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Objectives

Upon completing this course, the learner should:

- Gain awareness of AARC Guidelines for protocol creation and implementation
- Identify Various types Protocols
- Understand the impact of TDPs on patient outcomes
- Identify avenues for patient progression in the absence of TDPs

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What is a therapist driven-protocol (TDP)

*Initiation or modification of a patient care plan following a predetermined structured set of **physician orders**, instructions or interventions in which the therapist is allowed to initiate, discontinue, refine, transition, or restart therapy as the patient's medical condition dictates.*

Note: *This definition should not be confused with programs that include that includes discontinuation of therapy without a reorder, flagging therapy for physician reorder, standing orders or policies that dictate therapy durations.*

<https://www.aarc.org/resources/professional-documents/whitepapers/protocol-program-structure/>

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Goal of TDPs

1. To provide medications only to those patients in which it is clinically indicated
2. minimize unnecessary arterial blood sampling or arterial line placement
3. Promote/facilitate BPH
4. optimize the process of weaning patients from mechanical ventilation,
5. minimize unnecessary oxygen use
6. Appropriately allocate respiratory care services: more time in high priority areas
7. Reduce unnecessary cost to the patient: Decrease ventilator days, trach days, oxygen therapy days, LOS, etc.

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Benefits

- Enhanced allocation of respiratory care services,
- Accelerated liberation from mechanical ventilation/decreased vent days
- Accelerated Trach Liberation/Decreased trach days
- Decreased respiratory related adverse events
- Reduced number of Acute Care Transfers/ACTs
- reduced Length of stay
- and cost savings

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TDP Acceptance

in a survey of respiratory therapy (RT) managers, 98% reported using protocols in their institutions, and in the 2005 American Association for Respiratory Care Human Resources Survey, 90% of respiratory therapist respondents reported having delivered care by a protocol.

2009 American Association for Respiratory Care Survey, 84.8% of responding hospitals reported using oxygen protocols, 77.7% reported using mechanical ventilation protocols, and 60.9% reported using bronchodilator protocols.

<https://rc.rcjournal.com/content/58/10/1662>

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Barriers

- gaps in current understanding remain
- Lack of physician support
- Physician Perception
 - Physicians may sense a Loss of control
 - Lack of trust in the department
 - Concerned the therapists lack the clinical skillset to function under protocols

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Standard of Care

Based on the demonstrated efficacy of therapist implemented protocols, it is the position of the American Association for Respiratory Care that institution-approved protocols should be used by respiratory therapists as the standard of care for providing respiratory therapy services under qualified medical direction.

All programs however must comply with Federal and State regulations and standards including those published by their State Licensing Boards, The Joint Commission as well as the Centers for Medicare and Medicaid Services.

<https://www.aarc.org/resources/professional-documents/whitepapers/protocol-program-structure/>

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TDP Guidelines

AARC REQUIREMENTS

<https://www.aarc.org/resources/professional-documents/whitepapers/protocol-program-structure/>

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Policy/Protocol

Department policy must specify which respiratory therapists can deliver care outlined in the protocol, inclusive of the competencies required of individuals and demonstration of skills and knowledge.

EXAMPLES:

RESPONSIBLE PARTIES: Only Registered Respiratory Therapists, with demonstrated competency on file

RESPONSIBLE PARTIES: Only RRT and CRT, with demonstrated competency on file

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Medical Director Oversight

- Medical Director oversight and accountability for services provided using protocols must also be specified in department policy.

- EXAMPLE: This protocol will be implemented under the guidance of the pulmonary program director, following governing board approval.

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AARC CPG or EBP

The protocols should be written to reflect the indications, precautions, and therapy specifics as outlined in the AARC Clinical Practice Guidelines, or other evidence based references.

Evidence-based practice (EBP) is the process of applying current, best evidence (external and internal scientific evidence), patient perspective, and clinical expertise to make decisions about the care of the individuals you treat.

<https://www.asha.org/research/ebp/evidence-based-practice-process/>

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Governing Board Approval

All policies related to protocols, as well as the protocols themselves, must be approved by the appropriate institutional governing bodies

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Comply with institutional P&Ps

Policies for protocols must be compliant with other institutional policies related to the provision of care, with specific attention to pharmacy and nursing services. Because many therapist implemented protocols involve the administration of medication, there must be a single standard throughout the facility regarding the procurement, control and administration of medications.

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Physician's Order is Required

A physician order is required to implement respiratory therapy managed by protocols. The order may include a request for "Respiratory Protocol", a specific request such as "MDI Protocol" or other order details as specified and approved by the Medical Staff.

It should be noted that this is an area of contention with some surveying agencies when they encounter a facility that does not require a physician order.

1. Ensure orders are obtained
2. Ensure the exact protocol is in the medical record
3. Conduct audits to ensure compliance

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Physician notification criteria required

Protocols must include criteria, thresholds, and decision points that require the physician be notified for continuation of the protocol, options to consider including exemption from protocol with requirements for new non-protocol orders.

