

Long-Term Care of the Patient With a Tracheostomy

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An increasing number of technology-dependent patients are sent home for long-term home-management of stable chronic illness. With a patient who is going to undergo tracheotomy, patient-education (for the patient and his/her caregivers) should begin early (before the tracheostomy, if possible), should be individualized to the patient, and should include basic airway anatomy, medical justification for the tracheostomy, tube description and operation, signs and symptoms of respiratory and upper-airway distress, signs and symptoms of aspiration, suctioning technique, tracheostomy tube-cleaning and maintenance, stoma-site assessment and cleaning, cardiopulmonary resuscitation, emergency decannulation and reinsertion procedures, tube-change procedure, equipment-and-supply use and ordering procedures, and financial issues. There should be a scheduled follow-up plan with the attending physician. A combination of process-validation, through additional research, and expert consensus may be needed to standardize the long-term care of patients who undergo tracheostomy. Key words: tracheostomy, tracheotomy, home-care, caregiver, training, equipment, airway care, suctioning. [Respir Care 2005;50(4):534–537. © 2005 Daedalus Enterprises]

Introduction

A growing trend in recent years has been the long-term management of stable but chronically ill and technology-dependent patients in the home. This may be a result of

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Joseph S Lewarski RRT presented a version of this paper at the 20th Annual New Horizons Symposium at the 50th International Respiratory Congress, held December 4–7, 2004, in New Orleans, Louisiana.

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myriad factors, including increased economic pressures on acute-care medical facilities, which often result in shorter hospital lengths of stay and efforts to transition patients to less costly points of care. Additional factors may include (1) growing social acceptance of persons with disabilities, which supports the integration of medically fragile and chronically ill persons into the community, and (2) technological advances, which allow lay caregivers the ability to deliver limited forms of medical care in the home. The net result is a population of individuals living at home with various medical interventions and technology needs, who were previously restricted to institutional settings. Among this group are those with tracheostomies, which includes infants, adolescents, and adults.

The underlying medical conditions contributing to long-term-tracheostomy patients in the home are diverse and may include but not be limited to patients with upper-airway deformity or obstruction requiring improved airway management, patients requiring prolonged invasive ventilatory support, and patients with other diseases compromising the integrity of the upper airway. Regardless of the underlying condition, patients requiring long-term tracheostomy care face a series of common obstacles and share a set of common needs.

Clinical Evidence

In a health care environment moving quickly into an evidence-based approach to medical procedures and care, there appears to be an absence of such scientific evidence when seeking guidance and standards for the long-term management of patients with tracheostomies in the home or other noninstitutional environment. There are essentially no controlled studies or substantial peer reviewed research papers to guide care and practice in this field. In a thorough search of the literature, one finds little objective, controlled scientific data, and, as a result, much of the long-term tracheostomy care standard of practice in the United States is based on extrapolations of bedside tracheostomy care performed in acute-care settings. Other factors include local physician practice standards, anecdotal clinical data, third-party insurance payments, and common sense. One of the most comprehensive documents in this field of care is a consensus statement prepared by the American Thoracic Society, entitled *Care of the Child with a Chronic Tracheostomy*, which is a very complete set of recommendations derived from a review of the available and relevant published data, along with the consensus of a panel of experts.¹ Another resource, although more limited in scope, is the American Association for Respiratory Care (AARC) clinical practice guideline governing suctioning of the patient in the home.² The current AARC clinical practice guideline, although well referenced, is specific to suctioning only and does not effectively address other issues associated with the long-term care of patients with tracheostomies.

Based on the sources cited above, and on personal experience, the remainder of this article will discuss the components of a long-term tracheostomy care program (Table 1).

Patient and Caregiver Training

Early discharge planning and patient/caregiver training are required components of the care and treatment of any patient with a chronic illness, but are of particular importance in managing patients scheduled for discharge with a tracheostomy and the associated medical and technologi-

Table 1. Components of a Long-Term Tracheostomy Care Program

Patient and caregiver training
Appropriate tube selection
Airway management/ventilation
Tracheostomy tube and stoma site care
Suctioning needs
Humidification needs
Speech
Tubing change and decannulation

cal needs. Experience suggests that patient and caregiver training should begin as early as possible and should be adjusted and individualized to the patient. When possible, training should be initiated in advance of the actual tracheostomy procedure. Both adult and pediatric patient training should include the patient and at least one caregiver, but preferably, two. The details of appropriate patient training extend well beyond the scope of this overview, but at a minimum should include basic airway anatomy, medical justification for the tracheostomy, tube description and operation, signs and symptoms of respiratory and upper-airway distress, signs and symptoms of aspiration, suctioning technique, tracheostomy tube cleaning and maintenance, stoma site assessment and cleaning, cardiopulmonary resuscitation, emergency decannulation and reinsertion procedures, tube change procedure (pediatrics), equipment and supply use and ordering procedures, and a scheduled follow-up plan with the attending physician.³

Tracheostomy Tube Selection and Airway Management

Tracheostomy tube selection is commonly the responsibility of the medical facility and physician performing the initial surgical procedure. There are a number of clinical and technical considerations associated with tube selection. Clinical considerations may include the structural shape and anatomy of the airway, ventilation needs via the tracheostomy tube, need for supplemental oxygen, ambulation and activity needs, and speech and feeding concerns. Technical considerations may include tube brand and material, tubing size (diameter and length), need for a cuff, need for fenestration, need for an inner cannula (disposable or reusable), need to integrate with other respiratory devices (eg, swivel connectors, speaking valves). There is no specific research available documenting the optimal choices in tracheostomy tube selection. As a result, local practice standards and facility device preferences may play a major role in the actual tube selection.

