Assessment of general condition and nutritional status in children

Anna Piwowarczyk

Department of Peaditrics with Clinical Assessment Unit,

The Medical Univerity of Warsaw

General condition

?

DEALING WITH COLIC AND ACID REFLUX

www.luvyourbaby.com

Assessement based on the **observation**

- Behaviour/reaction to physician
- Ability to play
- Attention to the surrunding
- Any signs?
- Ability to talk/cry?
- Breathing
- Skin colour

General condition

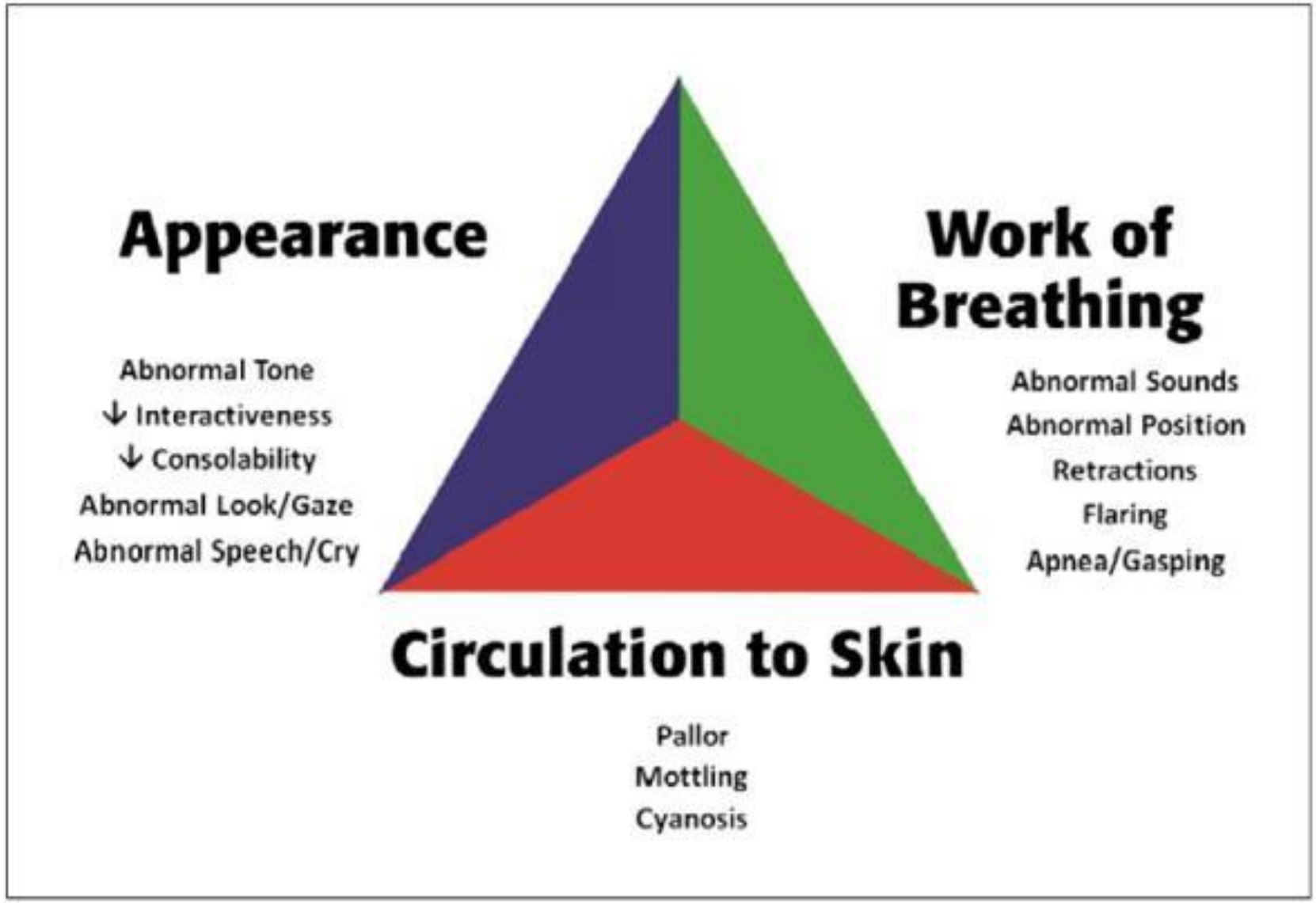
General apperance:

- degree of comfort
- state of well-being
- activity level
- physical appearance
- body habitus and nutritional status

Body position

Assessment of developement ☺

Pediatric Assessment Triangle – emergency medicine



AAP, 2000

Pediatric Assessment Triangle - ”score”

