HEMORRHAGIC
HEMOSTASIS

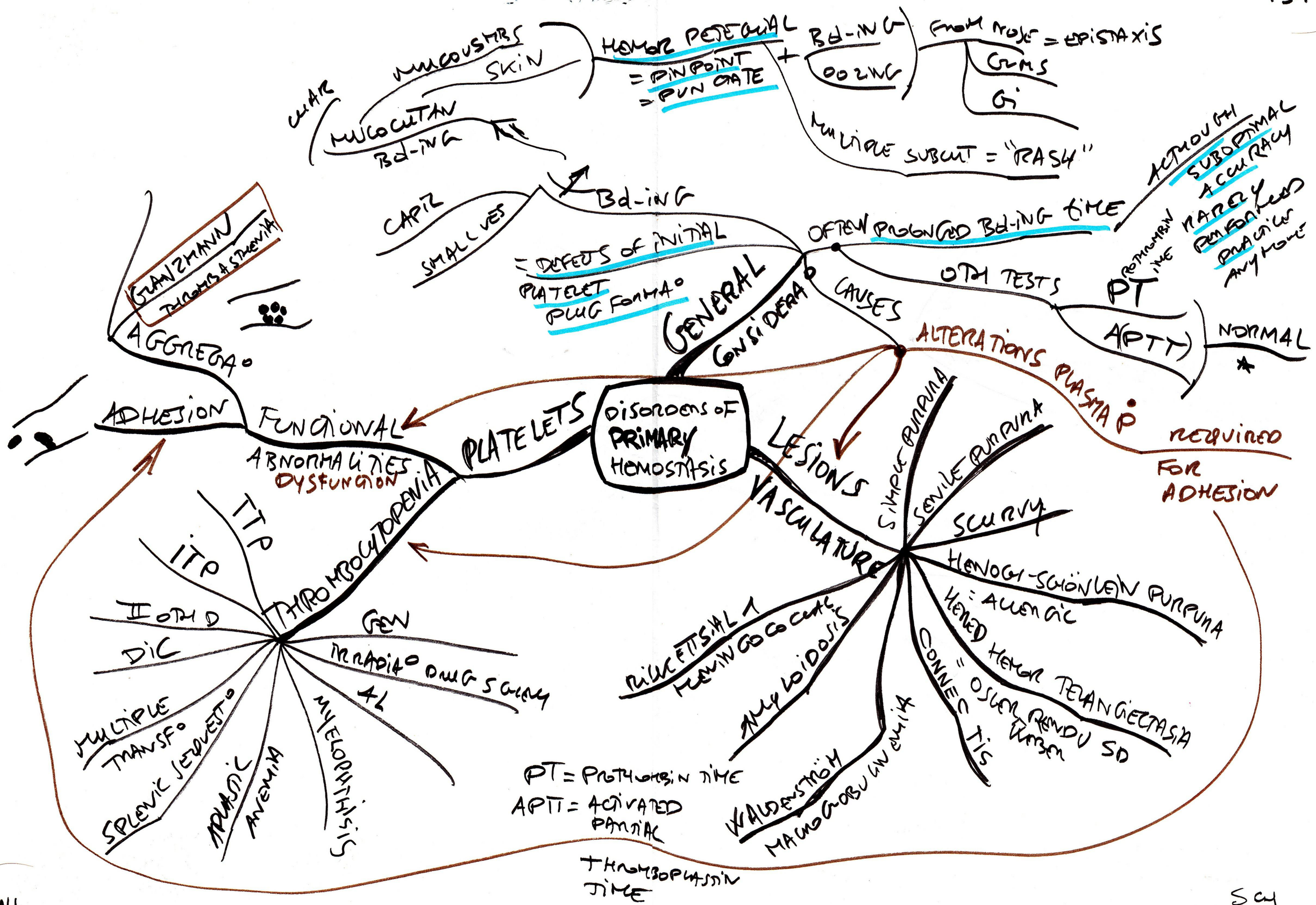
COMBINED
- LIVER
- DILUTIONAL COAGULOPAT
- DIC
  - PT ↑
  - PLAT COUNT ↓
  - THROMBIN TIME / FIBRINOGEN ASSAY ↑
  - PLAT PLUG FORMAT°
  - PINPOINT PUNCTATE DEFECTS INITIAL
  - SUBOPT ACCUM
  - PETECHIAL HEMOR
  - "RASH"
  - Bd-ING ↓
  - PERSISTENT Bd-ING
  - Bd-ING ↑
  - DERIVATIVES MULT TRANSF°
  - VITK
  - THROMBIN
  - APTT
  - PT
  - OBST COMP
  - CANCER
  - IRC TRAUMA IMMUNO
  - FIBRIN 1 FIBRINOGEN DEGRADPTS PROD
  - RELEASE TIS THROMBOPLASTIN
  - AND HEMOR
  - THROMB
  - GAGF
  - PLAT CONSUMP°
- VWD
  - VWF ASSAY
  - AUTOS DEFIC
  - FUNC DEFIC VIII
  - FAILURE PLAT ADHES
  - DUAL HEMOST DEFECTS
  - MOST COMMON HER Bd-ING
  - ↓ ACTIVITY II VII IX X
  - PROLONG - PT APTT
  - IN COMP INT COGN°
  - DEFIC EROG VITK
  - FAT MALABSO
  - INDISTINGUISHABLE
- VITK DEFIC
- CHRISTMAS D
  - ASSAY
  - B IX DEFIC
  - CLASSIC HEMOPH
  - A VIII DEFIC
  - ASSAY
  - FROM
  - APTT ↑
  - X LINK
- GEN
  - THROMBIN T
  - A(PTT)
  - PT
  - Bd-ING FROM LARGER VES
  - DEFIC PLASMA CLOT FACTORS

