Treloar's

Innovating Clinical Education for Safe Long-Term NIV in Children with Complex Neurodisability:

A Scalable Practice-Based Model

Dominic Twinn, *Clinical Educator (RCN, PGCert)*

Nicola Scivier, Highly Specialist Respiratory Physiotherapist



Treloar's overview

Residential school and college supporting children and young people with complex health needs.

180

students aged 4–25,
66% with CP. 11% NIV users

6

Boarding houses (care home)
5 CQC registered + 1 Ofsted

18 WTE

Nurses, 21 RNs, 6 HCAs +
Clinical Education team

400+

Student Support Assistants (HSW)

Care model

Nurses lead care planning, transitions, clinical skills training and delegation. SSAs support day-to-day care and learning, completing **70+ clinical skills** such as, Oral Suction, NP airway suction, medicines, gastrostomy care, AAI, catheter care and Non-invasive Ventilation.

Background

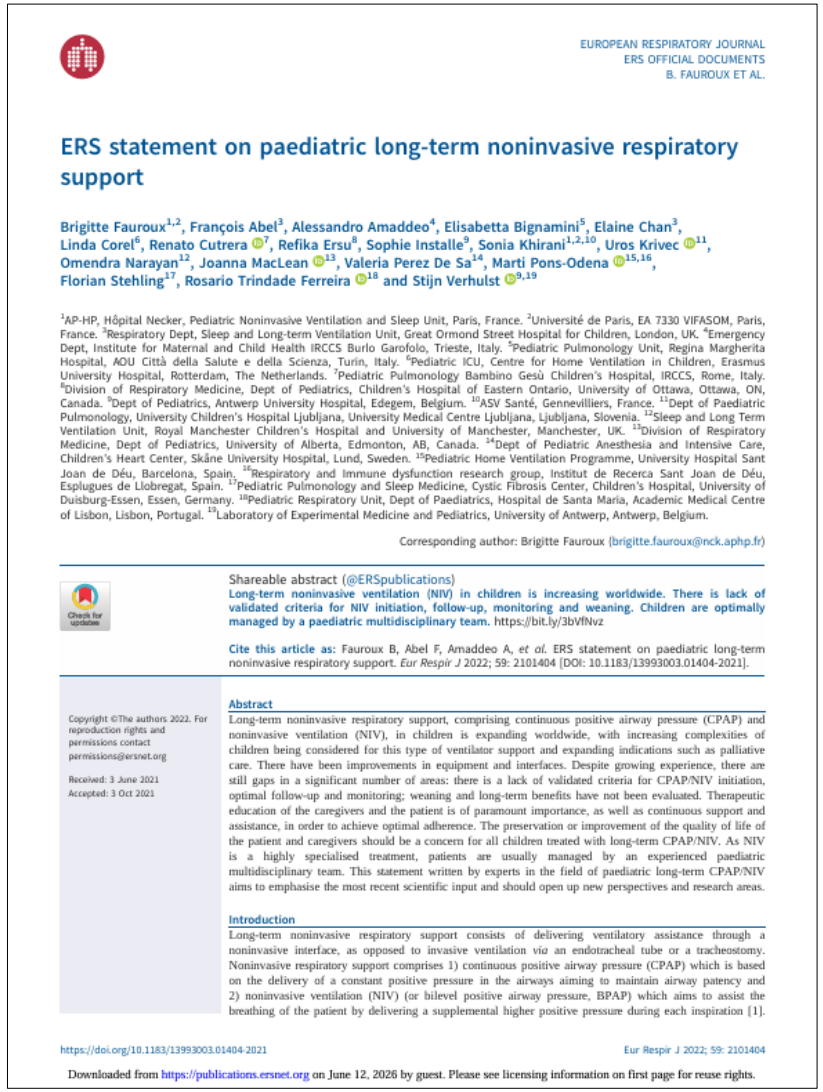
The Innovation

Impact

Key Take Aways

Background:

“Worldwide, long-term NIV use in children is increasing… along with increasing complexities of paediatric conditions.”



EUROPEAN RESPIRATORY JOURNAL
ERS OFFICIAL DOCUMENTS
B. FAUROUX ET AL.

