University Hospitals of Leicester NHS
NHS Trust

Non Invasive Ventilation in Acute Hypercapnia Respiratory Failure at LRI UHL Policy

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Name of Responsible Committee/Individual:	Andrew Furlong – Medical Director
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CONTENTS

REVIEW DATES AND DETAILS OF CHANGES MADE DURING THE REVIEW

V1 – reviewed November 2013 – Policy updated into new Trust template

- Reviewed August 2020 – policy updated to include COVID – 19 updates.
- Reviewed January 2024 – Updated AGP guidelines, updated BTS guidance, ward updates, Phillips trilogy competency.

KEY WORDS

Non-Invasive Ventilation, NIV, Hypercapnia, Type 2 Respiratory Failure

SUMMARY

This policy document is intended as guidance for staff commencing Non-Invasive Ventilation at the Leicester Royal Infirmary (LRI) for the management of hypercapnia respiratory failure. This policy will document required education for all disciplines in preparation for commencement of NIV and areas of safety to deliver the intervention. Staff responsibilities regarding commencement management and reporting of audits will also be addressed

1 INTRODUCTION

1.1 This document provides guidelines, for the management of Non - Invasive Ventilation (NIV) in Acute Acidotic Hypercapnia Respiratory Failure, this includes but not limited to patients with exacerbation of Chronic Obstructive Pulmonary Disease (COPD), neuromuscular disease, obesity hypoventilation, that is not responding to maximal medical therapy. It is for a specific group of patients with single system failure in whom NIV is intended as a short-term treatment and provides a three-step approach to identification, monitoring and transfer of patients requiring non-invasive ventilation.

1.2 NIV is the delivery of mechanical pressure to support the patient's inspiratory effort via either a full-face mask or nasal mask.

1.3 A glossary of terminology and all abbreviations used within this guidance can be found in (Appendix 1)

2 POLICY AIMS

2.1 The standards in this policy aim to rationalise the implementation and management of NIV therapies implemented on the Acute Care Bay (ACB) and Emergency Department (ED) at the Leicester Royal Infirmary (LRI).

2.2 This policy outlines

a) The point of need for NIV and patient inclusion criteria

b) Training and competencies required to prescribe, commence and manage NIV

c) Requirements for safe delivery of NIV on ACB and ED at LRI

d) Guidance for management of patients requiring NIV for greater than 48 hours

3 POLICY SCOPE

3.1 This policy applies to doctors, nurses and physiotherapists working in ACB and ED at the LRI. DART (Deteriorating Adult Response Team) Practitioners acting in support are also included.

3.2 Patients must be nursed by staff with the appropriate skills and knowledge to deliver safe NIV. Nurses within ED Resus and Acute Care Bay (ACB) are required to complete the NIV teaching package (available in H E L M) and receive training from the Education and Practice Development team in the respective environment.

3.3 Patients receiving NIV must be nursed in areas of close observation identified in ED and ACB. This is inclusive of Resus department in ED and ACB only. In those patients where NIV is not the ceiling of therapy, an Intensive Care referral should be made. Patients who develop acute acidotic hypercapnia respiratory failure who have received optimal medical management who now require NIV at the Leicester General Hospital, the medical team are to contact DART and the ACB registrar and/ or the CDU/ respiratory registrar to refer the patient for immediate transfer to ACB/ CDU as no NIV capacity at LGH. (Please note that this policy does not cover NIV at the LGH site)

3.4 Where necessary, nurses should be supported by medical staff, DART Practitioners/Physiotherapists and other allied health professionals trained in the delivery of NIV.

3.5 This policy applies to adult patients suffering hypercapnic respiratory failure only. Inclusion criteria should be reviewed for each patient prior to NIV commencement, to deem if the therapy is appropriate (see appendix3)

3.6 NIV can only be prescribed by those regulated healthcare professionals (Doctor, DART, Practitioner, Senior Physiotherapist) deemed competent to prescribe it (see appendix 5).

3.7 The emphasis always should be transfer of the patient once stable to the Glenfield Hospital for ongoing management by respiratory specialists where required (see appendix 8 for transfer guidance and checklist)

3.8 For any NIV advice during daytime hours 8:30-5pm weekdays please contact the Respiratory Registrar on call or the Respiratory support team (RST) at Glenfield ward 20.

4 DEFINITIONS

Non-invasive ventilation - NIV (often interchanged with the abbreviation NIPPV) allows for bi-level positive pressure ventilation to be applied throughout the whole of the respiratory cycle whilst breathing spontaneously and without any conduit access to the airways. Application of inspiratory positive airway pressure (IPAP) and expiratory positive airway pressure (EPAP) decreases the work of breathing thereby improving alveolar ventilation and minute ventilation, facilitating oxygenation without raising PaCO2.

