Policy and Guidelines on the Training Requirements for Developing Competency in the Initiation and Management of Non-Invasive Ventilation (NIV)

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POLICY STATEMENT

The Irish Society of Chartered Physiotherapists (ISCP) expect members to adhere to the Policy and Guidelines.

PURPOSE

Over the past two decades physiotherapists have developed skills and competencies that are considered beyond the traditional role of physiotherapy. One such area of practice is in the initiation and management of Non-Invasive Ventilation (NIV). Many physiotherapists take a lead role in the delivery of NIV services, expanding the boundaries of physiotherapy practice and implementation of evidence-based practice and research.
The purpose of this document is to outline to all Physiotherapists the criteria for training required for the independent initiation and management of NIV and for achieving and maintaining competency.

SCOPE

The document applies to all Physiotherapists who are involved in or undertaking training for the independent initiation and management of NIV.

LEGISLATION AND RELATED DOCUMENTS

1. BTS/ICS Guidelines for the Management of Acute Hypercapnic Respiratory Failure in Adults 2019
2. NCEPOD-Inspiring Change: A Review of the quality of care provided to patients receiving acute non-invasive ventilation 2017
3. BTS NIV QI https://www.brit-thoracic.org.uk/quality-improvement/clinical-resources/non-invasive-ventilation/
    a. Appendix 8- Imperial College London competency framework
    b. Appendix 9- suggested levels of competencies

The information contained in the guidelines is intended to be used in conjunction with the Rules of Professional Conduct incorporating the Code of Ethics and Guidelines for Professional Behaviour (2010), the European Region (WCPT) quality Assurance Standards of Physiotherapy Practice and Delivery (2018), Scope of Practice and relevant employer policies.

GUIDELINES:

1. ENTRY REQUIREMENTS

The following Clinical Governance policies should be in place in the workplace:

(i) Managing unexpected effects

(ii) Safeguarding of adults

(iii) Infection prevention/control

(iv)NIV policy detailing governance structures

The Physiotherapist should be currently working with a Respiratory patient caseload that involves:

- Clinical knowledge of anatomy and physiology of the respiratory system
- Conducting a comprehensive respiratory assessment
- Timely use of diagnostic investigations
- Interpret assessment findings to determine diagnosis
- Comprehensive knowledge of treatment interventions
- Managing patients on NIV
- Informing patients and gaining informed consent
- Communication with the MDT
- Adhering to ISCP and local documentation guidelines

2. EVIDENCE OF RELEVANT CLINICAL EXPERIENCE

All staff who initiate and manage patients requiring NIV independently within their role need to be deemed competent. To gain this competency the following are expected:

- Have a minimum of 5 years post graduate experience with a minimum of 3 years working full time (or the equivalent part time) in the area of Respiratory care.

- Work at a level of clinical specialism where the prescription and management of NIV would be considered essential to the delivery of direct patient care.
- Be competent in arterial blood gas (ABG) sampling and actively sampling as part of their current role. Be competent in the interpretation of an ABG and able to take appropriate action.
- All staff should work closely with a Respiratory Consultant for governance with the consultant with governance for NIV in sites that do not have a Respiratory Consultant.
- All staff should partake in relevant CPD to enable them to continue to practice competently (keep up to date with relevant BTS, ERS, courses, webinars and research).
- Staff joining the Hospital with previous and recent (practiced in last 12 months) experience / transferable skills must provide signed evidence of their competence and then complete a single competency checklist with a competent practitioner (Appendix 2).
- As evidence of best practice, staff can have this skill peer reviewed at any time by a competent colleague to ensure practice is at the hospital's expected level.
- A copy of the competency document must be kept in the physiotherapist's department.
- It is the manager's responsibility to ensure that the competency is recorded in the physiotherapist's file.

3. ADDITIONAL TRAINING REQUIREMENTS

a. THEORETICAL TRAINING

Theoretical training in NIV management may be undertaken on site under the supervision of a Respiratory Consultant. Alternatively, the Physiotherapist may attend a course run by equivalent or specialist external providers e.g. MSc module in NIV.
The content listed below must be covered in either case.

