



CHILOTORACE

diagnosi e aspetti nutrizionali

Ferrari Floriana
Terapia Intensiva Pediatrica
ASST Papa Giovanni XXIII
Bergamo

Chylothorax and chylous-like diseases are rare conditions and difficult to treat. But they may represent potentially life-threatening disorders.

between the years 1999 and 2012

Data of 34 patients were analyzed for this study

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Chylothorax is a relatively rare cause of pleural effusion in children.

M. Soto-Martinez, J. Massie / Paediatric Respiratory Reviews 10 (2009) 199–207

Chylothorax occurring after pediatric congenital heart surgery is an uncommon complication, occurring in 0.6% to 2% in reported series ...between September 1997 and August 2006 were reviewed. During this period, 1341 pediatric patients underwent surgery for congenital heart disease (CHD). Of these, 18 patients (1.35%) developed chylothorax

Nel nostro centro

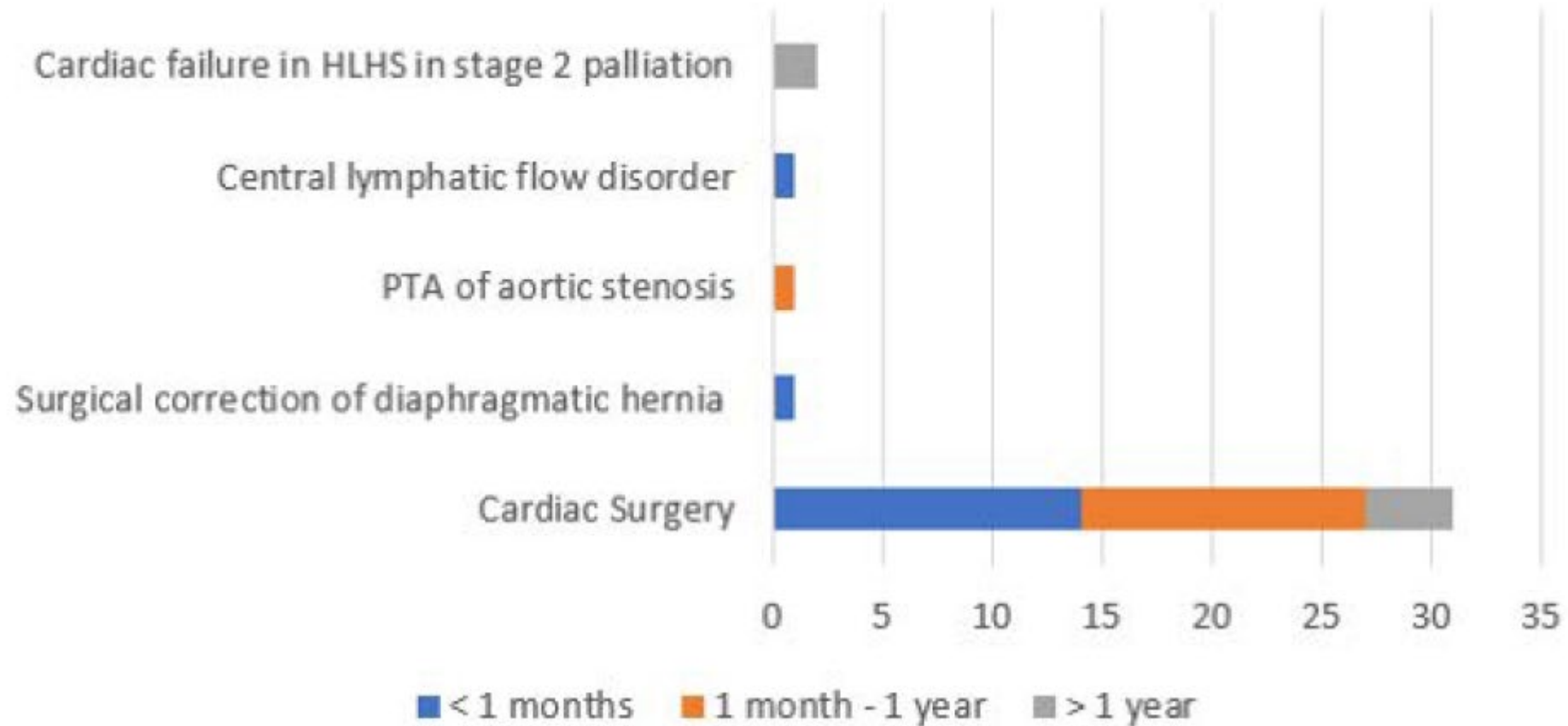
Management of post-operative chylothorax and chylous ascites in pediatric patients: preliminary results of a two year, single center PICU experience.

From January 2017 to February 2019 we enrolled 49 patients: 29 presented CT, 13 CA and 7 both effusions.