NIV also assists in unloading the respiratory muscles by reducing the trans-diaphragmatic pressure, pressure time index of respiratory muscles and diaphragmatic electromyography activity this leads to alteration in breathing pattern with an increase in tidal volume, decrease in respiratory rate and increase in minute volume whilst assisting in overcoming intrinsic peep. This allows better clearance of Co2 allowing pco2 to decrease.

In addition, NIV facilitates in resetting the respiratory centre ventilatory response to $PaC0_2$.

5 ROLES AND RESPONSIBILITIES

5.1 It is essential that ALL patients requiring acute NIV at LRI are to be nursed on an appropriate area i.e. ACB or ER. All staff MUST follow infection prevention guidelines by wearing appropriate Personal Protective Equipment (PPE). Those patients who utilise overnight NIV/CPAP can be cared for on any ward with the support of DART. Any issues bleep DART

5.2 Executive Lead Andrew Furlong – Medical Director

The Medical Director is Executive Lead for this Policy and has appointed a Senior Lead Clinician to act on their behalf. The Senior Lead Dr Alys Scadding is responsible for:

a) Providing an advisory, training and monitoring role on all aspects of NIV usage in acute hypercapnia respiratory failure

5.3 Named lead consultants within ED and ACB and Head of Nursing are responsible for:

a) Ensuring this policy is disseminated and implemented within their Clinical Management Group (CMG)

b) Identifying a 'sub lead' to support the implementation, training and monitoring of this policy and guidelines (see section 7)

c) Ensure staff can attend training as necessary in line with service need and as identified in their annual appraisal

d) Ensure staffs are aware of NIV audit process and are comfortable with its commencement, implementation andsubmission.

5.4 Consultant in charge of the Patient:

a) Has overall responsibility for the care of the patient

b) Provide advice and support to their medical team if concerns or issues are raised regarding

Training needs or competence

c) Ensure any incidences regarding pleural aspiration or chest drains are reported through Data

5.5 DART practitioner:

a) Provide support and guidance with commencement, implementation and ongoing management of NIV

In the case of patients receiving NIV who would be deemed suitable for ITU support, act as liaison with ITU to keep informed

5.6 Nursing Staff are responsible for:

Ensuring the care of patients requiring NIV usage in acute hypercapnia respiratory failure is provided in line with this policy and its associatedguidelines.
Any patient who brings into hospital their own NIV/CPAP machine must be referred to DART bleep 5293.

5.7 All staff undertaking the commencement of NIV or providing care for patients receiving NIV are responsible for:

a) Ensuring they are compliant with the standards set out in this policy and associated guidelines

b) Work within their own competence and act on any identified trainingneeds

c) Gain consent from patients (except in the event of a life-threateningemergency)

d) To report all incidents involving NIV (including near miss events) via the DATIX incident reporting system

5.8 Staff commencingtherapy

a) NIV must only be prescribed by Healthcare Professionals (Doctor, DART Practitioner, specialist nurses/RST and Senior Physiotherapist). This prescription must be documented in the patient medical notes.

5.9 Prior to commencement, it is the responsibility of the health care professional initiating NIV to discuss therapy implications with senior members of the parent team and negotiate transfer to an area of safety (ED resus/ACB). It is the responsibility of the health care professional instigating NIV to remain with the patient while an area of safety becomesavailable.

6 POLICY STATEMENTS AND PROCEDURES

6.1 Indications for NIV implementation

6.1.1 Patients may be suitable for NIV if they **have known or suspected COPD** and all the following features of Acute Hypercapnia Respiratory Failure:

a) Arterial pH <7.35 with PaCO2 >6.5

b) Arterial pH < 7.35 with PaCO2 > 6.5 **who are not for escalation to critical care,** resuscitation status and plan if NIV fails is mandatory to patient care. Escalation plan and NIV failure plan should be considered prior to NIV commencement.

c) Arterial pH < 7.35 with PaCO2 > 6.5 **who are for escalation to critical care**. Review by critical care (SpR or above)/Respiratory Physician should be sought at time of NIV commencement

6.1.2 For non-COPD patients' advice should be sought from medical registrar/ respiratory registrar/ RST or DART regarding use of NIV prior to its commencement

6.1.3 All patients requiring NIV at the LRI site should be referred to DART.

6.1.4 Patients requiring NIV therapy should receive this therapy at the point of need regardless of location once referred to the medical registrar on ACB and agreed that NIV therapy is suitable and accepted to go to ACB/Glenfield hospital. DART will stay with the patient on the ward until a suitable bed is available.

