

Chee et al BrJHaematol 2008, Kozek-Langenecker EJA 2013

# Anamnese og klinisk undersøgelse

- Anamnese
  - Familieanamnese
  - Personlig anamnese
  - Medicin anamnese
- Begrænsninger:
  - Ingen validerede standardiserede screenings redskab
  - Prædiktive egenskaber afhængig af de specifikke spørgsmål
  - Blødningssymptomer er subjektive
- Klinisk undersøgelse
  - Ekkymoser, suggilationer, ptekkier, teleangietctasier,
  - Hypertension, anæmi, nyrefunktion, diabetes, køn uafhængige risikofaktorer for blødning

# Blødningsrisiko vurdering via anamnese og klinisk undersøgelse



*Table 1.* **Preoperative Assessment of Bleeding Risk***

| |
|---|
| History |
| Excessive bruising, bleeding more than 3 minutes after brushing teeth, nosebleeds, prolonged bleeding after cuts, severe or prolonged menstrual periods |
| History of blood loss through the gastrointestinal or genitourinary tract |
| Severe bleeding after dental extraction, surgical operation, or childbirth |
| History of hemophilia or inherited familial hemorrhagic disorder |
| Personal history of liver disease, renal failure, hypersplenism, and hematologic or collagen vascular disease |
| Current or recent use of medication that may interfere with hemostasis |
| Physical examination |
| Purpura, hematoma, jaundice, and signs of cirrhosis |

* Data from reference 28.

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# Blødningsrisiko ved kirurgi

- Anamnese og klinisk undersøgelse prædiktere risikogrupper
- Lav risiko for post-operativ blødning

*Table 2.* **Risk for Bleeding Complications on the Basis of Clinical History and Physical Examination**

| Study, Year (Reference) | Low-Risk Patients | High-Risk Patients |
|---|---|---|
| Suchman and Mushlin, 1986 (27) | | |
| Total patients, *n* | 11 334 | 1004 |
| Postoperative hemorrhage, % | 0.22 | 1.7 |
| Houry et al., 1995 (28) | | |
| Total patients, *n* | 2291 | 951 |
| Death related to hemorrhage, % | 0.13 | 0.21 |
| Bruises, % | 4.8 | 8.7 |
| Hematomas, % | 3.0 | 4.0 |
| Reoperation to control hemorrhage, % | 0.48 | 1.2 |

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# Blødnings anamnese – prædiktiv værdi

**Table III.** Predictive value and likelihood ratios for the value of clotting tests or bleeding history in predicting postoperative bleeding and bleeding rate for patients with abnormal and normal coagulation tests.

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| Myssiorek and Alvi (1996) | 0·14 (0·03–0·44) | 5·10 (1·18–21·96 | n/a | n/a | 0·143 | 0·030 | 0·113 | −0·006, 0·408 |
| Kang *et al* (1994) | 0·22 (0·09–0·43) | 4·45 (1·86–10·63 | n/a | n/a | 0·222 | 0·056 | 0·166 | 0·037, 0·372 |
| Manning *et al* (1987) | 0·03 (0·01–0·13) | 0·95 (0·24–3·74) | n/a | n/a | 0·035 | 0·036 | −0·001 | −0·034, 0·094 |
| Suchman and Mushlin (1986) | 0·03 (0·01–0·05) | 2·08 (1·21–3·57) | 0·02 (0·01–0·03) | 5·04 (3·48–7·31) | 0·026 | 0·010 | 0·016† | 0·001, 0·041 |

PPV, positive predictive value; LR+, likelihood ratio for a positive test; n/a, not available; CI, confidence interval.
*Newcombe (1998) after EB Wilson, 1927 (with continuity correction).
†Significant difference at alpha ≤0·05

