



British Association of
Perinatal Medicine



Lung Ultrasound

Dr Anna Milan

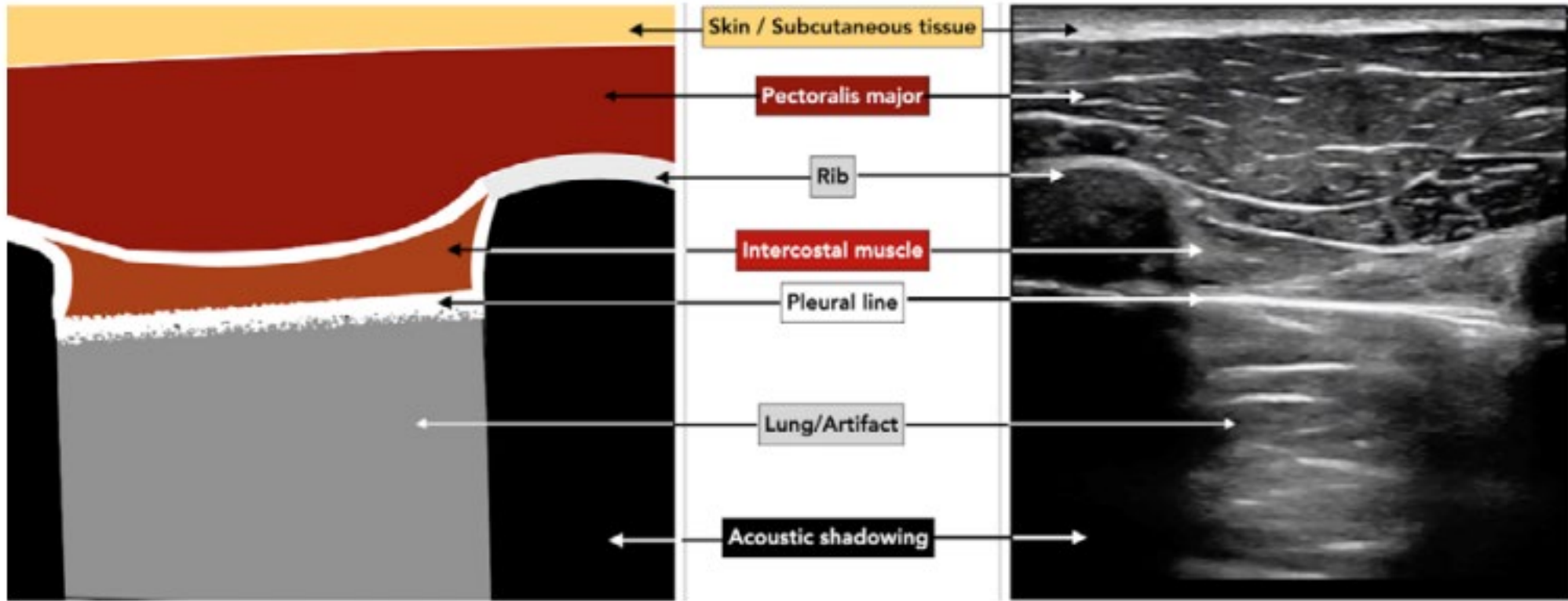
Neonatologist – Evelina London Neonatal Unit



British Association of
Perinatal Medicine

NeoFOCUS-UK 2024





WHAT IS LUNG ULTRASOUND?

Ultrasound of the chest
Assessment of the pleural and sub-
pleural regions

EVOLUTION of LUNG ULTRASOUND

1960s

Pleural effusions
Chest drain insertion
Lung biopsy

1990s

Daniel Lichtenstein:
Lung ultrasound in
ICU

2008

The BLUE protocol:

- obstructive disease
- pulmonary oedema
- pneumothorax
- pneumonia

2019-20

COVID protocols



ADULT ICU/ ACUTE MEDICINE

PAEDIATRIC ICU

2010-15

Can it be used
in PICU?