6.1.5 Upon stabilisation, steps should be taken to transfer the patient to a clinical area familiar with NIV usage (ED Resus/ACB/GH)

Other precautions for NIV therapy

NIV may be used in the following patients if this is to be the ceiling of therapy. Please seek expert advice (Respiratory SPR and/or Acute Medical Consultant/Critical Care SpR/Consultant/ DART) if NIV is to be considered in a patient with hypercapnia and one of the following: -

a) Life threatening hypoxemia

b) Severe co-morbidity

c) Confusion/agitation/severe cognitive impairment

d) Upper gastrointestinal surgery

e) Copious respiratory secretions

f) Bowel obstruction

g) Pneumonia

In patients suffering hypercapnia and any of the above for whom NIV is not the ceiling of therapy a Critical Care referral should be made

6.2 Contraindications for NIV

Absolute

a) Facial deformity/burns/trauma/recent facial or upper airway surgery

b) Fixed upper airway obstruction

Relative

c) Undrained pneumothorax/haemothorax

d) Inability to protect airway

e) GCS <8, confusion/agitation

f) ph. <7.15

g) Cognitive impairment warrants enhanced observation

NIV NOT indicated – refer to ITU for consideration of Invasive mechanical ventilation (IMV) if increasing respiratory rate/distress or PH <7.35 and Pco2 > 6.5

h) Acute asthmatic attack
i) Pneumonia

For troubleshooting guide (see appendix 6)

6.3 Location for NIV delivery

6.3.1 NIV therapy must be delivered in areas experienced in its management. At LRI this is ED Resus and ACB. In the case of patients requiring NIV for acute hypercapnia respiratory failure outside of these areas, transfer to ACB should be a priority.

6.3.2 The emphasis always should be transfer of the patient once stabilised to the Glenfield Hospital site for on-going management by respiratory specialists where required. Refer to (appendix 8) for the checklist to facilitate a safe transfer to Glenfield.

6.3.3 Patients requiring acute NIV within the ER should be referred to the respiratory support team (RST) via an electronic referral on nerve centre.

6.5 Specific Care for Patients Requiring NIV

6.5.1 Parameters for medical assistance/intervention must be set and clearly documented in patient records PRIOR to NIV commencement

6.5.2 Pre NIV baseline observations must include:

ABG (arterial blood gas)

a) Blood Pressure

b) Pulse

c) Respiratory Rate

d) Oxygen saturations

e) Percentage of oxygen delivered

6.5.1 Upon commencement of NIV therapy patients must receive 15-minute observations for first hour and hourly observations for minimum of 4 hours. Further observations must be completed as clinical condition dictates and no less than 4 hourly while NIV continues.

6.5.2 All patients receiving NIV must receive continuous SpO2 monitoring for the first 24 hours or until no longer acidotic

6.5.3 All patients receiving NIV must receive continuous ECG monitoring during the acute phase of NIV.

7 EDUCATION AND TRAINING REQUIREMENTS

7.1 Before commencement of NIV, the operator must meet all the required training. Each training requirement must be repeated annually to ensure competency via HELM https://www.e-lfh.org.uk/programmes/acute-niv/

7.2 In addition, the respiratory support team at Glenfield Hospital offers a NIV study day which can be booked via HELM to anyone who has responsibility for caring and managing patients who are receiving acute and long-term NIV in the hospital setting.

7.3 Training paths available include: -

7.3.1 Emergency Department Non-Invasive Ventilation training

Involves a NIV study day, practical demonstration and assessment in the workplace. Requires completion of a supervised practice booklet

7.3.2 Non-Invasive Ventilation for Ward Nurses

Involves a NIV study day and ward-based equipment competency assessment (See Appendix 9)

7.3.3 Non-Invasive Ventilation for Doctors

Involves a HELM information package.

7.3.4 Non-Invasive Ventilation for DART Nurses

Involves a NIV study day and completion of equipment and competency assessment (See Appendix 9)

7.2.4 Non-Invasive Ventilation for Physiotherapists and Allied Health Professionals

Completion of an equipment and skills competency package

8 PROCESS FOR MONITORING COMPLIANCE

8.1 The audit is completed for all patients on acute and long-term NIV admitted to GH either directly or from LRI. Auditing time of decompensation, ABG'S during the acute phase, and area therapy started. Audit finalised when:

a) Therapy is discontinued

b) Patient dies receiving therapy

8.2 Key performance indicators for NIV audit include:

a) Suitability of treatment based on inclusion criteria

b) Diagnosis

c) Effect of treatment after 1 hour and "door to mask time" including one-hour medical therapy for COPD patients

d) Effect of treatment after 4-6 hours

e) Outcome of therapy

f) Hospital mortality

g) Mortality by location

g) Complimentary therapies

8.3 If Concerns in care are highlighted with regards to NIV and its management a Datix from must be completed and the following should be made aware, Parent Consultant, the ward manager of the clinical area and a member of DART.