- Analysis and exploration of the pathophysiological processes leading to respiratory failure.
- Evaluation of methods of non-invasive respiratory support and management and how best to apply these to ensure the most appropriate care of these patients.

- Objective review of the evidence in order to demonstrate advanced decision-making in assessment, support and provision of non-invasive ventilation to manage respiratory failure.
- Review and appraisal of published research findings to identify, access, transfer, and apply evidence to their own practice setting.

b. PRACTICAL TRAINING

- Observation by the Physiotherapist of a minimum of 3 patients who require NIV (e.g. COPD exacerbation) treated by a Respiratory Consultant/ other appropriate practitioner *. For those involved in the delivery of NIV to different patient groups e.g. COPD, neuromuscular conditions, restrictive disease due to chest wall deformities, COVID 19 or disorders of sleep, 3 observations per condition is required.
- Assessment and management of a minimum of 3 patients requiring NIV by the Physiotherapist under the supervision of the Respiratory Consultant / other appropriate practitioner. For those involved in the delivery of NIV to different patient groups e.g. COPD, neuromuscular conditions, restrictive disease due to chest wall deformities, COVID 19 or disorders of sleep, 3 supervised practicals per condition is required.
- A log book containing at least 6 signed competency checklists must be completed (appendix 2)

The trainer may elect to supervise further sessions until satisfied with the competency of the Physiotherapist. This must be recorded in the log book

*Appropriate practitioner may be a NIV competent Physiotherapist or advanced nurse practitioner (ANP) in NIV

APPENDIX A

CLINICAL COMPETENCIES SCORING:

The following competency scoring system should be used to assess knowledge

Score	Level of Competency	
1	The individual has no knowledge or technical skills in this area and needs step by step guidance in every aspect.	Not competent
2	The individual has some knowledge and is beginning to link to competent practice and needs specific direction and demonstration in new skills.	Not competent
3	The individual can give simple explanations for actions and can perform technical skills safely and competently without direct supervision. The individual knows when to ask for guidance for more complex cases.	Competent
4	The individual is able to relate theory to practice and provide a sound rationale for actions. The individual is able to carry out technical skills independently with speed and consistency. The individual is able to teach and supervise others at a basic level. The individual knows when to ask for guidance from the clinical expert for the most complex cases.	Competent
5	The individual is able to consider options, relate theory to practice and provide a sound rationale for actions. The individual is able to carry out technical skills independently with speed, consistency and confidence. The individual is able to teach and supervise others at a more advanced level. The individual is able to participate in decision making with others regarding complex cases and groups of patients.	Competent
6	The individual is a recognised clinical expert, in terms of knowledge and skills, and is able to demonstrate sound problem solving/decision making and perform the technical task with confidence in a complex case. The individual is able to lead wider clinical decision making at, and beyond, individual patient care. The individual is able to supervise and takes the lead in teaching others and delivering and evaluating innovative care	Competent

APPENDIX B

COMPETENCY FRAMEWORK AND LOG BOOK

Complete and sign one checklist for each observed and supervised practical assessment (six in total).

- For the observational practical sessions (3): tick each area of competence covered. (All areas must be covered before moving to the supervised practical assessment)
- For the supervised assessments (3): level of competence (1-6) should be recorded

The physiotherapist prescribing and managing NIV must be a clinical expert. The level of competency required for this role is 4-6 for all competency statements by the third assessment.

1. Competency checklist for observational practical sessions (complete 3)

Clinician:	Assessor: Job title:	Date:
Observational no:	Ward location:	Is this the final assessment:Yes/No

Competency statement No:	Competency statement	Tick if covered during intervention. N/A if not
1	To be able to understand the indication for NIV including recognition of respiratory failure	
2	To be able to define the term NIV/BIPAP	
3	To understand the differences between CPAP and NIV/BIPAP including differences in indications and contraindications	
4	To understand that NIV does not treat the underlying cause of respiratory failure and that additional medical management is required	
5	To understand that ceiling of care/escalation of treatment plans need to be discussed and documented should NIV treatment fail	
6	To be able to understand the appropriate care environment for the use of NIV	
7	To be able to select all equipment for ventilator set-up including appropriate interface for the patient	

