APRT Competencies and Model Curriculum (for RRTs)

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CoBGRTE's Advanced Practice Respiratory Therapist (APRT) committee established a goal to create a model APRT curriculum that can be used in either a two-year (Master's) or three-year (clinical doctorate) graduate degree program. First, the APRT committee turned to previous work from pioneers in our field when it comes to APRT curriculum development. A previous intensive and systematic process for Developing a Curriculum (DACUM) was used to identify numerous key competencies necessary to include in coursework for the APRT. A total of 13 pulmonary physicians who've been recognized as experts in the field of pulmonary medicine suggested the tasks, procedures, and competencies they felt were needed by an APRT. Further competencies from the Accreditation Council for Graduate Medical Education (ACGME) were added to complete the all-encompassing list to use for building the APRT model curriculum. (Table 1)

Table 1. Key Competencies to Include in APRT Coursework

Patient Assessment

1. Understand etiologies, risk factors, underlying pathologic processes, and epidemiology for specific general medical/surgical and pulmonary conditions (see below).
2. Identify signs and symptoms of specific general medical/surgical and pulmonary conditions (see below).
3. Differentiate between the normal and the abnormal in anatomic, physiological, laboratory, and imaging findings and other diagnostic data.
4. Gather essential and accurate information about their patients.
5. Perform detailed cardiopulmonary patient assessments.
6. Identify appropriate methods to detect specific general medical and pulmonary conditions in an asymptomatic individual.
7. Perform history and physical examinations (inpatient and outpatient).
8. Appropriately use history and physical findings and diagnostic studies to formulate a differential diagnosis.
9. Enter data into the patient medical record (history, physical examination results, progress notes, reports of procedures and operations).
10. Select, order and interpret appropriate diagnostic and laboratory studies.
    a. Clinical laboratory tests (e.g. hematology and coagulation; clinical chemistry and immunology [includes cardiac enzymes]; toxicology and drug level monitoring; microbiology; blood lipids, other)
    b. Arterial and venous blood gas studies; identify acid-base disorders

c. Pulmonary function tests to include screening PFTs, complete PFTs (flows, volumes, diffusion tests), 6-minute walk, bronchial challenge, and pulmonary exercise testing
d. Nocturnal oximetry
e. Chest imaging studies (e.g. chest radiographs, CT, MR, ultrasound)
f. Electrocardiogram (ECG)

11. Assess patients with dyspnea.
12. Obtain detailed history and perform physical examination to identify/assess sleep disorders.
13. Perform preoperative pulmonary evaluation.
14. Obtain allergy exposure and symptom history.
15. Perform airway assessment, documentation and airway management (to include endotracheal tube placement verification) and evaluation for planned procedures.
16. Perform ventilator/critical care patient assessment to include:
    a. Indications/need for ventilatory support
    b. Assessment of oxygenation and ventilation
    c. Ventilator waveform assessment and interpretation
    d. Perform and evaluate results of capnography/end-tidal CO2 monitoring
    e. Assess weaning readiness
17. Initiate hemodynamic monitoring and interpret results (central lines, A-lines [pressure, pressure variation assessment] and fluid management).
18. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.
19. Apply medical information and clinical data systems to provide more effective, efficient patient care; apply technology to manage information, access on-line medical information, and support patient care decisions, and support patient and provider education.
20. Evaluate patients for admission, transfer or discharge in a variety of settings to include emergency department (ED), Long Term Acute Care (LTAC), general hospital floor, and/or the Intensive Care Unit (ICU).

Patient Care and Treatment

1. Identify the appropriate site of care for presenting conditions, including identifying emergent cases and those requiring referral or admission; perform office, clinic and ED triage to appropriate level of care.
2. Admit and discharge patients.
3. Prescribe and manage drugs and medications in the outpatient, acute and critical care settings to include understanding indications, contraindications, interactions, side effects and adverse reactions. Drugs and medications include (but are not limited to):
    a. Antibiotics and anti-infective agents (e.g. topical, inhaled, oral, I.M. or I.V.)
    b. Bronchodilators
    c. Anti-inflammatory drugs (e.g. inhaled and systemic steroids, anti-asthma agents)
    d. Cardiac/cardiovascular agents (e.g. vasopressors, inotropes, antihypertensive, antiarrhythmics, antianginals, antithrombotics)