Indicidenza annua di versamenti chilosì è 4% circa

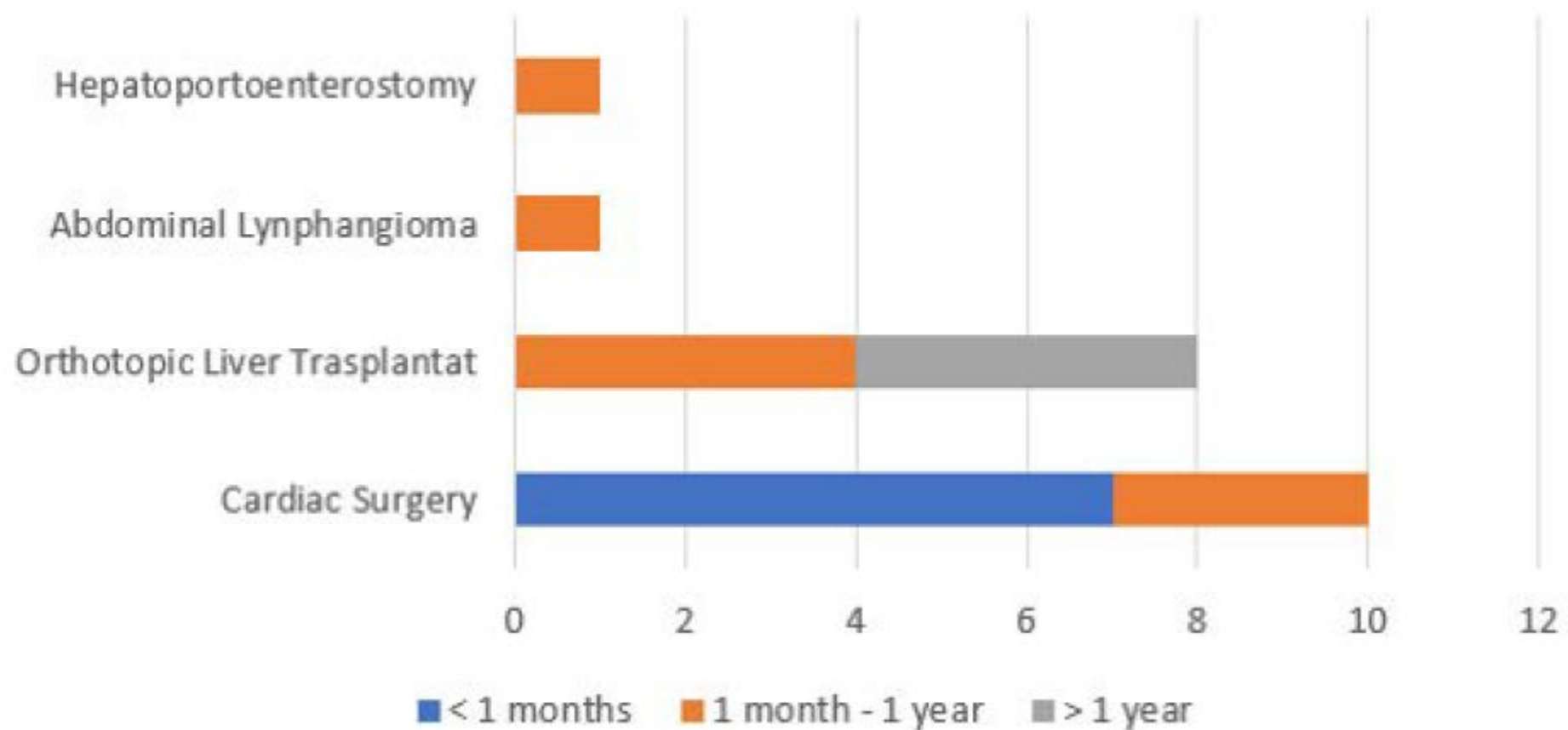
Incidenza annua chilotoraci è 3% circa

Chylothorax etiology and patient's age

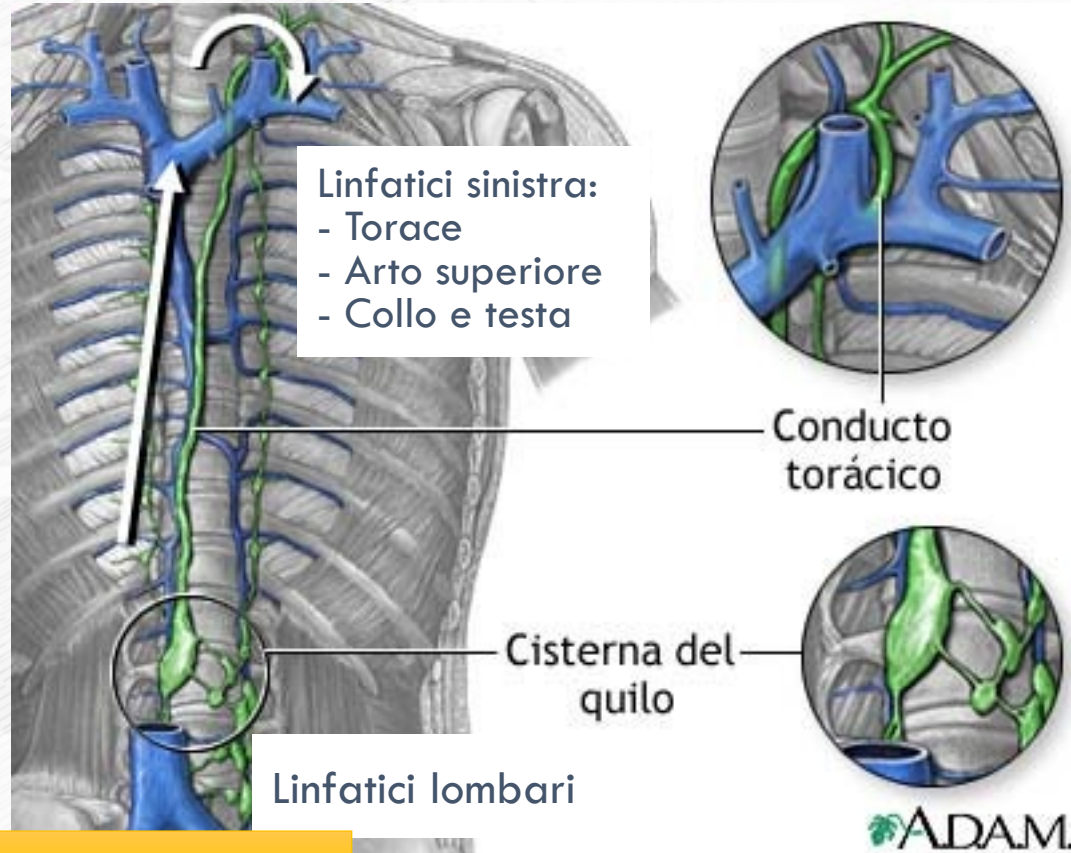


HLHS: ~~Werners~~ Hypoplastic Left Heart Syndrome; PTA: Percutaneous Transcatheter Angioplasty