PRIMARY
- GEN
- VASCULATURE
  - LESIONS
  - HEM PERIFOL KERAT PAPULES TWISTED CORKSCREW INTERMAIN
  - GINGIVAL HEM
  - HENOCH-SCHONLEIN ALLERGIC
  - PURPURAS
  - HER HEMOR TELANGIECTASIA
  - OSLER-WEBER-RENDU SD
  - CONNECTIVE ELEMENTS DAMAGE SD
  - WALDENSTRÖM MACROGLOBULINEMIA
  - AMYLOIDOSIS CARDIAC ⇒ DAM
  - RICKETTSIAL MENINGOCOCCAL
- PLATELETS
  - PLAT COUNT
  - ↑ Bd-ING
  - PETECHIAL Bd-ING
  - MEGAKARYOCYTE N ↑ — DESTRUC°
  - ↓ — GENIC ↓ PRODUC°
  - THROMBOCYTOPENIA
    - QUANTITATIVE
      - IRON ADMIN°
      - DRUGS GEN
      - AL
      - MYELOPHTHISIS
      - APLASTANEM
      - SPLENIC SEQUESTRAT°
      - MULT TRANSF°
      - DIC
      - II
      - ITP
      - ACQ IMMUNO DEF SD
      - SLE
    - QUALITATIVE
      - N COUNT
      - ↑ Bd-ING
      - ADAMTS13
      - TTP
      - HEREDITARY
      - ITP
      - FEV
      - REV INSULT
      - NEURO
      - PLAT DERIVED
      - HYMINE
      - MAGAKARYOCYTES
      - THROMBOCYT
      - MEGAKARYOCYT
      - TCITOP
      - ANTI PLAT
      - MICROANGIOP HEMOL ANEM
      - HEMOLYT
      - SCHISTOC
- FUNCTIONAL
  - AGGREGATION
  - ADHESION
  - GLANZMANN THROMBASTENIA
  - FAILURE SYNTHESIS
  - PLAT AGGREGANT TXA2
  - BERNARD-SOULIER D
  - VWD

SECONDARY
- Bd-ING ↑ NORMAL
- CONFIRMATORY TESTS OR OTHER SIGNIFICANT FINDINGS
- RARELY PRACT
- MOST COMPLEX
- PRIMARY SYST
  - FORM TYPE A
  - HEM URTICARIA
  - FEV ANT GI MEN
- VIRALLY
- EASY BRUISING
- SIMPLE
- SENILE SCURVY