The patient **MUST** meet the following **Assessment Criteria** daily prior to initiating weaning attempts:

- a. Respiratory Rate ≤ 30 without neurological impairment
- b. Respiratory Rate ≤ 40 with neurological impairment
- c. SpO_2 of $\geq 92\%$ on $< 50\%$ FiO_2 unless otherwise ordered by the physician
- d. PEEP < 10 cmH₂O & $FiO_2 < 50\%$
- e. Inspiratory pressures ≤ 30 cm H₂O
- f. Hemodynamic Stability (Stable HR & BP)

TOLERANCE CRITERIA

Patient will be considered intolerant if any of the following exists:

1. RR $> 10-20$ above baseline
2. Dyspnea, diaphoresis and/or use of accessory muscles
3. Heart rate > 20 BPM above baseline
4. Significant change in patient's hemodynamic status
5. Deterioration of arterial blood gases and/or development of cardiac arrhythmias
6. Change in mental status (e.g. somnolence, coma, agitation, anxiety, and/or lethargy)

If any of the above tolerance criteria occurs during the weaning process... The patient will be returned to the previously tolerated ventilator settings.

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Emergent Situation implementation

Policy should also define emergent situations in which respiratory therapists can immediately initiate protocols without a physician order. Protocols initiated in this manner shall be reviewed and authorized by physician signature within 24 hours.

Example: Rapid Response Protocol

Arterial Blood Gas protocol following a change in patient condition

Oxygen Initiation

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Compliance Audits

A quality assurance mechanism should be in place to assess if the respiratory therapist is providing care in compliance with protocol as well as capturing adverse responses.

Examples of this include:

- Protocol Compliance Audits
- Wean Rates
- Decannulation Rates
- ABG utilization
- Bronchodilator utilization
- Respiratory Related Adverse Events

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Types of TDPs

THERAPIST-DRIVEN PROTOCOLS

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TDP Examples

- Blood Gas
- Capnography monitoring
- Oxygen Therapy
- Bronchial Hygiene
- Medication Management
- Ventilator Management
- Lung Hyperinflation Therapy
- Speaking Valve Use
- Mobility

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Arterial Blood Gas TDP

Specifically, Browning et al¹⁰ evaluated respiratory therapists' effectiveness in determining when to sample ABGs. With a “before-and-after” study design, the investigators assessed the appropriateness of ABGs sampled during 3 intervals: prior to protocol implementation, and 1 and 3 months post-implementation. Using an ABG sampling protocol was associated with improved allocation of services (ie, the rate of inappropriately ordered ABGs declined from 43% before to 33% and 31% at 1 and 3 months, respectively).

This study also focused on the assessment of inappropriate ABG orders by type of provider. Strikingly, after protocols were implemented, respiratory therapists had rates of inappropriately ordered ABGs of 3% and 15% after 1 and 3 months post-implementation, whereas other providers generated markedly higher rates: 45% and 37% at 1 and 3 months, respectively.

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ABG protocol benefits

Associated benefits with implementing ABG protocols:

- Reduced number of ABGs drawn, per patient, per day
- Increased patient satisfaction
- Reduced costs to the establishment and patient

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Bronchopulmonary Hygiene protocol benefits (BPH)

- Reduced inappropriate respiratory care orders for BPH
- Reduction of bronchial hygiene therapy outside the ICU
- Increased patient satisfaction
- Reduced costs to the facility and the patient
- Appropriate allocation of respiratory services

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BRONCHOPULMONARY HYGIENE PROTOCOL

MD order for Bronchopulmonary Hygiene Protocol

Evaluate Indications:

- ✓ Difficulty with secretion clearance with sputum production > 25 ml/day
- ✓ Evidence of retained secretions
- ✓ Mucus plug induced atelectasis
- ✓ Foreign body in airway
- ✓ Diagnosis of cystic fibrosis, bronchiectasis, or cavitating lung disease

↓

Yes → Address any immediate need and contact MDRN

Does contraindication or potential hazard exist?

↓

Select method based on:

- ✓ Patient preference/comfort/pain avoidance
- ✓ Observation of effectiveness with trial
- ✓ History with documented effectiveness

Method may include:

- ✓ Manual chest percussion and positioning
- ✓ External chest wall vibration
- ✓ Intrapulmonary percussion

↓

Administer therapy no less than QID and PRN, supplemented by suctioning for all patients with artificial airways

↓

Re-evaluate pt every 24 hours, and 24 hours after discontinued

↓

Assess Outcomes: Goals achieved?

- ✓ Optimal hydration with sputum production < 25 ml/day
- ✓ Breath sounds from diminished to adventitious with ronchi cleared by cough
- ✓ Patient subjective impression of less retention and improved clearance
- ✓ Resolution/Improvement in chest X-ray
- ✓ Improvement in vital signs and measures of gas exchange if on ventilator, reduced resistance and improved compliance

↓

Care Plan Considerations:

- ✓ Discontinue therapy if improvement is observed and sustained over a 24-hour period.
- ✓ Patients with chronic pulmonary disease who maintain secretion clearance in their home environment should remain on treatment no less than their home frequency.
- ✓ Hyperinflation Protocol should be considered for patients who are at high risk for pulmonary complications as listed in the indications for Hyperinflation Protocol.

