Imperial College Healthcare NHS Trust

…….Adult Acute Non-Invasive Ventilation…….

Clinical Competency Assessment Framework

Name of Learner:

_____

Job Title and Band:

_____

Acknowledgements: Imperial College Healthcare NHS Trust

Contents

Rationale for competency

We recognise that as a healthcare professional you bring with you a range of knowledge and skills. The competencies have therefore been designed to build on these whilst at the same time helping you develop additional knowledge, skills and behaviour for clinical practice at Imperial College Healthcare NHS Trust. These competencies are for healthcare professionals who work in clinical areas that provide acute adult non-invasive ventilation and whom care for adult patients on acute non-invasive ventilation within ICHT.

What is a competency?

The term competency refers to the knowledge, skills and behaviour required to perform a job, or an element of it, successfully. A competency measures how people do something.

Learner:

You, the learner should read the competency standards within this document and reflect on your current knowledge and understanding of the theories underpinning the competency statement and standards. Discuss your self- assessment with your mentor. The assessment of your clinical practice requires evidence which will be analysed by you and your mentor. You may identify that learning/ training is required and these need to be documented in the action plan and you will receive feedback from your mentor to progress to the point of competence.

Mentor:

A mentor is someone who provides you with a relationship that facilitates personal growth and development. Within such a relationship, the mentor assists with career development and guides the mentee through organisational, social and political networks.

The name of your mentor is _____

Date mentor assigned _____

It is important that you meet regularly with your mentor, try to work the same shifts. It is important that you reflect on your clinical experiences and learn from them. The mentor should act as a role model for the learner to help them enhance their performance and maximise experience.

The mentor's role is to support and advise you. The mentor's responsibilities for clinical competencies include:

- Meeting with you when you receive the competencies.
- Discussing your personal objectives and identifying the learner's current level of knowledge.
- Discussing the resources and strategies required to achieve your learning,
- Facilitate learning opportunities and act as a role model.
- Assessment against the objectives outlined in the framework
- Agreeing an action plan for any objectives not achieved.

Assessment Process

The process of assessment consists of:

- **The Formative assessment** comes before the Summative assessment. The emphasis is on providing the Learner with constructive feedback for those criteria where they have not demonstrated competency, in order to assist them in achieving competency in **all** criteria at the Summative assessment.

- **The Summative assessment** is the final assessment at the end of the period of learning and must be completed where competency was not demonstrated for **all** criteria at the Formative assessment. Success in **all** the criteria of the Summative assessment must be achieved to demonstrate competency, where competency was not achieved against any criteria in the Formative assessment.

Who can sign the competency?

The allocation of a mentor is at the discretion of the manager in charge of the clinical area.

When possible your mentor should complete the assessments. If your mentor is not available, another member of the multidisciplinary team may complete the assessment following discussion with your mentor or manager.

Your mentor needs:

- Your mentor must have a previously completed the Adult Acute NIV competencies themselves and be competent in the skill
- Allocation of a mentor can be in discussion between the NIV QI Project team and the ward clinical practice educator/ward manager
- To be a Registered Nurse who has been qualified for a minimum of one year (NMC, 2015, NMC, 2008) or
- To be a Registered Respiratory Consultant (GMC) or
- To be a registered respiratory physiotherapist for a minimum of one year (HCPC) or
- The NIV project manager and NIV champions (see ward specific areas for champion lists)

Signing a competency

If the mentor finds that teaching rather than assessment is taking place, the assessment must cease. Teaching can continue to develop the learner and competence can be reassessed at a later date. It is expected that you will achieve competency within 4 weeks of participating in/completing an NIV study day or education update.

Learning Resources

A variety of resource materials and sources are available to you. These include:

- NIV QI Project team
- NIV ward champions – see ward specific areas for champion lists
- Respiratory Department
- Critical Care Outreach Team
- Clinical Practice Educators
- Internal NIV study day – see the source for upcoming dates
- NIV education programme (available lecture based or via online training video on the NIV resource page on the Source)
- Trust NIV guideline/policy – please see on the Source
- National guidelines

References and Reading List

Davidson, AC. Banham, S. Elliot, M. Kennedy, D. Gelder, C. Glossop, A. Church, AC. Creagh-Brown, B. Dodd, JW. Felton, T. Foex, B. Mansfield, L. McDonnell, L. Parker, R. Patterson, CM. Sovani, M. Thomas, L. (2016) *'BTS/ICS guideline for the ventilatory management of acute hypercapnic respiratory failure in adults'*

