

Assessment and Diagnostic Guideline: Cardio-Respiratory

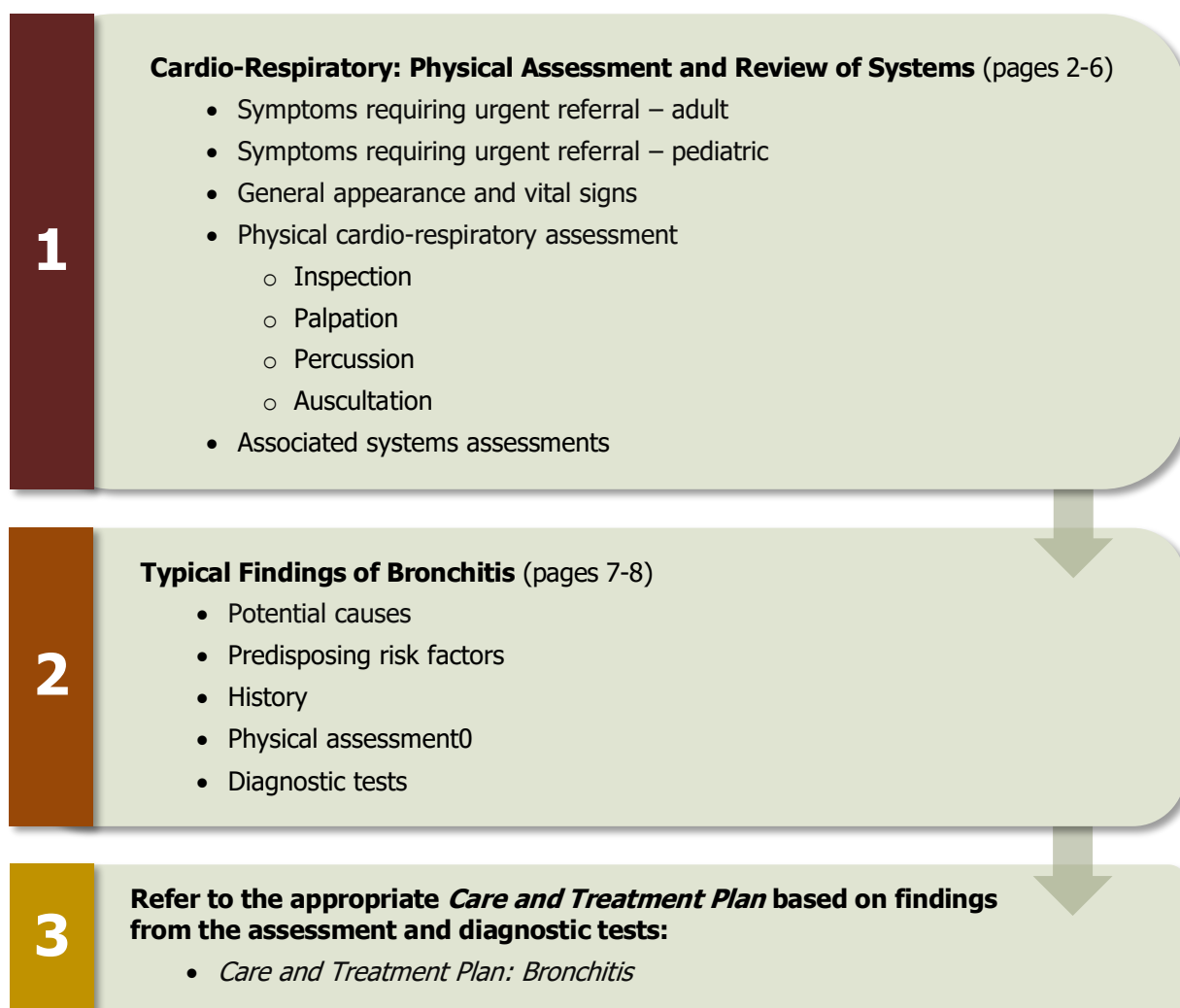
Registered Nurses who hold **Remote Nursing** Certified Practice (RN(C)) designation are authorized to manage, diagnose, and/or treat the following respiratory conditions:

- Acute Bronchitis (adult only)

This Guideline provides guidance to RN(C)s when conducting assessments and diagnostic tests related to cardio-respiratory conditions that can be managed and/or treated under the Certified Practice framework. RN(C)s maintain an RN scope of practice which is expanded in particular circumstances wherein the RN(C) is able to diagnose and treat a given condition.

RN(C)s must ensure they complete and document their assessments according to regulatory practice standards and their practice setting requirements. Upon arriving at a diagnosis, RN(C)s should consult the relevant *Care and Treatment Plans* to inform the management and treatment of the condition.

Visual Summary of Guideline



1) Cardio-Respiratory: Physical Assessment and Review of Systems

*Refer to the Assessment and Diagnostic Guideline: General as needed.

In addition to the health history and review of systems questions outlined in the Assessment and Diagnostic Guideline: General, for any client presenting symptoms affecting their cardio-respiratory system, review this list to ascertain additional signs and/or symptoms which may aid your clinical reasoning when considering conditions that can be treated by one of the DSTs.

Note: The Assessment and Diagnostic Guideline: General does not include the physical assessments.

Symptoms Requiring Urgent Referral – Adult

The first step is to differentiate acute cardio-respiratory distress and cardio-respiratory conditions that can be managed safely by RN(C)s.

New onset of the following signs and symptoms require immediate emergency care and referral to a physician or nurse practitioner:

- Severe dyspnea and inability to lay flat
- Inability to speak or fragmented speech
- Tracheal shift
- Unrelieved chest pain
- Unable to maintain SpO₂ 92% or greater on room air
- Cyanosis (central or peripheral cyanosis)
- Severe increasing fatigue
- Silent chest or crackles throughout lung fields
- Decreased level of consciousness
- Diminishing respiratory effort
- Nasal flaring or tracheal tug
- Intercostal indrawing
- Recent hospitalization for heart failure (HF)

Symptoms Requiring Urgent Referral – Pediatric

Children less than six months of age require consultation. The first step is to differentiate between acute cardio-respiratory distress and conditions that can be managed safely by RN(C)s.

The following signs and symptoms require immediate referral to a physician or nurse practitioner:

- Drooling and/or tripod
- Lethargy, fatigue
- Inability to speak or cry
- Shortness of breath (SOB), tachypnea greater than 60 breaths/minute
- Diminishing respiratory effort
- Tracheal shift
- Tracheal tugging
- Nasal flaring, head bobbing
- Intercostal indrawing
- Chest pain
- SpO₂ less than 92% on room air



- Cyanosis (central cyanosis is not detectable until SaO₂ is less than 85%)
- Silent chest
- Decreased level of consciousness, blackouts
- Immunocompromised
- Poor feeding and weight gain in infants and young children
- Extra heart sounds or murmurs
- Apneic or hypoxic spells
- Persistent tachycardia

General Appearance and Vital Signs

- Apparent state of health
 - Acutely or chronically ill
- Match between appearance and stated age
 - Appearance of comfort or distress
- Position of comfort (e.g., tripod, guarding)
 - Diaphoresis
 - Ability to speak in full sentences without stopping to take a breath
 - Skin colour
- Nutritional status
- Hydration status (older adults at risk)
- Mental status
- Hygiene
- Gait and mobility status
- Piercings and tattoos
- Vital signs
 - Temperature
 - Pulse
 - Respiration
 - SpO₂
 - Blood pressure (BP)
 - Orthostatic changes
 - Pulsus paradoxus
 - Ankle-brachial index (ABI)
 - Pain