AARC References for Bronchopulmonary Algorithm

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5/5/03 (Jan Phillips-Clar, Rick Ford, Judy Tietser, Jay Peters, David Vines)

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Bronchodilator Protocols

- Reduced over pre-scribing unnecessary therapies
- Reduced issues with under-prescribing much needed therapies
- Increased patient satisfaction
- Reduced misallocation of respiratory care
- Improved employee satisfaction
- Decreased cost to the facility and the patient

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Why the need for BDPs

The need for protocols has been framed by the frequent occurrence of misallocation of respiratory care, consisting both of over-ordering (ie, prescribing respiratory care that is unlikely to confer benefit) and under-ordering services (ie, failing to prescribe services that would be expected to offer benefit). (RCJ)

Evidence based literature supports the use of protocols to minimize unnecessary treatments and provide self-administration options for patients who demonstrate their ability to do so. (AARC)

<https://rc.rcjournal.com/content/58/10/1662>


<https://www.aarc.org/resources/professional-documents/whitepapers/protocol-program-structure/>

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2 main criteria for BDPs

- RT protocols must allocate RT treatments appropriately
 - the result of RT protocol use is that patients likely to benefit from RT treatments are ordered to receive such treatments
 - that patients who are unlikely to benefit from RT treatments are *not* ordered to receive RT treatments
- The respiratory treatments administered within RT protocols must provide clinical benefit for the conditions for which they are prescribed.
 - E.g. Clinically Indicated

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<p>Name of Policy: RT Assess and Treat Protocol</p> <p>Policy Number: 3364-136-04-12</p> <p>Department: Respiratory Care</p> <p>Approving Officer: Chief Nursing Officer</p> <p>Responsible Agent: Director, Respiratory Care</p> <p>Scope: The University of Toledo Medical Center Respiratory Care Department</p>	 <p>Effective Date: 8/1/2018</p>
<p><input checked="" type="checkbox"/> New policy proposal</p> <p><input type="checkbox"/> Major revision of existing policy</p>	<p><input type="checkbox"/> Minor/technical revision of existing policy</p> <p><input type="checkbox"/> Reaffirmation of existing policy</p>

(A) Policy Statement

The Respiratory Care Practitioner (RCP) will utilize the RT Assess and Treat Protocol to assess the patient for the purpose of determining the appropriate type(s) of therapy, frequency of therapy and criteria for continuing, changing or discontinuing the therapy. A physician must order "RT Assess and Treat per Protocol" or "RT Protocol" or "TDP" (Therapist Driven Protocol). Upon receiving the order, the RCP will follow the procedures described in this document to facilitate optimum patient care. If at any time the patient's clinical status deteriorates or an adverse event occurs, the physician will be immediately contacted.

(B) Purpose of Policy

To provide guidelines for the RCP for the implementation of the RT Assess and Treat Protocol. Copies of each protocol will be linked in the EMR for caregiver reference.

(C) Procedure

Clinical indications for this RT Assess and Treat Protocol include aerosolized bronchodilator medication therapy, bronchial hygiene therapy and lung volume expansion therapy. Patient assessments by RCP's are ongoing and concurrent with each RCP visit/treatment. A formal reassessment will be completed based on the severity score and PRN by the RCP if the patient's clinical status deteriorates. Therapy will then be adjusted as needed. Documentation of the RCP's patient assessment findings will be documented in the patient's EMR.

The following guidelines will be followed in evaluating a patient for therapy

Upon receiving a physician's order for the "RT Assess and Treat per Protocol", "RT Protocol" or "TDP" the RCP will:

1. Review the patient's chart for all pertinent information including:
 - Physician's order
 - Patient's History and Physical Examination
 - Physician's Progress Notes
 - Vital Signs
 - SpO2 on room air
 - Laboratory data
 - Surgical status
 - Diagnostic reports (e.g. x-rays, PFT's, various scans, sputum cultures, etc. if available)

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2. Perform a physical assessment
 - a) General observations: patient's color, pattern and effort of breathing, chest expansion (symmetrical and bilateral), level of consciousness and the ability to ambulate.
 - b) Cough and sputum production: Ability to take a deep breath as measured using an Incentive Spirometer. Effectiveness of cough as assessed by measuring peak flows. The RCP will ask the patient to cough and expectorate into a tissue for observation of color and viscosity and determine if suctioning will be required. If the patient is unable to produce sputum, the RCP should question the patient with regard to their sputum production, color, consistency, frequency and amount.
 - c) Percussion and palpation of the lung fields to assess and identify:
 - Areas of tenderness
 - Observe any chest wall abnormalities
 - Respiratory excursion and fremitus, to determine whether the underlying tissues are air-filled, fluid-filled or solid. This is not always indicated for all patients but can be helpful
 - d) Auscultation of the lung fields (which will help to identify respiratory therapy objectives and care plan)
 - To evaluate the airflow through the tracheobronchial tree and detect any possible obstructions
 - Breath sounds
 - Normal
 - Crackles
 - Rhonchi
 - Wheezes or pleural rubs

After the patient's overall assessment is complete, the RCP will initiate one, two, or all three of the following protocols based on assessment findings:

Bronchodilator Aerosol Therapy

1. Perform initial assessment for Bronchodilator Aerosol Therapy. Indications for bronchodilator aerosol therapy include:
 - Relieve, reduce or prevent re-occurring bronchospasm
 - Relieve, reduce or prevent re-occurring airway inflammation and mucosal edema
2. Patients will be scored based on the RCP's findings as documented in the patient's EMR. The type and frequency of the therapy will be determined based on this score as it falls into one of four (4) acuity levels. These levels are "Minimal", "Mild", "Moderate" and "Severe".
 - a) Minimal Score (0-2 points)
 - No indications for bronchodilators. Continue home regimen if applicable
 - b) Mild Score (3-5 points)
 - Albuterol 2.5 mg or 2 puffs Q4hr PRN W/A x 2 tx with automatic DC at 24 hrs. if score remains ≤ 3

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- Continue, review controller medications from home if applicable. Contact physician for adjustment of controller meds.
- RT to reassess within 72 hours

c) Moderate Score (6-8 points)