    e. Diuretics
    f. Cough and cold medications
    g. Sedatives, tranquilizers and analgesics
    h. Anesthetics, skeletal muscle relaxants and pain relievers
4. Identify and manage drug interactions.
5. Order and evaluate respiratory care procedures, therapies and techniques to include care plan development, implementation and evaluation.
    a. Prescribe and manage oxygen therapy
    b. Prescribe aerosolized medications to include teaching use of metered-dose Inhalers (MDIs), dry powder inhalers (DPIs), nebulizers (e.g. all inhaled aerosol devices).
    c. Airway clearance therapy to include teaching secretion removal devices.
    d. Prescribe and administer heliox.
    e. Titrate inhaled nitric oxide.
6. Manage critical care and mechanical ventilator patients.
    a. Develop, coordinate and communicate care plan with ICU team.
    b. Initiate invasive mechanical ventilatory support; stabilize patient and monitor, adjust and evaluate care.
    c. Manage complicated (complex) ventilator patients.
    d. Measure and manage Positive End-Expiratory Pressure (PEEP) – to include auto-PEEP.
    e. Prescribe and manage Non-Invasive Positive Pressure Ventilation (NIPPV).
    f. Initiate hemodynamic monitoring and evaluate results.
    g. Prescribe and manage medications in the ICU (see above); titrate vasopressors and 2200 inotropes.
    h. Perform invasive and non-invasive cardiopulmonary and hemodynamic monitoring (to include catheter insertion, maintenance and removal).
    i. Provide airway care; intubate and extubate patients.
    j. Manage upper airway obstruction post extubation.
    k. Conduct ICU discharge planning.
7. Manage acute cardiac emergencies (Advanced Cardiac Life Support [ACLS]).
8. Manage nutritional support in the critical care setting.
9. Participate in rapid response team.
10. Participate in selected patient transport.
11. Provide patient education for specific diseases.
12. Obtain advance directives.
13. Appropriately utilize palliative care techniques and consultation as needed.
14. Apply and teach personal protective devices.
15. Provide family interaction and updates.
16. Return patient calls with physician reviewed results.
17. Interact with specific medical teams (e.g. transplant team).
18. Initiate consults.
19. Perform inpatient and outpatient consults; serve as consultant to nurse managers.

20. Provide staff education.
21. Identify appropriate interventions and provide health care services and education for prevention of specific general medical and pulmonary conditions and maintaining health.
22. Conduct smoking cessation interventions to include motivational interviewing, patient counseling and prescribing medications.
23. Prescribe and oversee pulmonary rehabilitation programs.
24. Formulate and review homecare treatment plans.
25. Provide documentation for inpatient and outpatient billing and payment of services.
26. Identify, evaluate and manage specific medical, surgical and cardiopulmonary conditions including, but not limited to:
    a. Obstructive pulmonary disorders (asthma, COPD/emphysema/chronic bronchitis bronchiectasis/cystic fibrosis)
    b. Acute respiratory failure
    c. Acute Respiratory Distress Syndrome (ARDS)
    d. Infectious pulmonary disease (e.g. pneumonia, acute bronchitis, upper respiratory tract infection, mycobacterial disease, fungal lung disease, other)
    e. Pulmonary vascular disease to include pulmonary hypertension [including medications], thromboembolic disease [including anticoagulation for pulmonary embolism (PE) and deep venous thrombosis (DVT)], other embolic disease, and pulmonary edema
    f. Neoplastic pulmonary disease (e.g. lung cancer)
    g. Pneumothorax
    h. Interstitial lung disease
    i. Pneumoconiosis
    j. Hypersensitivity pneumonitis
    k. Sarcoidosis
    l. Other restrictive pulmonary disorders
    m. Chest trauma
    n. Burns and smoke inhalation
    o. Pleural disease/ pleural effusion
    p. Tobacco addiction/dependence
    q. Sleep disordered breathing
    r. Neuromuscular disease affecting respiration
    s. Coronary artery disease and myocardial infarction
    t. Congestive heart failure
    u. Shock (e.g. hypovolemic shock, anaphylactic shock, cardiogenic shock, septic shock and undifferentiated hypotension and shock states)
    v. Drug overdose
    w. Preoperative and postoperative care
    x. Anemia as a co-morbid condition with cardiopulmonary disease
    y. Obesity as a co-morbid condition with cardiopulmonary disease
    z. Neurologic disease as a cause of or as a co-morbid condition with cardiopulmonary disease

aa. Alcohol and drug abuse as a co-morbid condition with cardiopulmonary disease
bb. Diabetes as a co-morbid condition with cardiopulmonary disease
cc. Renal failure as a co-morbid condition with cardiopulmonary disease
dd. Fluid and electrolyte disorders
ee. Malnutrition as a co-morbid condition with cardiopulmonary disease