B – **Respiratory distress**

B + A or C – **Respiratory failure**

A + C - **Shock**

General danger signs

World Health Organization

Ability to drink / beeing breast fed
Vomiting +/-

Convulsions +/-

Lethargy / consciousness

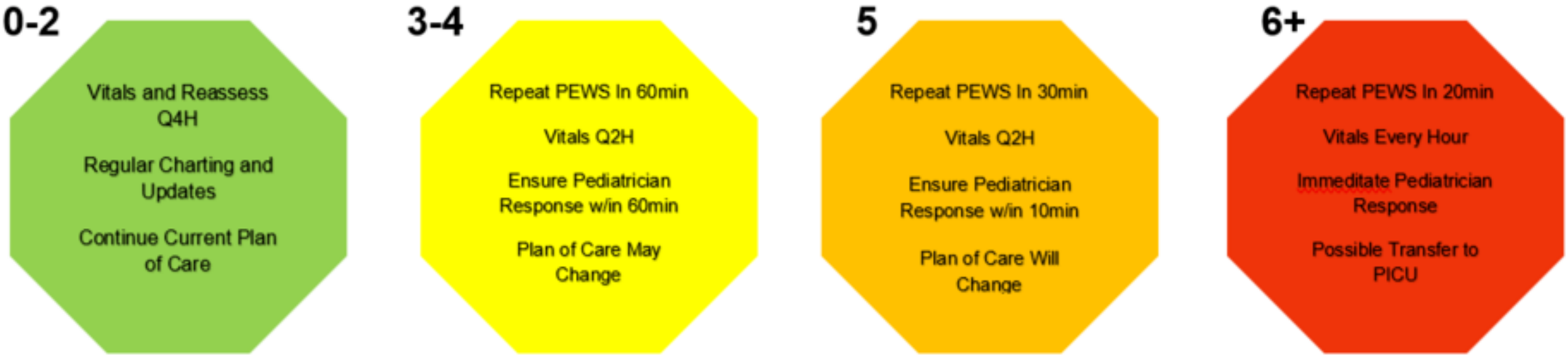
PEWS – pediatric early warning scores

Table 1.1	0	1	2	3	Score
Cardiovascular	Pink **or** capillary refill 1-2 seconds.	Pale **or** capillary refill 3 seconds.	Grey **or** capillary refill 4 seconds. Tachycardia of 20 above normal rate.	Grey and mottled **or** capillary refill ≥5 seconds. Tachycardia of 30 above normal rate **or** bradycardia.	
Respiratory	Within established baseline. No retractions Room Air	≥10 above established baseline. Mild Contractions Up to 2L/min **or** 30%	≥20 above established baseline. Moderate Contractions Up to 4L/min **or** 40%	≥30 above established baseline. Severe Contractions Grunting Up to 5L/min **or** 50%	
Behavior	Playing/Appropriate or Sleeping	Irritable, but Consolable	Irritable and Inconsolable Restless **or** Pain	Lethargic or Confused Reduced Response to Voice or Pain	
Score an additional 2pts for nebulizer use, suctioning, or persistent vomiting after surgery.					
				Total	

Table 1.2 Retraction Severity		
Mild	**Moderate**	**Severe**
Subcostal or Substernal	Intercostal or Supraclavicular	Suprasternal or Sternal

Monaghan A, *Pediatric Nursing* 2005

SCORE



0-2: no change in a child's status and regular rounding is acceptable

3-4: child's care is worsening, but it does not need immediate assistance. The plan of care may change or continued close monitoring will be initiated

5: the child's status is deteriorating and a change in the plan of care is needed to improve outcomes. This is an urgent situation that requires close monitoring and the involvement of other disciplines.

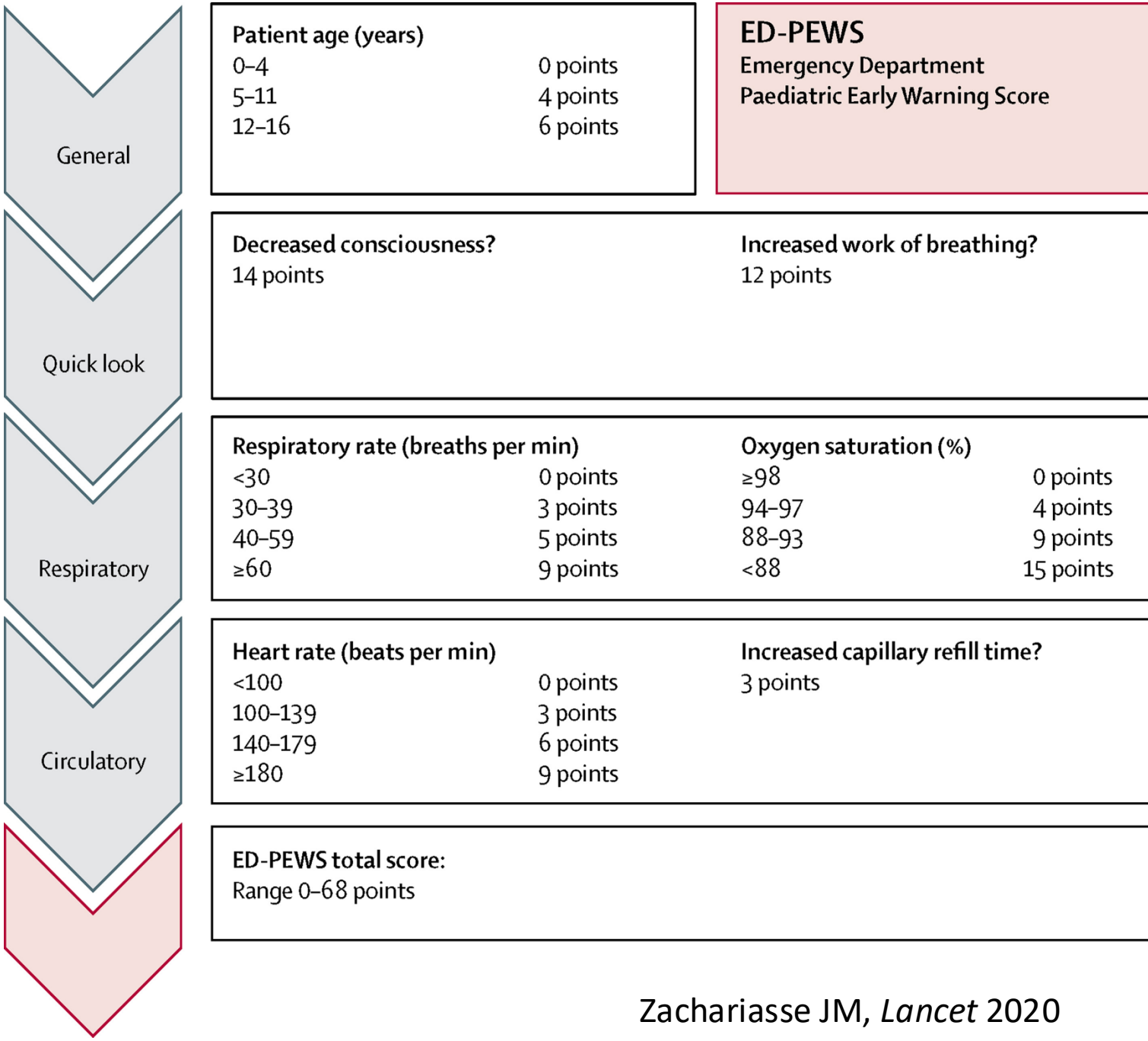
6+: there are severe consequences if quick intervention is not established, including possible permanent damage or death. A child with a PEWS score of 6+ will mostly be transferred to a PICU

Monaghan A, *Pediatric Nursing* 2005

ED-PEWS –
emergency deprtment

>= 15 - requires urgetnt care and close monitoring

< 6 – a low-urgency situation



Zachariasse JM, *Lancet* 2020

https://www.mdcalc.com/

Pediatric Appendicitis Score (PAS)
Predicts appendicitis in children.