- Albuterol/Ipratropium MDI 2 puffs inhaled or nebulizer (0.5 mg Ipratropium/2.5 mg Albuterol) Q6 hr. W/A + Albuterol 2.5 mg nebulizer or 4 puffs inhaled Q2 hr. PRN for shortness of breath.
- Continue controller medications from home regimen if applicable
- RT to reassess within 48 hours

d) Severe Score (≥ 9 points)

- Ipratropium 0.5 mg/Albuterol 2.5 mg (DuoNeb) Q6 hr.
- Albuterol 2.5 mg Q2 hr. PRN
- Formal reassessment within 24 hours

If no improvement/poor response (> 12 hrs.) or near extremis, contact physician for consideration of:

- Pulmonary consult
- 5 mg Albuterol via SVN x 3 back-to-back treatments
- Increase dosing, progress to greater frequency
- Full face mask NPPV
- ICU admit
- Heliox therapy

Lung Expansion Therapy

- Perform initial assessment for Lung Expansion Therapy. Indications for lung expansion therapy include:
 - Moderate hypoxemia while on oxygen therapy (e.g. SpO2 < 90% on 3-5 lpm O2 or greater)
 - Prevent or treat atelectasis
- Patients will be scored based on the RCP's findings as documented in the patient's EMR. The type and frequency of the therapy will be determined based on this score as it falls into one of four (4) acuity levels. These levels are "Minimal", "Mild", "Moderate" and "Severe".
 - Minimal Score (0-2 points)
 - Deep Breathing / Cough – 3-5 maneuvers Q1hr. W/A – RT to perform initial coach
 - Mild Score (3-5 points)
 - Deep Breathing / Cough – 3-5 maneuvers Q1hr. W/A – RT to perform initial coach with nurse to supervise ongoing.
 - RT to reassess within 72 hours
 - Moderate Score (6-8 points)
 - Positive expiratory pressure (PEP) device. Target of 10-20 cmH2O - TID
 - If no improvement/poor response after 12 hours of PEP therapy then...
 - CPAP @ 8-10 cmH2O for 2 hr. duration
 - RT to reassess within 48 hours

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d) Severe Score (≥ 9)

- MetaNeb (CHFO/CPEP mode) Q4hr W/A x 24 hrs. then QID
- If no improvement/poor response after 24 hrs. of MetaNeb therapy then...
- Full face mask CPAP at 8-10 cmH2O x 3 hrs. Q6 hrs. x 24 hrs.

Bronchial Hygiene Therapy

Perform initial assessment for Bronchial Hygiene Therapy. Indications for bronchial hygiene therapy include:

- Difficulty with secretion clearance unresponsive to simpler techniques
 - Atelectasis associated with mucous plugging
 - History of Cystic Fibrosis, Chronic Bronchitis or Bronchiectasis

Patients will be scored based on the RCP's findings as documented in the patient's EMR. The type and frequency of the therapy will be determined based on this score as it falls into one of four (4) acuity levels. These levels are "Minimal", "Mild", "Moderate" and "Severe".

- Minimal Score (0-2 points)
 - Deep Breathing / Cough – 3-5 maneuvers Q1hr W/A – RT to perform initial coach
- Mild Score (3-5 points)
 - Deep Breathing / Cough – 3-5 maneuvers Q1hr W/A – RT to perform initial coach
 - If no improvement/poor response after 12 hours ...
 - Acapella 3-5 maneuvers TID – RT to perform initial coach
 - RT to reassess within 72 hours
- Moderate Score (6-8 points)
 - EZPap/Acapella/Percussion therapy TID. Vest therapy may be used if appropriate.
 - For Cystic Fibrosis/Bronchiectasis: Vest therapy Q6 hr. W/A x 24 hrs. then BID
 - For Neuromuscular cough weakness: Cough Assist Device Q6hr. W/A
 - RT to reassess within 48 hours
- Severe Score
 - Intrapulmonary Percussive therapy (MetaNeb – CHFO & CPEP mode) Q4 hr.
 - If no improvement/poor response after 12 hrs. – increase MetaNeb therapy to Q2 hrs.
 - If no improvement/poor response, contact MD for consideration of bronchoscopy
 - Suction NT/Trach PRN
 - RT to reassess within 24 hours

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REFERENCE:

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<p>Approved by:</p> <p><i>[Signature]</i> Michael Taylor Director, Respiratory Care</p> <p><i>[Signature]</i> Monesca Smith Chief Nursing Officer</p> <p><small>Review/Revision Completed By: Director, Respiratory Care</small></p>	<p>Review/Revision Date:</p> <p>_____ Date _____</p> <p>_____ Date _____</p> <p>Next Review Date: August 1, 2021</p>
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Policies Superseded by This Policy:

It is the responsibility of the reader to verify with the responsible agent that this is the most current version of the policy.

https://www.utoledo.edu/policies/utmc/respiratory_care/pdf/3364-136-04-12-rt-assess-and-treat-protocol.pdf

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SUBJECT: Bronchodilator Administration Protocol
 ISSUED: 07/01/17
 REVISED: 08/13/19

Place Patient
Label Here

Physician Signature: _____ Date Ordered: _____ Time: _____

PURPOSE: To establish a procedure to follow when assessing patients for the indications, objectives, and frequency of bronchodilator administration.