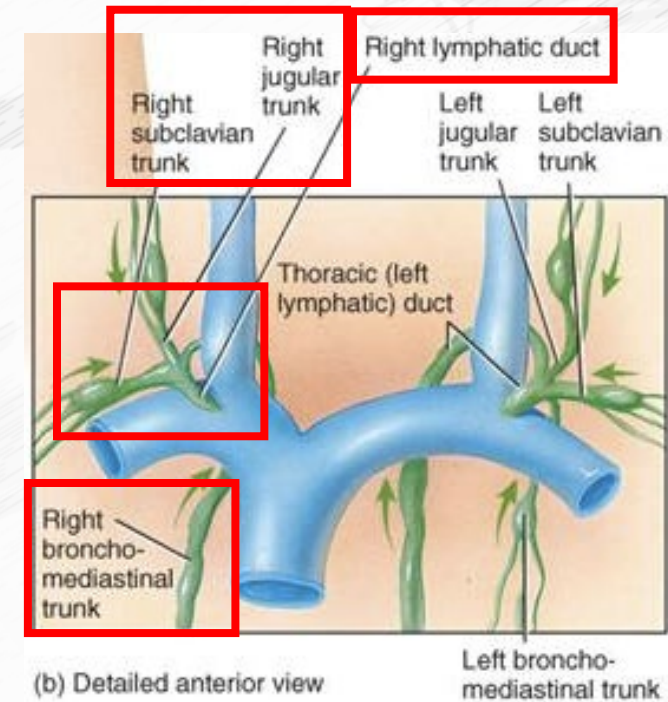
Chylous ascitis etiology and patient's age



Anatomia del sistema linfatico



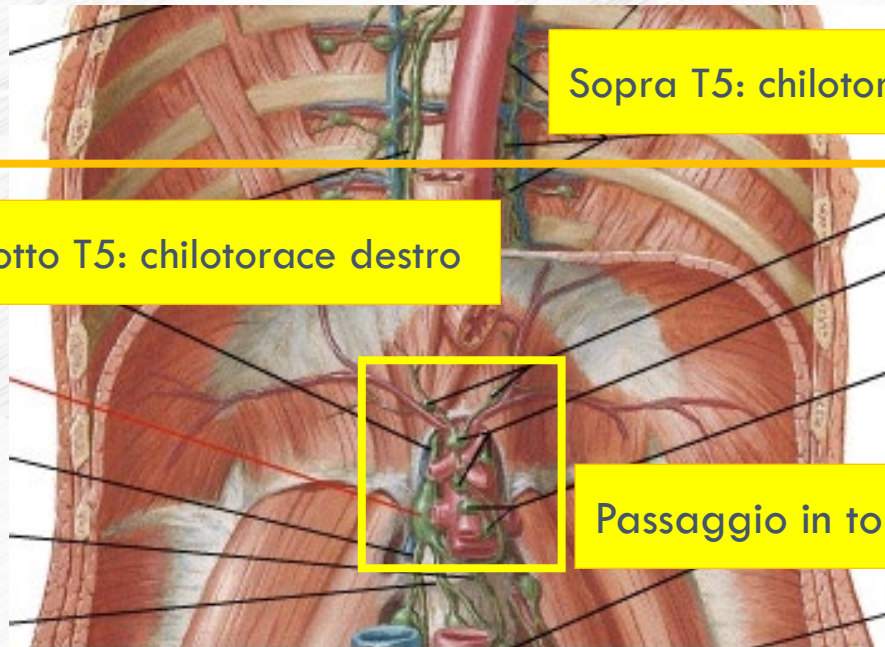
Linfatici intestinali



Anatomia del dotto toracico

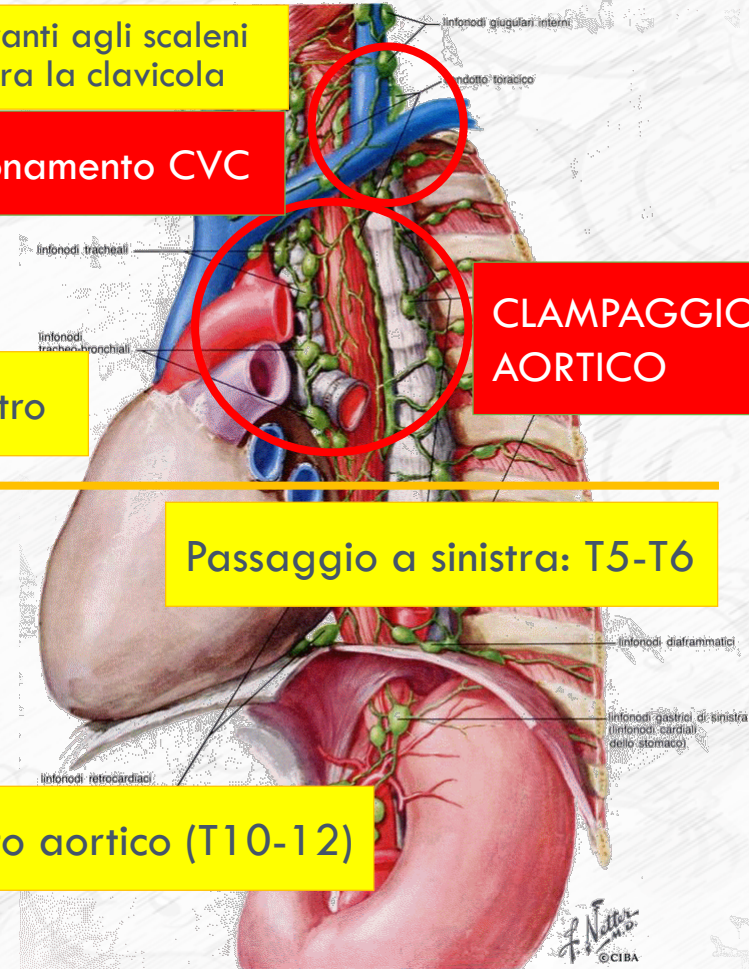
Funzioni del CHILO:

- Trasporto lipidi e vitamine liposolubili
- Riassorbimento liquido in eccesso
- Funzione immunitaria



Davanti agli scaleni
Sopra la clavicola

Posizionamento CVC



CHILOTORACE: eziologia

A. Congenital

- Congenital lymphatic malformations
 - Lymphangiomatosis
 - Lymphangiectasia
- Atresia of the thoracic duct
- Associated with various syndromes
 - Down Syndrome
 - Noonan Syndrome
 - Turner Syndrome
 - Hydrops fetalis

D. Malignancies

- Lymphoma
- Teratoma
- Sarcoma
- Neuroblastoma

E. Miscellaneous

- Benign tumours
- Tuberculosis/Histoplasmosis
- Sarcoidosis

Transdiaphragmatic movement of chylous ascites

B. Traumatic

Surgical

Cervical

Excision of lymph nodes

Thoracic

0.85-6.6%

Surgery for congenital heart diseases

Surgery for mediastinal tumours

Surgery for congenital lung malformations

Others

Invasive diagnostic and therapeutic procedures

Subclavian vein catheterization

Non-iatrogenic trauma

Hyperextension or stretching of chest wall or thoracic spine

Forceful cough or vomiting

Child birth

C. High central venous pressure

Thrombosis of the superior vena cava or subclavian vein

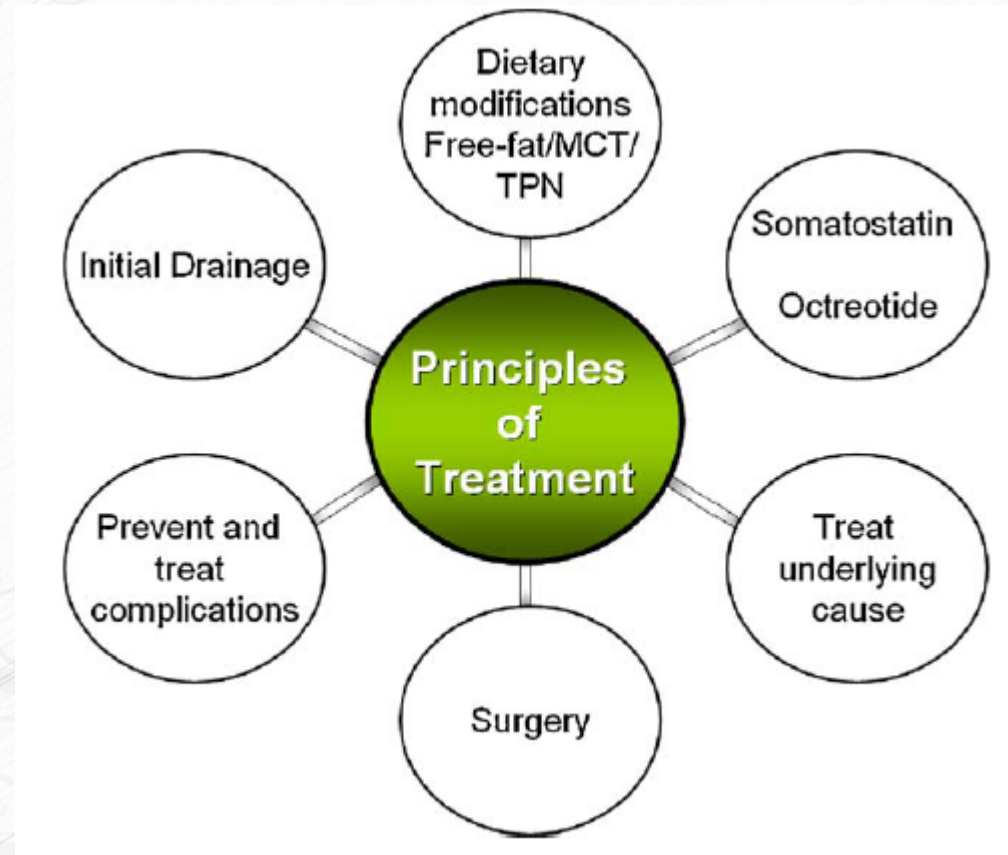
Post-Fontan surgery

CHILOTORACE: criteri diagnostici

Component/Feature	
pH	7.4 – 7.8
Colour	Milky (clear in starvation)
Sterile	Yes
Bacteriostatic	Yes
Total fat	0.4 – 6 g/dl
Cholesterol	65 – 220 mg/dl
Triglycerides	> 1.1 mmol/L (>110 mg/dl).
Total Protein	2 – 6 g/dl
Albumin	1.2 – 4.1g/dl
Globulin	1.1 – 3.1 g/dl
Electrolytes	Similar to plasma
Glucose	2.7 – 11 mmol/L
Cellularity	
Absolute cell count	> 1,000 cell/L
Lymphocytes	> 80%
Erythrocytes	50 – 600/mm ³
Chylomicrons	Yes

ESAME	CRITERI DIAGNOSTICI TIPED HPG23	
Chilomicroni	Presenti	Chilotorace dx sopra T5
Trigliceridi	> 110mg/dL	
Elementi cellulari	> 1000/L	
Linfociti	> 80%	
Aspetto	Torbido - lattescente	

