HOSPITAL PRACTICE: ANAMNESIS AND PHYSICAL EXAMINATION IN PEDIATRIC HEMATOLOGY

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HISTORY TAKING

- The most important step of diagnostic process
- Critical
- Must
- Needs
  - Expertise
    - The result is interprator dependent
    - A good inspector
    - Communication skills
  - Time consuming

IS PEDIATRIC HISTORY TAKING DIFFERENT?

- Always someone other than patient
- Legal caregiver
- 2 sources
  - Patient
  - Family
    - Sometimes extended family
- Usually; A wonderful quality
- Sometimes harder
  - Anxious or tired parents,
    - Empathy is the solution.
- Adolescent: by his/her approval, give sometime for alone anamnesis

CONSULTATION BEGINS….

- Introduce yourself
  - Not always in outpatient clinic
- Know the caregivers and patient
  - Parents, extended family
- Build a rapport with the family and child
  - Eye contact
  - Let the children to be free
    - Some children needs some time
    - Best is in her parents arms
- Do not forget to address questions to the child, when appropriate

CONSULTATION

- Introduce yourself – name / role
- Confirm patient details – name / DOB
- Explain the need to take a history
- Gain consent to take a history
- Ensure the patient is comfortable

PEDIATRIC HEMATOLOGY PERSPECTIVE

- Age

AGE SPECIFIC ETIOLOGIES
AGE SPECIFIC CUT OFFS

Severe Anemia at 2 mo

Not Beta talasemia

HbF

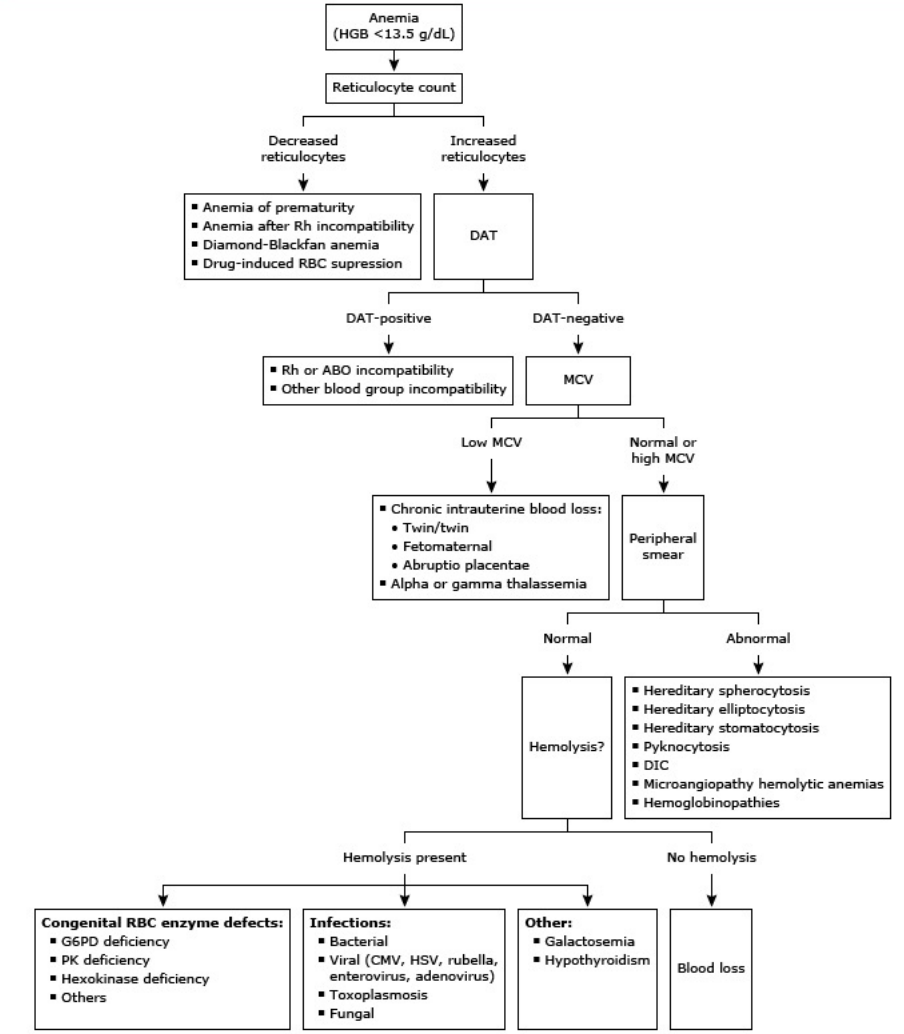
Not iron deficiency

except extreme prematurity

blood loss

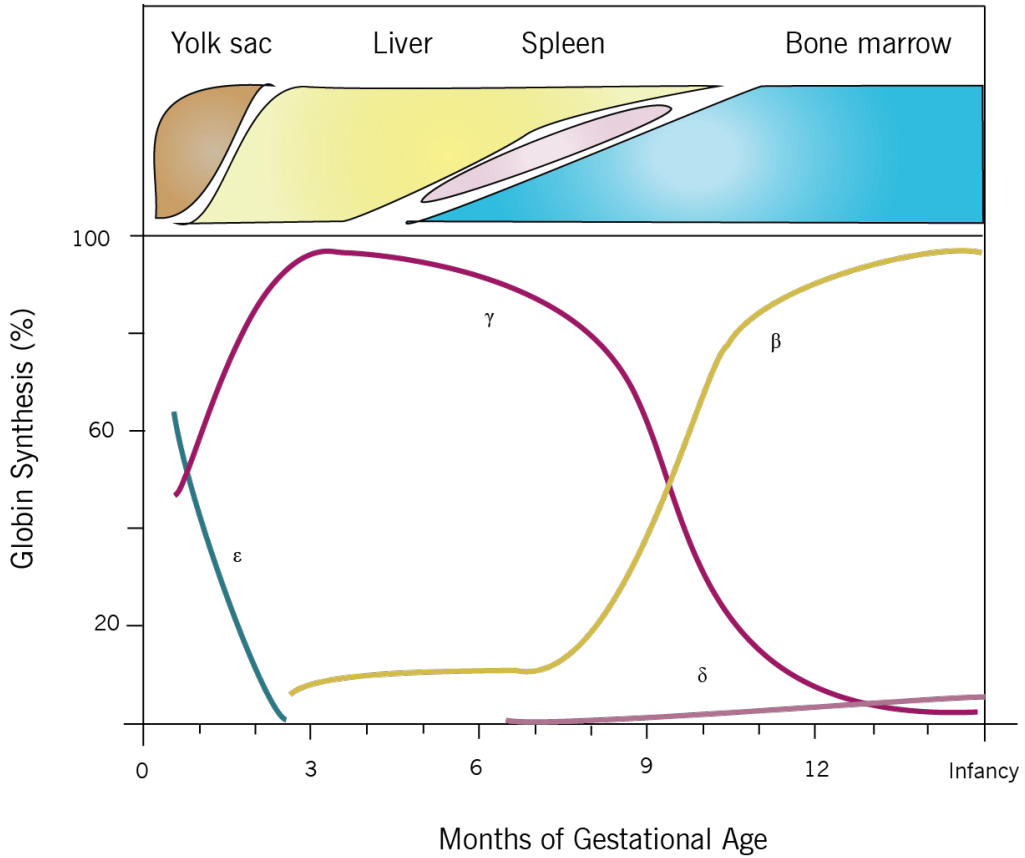
twin to twin transfusion

Diagnostic approach to anemia in the newborn



HGB: hemoglobin; RBC: red blood cell; DAT: direct antiglobulin test; MCV: mean corpuscular volume; DIC: disseminated intravascular coagulation; G6PD: glucose-6-phosphate dehydrogenase; PK: pyruvate kinase; CMV: cytomegalovirus; HSV: herpes simplex virus.