ERS statement on paediatric long-term noninvasive respiratory support

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Shareable abstract (@ERSpublications)
Long-term noninvasive ventilation (NIV) in children is increasing worldwide. There is lack of validated criteria for NIV initiation, follow-up, monitoring and weaning. Children are optimally managed by a paediatric multidisciplinary team. https://bit.ly/3bVfNvz

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Abstract

Long-term noninvasive respiratory support, comprising continuous positive airway pressure (CPAP) and noninvasive ventilation (NIV), in children is expanding worldwide, with increasing complexities of children being considered for this type of ventilator support and expanding indications such as palliative care. There have been improvements in equipment and interfaces. Despite growing experience, there are still gaps in a significant number of areas: there is a lack of validated criteria for CPAP/NIV initiation, optimal follow-up and monitoring; weaning and long-term benefits have not been evaluated. Therapeutic education of the caregivers and the patient is of paramount importance, as well as continuous support and assistance, in order to achieve optimal adherence. The preservation or improvement of the quality of life of the patient and caregivers should be a concern for all children treated with long-term CPAP/NIV. As NIV is a highly specialised treatment, patients are usually managed by an experienced paediatric multidisciplinary team. This statement written by experts in the field of paediatric long-term CPAP/NIV aims to emphasise the most recent scientific input and should open up new perspectives and research areas.

Introduction

Long-term noninvasive respiratory support consists of delivering ventilatory assistance through a noninvasive interface, as opposed to invasive ventilation *via* an endotracheal tube or a tracheostomy. Noninvasive respiratory support comprises 1) continuous positive airway pressure (CPAP) which is based on the delivery of a constant positive pressure in the airways aiming to maintain airway patency and 2) noninvasive ventilation (NIV) (or bilevel positive airway pressure, BPAP) which aims to assist the breathing of the patient by delivering a supplemental higher positive pressure during each inspiration [1].

https://doi.org/10.1183/13993003.01404-2021 Eur Respir J 2022; 59: 2101404

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(Fauroux et al., 2022)

Background:

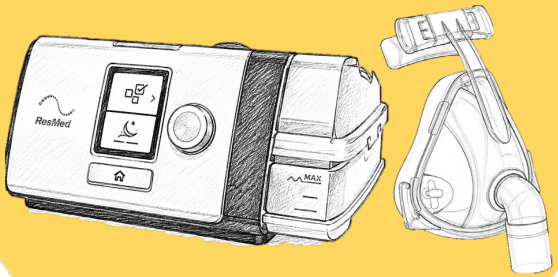
The Challenge

The Child or Young Person



- Inability to summon help,
- Anxiety
- Sleep Disturbance,
- Comorbidities e.g. seizures, poor swallow
- Inability to remove interface.

The Machine & Interface



- Interface side effects,
- Aspiration,
- Suffocation
- CO2 rebreathe
- Digestive discomfort

The Caregiver



- Lack Motivation
- Level of night-time monitoring
- Set-up errors
- Unfamiliarity

(Grychtol & Chan, 2018)

Educational Challenge

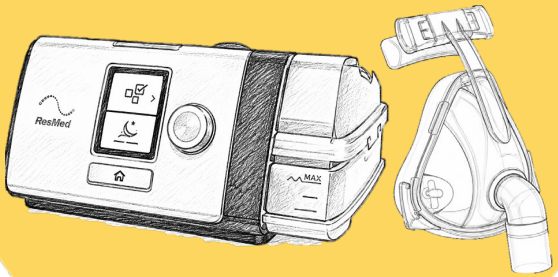
Limited National Guidance

The child or young person



- Burden of Training
- Changes in respiratory support requirements
- Other health needs changing
- Multiple service users in one organisation: Multiple LTV Teams

The Machine & Interface



- Variety of Machines
- Alarm trouble shooting
- Interface Variety
- Cleaning and Maintenance
- Humification

The Caregiver



- Diverse Non-Specialist Workforce
- Delegation: Confidence vs. Competence
- Decision-Making and Escalation
- Recognising Red Flags

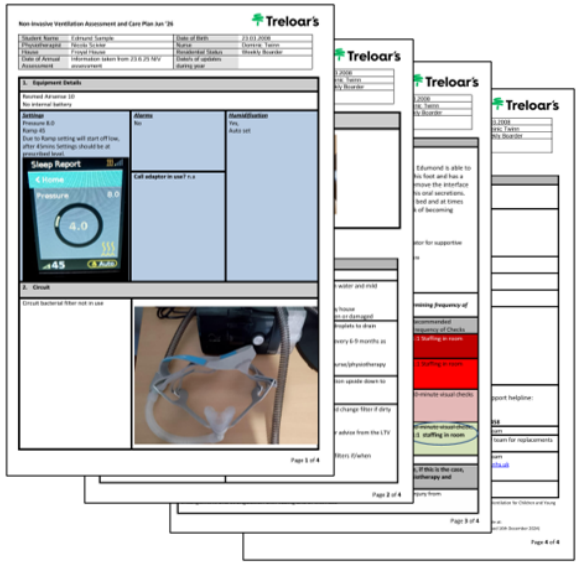
Ensuring Sustainability, Safety and Confidence