Additional Pediatric Considerations

- Appears stated age and within growth parameters
- Degree of consolability and cooperation
- Activity level
- Emotional reaction to caregiver and examiner
- Character of cry (in infants less than six months of age)
- Bruising, contusions, abrasions (suggestive of trauma)



Age	Heart Rate (beats/min)	Blood Pressure (mm Hg)	Respiratory Rate (breaths/min)
Premature	120-170	55-75/35-45	40-70
0-3 months	100-150	65-85/45-55	35-55
3-6 months	90-120	70-90/50-65	30-45
6-12 months	80-120	80-100/55-65	25-40
1-3 years	70-110	90-105/55-70	20-30
3-6 years	65-110	95-110/60-75	20-25
6-12 years	60-95	100-120/60/75	14-22
12+ years	55-85	110-135/65/85	12-18

Source: Wedro, B. C. (Ed.). (2013). *Pediatric vital signs*.

Physical Assessment of Carido-Respiratory

Inspection

- Colour, cyanosis
- Shape of chest
- Symmetry of chest movement
- Rate, rhythm and depth of respiration, respiratory distress
- Intercostal indrawing
- Use of accessory muscles
- Precordium: visible pulsations
- Chest wall scars, bruising, signs of trauma
- Jugular venous pressure
- Colour of conjunctiva
- Extremities
- Hands: edema, cyanosis, clubbing, nicotine stains, cap refill greater than 2 seconds
- Feet and legs:
 - Changes in foot colour with changes in leg position (blanching with elevation, rubor of dependency)
 - Ulcers, edema (check sacrum if client is bedridden)
 - Colour (pigmentation, discolouration)
 - Distribution of hair
 - Varicose veins
- Skin: rashes, lesions, xanthomas

Additional Pediatric Considerations

- Anxious appearance or respiratory distress
 - Acrocyanosis may be normal in infants <1 month
- Shape of chest
 - An infant's chest is barrel shaped slowly becoming adult-like by 6 years



- Tripoding, nasal flaring, drooling, grunting
- Tracheal tug
- Precordium: visible pulsations may be normal
- Tingling
- Leg cramps or pain at rest
- Rashes or eczema
- Audible grunting, wheezing
- Hands: cap refill (<3 seconds)

Palpation

- Tracheal position (midline)
- Chest wall tenderness or crepitus
- Respiratory excursion
- Tactile fremitus
- Spinal abnormality
- Lymph nodes (axillary, supraclavicular, cervical)
- Masses
- Apical beat:
 - Point of maximal impulse (PMI) normally located at the fifth intercostal space, mid-clavicular line
 - Assess quality and intensity of apical beat
 - Apical beat may be laterally displaced, which indicates cardiomegaly
- Identify and assess pulsations and thrills
- Hepatomegaly, right upper quadrant (RUQ) tenderness
- Assess peripheral pulses: radial, brachial, femoral, popliteal, posterior tibial, dorsalis pedis
 - Check for synchrony of radial and femoral pulses
- Edema: pitting (grade 1 to 4) and level (how far up the feet and legs the edema extends); sacral edema

Additional Pediatric Considerations

- Not as useful in children less than 3 years
- Spinal abnormality
- Apical beat:
 - Point of maximum impulse (PMI) in infants and toddlers at the fourth intercostal space and just left of the midclavicular line
 - PMI in child 7 years and older is at fifth intercostal space and just right of midclavicular line

Percussion of Lung Fields

- Resonance
 - Increased resonance over hyperinflated areas
 - Dullness to percussion over areas of consolidation
 - Location and excursion of the diaphragm

Additional Pediatric Considerations

- Useful in children greater than 2 years



Auscultation of Lungs

- Listen for sounds of normal air entry before trying to identify abnormal sounds
- Degree of air entry throughout the chest (should be equal)
- Quality of breath sounds (e.g. bronchial, bronchovesicular, vesicular)
- Ratio of inspiration to expiration
- Adventitious sounds:
 - Wheezes (rhonchi), crackles (rales), pleural rub, stridor, decreased breath sounds