NICOLASLEVY.NET

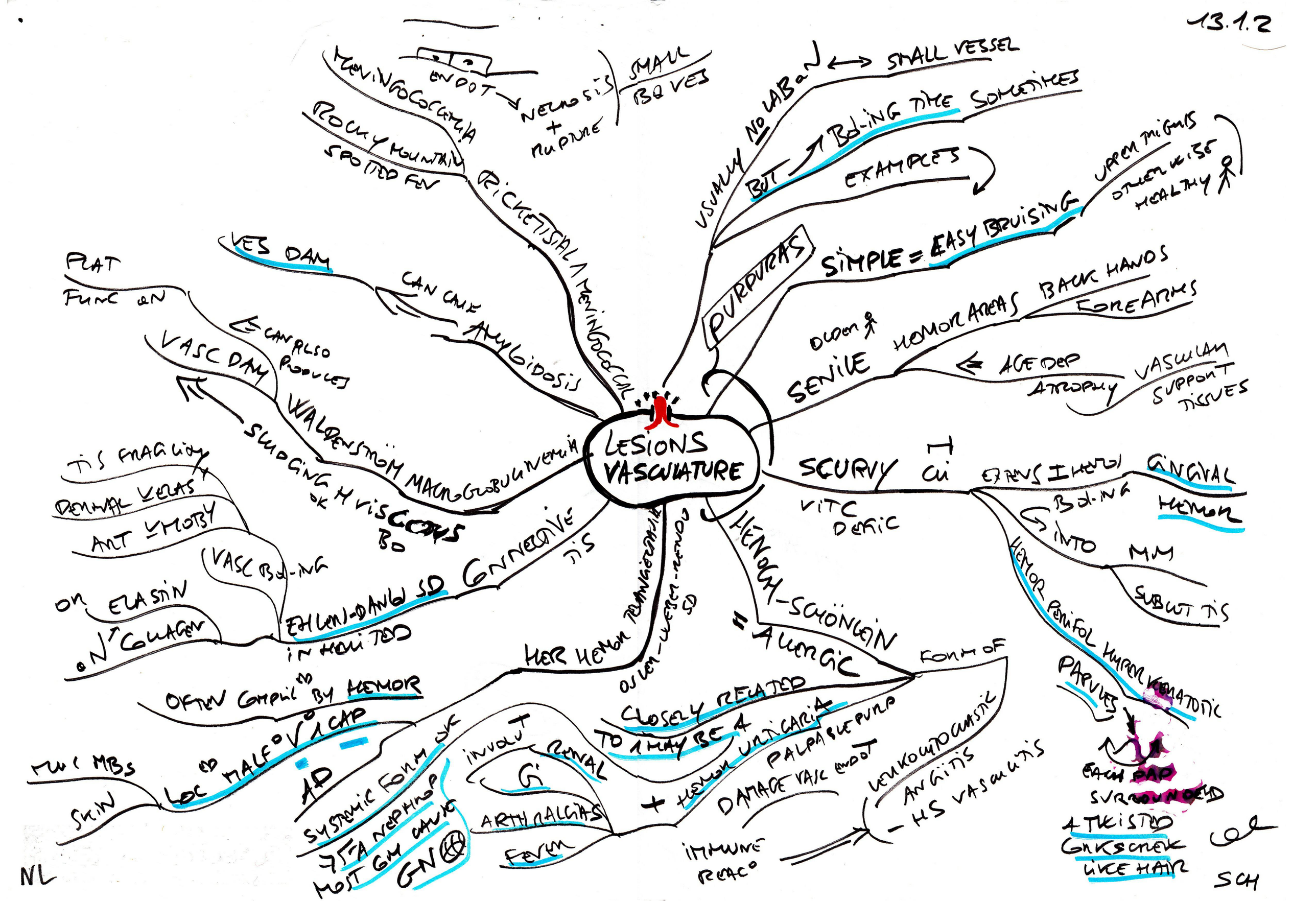
SCHNEIDER 2013


DISORDERS OF PRIMARY HEMOSTASIS
PLATELETS
VASCULATURE
LESIONS
GENERAL CONSIDERATIONS
CAUSES
ALTERATIONS PLASMA
OFTEN PROLONGED BLEEDING TIME
ALTHOUGH SUBOPTIMAL ACCURACY MARKED PERFORMED PRACTICE ANYHOW
OTH TESTS
PT (PROTHROMBIN TIME)
APTT
NORMAL
REQUIRED FOR ADHESION
HEMOR PETECHIAL
= PINPOINT
= PUN GATE
BLEEDING
OOZING
FROM NOSE = EPISTAXIS
GUMS
GI
MULTIPLE SUBCUT = "RASH"
MUCOUSMBRS
SKIN
MUCOCUTAN BLEEDING
CAPIL
SMALL VES
= DEFECTS OF INITIAL PLATELET PLUG FORMATION
GLANZMANN THROMBASTHENIA
AGGREGATION
ADHESION
FUNCTIONAL ABNORMALITIES DYSFUNCTION
THROMBOCYTOPENIA
ITP
TTP
HOTH D
DIC
MULTIPLE TRANSFO
SPLENIC SEQUEST
APLASIC ANEMIA
MYELOPATHISIS
AL
IMMAGIA DRUG SCURV
GEN
SIMPLE PURPURA
SENILE PURPURA
SCURVY
HENOCH-SCHÖNLEIN PURPURA
ALLERGIC
HEREDITARY HEMOR TELANGIECTASIA
OSLER RENDU SD
WEBER
CONNECTIVITIS
WALDENSTRÖM MACROGLOBULINEMIA
AMYLOIDOSIS
PULMONARY HEMIWOOCCHAL
PT = PROTHROMBIN TIME
APTT = ACTIVATED PARTIAL THROMBOPLASTIN TIME

