

## Introduction

The COVID-19 pandemic caused a sudden and unprecedented surge in ICU admissions for severe acute respiratory failure.

Whilst there is a wealth of knowledge surrounding risk factors for developing critical care myopathy and effects of prolonged ICU stay on functional outcomes,<sup>1,2,3</sup> little was known about the pathophysiology, treatment or physical outcomes of patients admitted to ICU with COVID-19.

Within our organisation, patients recovering from the acute respiratory failure phase of COVID-19 demonstrated a range of presentations impacting rehabilitation whilst in ICU.

### Aim:

To explore whether time taken to wake post sedation hold impacts on functional outcomes of patients surviving ICU admission for COVID-19.

## Methods and Materials

A retrospective clinical review of patients admitted to ICU with a primary diagnosis of COVID-19 between March-April 2020 was conducted at a large London NHS Foundation Trust.

Electronic clinical notes were reviewed, and the following data were extracted: age, ethnicity, sex, BMI, pre-admission clinical frailty score, duration of sedation, days taken to wake from sedation, duration of mechanical ventilation, ICU length of stay (LOS) and hospital LOS.

Functional outcomes were defined using the Intensive Care Unit Mobility Score (ICUMS).

Data were analysed using descriptive statistics and reported as absolute numbers, percentages (%) and median (range).

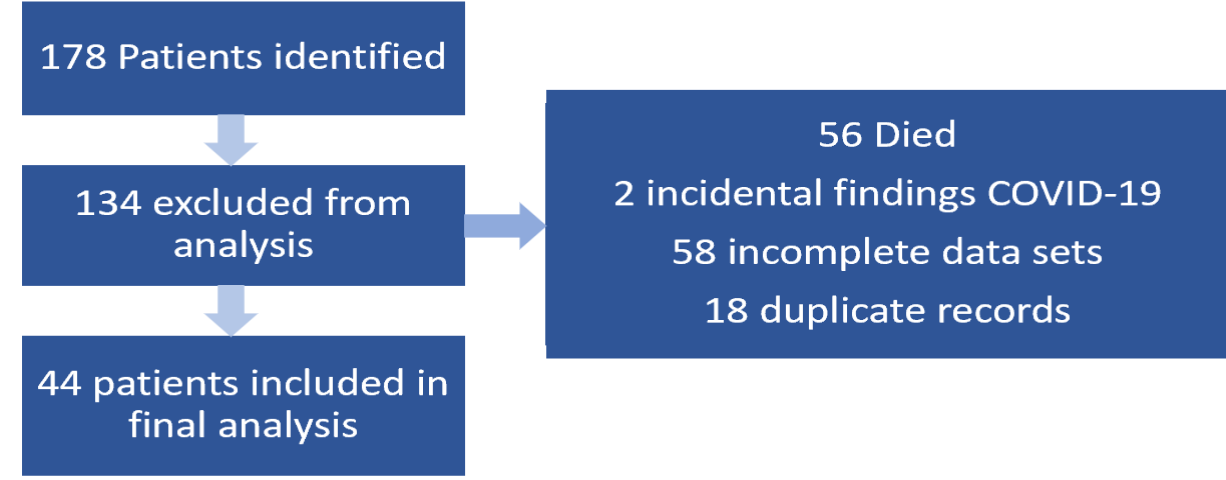
Table 1. Rehabilitation Groups.

Group	Characteristics
Group 1	Never requiring sedation and mechanical ventilation
Group 2	Woke from sedation (RASS $\geq$ -1) within 72 hours with preserved muscle power (ICUMS $\geq$ 5 on ICU discharge)
Group 3	Woke from sedation within 72 hours but myopathic (ICUMS $\leq$ 4 on ICU discharge)
Group 4	Slow to wake (> 72 hrs)

Table 2. Characteristics of each rehabilitation group.

	Age	Gender (% Male)	Ethnicity (% White)	BMI	Clinical Frailty Score	Sedation duration (days)	Midazolam	NMBA	Steroids	Total sedative agents	Mech Vent (days)
Group 1 (n=8)	44(26-78)	57%	43%	26.1(21.7-59.3)	2(1-6)	0	0%	0%	0%	0	0
Group 2 (n=10)	48(34-60)	60%	30%	27.5(19.9-38.6)	2(1-4)	7(1-39)	40%	30%	30%	2(2-4)	7(1-61)
Group 3 (n=10)	54.5(39-63)	60%	30%	28.9(22.0-42.6)	3(1-7)	9(3-26)	40%	40%	20%	2(1-4)	9.5(6-28)
Group 4 (n=16)	59(47-72)	63%	25%	30.1(20.8-53.5)	3(1-5)	13(7-31)	56%	63%	56%	3(2-4)	32.5(14-55)

## Results



Patients could be categorised into four rehabilitation groups (Table 1).