HB SWITCH (GLOBIN CHAIN)



Period of Life	Hemoglobin Species	Globulin Chains	% Present in Adult
Embryonic	Gower-1	Two ζ, two ε	
	Gower-2	Two α, two ε	
	Portland-1	Two ζ, two γ	
	Portland-2	Two ζ, two β	
Fetal	Hemoglobin F	Two α, two γ	
Adult	Hemoglobin A	Two α, two β	92–95
	Hemoglobin A_2	Two α, two δ	<3.5
	Hemoglobin F	Two α, two γ	<1

AGE SPECIFIC CUT-OFFS

- Red blood cell

Table A1-4 Red Cell Values at Various Ages: Mean and Lower Limit of Normal (−2 SD)[a]

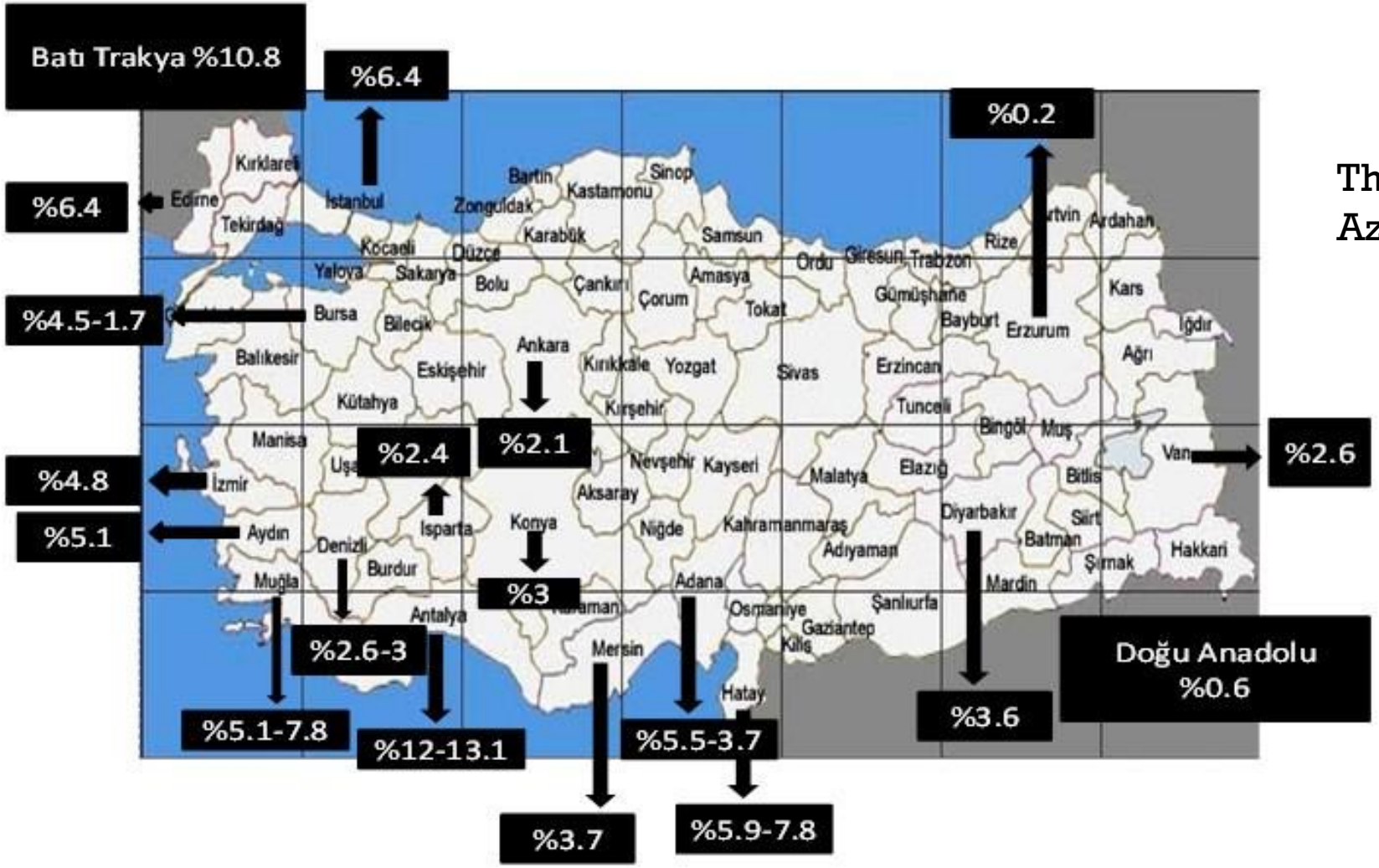
	Hemoglobin (g/dl)		Hematocrit (%)		Red Cell Count (10^{12}/l)		MCV (fl)		MCH (pg)		MCHC (g/dl)		Reticulocytes	
Age	Mean	−2 SD	Mean	−2 SD	Mean	−2 SD	Mean	−2 SD	Mean	−2 SD	Mean	−2 SD	Mean	−2 SD
Birth (cord blood)	16.5	13.5	51	42	4.7	3.9	108	98	34	31	33	30	3.2	1.8
1–3 days (capillary)	18.5	14.5	56	45	5.3	4.0	108	95	34	31	33	29	3.0	1.5
1 week	17.5	13.5	54	42	5.1	3.9	107	88	34	28	33	28	0.5	0.1
2 weeks	16.5	12.5	51	39	4.9	3.6	105	86	34	28	33	28	0.5	0.2
1 month	14.0	10.0	43	31	4.2	3.0	104	85	34	28	33	29	0.8	0.4
2 months	11.5	9.0	35	28	3.8	2.7	96	77	30	26	33	29	1.6	0.9
3–6 months	11.5	9.5	35	29	3.8	3.1	91	74	30	25	33	30	0.7	0.4
0.5–2 years	12.0	10.5	36	33	4.5	3.7	78	70	27	23	33	30	1.0	0.2
2–6 years	12.5	11.5	37	34	4.6	3.9	81	75	27	24	34	31	1.0	0.2
6–12 years	13.5	11.5	40	35	4.6	4.0	86	77	29	25	34	31	1.0	0.2
12–18 years														
Female	14.0	12.0	41	36	4.6	4.1	90	78	30	25	34	31	1.0	0.2
Male	14.5	13.0	43	37	4.9	4.5	88	78	30	25	34	31	1.0	0.2
18–49 years														
Female	14.0	12.0	41	36	4.6	4.0	90	80	30	26	34	31	1.0	0.2
Male	15.5	13.5	47	41	5.2	4.5	90	80	30	26	34	31	1.0	0.2