Procedures including but not limited to:

1. Perform specific medical and surgical procedures considered essential in the area of practice.
2. Administer and monitor conscious sedation and analgesia.
3. Assist/perform bedside bronchoscopy.
4. Assist/perform thoracentesis.
5. Insert, manage and remove chest tubes.
6. Assist with percutaneous tracheostomy.
7. Change tracheostomy tubes.
8. Intubate patients.
9. Perform extubation.
10. Insert supraglottic airway.
11. Perform airway exchange catheter.
12. Perform esophageal intubation (e.g. nasal/oral Gastrointestinal (GI) decompression, monitoring, enteral feeds, medication administration).
13. Perform Bronchoalveolar Lavage (BAL) (combi-cath mini BAL).
14. Perform and interpret results of Mantoux testing (PPD).
15. Utilize ultrasound for assessment of pleural air, fluid or vascular access (e.g. line insertion).
16. Insert and manage central venous and arterial catheters.
17. Perform and interpret pulmonary function testing.
18. Order, obtain and analyze ABG samples.
19. Order, initiate and evaluate capnography.
20. Order, perform and evaluate cardiopulmonary exercise testing.

Accreditation Council for Graduate Medical Education (ACGME): ACGME Critical Care Medicine Competencies included in curriculum

1. acute lung injury, including radiation, inhalation, and trauma; (Outcome)
2. acute metabolic disturbances, including overdosages and intoxication syndromes; (Outcome)
3. anaphylaxis and acute allergic reactions in the critical care unit; (Outcome)
4. cardiovascular diseases in the critical care unit; (Outcome)
5. circulatory failure; (Outcome)
6. end-of-life issues and palliative care; (Outcome)
7. hypertensive emergencies; (Outcome)
8. immunosuppressed conditions in the critical care unit; (Outcome)
9. metabolic, nutritional, and endocrine effects of critical illness, hematologic and coagulation disorders associated with critical illness; (Outcome)

10. multi-organ system failure; (Outcome)
11. perioperative critically-ill patients, (Outcome)
12. renal disorders in the critical care unit, (Outcome)
13. including electrolyte and acid-base disturbance and acute renal failure; (Detail)
14. sepsis and sepsis syndrome; (Outcome)
15. severe organ dysfunction resulting in critical illness, (Outcome)
16. including disorders of the gastrointestinal, neurologic, endocrine, hematologic, musculoskeletal, and immune systems, as well as infections and malignancies; and, (Detail)
17. shock syndromes. (Outcome)
18. emergency cardioversion; (Outcome)
19. interpretation of intracranial pressure monitoring; (Outcome)
20. nutritional support; (Outcome)
21. use of ultrasound techniques to perform thoracentesis and place intravascular and intracavitary tubes and catheters; and, (Outcome)
22. use of transcutaneous pacemakers
23. pericardiocentesis; (Outcome)
24. renal replacement therapy

Professionalism

1. Maintain respect, compassion, and integrity.
2. Demonstrate caring and respectful behaviors when interacting with patients and their families.
3. Work effectively with physicians and other health care professionals as a member a health care team or other professional group.
4. Work effectively with physicians and other health care professionals to provide patient-centered care.
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.
6. Use effective listening, nonverbal, explanatory, questioning, and writing skills to elicit and provide information.
7. Accept responsibility for promoting a safe environment for patient care and recognizing and correcting systems-based factors that negatively impact patient care.
8. Demonstrate commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
9. Demonstrate professional relationships with physician supervisors and other health care providers.
10. Appropriately adapt communication style and messages to the context of the individual patient interaction.
11. Partner with supervising physicians, health care managers and other health care providers to assess, coordinate, and improve the delivery of health care and patient outcomes.
12. Create and sustain a therapeutic and ethically sound relationship with patients.
13. Demonstrate emotional resilience and stability, adaptability, flexibility and tolerance of ambiguity and anxiety.
14. Demonstrate accountability to patients, society, and the profession.

