

# Sustainability practice in critical care through Spontaneous Awakening Trial (SAT) and Spontaneous Breathing Trial (SBT).

## Introduction.

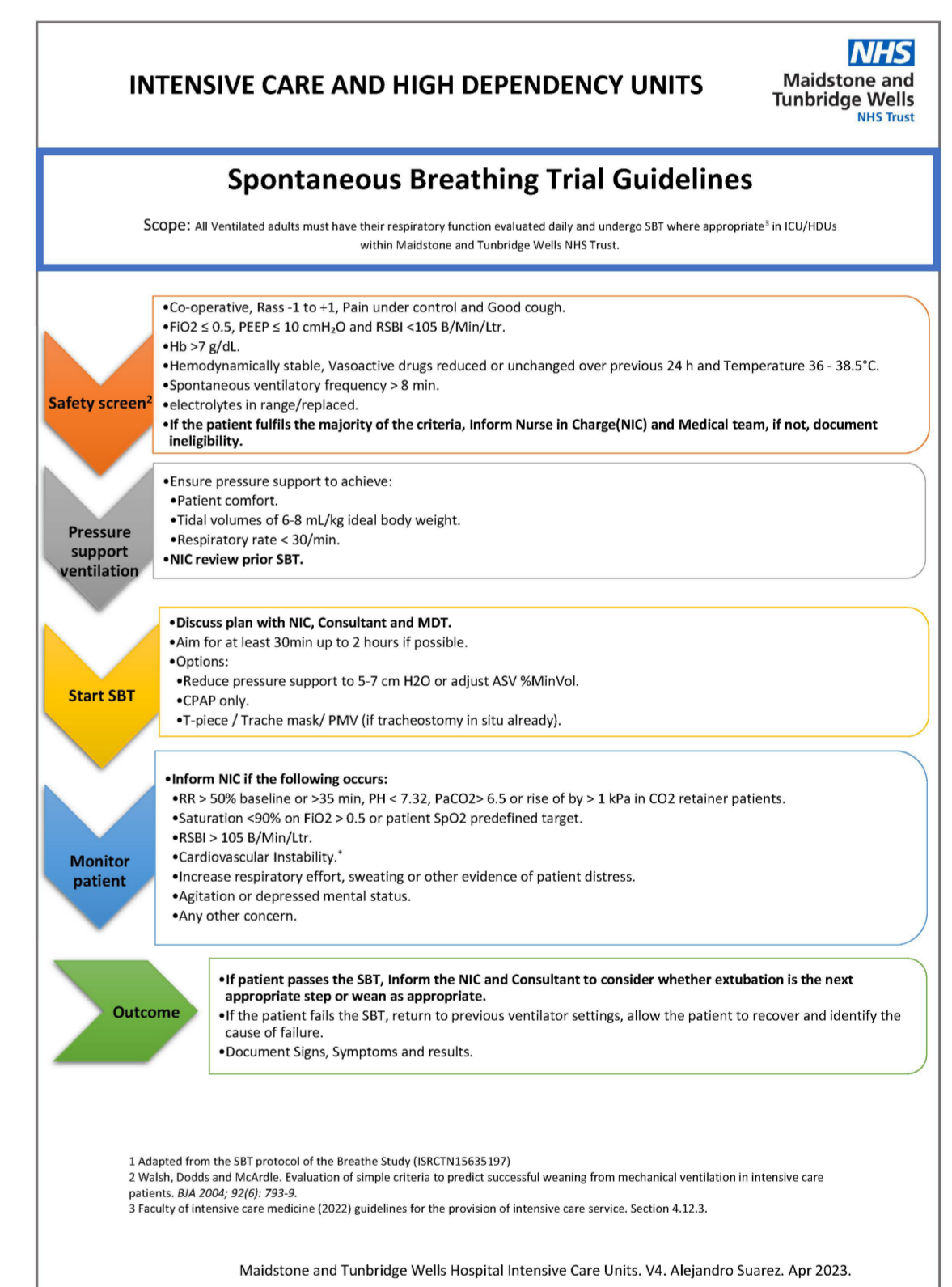
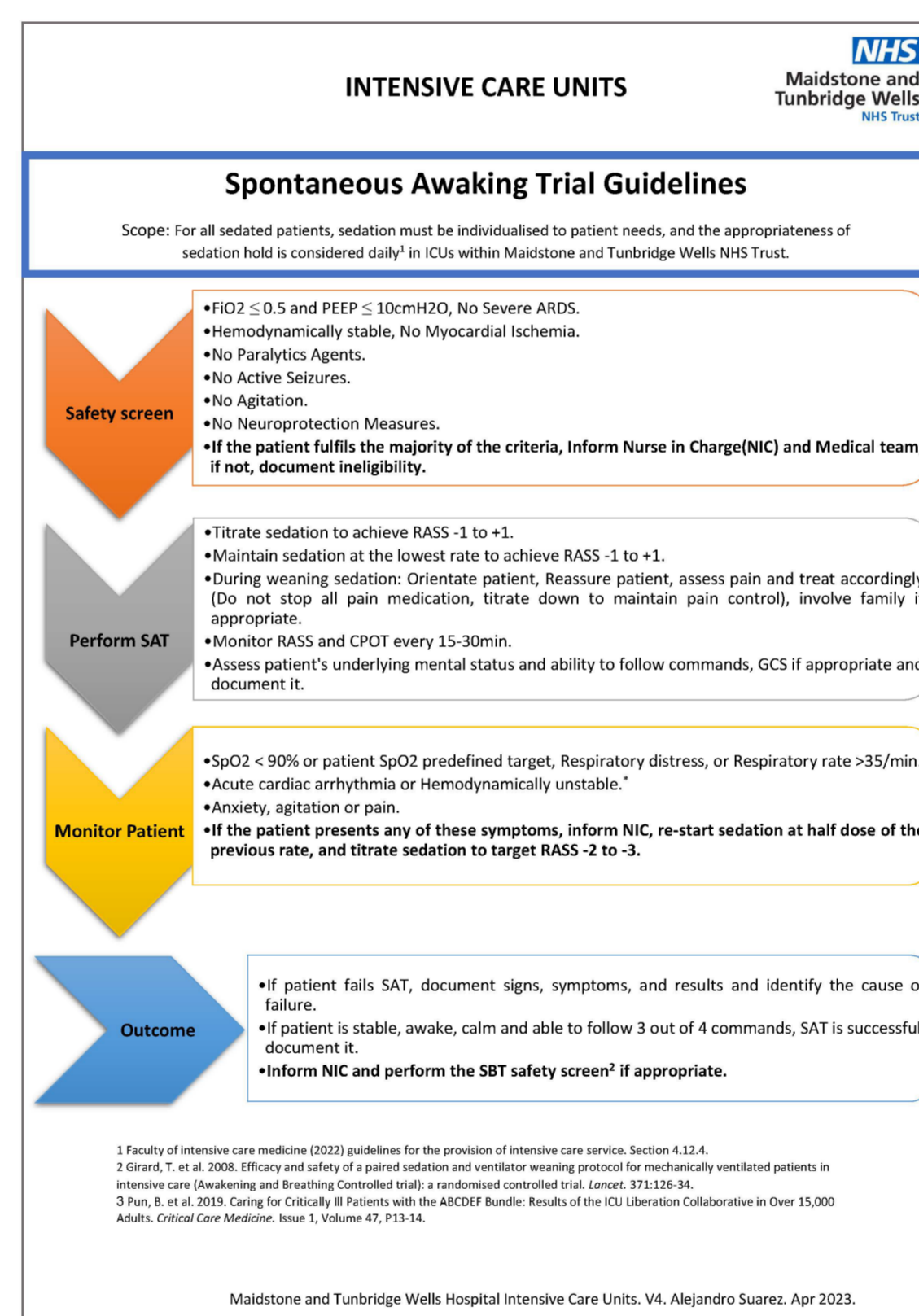
Previous audit results show poor compliance with national standards, Guidelines for the Provision of Intensive Care Services (GPICS) in section 4.12.3 states that all ventilated patients must have their respiratory function evaluated daily and undergo spontaneous breathing trials where appropriate and 4.12.4 Sedation must be individualised to patient needs and the appropriateness of sedation hold considered daily, which may lead to a reduction of survival rates, an increase in the number of mechanical ventilation (MV) days, delirium, Intensive Care Unit (ICU) re-admissions, and an increase in ventilator-associated pneumonia (VAP) and ICU length of stay (LOS)<sup>13</sup>, this has a social, financially and environmental impact, showing the Sustainability impact may bring benefits to this project including motivation and energy for change<sup>2</sup>; Sedatives are some of the most commonly used drugs in ICU. From August to December 2022, the local ICU used 470 bottles of 2% propofol, one of the unit's most used/purchased drugs. The use of propofol for prolonged sedation appears to be safe and may reduce the duration of MV and LOS compared to long-acting benzodiazepines<sup>7</sup>. Propofol bottles from major commercial