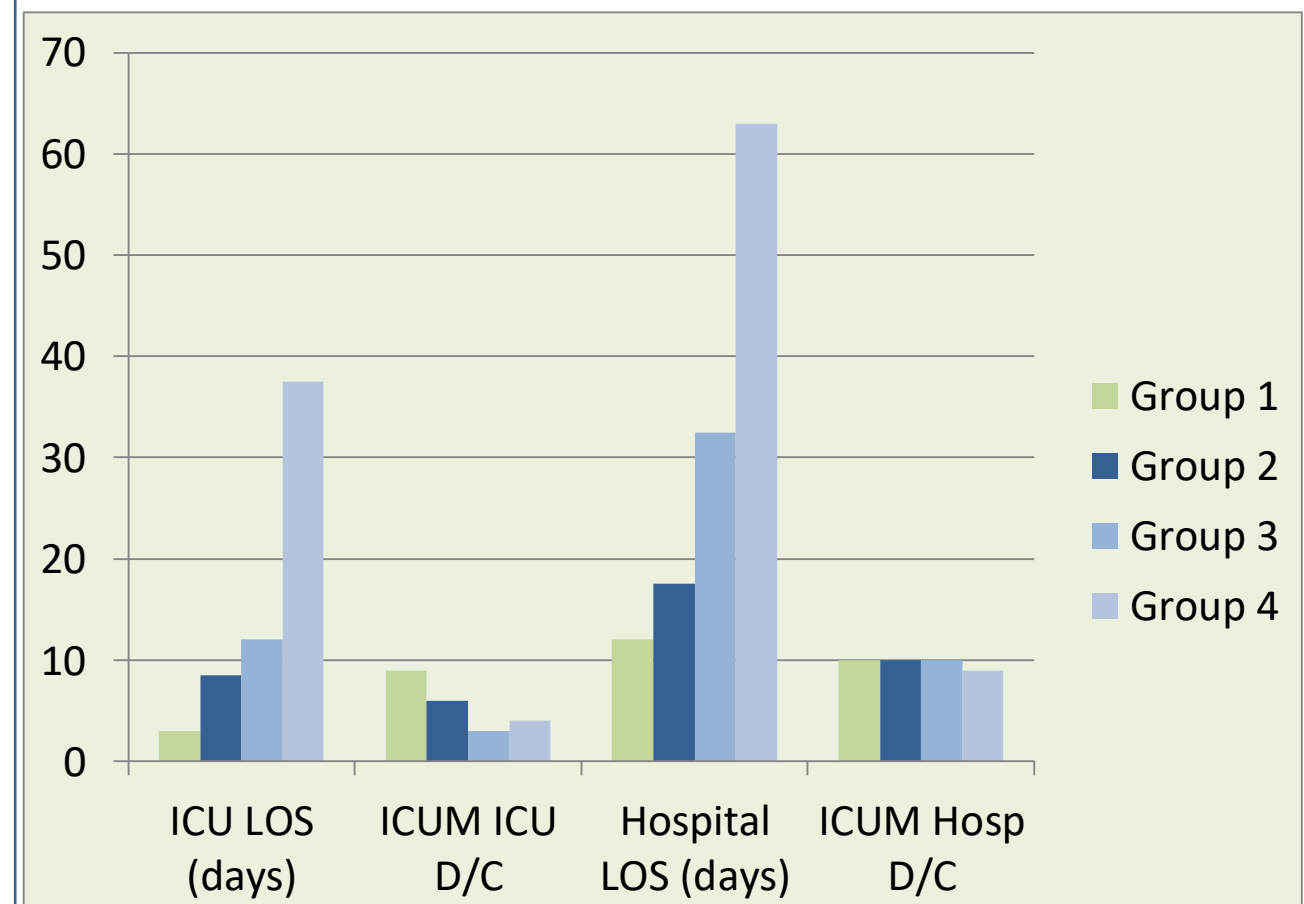


Chart 1. Length of stay and functional outcomes per rehabilitation group.

Those slow to wake following sedation hold (group 4) had an increased age, BMI, and non-white ethnicity when compared to other groups (table 1).

Sedation duration was longer, with neuromuscular blocking agents (NMBA) and steroid use more prevalent in group 4 compared to the other groups. There was also increased midazolam administration and higher number of total sedative agents received by these patients (table 1).

Those slow to wake (group 4) were ventilated for longer than the other groups (table 1).

Those who were slow to wake had a lower ICUMS at ICU discharge than those waking with preserved strength or never sedated (chart 1).

Time taken to wake from sedation also resulted in longer ICU and hospital LOS. Similar functional outcomes at hospital discharge were noted between all 4 groups (chart 1).

## Conclusions

Patients slow to wake from sedation following ICU admission for a primary diagnosis of COVID-19 had a longer duration of sedation, mechanical ventilation and ICU LOS, reduced functional ability at ICU discharge and a longer hospital LOS.

Patients could be categorised into 4 rehabilitation groups which appear to show trends towards certain characteristics.

This preliminary observational clinical data supports the testable hypothesis that within ICU COVID-19 rehabilitation phenotypes may exist, which warrants further investigation with larger data sets across waves of the pandemic.

## References

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