The Innovation:

The System

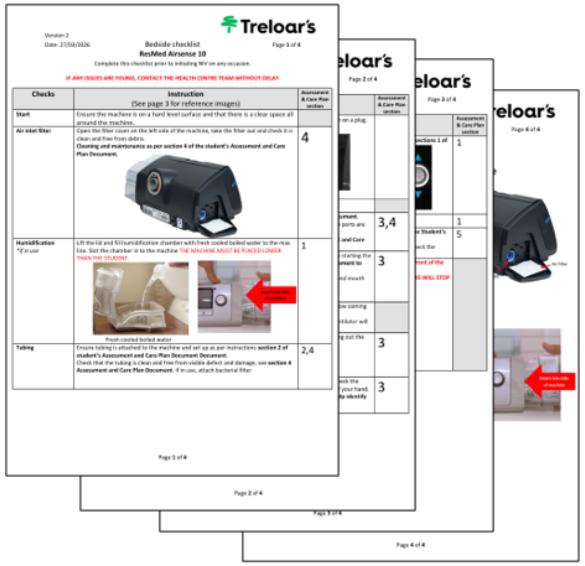
Assessment and Care Document

- **Joint Physio and Nurse Assessment** – based off LTV prescription/Service.
- **6 Key sections:**
  1. Equipment Details
  2. Circuit
  3. Interface
  4. Cleaning and maintenance
  5. Student Profile – Including level of dependence and Risk Stratification.
  6. Additional Details- for use by Health Centre & Physiotherapy



