Tuberculose bij kinderen

Wat is er anders?

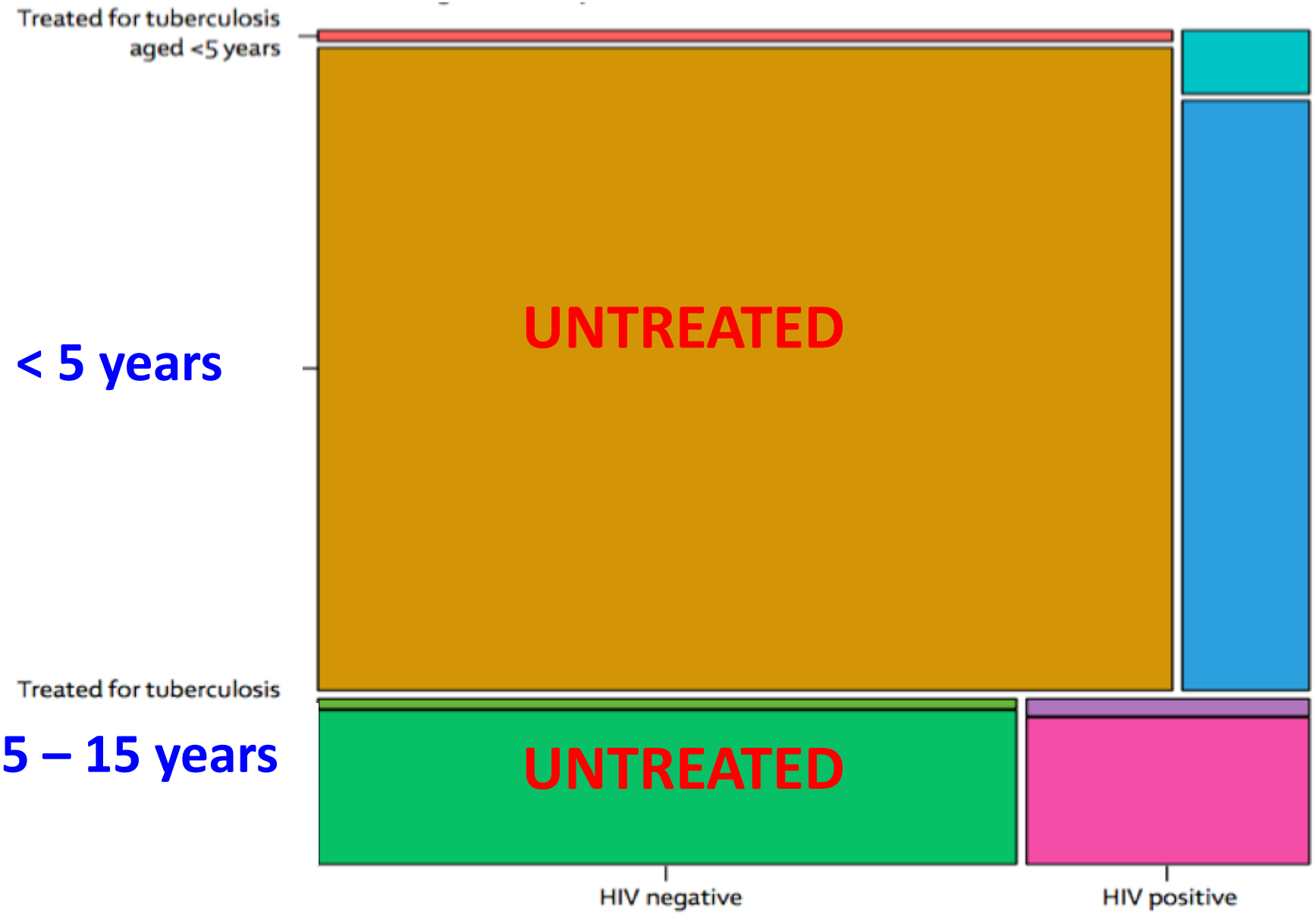
Prof. Dr. Daan Van Brusselen

Kinderinfectiologie en Tropische Pathologie bij kinderen
Antwerp Pediatric Clinical Trial Network (Vaccinations & Infectiology)

Universiteit Antwerpen

ZIEKENHUIS aan de STROOM

Global burden of TB mortality in children



Dodd PJ, Yuen CM, Sismanidis C, Seddon JA, Jenkins HE. The global burden of tuberculosis mortality in children: a mathematical modelling study. The Lancet Global health. 2017

Epidemiologie in België

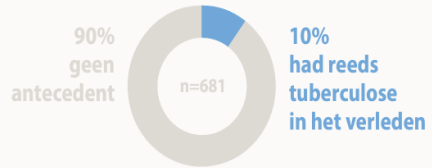
- Lage incidentie (+/- 7-8/100 000)

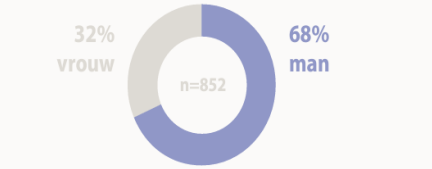
- **MAAR:**

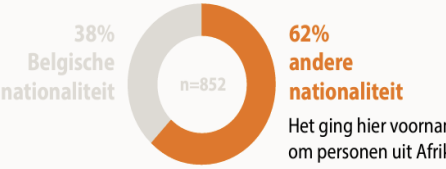
  - Incidentie **10x hoger bij adolescenten met migratie-achtergrond**

  - Bijna **1/5 bij asielzoekers** = TB disease

PROFIEL VAN DE TUBERCULOSEPATIËNT

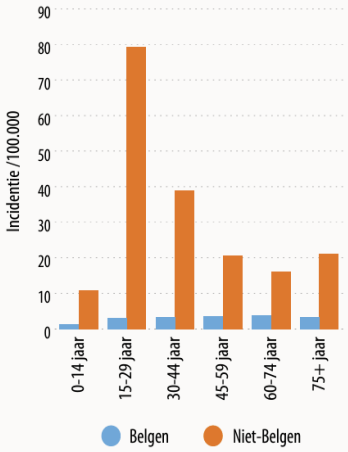


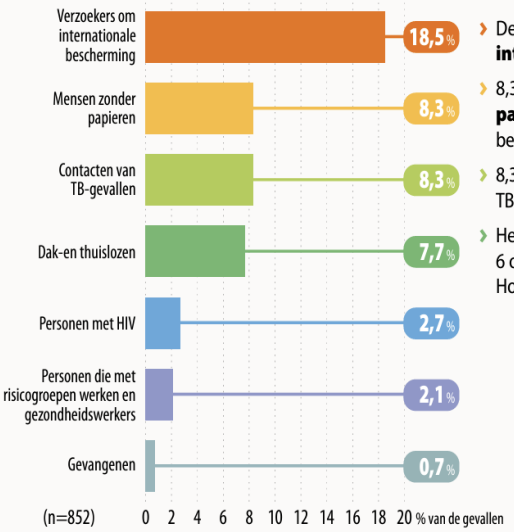




Het ging hier voornamelijk om personen uit Afrika, Zuid-Azië en Oost-Europa.

- In de Belgische bevolking is de incidentie relatief homogeen binnen de verschillende leeftijdsgroepen.
- Bij de niet-Belgen bevindt de piek zich bij de **jongvolwassenen**. Daarna neemt de incidentie af met een kleine toename bij de 75 plussers.





- De grootste risicogroep bestond uit verzoekers om **internationale bescherming** (18,5%).
- 8,3% van de gevallen waren **mensen zonder papieren**, waarvan meer dan de helft zich in Brussel bevond.
- 8,3% van de gevallen waren **contacten** van TB-patiënten.
- Het percentage **dak- en thuislozen** was 7,7%; 6 op de 10 daklozen bevond zich in het Brussels Hoofdstedelijk Gewest.

Voor bepaalde bevolkingsgroepen die een verhoogd risico lopen op tuberculose zijn specifieke maatregelen voorzien. Desondanks moeten er extra maatregelen genomen worden om de «hard-to-reach» groepen te bereiken.

