Screening assays in Haemostasis

1) Questionnaire

- Personal and familial history
- Treatments
- Diseases
- Clinical symptoms

2) Physical examination

3) Pre-operative Haemostasis screening assays

- **Prothrombin time (PT)**
  - Screening test for the extrinsic and common pathways of coagulation (factors II, V, VII, X). Limited sensitivity to fibrinogen.
  - Usual normal ranges: 12 - 13 sec (may vary between reagents, please refer to manufacturer's insert)
- **Activated Partial Thromboplastin Time (aPTT)**
  - Screening test for the intrinsic and common coagulation pathways of coagulation (factors VIII, IX, XI, XII, V and II). Limited sensitivity to fibrinogen.
  - May be normal in some forms of von Willebrand disease
  - Usual normal range: ratio patient/reference I 1.2
- **Thrombin time**
  - Exploration of fibrin formation
  - Usual normal range: < 21 seconds (may vary between reagents, please refer to manufacturer's insert)

Effects of coagulation factors and protein levels on clotting assays

FACTORS	NORMAL VALUES	MINIMUM LEVEL FOR LOW BLEEDING RISK	INFLUENCE OF COAGULATION TESTS[2]		
			PT[3]	aPTT[4]	TT[5]
XII	60 - 150%	-	N	↑	N
XI	60 - 150%	20 - 30%	N	↑	N
VIII	60 - 150%	30 - 40%	N	↑	N
IX	60 - 150%	30 - 40%	N	↑	N
VII	55 - 170%	10 - 20%	↑	N	N
X	70 - 120%	30 - 40%	↑	↑	N
V	70 - 120%	30 - 40%	↑	↑	N
II	70 - 120%	30 - 40%	↑	↑	N
Fibrinogen	2 - 4 g/L	0.5 - 1 g/L	N or ↑	N or ↑	↑
VWF	50 - 160%	40%	N	N or ↑	N
Antithrombin	80 - 120%	-	N	N	N
Protein C	70 - 130%	-	N	N	N
Protein S	60 - 140%[6]	-	N	N	N

1. Approximate level in the case of a single factor deficiency. These levels may vary according to different clinical settings, e.g. haemophiliacs undergoing surgery will require higher levels of FVIII
2. Results vary as a function of sensitivity of reagents and single or multiple factor levels
3. PT: Prothrombin Time
4. aPTT: activated Partial Thromboplastin Time
5. TT: Thrombin time
6. Sex and age-dependent

- **Fibrinogen level**
  - Quantitative assay of fibrinogen level
  - Usual normal range: 2-4 g/L (200-400 mg/dL)
  - Elevated fibrinogen levels are observed in inflammatory syndrome (acute or chronic)
- **Platelet count**
  - Number of circulating platelets
  - Usual normal range: 150-400 G/L

4) Screening assays for Disseminated Intravascular Coagulation (DIC)

PT, aPTT and fibrinogen levels, as well as D-Dimers, are generally abnormal in acute DIC but may be normal during chronic and subacute DIC. These screening tests are thus of limited specificity and sensitivity for the diagnosis of DIC (see section on DIC). Recent studies suggest that fibrin monomer may constitute early and more specific markers of DIC.

5) Screening assays for thrombophilia

- There are as yet no global tests available to explore all thrombophilia factors.
- First-line activity assays are required for monitoring of inhibitors (see Thrombophilia section).

6) Screening tests for Lupus Anticoagulants (LA)

- The screening assays are phospholipid-dependent function tests. At least two different tests are required for detection of LA (see Lupus Anticoagulants section).

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