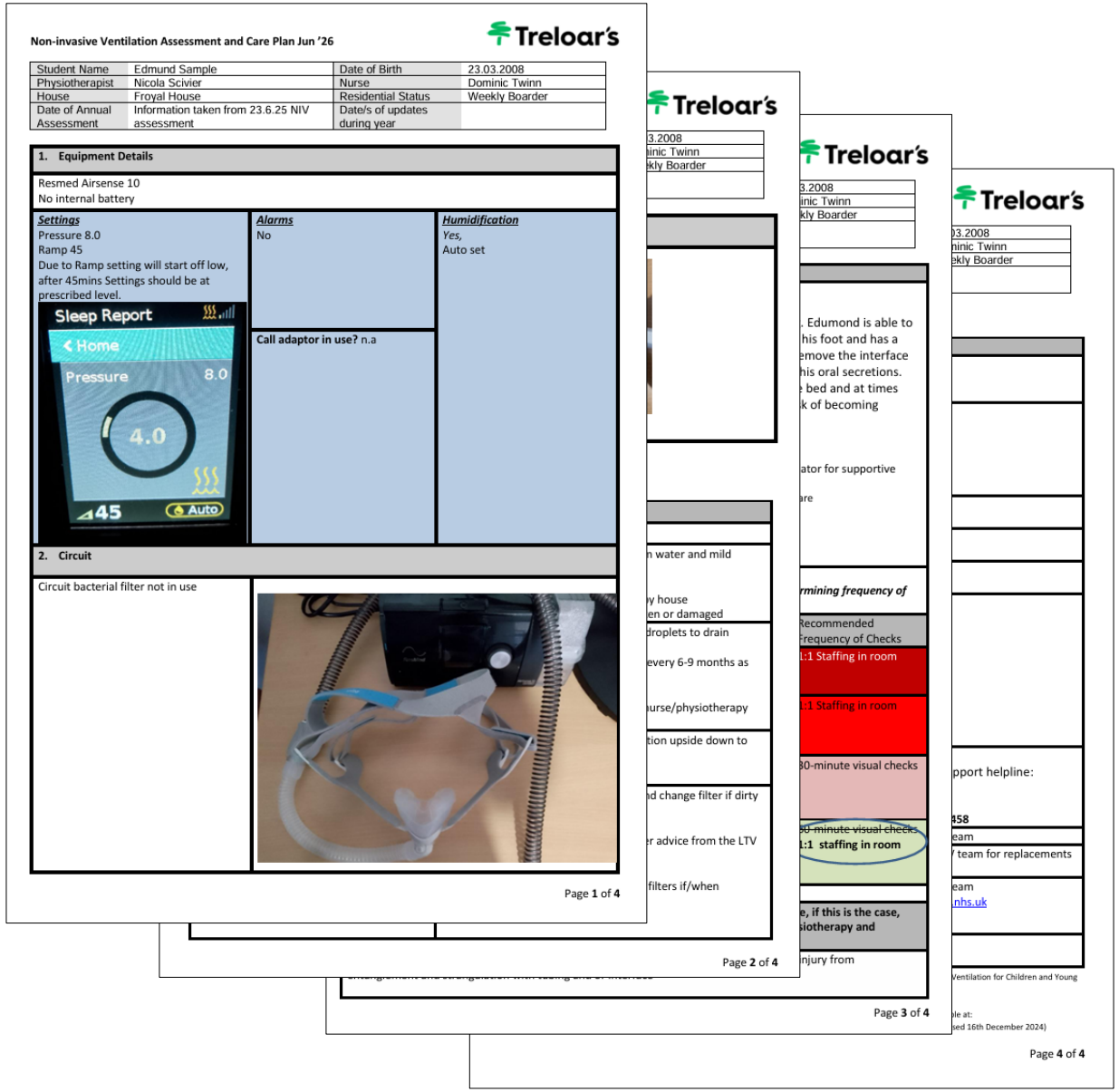
Bedside Checklist

- Standardised layout
- Ventilator Specific
- Interface safety checks
- Cognitive Aid
- An NIV pre flight checklist. .



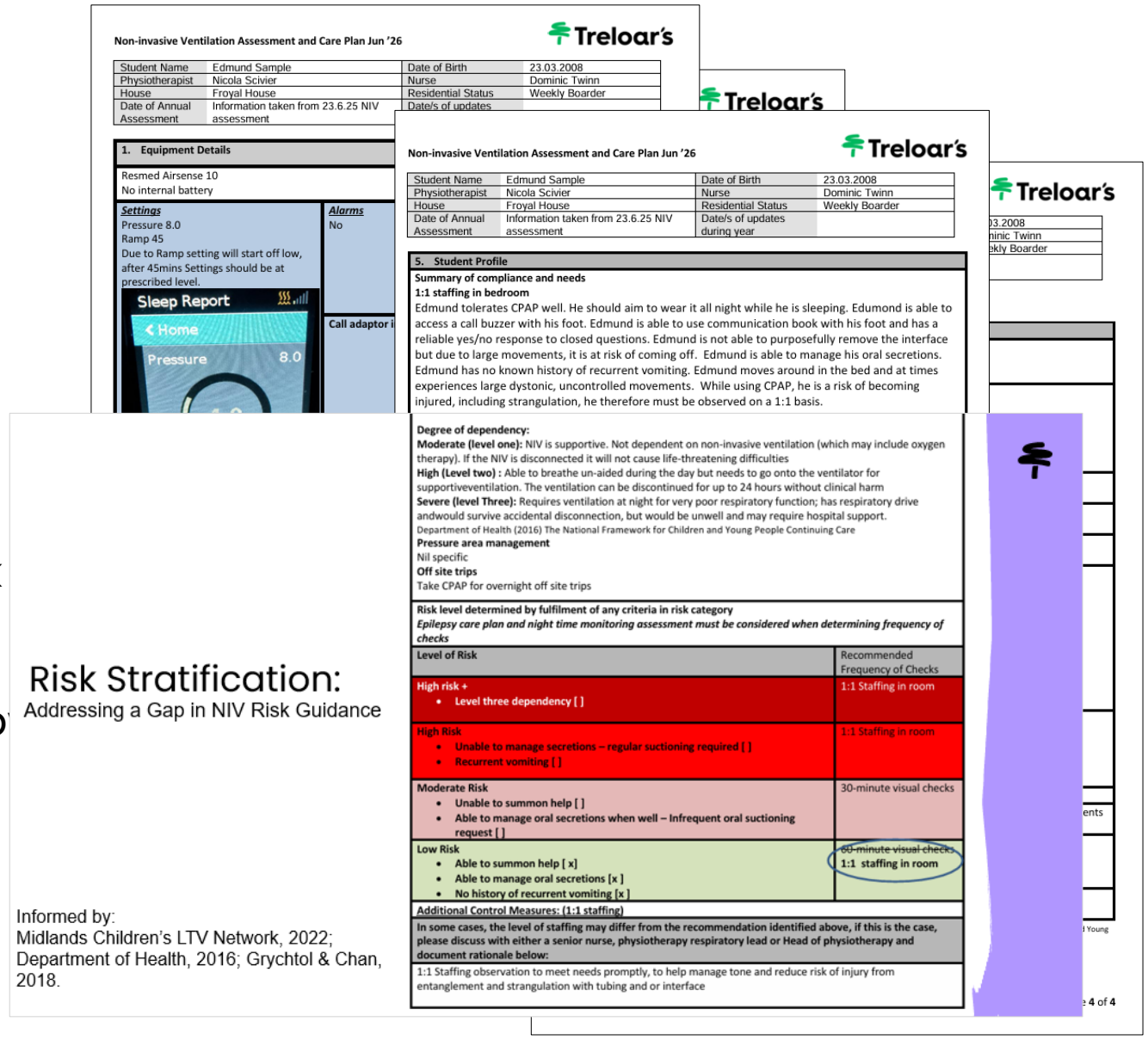
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Non-invasive Ventilation Assessment and Care Plan Jun '26