[a]These data have been compiled from several sources. Emphasis is given to studies employing electronic counters and to the selection of populations that are likely to exclude individuals with iron deficiency. The mean ±2 SD can be expected to include 95% of the observations in a normal population.
From: Dallman PR. Blood and blood-forming tissue. In: Rudolph A, editor. Pediatrics. 16th ed. E. Norwalk, CT: Appleton-Cernuary-Croles, 1977, with permission.

PEDIATRIC HEMATOLOGY PERSPECTIVE

- Starts with
  - Age
  - Gender
    - X linked
  - Place of birth, homeland

PLACE OF BIRTH- HOMELAND



Thalassemia carrier frequency 2,1%
Azerbaijan: 10%

PRESENTING (CHIEF) COMPLAINT

- Most important step
  - Rest will be build on it
  - Try to record their own words
- *What is the complaint today?*
- *What has brought your child today?*

- A thalassemia patient came to hospital
  - For regular transfusion
  - For fever
  - For a car accident
  - For bone marrow transplantation
  - …
  - ..
  - ..

HISTORY OF PRESENTING COMPLAINT

- Onset
- Duration
- Severity
- Course
- Intermittent or continuous
- Precipitating factor
- Relieving factor
- Associated features
- Previous episodes
- Any contact with similar illness in others/siblings, or infectious outbreaks?

SOME CLUES FOR ANAMNESIS

- B- Symtoms
  - Weight loss
  - Fever
  - Night sweets

Malignancy

- Stool
  - Dark

GASTROINTESTINAL BLEEDING

- **Melena**

  Digested blood in stool

  - black, tarry, oil like, fouly stools,
  - originates proximal to the ligament of Treitz
  - 50 ml blood is enough

- **Hematemesis**
  - digested or fresh blood in emesis
  - originates proximal to the ligament of Treitz

HISTORY FOR BLEEDING DIATHESIS

Stressful events for bleeding risks

- Heel prick
- Umbilical cord seperation
- Circumcision
- Crawling, Benining to walk
- Blood sampling
- Surgery
- Menstrual bleeding
  - Duration, amount, cycle, frequency of changing sanitary pads
- Hemarthosis
- Familial bleeding history
  - Mother, father
  - Maternal uncle and cousin

PAST MEDICAL HISTORY

1) Prenatal
- illness or complications during gestation

2) Natal
- Birth and first month
  - Jaundice
    - Hemolytic anemias, G-6PD deficiency

3) Postnatal
- Immunization
- Developmental
- Feeding
- Drug history
- Allergies
- Hospitalizations
- Surgeries

NUTRITION

- PICA (Repeated eating of nonfood substances)
  - Iron deficiency anemia, Zn deficiency
- Hemolytic crisis after Fava beans, broad beans
  - G-6PD deficiency
- Low meat consumption
  - Iron and vitamin B12 deficiency
- Increased Goat milk consumption
  - Folic acid deficiency
- Vegan or vegetarian
  - Iron, Vitamin B12 deficiency?

FAMILY HISTORY

- **Consanguineous marriage**
  - Autosomal recessive
  - Same village? Same city
- **Familial cancers**
  - %10 of childhood cancers are due to germline mutations
- **Early child death**
  - Bone marrow failure syndromes
  - Severe congenital syndromes
- **Anemia in family**
  - Thalassemia syndromes
  - Sickle cell anemia
- **Splenectomy, neonatal jaundice, cholecystectomy**
  - Hemolytic anemias
- **Bleeding in maternal uncle**
  - Hemophilias (X linked)

SOME CLUES FOR PHYSICAL EXAMINATION

- Starts with observing the patient and establishing a rapport
- Painful or irritant examinations must be postponed

  Ear, oropharynx examinations,
- Vital signs:
  - Temperature, Heart Rate, Respiratory Rate, Blood Pressure
- Anthropometric measurements

ANTHROPOMETRIC MEASUREMENTS

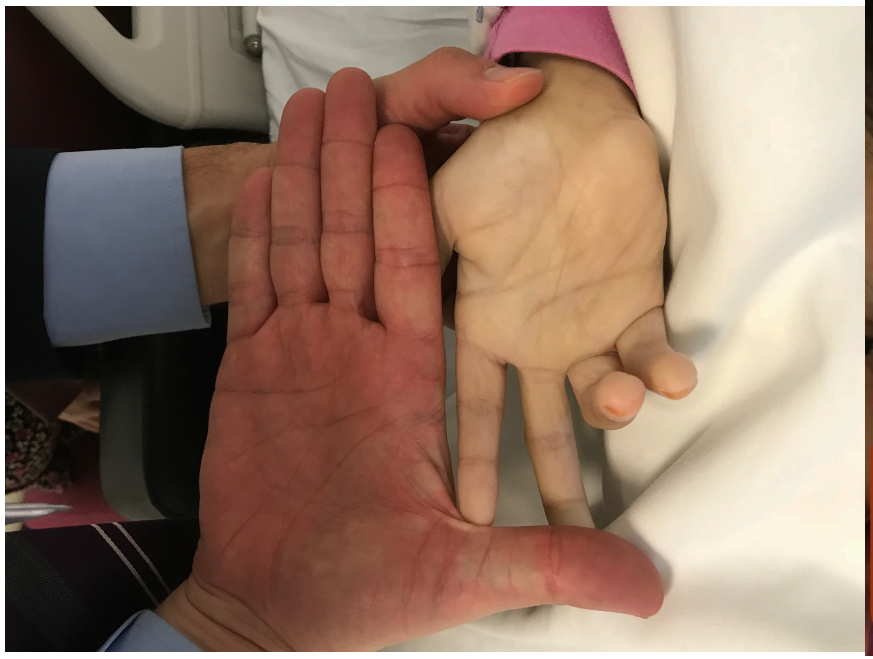
- Height, weight, head circumference
  - Microcephaly
  - Short stature
- Percentiles

