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DHA TELEHEALTH CLINICAL GUIDELINES

FOR VIRTUAL MANAGEMENT

OF COUGH – 46

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INTRODUCTION

Dubai Health Authority (DHA) is the responsible entity for regulating, licensing and monitoring health facilities and healthcare professionals in the Emirate of Dubai. The Health Regulation Sector (HRS) is an integral part of DHA and was founded to fulfil the following overarching strategic objectives:

Objective #1: Regulate the Health Sector and assure appropriate controls are in place for safe, effective and high-quality care.

Objective #2: Position Dubai as a global medical destination by introducing a value-based, comprehensive, integrated and high-quality service delivery system.

Objective #3: Direct resources to ensure happy, healthy and safe environment for Dubai population.

ACKNOWLEDGMENT

This document was developed for the Virtual Management of Cough in collaboration with Subject Matter Experts. The Health Policy and Standards Department would like to acknowledge and thank these professionals for their dedication toward improving the quality and safety of healthcare services.

The Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Telehealth is based on Evidence Based Practice (EBP) which is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient.

It means integrating individual clinical expertise with the best available external clinical evidence and guidelines from systematic research

This guideline is presented in the format comprising of clinical history/symptoms, differential diagnosis, investigations and management. Identification of 'Red Flags' or serious conditions associated with the disease is an essential part of this telehealth guideline as it aids the physician to manage patients safely and appropriately by referrals to ER, family physicians or specialists for a face to face management.

DEFINITIONS/ABBREVIATIONS

Virtual Clinical Assessment: Is the evaluation of the patient's medical condition virtually via telephone or video call consultations, which may include one or more of the following: patient medical history, physical examination and diagnostic investigations.

Patient: The person who receives the healthcare services or the medical investigation or treatment provided by a DHA licensed healthcare professional.

ABBREVIATIONS

DHA	:	Dubai Health Authority
EBP	:	Evidence Based Practice
ER	:	Emergency Room
KPI	:	Key Performance Indicator

1. BACKGROUND

1.1. Introduction

1.1.1. The symptom of cough is one of the most common symptoms for which outpatient and/or virtual consultations are sought.

1.1.2. Although cough is a troublesome symptom that causes discomfort to patients, it serves a potentially beneficial purpose by clearing the airways of excessive mucus, irritants, or abnormal substances such as edema fluid or pus. However, while cough may serve a useful function, it can also lead to a variety of problems, including exhaustion, feeling self-conscious, insomnia, changes in lifestyle, musculoskeletal pain, hoarseness, excessive perspiration, and urinary incontinence in some cases, These problems are more likely to be prominent in the setting of chronic versus acute cough.

1.2. Classifications of cough

1.2.1. Cough can be classified based upon the duration of the cough into 3 categories:

- a. Acute cough, lasting less than 3 weeks
- b. Subacute cough, lasting between 3 and 8 weeks
- c. Chronic cough, lasting more than 8 weeks

1.3. Acute Cough

1.3.1. Acute cough is most commonly associated with the common cold, but it also can be associated with life-threatening conditions (e.g., pulmonary embolism, congestive heart failure, pneumonia). The first step in the treatment of acute cough is to determine if the cause of the cough is one of these serious conditions or an acute upper respiratory infection (e.g. common cold), lower respiratory tract infection, or an exacerbation of a preexisting condition (e.g., asthma, bronchiectasis, chronic obstructive pulmonary disease [COPD], or upper airway cough syndrome).

1.4. Subacute Cough

1.4.1. The first step in diagnosing subacute cough is to determine whether the cough has followed a respiratory infection. If the cough does not appear to be postinfectious, it should be managed as if it were a chronic cough.

1.4.2. If the cough began with an upper respiratory tract infection and has lingered, it is usually considered a postinfectious cough. It is most probably caused by postnasal drip, upper airway irritation, mucus accumulation, or a manifestation of bronchial hyperresponsiveness that may be associated with asthma. Ongoing allergen or irritant exposure, lingering effects of an infection, pneumonia, and acute exacerbation of chronic bronchitis should also be considered.