Chee et al BJH 2008

# Blødningsanamnese

**Table 5. Multivariate Odds Ratios of Symptoms in a Screening Situation***

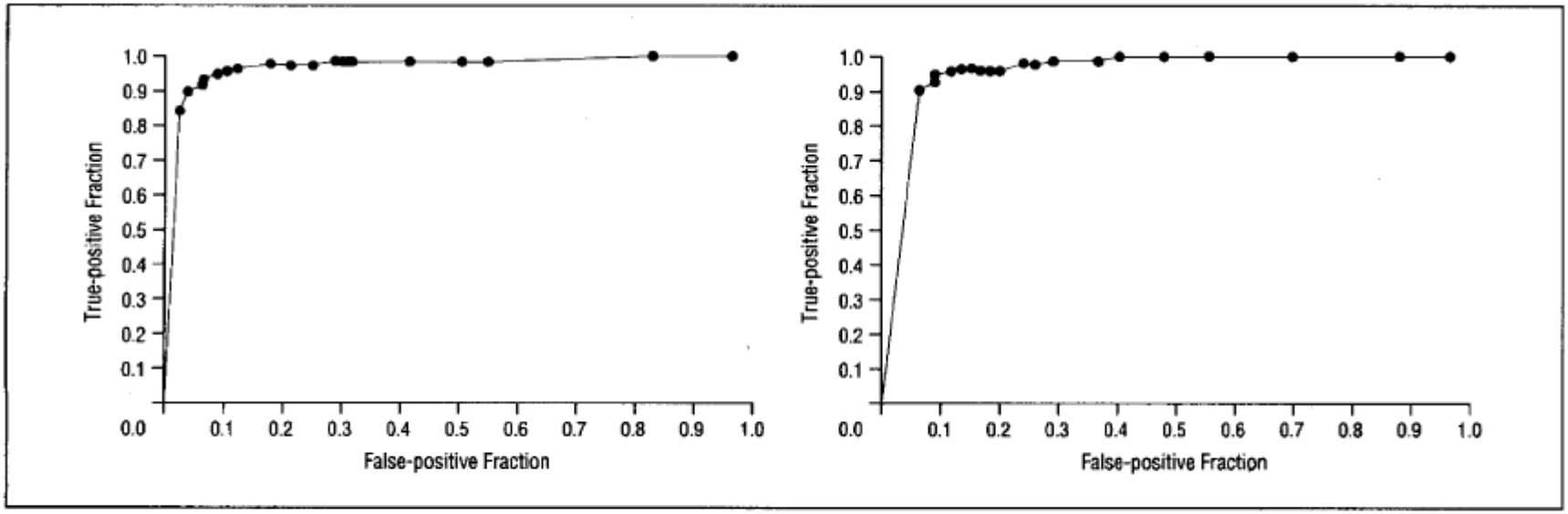



**Figure 2.** *A plot of the true-positive fraction (sensitivity) against the false-positive fraction (1 minus specificity) for the interview in a screening situation. The receiver operating characteristic curve on the left concerns the interview in which only questions with regard to the presence or absence of symptoms were included (simple interview). In the receiver operating characteristic curve on the right, the interview was extended with questions about the severity of symptoms (elaborate interview).*

| | | |
|---|---|---|
| Profuse bleeding at delivery | 2.1 | 0.3-13.5 |
| Frequent gumbleeds | 0.7 | 0.3-2.0 |
| Blood in urine (ever) | 0.5 | 0.1-2.3 |

**The weight of items in decreasing order. 95% CI indicates 95% confidence interval of the odds ratio. Sex and frequent ingestion of acetylsalicylic acid–containing medication were taken into account.*