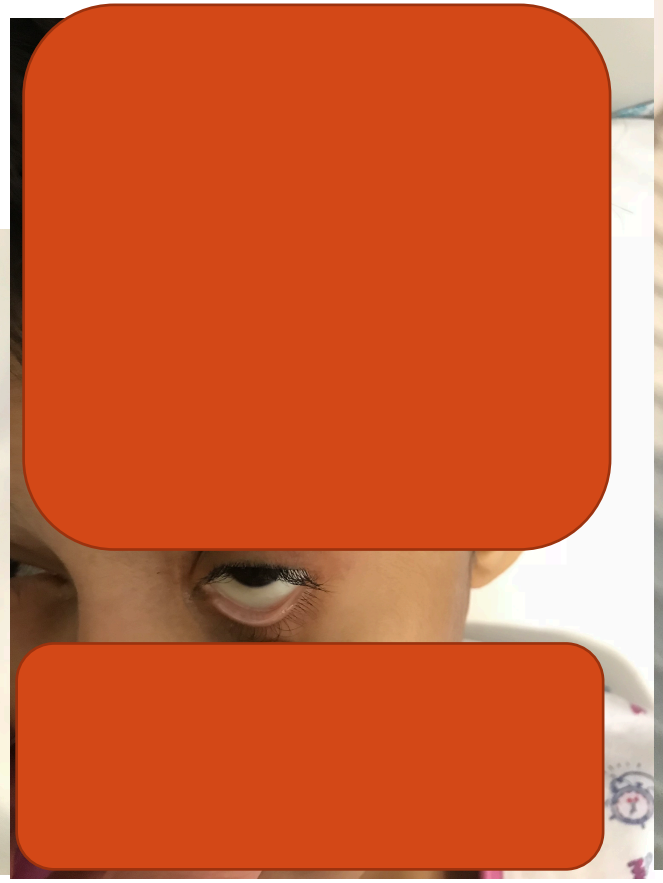
FANCONI APLASTIC ANEMIA

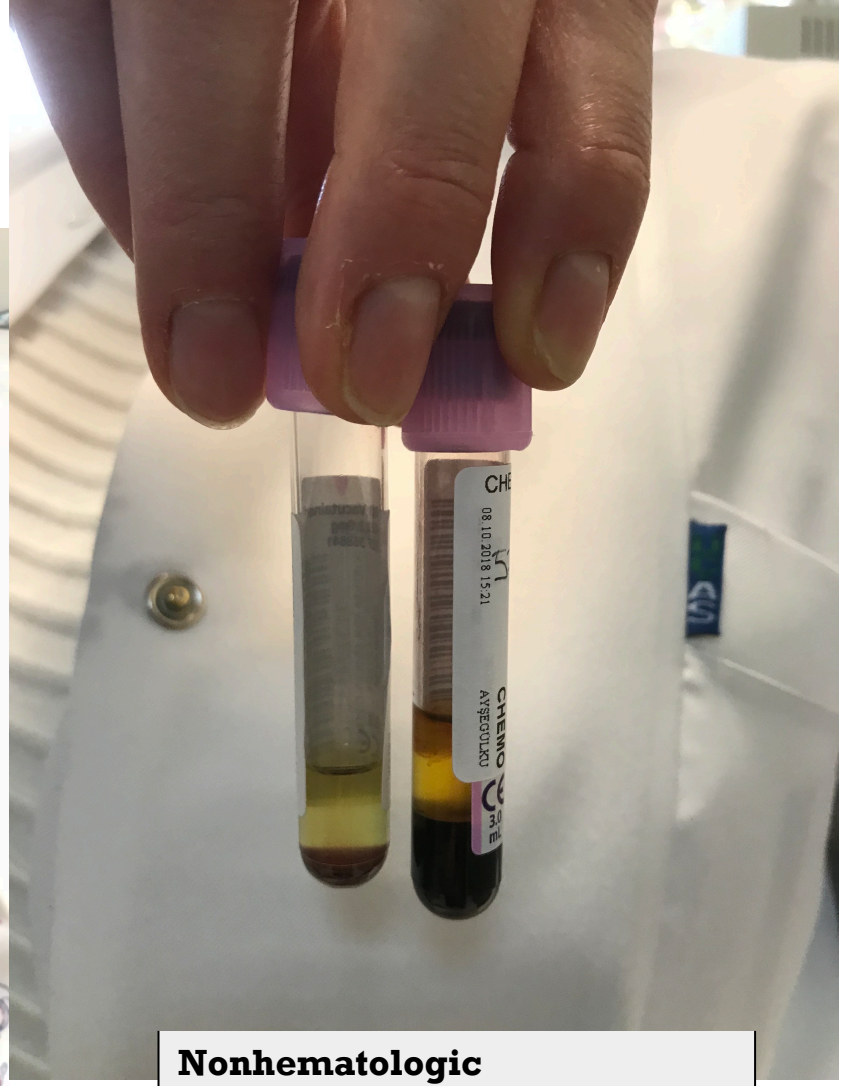
SOME CLUES FOR PHYSICAL EXAMINATION

- Anthropometric measurements
- Skin
  - Pallor

PALLOR







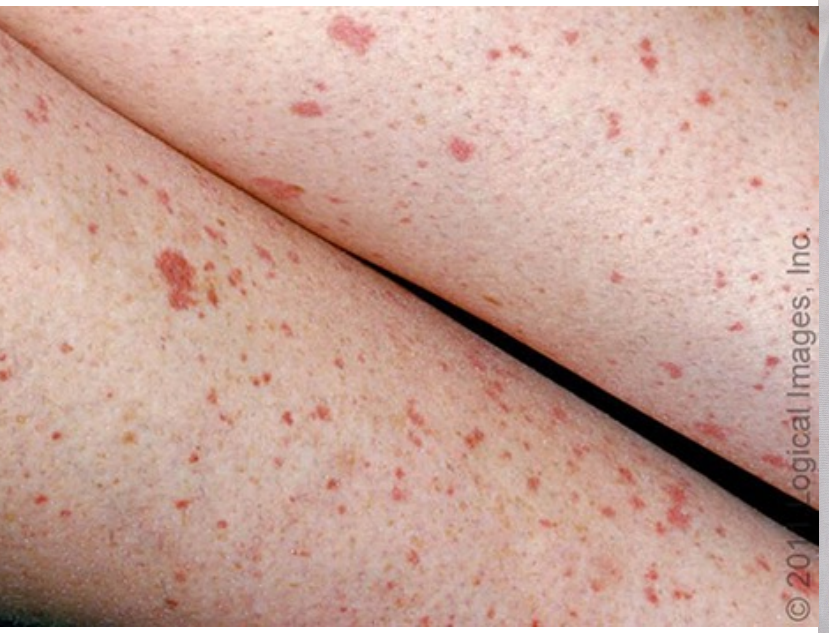
Nonhematologic
Respiratory failure*
Shock*
Hypoglycemia*
Pheochromocytoma*
Skin edema
Fair skinned complexion