1.4.3. Patients suspected of being infected with *B. pertussis* (i.e., whooping cough) should be referred or investigation should be ordered for patient has a nasopharyngeal swab for culture. Patients with confirmed whooping cough should receive macrolide antibiotics and should be isolated for 5 days beginning on the first day of treatment.

1.5. Chronic Cough

1.5.1. Chronic cough is often caused by more than one condition. The diagnosis should begin with a medical history and chest x-ray if indicated. Please note that if there has been inadequate response to treatment and/or further investigations are needed (e.g. High-resolution CT) then a referral to specialists/hospital should be made for further evaluation and management.

1.5.2. Refer to APPENDIX 1 for a diagnostic approach to chronic cough.

2. SCOPE

2.1. Telehealth services in DHA licensed Health Facilities.

3. PURPOSE

3.1. To support the implementation of Telehealth services for patients with Cough in Dubai Health Authority (DHA) licensed Health Facilities

4. APPLICABILITY

4.1. DHA licensed physicians and health facilities providing Telehealth services.

4.2. Exclusion for Telehealth services are as follows

4.2.1. Emergency cases where immediate intervention or referral is required.

4.2.2. Prescribe Narcotics, Controlled or Semi-Controlled medications.

5. RED FLAGS

5.1. Chronic "smoker's cough" in patients who are current or ex-smokers (risk of lung cancer)

5.2. A cough that persists more than one month following smoking cessation

5.3. Hemoptysis that does not occur in the setting of an airway infection (to rule out TB, Lung cancer)

5.4. Recurrent or chronic cough in elderly or infirm with suspected swallowing dysfunction or aspiration cough.

5.5. Cough associated with breathlessness

5.6. Cough associated with wheeze

5.7. Severe thoracic pain/ pleuritic chest pain/pleurisy (to rule out pneumonia, TB, Pulmonary embolism)

5.8. Persistent cough for more than three weeks.

5.9. Systemic symptoms: persistent fever (pneumonia, TB); night sweats, weight loss (TB, lung cancer)

5.10. Persistent nocturnal cough.

5.11. Recurrent chest infections

- 5.12. Coughing up sputum every morning for more than three months of the year (to rule out bronchiectasis).
- 5.13. History of contact with TB and/or HIV
- 5.14. Productive cough accompanied by fever, dyspnea, and pleuritic chest pain, suspected pneumonia.
- 5.15. Dry non-productive cough associated with dyspnea (which can be an early sign of left-sided heart failure).
- 5.16. Recurrent wet-sounding cough after eating or drinking (suspected Aspiration)
- 5.17. Constant coughing, often with blood-stained sputum with or without shortness of breath, suspected lung cancer
- 5.18. Cough onset after exposure to fire, suspected acute inhalation injury
- 5.19. *Acute and severe* cough regardless of any cause

6. CLINICAL HISTORY

6.1. Taking good clinical history often provides important initial clues and is crucial to establish the diagnosis. Therefore, a detailed exploration of the problem and how it affects the patient is essential. The following questions should be explored during the virtual consultation:

- 6.1.1. Onset and duration of cough
 - a. Acute: cough lasting < 3 weeks
 - b. Subacute: cough lasting 3–8 weeks

- c. Chronic: cough lasting > 8 weeks in adults; > 4 weeks in children

6.1.2. Quality

- a. Productive / sputum (which can be due to pneumonia, bronchitis, bronchiectasis, pulmonary edema, TB, URTI)
- b. Nonproductive/ dry cough (which can be due to asthma, interstitial lung disease, viral URTI)

6.1.3. Timing

- a. Nocturnal cough (which could be due to asthma, upper airway cough syndrome (UACS), GERD).
- b. Seasonal / geographical variation (which could be due to allergy / irritant-induced cough. Eg. Asthma, hypersensitivity pneumonitis, UACS due to allergic rhinitis, acute bronchitis)
- c. Worse at work