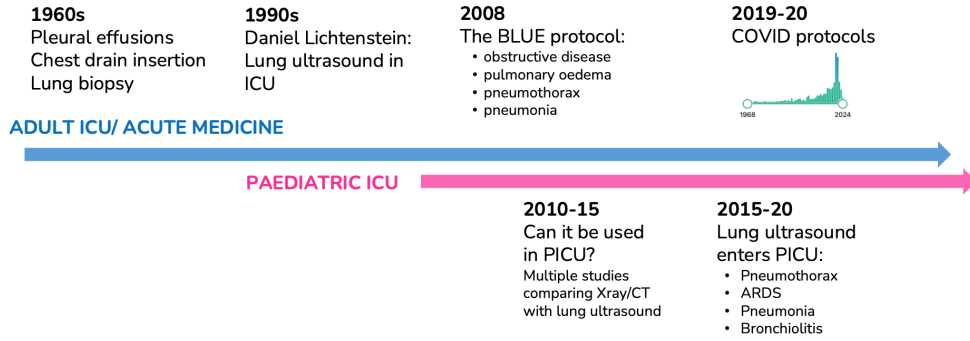
Multiple studies
comparing Xray/CT
with lung ultrasound

2015-20

Lung ultrasound
enters PICU:

- Pneumothorax
- ARDS
- Pneumonia
- Bronchiolitis

EVOLUTION of LUNG ULTRASOUND



NEONATAL ICU

2007-2014

- TTN
- RDS

2011-2016

- MAS
- Congenital pneumonia
- Pneumothorax

2015-2021

Patterns and scores

2019

ESTHER PROJECT

2020

ESPNIC consensus

2022

AAP clinical reports

ROLE OF LUNG ULTRASOUND IN NICU



As a real-time diagnostic tool: to help identify the cause of respiratory compromise (TTN, RDS, MAS, pneumothorax, pneumonia, atelectasis, effusion...) and optimise their treatment (e.g. surfactant)



As a prognostic tool: to assess need for admission, monitor disease progression and response to treatment

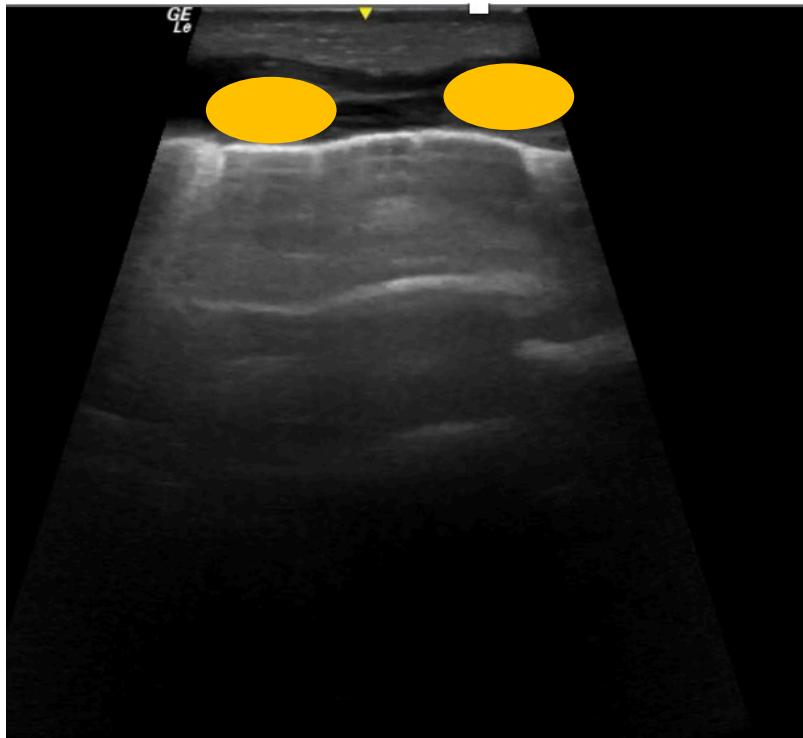


As a bedside tool: to identify the need for and to guide procedures (chest drain insertion)