Scramek Arch Intern Med 1995

# Blødningsanamnese

**TABLE 2.** Questionnaire for the Detection of an Increased Risk for Bleeding

1. Have you ever experienced strong nose bleeding without prior reason?
2. Did you ever have—without trauma—"blue spots" (hematoma) or "small bleed (at the torso or other unusual regions of the body)?
3. Did you ever have bleeding of the gums without apparent reason?
4. How often do you have bleedings or "blue spots" (hematoma): more than 1 or
5. Do you have the impression that you have prolonged bleedings after minor wo
6. Did you have prolonged or grave bleedings after or during operations (e.g., tor appendectomy or during labor)?
7. Did you ever have prolonged or grave bleedings while after a tooth extraction?
8. Did you ever recieve blood packs or blood products during an operation? If so,
9. Is there a history of bleeding disorders in your family?
10. Do you take analgesic drugs or drugs against rheumatic disease? If so, please s
11. Do you take other drugs? If so, please specify:
12. Do you have the impression that you have prolonged menstruation (> 7 days) change (to be answered only by women)?



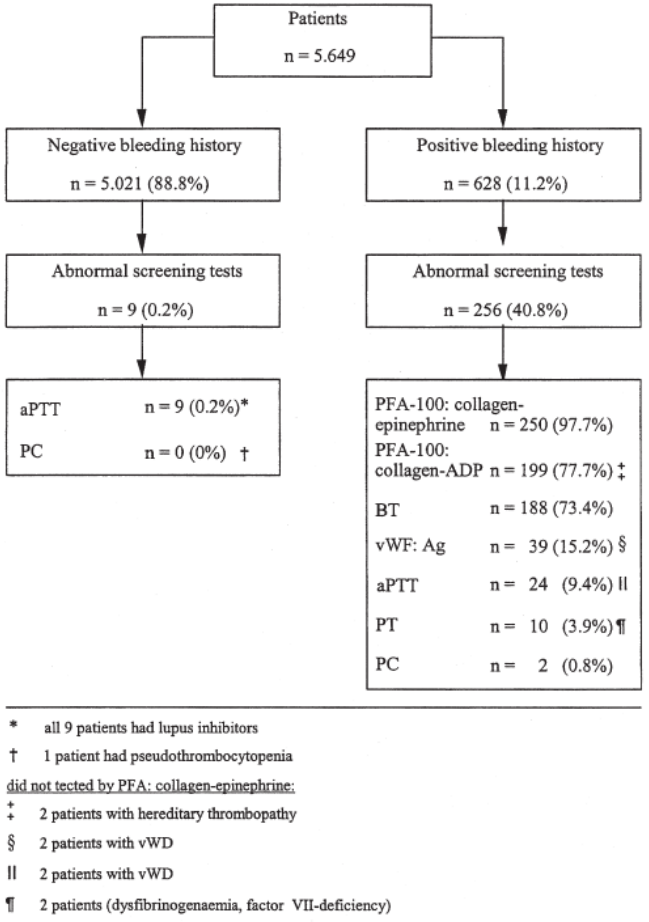



**FIG. 1.** Abnormal laboratory results in patients with negative bleeding history and positive bleeding history and/or evidence of impaired hemostasis, e.g., drug ingestion.