9 EQUALITY IMPACT ASSESSMENT

9.1 The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.

9.2 As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

10 SUPPORTING REFERENCES, EVIDENCE BASE AND RELATED POLICIES

This policy has been adapted from the British Thoracic Society Guidelines for management of patients with COPD suffering acute type 2 respiratory failure.

The Use of Non-Invasive Ventilation in the management of patients with chronic obstructive pulmonary disease admitted to hospital with acute type II respiratory failure (With particular reference to Bi-level positive pressure ventilation), 2008. Mike Roberts, Katharine Young, Paul Plant, Louise Restrick, Robert Winter, Alistair Reinhardt, Christine Mikelsons, Sunny Kaul, Joanna Brown, Katie Scales, Karen Reid https://www.brit-thoracic.org.uk/quality-improvement/guidelines/niv/ (Accessed 10/11/2023)

11 PROCESS FOR VERSION CONTROL, DOCUMENT ARCHIVING AND REVIEW

11.1 This document will be uploaded onto SharePoint and available for access by Staff through Insite. It will be stored and archived through thissystem.

11.2 This document will be reviewed every three years by DART.

Appendix 1: Definitions

NIV- Non-invasive Ventilation

Use of a positive pressure system to assist and support the spontaneous respiratory effort of a patient. Support will be supplied in a biphasic manner (Alternating level of positive pressure between inspiration and expiration) via a specialist ventilator and facemask.

IPAP- Inspiratory Positive Airway Pressure

Minimum level of pressure exerted upon patient at the point of inspiration, encouraging improved gaseous exchange. Measured in cmH20

EPAP- Expiratory Positive Airway Pressure

Minimum level of pressure exerted against expiratory effort of patient. This ensures a minimum level pressure within NIV system, promoting alveolar reclamation. Measured in cmH20

Type 1 respiratory failure

Relative hypoxia in absence of hypercapnia

Type 2 respiratory failure

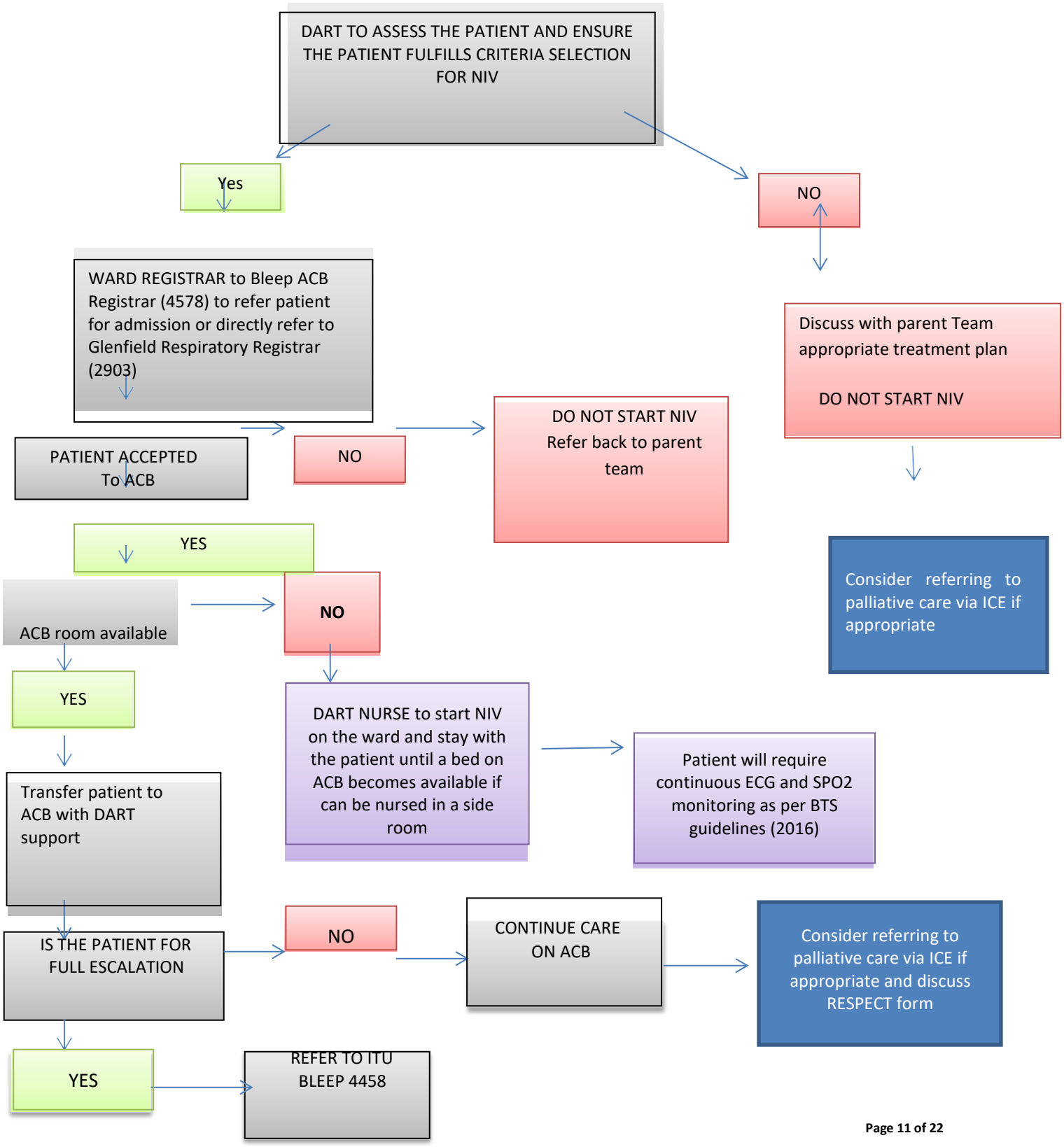
Relative hypoxia in presence of hypercapnia