REAL-TIME DIAGNOSTIC TOOL

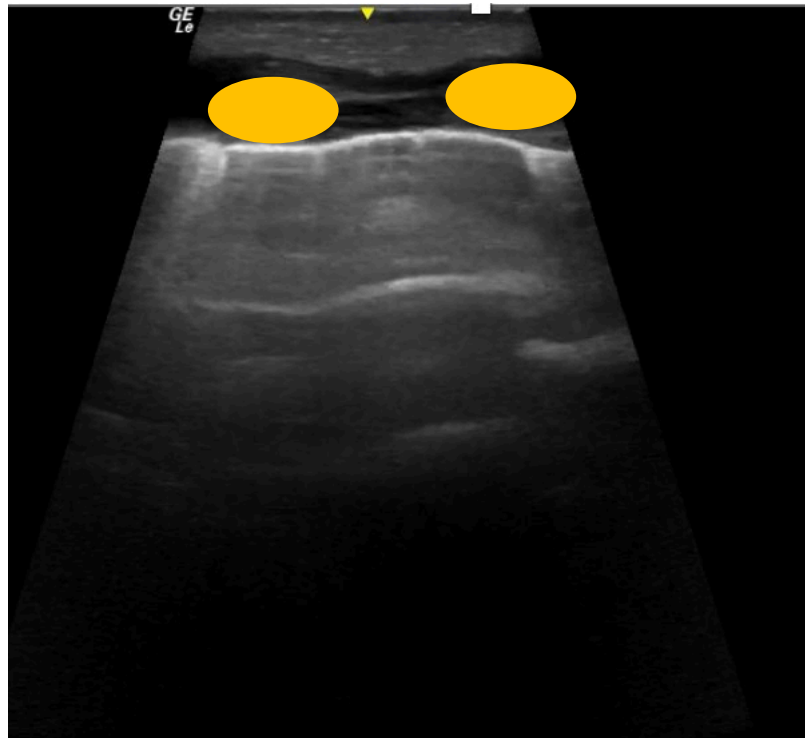
NORMAL LUNG



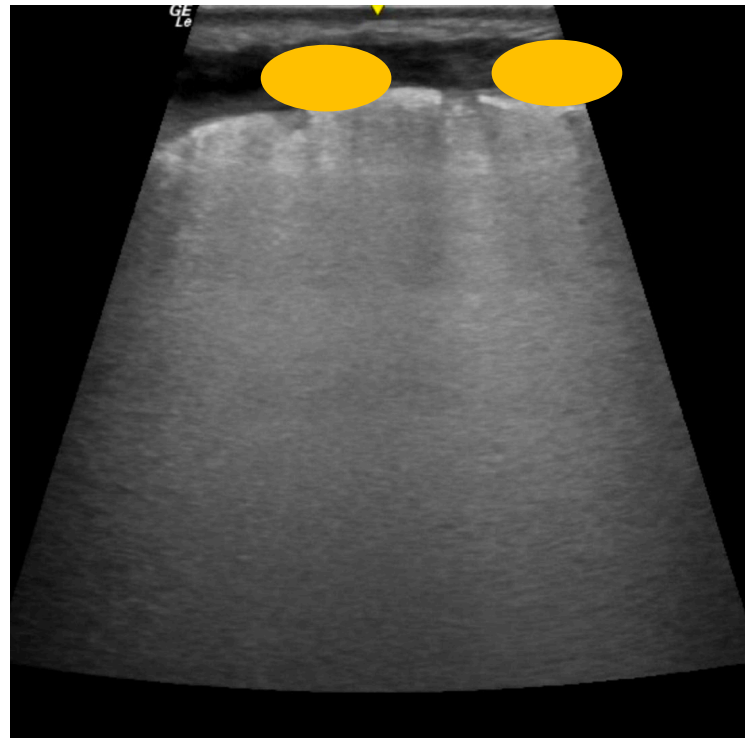


REAL-TIME DIAGNOSTIC TOOL

NORMAL LUNG



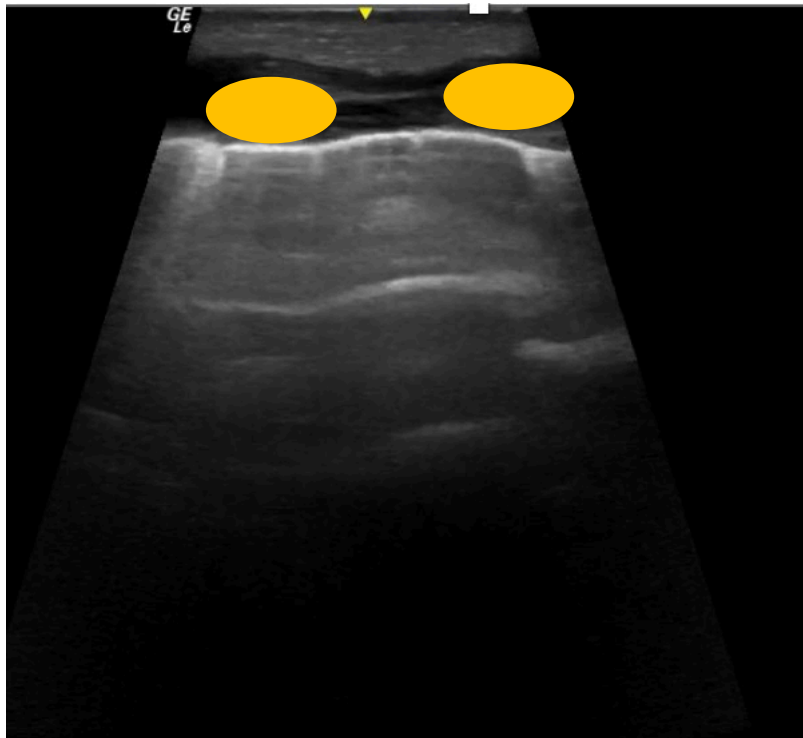
RDS



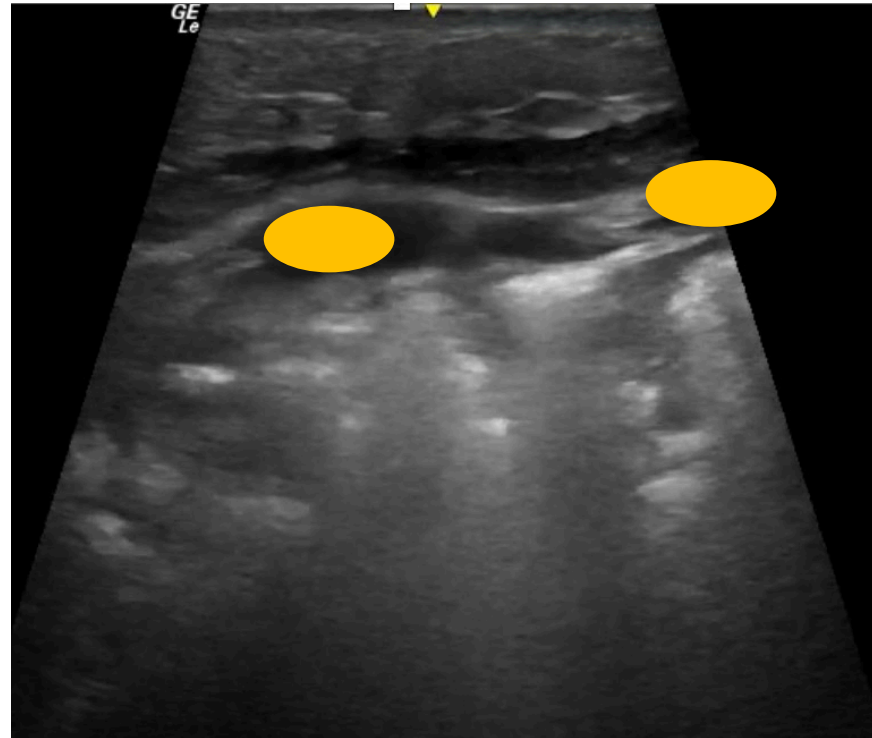


REAL-TIME DIAGNOSTIC TOOL

NORMAL LUNG



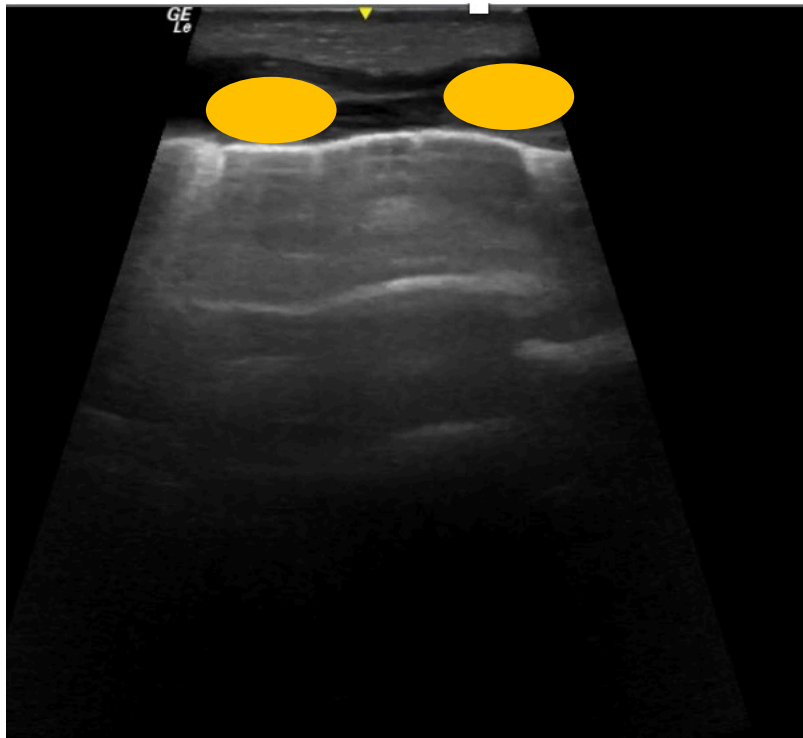