6.1.4. Risk factors

- a. History of current and previous smoking (pack years)
- b. Occupational history (which can lead to diagnosis of pneumoconiosis, hypersensitivity pneumonitis)
- c. Medication history (e.g ACE inhibitors, B-blockers, aspirin since these can induce dry cough and/or bronchoconstriction).
- d. History of allergies

- e. History of contact with an individual who has TB or foreign travel to TB-prevalent areas

6.1.5. Associated symptoms

- a. URI: rhinorrhea, odynophagia, myalgia, fever: suggestive of URI
- b. Allergic origin: itching and watering of eyes, rhinorrhea, itching
- c. Cough-variant asthma: exacerbation of cough with activity
- d. GERDL heartburn or reflux.
- e. Any unintentional weight loss (possible lung cancer)
- f. Difficulty breathing
- g. Chest pain
- h. Wheeze
- i. Hemoptysis
- j. Symptoms of heart failure (e.g. orthopnea, ankle swelling, breathlessness when lying flat)

7. CAUSES OF COUGH AND DIFFERENTIAL DIAGNOSIS

The most common etiologies of chronic cough are upper airway cough syndrome (due to postnasal drip), asthma, and gastroesophageal reflux. However, a number of other important etiologies must also be considered in patients presenting with persistent cough. As an example, a post-infectious etiology is a particularly common cause of subacute cough, with

the cough often lingering long after the other acute symptoms of the infection have dissipated.

Cough may also be a complication of drug therapy, particularly with angiotensin converting enzyme (ACE) inhibitors.

Other less common causes of chronic cough include a number of disorders affecting the airways (non-asthmatic eosinophilic bronchitis, chronic bronchitis, bronchiectasis, neoplasm, foreign body) or the pulmonary parenchyma (interstitial lung disease, lung abscess)

However, some patients may experience chronic cough of unclear etiology for years, despite extensive evaluation. The etiology of so-called "chronic idiopathic cough" is unknown; exaggerated cough reflex sensitivity has been suggested

7.1. Upper airway cough syndrome

7.1.1. Several studies suggest that upper airway cough syndrome related to postnasal drip is a common cause of subacute and chronic cough. Underlying reasons for postnasal drip include allergic, perennial nonallergic, and vasomotor rhinitis; acute nasopharyngitis; and sinusitis. Once secretions are present in the upper airway, cough is probably induced by stimulation of cough receptors within the laryngeal mucosa.

7.1.2. Symptoms of postnasal drip include frequent nasal discharge, a sensation of liquid dripping into the back of the throat, and frequent throat clearing.

However, postnasal drip may also be "silent," so that the absence of these symptoms does not necessarily exclude the diagnosis

- 7.1.3. Because the symptoms and signs of postnasal drip are nonspecific, there are no definitive criteria for its diagnosis, and it is ultimately the response to therapy that secures the diagnosis. When an alternative specific cause for cough is not apparent, empiric therapy of postnasal drip should be attempted before embarking on an extensive diagnostic work-up for other etiologies. Radiographic evidence of mucosal thickening is a relatively nonspecific finding, and radiographic studies generally are not indicated unless empiric treatment of chronic rhinitis has failed

7.2. Asthma

- 7.2.1. Asthma is the second leading cause of persistent cough in adults, and the most common cause in children. Cough due to asthma is commonly accompanied by episodic wheezing and dyspnea; however, it can also be the sole manifestation of a form of asthma called "cough variant asthma". Cough variant asthma can progress to include wheezing and dyspnea.

- 7.2.2. A diagnosis of asthma is suggested when the patient is atopic or has a family history of asthma. Asthma-related cough may be seasonal, may follow an upper respiratory tract infection, or may worsen upon exposure

to cold, dry air, dust, mold, or to certain fumes or fragrances. A cough accompanied by wheezing or dyspnea, or one that occurs following initiation of beta-blocker therapy also suggests asthma.