Pediatric Asthma Score (PAS)
Stratifies asthma severity in children.

Pediatric Asthma Severity Score (PASS) for Asthma Exacerbation Severity
Determines pediatric asthma severity based on physical exam findings.

Pediatric Crohn's Disease Activity Index (PCDAI)
Stratifies severity of Crohn's disease in pediatric patients.

Pediatric Early Warning Score (PEWS)
Identifies pediatric patients at risk for clinical deterioration.

Paediatric Glasgow Coma Scale

- **Eye response**:

4. Eyes opening spontaneously
3. Eye opening to speech
2. Eye opening to pain
1. No eye opening or response

- **Verbal response**:

5. Smiles, oriented to sounds, follows objects, interacts.
4. Cries but consolable, inappropriate interactions.
3. Inconsistently inconsolable, moaning.
2. Inconsolable, agitated.
1. No verbal response.

- **Motor response**:

6. Infant moves spontaneously or purposefully
5. Infant withdraws from touch
4. Infant withdraws from pain
3. Abnormal flexion to pain for an infant
2. Extension to pain
1. No motor response

Assessment of general status
- basis

TRIAGE (vital signs)

Observation – standardized scales

TRUST in parental assessment

Assessment of nutritonal status

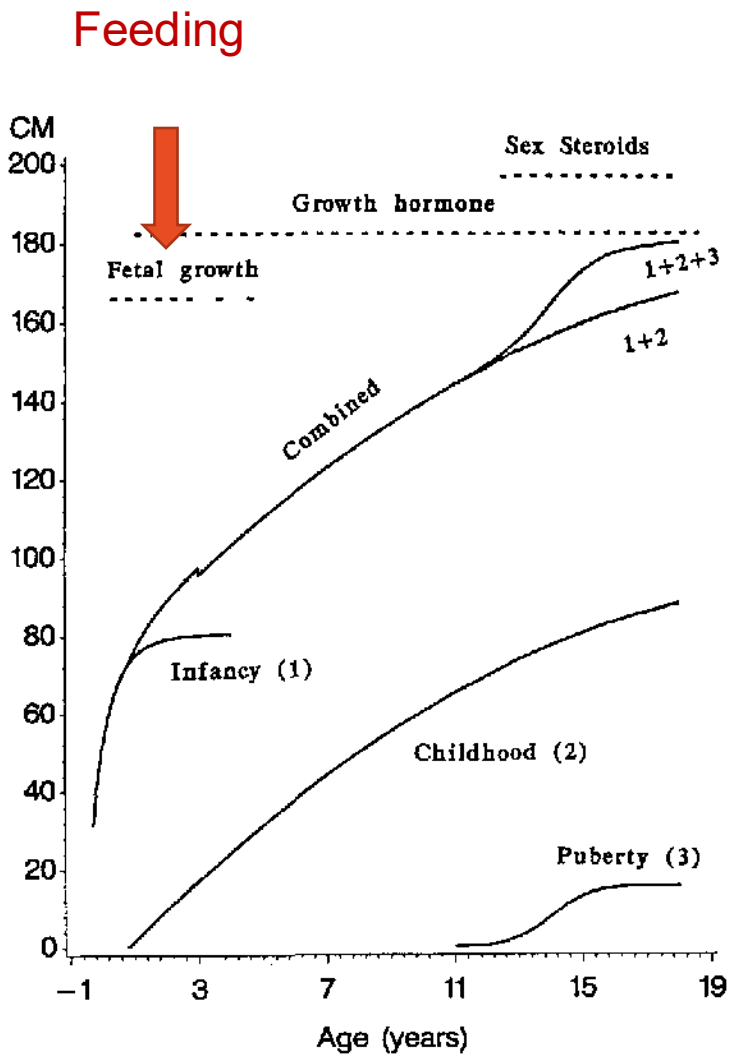
Factors afecting growth & development

- Genes
- Racial/ethnic differences
- Hormons
- Nutrition

Pediatric Nutrition in Practice, Koletzko B, Karger Publishers, 2008

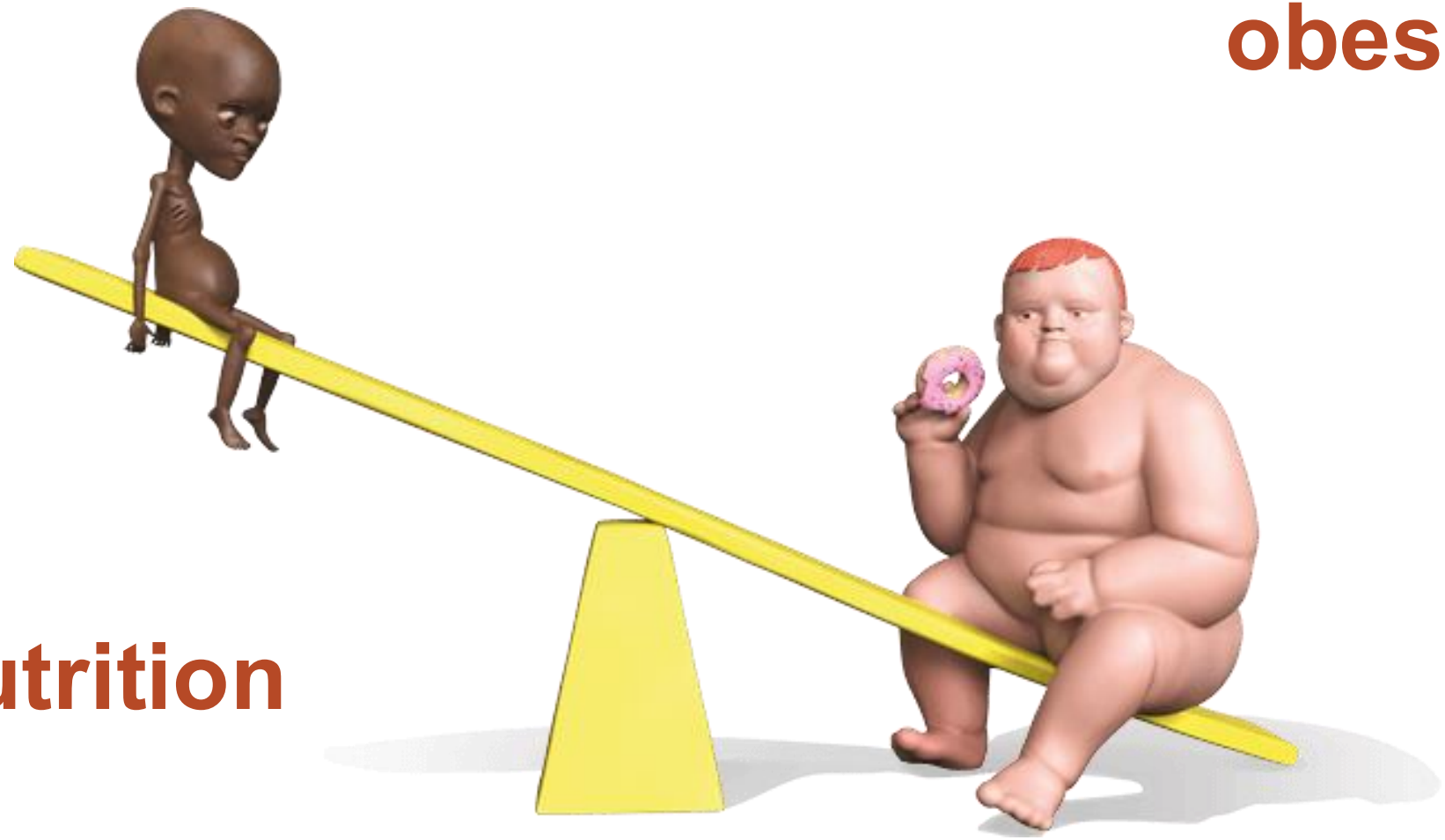
Stages of developement

- Intrauterine
- Infancy