CONSOLIDATION



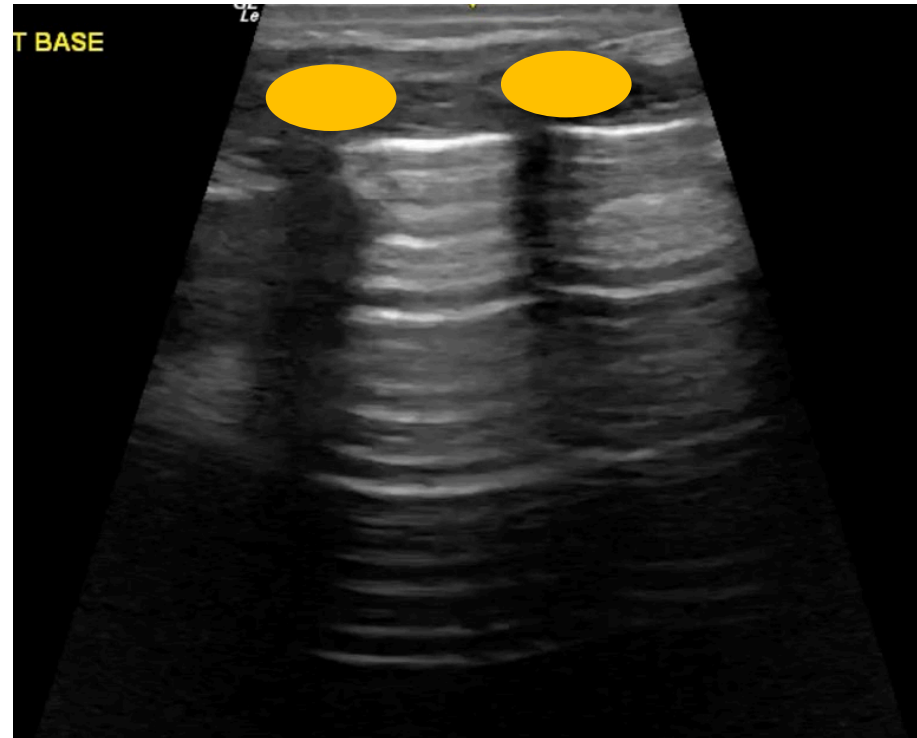


REAL-TIME DIAGNOSTIC TOOL

NORMAL LUNG



PNEUMOTHORAX



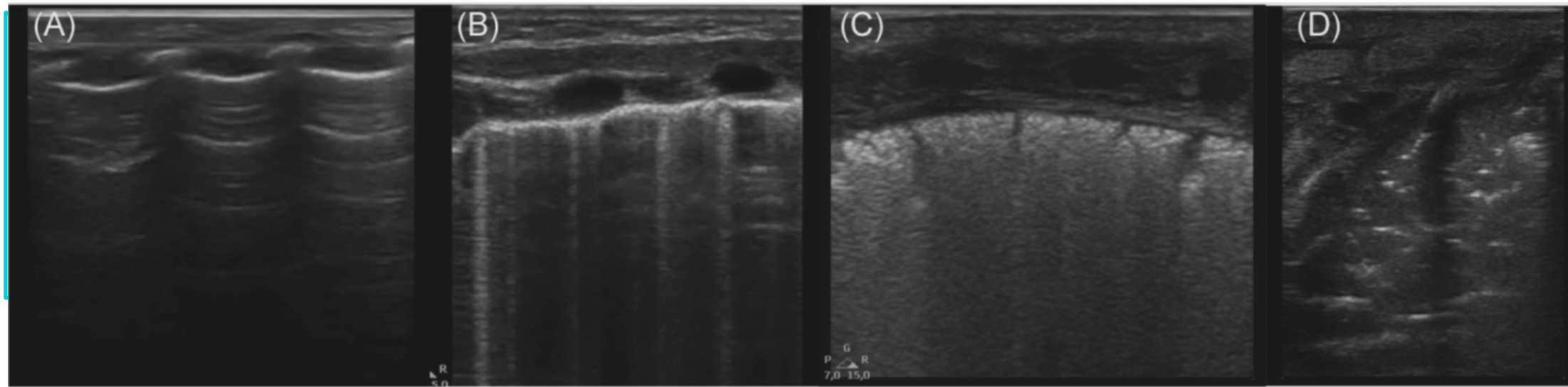
Lung ultrasound is more accurate than Xray for detection of effusions or pneumothorax

Similar sensitivity and specificity to chest Xray in pneumonia

Chiumello D et al. Crit Care Med. 2019

Lichtenstein D et al. Current Pediatric Reviews, 2012

LUNG ULTRASOUND SCORES



Normal	Interstitial Syndrome	White Lung	Consolidation
Score 0	Score 1	Score 2	Score 3

BENEFITS OF LUNG ULTRASOUND

FAST ASSESSMENT

- SAFE-R protocol
- crashing neonate protocol

PERSONALISED CARE

- extubation readiness
- prediction of evolution to CLD and responsiveness to diuretics

ACCURATE DIAGNOSIS

- right treatment at the right time
- safer invasive procedures

PATIENT/PARENTS

- no exposure to radiations
- no need to move the patient
- can be timed around patient's needs
- favours parental engagement

