



Critical Care Programme

Advancing Module Respiratory Workbook

Acknowledgements

This document has been adapted from the core workbooks associated with the Greater Manchester Multi-professional Critical Care Programme (2001-2011). As such, all contributors are acknowledged by the Greater Manchester Critical Care Skills Institute.

This version of the workbook has been compiled and completed by our team of practice educators involved in the delivery and development of our current Critical Care Programme.

Aim of the workbook

To act as a support tool for pre-course preparation and on-going learning. It is a vital resource for students on our Critical Care Programme preparing for the Advancing Module Respiratory Day. It is recommended students complete the workbook prior to attending the study day.

On completion you will be able to

- ❖ Identify ventilator associated complications
- ❖ **Discuss the different modes of ventilation**
- ❖ Identify what local ventilator educational/support resources are available
- ❖ **Discuss the nursing care of the ventilated patient**

The package is designed as an aid to understanding ventilation and to encourage further exploration of the contents and is by no means exhaustive in its contents.

Mechanical Ventilation

The use of mechanical ventilation cannot and will not cure a disease process, but provides support for the patient until resolution of the symptoms is accomplished.

There are numerous reasons for the use of mechanical ventilation. In the box below list some of the major ones.

.

Using a textbook and your experiences, list the possible side effects of Positive Pressure Ventilation in the box below.

.

That is a big box! Review your list. Think body systems. **Consider the wider physiological effects of positive pressure ventilation. Now amend your list and make any additional notes you need. List any references you use along the way. They could come in useful later.**

GET TO KNOW YOUR VENTILATOR!

There are many different types and designs of ventilator, it is essential that you understand the ventilators you currently use in practice.

Look at the ventilators used on your own unit (invasive ventilators). Name them here. Record the name of the ventilator and the company who produce the ventilators you use:

List the company website details if you can find them. Have a look at the website and navigate around it. These are often useful reference points and many companies are now providing more training and educational resources for users in practice. Have a look and see what you can find. These you can access to inform and support your practice. You may be asked to create usernames and passwords to access some of these materials.



The LTV 1000 is an example of one ventilator used widely within Greater Manchester (GM) – make sure it is on your list. It is the transport ventilator used in many GM Hospitals.

In Greater Manchester the Practice Educators report that the following ventilators are in use. They have provided the associated web-addresses (some contain great interactive learning materials – well worth a look).

Dräger: https://www.draeger.com/en_uk/Hospital/Portfolio/Ventilation-Respiratory-Monitoring

GE Carescape R860: <https://www.gehealthcare.com/products/ventilators/carescape-r860>

Hamilton: https://www.hamilton-medical.com/en_GB/Products.html

LTV: <https://www.airliquidehealthcare.ca/products/respiratory/medical-ventilators/ltv-1200-1100>

Novalung Vision Alpha: <https://www.xenios-ag.com/novalung/>

Oxylog 3000: https://www.draeger.com/en_uk/Hospital/Products/Ventilation-and-Respiratory-Monitoring/Emergency-and-Transport-Ventilation/Oxylog-3000-plus

Puritan Bennett 840: <https://www.medtronic.com/covidien/en-us/products/mechanical-ventilation/puritan-bennett-840-ventilator.html>

<https://www.medtronic.com/covidien/en-us/products/mechanical-ventilation.html>

Servo I: <https://www.getinge.com/int/products/hospital/mechanical-ventilation/>

There are standard modes of ventilation and techniques for changing the way a breath is delivered to a patient that maybe employed almost universally. The most common are abbreviated for you in the following pages. Check a text book, use websites and discuss with your mentor. In the boxes provided: **name in full and describe indications for use.** Comment on any associated risks and benefits for each section. Make a list of what settings you would routinely adjust to achieve each ventilation mode.

C.M.V.

S.I.M.V.

V.C.V.

P.C.V.

P.R.V.C.

BI-LEVEL / BI-PAP

BI-LEVEL VG

C.P.A.P.

PS or ASB

PEEP

I:E RATIO

AC/PC

APRV

Some ventilator companies incorporate novel additions to their basic ventilator modes. These aid patient comfort or reduce incidence of some of the recognized problems of positive pressure ventilation. Some are listed below, along with common respiratory parameters we record and other associated ventilation terminology. **For each of the terms provide a definition and explain their significance in relation to respiration, ventilation and patient management. If appropriate state how each is monitored or altered on your ventilators.**

Please make the answers you provide as complete as possible and **bring them with you on your allotted study day** – your answers could prove useful!

Frequency

Tidal Volume

Minute Volume

Compliance

Tube Compensation

Resistance

Apnoea Ventilation

Airway Resistance

Auto PEEP / Intrinsic PEEP

Inspiratory Time

Triggering

Care of the Ventilated Patient

The maintenance of patient hygiene standards and comfort are the foundations of good nursing care. Eye and mouth care are two simple caring tasks that fall within this category of care. Whilst they may be considered basic nursing care they are fundamental to the prevention of harms to patients in critical care areas.

Review the main reasons why we provide regular Eye and Mouth Care to ventilated patients. Explain how and why this differs from the care provided to general patients. Check out your local protocols and provide a brief synopsis of any guidelines your unit has – record frequency of care, list any solutions used; and reference any resource materials used to complete this section. If you are unable to find local policies then make notes with reference to The Royal Marsden NHS Trust Manual of Clinical Nursing Procedures (latest version can be accessed from hospital intranet sites).

Eye Care

Mouth Care

Care Bundles are:

Define and site reference

Nationally, the Department of Health (DOH), the Institute for Healthcare Improvements (IHI) and Intensive Care Society (ICS), and on a local level, the Greater Manchester Critical Care Network all advocated their use.

List the components of the current ventilator care bundle in the boxes below and give a brief synopsis of why they are included. List any references you find to support these practices in the ventilated patient. The website of the Institute for Healthcare Improvements (www.IHI.org) and the DOH website on reducing healthcare associated infections (<http://hcai.dh.gov.uk>) are both useful starting points.

Intervention 1

Intervention 2

Intervention 3

Intervention 4

Intervention 5

Intervention 6

Suggested Reading and References:

Access websites suggested in the text above.

Make use of critical care text books, examples include:

Adams, S.K., and Osbourne, S. (2009) *Oxford Handbook of Critical Care Nursing*, Oxford: Oxford University Press.

Cutler, J. (2007) *Critical Care Nursing Made Incredibly Easy!* (2nd Edition), Philadelphia: Lippincott, Williams and Wilkins.

Intensive Care Society. (2016) *Handbook of Mechanical Ventilation*. London: Intensive Care Foundation. (www.ics.ac.uk)

Mallett, J., Albarran, J.W., Richardson, A. (2013) *Critical Care Manual of Clinical Procedures and Competencies*. Chichester, West Sussex: John Wiley and Sons Ltd.

Morton, P.G., Fontaine, D.K., Hudak, C.M. (2005) *Critical Care Nursing: A Holistic Approach*, (7th Edition), Philadelphia: Lippincott, Williams and Wilkins.

Schell, H.M., Puntillo, K.A. (2006) *Critical Care Nursing Secrets*, (2nd Edition) New York: Elsevier

Woodrow, P. (2006) *Intensive Care Nursing: A Framework for Practice*, (2nd Edition). Oxford: Routledge