- Childchood
- Adolescence



A Biologically-Oriented Mathematical Model (ICP) for Human Growth, Karlberg J, 1989

Abnormal nutritional status



obesity

malnutrition

Hospital malnutrition

Table 2 Prevalence of acute malnutrition in hospitalized children with mixed diagnoses

Reference	Country	Age	*n*	Prevalence (%)*	Definition
Pawellek *et al.* [25•]	Germany	All ages	475	6.1	WFH <80%
Rocha *et al.* [26]	Brazil	<5 years	186	6.9	WFH <−2 SD
Marteletti *et al.* [27]	France	2 months–16 years	280	11	WFH <−2 SD
Dogan *et al.* [28]	Turkey	1 month–23 years	528	27.7	WFH <−2 SD
Ozturk *et al.* [29]	Turkey	2–6 years	170	31.8	% ideal BW/H <80%
Hankard *et al.* [30]	France	>6 months	58	21	BMI <−2 SD
Hendricks *et al.* [31]	USA	0–18 years	268	7.1	WFH <80%
Hendrikse *et al.* [32]	UK	7 months–16 years	226	8.0	WFH <80%
Moy *et al.* [33]	UK	3 months–18 years	255	14	WFH <−2 SD

BW/H, bodyweight for height; WFH, weight for height.
* Prevalence (%) derived from original studies using equivalent criteria.

6-32%

Joosten KFM and Hulst JM, Curr Opin Pediatr 2008;20:590-6

Malnutrition in chronic diseases

- Cardilogy 60%
- Neurology 10-30%
- Neoplastic process 10-28%
- Gastrointestinal diseasess 15-30%
- Psychiatry

Prevalence of malnutrition in paediatric hospital patients; Pawellek i wsp. Clin Nutr 2008; 27:72–76

Imblanced diet

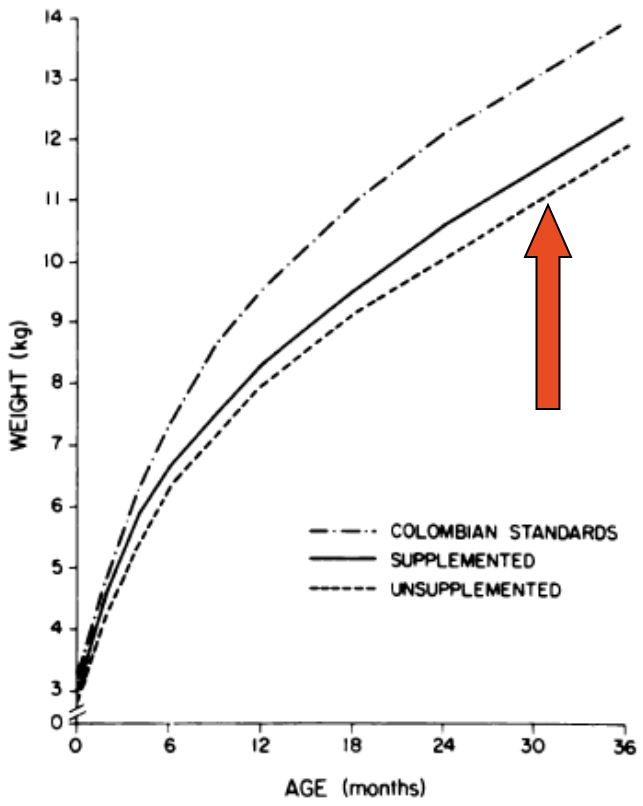


FIG. 1. Attained weight (kilograms) from birth to 36 months, by supplementation group, as compared to Colombian standards.