Treloar's

Student Name	Edmund Sample	Date of Birth	23.03.2008
Physiotherapist	Nicola Scivier	Nurse	Dominic Twinn
House	Froyal House	Residential Status	Weekly Boarder
Date of Annual Assessment	Information taken from 23.6.25 NIV assessment	Date/s of updates during year	

1. Equipment Details

Resmed Airsense 10
No internal battery

Settings
Pressure 8.0
Ramp 45
Due to Ramp setting will start off low, after 45mins Settings should be at prescribed level.

Alarms
No

Sleep Report
Home
Pressure 8.0

Call adaptor i

5. Student Profile

Summary of compliance and needs
1:1 staffing in bedroom
Edmund tolerates CPAP well. He should aim to wear it all night while he is sleeping. Edumond is able to access a call buzzer with his foot. Edmund is able to use communication book with his foot and has a reliable yes/no response to closed questions. Edmund is not able to purposefully remove the interface but due to large movements, it is at risk of coming off. Edmund is able to manage his oral secretions. Edmund has no known history of recurrent vomiting. Edmund moves around in the bed and at times experiences large dystonic, uncontrolled movements. While using CPAP, he is a risk of becoming injured, including strangulation, he therefore must be observed on a 1:1 basis.

Degree of dependency:
Moderate (level one): NIV is supportive. Not dependent on non-invasive ventilation (which may include oxygen therapy). If the NIV is disconnected it will not cause life-threatening difficulties
High (Level two) : Able to breathe un-aided during the day but needs to go onto the ventilator for supportiveventilation. The ventilation can be discontinued for up to 24 hours without clinical harm
Severe (level Three): Requires ventilation at night for very poor respiratory function; has respiratory drive andwould survive accidental disconnection, but would be unwell and may require hospital support.
Department of Health (2016) The National Framework for Children and Young People Continuing Care
Pressure area management
Nil specific
Off site trips
Take CPAP for overnight off site trips

Risk level determined by fulfilment of any criteria in risk category
Epilepsy care plan and night time monitoring assessment must be considered when determining frequency of checks

Level of Risk	Recommended Frequency of Checks
High risk + • **Level three dependency [ ]**	1:1 Staffing in room
High Risk • **Unable to manage secretions – regular suctioning required [ ]** • **Recurrent vomiting [ ]**	1:1 Staffing in room
Moderate Risk • **Unable to summon help [ ]** • **Able to manage oral secretions when well – Infrequent oral suctioning request [ ]**	30-minute visual checks
Low Risk • **Able to summon help [x]** • **Able to manage oral secretions [x]** • **No history of recurrent vomiting [x]**	~~60-minute visual checks~~ **1:1 staffing in room**

Additional Control Measures: (1:1 staffing)
In some cases, the level of staffing may differ from the recommendation identified above, if this is the case, please discuss with either a senior nurse, physiotherapy respiratory lead or Head of physiotherapy and document rationale below:
1:1 Staffing observation to meet needs promptly, to help manage tone and reduce risk of injury from entanglement and strangulation with tubing and or interface

Risk Stratification:
Addressing a Gap in NIV Risk Guidance

Informed by:
Midlands Children's LTV Network, 2022;
Department of Health, 2016; Grychtol & Chan, 2018.