8	To be able to ensure patient understanding and consent to NIV	
9	To be able to initiate NIV on a patient including selecting appropriate prescribed starting settings and understand the importance of emergency alarm settings	
10	To understand when and how to titrate NIV settings/adjust therapy to patients' condition and/or NIV prescription	
11	To be able to interpret NIV settings and modes of NIV	
12	To be able to obtain an ABG sample	
13	To be able to accurately interpret ABGs	
14	To be able to effectively and safely monitor a patient on NIV including observations and frequency of blood gases	
15	To be able to recognise and troubleshoot possible causes of no improvement following initiation of NIV	
16	To be able to monitor NIV compliance / synchrony and adequacy of ventilation and adjust comfort settings appropriately	
17	To be able to decide when it is appropriate to initiate breaks from NIV and make recommendations	
18	To be able to initiate and lead on a weaning plan	
19	To be able to manage a deteriorating patient on NIV and escalate concerns to appropriate teams	
20	To be able to recognise when NIV is failing and appropriate need for referral to palliative care	
21	Identify potentially appropriate patients for temporary / long term home mechanical ventilation	
22	To be able to provide NIV training to all members of the MDT and assess competence of staff delivering NIV care	
Clinician Signature:	Assessor signature:	Date:

2. Competency checklist for supervised practical assessments (complete 3)

Clinician:	Assessor: Job title:	Date:
Supervised practical no:	Ward location:	Is this the final assessment:Yes/No

Competency statement No:	Competency statement	Level of competence:
1	To be able to understand the indication for NIV including recognition of respiratory failure	
2	To be able to define the term NIV/BIPAP	
3	To understand the differences between CPAP and NIV/BIPAP including differences in indications and contraindications	
4	To understand that NIV does not treat the underlying cause of respiratory failure and that additional medical management is required	
5	To understand that ceiling of care/escalation of treatment plans need to be discussed and documented should NIV treatment fail	
6	To be able to understand the appropriate care environment for the use of NIV	
7	To be able to select all equipment for ventilator set-up including appropriate interface for the patient	
8	To be able to ensure patient understanding and consent to NIV	
9	To be able to initiate NIV on a patient including selecting appropriate prescribed starting settings and understand the importance of emergency alarms	
10	To understand when and how to titrate NIV settings/adjust therapy to patients' condition and/or NIV prescription	

11	To be able to interpret NIV settings and modes of NIV	
12	To be able to obtain an ABG sample	
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16	To be able to monitor NIV compliance / synchrony and adequacy of ventilation and adjust comfort settings appropriately	
17	To be able to decide when it is appropriate to initiate breaks from NIV and make recommendations	
18	To be able to initiate and lead on a weaning plan	
19	To be able to manage a deteriorating patient on NIV and escalate concerns to appropriate teams	
20	To be able to recognise when NIV is failing and appropriate need for referral to palliative care	
21	Identify potentially appropriate patients for temporary / long term home mechanical ventilation	
22	To be able to provide NIV training to all members of the MDT and assess competence of staff delivering NIV care	Date:
Clinician Signature:	Assessor signature:	