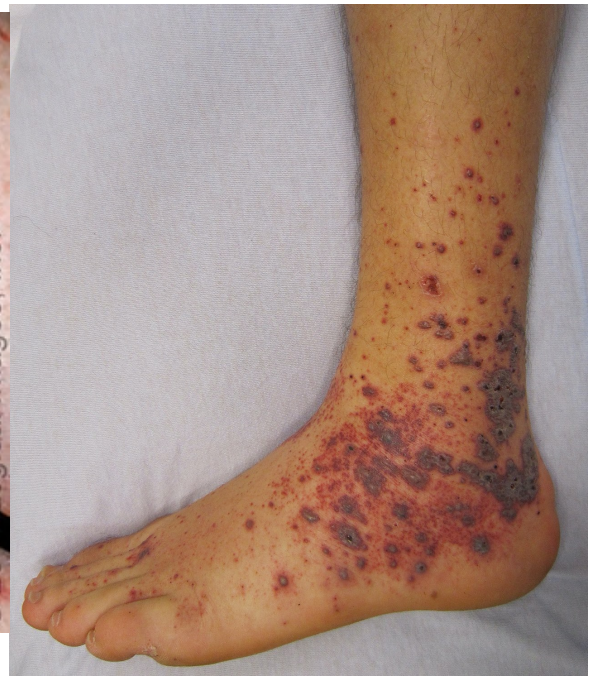
SOME CLUES FOR PHYSICAL EXAMINATION

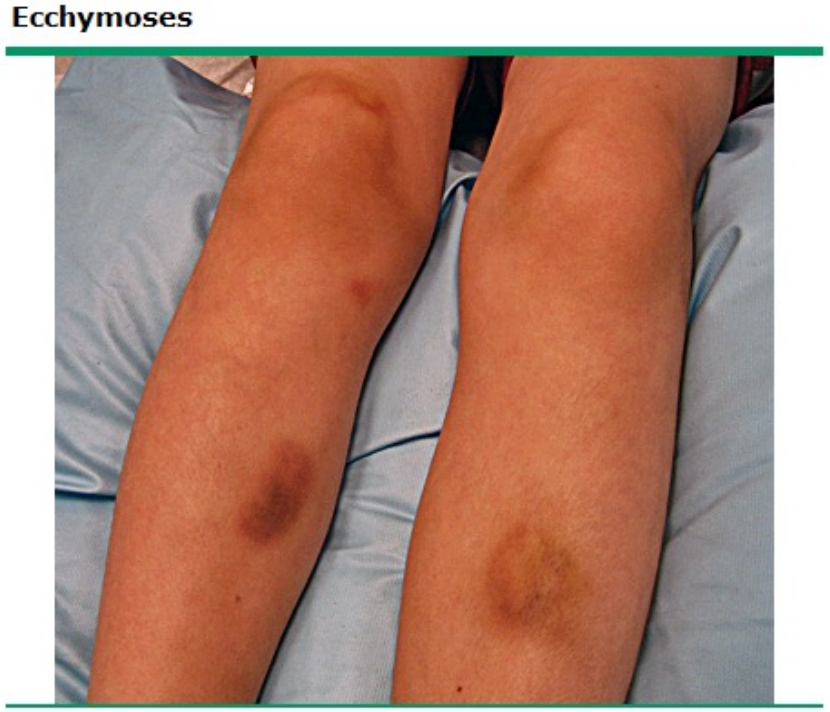
- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura

PETECHIA, PURPURA (ECCHYMOSES)

- Petechia: Pinpoint areas (less than 2 mm) of hemorrhage, which are reddish-purple lesions
- Purpura. 3-10 mm, ecchymoses: > 1 cm
- Petechia, and purpura do not bleach,



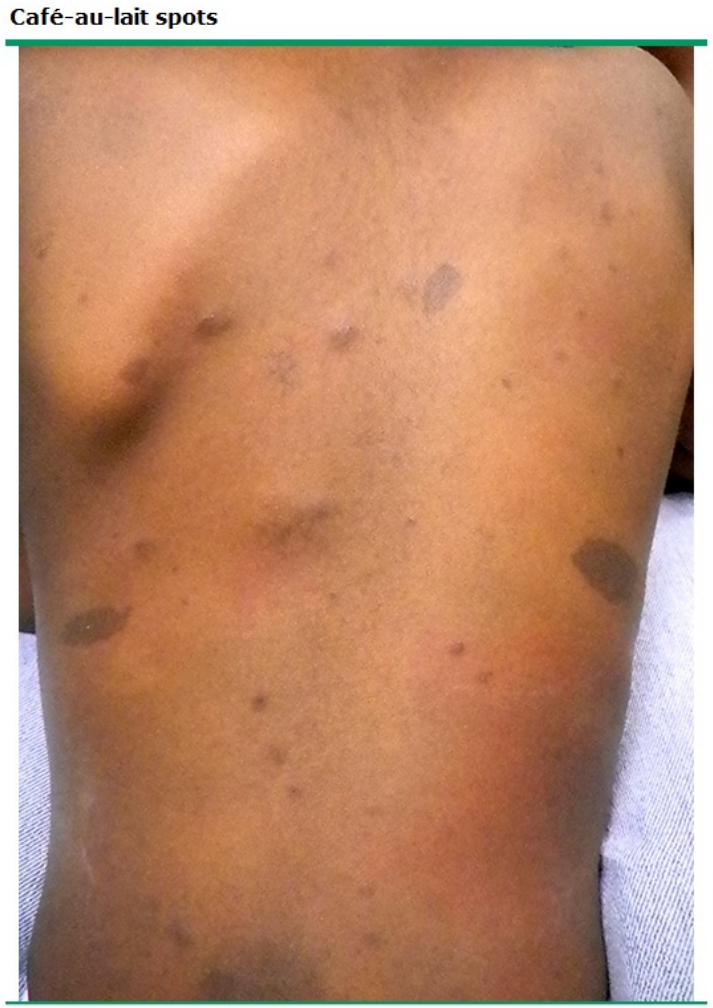




SOME CLUES FOR PHYSICAL EXAMINATION

- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura
  - Café au lait

CAFÉ AU LAIT



Most people with NF1 have blotches of medium to dark brown skin called "café-au-lait spots."