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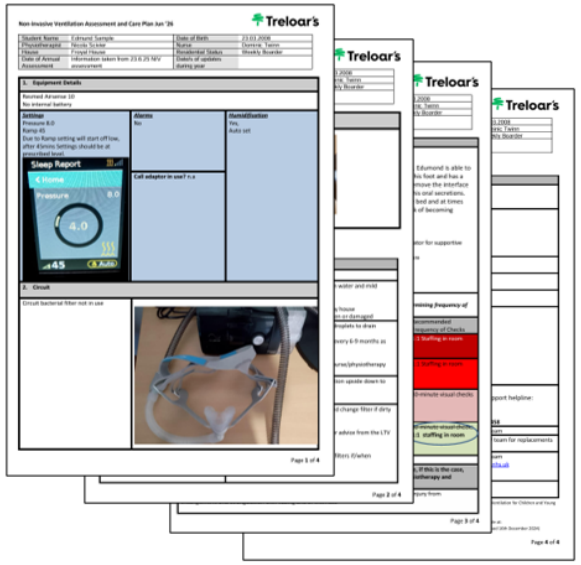
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The System

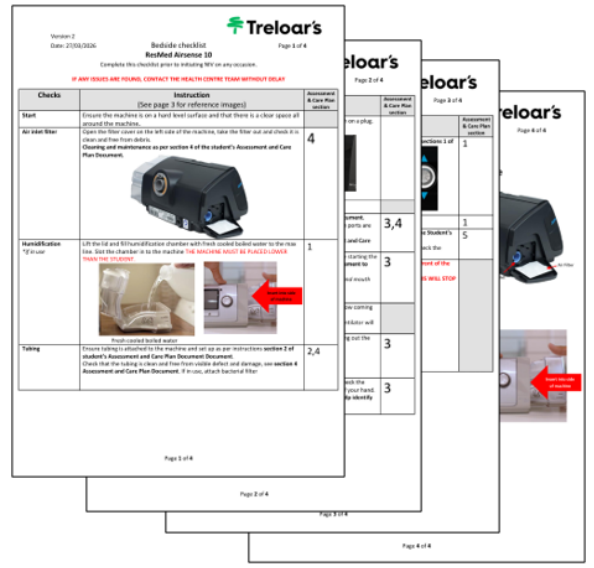
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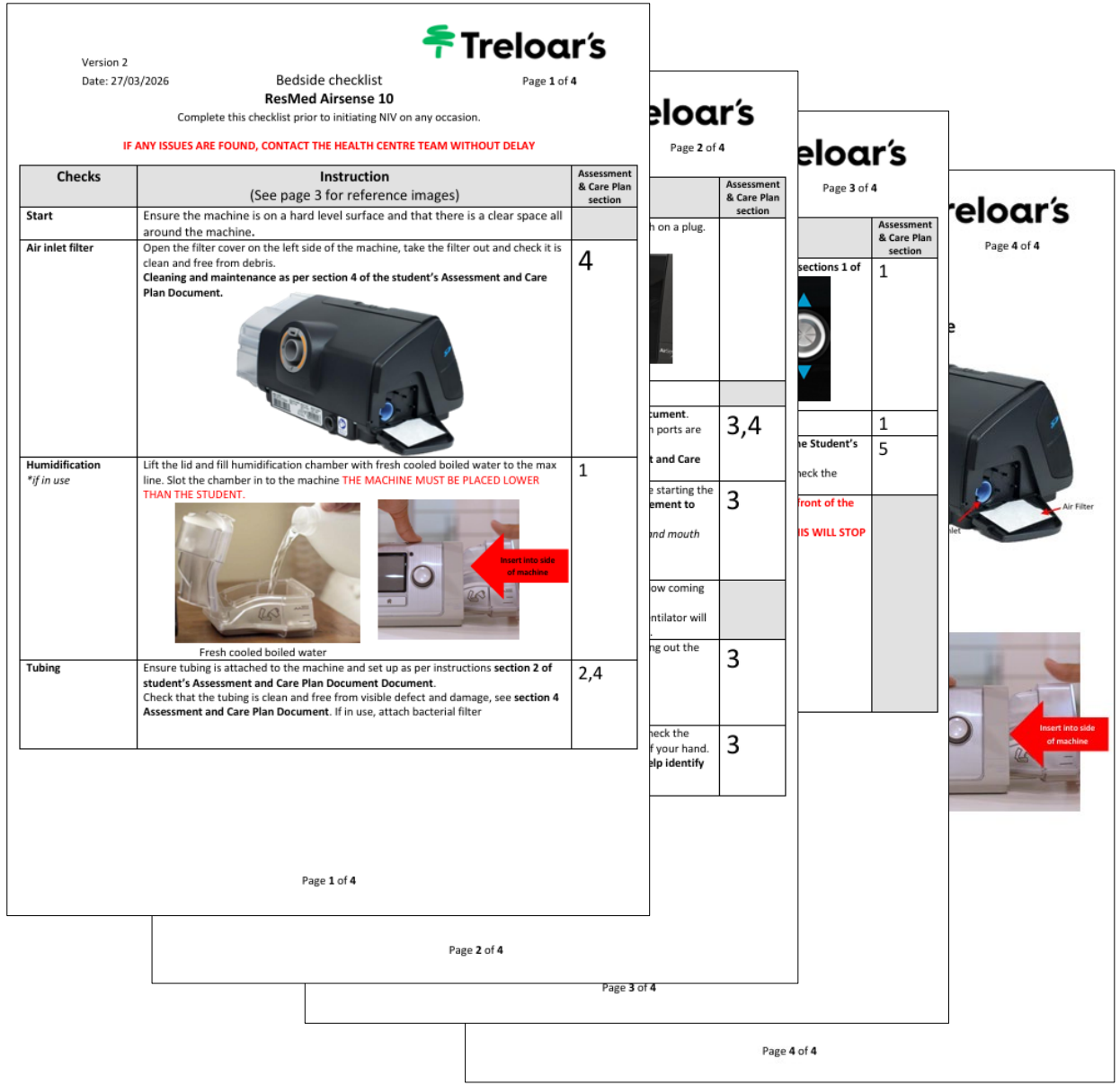
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Treloar's