RESPONSIBILITY: Respiratory Therapists under the guidance of the ordering Physician

PROTOCOL:

1. RT will discuss with the physician the appropriateness of protocol implementation for all patients receiving orders for respiratory therapy, and an order must be obtained prior to implementation.
2. When a new order for respiratory therapy is received, the assigned therapist is responsible for completing a patient assessment titled RT Bronchodilator Assessment Form.
3. Once the appropriate frequency has been determined a copy of the protocol and the RT Bronchodilator Assessment Form will be placed in the patient's medical record (for paper and MedHost charting place in hard chart directly behind the Admission Orders, for EMR charting scan into medical record; if EPIC, scan into Media attach to the protocol order).
4. RT will reassess according to the classification identified as outlined on the Aerosol Protocol Assessment Sheet. An additional assessment may be done any time a respiratory therapist suspects a patient's condition is deteriorating or improving, and more or less aggressive therapy may be indicated. Based upon the assessment done, the frequency of the bronchodilator therapy may be changed to the frequency indicated on the Bronchodilator Assessment Form.
5. After each assessment, it is the responsibility of the respiratory therapist to communicate any changes in writing in the appropriate location of the medical record.
6. The evaluation is to state the assessment and the change in therapy.
 - a. This plan will include current medication and the new frequency of the new administration.
 - b. This plan may include the initiation of CPT, IS or PEP therapy if patient demonstrates the inability to mobilize secretions.
7. If an assessment indicates an increased frequency of medication administration, and the patient is requesting additional PRN treatments greater than the frequency indicated by the assessment, or is in severe distress, the patient may be given two additional PRN bronchodilator treatments, twenty minutes apart. If the patient does not improve when given the additional medication, the physician is to be notified, and informed the patient is not responding to therapy.
8. The protocol may be discontinued at any time by a written order from the physician. If the patient is removed from Protocol, assessments will be performed according to the bronchodilator medication administration policy.

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	0	1	2	3	4	Points
Pulmonary history	No pulmonary history/Non-Smoker	Active Smoker without diagnosis of COPD or Asthma	History of COPD or Asthma with Occasional Bronchodilator use at Home	History of COPD or Asthma with Routine or Daily Bronchodilator Use at Home	History of COPD or Asthma with Daily Bronchodilator and Inhaled Steroid at Home	
Respirations	Normal respirations/Regular Rate and Pattern	Tachypnea without increased work of breathing	Dyspnea/Shortness of Breath with minimal exertion	Dyspnea/Shortness of Breath at rest	Severe Shortness of breath with or without Marked Accessory Muscle use	
Breath Sounds	Clear Bilaterally	Diminished and Clear	Faint Wheezing	Audible Wheezing	Severely diminished, Wheezing	
Cough	Strong Spontaneous	Weak Non-Productive	None, requires frequent suctioning, unable to mobilize secretions	Frequent, Acute onset	Persistent, uncontrollable, Hyper-Spastic	
Total Points						

Class 1 0 – 1 points	Class 2 2 - 3 points	Class 3 4 – 7 points	Class 4 8 – 11 points	Class 5 12-16 points
Treatment Frequency	Treatment Frequency	Treatment Frequency	Treatment frequency:	Treatment frequency:
<ul style="list-style-type: none"> • No treatment indicated 	<ul style="list-style-type: none"> • Unit dose Albuterol Q6 PRN (pt. assessed Q6 until no indications are noted for 48 hours, then as called upon) • If patient demonstrates inability to mobilize secretions, consider PEP Therapy and/or Secretion Clearance Device 	<ul style="list-style-type: none"> • QID & Q4 PRN with unit dose Albuterol DR • TID & Q6 PRN unit dose Duoneb if patient has COPD • If patient demonstrates inability to mobilize secretions, consider PEP Therapy and/or Secretion Clearance Device 	<ul style="list-style-type: none"> • Q6 & Q3 PRN unit dose Albuterol (unit dose Duoneb if COPD) • If patient demonstrates inability to mobilize secretions, consider PEP Therapy and/or Secretion Clearance Device 	<ul style="list-style-type: none"> • Q4 & Q2 PRN unit dose Albuterol (unit dose Duoneb if COPD) • If patient demonstrates inability to mobilize secretions, consider PEP Therapy and/or Secretion Clearance Device

- Class 2 & 3 will be re-assessed minimally every 3 days, may be assessed more frequently if change in patient condition
- Class 4 & 5 will be re-assessed daily
- Therapy may be de-escalated following 2 consecutive scores in the next lower classification.
- Therapy will be escalated following 1 score in next higher classification.

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Large scale implementation of BDPs

A large-scale implementation of a respiratory-therapist-driven protocol (TDP) included 100 hospitals. The use of BDPs was strongly encouraged throughout the organization.

Implementation resulted in:

- Decreased utilization of bronchodilators
- Decreased cost to patients and facilities
- Decreased workload for RTs; allowing for proper allocation of care
 - RTs were able to focus on ventilator and trach liberation
 - Spend more time with higher acuity patients
- Improved employee satisfaction
- Decreased turnover

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Mechanical Ventilation protocol benefits

- Decreased ventilator days/increased liberation
- Improved wean rates
- Decreased length of stay
- Improved patient satisfaction
- Improved employee satisfaction
- Decreased employee turnover
- Decrease in respiratory related adverse events

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Mechanical Ventilation protocol benefits

Therapist-driven protocols have been shown to decrease the duration of mechanical ventilation, reduce cost, length of stay, and improve the rate of weaning when compared with physician-directed weaning.

<https://pubmed.ncbi.nlm.nih.gov/17368162/>

Delivering the best possible care to patients on mechanical ventilation means getting those patients off mechanical ventilation as soon as it is safely possible; the best way to make sure that happens is to follow protocols developed specifically for this area of practice.