UpToDate®

Café au lait spots

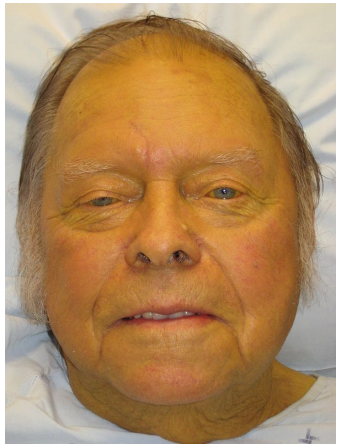
Ataxia–telangiectasia
Basal cell nevus syndrome
Benign congenital skin lesion
Bloom syndrome
Chédiak–Higashi syndrome
Congenital melanocytic naevus
Fanconi anemia
Gaucher disease
Hunter syndrome
Jaffe–Campanacci syndrome
Legius syndrome
Maffucci syndrome
They can be caused by vitiligo in the rare McCune–Albrig
Multiple mucosal neuroma syndrom
Neurofibromatosis type I (NF-1)
Noonan syndrome
Silver–Russell syndrome
Tuberous sclerosis
Watson syndrome
Wiskott–Aldrich syndrome

SOME CLUES FOR PHYSICAL EXAMINATION

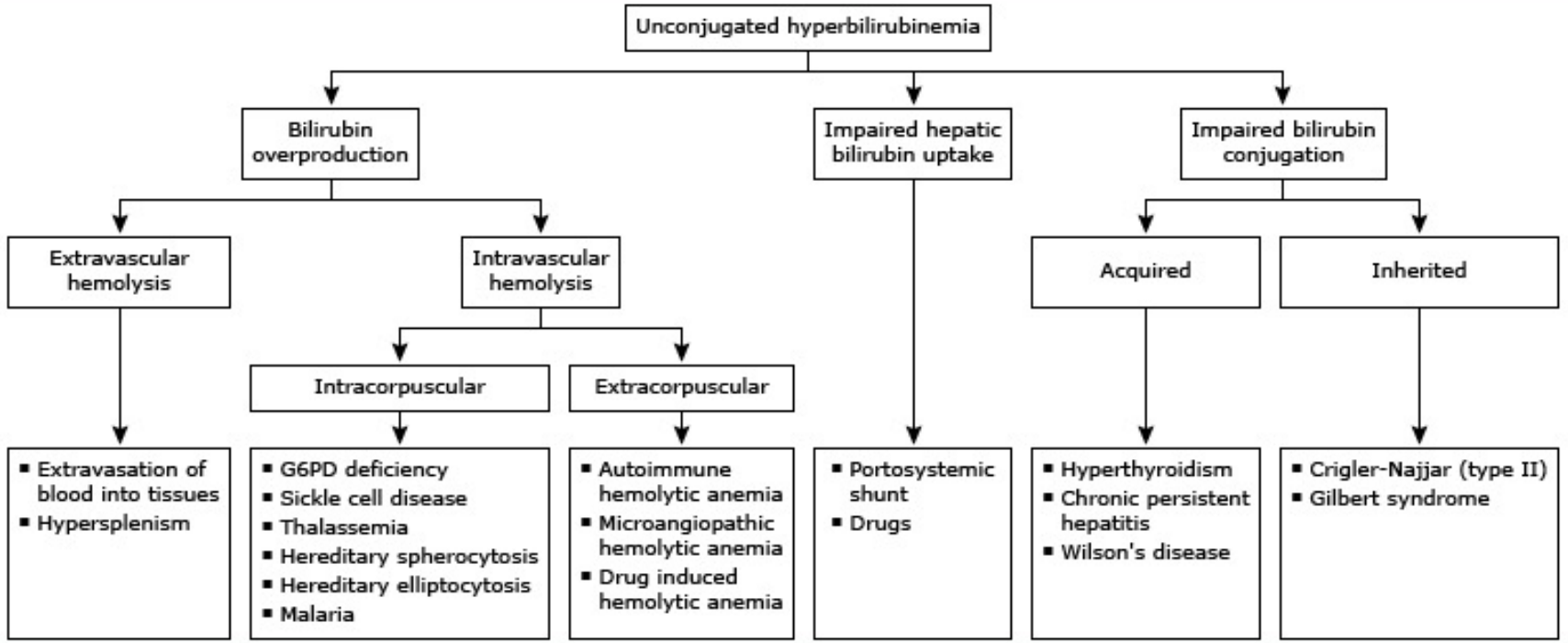
- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura
  - Café au lait,
  - Jaundice

JAUNDICE

- Yellowish discoloration of the skin and sclerae
- Elevated bilirubin
  - >2 mg/dl



Classification of unconjugated hyperbilirubinemia in children and infants beyond the neonatal period



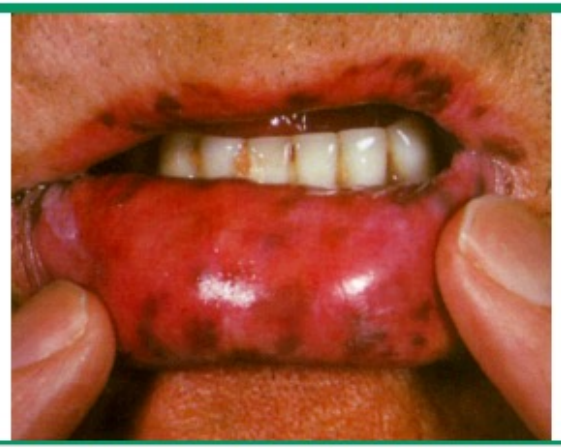
G6PD: glucose-6-phosphate dehydrogenase deficiency.

SOME CLUES FOR PHYSICAL EXAMINATION

- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura
  - Café au lait,
  - Jaundice
  - Pigmented lesions in gastric mucosa

MUCOSAL HYPERPIGMENTED LESIONS

Oral lesions in Peutz-Jeghers syndrome



Photograph shows the characteristic circumoral pigmentation in a patient with the Peutz-Jeghers syndrome. The pigmentation may not be obvious as in this patient, and it should always be sought carefully in young patients presenting with unexplained gastrointestinal bleeding, particularly if there is a family history of such bleeding.

Reprinted with permission from Pounder RE, Allison MC, Dhillon AP. A Colour Atlas of the Digestive System, Wolfe, London 1989 p. 118.