7.3. Gastroesophageal reflux

7.3.1. Gastroesophageal reflux is often reported to be the second or third most common cause of persistent cough, although it is the most common cause in some reports, occurring in 30 to 40% of patients. Many patients complain of symptoms of gastroesophageal reflux (heartburn or a sour taste in the mouth); however, these symptoms are absent in more than 40% of patients in whom cough is due to reflux. Several factors are potentially responsible for the cough associated with gastroesophageal reflux:

- a. Stimulation of receptors in the upper respiratory tract (eg, in the larynx).
- b. Aspiration of gastric contents, leading to stimulation of receptors in the lower respiratory tract.
- c. An esophageal-tracheobronchial cough reflex induced by reflux of acid into the distal esophagus

7.3.2. Some of the GERD cases can be diagnosed clinically. However, patient can be referred to specialist to confirm diagnosis. The investigations that might be required include

- a. Barium swallow - this study is negative in the majority of patients and many patients with reflux do not have cough.
- b. Prolonged (24 hour) esophageal pH monitoring, ideally performed with event markers to allow correlation of cough with esophageal pH, is generally considered the optimal diagnostic study, with a sensitivity exceeding 90%. However, even with maximal antireflux therapy, some patients with positive results on esophageal pH monitoring continue to cough.
- c. Esophageal manometry- Esophageal dysmotility, with or without evidence of GERD, appears to be common in patients with chronic cough. However, the role of esophageal manometry in the evaluation remains to be defined

7.3.3. Gastroesophageal reflux can also contribute to asthma symptoms

7.4. Laryngopharyngeal reflux

7.4.1. Laryngopharyngeal reflux (LPR) is the retrograde movement of gastric contents (acid and enzymes such as pepsin) into the laryngopharynx leading to symptoms referable to the larynx/hypopharynx. Most patients

are relatively unaware of LPR with only 35% reporting heartburn. Typical LPR symptoms include dysphonia/hoarseness, chronic cough, mild dysphagia and nonproductive throat clearing

7.4.2. LPR is seen as primarily an upper esophageal sphincter (UES) problem that mainly occurs in the upright position during periods of physical exertion (eg, bending over, Valsalva, exercise). In contrast, GERD is felt to be a problem of the lower esophageal sphincter and mainly occurs in a recumbent position. There appears to be a lower incidence of esophageal dysmotility in LPR versus GERD.

7.4.3. Referral for direct laryngoscopic evaluation can assist in the diagnosis of cough from reflux. Arytenoid erythema and edema and pharyngeal inflammation often suggest laryngeal and pharyngeal reflux, and when seen, suggest that a course of treatment for reflux is indicated with monitoring of the cough on such therapy.

7.5. Respiratory tract infection

7.5.1. Cough following viral or other upper respiratory tract infection can persist for more than 8 weeks after the acute infection. Such cases increase in frequency during outbreaks of *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, and *Bordetella*.

- 7.5.2. Several possibly interrelated mechanisms may be responsible for cough in this setting:
- a. Secretions from a postnasal drip may stimulate receptors in the upper respiratory tract.
 - b. Enhanced sensitivity of airway nerves may be present after upper respiratory tract infections, particularly in those patients who develop a nonproductive cough. A possible explanation for this response is exposure of afferent nerves, located immediately below epithelial tight junctions, as a consequence of viral-induced epithelial necrosis.
 - c. Airway inflammation following acute viral respiratory infections is associated with airway hyperresponsiveness and the potential for cough as well as airway constriction.
- 7.5.3. Pertussis is a common, but under recognized, cause of persistent cough in adolescents and adults.
- 7.5.4. Some patients appear to have unsuspected bacterial suppurative disease of the large airways, in the absence of bronchiectasis, as a cause of chronic cough.

7.6. ACE inhibitors

7.6.1. A nonproductive cough is a well-recognized complication of treatment with angiotensin converting enzyme (ACE) inhibitors, occurring in up to 15% of patients treated with these agents. Although the pathogenesis of the cough is not known with certainty, it has commonly been hypothesized that accumulation of bradykinin, which is normally degraded in part by ACE, may stimulate afferent C-fibers in the airway.

7.6.2. The important observation that cough does not appear to occur with increased frequency in patients treated with angiotensin II receptor antagonists (which do not increase kinin levels) is consistent with the kinin hypothesis.