<https://www.aarc.org/nn19-ventilator-weaning-protocols/>

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MEMORIAL HOSPITAL, INC. <i>POLICY/PROCEDURE</i>	
<p>RESPIRATORY CARE DEPARTMENT PAGE 1 OF 2 SUBJECT: WEANING/EXTUBATION PROTOCOL EFFECTIVE DATE:</p> <hr/> <p>LAST REVISION:</p> <hr/> <p>PURPOSE: Upon the physician ordering "Weaning Protocol", the RCP will follow the procedure described below to facilitate in a safe and timely removal of the endotracheal tube at the earliest appropriate time.</p> <p>INDICATIONS: When the airway control afforded by the endotracheal tube is deemed no longer necessary for the continued care of the patient, thereby, improving patient comfort and cost effectiveness. The patient should be capable of maintaining a patent airway and adequate spontaneous ventilation to maintain adequate arterial blood oxygenation. Prolonged translaryngeal intubation is associated with many complications including but not limited to sinusitis, vocal cord injury, laryngeal injury, laryngeal stenosis, tracheal injury, hemoptysis, respiratory failure, and pulmonary infection / pneumonia.</p> <p>CONTRAINDICATIONS: None.</p> <p>HAZARDS / COMPLICATIONS: None</p> <p>PROCEDURE: Obtain order for "Weaning Protocol" from physician. Assess and measure the following:</p> <ol style="list-style-type: none"> 1. Patient has normal consciousness. 2. Adequate protective reflexes. 3. Easily managed secretions. 4. Obtain ABG's pre weaning, pH >7.38, pCO2 <45. 5. Patient is hemodynamically stable. <ul style="list-style-type: none"> • B/P > 100 Systolic. • Pulse < 120 bpm. • Urine output > 20 cc's / hr. • Pulmonary Wedge Pressure >3, <15 or CVP >2, <20. 6. Maximum negative inspiratory pressure > 20 cmH2O. 7. Vital Capacity >8 mL/Kg ideal body weight. 8. Spontaneous exhaled minute ventilation <10 L/min. 9. Spontaneous Vt > 400 cc's. 10. Maintains SpO2 >90. 	<p>AFFECTED DEPARTMENTS: APPROVED BY:</p> <p style="text-align: center;">MEMORIAL HOSPITAL, INC. <i>POLICY/PROCEDURE</i></p> <hr/> <p>RESPIRATORY CARE DEPARTMENT PAGE 2 OF 2 SUBJECT: WEANING/EXTUBATION PROTOCOL EFFECTIVE DATE:</p> <hr/> <p>LAST REVISION:</p> <hr/> <p>If the previous criteria is met and maintained, proceed with the following:</p> <ol style="list-style-type: none"> 1. Turn ventilator rate to "0", with the CPAP set at 5 cm/H2O. 2. Adjust pressure support as necessary. 3. Monitor patient. • If respiratory rate increases >30 or SpO2 <90, obtain ABG and call results to physician. 4. Obtain ABG's in 1 hour after patient placed on CPAP. 5. Page ordering Physician with results. 6. Extubate patient if ordered. 7. Place on prescribed O2 delivery system. 8. Continue to monitor patient.

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NUMBER: _____ ISSUE DATE: _____
 SUBJECT: _____ REVISED: _____

Physician Signature: _____ **Date Ordered:** _____ **Time:** _____

PURPOSE:
 To provide continuity of care and continuous progression of weaning from mechanical ventilation

RESPONSIBILITY:
 Respiratory Therapists under the guidance of the Pulmonary Physician

PROTOCOL

This protocol will be implemented only upon obtaining a physician's order. Upon obtaining a physician's order, EMR sites will enter the protocol into the medical record attached to the order as a SmartPhrase assigned by the physician. Paper sites will have the protocol signed, dated and timed by the physician, then placed into the physician's order section of the chart under the admission orders. The presence of the protocol in the medical record does NOT indicate candidacy for weaning. Each patient should meet the assessment criteria identified prior to implementation.

Responsibilities:

- The RT will work closely and communicate effectively with appropriate nursing and medical staff in the management and weaning of all ventilator patients.
- The RT will assure that airway care is optimized during mechanical ventilator support. In addition, the RT will manage oxygen administration according to policy.
- The RT will acquire ABG samples per discretion as needed when feasible.
- Should there be an acute deterioration of the patient's pulmonary condition at any time during the management or weaning of the ventilator, the therapist will immediately notify the pulmonary physician and take appropriate steps to treat the symptoms.

NOTE: Steps may include but are not limited to Arterial Blood Gases and changes in oxygenation and mechanical ventilation.

PROTOCOL
 Protocol Guidelines for initiation of Mechanical Ventilation:

- Upon Admission the respiratory therapist will obtain ventilator settings from the Physician writing admission orders for the patient.

- The RT assigned may also determine appropriateness of settings based upon ABG results taken on said settings. If changes are required, the pulmonary physician will be notified and new orders obtained.
- Once ventilator settings are deemed appropriate, the therapist will document the settings according to policy.
- The patient MUST meet the following **Assessment Criteria** daily prior to initiating weaning attempts:
 - Respiratory Rate ≤ 30 without neurological impairment
 - Respiratory Rate ≤ 40 with neurological impairment
 - SpO₂ of $\geq 92\%$ on $< 50\%$ FiO₂ unless otherwise ordered by the physician
 - PEEP < 10 cmH₂O & FiO₂ $< 50\%$
 - Inspiratory pressures ≤ 30 cm H₂O
 - Hemodynamic Stability (Stable HR & BP)
- If criteria listed above is within acceptable limits, Patient is deemed Medically Ready for Spontaneous Breathing Trials (SBTs) and SBT will be attempted within 2 calendar days of admission by taking the following steps:
 - Change ventilator to PSV mode with PS at 5 cmH₂O and PEEP at 5 cmH₂O
 - The Respiratory Therapist should remain at the bedside to ensure patient safety while completing the Initial Respiratory Assessment
 - If patient tolerates SBT times 15 minutes, the SBT will be considered successful and patient will be deemed ready to begin the weaning process.

