# Lung ultrasound score to predict the need of second dose of surfactant and respiratory outcomes in neonatal respiratory distress syndrome

Submission date	Recruitment status	<ul><li>Prospectively registered</li></ul>
10/07/2025	No longer recruiting	☐ Protocol
Registration date	Overall study status	Statistical analysis plan
19/09/2025	Completed	Results
Last Edited	Condition category	[] Individual participant data
19/09/2025	Neonatal Diseases	[X] Record updated in last year

#### Plain English summary of protocol

Background and study aims:

Newborn respiratory distress syndrome (NRDS) happens when a baby's lungs are not fully developed and cannot provide enough oxygen, causing breathing difficulties. NRDS usually occurs when the baby's lungs have not produced enough surfactant. Lung ultrasound score (LUS) calculated in the first 2 hours of life can reliably guide surfactant replacement in newborns with respiratory distress syndrome. This study explores the role of the early LUS in predicting the need for a second dose of surfactant.

#### Who can participate?

Premature newborns with respiratory distress, born between 25-33 weeks of gestational age

#### What does the study involve?

Preterm newborns stabilized with respiratory distress according to the local NICU protocol with any kind of respiratory support were enrolled within 120 minutes of birth and LUS was calculated. Surfactant administration is decided by an attending neonatologist, unaware of the results of the LUS, based on radiographic and clinical signs.

The local investigator recorded the subsequent respiratory support provided and important clinical outcomes until discharge. The primary aim of the study is to evaluate the early LUS performance as a predictor of the second surfactant dose administration by an attending physician.

#### What are the possible benefits and risks of participating?

The possible benefit is to receive an early and individualized administration of the second surfactant dose before further deterioration of the newborn's clinical condition and potentially with better respiratory outcomes. No risks are expected because lung ultrasound is a non-invasive and radiation-free tool.

Where is the study run from? University Federico II (Italy)

When is the study starting and how long is it expected to run for? February 2022 to May 2025

Who is funding the study? University Federico II (Italy)

Who is the main contact? Prof. Francesco Raimondi, raimondi@unina.it

# Contact information

#### Type(s)

Public, Scientific, Principal investigator

#### Contact name

Prof Francesco Raimondi

#### **ORCID ID**

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# Additional identifiers

Clinical Trials Information System (CTIS)

Nil known

ClinicalTrials.gov (NCT)

Nil known

Protocol serial number

001

# Study information

#### Scientific Title

An early lung ultrasound score predicts the need for surfactant retreatment and long-term outcomes in neonatal respiratory distress syndrome

#### Acronym

#### LUSecond

#### Study objectives

To evaluate the lung ultrasound score (LUS) performance as a predictor of the second surfactant dose administration by a masked attending physician. An early LUS, done in the first 2 hours of life, will be considered.

#### Ethics approval required

Ethics approval required

#### Ethics approval(s)

approved 11/02/2022, Comitato Etico Universita Federico II (Pansini 5, Naples, 80131, Italy; +39 (0)81 7462596; segreteria@comitatoeticocampania3.it), ref: 386/21

#### Study design

Observational prospective study

#### Primary study design

Observational

#### Study type(s)

Diagnostic

#### Health condition(s) or problem(s) studied

Neonatal respiratory distress syndrome

#### **Interventions**

Preterm neonates stabilized according to the local NICU protocol and managed with any kind of respiratory support are enrolled within 120 minutes of birth when important prenatal variables were recorded. During this time, the attending neonatologist, unaware of the purpose of the study, decides on the initial stabilization with either CPAP or nasal intermittent ventilation or mechanical ventilation according to the clinical condition.

An investigator who was not involved in the clinical care records the respiratory support mode and level and oxygenation indices. The investigator also performed a lung ultrasound scan as previously described using three predefined ultrasound views (middle clavicular, anterior axillary and posterior axillary lines) on each side.

#### Intervention Type

Other

#### Primary outcome(s)

Early LUS performance as a predictor of the second surfactant dose administration by a masked attending physician. LUS is performed in the first 2 hours of life using the Brat score.

## Key secondary outcome(s))

Main respiratory outcomes in relation to the need for a second surfactant dose, measured by evaluating oxygen indices and the respiratory technique used at stabilization.

Bronchopulmonary dysplasia (according to the Jensen definition) and the number of deaths will be registered at discharge.

#### Completion date

31/05/2025

# Eligibility

#### Key inclusion criteria

- 1. Premature neonates with respiratory distress syndrome (RDS)
- 2. Born between 25-33 weeks of gestational age calculated from the first day of the last menstrual period
- 3. Studied before their first surfactant dose

#### Participant type(s)

Patient

#### Healthy volunteers allowed

No

#### Age group

Neonate

#### Lower age limit

0 days

#### Upper age limit

1 days

#### Sex

All

#### Total final enrolment

225

#### Key exclusion criteria

- 1. Lack of parental consent
- 2. Major congenital malformations
- 3. Surfactant administration before lung ultrasound

#### Date of first enrolment

01/03/2022

#### Date of final enrolment

31/05/2025

# **Locations**

#### Countries of recruitment

Italy

# Study participating centre University Federico II

Via Pansini 5 Napoli Italy 80131

# Sponsor information

#### Organisation

University of Naples Federico II

#### **ROR**

https://ror.org/05290cv24

# Funder(s)

#### Funder type

University/education

#### **Funder Name**

Università degli Studi di Napoli Federico II

#### Alternative Name(s)

University of Naples Federico II, University of Naples, Federico II University of Naples, Università di Napoli, Università di Napoli Federico II, UNINA

#### **Funding Body Type**

Government organisation

#### Funding Body Subtype

Universities (academic only)

#### Location

Italy

## **Results and Publications**

#### Individual participant data (IPD) sharing plan

The dataset of the current study will be available upon reasonable request to Prof. Francesco Raimondi (raimondi@unina.it)

# IPD sharing plan summary

Available on request

**Study outputs** 

Output type Details Date created Date added Peer reviewed? Patient-facing?

Participant information sheet 11/11/2025 No Yes