APPENDIX C

GUIDELINES FOR ASSESSORS

Competency	Guidance
1. To be able to understand the indication for NIV including recognition of respiratory failure	• To define type two respiratory failure: pH < 7.35 AND PaC02 ≥ 6.5 • To be able to recognise increase work of breathing as an indication for NIV • Recognises that there is no evidence-base for the use of NIV in patients with acute asthma exacerbations or pneumonia • To be able to identify the following as evidence-based indications for NIV: *Respiratory acidosis in acute exacerbations of COPD (pH < 7.35 AND PaC02 ≥ 6.5, RR > 23) *Neuromuscular Disease (respiratory illness with RR > 20 if usual VC < 1L or pH < 7.35 AND PaC02 ≥ 6.5) *Obesity: pH < 7.35 AND PaC02 ≥ 6.5, RR > 23 or daytime PaC02 ≥ 6.0 and drowsy *Rib fractures in Major Trauma Pathway • Recognises that there is no evidence-base for the use of NIV in patients with acute asthma exacerbations or pneumonia
2. To be able to define the term NIV/BIPAP	• NIV is the provision of ventilatory support through the patient's upper airway • NIV can be provided via a mask or similar device • NIV is a supportive measure only and doesn't treat the underlying cause of the patient's respiratory failure
3. To understand the differences between CPAP and NIV/BIPAP including differences in indications and contraindications	• Identifies that Continuous Positive Airway Pressure (CPAP) is not classified as NIV • Aware contraindications include: *Undrained pneumothorax (absolute) *Facial burns (absolute) *Fixed upper airway obstruction (absolute) *For at least 2 weeks post oesophagectomy (absolute) *pH < 7.15 (relative)

	• Explains that CPAP is used in the treatment of Type 1 Respiratory Failure (Pa02 < 8 kPa) and main indications include: *Atelectasis/decreased lung volumes/lung collapse *Pulmonary Embolism *Pulmonary Odema *Post-operative pain/pain from chest trauma *Infective process eg pneumonia • Explains that NIV is used in the treatment of Type 2 Respiratory Failure (pH < 7.35 AND PaC02 ≥ 6.5) • Indications given in competency 1 • Aware contraindications include: *Undrained pneumothorax (absolute) *Facial burns (absolute) *Fixed upper airway obstruction (absolute) *For at least 2 weeks post oesophagectomy (absolute) *pH < 7.15 (relative) *GCS < 8 (relative) *Confusion/agitation (relative) *Cognitive Impairment (relative) *Vomiting (relative)
4. To understand that NIV does not treat the underlying cause of respiratory failure and that additional medical management is required	• States that NIV is a supportive measure only • States patients should receive an hour of medical management following initial ABG showing Acute Hypercapnic Respiratory Failure (AHRF) prior to a repeat ABG to determine need for NIV • Aware that appropriate medical management can reverse respiratory failure without the need for NIV • States the following as medical management: *Controlled oxygen therapy to target SpO_2 *Nebulised bronchodilator *Steroids if clinically indicated *Antibiotics if clinically indicated *States this medical management should continue during NIV treatment

	*Recognises ordering a chest x-ray prior to NIV as good practice but that this should not delay NIV treatment
5. To understand that ceiling of care/escalation of treatment plans need to be discussed and documented should NIV treatment fail	• States that ceiling of care/escalation should be a shared-decision between patient (+/- their relative/carer) and the clinician • States that ceiling of care/escalation should be discussed prior to initiation of NIV • States that the following should be discussed: *Whether the patient would like NIV treatment *Whether the patient would like invasive ventilation *Whether the patient would like to be resuscitated in the event of cardiac arrest *Where the patient's level of care should take place: ward based, level 2, level 3
6. To be able to understand the appropriate care environment for the use of NIV	• Recognises there are designated NIV areas within the hospital where patients on NIV should be cohorted • Recognises that patients should receive continuous cardiac monitoring for at least the first 12 hours of NIV or until the initial respiratory acidosis has resolved • Recognises need for hourly observations for at least the first 12 hours of NIV treatment • Recognises that if the patient requires an arterial line they can only be managed in a level 2 care setting • Recognises those who are caring for patients on NIV across disciplines must be competent to do so • Recognises when the patient requires escalation to a higher level of care
7. To be able to select all equipment for ventilator set-up including appropriate interface for the patient	• Locate where the machine is stored • Selects circuit and bacterial filter • Selects full face mask, total face mask or hood – provides rationale for each including use of total face mask if the patient has pressure damage on the bridge of their nose, ensures interface has correct expiratory port • Demonstrates appropriate clinical hygiene measures before coming in contact with the patient or opening any equipment