Koscielny Clin App TH 2004

# Positiv blødningsanamnese og koagulationsscreening

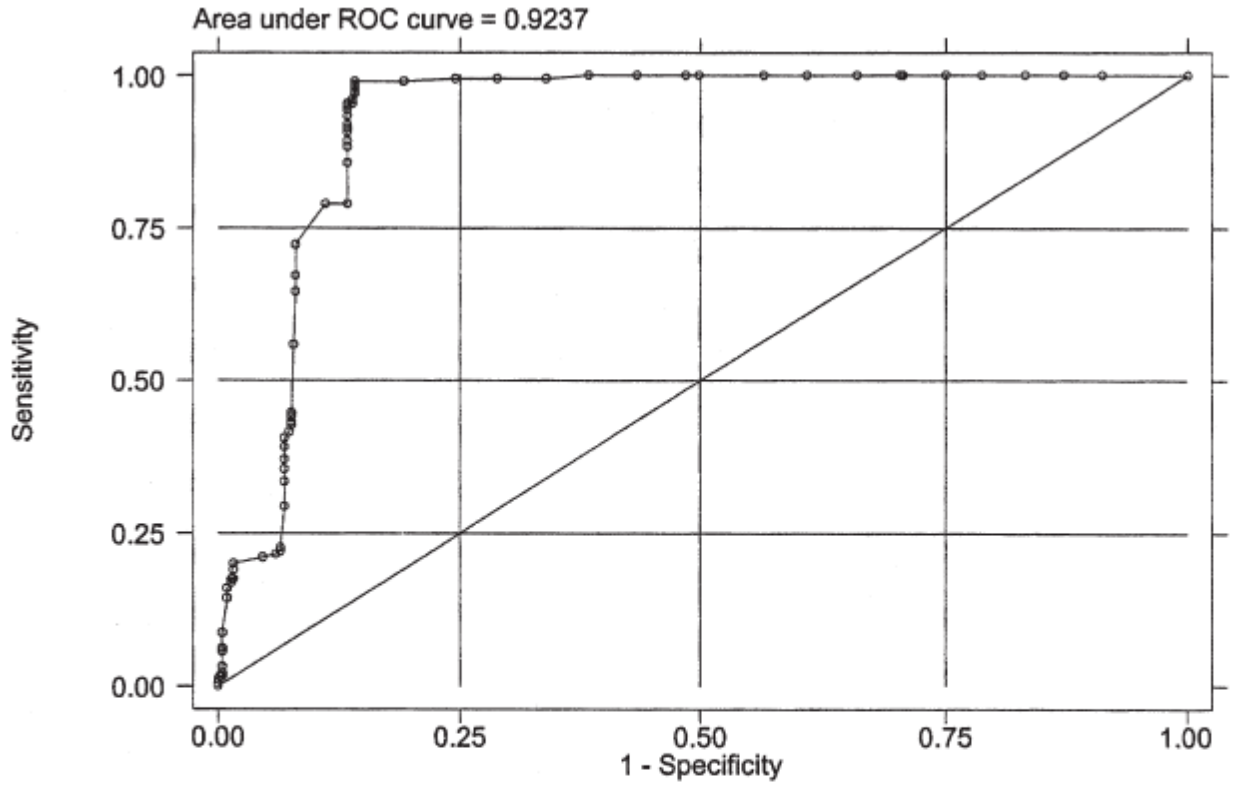



**FIG. 3.** Receiver operator characteristic (ROC) curve for the PFA-100: collagen-epinephrine in comparasion to other screening-tests (BT, aPTT, PT, vWF: Ag) in a total of 628 patients (with positive bleeding history and/or evidence of impaired hemostasis, e.g. drug ingestion) PFA-100: collagen-epinephrine: sensitivity: 90.8%; specifity: 86.6%.

Koscielny Clin App TH 2004

# Blødnings QC og BAT

## > WHAT BLEEDING ASSESSMENT /AILABLE?

ilable, as well as a newer combined tool developed by
s and Haemostasis (ISTH) in an effort to consolidate the
n a set of provisional criteria for the diagnosis of von
shed in 2005.[13] The tools are referenced in Table 5.

xcellent articles which provide an overview of the

d value of bleeding assessment tools. Journal of
): 2223–2229. (This article includes a Comparison of