Peutz-Jeghers Syndrome

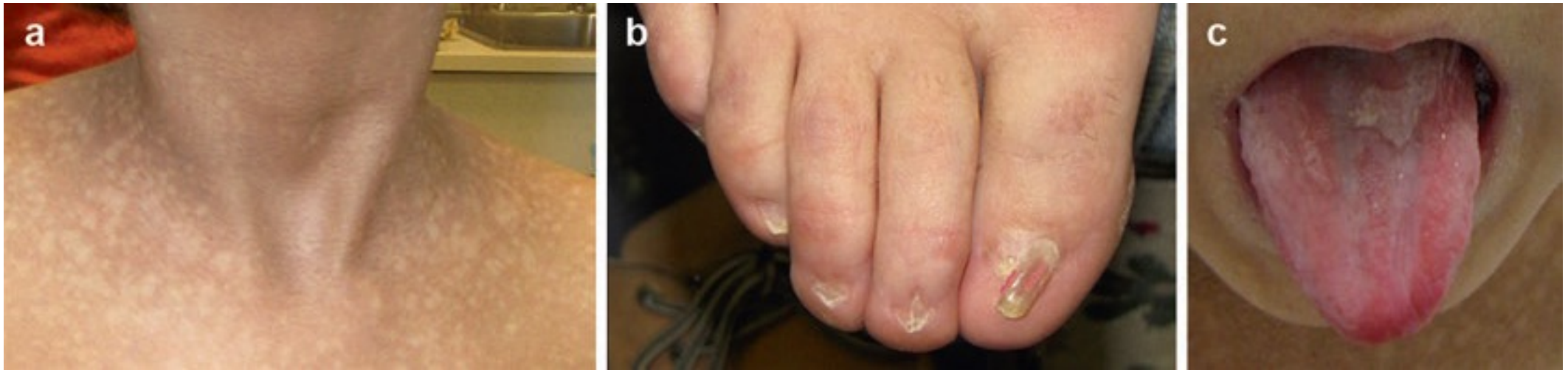
Familial polyposis syndrome

SOME CLUES FOR PHYSICAL EXAMINATION

- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura
  - Café au lait,
  - Jaundice
  - Pigmented lesions in gastric mucosa
  - Nail abnormalities

NAIL ANOMALIES

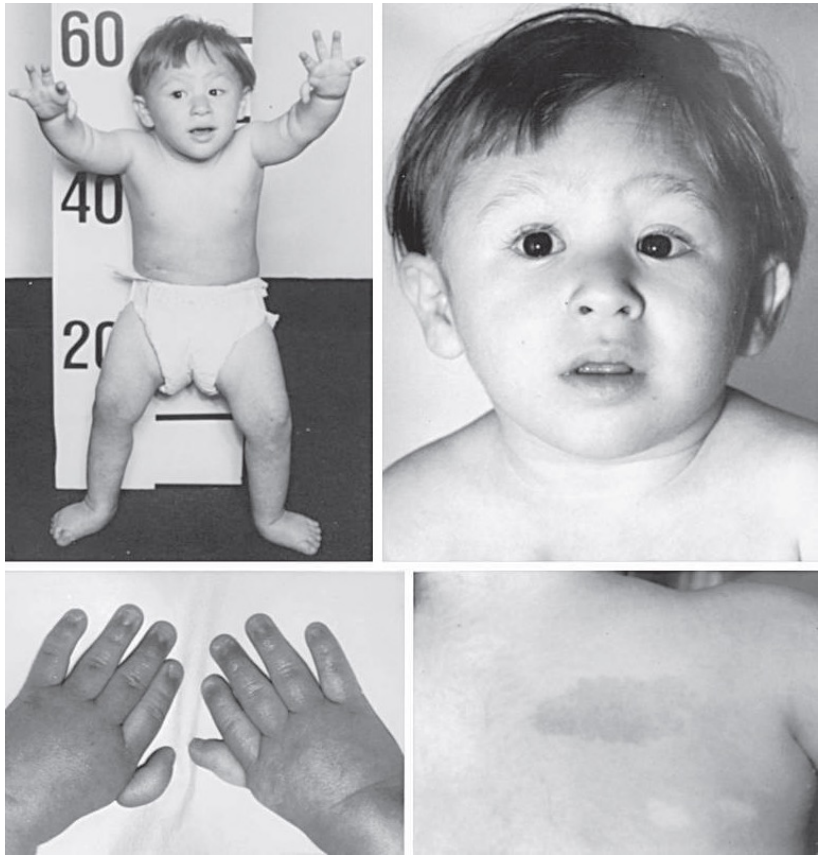
- Dyskeratosis Congenita (bone marrow failure syndrome)
- Hyperpigmentation nail dystrophy leukoplakia



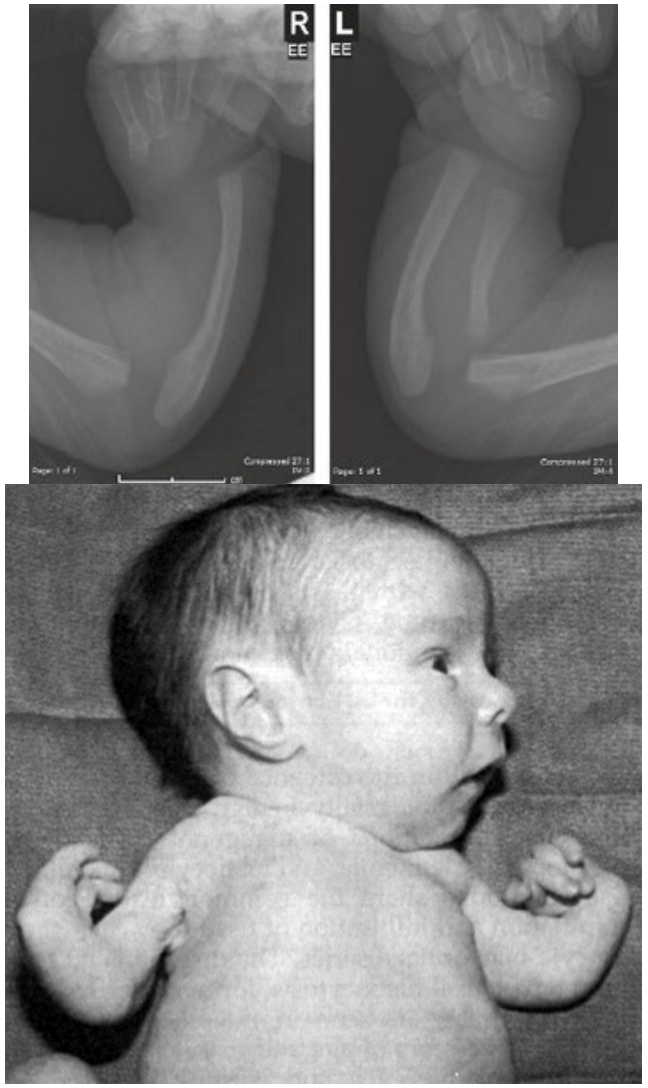
SOME CLUES FOR PHYSICAL EXAMINATION

- Extremities
  - Finger anomalies

FINGER ABNORMALITIES



Fanconi Aplastic Anemia (thumb is absent or dysmorphic)