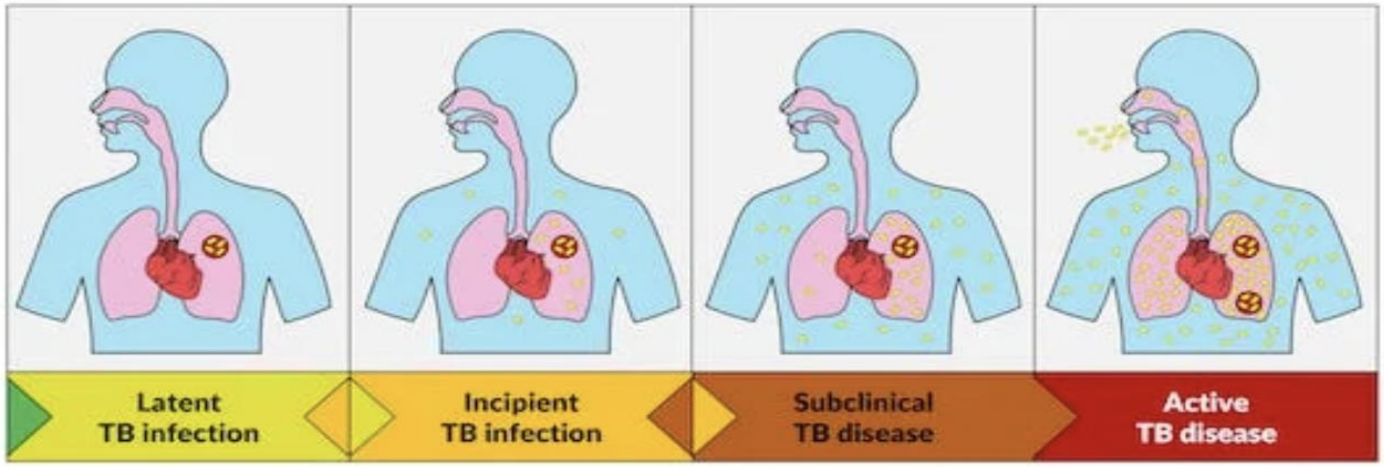
Disease progression

- **VOLWASSENE**
  life-time progression risk = 8-10% (als HIV negatief)

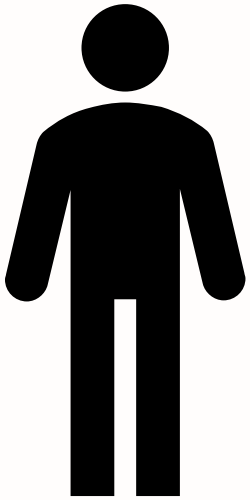
- **KIND**
  - <1y = 50% annual risk
  - <5y = 6-24% annual risk
  - 6-15y =6-12% annual risk

- **PERINATALE TRANSMISSIE:**
  50% mortaliteit

N



Pediatrische TB =



SAME
SAME
BUT
DIFFERENT

ZIEKENHUIS aan de STROOM

Children have…

- More risk of progression to disease
- More often disseminated disease
- More EPTB
- Higher mortality
- Atypical presentations
- Pauci-bacillary
  - *Little bacteriological confirmation*
- Cannot produce sputum
- Different CXR characteristics:
  - *Few cavities if prepubertal*

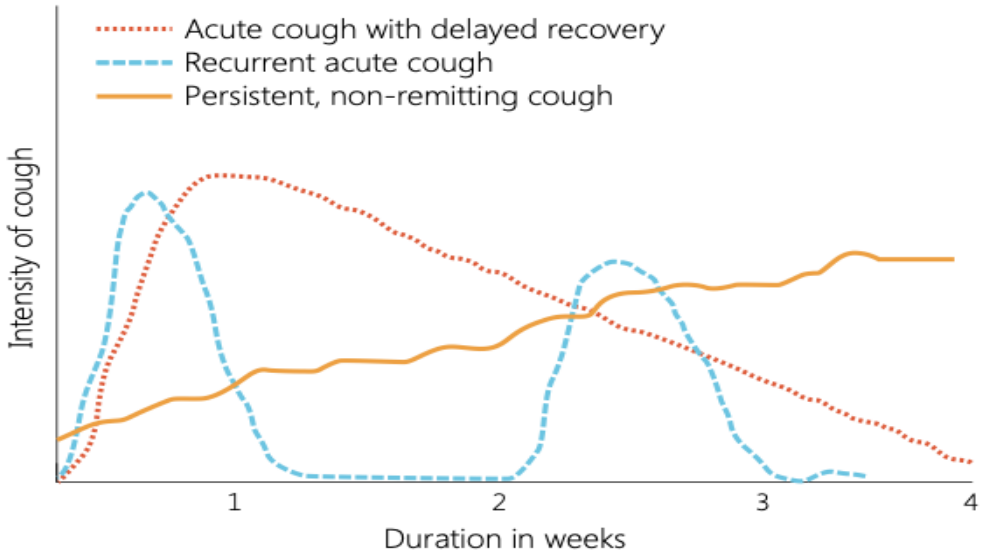
So you might think you know TB

But do you?

Wanneer aan TB denken bij een kind?

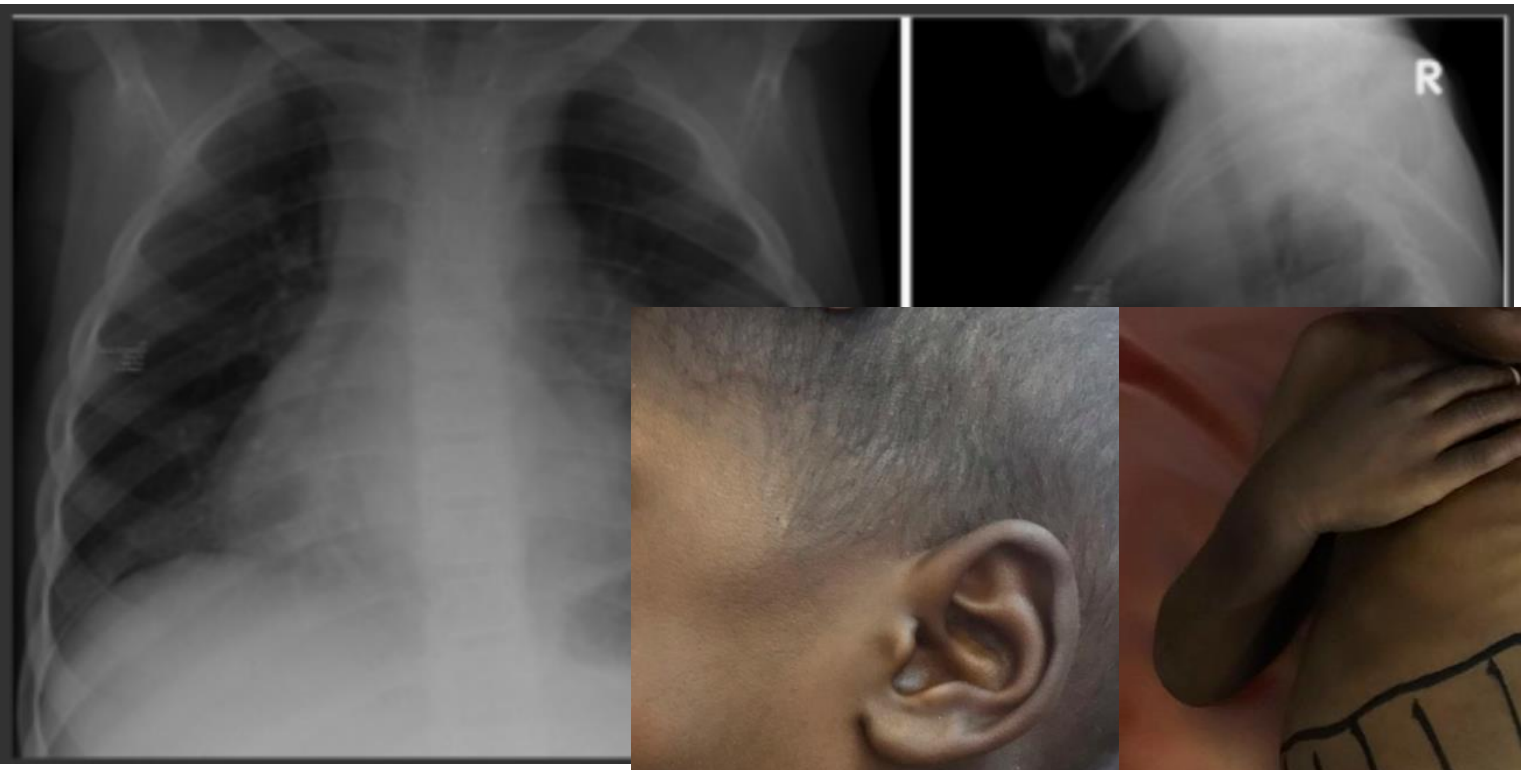
Amaigrissement (FTT) / Asthenie / Anorexie

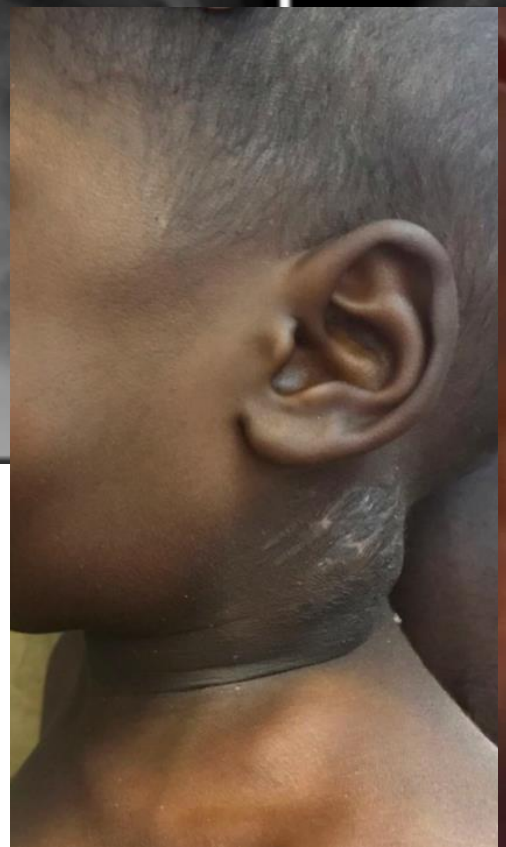
Toux / Temperature / Transpiration



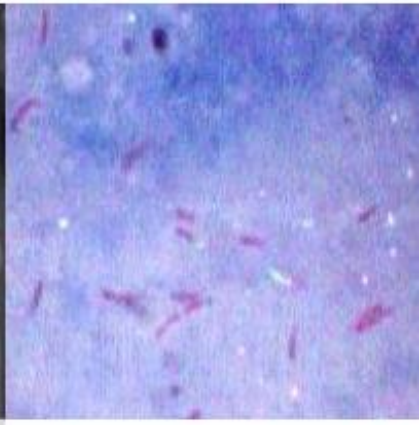
ZIEKENHUIS aan de STROOM

Ziektespectrum = breed





Diagnosing Childhood Tuberculosis - What do we have?