CHILOTORACE: terapia

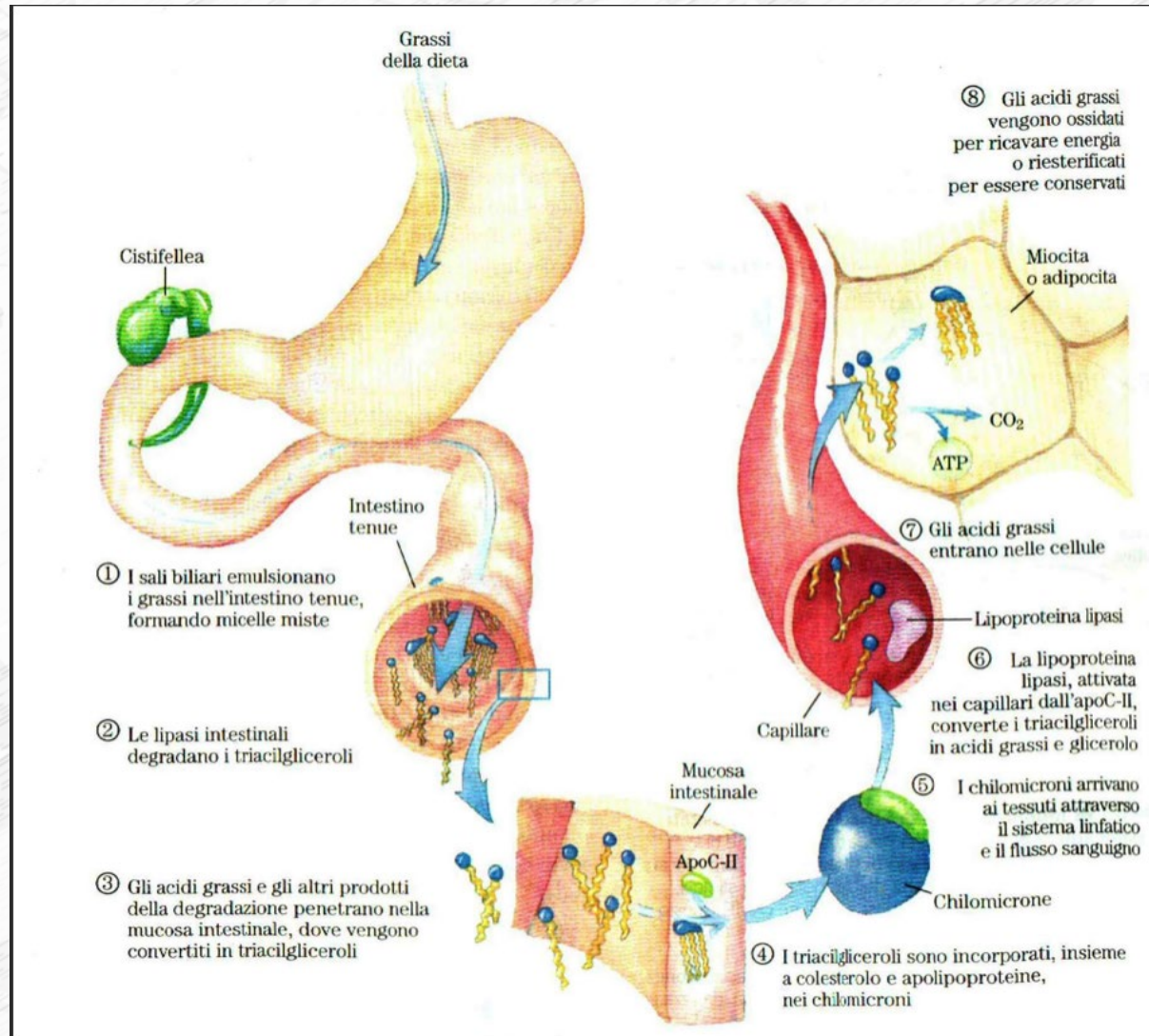


CHILOTORACE: drenaggio

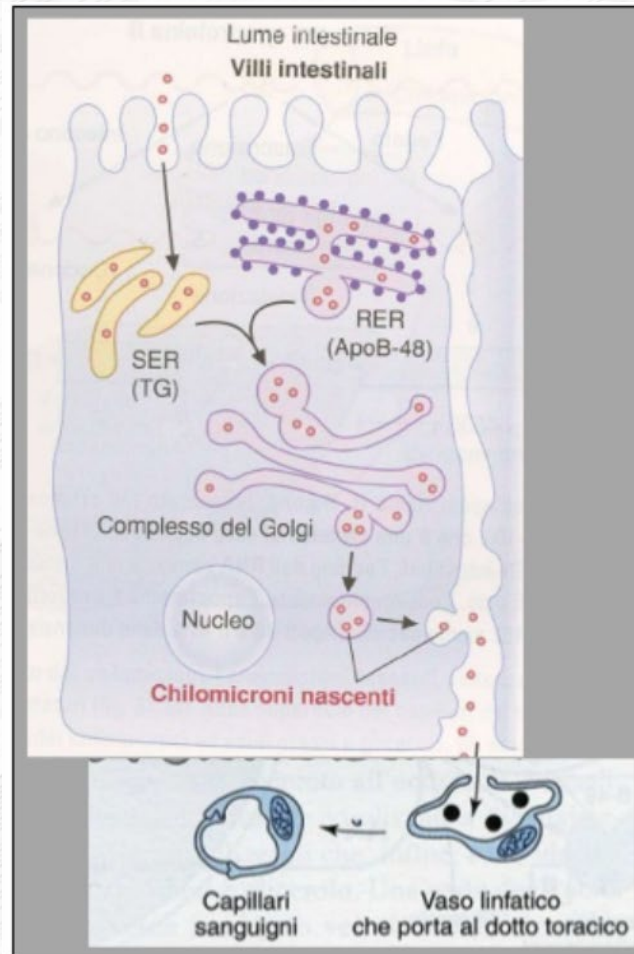


- Rispansione del polmone
- Monitoraggio efficacia terapia

CHILOTORACE: nutrizione

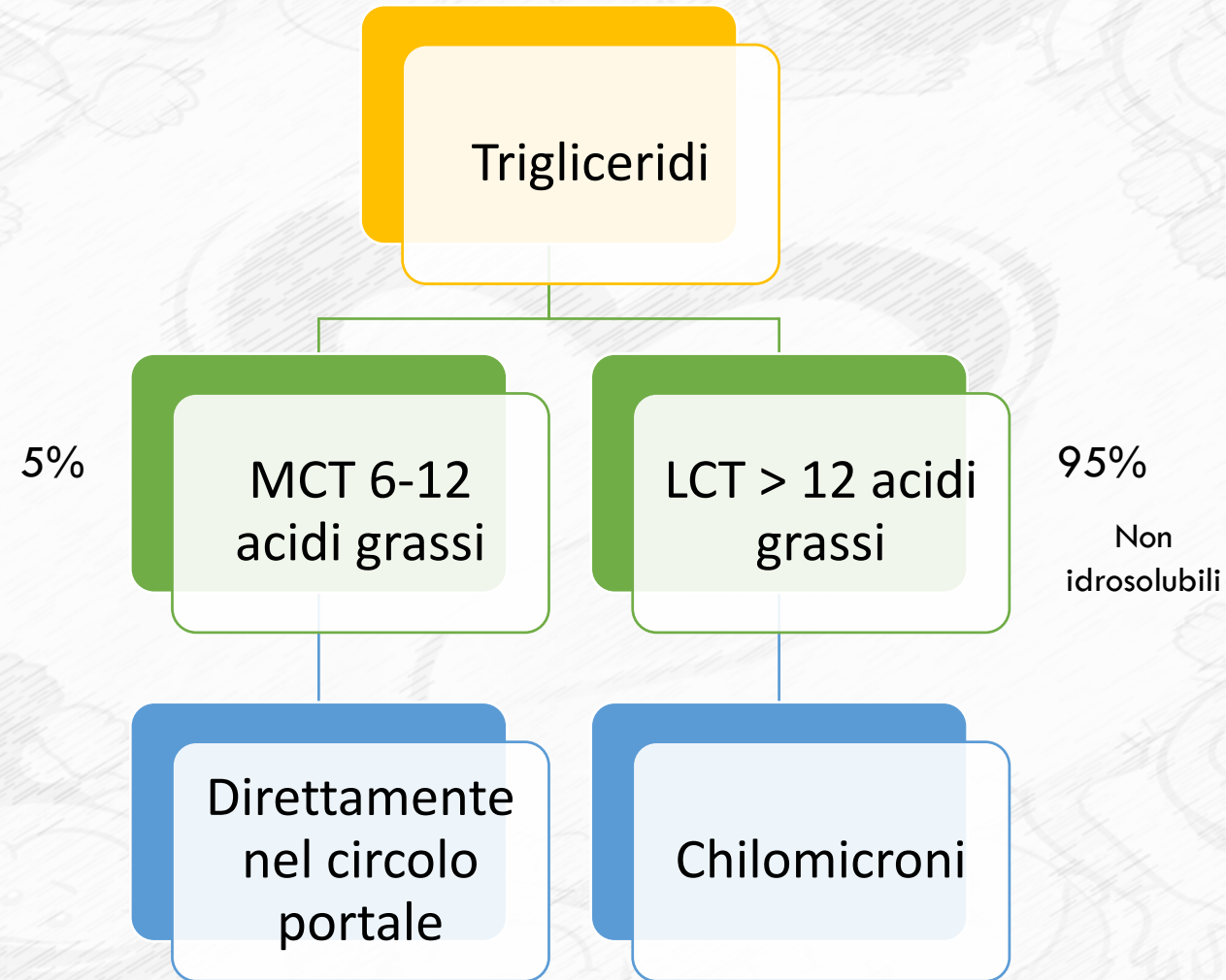


CHILOTORACE: nutrizione



- Apolipoproteina: **Apo B-48**
- Apo B-48 viene sintetizzata sul RER degli enterociti. Durante la sintesi (RER-REL-GOLGI), la sua porzione N-terminale acquisisce un nucleo di lipidi idrofobici (TG ed esteri del colesterolo) → si formano chilomicroni
- I chilomicroni vengono secreti mediante esocitosi a livello della membrana basolaterale degli enterociti ed entrano nei vasi linfatici → sangue
- Raggiungono il sangue circa 1-2 ore dopo il pasto

CHILOTORACE: nutrizione



CHILOTORACE: nutrizione

Average Contents	Unit	per 100g	per 100ml*
Energy	kcal	444	74.6
	kJ	1871	314
Protein	g	12.9	2.2
Carbohydrate	g	69.1	11.6
sugars	g	13.4	2.3
Fat	g	12.9	2.2
saturates	g	11.2	1.9
monounsaturates	g	0.4	0.07
polyunsaturates	g	1.3	0.22
linoleic acid	mg	900	151
α -linolenic acid	mg	170	28.6
DHA	mg	60	10.1
AA	mg	60	10.1
LCT	%	16	16
MCT	%	84	84
LA/ALA	ratio	5.4:1	5.4:1
Dietary fibre	g	0	0

CHILOTORACE: nutrizione

Nutrizione parenterale



Si utilizza quando, nonostante terapia con nutrizione con MCT, non si ottiene una riduzione del volume del versamento

Necessita di accesso venoso centrale

CHILOTORACE: octreotide

Definizione

- Analogo della somatostatina a lunga durata d'azione

Meccanismo d'azione

- Vasocostrizione splancnica
- Riduce motilità gastrointestinale
- Riduce secrezioni biliari e pancreatiche

Somministrazione

- Ancora poco chiaro quando iniziare la terapia
- EV: dose mediana 68 mcg/kg/die (7,2-240 mcg/kg/die)
- SC: dose mediana 40 mcg/kg/die (2-68 mcg/kg/die)
- Effetto dopo 3-6 giorni dall'inizio della terapia