Hypercapnia

Serum Carbon Dioxide levels >6.5 KPa

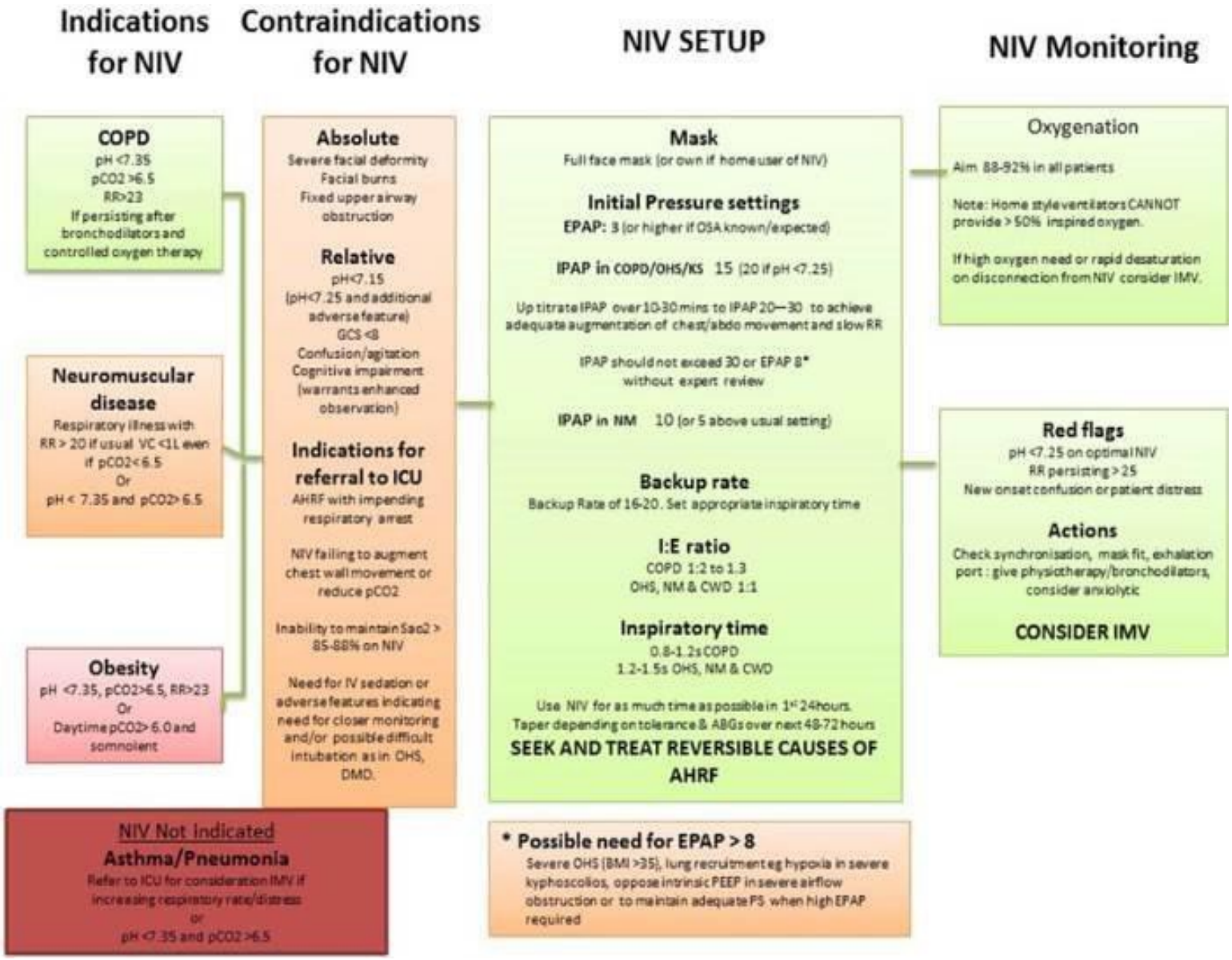
Appendix 2

ACB NIV Admission Flow chart



Appendix 3

BTS Guidelines (2016) for Clinical Management of NIV in Acute Hypercapnia Respiratory In Adults



Guidelines for Clinical Management of NIV in Acute Exacerbation of Acute Acidotic Hypercapnic Respiratory Failure on ACB and ED at LRI Site

Patient fulfils criteria selection for NIV (Refer to appendix 3)

Establish NIV

- Pressure Support
- Full face mask
- IPAP commence at 10 cms H20 increasing, as tolerated to 20 - 30 cms H20 within the first 10-15 mins
- EPAP 4cm H_2O
- Back up rate 12-15 bpm and Ti to 1sec
- Set alarms and Lock machine
- Additional O_2 to keep SpO_2 88-92%
- Continuous saturation & ECG monitoring
- Complete NIV Patient record (step 2)

Set calling parameters with medical staff

Repeat ABG's 1 hour later

STABLE/IMPROVED

- PH stable/improved PCO_2
- stable/improved RR stable SpO_2 88-92%
- Clinically improved

Continue NIV at current settings as tolerated with minimal interruption for 1st 24hrs

- Repeat ABG 4-6 hours later
- Refer to Respiratory Consultant at Glenfield Hospital for ongoing management

STABLE/IMPROVED

- Continue NIV at current settings as tolerated for 1st 24hrs with minimal interruption
- Arrange transfer to GGH
- Follow/complete NIV transfer sheet (Step 3)

FAILURE TO RESPOND/DETERIORATION

- pH falling
- $PaCO_2$ rising
- PaO_2 falling
- Clinically deteriorating

In all cases optimise NIV*

- Assess for leakage
- Check ventilation circuit
- Check ventilation adequate
- Assess for pneumothorax/aspiration
- Check medical treatment delivered
- Check patient synchronisation with ventilator

$PaCO_2$ Rising

- Aim for max IPAP up to 25cm H_2 0
- Adjust O_2 delivery aim for SpO_2 88- 92%
- Check trigger sensitivity

PaO_2 Falling

- Increase FiO_2
- Increase EPAP (and Increase IPAP to maintain Pressure Support difference)