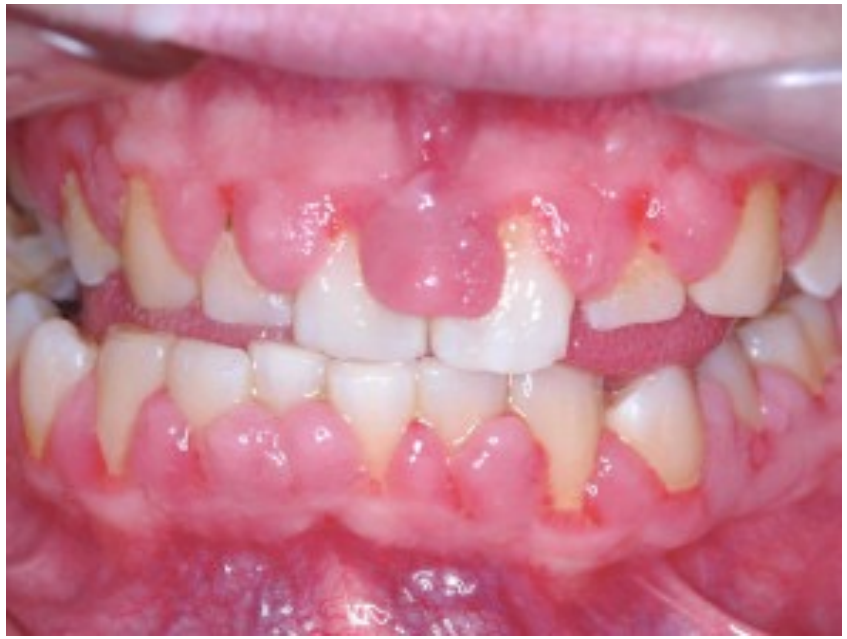


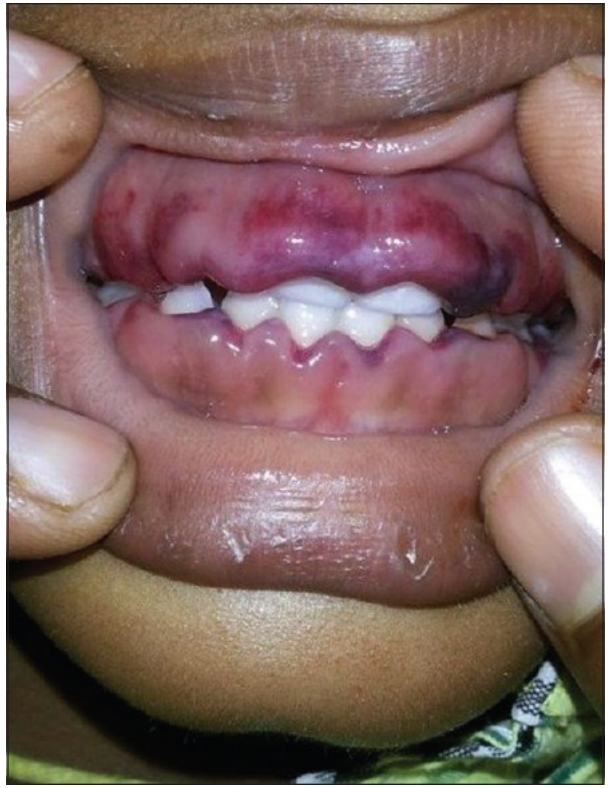
Thrombocytopenia with absent Radii (thumb is normal)

SOME CLUES FOR PHYSICAL EXAMINATION

- Anthropometric measurements
- Skin
  - Pallor
  - Petechia, purpura
  - Café au lait,
  - Jaundice
  - Pigmented lesions in gastric mucosa
  - Nail abnormalities
  - Gum hypertrophy

GINGIVAL HYPERTROPHY

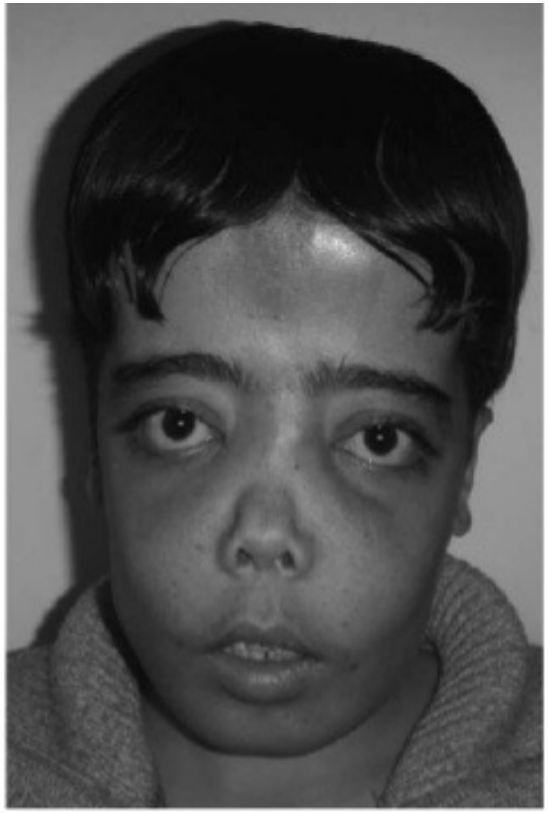


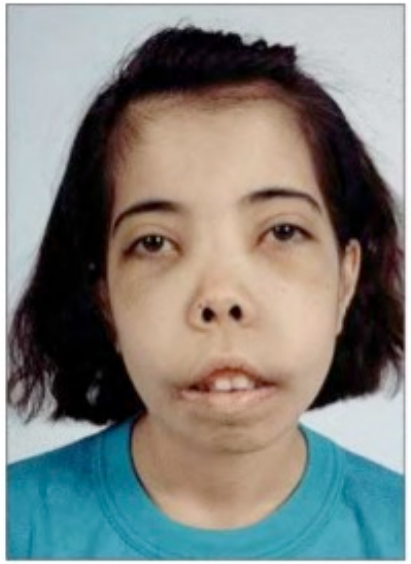


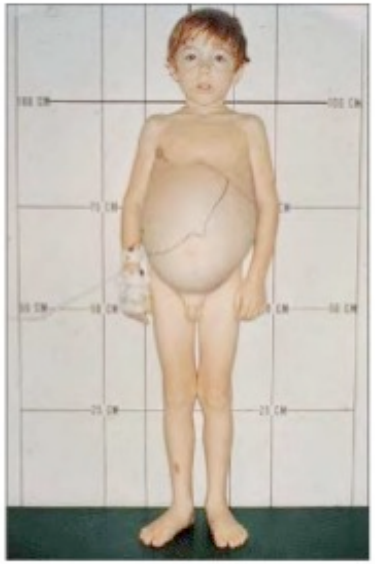
Leukemia (AML)
Cyclosporine
Anticonvulsants
antihypertensives

Clinical features

- Pallor (anemia)
- Jaundice
- Failure to thrive
- Bossing of the skull
- Maxillary overgrowth
- In absence transfusion, may develop Hepatosplenomegally
- Transfusion dependent







FACIAL APPEARENCE

- Beta Thalassemia Major

SUMMARISING

- At the end of the history-taking
- helps doctor and parent(s)
- to summarise understanding (including diagnosis, problems and any psychological factors).
- It is important to give the child and the parent(s) an opportunity to reveal omitted details and to ask questions.

DISCUSSION