lly useful? Hemaotology. Am Soc Hematol Educ Program,

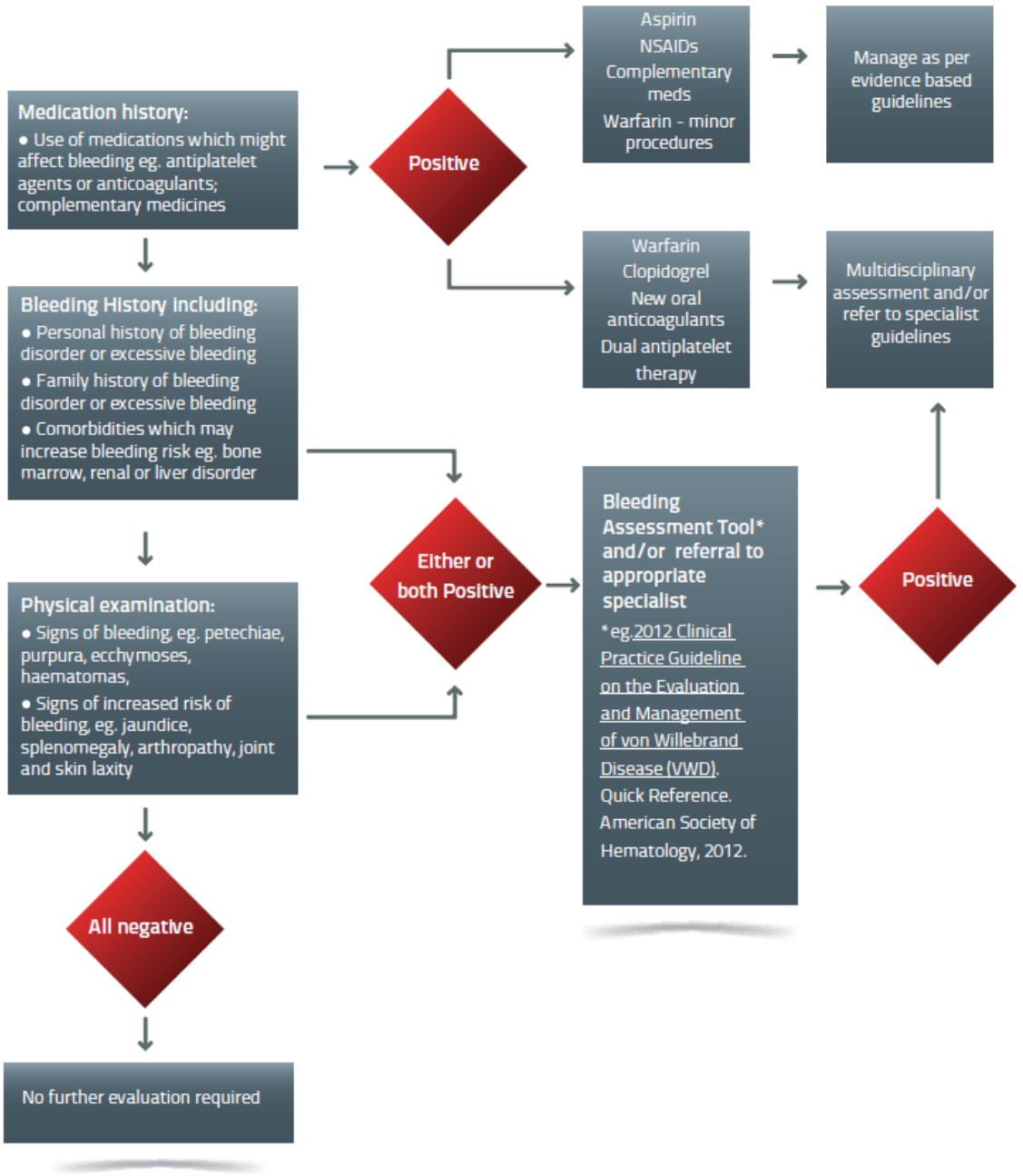
**Table 5: Bleeding Assessment Tools**

| Tool | Reference and links to questionnaire and bleeding score | Estimated completion time3 |
|---|---|---|
| ASH evaluation and management of VWD | 2012 Clinical Practice Guideline on the Evaluation and Management of von Willebrand Disease (VWD). Quick Reference. American Society of Hematology, 2012.[14] | 5-10 mins |
| SIMTI evaluation of haemorrhagic risk | Liumbruno GM, Bennardello F, Lattanzio A, Piccoli P, Rossetti G. Italian Society of Transfusion Medicine and Immunohaematology (SIMTI) Working Party. Recommendations for the transfusion management of patients in the peri-operative period. I. The pre-operative period. Blood Transfus, 2011; 9:19–40.[15] | 40 mins |
| International Society of Thrombosis and Haemostasis (ISTH) -BAT | Rodeghiero F, Tosetto A, Abshire T, Arnold D, Coller B, et al. and On Behalf Of The ISTH/SSC Joint VWF And Perinatal/Pediatric Hemostasis Subcommittees Working Group. ISTH/SSC bleeding assessment tool: a standardized questionnaire and a proposal for a new bleeding score for inherited bleeding disorders. Journal of Thrombosis and Haemostasis, 2010; 8: 2063–2065.[12] ISTH questionnaire and bleeding score. | 20 mins |
| Paediatric Bleeding Questionnaire | Bowman M, Riddel J, Rand ML, Tosetto A, Silva M, and James PD. Evaluation of the diagnostic utility for von Willebrand disease of a pediatric bleeding questionnaire. J Thromb Haemost, 2009;7:1418–1421.[16] Paediatric questionnaire and bleeding score | 20 mins |
| Condensed MCMDM-1 VWD | Bowman M, Mundell G, Grabell J, et al. Generation and validation of the Condensed MCMDM-1VWD Bleeding Questionnaire for von Willebrand disease. J Thromb Haemost, 2008; 6:2062–2066.[17] Condensed MCMDM-1 VWD questionnaire and bleeding score | 5-10 mins |