- Do not increase EPAP over 7cm H_2 0

Improvement

Yes

Continue

- Refer to respiratory consultant for transfer
- Follow/complete transfer sheet (Step3)

No

- Re -assess patient
- Review treatment
- Consider discontinuing NIV and palliation

Training for Non-medical staff to enable prescription of NIV for patients on ACB and ED at LRI Site

Authorised Personnel

All professionals who undertake this role must fulfil all the following criteria: -

Nurse

- Registered nurse with the NMC
- Regularly care for patients requiring advanced respiratory support (CPAP, High Flow)
- Member of DART
- Able to instigate basic resuscitation measures
- Possess current basic life support certificate

Physiotherapist

- Named registered physiotherapist with HPC working within respiratory care at Band 7 or above/ Band 6 with 3 years respiratory physiotherapy experience
- Regularly care for patients requiring advanced respiratory support (CPAP, High flow)
- Able to instigate basic resuscitation measures
- Possess current basic life support certificate

All Authorised Personnel must:

- Only develop practice in relation to the appropriate part of their registrar
- Accept accountability for their practice
- Attend a training session on NIV machine including setting of parameters, changing parameters, setting alarms, locking machine and trouble shooting.
- Complete education competencies associated with machine (see appendix 3)
- Complete specialist nurse scenarios via on-line assessment
- Complete NIV theoretical competencies (see appendix 4)
- Demonstrate an understanding of Arterial Blood Gas analysis
- Demonstrate an understanding of Respiratory physiology
- Demonstrate understanding of altering NIV parameters in relation to interpretation of Arterial Blood Gases
- Up to date with Basic Life Support Training
- Be aware of and demonstrate understanding of the following documents:

Potential Complications/Trouble shooting for NIV Appendix 6

Complication	Cause	How to avoid/ What to do
Pneumothorax	• Resulting from high inspiration pressures in patients with bullous disease	Limit IPAP </= 25cm H_2O where possible. If suspected discontinue NIV apply oxygen via reservoir bag 15L/min and call for urgent senior assistance
Hypotension	• Increased intra-thoracic pressure and decreased venous return • Development of auto-peep	Assess patient's volume status and ensure patient is appropriately fluid resuscitated. Ensure NIV settings allow for full expiration
Failure to ventilate	• Poor interface or clinical sensitivity not set • Sub-optimal treatment of underlying condition • Development of complications • Clinical deterioration	Clinically reassess, optimise therapy. Including titration of IPAP & EPAP pressures appropriately. Seek advice from RST at earliest opportunity. Failure to improve consider palliation
Upper airway Obstruction	• Drop in conscious level	Discontinue NIV. Head tilt chin lift, apply oxygen and call for urgent senior assistance
Air Leak	• Interface not fitting well	A small air leak is acceptable as the machine will compensate. Monitor ABGs. If unable to find a suitable interface contact RST.
Increased risk of aspiration	• Patient may vomit and be unable to remove mask	Ensure patient is conscious and knows how to remove mask or call for nurse
Gastric distension & vomiting	• Caused by patient swallowing large amounts of air	Remove mask intermittently, (consider nasogastric tube but this is not common practice)
Retention of secretions	• Application of dry gases	Regular nebulisers, Ensure appropriate hydration (oral/ IV). Physiotherapy referral. Consider adjuncts for secretion removal
Pressure sores on nose and ears	• Inappropriate fitting mask • Mask applied to tightly	Check pressure areas regularly consider different interfaces.
Patient intolerance/Lack of compliance	• May feel unpleasant and more difficult to breathe. • Can feel claustrophobic	Reassure and explain benefits, consider intermittent NIV. Consider input from palliative care for symptom control.

Sleep Fragmentation	• Monitoring and treatment interventions	Ensure all interventions carried out simultaneously where possible to allow for sleep

Step 2

LRI NIV Record Part A

Patient details

Full name

DoB

Unit number

(use sticker if available)

- Date / Time NIV started _____
- NIV started in ☐ ER ☐ ACB
- ITU called ☐ Yes ☐ No ☐ N/A
- Responsible consultant _____
- Name & job role (middle grade or above) Of health care practitioner prescribing NIV _____
- GGH duty respiratory Consultant called? ☐ Yes ☐ No ☐ N/A

ABG prior to starting NIV

Time	
pH	
$PaCO_2$	
PaO_2	
Bicarbonate(actual)	
Base excess	
SaO_2	
FiO_2	
Respiratory rate	

Initial NIV Settings

Mask Size	☐ S ☐ M ☐ L ☐ Nasal (if even 'L' does not fit)
IPAP	
EPAP	
FiO_2 (L/min)	
SpO_2 on NIV	

Blood gases on NIV

	Date	Time	pH	$PaCO_2$ (kPa)	PaO_2	FiO_2 (L/min)	Notes
1h after NIV started							
4-6h after NIV started							
							• Refer to resp consultant at Glenfield Hospital view to transfer • Consider palliation if not clinically improving
12-24h after NIV started							
							Transfer to Glenfield Hospital once accepted

Medical calling parameters (to be completed by health care practitioner prescribing NIV)

		Signature / print name
RR < or >	Drop in conscious level	
SpO_2 <	Haemodynamic instability	

If at any time clinical condition or calling parameters are triggered medical staff must be notified.

LRI NIV Record Part B – NIV Prescription & Monitoring Chart

Patient details

Full name

DoB

Unit number

(use sticker if available)

- **Patients on NIV require continuous monitoring of**
  - SpO_2
  - ECG (during acute phase)
- **Respiratory rate and SpO_2 must be recorded**
  - every 15min during 1st hour after NIV started
  - hourly for 4 hours
  - thereafter as clinical condition requires
  - **viral filters to be changed daily**
- **Any changes to NIV machine and supplemental O_2 settings must be recorded and signed for**

Date	Time	IPAP / EPAP (only record if changed)	DAILY viral filter check	FiO_2 (only record if changed)	Resp rate	SpO_2	Facial pressure areas checked (Y/N)	Nurse initials
		/						
		/						
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Date / Time NIV was discontinued

Reason for discontinuing NIV must be documented in patient's notes

Appendix 8

GLENFIELD POLICY FOR TRANSFER OF PATIENTS INTO AND OUT OF THE UNIT (WARD 20/CDU)

Transfer destination

The ward is currently staffed to receive patients from LRI (most likely ACB) within working hours, currently **arriving** onto the ward between 9am and 8pm in order to be clerked by the ward or on call team and undergo senior review at a time when the most medical staff are in the hospital. This means that patients **referred** to the ward between 7am and 4pm will likely arrive between the times specified above. Patients being referred or arriving to the unit outside of those times should be admitted to CDU.