7.6.3. ACE inhibitor-induced cough has the following general features:

- a. It usually begins within one week of instituting therapy, but the onset can be delayed up to six months.
- b. It often presents with a tickling, scratchy, or itchy sensation in the throat.
- c. It typically resolves within 1 to 4 days of discontinuing therapy, but can take up to 4 weeks.
- d. It generally recurs with re-challenge, either with the same or a different ACE inhibitor.

- e. It is a more common complication in women than in men, and is also more common in those of Chinese ancestry
- f. It does not occur more frequently in asthmatics than in non-asthmatics.
- g. It is generally not accompanied by airflow obstruction. In one study, for every 10 patients with cough induced by ACE inhibitors, there was approximately one patient with development or aggravation of asthma, bronchospasm, or dyspnea. Cough did not necessarily accompany these other respiratory problems.

7.7. Chronic bronchitis

- 7.7.1. Chronic bronchitis is defined as the presence of cough and sputum production on most days over at least a 3-month period for more than two consecutive years in a patient without other explanations for cough. Almost all patients are smokers, except a small number who have chronic exposure to an airway inflammation due to other fumes or dusts. Because of the high prevalence of smoking, chronic bronchitis remains one of the most frequent causes of chronic cough. However, most smokers with chronic bronchitis do not seek medical attention for their cough, and in most series of chronic cough, chronic bronchitis accounts for 5% or less of cases.

7.7.2. The sputum produced is usually clear or white. A purulent appearance to sputum often suggests a concomitant upper or lower respiratory infection, such as acute bronchitis, bronchiectasis, or sinusitis. In any smoker who presents for evaluation of cough, one must ensure that the symptoms do not represent a change in a chronic cough that is suggestive of a neoplasm

7.8. Bronchiectasis

7.8.1. Bronchiectasis results from severe, repeated, or persistent airway inflammation that leads to progressive airway damage. Bronchi become dilated and cystic, leading to poor mucus clearance, secretion pooling, and chronic infection of the lower respiratory tract. This, in turn, serves to worsen airway inflammation and bronchial destruction.

7.8.2. Cough is a major symptom of bronchiectasis. While some patients with bronchiectasis have only a dry cough, most produce chronic sputum that is mucopurulent, and which becomes frankly purulent during an exacerbation. The chest radiograph may suggest the disease by demonstrating crowded lung markings, thickened bronchial walls, or small fluid-filled cystic structures. However, these findings are insensitive and nonspecific, and, therefore, patient should be referred to

pulmonologist for chest CT with high-resolution imaging, which is the optimal method of securing the diagnosis.

7.9. Lung cancer

7.9.1. Bronchogenic carcinoma is a feared diagnosis in which cough is present in a significant number of cases. However, lung cancer is the etiology in less than 2% of the cases of chronic cough. Most cases of lung cancer that manifest with cough are due to neoplasms originating in the large central airways, where cough receptors are common.

7.9.2. Pulmonary lymphangitic carcinomatosis from extrapulmonary malignancies can also present as cough, but is generally accompanied by dyspnea.

7.9.3. Bronchogenic cancer should be considered as a possible etiology of cough in any current or former smoker, and should be particularly suspected in those with:

- a. A new cough or a recent change in chronic "smoker's cough"
- b. A cough that persists more than one month following smoking cessation
- c. Hemoptysis that does not occur in the setting of an airway infection

7.10. Non-asthmatic eosinophilic bronchitis

7.10.1. Non-asthmatic eosinophilic bronchitis is an increasingly recognized cause of chronic nonproductive cough, particularly in patients who lack any of the risk factors described above. Patients with this disorder demonstrate atopic tendencies, with elevated sputum eosinophils and active airway inflammation in the absence of airway hyperresponsiveness. These same findings with evidence of hyperresponsiveness are consistent with the diagnosis of cough-variant asthma

8. INVESTIGATIONS

8.1. Cough is often a clinical diagnosis (diagnostic tests are not routinely indicated in this case). But depending on the history and suspected diagnosis, some investigations include the following:

- 8.1.1. CBC, U&Es, CRP, LFTs
- 8.1.2. Chest X-ray
- 8.1.3. Peak flow diary (home/work)
- 8.1.4. Pulmonary function tests
- 8.1.5. Sputum testing for microscopy, culture and sensitivity
- 8.1.6. ECG
- 8.1.7. Helicobacter pylori stool antigen

- 8.1.8. Referral for Echocardiogram
- 8.1.9. For more detailed imaging, such as high-resolution CT, diagnostic uncertainty, and persistent cough where initial/above investigations may have not revealed much, patient should be referred to specialist for further evaluation and assessment.

9. REFERRAL CRITERIA

- 9.1. Referral to Emergency Department
 - 9.1.1. Cough associated with breathlessness
 - 9.1.2. Severe thoracic pain/ pleuritic chest pain/pleurisy (to rule out pneumonia, TB, Pulmonary embolism)
 - 9.1.3. Cough onset after exposure to fire (suspected acute inhalation injury)
 - 9.1.4. Acute *and* severe cough regardless of any cause
 - 9.1.5. Recurrent wet-sounding cough after eating or drinking (suspected Aspiration)
 - 9.1.6. Productive cough accompanied by fever, dyspnea, and pleuritic chest pain, suspected pneumonia.
 - 9.1.7. Systemic symptoms: persistent fever and night sweats, (pneumonia, TB)
 - 9.1.8. Recurrent or chronic cough in elderly or infirm with suspected swallowing dysfunction or aspiration cough.
 - 9.1.9. Cough associated with significant amount of hemoptysis

- 9.2. Referral to Family Medicine Specialists or pulmonary specialist
- 9.2.1. Chronic "smoker's cough" in patients who are current or ex-smokers (risk of lung cancer)
 - 9.2.2. Mild to moderate hemoptysis that does not occur in the setting of an airway infection (to rule out TB, Lung cancer)
 - 9.2.3. Persistent cough for more than three weeks and symptoms are not settling despite initiation of treatment virtually
 - 9.2.4. Cough associated with wheeze
 - 9.2.5. Persistent nocturnal cough.
 - 9.2.6. Recurrent chest infections
 - 9.2.7. Coughing up sputum every morning for more than three months of the year (to rule out bronchiectasis).
 - 9.2.8. Onset of cough following contact or exposure to patients with TB and/or HIV.
 - 9.2.9. Dry non-productive cough associated with dyspnea (which can be an early sign of left-sided heart failure).
 - 9.2.10. Constant coughing, often with blood-stained sputum with or without shortness of breath, suspected lung cancer
 - 9.2.11. Cough associated with night sweats or weight loss (which could be due to TB).

- 9.2.12. If diagnosis is uncertain
- 9.2.13. If patient's condition requires more detailed investigations such as high-resolution CT