suppliers in the UK are made of Type II glass, borosilicate glass, that confers the glass light and heat resistance properties, but unfortunately not re-usable. The drug is also highly discarded; wasted or discarded propofol accounted for 45% of its use<sup>10</sup>. Furthermore, propofol waste in water streams is responsible for toxicity, bioaccumulation, and persistence on aquatic life, including algae growth inhibition and acute toxicity in small crustaceans and freshwater fish<sup>4</sup>. Improvement can be achieved by optimising and reducing sedation and decreasing ICU LOS; the consequences of prolonged sedation can be increased periods of MV, leading to prolonged stays in ICU. Prolonged ventilation, on its own, is a predicted cause of increased ICU LOS<sup>12</sup>. Sedation is linked with higher ICU delirium incidences and prolonged MV periods. Patients with delirium have longer ICU and hospital LOS<sup>3</sup>. The recommendations are a consensus within the ICU community: the goal is ICU liberation by reducing the amount/time of sedation, promoting regular sedative interruptions, practising targeted sedation protocols, aiming for more ventilator-free days, and promoting early mobilisation<sup>1,5,8,11,14,15</sup>. Increasing compliance to these standards and staff awareness through introducing SAT and SBT guidelines aims to reduce the social, financial, and environmental impact and improve compliance with GPICS 4.12.3. and 4.12.4.