	• Able to demonstrate correct use of size guide for mask • Nebuliser delivery (if an inline option is available) • Recognise/understand indications for humidification
8. To be able to ensure patient understanding and consent to NIV	• Demonstrates explanation to the patient (+/- their relative/carer) on NIV treatment, including: * Machine is designed to help breathing and to remove waste gas *Provides a constant flow of air when the patient breathes in *Requires a mask to be fitted on the patient's face, which will be strapped. It will be uncomfortable initially *The patient will need to wear the mask continuously for the first 24 hours, but will be allowed short periods of time off for mouth care/oral intake Ensures a shared-decision is reached between the patient (+/- their relative/carer) on whether NIV treatment is wanted
9. To be able to initiate NIV on a patient including selecting appropriate prescribed starting settings and understand the importance of emergency alarms	• Demonstrates correctly setting up the machine, including: *Attaching the circuit, bacterial filter and mask *Switches on the machine, recognising it should be plugged in to a mains electrical supply *Connects to wall compressed 02 (understands difference when using oxygen tubing to entrain oxygen) • Demonstrates awareness that if the patient previously on home NIV that the interfaces are not readily interchangeable with hospital ventilators • Selects S/T mode and provides rationale that this is spontaneous-timed, meaning the patient breathes spontaneously but the machine can provide timed breaths if the patient goes apnoeic • Sets the starting IPAP 10-15cmH20 and starting EPAP 4cmH20 • Sets the back-up rate 12-16 • Sets appropriate Fi02 for the patient • Sets appropriate inspiratory time and I:E ratio for patient's presenting condition (1:2-1:3 for COPD, 1:1 for NMD) • Sets appropriate rise time for patient's work of breathing (lower rise time for higher respiratory rate)

	• States the importance of emergency alarms in recognising deterioration in the patient's condition and is able to select the following: *Apnea alarm – alerts when the patient stops breathing *High respiratory rate – alerts when the patient's respiratory rate goes above set value *Low respiratory rate – alerts when the patient's respiratory rate goes below a set value *High tidal volume - alerts when the patient's tidal volume goes above a set value *Low tidal volume - alerts when the patient's tidal volume goes below a set value
10. To understand when and how to titrate NIV settings/adjust therapy to patients' condition and/or NIV prescription	• Checks for inappropriate large leaks/poor mask fit • States if PaC02 on ABG is deranged – increase IPAP to increase tidal volume • States if Pa02 on ABG is deranged (hypoxia) – increase EPAP or Fi02 and recognise rational for increasing IPAP by same amount • Recognises when the patient is ready to wean from NIV through correction of their respiratory acidosis but states the need to continue monitoring the patient during the wean for signs of deterioration in respiratory function
11. To be able to interpret NIV settings and modes of NIV	• IPAP: states IPAP supports patient's inspiration, increasing tidal volumes to assist for C02 removal. States that IPAP is always higher than EPAP • EPAP: states EPAP splints open airways to prevent atelectasis and improve oxygenation. States awareness that changes in EPAP can affect pressure support and therefore IPAP may need to be altered as a result • Fi02: states importance of ensuring Fi02 requirements meet target Sp02 prescribed • Rise time: states rise time is speed at which inspiratory pressure increases to the set target pressure • I:E ratio- can discuss how it be influenced by changing the inspiratory time (Ti)

12. To be able to obtain an ABG sample	• States when an ABG is indicated • Is competent in ABG sampling in line with local policy • Adheres to ISCP policy and guidelines
13. To be able to accurately interpret ABGs	• Demonstrates the ability to interpret normal/abnormal values of an ABG • Recognises T2RF and need for NIV by pH < 7.35 AND PaC02 ≥ 6.5 • Recognises the consequence of oxygen toxicity and it's possible cause of a deranged ABG • When reviewing the ABG, comments on the Fi02 and Sp02 value
14. To be able to effectively and safely monitor a patient on NIV including observations and frequency of blood gases	• Demonstrates interpretation of patient feedback values on the NIV machine screen, including: *Respiratory Rate *Spontaneous/Timed/Exhaled bar *Tidal volumes *Leak *% triggered • States the need for continuous cardiac and Sp02 monitoring for at least the first 12 hours of NIV or until the respiratory acidosis has resolved • States the need for an ABG one hour post initiation of NIV • States the need for an ABG four hours post initiation of NIV • States the need for an ABG one hour after any changes in NIV setting
15. To be able to recognise and troubleshoot possible causes of no improvement following initiation of NIV	• Recognises if PaC02 continues to increase to increase IPAP • Recognises if the patient remains hypoxic to increase EPAP and/or Fi02 • Able to recognise when a patient has asynchrony with the ventilator and is able to reason possible solutions to this (rise time, ramp, I:E ratio, trigger) • Recognises the potential for skin breakdown due to the NIV mask and appropriately suggests use of a barrier or different interface