NL

SCH

13.1.2


LESIONS VASCULATURE
MENINGOCOCCEMIA
ENDOT
NECROSIS + RUPTURE
SMALL BLOOD VESSELS
ROCKY MOUNTAIN SPOTTED FEV
RICKETTSIAL MENINGOCOCCAL
VESS DAM
CAN CAUSE AMYLOIDOSIS
FLAT
FUNC ON
CAN ALSO PRODUCE
VASC DAM
WALDENSTROM MACROGLOBULINEMIA
SLOWING OF HYPERVISCOUS BLOOD
TISS FRAGILITY
DERMAL VEINS
ANT HEMORRHAGE
VASC BLEEDING
ON ELASTIN
N COLLAGEN
ETHLENE-DIAMINE SD
CONNECTIVE TISS
IN HEMOPTOID
OFTEN COMPLICATED BY HEMOR
MULT MBS
SKIN
LOC MALF VICAP
AD
SYSTEMIC FORM OF
TTA NEPHROP
MOST GN CAUSE
GN
INVOLVT
RENAL
GI
ARTHRALGIAS
FEVER
HER HEMOR TELANGIECTASIA
OSLER-WEBER-RENDU SD
HENOCH-SCHÖNLEIN
ALLERGIC
FORM OF
CLOSELY RELATED
TO 1 MAY BE A
+ HEMOR URTICARIA
PALPABLE PURP
DAMAGE VASC ENDOT
IMMUNE REACT
LEUKOCYTOCLASTIC ANGIITIS
- HS VASCULITIS
PURPURAS
USUALLY NO LAB
SMALL VESSEL
BUT BLEEDING TIME SOMETIMES
EXAMPLES
SIMPLE = EASY BRUISING
UPPER LIMBS
OTHERWISE HEALTHY
SENILE
DUE TO
HEMOR AREAS
BACK HANDS
FOREARMS
AGE DEP ATROPHY
VASCULAR SUPPORT TISSUES
SCURVY
VITC DEFIC
EXPENS IMPROV
GINGIVAL HEMOR
BLEEDING INTO
MM
SUBCUT TIS
HEMOR PERIFOL HYPERKERATOTIC
PAPULES
EACH PAP SURROUNDED
ATHEISTED
CORKSCREW LIKE HAIR
NL
SCH

13.1.3.1

THROMBOCYTOPENIA

GENERAL

- CLIN FEATURES
  - PETEC CUT BLEEDING
  - INTRACRAN
  - OOZING FROM MUC
- PLAT COUNT
- BLEEDING TIME
- CLIN
  - PO
  - ADJUNCT
  - UNREPLACED LOSS
  - DILU
  - ASPIRIN
  - MEGAK KIDNEY CAUSES PO
  - IRRAD
  - DRUGS
  - CHEM
- QUANTITATIVE DYSFUNC
- RELIABLE BEST
  - FAST
  - TEST
  - FUNC
- INACCUR REPRODUC

ITP

- CHRONIC
  - ADULTS
  - IMMUNO
  - REAC
  - VIRAL
  - SELF LIMITING
  - ACUTE
- CHILDREN
- IMMUNE AUTOIMM
- CLIN
  - GAR
  - LACK PALPABLE SPLENOMEG
  - DIBRATIC
  - HAEMORRHAGIC
  - PURPURA
- THROMBOCYTOPENIA
  - NORM MEGAK
  - EXPLOSIVE TREATIC AGENT
- ANTIPLAT AB
- FETAL
- (CAUSE) MATERNAL
- DAMAGE
- COAT
- SELECTIVELY REMOVED BY SPLENIC

SLE

- ACQUIRED IMMUNODEF
- SD

DIC

- CAUSES
- SEPSIS TOXIN
- E. coli O157:H7 V SHIGELLA DYSENTERIE
- CLIN
  - PLAT DERIVED HYALINE MICROAGGREGATES SMALL VES
  - = M VASC PLAT THROMBI
  - MANIFOP HEMOLYTIC ANEMIA
  - THROMB