NOTE: All Intubated patients who meet the above criteria a SBT will be attempted daily in collaboration with nursing and sedation vacation. If SBT is successful the patient will progress to 3b.
- Upon implementation of the weaning process, the RT will wean according to the following:**
 - STEP 1: Spontaneous Breathing Trial (SBT)**
 - The SBT will be completed as defined in number 5 above
 - If the patient "passes" the SBT, he/she progresses to step 2. If the patient "fails" the SBT, he/she is returned to full ventilator support and the SBT is repeated every 24 hours until the patient passes or the physician writes an order for "no weaning"
 - STEP 2: Trach Collar Trial (ATC)**
 - ATC is initially attempted BID
 - Initial duration is 1 hour per trial with close supervision by staff
 - Once the patient is able to tolerate ATC for 1 hour BID, the ATC time is progressively increased to 2 hours BID, 3 hours BID, 4 hours BID
 - The patient should be placed on full ventilator support between ATC trials and at night to promote patient safety, prevent atelectasis, and facilitate secretion clearance.
 - Physicians may consider further stepwise reduction of ventilator time (8 hours, 6 hours, 4 hours, then 2 hours per night) before discontinuation.

NOTE: Obtain ABG once the 24 hour interval has been met; if results are within Normal Limits continue ATC as tolerated by patient.
 - STEP 3: Liberation of Mechanical Ventilation**
 - Ventilator will remain in the room on standby for a minimum of 48 hours unless patient is extubated, at which time the ventilator would be removed

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- Intubated Patients: Place on SBT for 1-2hrs, obtain ABG, check for gag and cuff leak, assess RSBI, VC and NIF as clinically indicated. Report results of all tests to Pulmonologist and obtain extubation order.
- Unless otherwise ordered by the physician, the ventilator will be removed from the room after 48 hours of spontaneous respirations
- Patient must remain on continuous pulse oximeter for a minimum of 24 hours following discontinuation of mechanical ventilation. See clinical monitoring guidelines policy and procedure for further clarification.
- Should the patient be identified as a potential candidate for decannulation, continuous pulse oximetry must remain on the patient during trach weaning and continue for a minimum of 24 hours following decannulation.

The following criteria will be used as a guide during the weaning process:

AC Ventilation:
 AC (either volume or pressure control) will be set to deliver tidal volumes of 6 ml/kg Ideal Body weight (Per IBW chart below). If the initial tidal volume creates inspiratory pressures (PIP) > 35 cm H₂O, the tidal volume will be reduced (In such cases the respiratory rate may be increased to restore minute ventilation).

Trach Collar:
 Place patient on a continuous aerosol, ensure appropriate humidification and flow. Monitor patient and increase duration accordingly as tolerated by patient; if patient becomes intolerant patient will be placed back on vent with previously tolerated settings.

PEEP:
 RT may adjust PEEP by increments of 2 cmH₂O, not to exceed 7 cmH₂O. If patient requires PEEP > 7 cmH₂O, physician must be notified immediately unless otherwise ordered by the physician.

NOTE: Should patient require increase in support at any time due to intolerance, RT will obtain ABG or thoroughly document patient condition in order to warrant such changes.

TOLERANCE CRITERIA

Patient will be considered intolerant if any of the following exists:

- RR $> 10-20$ above baseline
- Dyspnea, diaphoresis and/or use of accessory muscles
- Heart rate > 20 BPM above baseline
- Significant change in patient's hemodynamic status
- Deterioration of arterial blood gases and/or development of cardiac arrhythmias
- Change in mental status (e.g. somnolence, coma, agitation, anxiety, and/or lethargy)

If any of the above tolerance criteria occurs during the weaning process... The patient will be returned to the previously tolerated ventilator settings.

Supporting Documentation

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NIH Predicted Body Weight / Tidal Volume Chart. (n.d.). Retrieved February 28, 2018, from <http://www.denver.edu/academics/colleges/medicalschool/departments/surgery/divisions/trauma/Trauma-at-LCH/Documents/SICU-Protocols/NIH-Predicted-Body-Weight-Tidal-Volume-Chart.pdf>

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SBTs

1. the number of patients eligible for SBT
2. the number of eligible patients assessed for SBT by Day 2
3. the number of patients found ready for SBT who receive SBT by Day 2
4. the number of patients who pass an SBT by Day 2
5. The percentage of patients assessed for readiness for SBT by Day 2 of LTCH stay.
6. The percentage of patients found ready for SBT, for whom an SBT was performed by Day 2 of LTCH stay.

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/LTCH-Quality-Reporting/Downloads/Ventilator-Weaning-QM-TEP-Summary-Report-2016.pdf>

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Weaning from Mechanical Ventilator in a Long-term Acute Care Hospital: A Retrospective Analysis

51 patients on mechanical ventilation before initiation of protocol-based ventilator weaning formed the control group. 111 patients on mechanical ventilation after implementation of the protocol formed the study group. Time to wean from the mechanical ventilation before the implementation of protocol-driven weaning by RT was 16.76 +/- 18.91 days, while that after the implementation of protocol was 7.67 +/- 6.58 days ($p < 0.0001$).