NCEPOD (2017) *'Acute Non-Invasive Ventilation: inspiring change'*

Rochwerg, B. Brochard, L. Elliot, M. Hess, D. Hill, N. Nava, S. Navalesi, P. Antonelli, M. Brozek, J. Conti, G. Ferrer, M. Guntupalli, K. Jaber, S. Keenan, S. Mancebo, J. Mehta, S. Raoof, S. (2017) '*Official ERS/ATS clinical practice guidelines: non-invasive ventilation for acute respiratory failure'* Eur Respir J (50)

Mentor Signature Verification

Print name	Signature	Band

Supervised Practice Attempts

Please log any practice attempts here prior to undertaking the assessment

Assessed by: **Job role:** **Date:**	Comments:
Assessed by: **Job role:** **Date:**	Comments:
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Assessed by: **Job role:** **Date:**	Comments:

Clinical Competencies Scoring

The following competency scoring system should be used to assess knowledge.

Action required:

1) Learner to complete self-assessment score within 1 week of receiving the competency assessment document.
2) Evidence should be provided to support competence, e.g. (certificate from previous trust, attendance at study day, etc.)
3) Set timescales with mentor for formative completion.
4) Complete action plan following formative assessment (if required).
5) Complete summative self-assessment (if required).
6) Set timescale for completion of summative competency

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 yet competent
2	The individual has some knowledge and is beginning to link to practice and needs specific direction and demonstration in new skills.	
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 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.	
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.	
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.	

When conducting a formative assessment, if a score of 3 or more is achieved, this is considered a pass and should be documented in the summative column.

OBJECTIVE: **Adult Non-Invasive Ventilation (NIV)**	**ASSESSMENT**							
	FORMATIVE **(Score of 3 or more? Document scores of 3 or more in the Summative column only - this is a pass)** Date: ……..			**ACTION PLAN**	**SUMMATIVE** Date……			**EVIDENCE**
	Score - Learner	**Score - Mentor**	**Mentor initial**	**Any areas for improvement? (include timescales)**	**Score - Learner**	**Score - Mentor**	**Mentor initial**	**Evidence to support competency?**
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 effectively use the NIV care bundle including prescription of NIV/altering NIV settings on Cerner								
4. To understand the differences between CPAP and NIV/BIPAP including differences in indications and contraindications								

5. To understand that NIV does not treat the underlying cause of respiratory failure and that additional medical management is required								
6. To understand that ceiling of care/escalation of treatment plans need to be discussed and documented should NIV treatment fail								
7. To be able to understand the appropriate care environment for the use of NIV								
8. To be able to select all equipment for ventilator set-up including appropriate interface for the patient								
9. To be able to ensure patient understanding and consent to NIV								
10. To be able to initiate NIV on a patient including selecting								

appropriate prescribed starting settings and provision of adequate explanation/information to the patient +/- their relative/carer, understand the importance of emergency alarms								
11. To understand when and how to titrate NIV settings/adjust therapy to patients' condition and/or NIV prescription								
12. To be able to interpret NIV settings and modes of NIV								
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 identify the need for humidification on and off NIV and need for airway clearance techniques								
16. To be able to recognise and troubleshoot possible causes of no improvement following initiation of NIV								
17. To be able to manage a deteriorating patient on NIV and escalate concerns to appropriate teams								
18. To be able to recognise when NIV is failing and appropriate need for referral to palliative care								
19. To understand both the physiological and psychological effects of NIV								
20. To be able to use NIV to improve lung expansion as a physiotherapy treatment technique								
21. To be able to access the local policy on the source and the NIV								

algorithm								
In order to demonstrate competence, the Learner **must** be scored as 3 or more by the Mentor in **all** Objectives								
I have been assessed as competent in all these objectives and am willing to assume responsibility to ensure I consistently demonstrate competency and abide by Trust policy. A copy of this page should be given to the Learner's line manager and held locally. Signature of Learner: …… Print name: …….. Date: …….								

Adult Acute Non-Invasive Ventilation Competencies

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
	• 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 effectively use the NIV care bundle including prescription of NIV/altering NIV settings on Cerner	• Is aware the NIV care bundle must be completed prior to the patient being initiated on NIV • Is aware that NIV must be prescribed prior to the patient being initiated on NIV • Locates and/or (delete as appropriate) complete the elements of the care bundle (ad hoc recording, medics forms, Non-Invasive Ventilation) • Locates and/or (delete as appropriate) completes prescription of NIV (medications, +add, search: BIPAP) • Locates and/or completes (delete as appropriate) the NIV prescription to alter NIV settings