10. MANAGEMENT OF COUGH

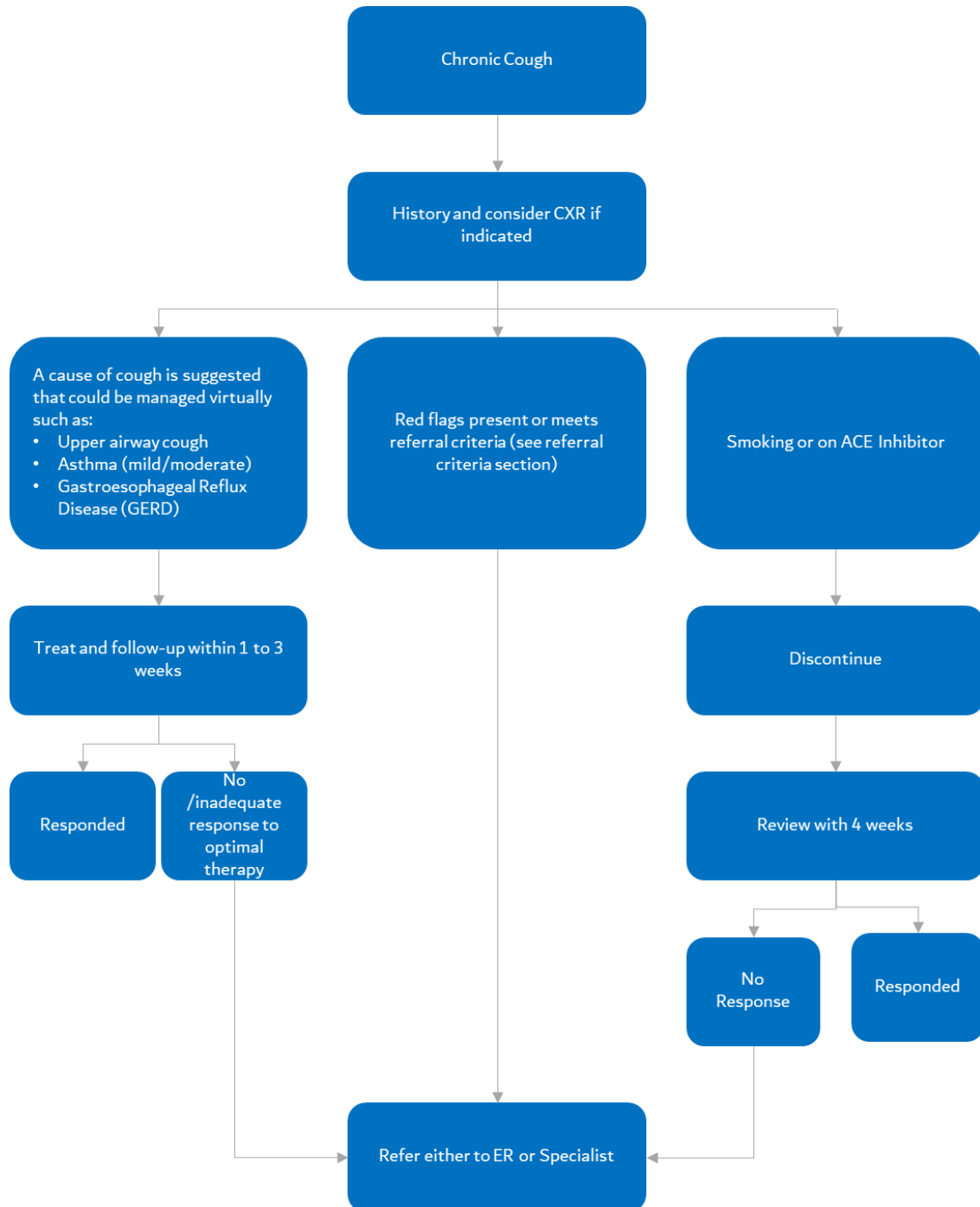
- 10.1. Refer to APPENDIX 2 for the Virtual Management of Cough Algorithm
- 10.2. Treatment of cough depends on the cause/ diagnosis. Therefore, the first priority for management of a patient with persistent cough is establishing an etiology/cause, so that therapy can be directed at the underlying cause.
- 10.3. For specific therapy for the most common causes of acute cough (such as URTI/common cold, allergic rhinitis, asthma and dyspepsia/GERD), could be found by referring to specific diagnosis-related Telehealth Guidelines. For example, if a common cold is thought to be the cause of a cough, then one can refer to Virtual Management of Common Cold Guideline for detailed management of this condition.
- 10.4. However, it is important to emphasize that the initial priorities for patients with cough lasting more than three weeks (subacute or chronic cough) are to identify a precipitant or etiology, and then to eliminate the precipitant. For example, for ACE inhibitor-induced cough, treatment consists of discontinuing the ACE inhibitor and, if necessary, switching the patient to losartan or another angiotensin II receptor antagonist

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APPENDICES

APPENDIX 1 – DIAGNOSTIC APPROACH TO CHRONIC COUGH



APPENDIX 2 – VIRTUAL MANAGEMENT OF COUGH ALGORITHM