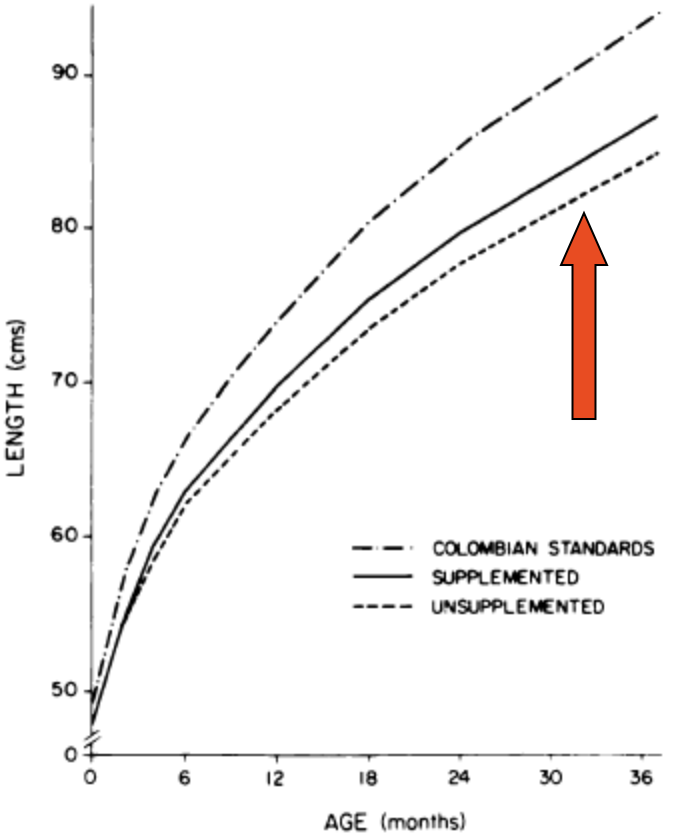
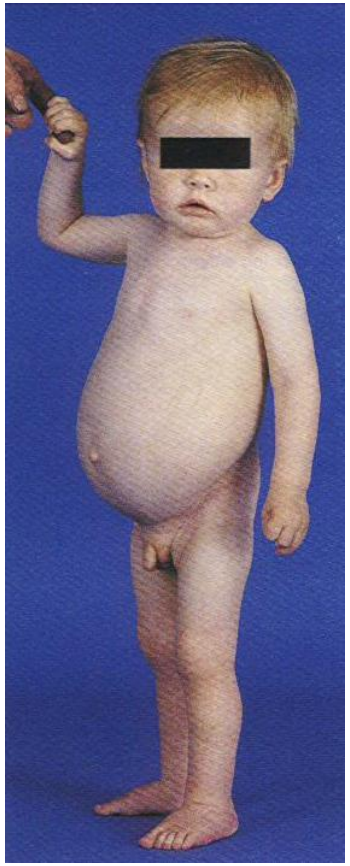


FIG. 2. Attained length (centimeters) from birth to 36 months, by supplementation group, as compared to Colombian standards.

The effects of nutritional supplementation on physical growth of children at risk of malnutrition, Mora JO, *Am. J. Clin. Nutr.* 34: 1885-1892, 1981



Nutritional assessment

Nutritional assessment

- Growth assessment (anthropometric measurements)
- Dietary, medical, and medication history
- Physical examination
- Laboratory tests

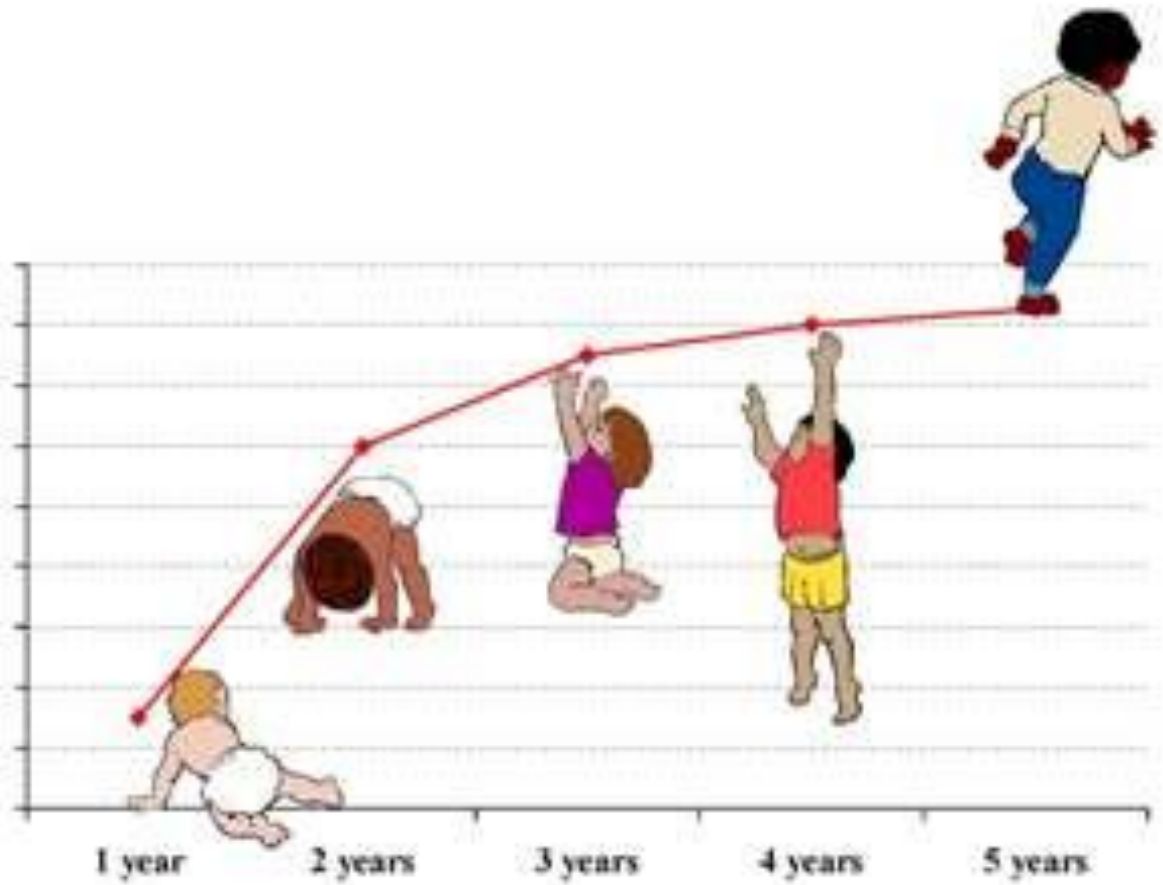
Growth evaluation

- obtaining, plotting, and interpreting
  - weight,
  - length,
  - head circumference