4. 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
	• 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)
5. 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 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 via venturi mask ○ Nebulised bronchodilator ○ Steroids ○ 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
6. 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 • Locates where to find and/or document ceiling of care plans: in the NV care bundle and the 'EC & treatment plan and resus status form'
7. To be able to understand the appropriate care	• Recognises there are designated NIV areas within the trust where

environment for the use of NIV	• 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
8. To be able to select all equipment for ventilator set-up including appropriate interface for the patient	• Locate where the V60 machine is stored • Selects circuit with pressure cable and bacterial filter • Selects humidification box, circuit and 1L bag of sterile water if clinically indicated/required • Selects full face mask or total face mask – provides rationale for mask 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 on mask packet against the patient to choose either S/M/L mask

9. 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 • Provides an NIV patient information leaflet to the patient (+/- their relative/carer) • Signposts patients (+/- their relative/carer) to the patient information/education video

10. To be able to initiate NIV on a patient including selecting appropriate prescribed starting settings and provision of adequate explanation/information to the patient +/- their relative/carer, understand the importance of emergency alarms	• Demonstrates explanation of the following to the patient (+/- their relative/carer):
	  ○ 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
	• Provides the patient (+/- their relative/carer) with the NIV patient information leaflet and signposts them to the INTU video
	• Demonstrates correctly setting up the V60, including:
	  ○ Attaching the circuit, pressure line , bacterial filter and mask (+/- humidification)
	  ○ Switches on the V60, recognising it should be plugged in to a mains electrical supply
	  ○ Connects V60 to wall compressed 02
	  ○ Selects the appropriate interface and expiratory port under 'menu' to that selected for the patient. 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/CHS) ○ Sets appropriate rise time for patient's work of breathing (scale 1-5, 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
11. 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 • 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
12. To be able to interpret NIV settings and modes of NIV	• Recognises S/T mode as NIV 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 • 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 • I:E ratio

13. To be able to accurately interpret ABGs	• Demonstrates the ability to interpret normal/abnormal values of an ABG:
	  ○ pH: 7.35-7.45
	  ○ PaC02: 4 – 6.5
	  ○ Pa02: 11-14
	  ○ HC03: 22-28
	  ○ BE: +2- -2
	• 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 V60 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
	• Accurately documents observations on Cerner
	• 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 settings

15. To be able to identify the need for humidification on and off NIV and need for airway clearance techniques	• States that not all patients require humidification through the V60
	• States patients who may benefit are:
	  ○ Patients complaining of dry mouth whilst on NIV
	  ○ Patients with thick sputum and having difficulty clearing
	  ○ Patients complaining of eye irritation
	  ○ If there is continuous excess leak from the mask
	  ○ Patients receiving NIV via a tracheostomy
	• Recognises thick secretions, difficulty clearing or ineffective cough as a prompt to refer to respiratory physiotherapy
	• Explains that saline nebulisers may be beneficial
	• Explains the use of humidified oxygen when the patient is not on NIV

16. 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 • 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
17. 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
	• Recognises need for ABG at time of deterioration
	• Recognises need for clinical 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

18. 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

19. To understand both the physiological and psychological effects of NIV	• Able to explain the basic physiological principles of EPAP
	• Able to explain the basic physiological principles of IPAP
	• Recognises the importance of patient experience in the treatment of NIV and makes reference to the following in order to ensure patient experience is at the centre of treatment:
	  ○ Ensuring the care bundle is completed prior to NIV initiation
	  ○ Includes information on NIV provided to the patient and their relative/carer
	  ○ Explains possible treatment length to patient
	  ○ Explains to the patient how to call for help if required
	  ○ Explains the process of mask fitting and feel of the ventilator to the patient
	  ○ Continuously reassures patient
	  ○ Initially remains with patient whilst titrating settings

20. To be able to use NIV to improve lung expansion as a	• Recognises when patients may require referral to chest physiotherapy

physiotherapy treatment technique	• for sputum retention, mobility, lung collapse, dysfunctional breathing • Recognises when it may or may not be safe to increase the IPAP to improve lung expansion during treatment sessions • Demonstrates rationale behind increasing the IPAP • Demonstrates ability to clearly explain the treatment process to the patient
21. To be able to access the local policy on the source and the NIV algorithm	• Demonstrates ability to locate the trust guideline/policy on The Source • Demonstrates ability to locate the NIV algorithm on The Source, ventilators and in clinical areas • Explains the NIV algorithm

- **This 'Guidelines for Assessors' section is just guidance and is by no means an exhaustive list.**
- **It remains the Mentor's responsibility to ensure that competence is measured and achieved.**