History

↓

Negative predictive value 99,8%

Ozuah (2001) JAMA

Tuberculin-Skin Test (1890)

↓

Low Specificity & sensitivity

Chest X-ray (1896)

↓

Low Specificity & sensitivity

Bacteriology (1882)

↓

Low Sensitivity & sensitivity

Diagnostic accuracy of chest radiography in detecting mediastinal lymphadenopathy in suspected pulmonary tuberculosis

G H Swingler, G du Toit, S Andronikou, et al.

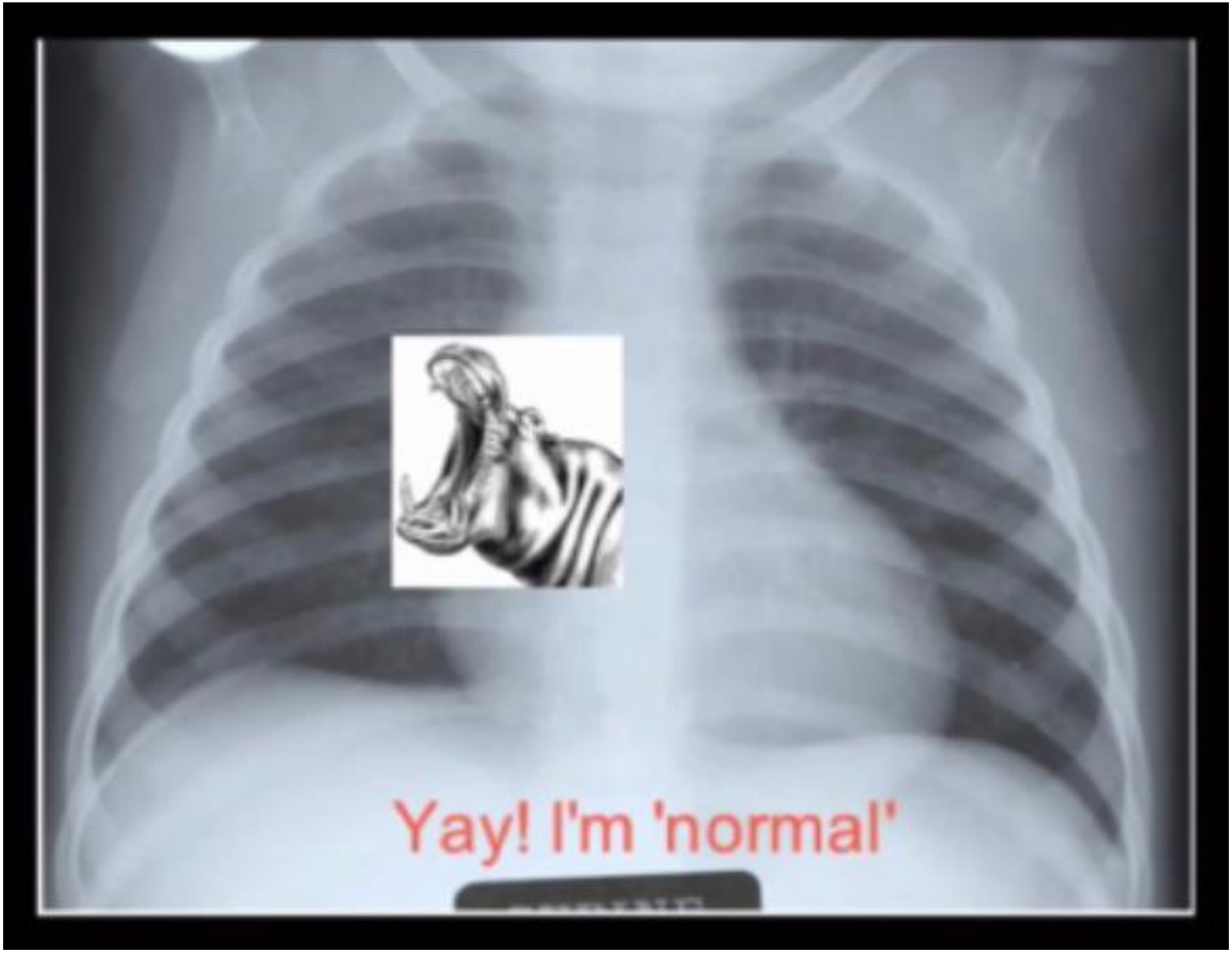
Arch Dis Child 2005 90: 1153-1156

Sensitivity = 67%

Specificity = 59%

Pediatricians> general physicians

Savvas Andronikou
MBBCh, FCRad, FRCR, PhD


Yay! I'm 'normal'


Yay! I'm 'normal'


Yay! I'm 'normal'

X-ray diagnose van TB bij kinderen

=

Hilaire adenopathie

Right hilar lymphadenopathy

R hilar lymphadenopathy

Left hilar lymphadenopathy

Calcified lymphadenopathy

Wat als ?

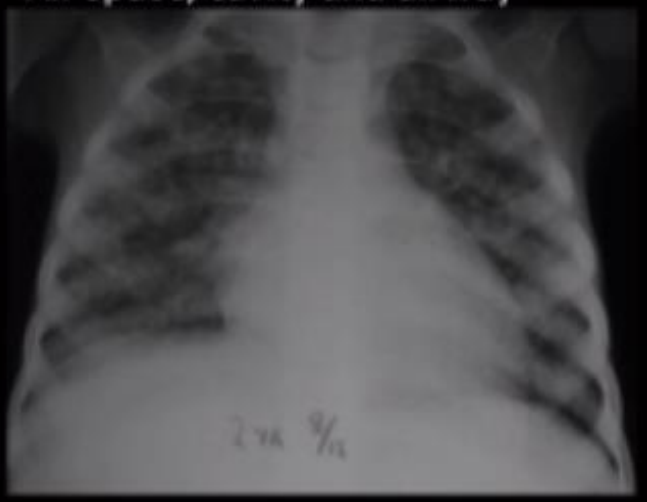
Inconclusive pneumonia?
Be Sherlock Holmes and uncover TB