| European Molecular and Clinical Markers for the Diagnosis and Management of type 1 VWD (MCMDM-1 VWD) | Tosetto A, Rodeghiero F, Castaman G, et al. A quantitative analysis of bleeding symptoms in type 1 von Willebrand disease: results from a multicenter European study (MCMDM-1 VWD). J Thromb Haemost, 2006;4:766–773.[18] MCMDM-1 VWD Questionnaire and Bleeding score | 40 mins |
| Vincenza bleeding score | Rodeghiero F, Castaman G, Tosetto A, Batlle J, Baudo F, et al. The discriminant power of bleeding history for the diagnosis of type 1 von Willebrand disease: an international, multicenter study. J Thromb Haemost, 2005; 3:2619-26.[19] Vincenza questionnaire and bleeding score | 40 mins |

Bonhomme et al Can J Anest 2016,
Koscielny el al Clin App TH 2004, NBA 2015

# THE PRE-OPERATIVE BLEEDING RISK ASSESSMENT TOOL

National blood authority, AU



# Høj-risiko patienter

- Høj risiko kirurgi
  - Thorax og abdominal kirurgi > 2 timer > 500 ml blodtab
  - Kompleks kardiovaskular kirurgi – blodtab og koagulopati
  - Neurokirurgi
- Abnorm hæmostase grundet co-morbiditet
  - Uræmi, akutte sygdomme,
- Arvelige blødningsforstyrrelser
  - vWF, hæmofili A og B, PAI-1 og alfa-2-makroglobulin mangel
- Antikoagulerede patienter

# Konklusion (1)

- Koagulationsscreening før kirurgi til forudsigelse af postoperativ blødningskomplikationer er ikke indiceret
- Udfør blødningsanamnese
  - Familie anamnese (arvelige blødningsforstyrrelser)
  - Tidligere post-traumatiske/post-operative blødninger
  - Medicin anamnese
  - Co-morbiditet
- Negativ blødningsanamnese ingen yderligere udredning nødvendig
- Positiv blødningsanamnese eller klinisk tilstand som kan medføre blødning (eks leversygdom) → udredning

# Konklusion (2)

- At udføre ikke indiceret koagulations screening kan medføre unødvendig:
  - Udsættelse af kirurgisk indgreb
  - Yderligere udredning af patienten baseret på ikke indicerede undersøgelser og konsekvensløse svar
  - Ængstelse hos patienten
  - Unødige omkostninger ved blodprøvetagning og analysering