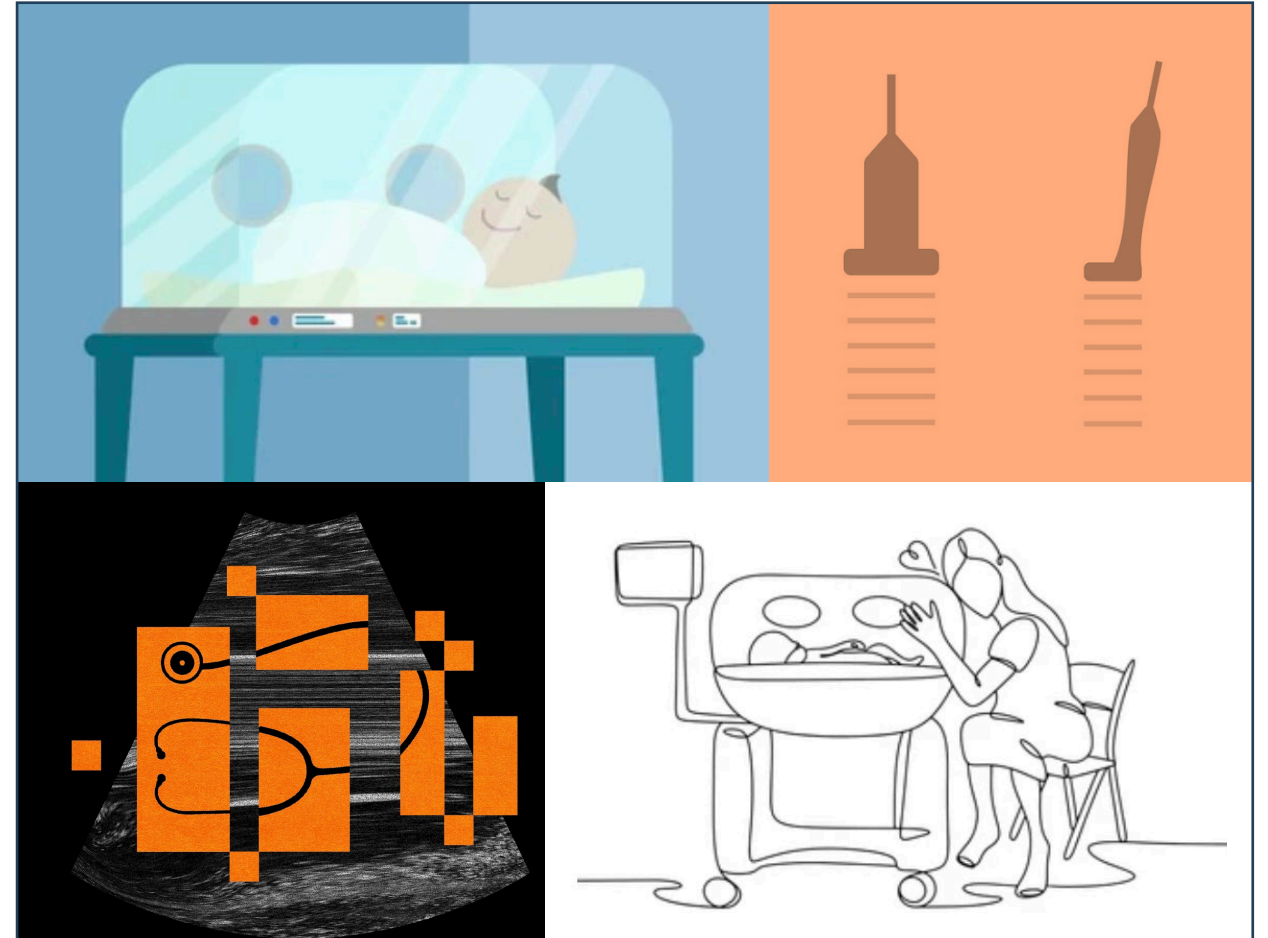


Summary

Lung ultrasound is a well-known imaging technique

Its role in neonatology has flourished in the past 10-20 yrs, supported by the large body of international literature available

It allows for a physiology-based approach to the patient, in line with the concept of personalised medicine



NeoFOCUS-UK commitment

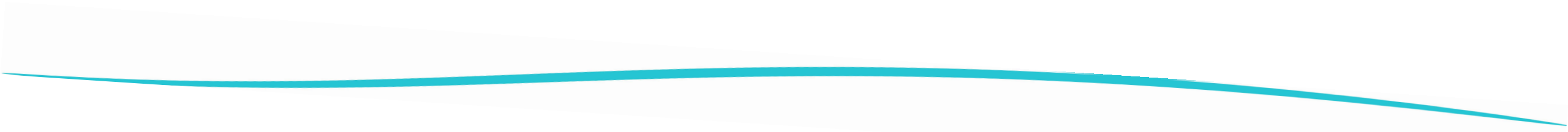
PROMOTING A FRAMEWORK FOR PRACTICE for
the implementation of lung ultrasound in neonatology

BRIDGING THE GAP

promoting standardised training and accreditation
programs to match the interest expressed by
professionals working in NICU (trainees,
neonatologists, ANNPs, physiotherapists)

SUPPORTING RESEARCH AND QI PROJECTS





British Association of
Perinatal Medicine

NeoFOCUS-UK 2024