	• Recognises that the ventilator is only designed to compensate for a specific amount of mask leak and realises the need to adjust the interface, straps and apply pressure dressing if needed • Recognises that a patient may be swallowing air and their abdomen becoming distended and therefore recommends the need for an NG tube if indicated • Recognises that patients may become agitated whilst on NIV and careful consideration should be given to the use of sedation • Recognises the effects of inspiratory pressure on intra-thoracic pressure and subsequently the cardio-vascular system, particularly in relation to blood pressure
16. To be able to monitor NIV compliance / synchrony and adequacy of ventilation and adjust comfort settings appropriately	• Able to recognise when a patient has asynchrony with the ventilator and is able to reason possible solutions to this (rise time, ramp, I:E ratio, trigger) • Recognises that the ventilator is only designed to compensate for a specific amount of mask leak and realises the need to adjust the interface, straps and apply pressure dressing if needed
17. To be able to decide when it is appropriate to initiate breaks from NIV and make recommendations	• To recognise that NIV should be almost continuous for first 24hrs. • Short breaks can be given for oral intake and nebulisers. Inline nebulisers may be used if unable to tolerate breaks • To recognise once ABGs improving longer breaks can begin • To recognise a patient not tolerating a break *Increasing RR *Increased work of breathing/distress • To identify appropriate plan for breaks e.g. controlled oxygen, humidified oxygen/HFNC
18. To be able to initiate and lead on a weaning plan	• To be able to discuss when to begin weaning • To be able to document a weaning plan for others to follow • e.g. Gradually increase breaks from NIV during day, continue nocturnal NIV

19. To be able to manage a deteriorating patient on NIV and escalate concerns to the appropriate teams	• States key symptoms of patient deterioration whilst on NIV: *Decreased GCS *Decreased Sp02 *Agitation/confusion *Decreased triggering of breaths on ventilator/increase reliance on back-up breaths * Increased $PaCO_2$ / decreased pH • Recognises need for ABG at time of deterioration • Recognises need for medical review including chest x-ray • Recognises escalation to ICU if appropriate • Recognises role of palliative care in deteriorating patients on NIV • Demonstrates rationale for altering NIV settings to respond to patient's deteriorating ABG
20. To be able to recognise when NIV is failing and appropriate need for referral to palliative care	• Demonstrates awareness of patient's ceiling of care • Reviews trends in ABGs and NIV treatment • Demonstrates communication with MDT regarding patient's deterioration • Demonstrates ability to discuss deterioration/treatment failure with patient and their relative/carer
21. Identify potentially appropriate patients for temporary / long term home NIV	• Recognises the patient with chronic respiratory failure who may benefit from long term NIV at home • Able to counsel the patient and carer on the benefits of long term NIV
22. To be able to provide NIV training to all members of the MDT and assess competence of staff delivering NIV care	• To be able to supervise and takes the lead in teaching others • Demonstrates an ability to assess competency of staff delivering NIV

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Other Documents superseded by this one	None
Access to Document	All members
Location of Inventory of Documents	Inventory of Documents (Clinical Section, Professional Practice, PD etc.)
Related Documents (Example)	• Rules of Professional Conduct incorporating the Code of Ethics and Guidelines for Professional Behaviour • Quality Assurance Standards of Physiotherapy Practice and Delivery ER-WCPT 2018 • Scope of Practice (current)