Air space and airway

Air space, cavity and airway

Air space expansile and airway

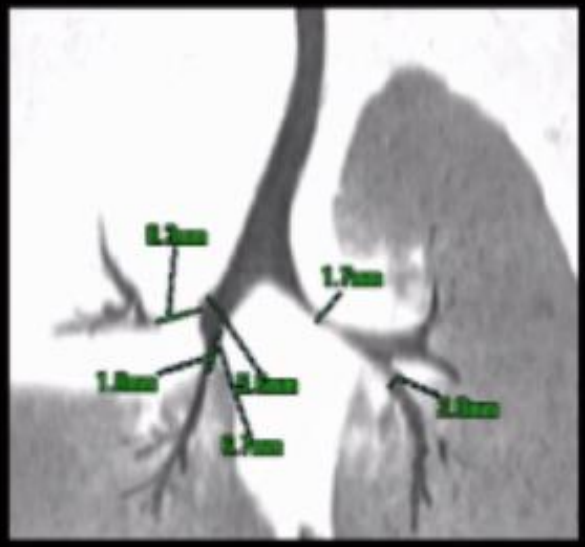
Air space, effusion and airway

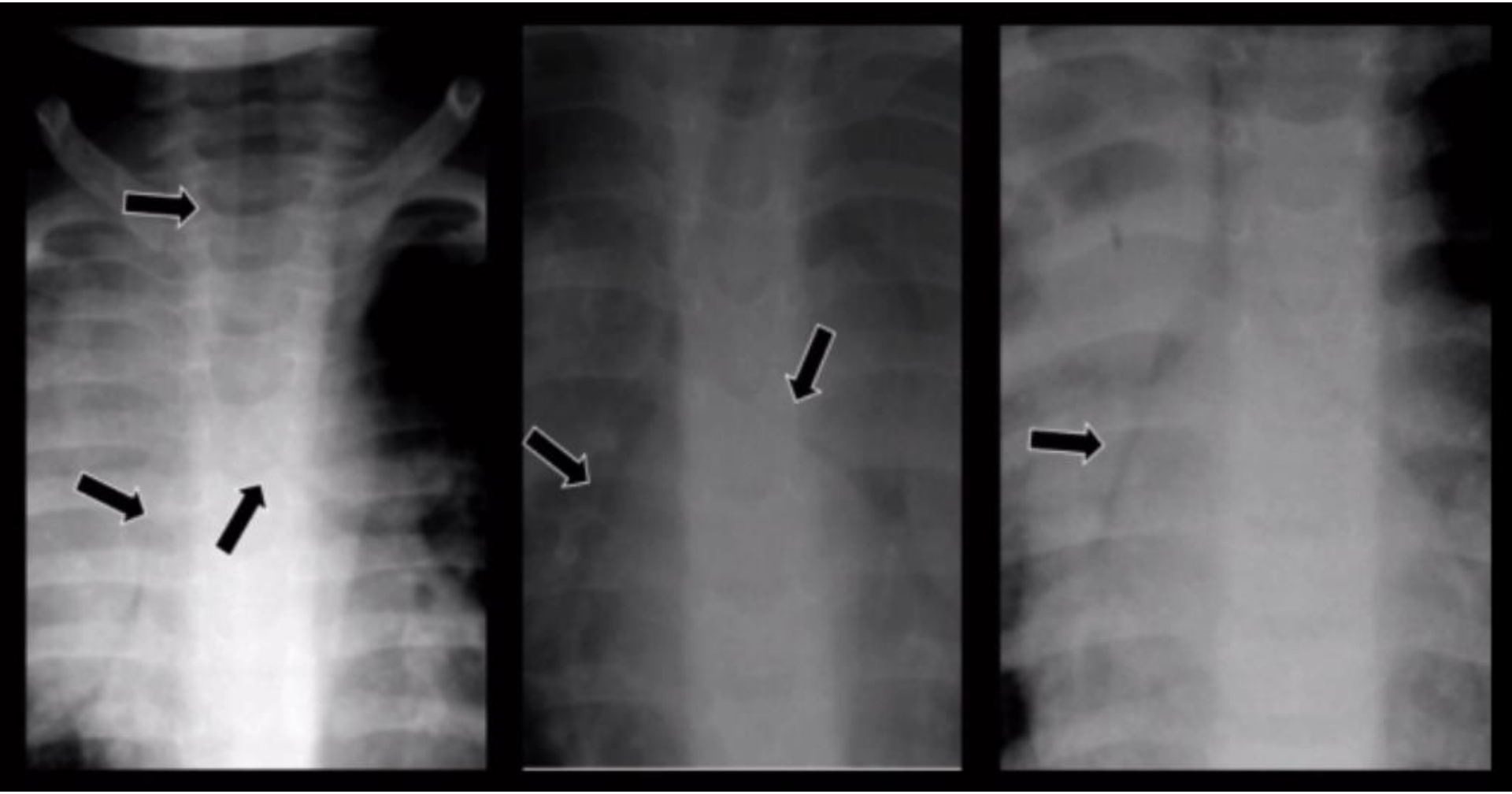


Milliary nodules

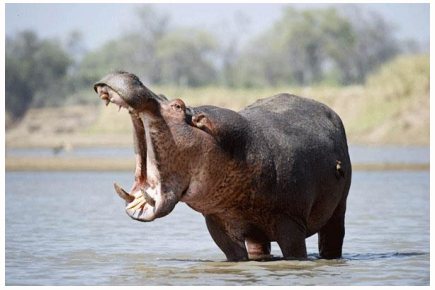
Als geen duidelijke ‘cauliflower’:

Airways are a up-side-down tree
Lymphadenopathy =
‘compressed air-way branches’



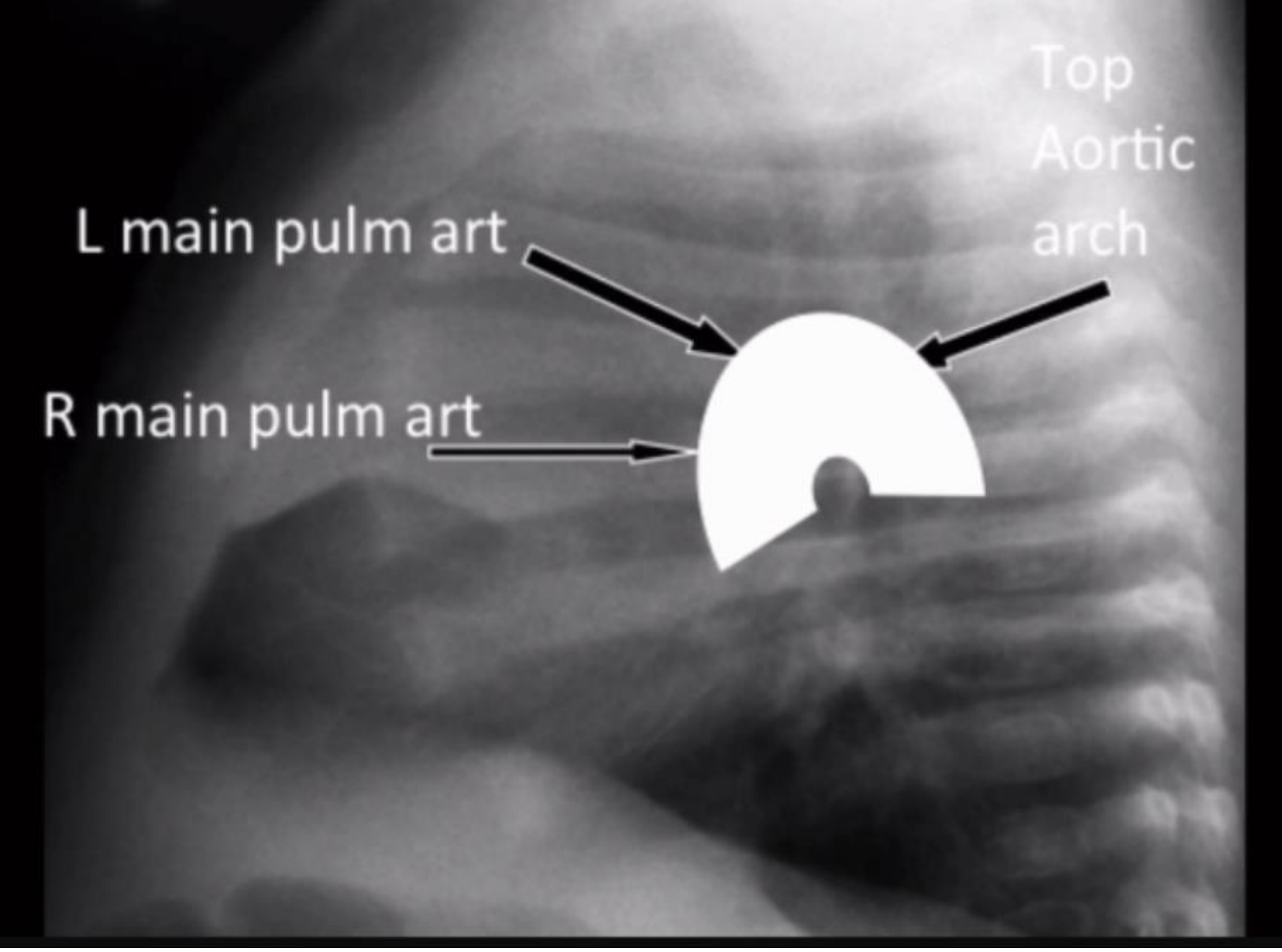


RX ‘face’

- Normaal = 
- Abnormaal = 
- OF
  - ‘airway compression’
  - caviteiten OF miliair