Additional Pediatric Considerations

- Broncho-vesicular sounds are heard throughout the peripheral lung field up to 5-6 years
- Transmitted upper airway sounds such as nasal congestion are commonly noted in small children

Auscultation of Heart

- Listen to normal heart sounds before trying to identify murmurs
- Auscultate at aortic, pulmonic, Erb's point, tricuspid and mitral valve
- Attempt to identify:
 - Rate and rhythm
 - S1 and S2 sounds and their intensity
 - Added heart sounds (S3 and S4), rubs, splitting of S2 and relation to respiration
 - Murmur and relation to position
- Auscultate carotid arteries, abdominal aorta, renal arteries, iliac arteries, and femoral arteries for bruits

Additional Pediatric Considerations

- *Note:* 50% of children develop an innocent murmur at some time in their lives

Associated Systems

- Examination of the ear, nose, and throat should also be carried out because of the interrelatedness between these systems and structures and the functioning of the lower respiratory tract.

Associated Symptoms

- Fever
- Malaise
- Fatigue
- Night sweats
- Weight loss
- Palpitations
- Nausea and vomiting
- Gastroesophageal reflux

Additional Pediatric Considerations

- Consider GI/GU assessment, if appropriate



2) Typical Findings

Bronchitis

Potential Causes

Viral infection: 90% of cases

- Influenza A or B, adenovirus, rhinovirus, para-influenzae, corona virus, Respiratory Syncytial Virus (RSV), human metapneumovirus

Bacterial infection: 10% of cases

- Mycoplasma pneumoniae, Chlamydia pneumoniae, Bordetella pertussis possible causes
- Streptococcus pneumoniae and H. Influenzae usually only causative organisms if there is underlying lung disease

Predisposing Risk Factors

- Chronic sinusitis
- Chronic Obstructive Pulmonary Disease (COPD)
- Asthma
- Bronchiectasis
- Immunocompromised (chronic asthma)
- Smoking
- Second hand smoke
- Air pollutants, environmental factors
- Alcoholism
- Gastro Esophageal Reflux Disease (GERD)
- Wood stoves
- Mould

Initially the presentation of acute bronchitis is difficult to distinguish from an Upper Respiratory Tract Infection (URTI).

Later the presentation of acute bronchitis and pneumonia are often similar. In general, clients with pneumonia are sicker and usually have more chest abnormalities.

The organisms that cause bronchitis can also cause pneumonia. The difference is in where the infection lies anatomically. Bronchitis involves the larger airways, whereas pneumonia involves the smaller airways and air sacs.

History

- Previous infection of Upper Respiratory Tract (URT)
- General malaise
- Fever
- Cough: initially dry, later productive of white, yellow, or green sputum
- Cough for more than 5 days
 - Cough often lasts 10-20 days
 - 45% still have a cough after two weeks, and 25% still have a cough after 3 weeks
- Muscular aching in the chest wall or discomfort with coughing
- Wheezing may be present
- Dyspnea on exertion may be present



Physical Assessment

- Temperature may be mildly to moderately elevated
- Pulse may be mildly elevated if febrile
- Respirations may be slightly elevated
- Purulent sputum is common in 50% of cases
- Rhinitis may be present
- Expiratory phase may be slightly prolonged
- Wheezes (scattered, low pitched) may be present
- Abnormal vital signs (fever, tachypnea or tachycardia) and signs of consolidation or rales on physical exam suggest the possibility of pneumonia

Diagnostic Tests

- Electrocardiogram (ECG), Culture and Sensitivity (C&S) of sputum
- Consider swab for pertussis, particularly if cough lasts more than 6 days and is accompanied by vomiting
- Consider Tuberculosis (TB) skin test for cough greater than 2 weeks and in high risk or susceptible populations

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