Version 2
Date: 27/03/2026

Bedside checklist
ResMed Airsense 10

Page **1** of **4**

Complete this checklist prior to initiating NIV on any occasion.

IF ANY ISSUES ARE FOUND, CONTACT THE HEALTH CENTRE TEAM WITHOUT DELAY

Checks	Instruction (See page 3 for reference images)	Assessment & Care Plan section
Start	Ensure the machine is on a hard level surface and that there is a clear space all around the machine.	
Air inlet filter	Open the filter cover on the left side of the machine, take the filter out and check it is clean and free from debris. **Cleaning and maintenance as per section 4 of the student's Assessment and Care Plan Document.**	4
Humidification **if in use*	Lift the lid and fill humidification chamber with fresh cooled boiled water to the max line. Slot the chamber in to the machine THE MACHINE MUST BE PLACED LOWER THAN THE STUDENT. Fresh cooled boiled water	1
Tubing	Ensure tubing is attached to the machine and set up as per instructions **section 2 of student's Assessment and Care Plan Document Document**. Check that the tubing is clean and free from visible defect and damage, see **section 4 Assessment and Care Plan Document**. If in use, attach bacterial filter	2,4

Page **1** of **4**

Page **2** of **4**

Page **3** of **4**

Page **4** of **4**

Bedside Checklist

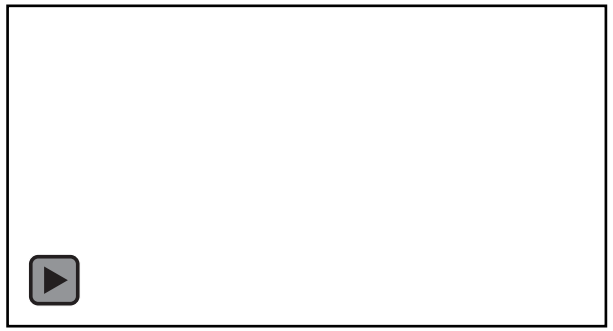
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Interface "mask" 	Is it clean and intact?
Anti-suffocation valve – before airflow start. 	Is it in the correct position?
Start Airflow	Turn on Ventilator.
Anti-suffocation vale – after airflow start. 	Has it changed position and is it moving freely?
Expiratory port. 	Is air flow coming out?

The Training Model

SharePoint NIV resource hub available throughout

In-house videos • bedside checklist walkthrough • revisit before, during and after assessment



Continued Learning: Regular Practice checks

Competency: generic NIV Staff member competent to use A NIV machine without supervision.

Summative assessment: Simulated or with CYP or simulated with a Nurse

Formative assessment: Simulated practice with a trained HCA or Nurse.
Two or More.

Student Specific Preparation: Review care plan + checklist.