MULTIPLE TRANSFUSIONS

- CLI RELATED TO HUS
- TRANSFUSION NEW
- DILUO

SPLENIC SEQUEST

- M UNCLEAR
- MEC DAMAGE RBC
- HEMOST SUBSTOCK
- ⇒ ↓ CIRCULATING PLAT

APLASTIC ANEM

- EXPOSURE TOXIC BENZENE
- AUTOIMM DESTRUC BY T CYTOTOXIC

MYELOPHTHISIS

- ↓PO ⇐ REPLACT BY BLAST ¢
- ↓PO ⇐ REPLACT BY TUMOR ¢

DEPLETED PLAT

- NORMAL OR HIGH MEGAK WITH LITTLE WBF
- → PROTEINS PLAT MAGNATE FORMAO
- ⇑ CONSUMPO

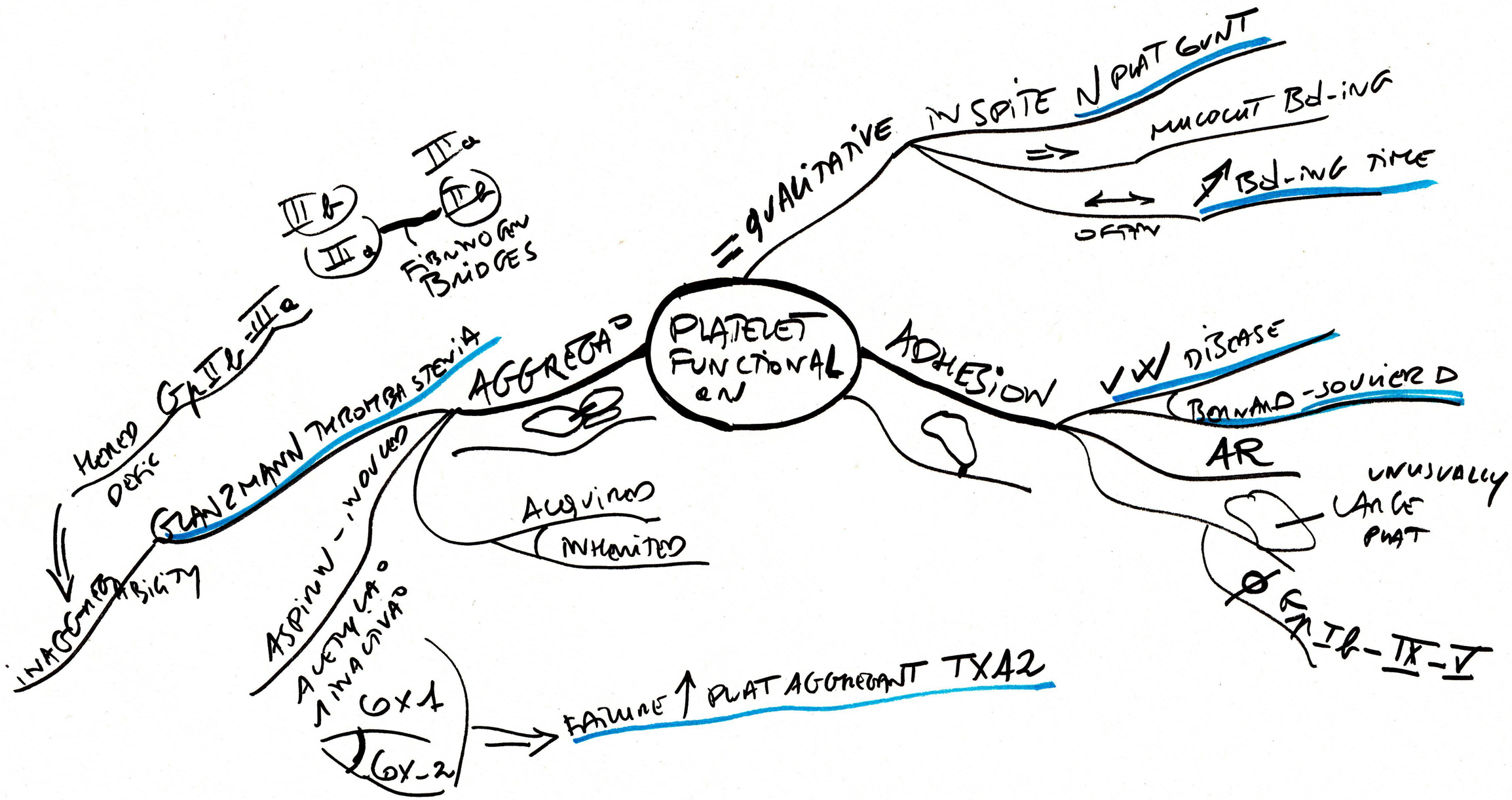
VWF

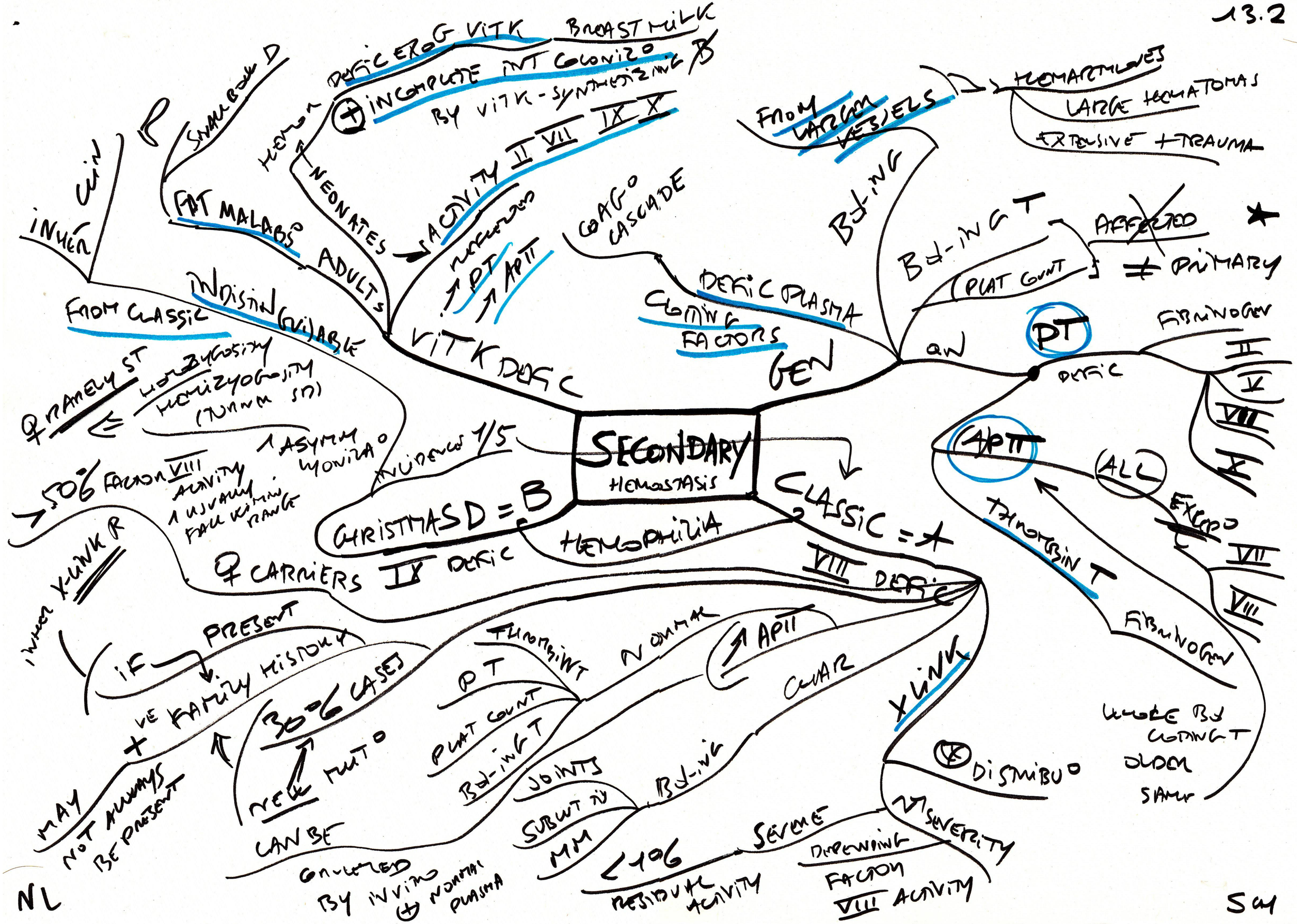
- DEFIC
- METALLOPROTEASE ADAMTS13
- NL

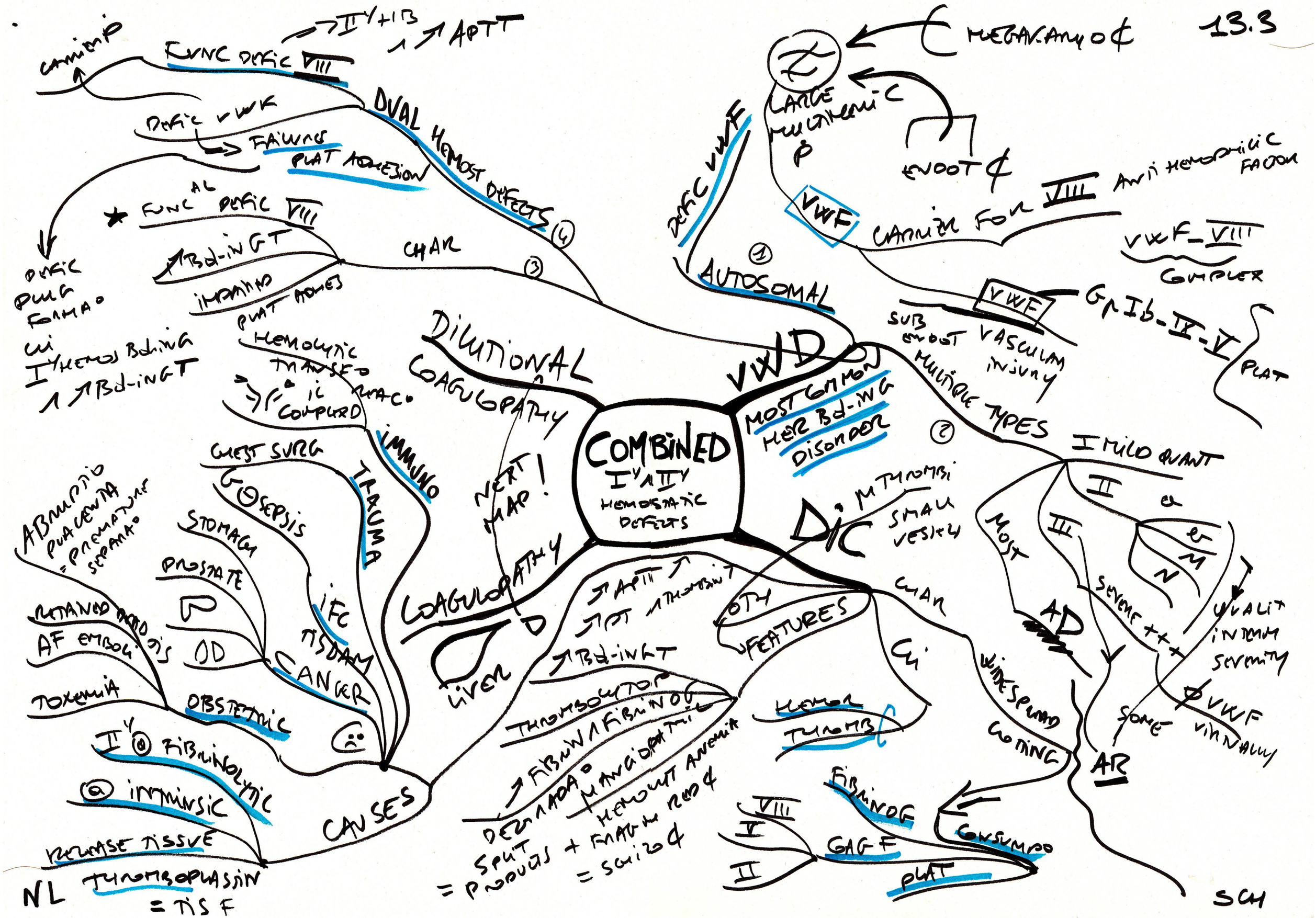
REN INSUF

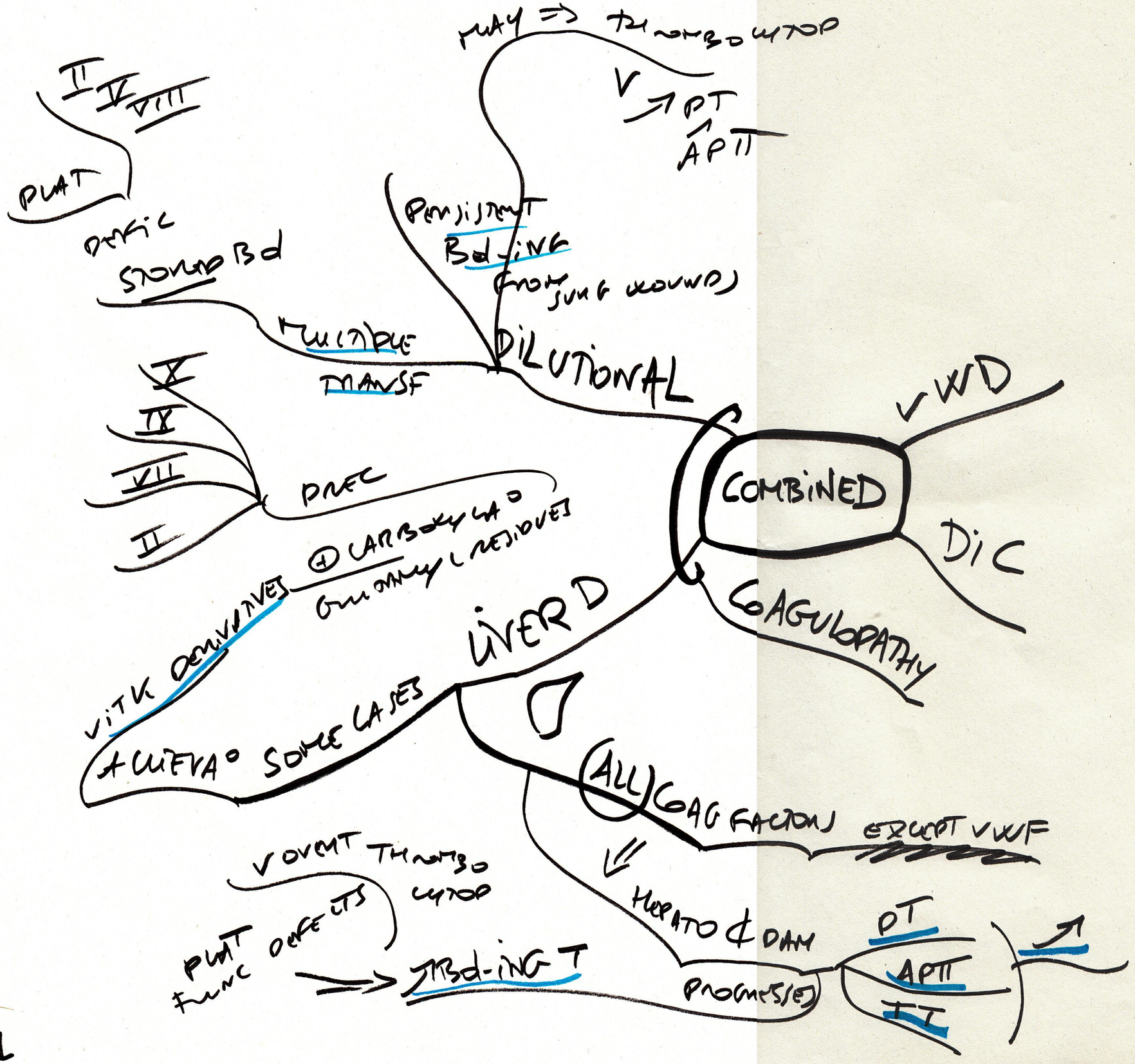
- FEVER
- MANIFNT NEUROL
- OTH

SCH


PLATELET FUNCTIONAL ON
QUALITATIVE
IN SPITE N PLAT COUNT
MUCOCUT BD-ING
BD-ING TIME
OFTEN
ADHESION
VW DISEASE
BERNARD-SOULIER D
AR
UNUSUALLY LARGE PLAT
GP Ib-IX-V
AGGREGATION
ACQUIRED
INHERITED
GLANZMANN THROMBASTENIA
HEREDITARY GP IIb-IIIa
INAGGREGABILITY
ASPIRIN-INVOLVED
ACETYLATION
IRREVERSIVE
COX-1
COX-2
FAILURE ↑ PLAT AGGREGANT TXA2
IIb
IIa
IIa
IIb
FIBRINOGEN BRIDGES