CHILOTORACE: chirurgia

Surgery should be considered when medical management of chylothorax has failed to reduce chyle flow and allow healing of the duct. There is no consensus on the timing of surgery. Most authors advocate three to four weeks of medical therapy

M. Soto-Martinez, J. Massie / Paediatric Respiratory Reviews 10 (2009) 199–207

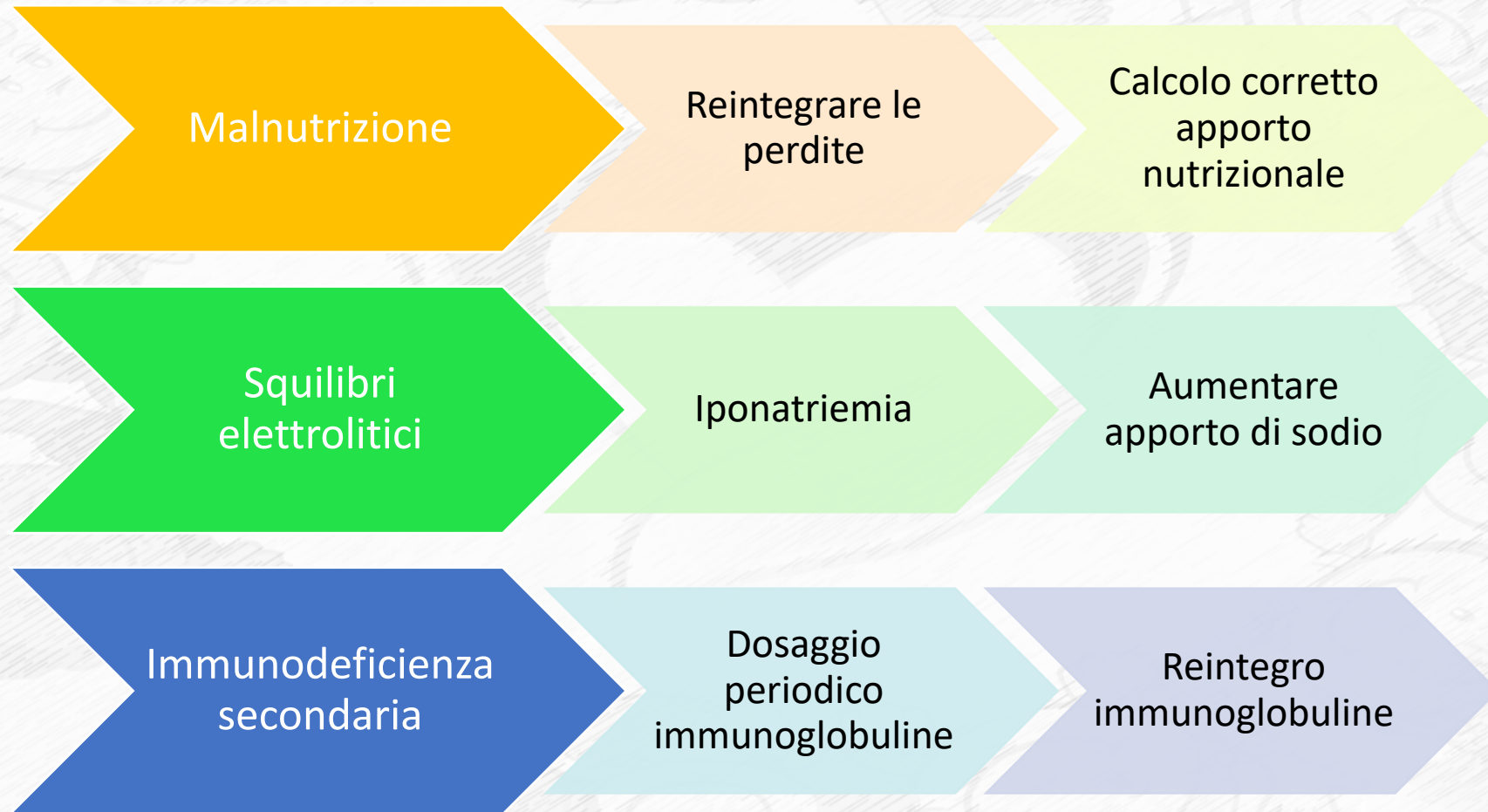
Legatura dotto
toracico

Pleurodesi
toracoscopica o da
drenaggio

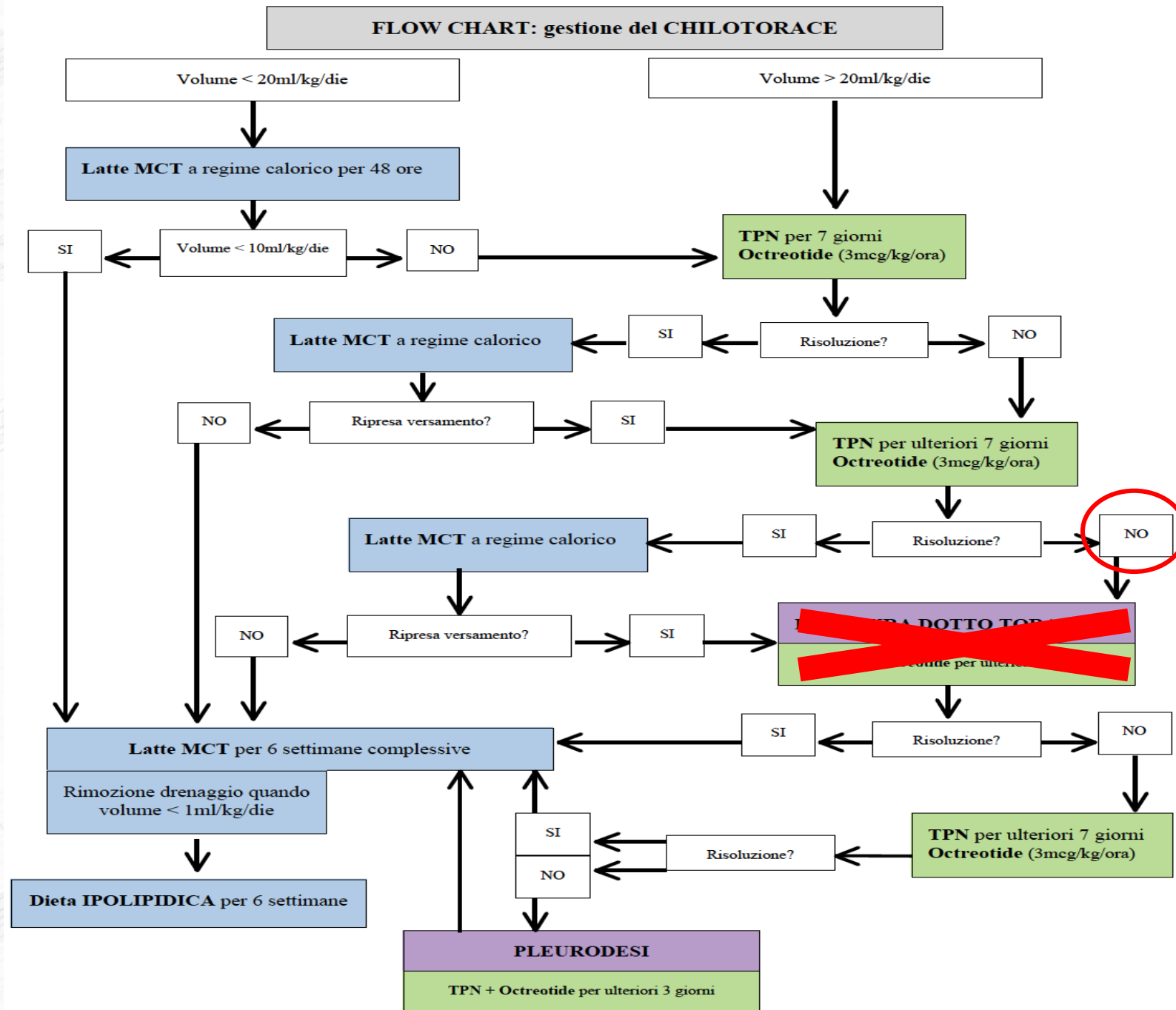
Creazione di
shunts
pleuroperitoneali

Cateterismi interventistici disostruttivi o
per embolizzazione dotto toracico

CHILOTORACE: prevenzione e trattamento complicanze

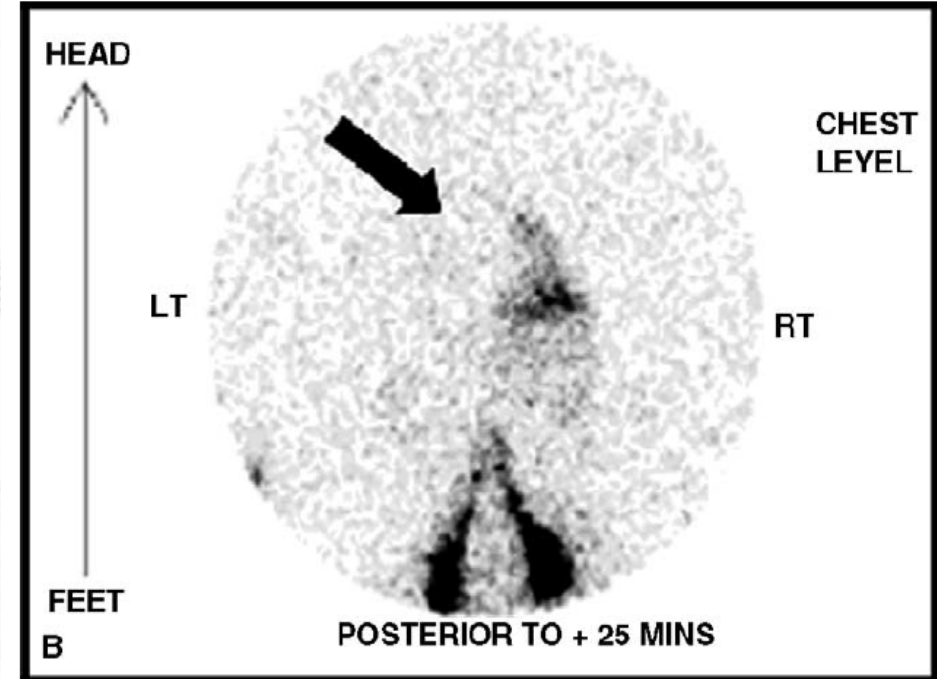


CHILOTORACE: flowchart



CHILOTORACE: approfondimenti diagnostici

- Linfografia + TC
- Linfoscintigrafia
- RM con sequenze apposite



Servono a identificare l'origine della perdita nel sistema linfatico
Richiedono molto expertise

CHILOTORACE: plerodesi

In caso di chilotorace refrattario
a terapia farmacologica e in
mancanza di opzione chirurgica,
un'alternativa è la pleurodesi
farmacologica con
iodopovidone



CHILOTORACE: la nostra esperienza

All CA and all but one CT resolved with medical therapy.

67% CT and 70% CA resolved with diet (medium-chain triglyceride [MCT] milk) in a median of 3 (2-4) days.

One week of total parenteral nutrition (TPN) was effective for 8% CT and 10% CA.

In 22% CT and 20% CA we proceeded with TPN with adjunct of octreotide and achieved resolution respectively at day 20 (13-24) and 14 (12-24) from diagnosis.

The lymphoscintigraphy of the refractory patient revealed a central lymphatic flow disorder: symptoms resolved after pleurodesis.

Infection developed in 55% of patients, among them we registered 41% sepsis and 27% septic shock.

Four patients died in PICU: all underwent cardiac surgery for congenital heart disease; 2 presented CT and 2 CA.