## Methods

- This quality improvement project includes a plan-do-study-act cycle (Langley et al., 2009)
- Retrospective and randomised audit to evaluate compliance with GPICS 4.12.3; 4.12.4
- Retrospective data collection to monitor the use of propofol before and after the introduction of SAT and SBT Guidelines.

## Discussion

A previous study was conducted at a local ICU, involving 25 patients on ventilators. Unfortunately, compliance with national standards was poor, with only 54% of patients being assessed for SAT and SBT. Additionally, local weaning protocol documentation was not in place for any of the patients. However, due to limitations in the audit, the small sample size of just 25 patients and unclear documentation made it difficult to draw definitive conclusions. Currently, data is being collected on the use of propofol and will be compared to pre-guideline implementation. The aim is to reduce energy expenditure and CO<sub>2</sub>e emission by January 2024, compared to estimates generated in January 2023. To achieve this, the sub-goals are to reduce the total amount of sedation used in the unit by January 2024 and to achieve SAT audit compliance of 80% by January 2024.



## Conclusion.

To promote sustainability, ICU can enhance its operations by implementing the latest guidelines and increasing awareness of the social, financial, and environmental impact. It is vital to highlight the benefits that can be achieved by adhering to these guidelines, while also striving to enhance current practices and educate staff. Although the final figures may not lead to an immediate reduction in energy expenditure and CO<sub>2</sub>e emissions, the ultimate objective is to maintain the quality of patient care and benefit our communities.

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