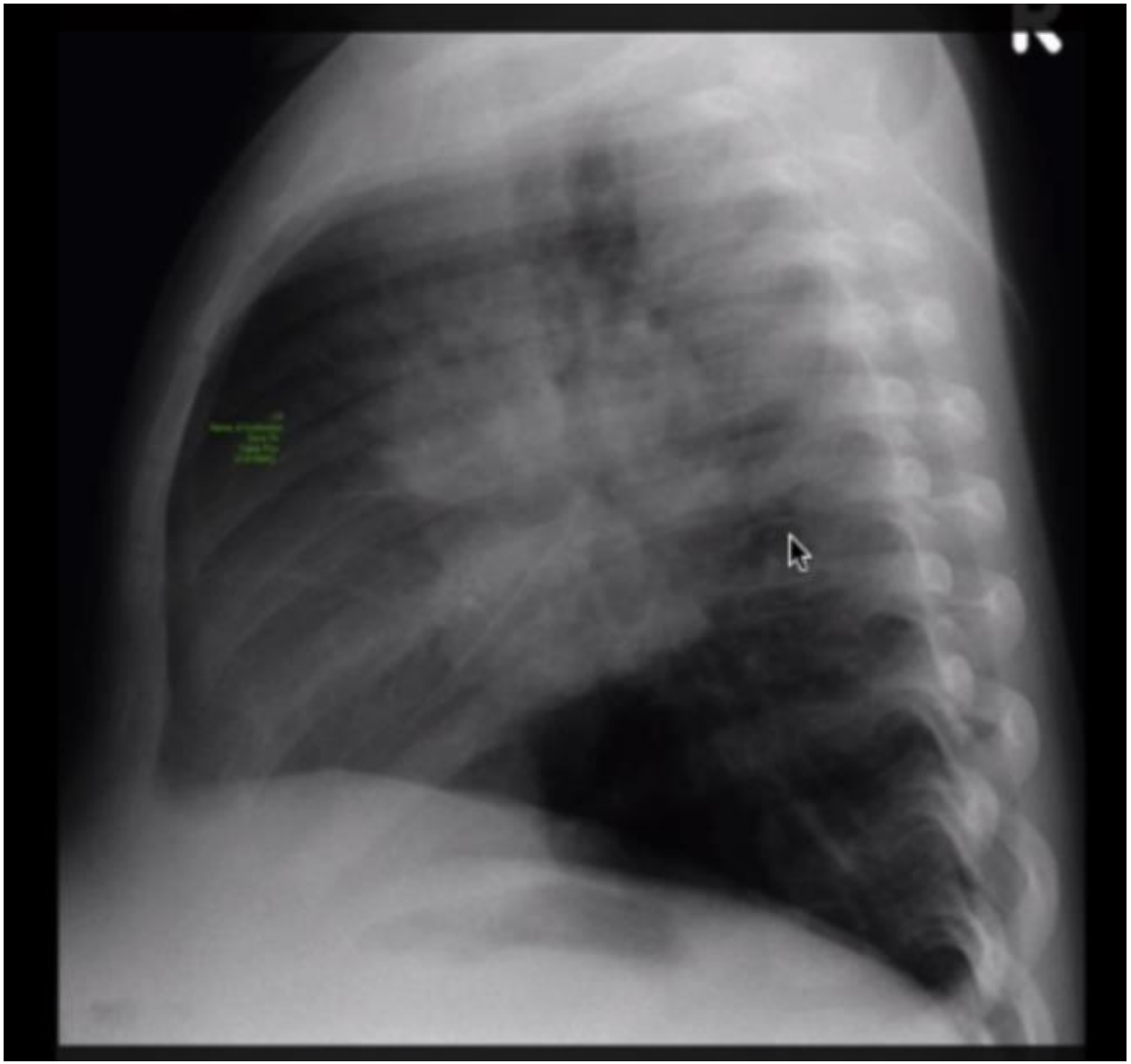
ZIEKENHUIS aan de STROOM

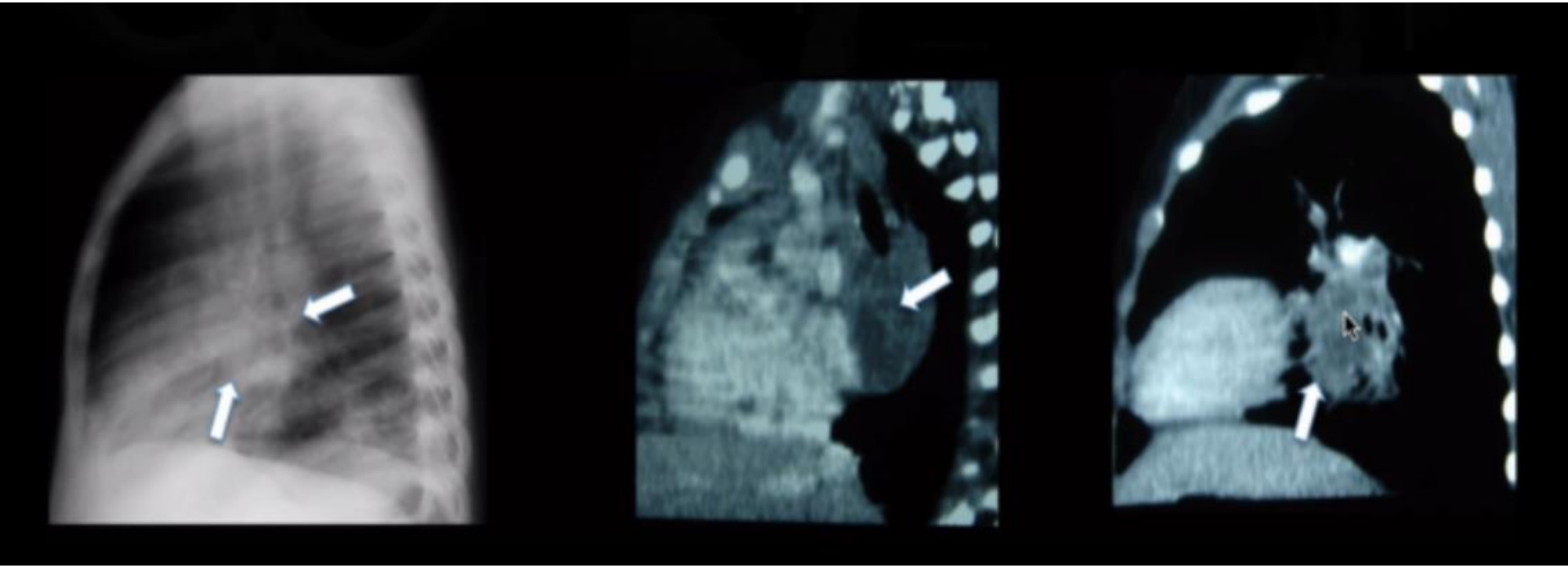

I'm also normal!!


Top
Aortic
arch
L main pulm art
R main pulm art

Normaal
=

En dit ?