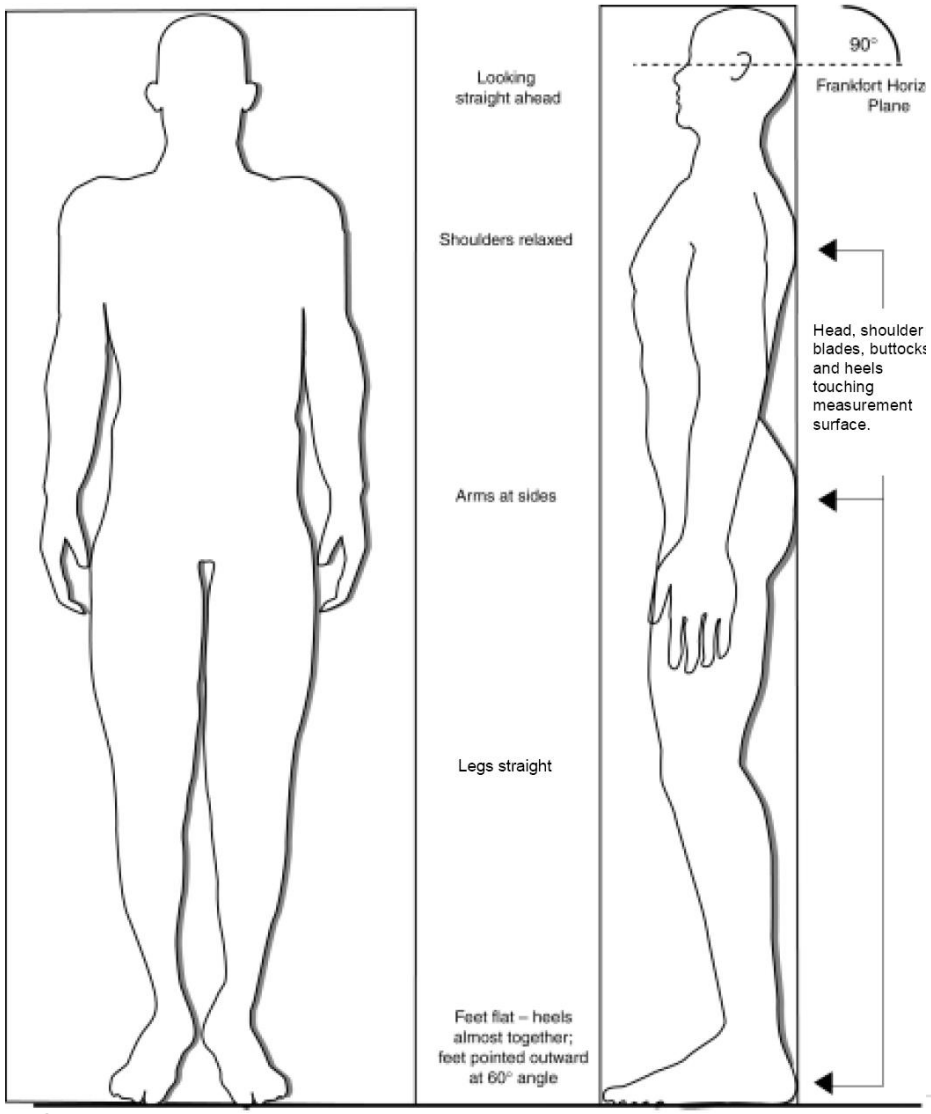
Standardized equipement

Growth charts

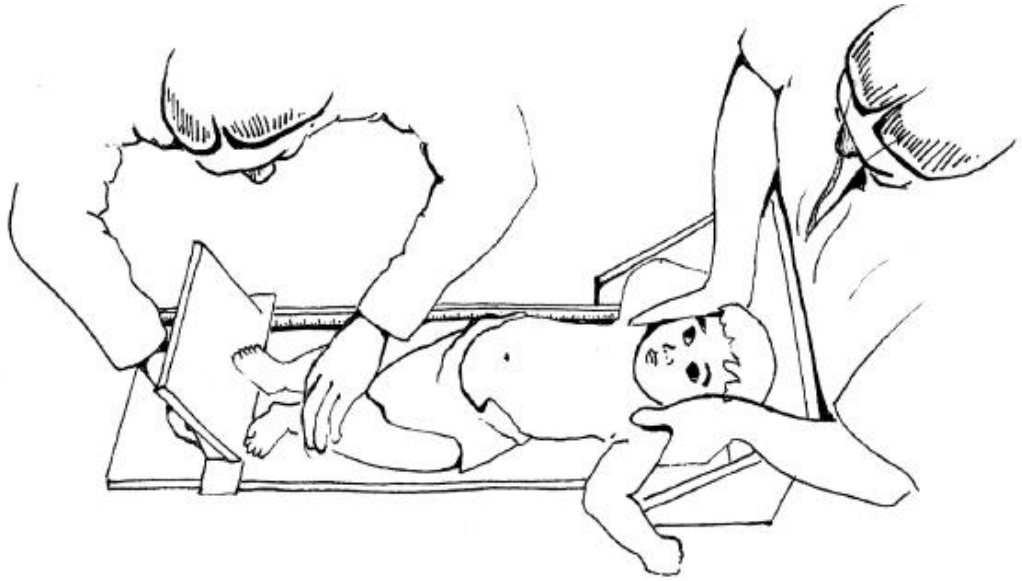
Growth charts

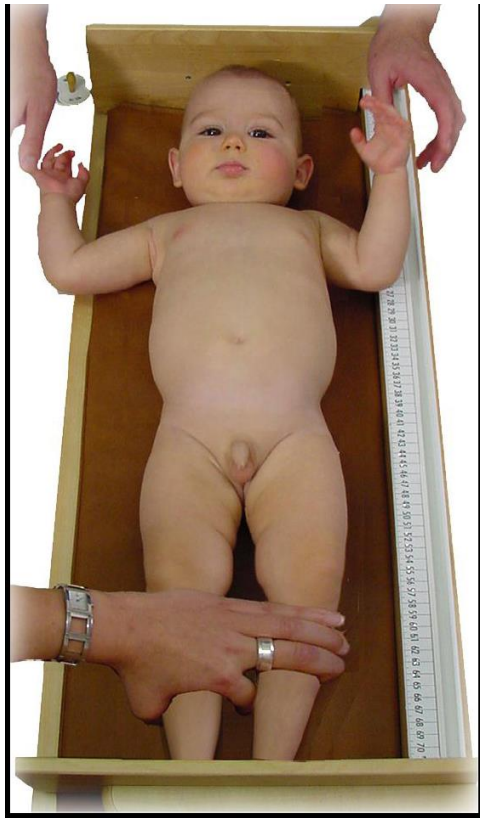


- WHO (Growth standards < 5 yo, growth reference: 5-19 yo)
- OLA/OLAF (3-18 yo) – Polish population
- Specific groups of patients (cerebral palsy, premature infants, Downe syndrome)


Looking straight ahead
Shoulders relaxed
Arms at sides
Legs straight
Feet flat – heels almost together; feet pointed outward at 60° angle
90°
Frankfort Horiz Plane
Head, shoulder blades, buttocks and heels touching measurement surface.