Theory and Practical session *(2 hour)*:
Hands on with student specific ventilator and interface

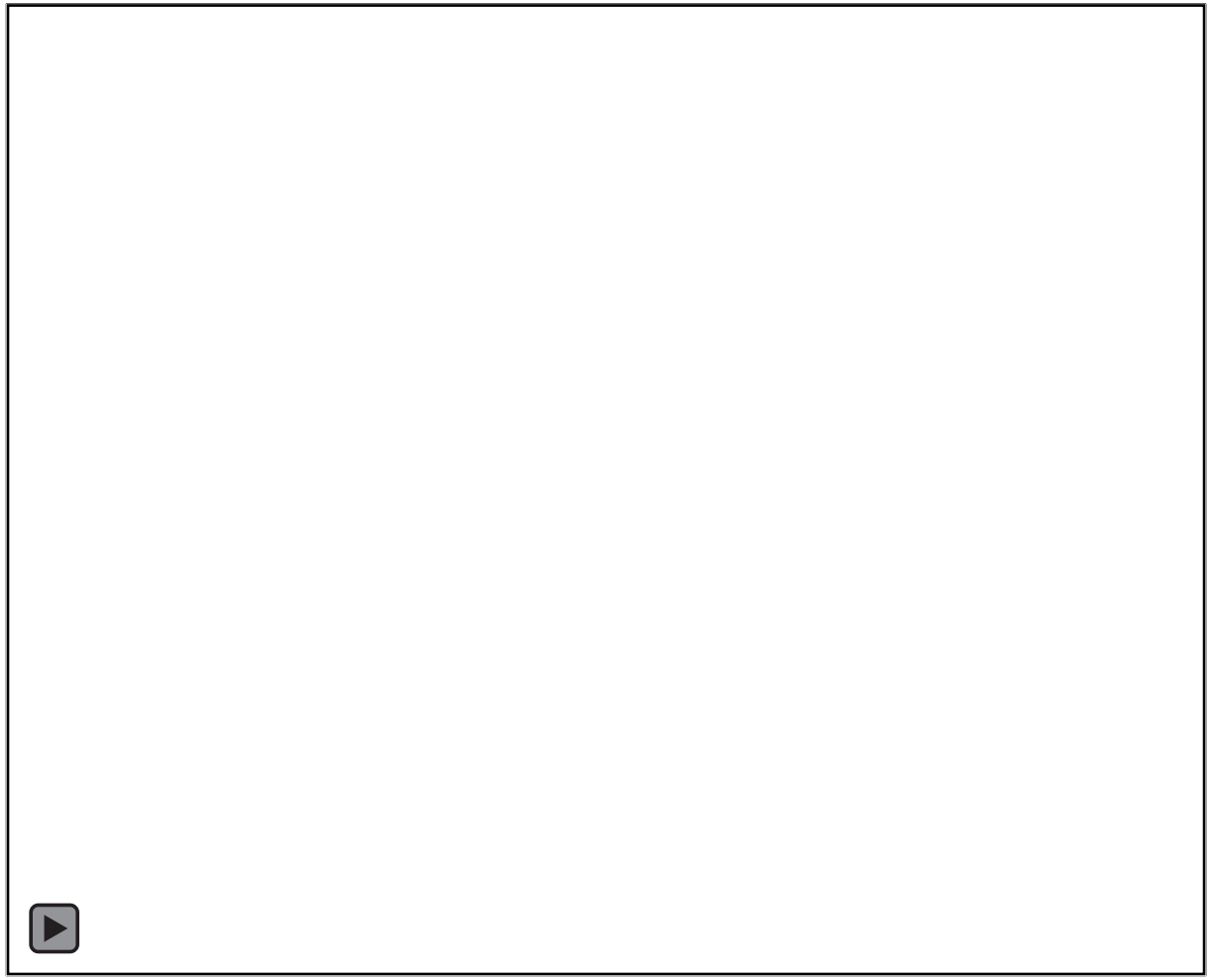
Foundations: Staff member is familiar with CYP.

Learning Loop: when ventilator is unfamiliar

CYP safety + learner knowledge, skill and **confidence**

Competency assessment

Shifting the Focus:
From Machine to Child



Impact:

Early implementation evidence

Improving Conditions



Staff confidence



CYP Feedback



Key Take Away

1. Standardise your system
2. Risk stratify the individual
3. Develop staff before they reach the child

Questions?

References

Department of Health (2016) *National Framework for Children and Young People's Continuing Care.* GOV.UK, [online] Available at: https://assets.publishing.service.gov.uk/media/5a80e998ed915d74e623126b/children_s_continuing_care_Fe_16.pdf (Accessed 16th December 2024)

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Midlands Children's Long Term Ventilation Network (2022) *Quality Standards: Services Providing Long Term Ventilation for Children and Young People* . Midlands Children's Long Term Ventilation Network Version 5.