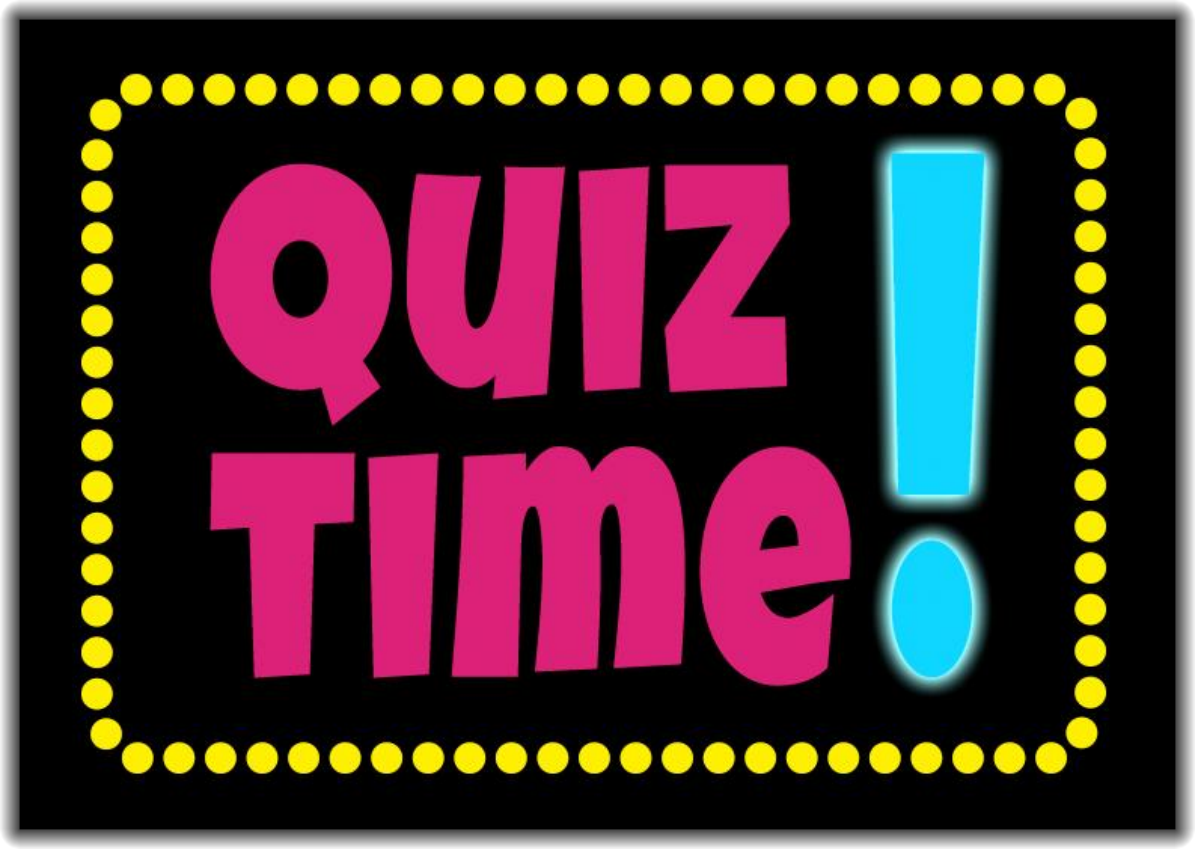


RX profiel

Normaal =

Abnormaal =

ZIEKENHUIS aan de STROOM

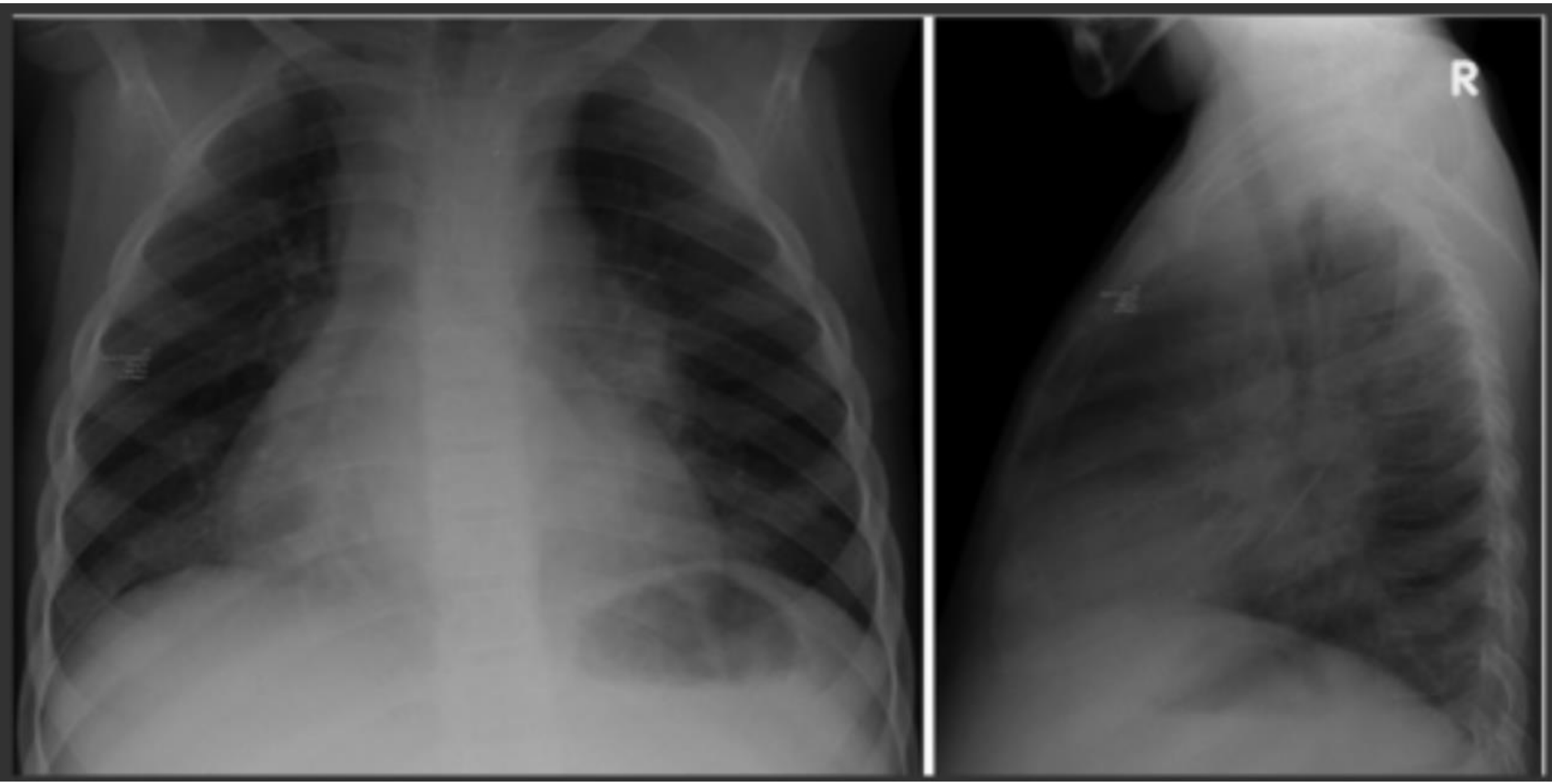


- A = behandel als TB

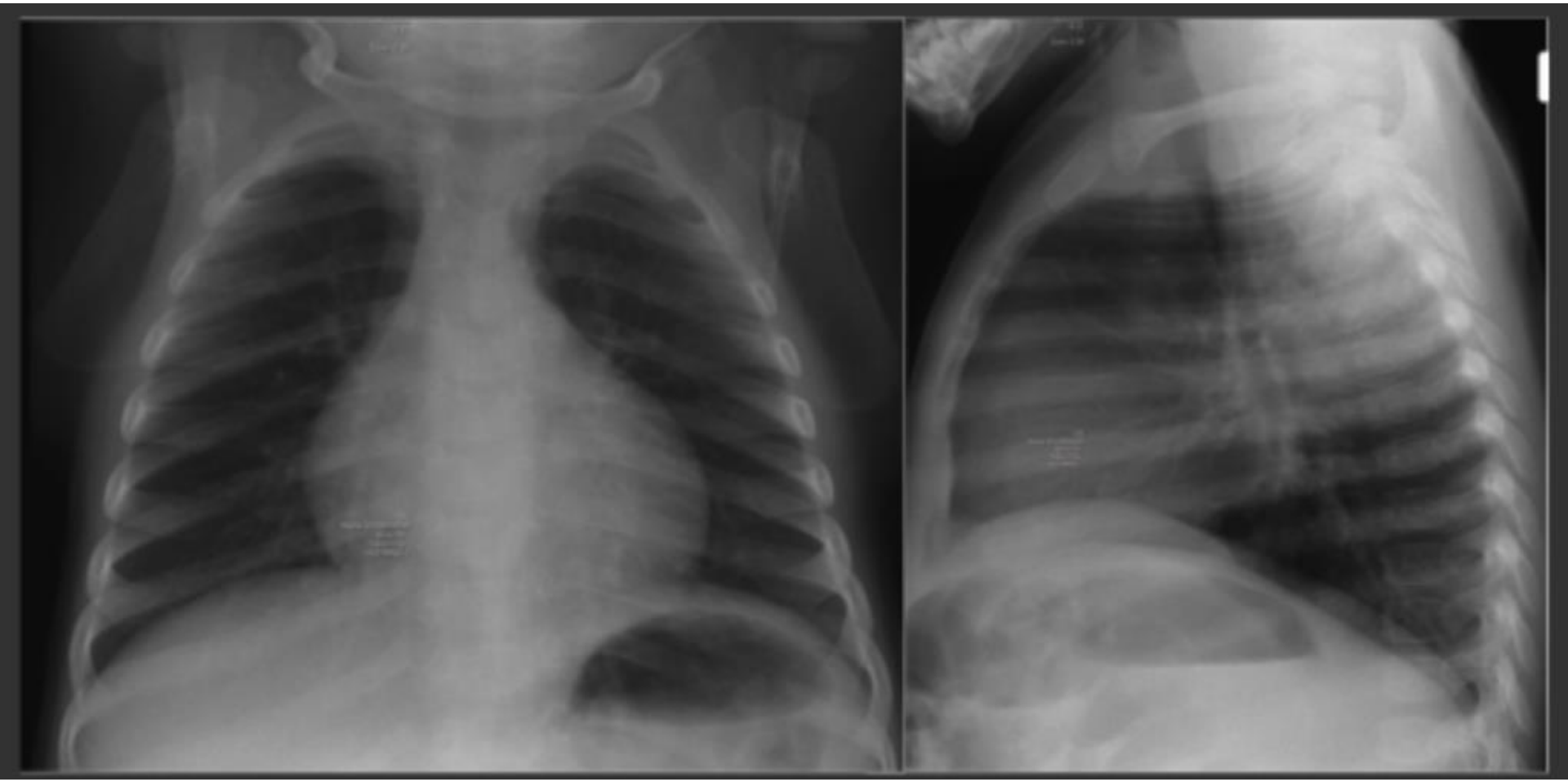
- B = inconclusief
(abnormaal, maar kan ook andere infectie zijn)