SECONDARY
HEMOSTASIS
VITK DEFIC
GEN
INCOMPLETE INT COLONIZO
BY VITK-SYNTHESIZING
BREAST MILK
SMALL BOWL D
FAT MALABS
ADULTS
NEONATES
ACTIVITY II VII IX X
↑ PT
↑ APTT
COAGO CASCADE
DEFIC PLASMA
CLOTTING FACTORS
FROM LARGER VESSELS
HEMARTHROSES
LARGE HEMATOMAS
EXTENSIVE + TRAUMA
BLEEDING
BLEEDING T
PLAT COUNT
AFFECTED
≠ PRIMARY
PT
FIBRINOGEN
II
V
VII
X
DEFIC
APTT
ALL
EXCEPTO
THROMBIN T
FIBRINOGEN
VIII
VIII DEFIC
XLINK
DISTRIBUTO
WHOLE BLOOD CLOTTING
OLDER SAMP
↑ SEVERITY
DEPENDING FACTOR VIII ACTIVITY
SEVERE
<1%
RESIDUAL ACTIVITY
JOINTS
SUBCUT TIS
MM
BLEEDING
CLASSIC = X
CHRISTMAS D = B
HEMOPHILIA
INVIDUALS 1/5
ASYMM MONIZATO
>50% FACTOR VIII ACTIVITY
↑ USUALLY FALL WITHIN RANGE
♀ CARRIERS IX DEFIC
INHER X-LINK R
IF PRESENT
+ VE FAMILY HISTORY
MAY NOT ALWAYS BE PRESENT
30% CASES
NEW MUTO
CAN BE
CONFIRMED BY INVITRO + NORMAL PLASMA
PT
PLAT COUNT
BLEEDING T
THROMBIN T
NORMAL
↑ APTT
CHAR
INHER
CLIN
HOMOZYGOSITY
HOMOZYGOSITY (NORM SP)
QUANTITY
FROM CLASSIC
INDISTIN (VI)ABLE
NL
SCH


COMBINED
I y II
HEMOSTATIC DEFECTS
DIVAL HEMOST DEFECTS
FUNC DEFIC VIII
II y + IB
APTT
DEFIC VWF
FAILURE
PLAT ADHESION
★ FUNC AL DEFIC VIII
CHAR
DEFIC PLUG FORMAT
III HEMOS BLEEDING
BLEEDING
IMPAIRED PLAT ADHES
HEMOLYTIC TRANSFUS
IC COMPUND
DILUTIONAL COAGUOPATHY
IMMUNO
TRAUMA
CHEST SURG
SEPSIS
STOMACH
PROSTATE
IFC
TISDAM
CANCER
OBSTETRIC
ABRUPTIO PLACENTA = PREMATURE SEPARAT
RETAINED DEAD FETUS
AF EMBOLISM
TOXEMIA
II y FIBRINOLYTIC
INTRINSIC
RELEASE TISSUE
CAUSES
NL THROMBOPLASTIN = TISF
NEXT MAP!
COAGULOPATHY
LIVER
DIC
APTT
PT
THROMBIN
BLEEDING
THROMBOCYTOP
FIBRIN/FIBRINOG
DEGRADATION
= SPLIT PRODUCTS + FRAGM RBC
MANGIOPATHIC HEMOLYT ANEMIA
= SCHIZOC
OTH FEATURES
HEMOR THROMB
FIBRINOG
CONSUMPTION
GAGF
PLAT
VIII
V
II
CHAR
WIDESPREAD CLOTTING
MICROTHROMBI
SMALL VESSELS
VWD
MOST COMMON HER BLEEDING DISORDER
MULTIPLE TYPES
I MILD QUANT
II a
b
M
N
III
MOST
AD
SEVERE +++
QUALIT INTERM SEVERITY
SOME
VWF VIRTUALLY
AR
SCH
VWF
LARGE MULTIMERIC P
EVOOT
HEPATAMYOC
AUTOSOMAL
VWF
CARRIER FOR VIII
ANTI HEMOPHILIC FACTOR
VWF_VIII
COMPLEX
VWF
SUB ENDOT VASCULAR INJURY
GPIb-IX-V
PLAT


PLAY ⇒ THROMBOCYTOP
V
PT
APTT
II
IV
VIII
PLAT
DEFIC
STORAGE Bd
PERSISTENT
Bd-ING
(FROM JUNG WOUND)
MULTIPLE
TRANSF
DILUTIONAL
V
IX
VII
II
PREC
COMBINED
VWD
DIC
COAGULOPATHY
VITK DERIVATIVES
⊕ CARBOXYLATO
GLUTAMYL RESIDUES
ACHIEVA° SOME CASES
LIVER D
(ALL) COAG FACTORS
EXCEPT VWF
V OVERT THROMBO
CYTOP
PLAT
FUNC DEFECTS
BLEEDING T
HEPATO & DAM
PROGRESSES
PT
APTT
TT

NL

SCM