15. Demonstrate commitment to excellence and on-going professional development.
16. Effectively interact with different types of medical practice and delivery systems.
17. Demonstrate responsiveness to the needs of patients and society.
18. Demonstrate self-reflection, critical curiosity and initiative.
19. Apply an understanding of human behavior.
20. Contribute to office function meetings (team player).
21. Recognize and appropriately address gender, cultural, cognitive, emotional and other biases; gaps in medical knowledge; and physical limitations in themselves and others.
22. Understanding of legal and regulatory requirements for provision of patient care.
23. Practice cost-effective health care and resource allocation that does not compromise quality of care.
24. Advocate for quality patient care and assist patients in dealing with system complexities.
25. Participate in ICU quality improvement.
26. Facilitate the learning of students and/or other health care professionals.
27. Analyze practice experience and perform practice-based improvement activities using a systematic methodology in concert with other members of the health care delivery team.
28. Participate in ICU Infection Control and Quality Assurance (QA) Review.
29. End-of-life issues and palliative care; through professionalism.

A small group of APRT committee members were tasked to take the competencies in Table 1 and create a model curriculum flexible enough to implement into a two-year master's or three-year clinical doctorate degree. Competencies were separated into three sub-categories including patient assessment, patient care and treatment, and professionalism. Upon a quick review of the model curriculum (Table 2), these three important areas of patient care are noticeable throughout the course of study. Advanced clinical practice, under the guidance of a physician mentor, is an integral part of the APRT student's academic experience during the latter phase of the curriculum.

We should applaud the trailblazers we have in the field of respiratory therapy academia, as they have laid a path for others to follow for advancing the education of our future respiratory therapists. Members from the APRT committee, led by past-chair Douglas Gardenhire, EdD, RRT-NPS, FAARC, worked together to create the model curriculum. Other notable academic leaders in the field of respiratory therapy contributing to the model APRT curriculum were:

Patient Assessment: David Shelledy, PhD, RRT, FAARC
Patient Care and Treatment, Didactic: Tom Barnes EdD, RRT, FAARC, James Hulse, PhD, RRT and Georgianna Sergakis PhD, RRT
Patient Care and Treatment, Clinical: Jonathan Waugh PhD, RRT, Art Taft PhD, RRT, and Russ Acevedo MD, FAARC, FAACP
Professionalism: Jose Rojas PhD, RRT and Janet Vogt MHS, RRT

Table 2. APRT Model Curriculum

PROFESSIONAL CURRICULUM
ADVANCED PRACTICE RESPIRATORY THERAPY

YEAR ONE

Fall Semester:

APRT 7001	(5 hrs)	Advanced Patient Assessment I
APRT 7011	(4 hrs)	APRT Professional Skills I
APRT 7020	(5 hrs)	Advanced Patient Care and Treatment I
APRT 7021	(2 hrs)	Advanced Patient Care and Treatment Lab I

Total Hours: 16

Spring Semester:

APRT 7002	(5 hrs)	Advanced Patient Assessment II
APRT 7012	(4 hrs)	APRT Professional Skills II
APRT 7030	(5 hrs)	Advanced Patient Care and Treatment II
APRT 7031	(2 hrs)	Advanced Patient Care and Treatment Lab II

Total Hours: 16

Summer Semester:

APRT 7013	(4 hrs)	APRT Professional Skills III
APRT 7040	(5 hrs)	Advanced Patient Care and Treatment III
APRT 7041	(2 hrs)	Advanced Patient Care and Treatment Lab III
APRT 8060	(3hrs)	Intro to Graduate Statistics

Total Hours: 14

YEAR TWO

Fall Semester:

APRT 8051	(4 hrs)	APRT Clinical Practice I
APRT 8052	(4 hrs)	APRT Clinical Practice II
APRT 8053	(4 hrs)	APRT Clinical Practice III
APRT 8001	(1 hr)	Seminar I

Total Hours: 13

Spring Semester:

APRT 8054	(4 hrs)	APRT Clinical Practice IV
APRT 8055	(4 hrs)	APRT Clinical Practice V
APRT 8056	(4 hrs)	APRT Clinical Practice VI
APRT 8002	(1 hr)	Seminar II

Total Hours: 13

Summer Semester:

APRT 8057	(3 hrs)	APRT Clinical Practice VII
APRT 8058	(3 hrs)	APRT Clinical Practice VIII
APRT 8003	(1 hr)	Seminar III

Total Hours: 7

Total Program Hours: 79

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