Mortality proportion in patients after implementation of protocol-based ventilator weaning was 0.21 as compared to 0.37 in the control group ($p=0.0153$). The daily cost of patient care for the LTAC while on mechanical ventilation was \$2200/day per patient while it was \$ 1400/day per patient while not on mechanical ventilation leading to significant cost savings.

Protocol-driven liberation from mechanical ventilation can significantly decrease the duration of a mechanical ventilator, leading to decreased mortality and cost savings.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7774095/>

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Large scale implementation of ventilator weaning TDPs

A large-scale implementation of a respiratory-therapist-driven protocol (TDP) included 100 hospitals. 4 standardized protocols were introduced, and the use of one of the four was strongly encouraged throughout the organization.

During a 12-mo period, we monitored each facility's wean rates, and which protocols were in use by said facilities. The largest barrier to protocol implementation was lack of physician support. The largest barrier to compliance with protocols, was lack of staffing/employee turnover.

For those facilities with physician support, protocol implementation, and high compliance rates, it was determined the wean rates were higher by 6 to 10%.

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Implementation

- Protocol Creation
- Medical Director Approval
- Physician Buy-in (which may be a program director or an entire practice)
- Governing Board Approval
- Education to key stakeholders
- Rolling out the protocol – aka Go-Live
- And Ongoing compliance Audits

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Education Protocol

CAROLINAS MEDICAL CENTER
RESPIRATORY CARE DEPARTMENT
ADULT PROTOCOL EDUCATION PROCESS

PURPOSE:

To ensure that all staff members who take care of adult patients including CVRU adequately orientate to the adult protocol education process. The education process is designed to assure competency.

DESCRIPTION:

All adult house and CVRU staff members (inclusive of managers) will be participating actively in the Adult Protocol Process within the Respiratory Care Department. Videotapes addressing the different aspects of patient driven protocols is required viewing. The areas to be addressed are asthma (RAD), COPD (including bronchitis and bronchiectasis), and postoperative care. As the respective videos are viewed the applicable test will be taken. Satisfactory completion of these tests will allow the staff member to round with an assessor and be critiqued at the bedside on their performance. When they have finished this entire process they will rotate assignments with the other clinical assessors. This mandatory orientation process is to be completed within the first 90 day, probationary period.

PROCEDURE:

1. Each staff member will receive a copy of Patient Driven Assessment, Bronchial Hygiene Protocol, Bronchodilator Protocol, and Volume Expansion Protocol. These will be contained within their orientation binder and pocket cards. Staff members should familiarize themselves with the contents therein.
2. Upon reading this material they will begin viewing the following videos. These videos are:
 - A) Chest Physical Assessment
 - B) Chest Physical Assessment/Patient Interviewing Techniques

- C) Asthma Medications - The Old and the New
 - D) Asthma RAD / FFTs
 - E) Bronchiectasis/COPD/Emphysema
 - F) Pneumonia, Labs and Care of the Postoperative Patient
 - G) Respiratory Care of the Postoperative Patient
3. When all protocols have been read and all the videos viewed in their entirety the staff member will complete the following exams:
 - A) Asthma/Reactive Airway Disease
 - B) Bronchitis / Bronchiectasis / COPD
 - C) Pneumonia / Postoperative Care
 4. The staff member will follow successfully completing these three tests by rounding with an approved assessor to gain further experience and finish a bedside check off.
 5. If at anytime during this process further remediation is deemed necessary this remediation will occur before proceeding to the next step in the process.
 6. Adult protocol training will only be considered completed for a particular staff when:
 - A) All written material has been reviewed
 - B) All seven videos have been viewed
 - C) All three tests have been completed satisfactorily
 - D) The staff member has rounded and been checked off by an approved assessor
 7. Staff members will not be employed in the role of assessor until such time as they have completed the process outlined above or been approved by the Clinical Specialist or his/her designee.

Quality Metrics

EDUCATION

Metrics to be monitored

- Wean Rates
- Bronchodilator utilization
- ABGs ordered and performed
- Ventilator Days/Trach Days
- Adverse Events related to protocol use

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Identifying avenues for patient progression in the absence of TDPs

- Find a protocol you would like to implement (similar to your physician's weaning style)
- If it's a BDP, research best practice and select a protocol to present to the physician's
- If the physicians are completely opposed, educate the staff regarding the step by step process your physician's follow
- Encourage physician rounding and respiratory therapy recommendations
- Be sure the RTs are updating the physicians regarding the progress of the patient
- Many RTs are able to build relationships with physicians and make recommendations to progress the patient, and change frequency of medications
- Be sure they obtain an order for any recommendations agreed upon

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Summary

- respiratory therapists duty in the absence of protocols
 - continue to make recommendations to physicians
 - provide clinically indicated care that is a benefit to the patient
 - progress the patient
- AARC resources
 - AARC.org
 - Protocol guidelines
- Implementation of protocols
 - reduces ventilator days, trach days, overall length of stay
 - reduces costs to the facility and the patient
 - aids in the process of proper resource allocation.
- When Respiratory therapists are able to limit care to that which is clinically indicated
 - spend more time at the bedside of the higher acuity patients
 - focus on liberation from mechanical ventilation, trach weaning, medication management
 - Progress patients to the next level of care.

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Questions

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References

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7. https://www.utoledo.edu/policies/utmc/respiratory_care/pdfs/3364-136-04-12-rt-assess-and-treat-protocol.pdf