Height



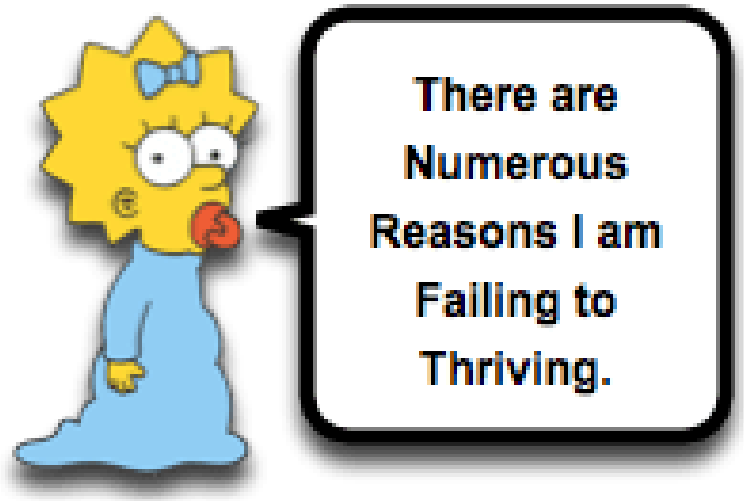


Lenght

Body mass

Malnutrition – failure to thrive in childhood is a state of undernutrition due to:

inadequate caloric intake,
inadequate caloric absorption,
excessive caloric expenditure



Anthropometric Criteria for Diagnosing Failure to Thrive

Body mass < 5th pc

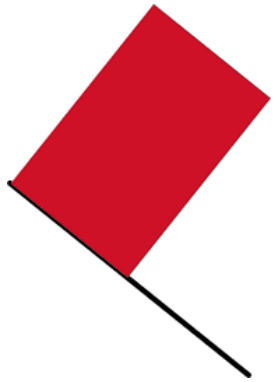
BMI < 5 th pc

?

?

?

Red Flag Signs and Symptoms Suggesting Medical Causes of Failure to Thrive



Symptoms

- Cardiac findings suggesting congenital heart disease or heart failure (e.g., murmur, edema, jugular venous distention)
- Developmental delay
- Dysmorphic features
- Organomegaly or lymphadenopathy

Signs

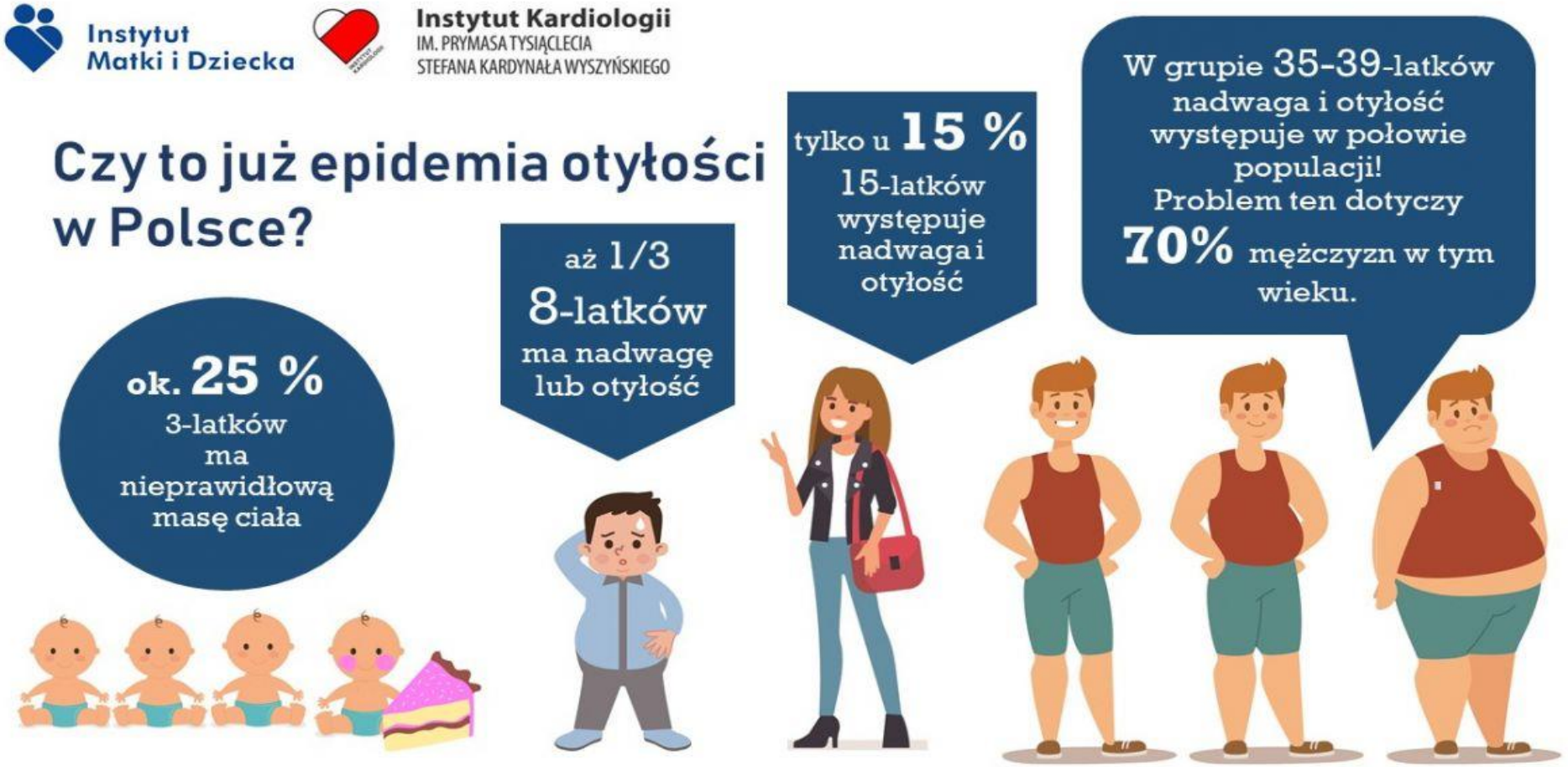
- Failure to gain weight despite adequate caloric intake
- Recurrent or severe respiratory, mucocutaneous, or urinary infection
- Recurrent vomiting, diarrhea, or dehydration