The SpR or Consultant in charge of the patient will discuss the case with either

1) the respiratory SpR taking referrals via bleep 2681 between 9am and 5pm or,
2) The on-call CDU SpR via bleep 2903 at all other times including weekends and Bank Holidays. The referral process and the handover of the patients is outlined in the diagram below:

Estimated arrival between 9 am to 8 pm Monday to Friday

- Once referral has been accepted staff in ED/ACB to contact GH bed co-ordinator and confirm that a bed will be available on **Ward 20** or **CDU** (if bed not available please follow pathway 2)
- Nurse in ED/ACB to handover patient to the responsible nurse on Ward 20 or CDU
- Ward 20/CDU nurse to inform ward junior doctors of patient accepted for transfer
- Junior doctor to contact on call SpR for handover
- Ward 20/CDU nurse to inform junior doctor when patient arrived to review within one hour with subsequent respiratory SpR senior review within four hours
- DART to be informed (Bleep 2808)
- Respiratory Registrar who accepted the patient is responsible to handover patient if they have not arrived before shift completed

Estimated arrival between 8 pm to 9 am Monday to Friday and anytime during weekends and Bank Holidays

- Once the referral has been accepted the nursing staff in ED/ACB should contact the GH CDU nurse in charge to confirm that a bed is available (every effort will be made to facilitate this) and arrange transfer
- Nurse in ED/ACB to handover patient to the responsible nurse on CDU
- CDU staff nurse to make sure that medical team on CDU are aware of patient transfer
- Junior doctor to review patient within one hour of arrival with subsequent CDU registrar review within four hours
- DART to be informed (bleep 2808)
- CDU Registrar who accepted the patient is responsible to handover patient if they have not arrived before shift completed

Step 3

LRI NIV checklist for transfers to Glenfield Hospital

Patient details

Full name

DoB

Unit number

(use sticker if available)

- Please retain this proforma in patient's record
- Transfers from **ACB** should not normally be undertaken out of hours
- Transfers of patients suitable for potential escalation to ITU care from **ED** should not be undertaken out of hours

Medical checklist

- Accepted by Glenfield Hospital respiratory consultant; _____ ☐

  Name

- Glenfield Hospital respiratory team has confirmed patient destination; _____ ☐

  Ward

- Nurse coordinator on Glenfield Hospital receiving ward contacted
  - Bed will be available (ED patients: within 4 hours of patient's arrival in ED) ☐
  - NIV machine will be available on ward ☐
- Resuscitation (DNAR) status of patient documented in patients notes ☐
- If escalation to ITU appropriate
  - Patient has been reviewed by LRI ITU team ☐
  - Glenfield Hospital ITU bed available ☐
  - Glenfield Hospital ITU medical staff contacted ☐
  - Glenfield Hospital critical care outreach team contacted (bleep 5293) ☐

Signature_____Role_____Print name_____Date_____Time_____

Nursing checklist

- Paramedic crew ambulance booked; _____ ☐

  reference number *time booked*

- Items prepared for transfer Patient record ☐ Property ☐ Medication ☐
- Next of kin notified of transfer reason, time and destination ☐
- Escort (e.g. HCA) available to bring NIV machine back to its LRI base ☐
- Receiving ward called immediately prior to patient leaving LRI - bed and NIV machine ready ☐

Signature_____Role_____Print name_____Date_____Time_____

Appendix 10

University Hospitals of Leicester NHS Trust Phillips Trilogy Evo
NON-INVASIVE VENTILATOR
Competency Checklist

Name:_____ Position:_____ Site: LRI

Competency Training Statement: Participant will demonstrate the theory of operation and practical application of the ventilator in a clinical setting

Performance Criteria	**Phillips Trilogy Evo**	
1) Demonstrate set up/operation and correct application of NIPPI inc a) Is able to list the safety features of the ventilator.	**Competency Date**	**Assessor**
B) Is able to safely connect AC power.		
C) Is able to ensure battery back-up is charged or charging.		
D) Is able to turn ventilator on/off.		
E) Is able to set-up tubing and interface components.		
f) Is able to select correct mode and set correct prescribed ventilator setting.		
G) Is able to set upper and lower flow pressure alarms.		
H) Is able to lock and unlock machine.		
I) Is able to attach oxygen correctly if required.		
J) Is able to attach and correctly use in line nebuliser.		
K) Is able to trouble shoot machine when alarms.		
L) Is able to disconnect and dispose of tubing correctly.		