- C = normaal

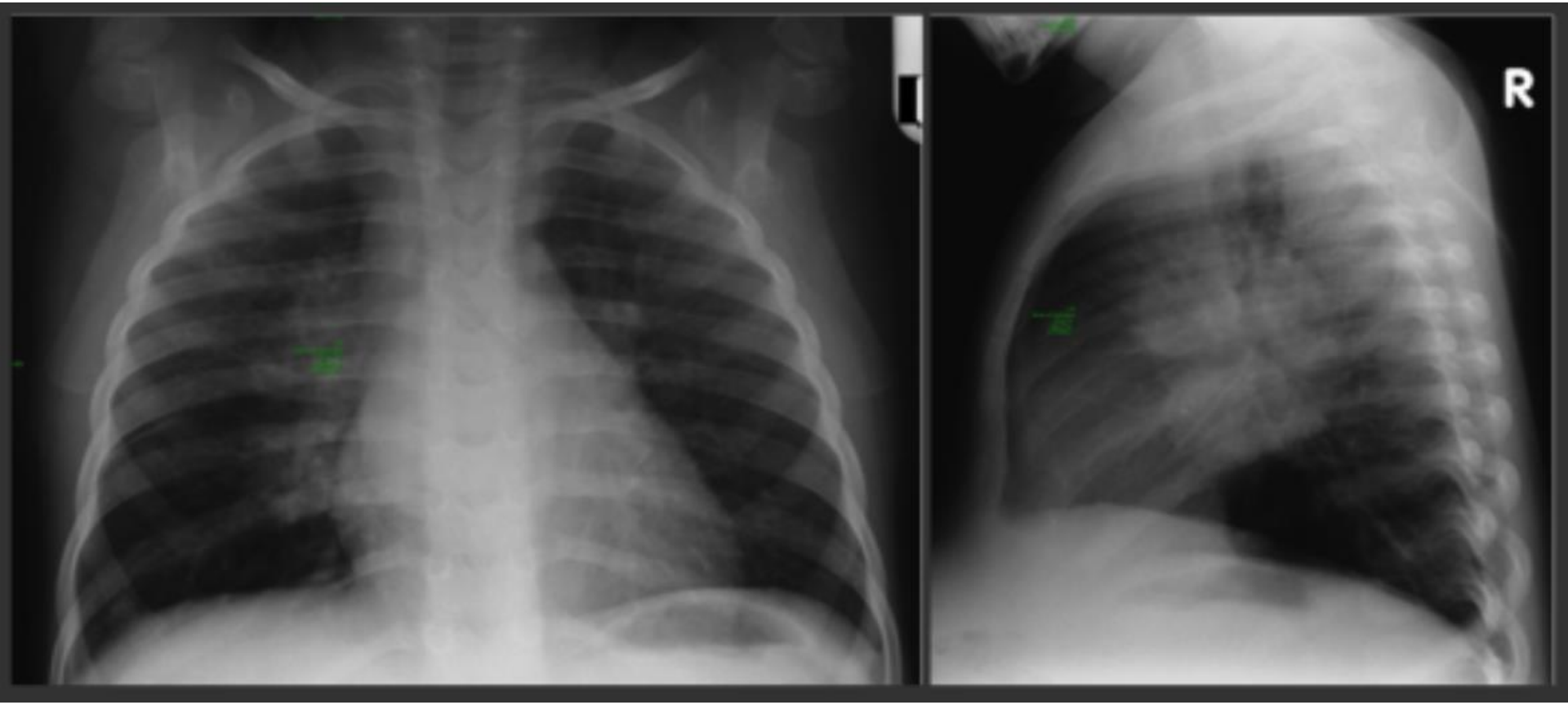
RX I



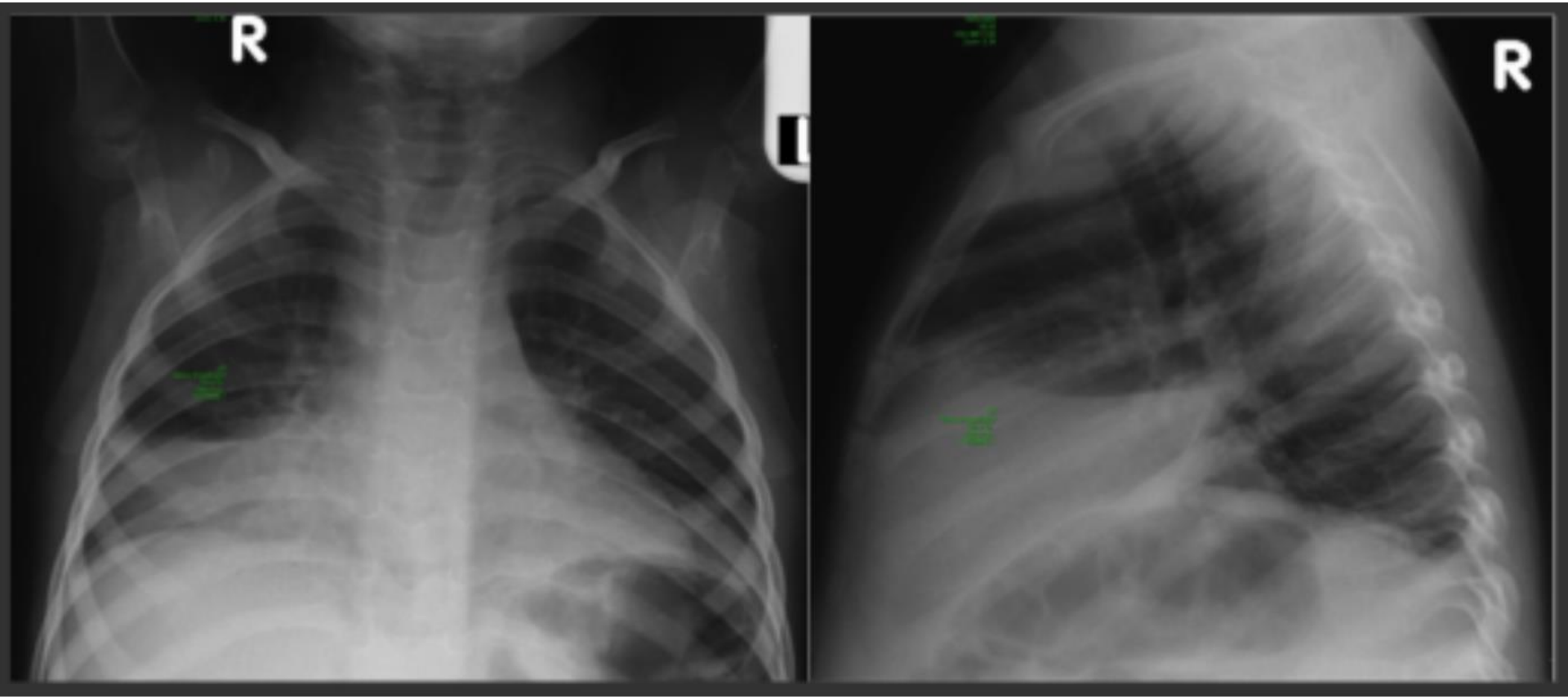
RX 2



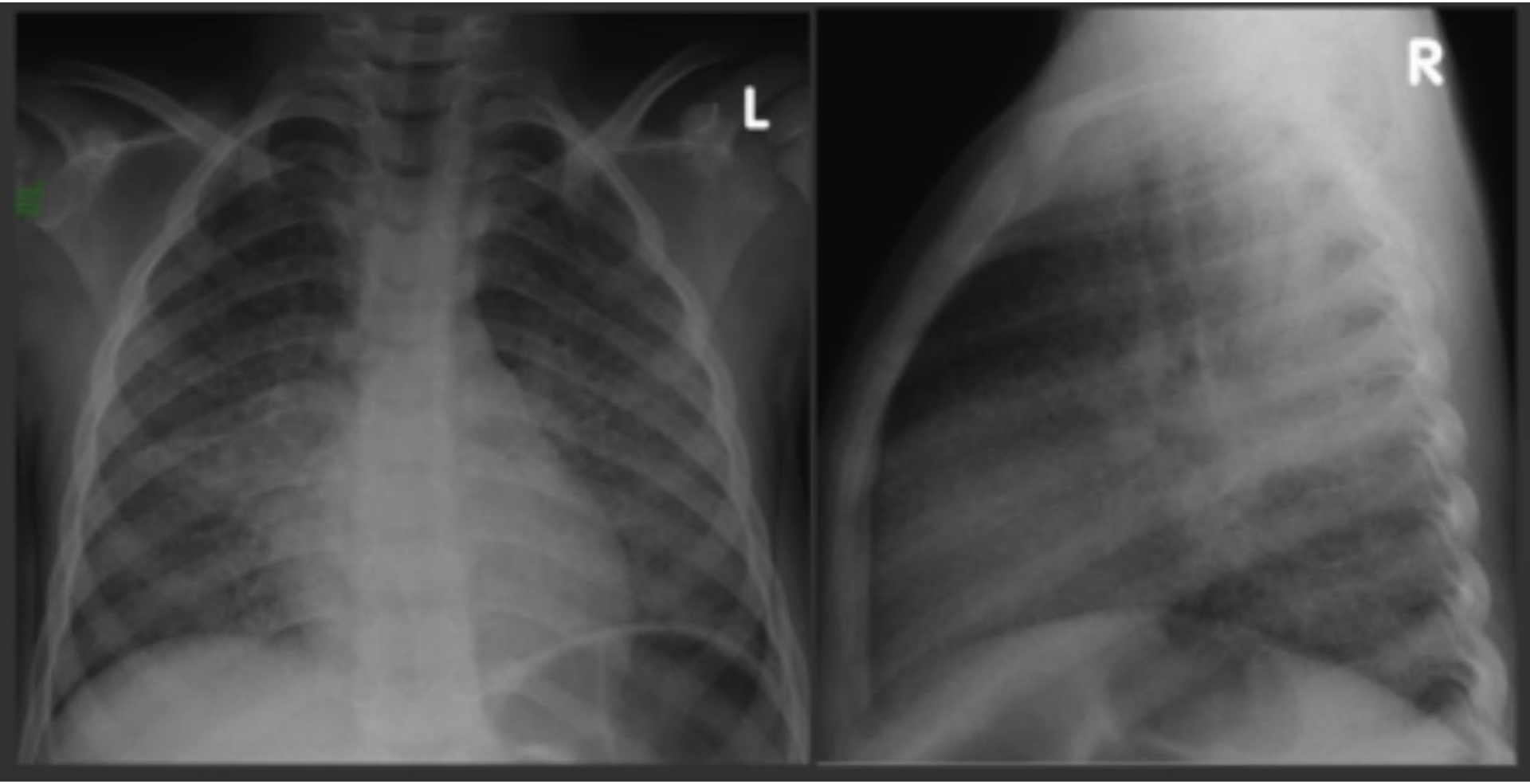
RX 3



RX 4



RX 5



Behandeling drugsensitieve TB

For children of ≥3 months, the 4-month **2HRZ(E)/2HR* treatment regimen** may now be recommended by the NTP for non-severe forms of drug-susceptible TB, which is defined as:

- Lymph node TB that is peri
  (no evidence of TB elsewhe
- Uncomplicated PTB on CX
  airway obstruction or non-c
  lungs and without miliary p
- Uncomplicated TB pleural e

The standard **6-month treatment regimen** should be used for:

- Children of all ages with severe PTB disease presumed or proven to be drug-susceptible. This includes intrathoracic lymph node enlargement with airway compression, cavitations or extensive lung disease with more than one lobe involved on CXR (see Appendix 3);
- Infants aged 0–2 months with PTB or lymph node TB, irrespective of severity; and
- Smear-positive TB with four drugs

TB meningitis presumed to be drug-susceptible can be treated with:

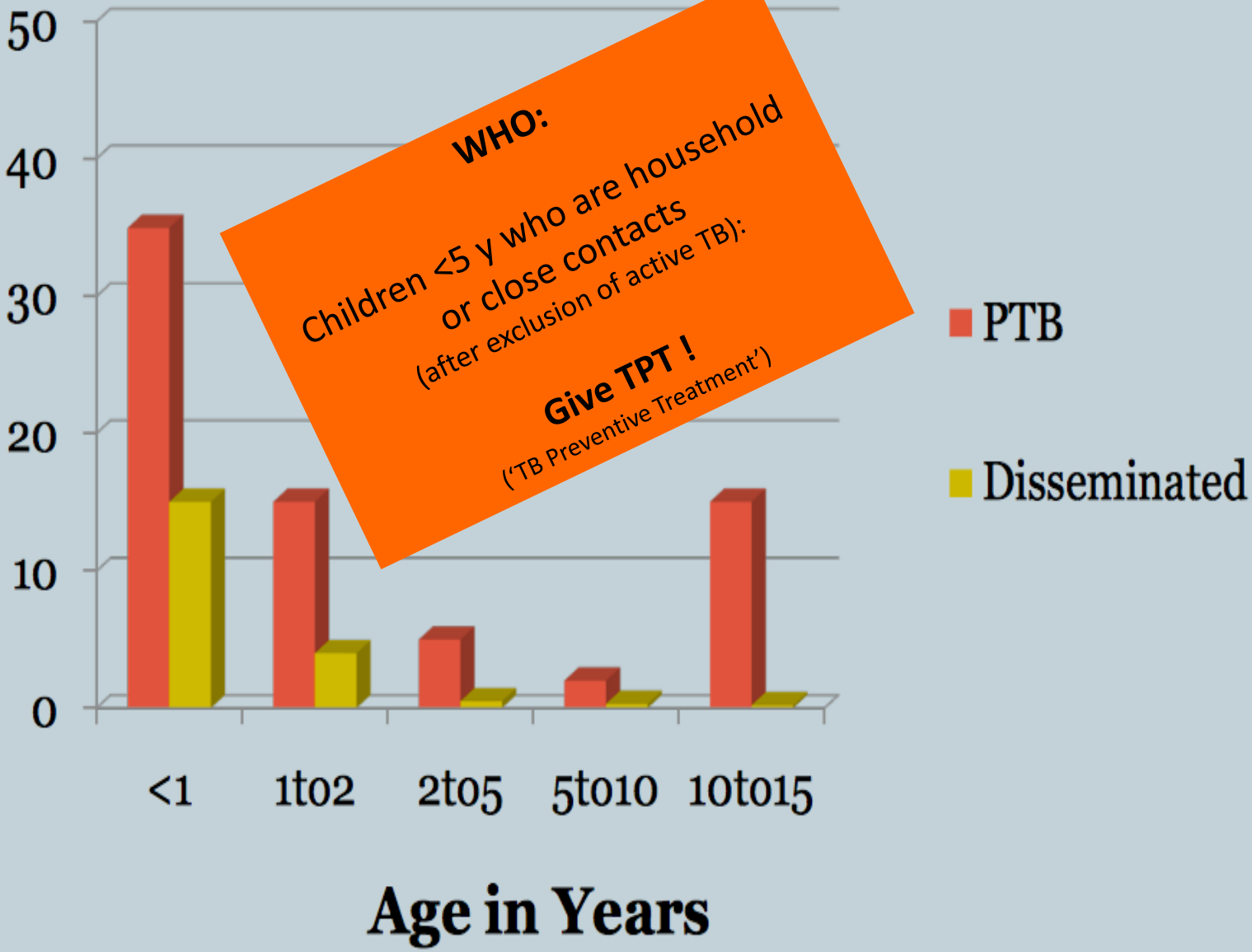
- Standard 12 months' regimen (2HRZE/10HR); or
- Intensive regimen of four drugs for 6 months (6HRZETH), with higher dosages of INH and RIF and ETH replacing EMB.

The 12-month regimen comprising 2HRZE/10HR is recommended for osteo-articular TB, which includes spinal TB. Except for non-severe peripheral lymph node TB, all other forms of EPTB can be treated for 6 months with 2HRZ(E)/4HR.

ZIEKENHUIS aan de STROOM

Disease Progression (Percent)

Of latent TB to active TB



WHO:

Children <5 y who are household or close contacts (after exclusion of active TB):

Give TPT !

('TB Preventive Treatment')

Marais et al. Int J Tuberc Lung Dis. 2004, 8(4):392–402

Hoe screenen voor latente TB (LTBI / TBI) in België (= low prevalence)

- ECDC: **IGRA** (at least 3m after TST *) **= useful, BUT does not replace TST. Can be added to TST as part of 'overall risk assessment' ****
  E.g. TST+/IGRA-: consider IGRA as false-neg in young kids (< low capacity to produce IF-G)

- In België: zeker <2j: **ook RX (en eventueel sedimentatie)**

- **D/ Household or close contacts <5 years:**
  - Treat LTBI **even if the initial TST or IGRA is negative** ("window prophylaxis")

  - Repeat testing **8** to 12 weeks after the last date of contact:
  If positive, LTBI treatment should be continued to completion
  *If negative, LTBI treatment **could** STOP (unless malnourished/very young: low sensitivity of TST/IGRA)*

- **D/ Older Household or close contacts:**
  Positive on TST / IGRA: give complete prohylaxis

ZIEKENHUIS aan de STROOM

Interpretatie TST

Induration Size	Risk Factors
≥5 mm	• Close contacts of known or suspected contagious cases • Suspected TB disease (abnormal chest radiograph or clinical evidence) • HIV infection, other immunosuppressive conditions (eg, s/p organ transplant), or receiving immunosuppressive therapy (eg, high-dose prolonged course of corticosteroids or TNF-α antagonists)
≥10 mm	• Birth in a high-prevalence country • Previous residence or significant travel to a high-prevalence country • Certain medical risk factors: diabetes mellitus, silicosis, chronic renal failure, malnutrition, Hodgkin disease, lymphoma • High-risk populations (persons experiencing homelessness, injecting or using illegal drugs, or living in high-risk congregate settings, such as nursing homes, homeless shelters, or correctional facilities) • Children with frequent exposure to adults living with HIV and other high-risk adults as above • Age younger than 4 years
≥15 mm	• No risk factors

Welke profylaxe ?

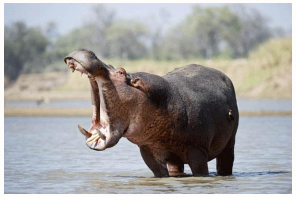
Table 5 TPT regimen options for contacts of persons with drug-susceptible TB

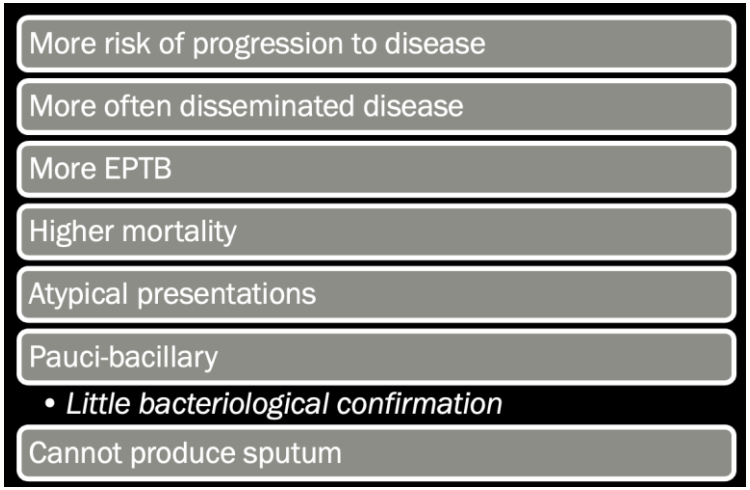
TPT regimen		Comment
6H	Six months of **daily** INH	Especially suitable for children and adolescents living with HIV* and receiving ART
3HR	Three months of **daily** INH and RIF	Suitable for non-HIV-infected children <25 kg if dispersible FDCs available
4R	Four months of **daily** RIF	Suitable for non-HIV-infected children and adolescents 5-19 years
3HP	Three months of **weekly** INH and RPT	Not yet recommended for child <2 years, as the use of currently available preparations may be challenging for young children. However, this may change as recommended dosage data and child-friendly preparations of RPT become available
1HP	One month of **daily** RPT and INH	Not currently recommended for children <13 years

En als MDR contact ??

ZIEKENHUIS aan de STROOM

Take home

- Negatieve RX = geen exclusie van TB
- Normale RX =  
- Abnormale RX =  
- **Same same, but different:**



ZIEKENHUIS aan de STROOM

Expertisecentrum

Infectieziekten en tropische pathologie bij kinderen

De dienst Infectieziekten en tropische pathologie bij kinderen behandelt jonge patiënten met bijzondere infectieziekten.

Contacteer de dienst

Infectieziekten en tropische pathologie bij kinderen | Pediatrie

Prof. dr. Ine Decuyper

ZAS Paola

Infectieziekten en tropische pathologie bij kinderen | Pediatrie

Prof. Dr. Daan Van Brusselen

ZAS Vincentius

Infectieziekten en tropische pathologie bij kinderen | Pediatrie

Dr. Lydia Van Kesteren

ZAS Paola