Cole S, Am Fam Physician, 2011

Hospitalization should be considered:

- signs of serious malnutrition
- comorbidity of chronic disease
- if the child does not improve with outpatient management
- signs of traumatic injury
- severe psychosocial impairment of the caregiver is evident
- suspicion of abuse or neglect exists
- caregivers' fear

Overweight – Polish data



Normal body mass: BMI > 5 i <85 pc on age and sex (CDC)

Dietary assessment

- Quality – meal times, way of consuption, composition of meals, atmosphere, feeding problems

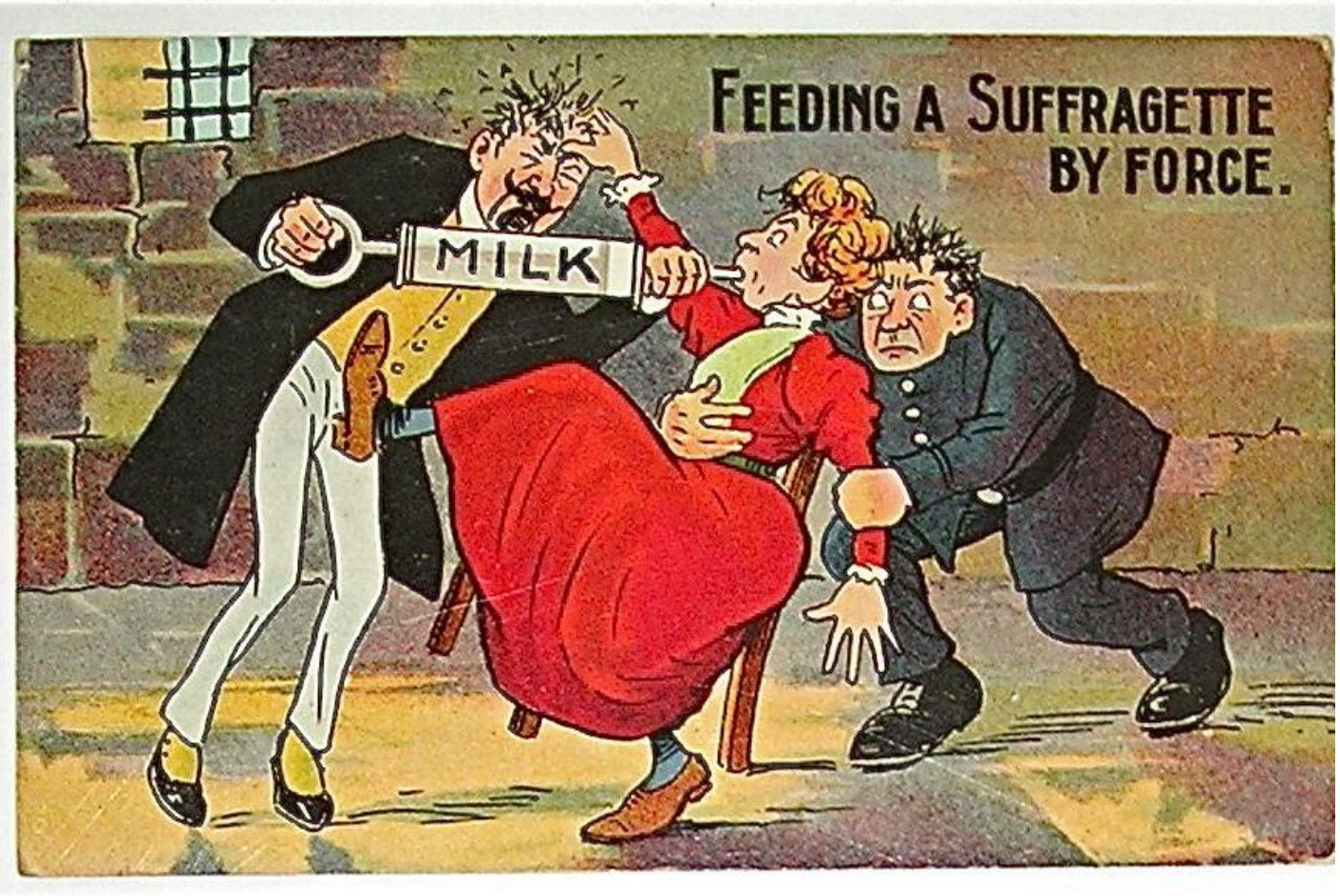
- Dietary records (nutritional intake in numbers)

Feeding – taking a history

Infancy

- breast/formula feeding, technique, time periods, solids' introduction
- formula feeding: portions, frequency, way of preparing, supplements

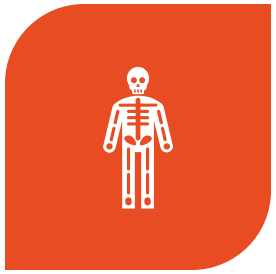
Feeding – taking a history



Young children

- Amount of meals, beverages
- Atmosphere
- Place of meals
- Dietary record

Health status



GROWTH PATTERN

ACUTE/CHRONIC DISEASES

SIGNS AND SYMPTOMS

LIFE STYLE

Family history

- Growth pattern of parents
- Socioeconomic status of the family

Overweight

- Definition ?
- Assessment tools

BMI = body mass[kg] / lenght/height [m] 2

BMI does not measure body fat directly

Weight Status Category	Percentile Range
Underweight	<5th percentile
Normal or Healthy Weight	5th to < 85th percentile
Overweight	85th < 95th percentile
Obese	≥ 95th percentile

Children under 5 yo

overweight is weight-for-height > 2 standard deviations above WHO Child Growth Standards median;
obesity is weight-for-height > 3 standard deviations above the WHO Child Growth Standards median.

Children aged between 5–19 yo

overweight is BMI-for-age > 1 SD above the WHO Growth Reference median;
obesity is > 2 SD above the WHO Growth Reference median.