Tracheostomy Tube and Stoma Care

Consistent with other components of the long-term management of the patient with a tracheostomy, there is little research or published consensus in regard to long-term tracheostomy tube and stoma care. The frequency of tracheostomy tube-changes varies widely and is often driven by local practice. Nursing journal papers nearly 20 years old make reference to pediatric tubing changes in home-care patients on a schedule ranging from daily to monthly.⁴ There is essentially no published or recommended standard for adult tracheostomy tube changes, and again most current protocols are the result of local practices. Tracheostomy and stoma-site care also varies greatly, with no single consensus or science-based standard. Common home-care tracheostomy and stoma cleaning agents include hydrogen peroxide, diluted acetic acid, commercial medical disinfectants (eg, Control III), and simple soap and water. Care standards often evolve from the availability of reimbursed resources, such as tracheostomy-care cleaning supplies. Third-party insurance policies often dictate practice by limiting the type and quantity of tracheostomy supplies that will be paid for under the home medical equipment and supply insurance benefit. In many instances, one tracheostomy-care cleaning kit per day is the “allowed amount,” and therefore common practice is once-daily tracheostomy and stoma-site cleaning and care.

Suctioning

Assuring a patent airway and effective secretion management are vital components of long-term tracheostomy care. Suctioning is defined as the mechanical aspiration of secretions from the airway and a necessary part of routine care of the patient with a tracheostomy. The AARC clinical practice guideline “Suctioning of the Patient in the Home” is a relatively complete document that provides guidance that includes patient preparation, the actual suctioning event, and post-suction care. Key elements from the clinical practice guideline include self-suctioning training when possible; guidelines for pre-oxygenation or hyperinflation, which may not be needed for stable home patients; acceptance and promotion of clean (nonsterile) technique; suction catheter size selection; suction catheter insertion depth; frequency of suctioning; reuse of suction catheters; and consensus opposing the routine use of saline lavage.²

Humidification

The human upper airway serves as an anatomical heat-and-moisture exchanger, helping to filter, warm, and humidify inspired gas. Under normal conditions, the upper airway efficiently adds heat and moisture and thus pro-

duces a temperature gradient starting with ambient at the nose, to body-temperature in the lungs. Bypassing the upper airway may produce unwanted humidity deficit, and as a result it is common practice to provide supplemental heat and humidity to patients with artificial airways. The use of supplemental heat-and-humidity systems in conjunction with long-term-tracheostomy patients in the home varies greatly and is, again, often based more on local practice than on objective scientific evidence. The use of technology to deliver humidification varies and includes large-volume air compressors for flow-generation, heated passive humidifiers, heated and nonheated jet nebulizer systems, and disposable heat-moisture exchangers. The use of heat-and-humidification systems with adult long-term-tracheostomy patients is often based solely on local clinical practice, as there is little science and no consensus on this subject. Stable adult patients with adequate systemic hydration often tolerate little or no supplemental humidity and/or heat, as is often evidenced from clinical practice. It appears that many stable adult patients become acclimated to breathing room air via the tracheostomy, although there are little to no objective data validating such. In pediatric long-term-tracheostomy patients, there is a general consensus supporting supplemental heat and humidification in the home, at levels similar to institutional settings. The small airways and low body-weights of infants and children may make them more susceptible to minor changes in systemic fluid balance, increasing the risk of airway/secretion-drying and subsequent humidity deficiency. The goal of supplemental heat and humidity in pediatric long-term-tracheostomy patients is to target the normal physiology, which includes a temperature at the carina of approximately 32–34°C and approximately 100% relative humidity. However, the reality and challenges of home care, including insurance coverage guidelines, environmental obstacles, technology obstacles, and cost constraints, may prevent some pediatric patients from achieving such ideal clinical goals. Ensuring airway patency, effective secretion management, and patient comfort are additional clinical goals and practical end points

Speech

Communication is one of the most important considerations associated with the long-term management of patients with tracheostomies. Loss of effective communication can isolate adult patients and inhibit normal social and communication development in pediatrics. There are a number of tracheostomy adjuncts to promote speech, including cuffless tracheostomy tubes, fenestrated tracheostomy tubes, and one-way speaking valves. All tracheostomy patients should be referred for speech therapy prior to the surgical placement of the tracheostomy or soon thereafter.

Speech goals should include, at a minimum, effective swallowing and vocal communication.

Tracheostomy Tube Changes and Decannulation

As previously stated, there is no consensus or objective science governing the frequency of tube changes in long-term tracheostomy patients. Decannulation of long-term tracheostomy patients can be divided into 2 basic categories: (1) planned decannulation and (2) accidental decannulation. Planned decannulation is a goal for many tracheostomy patients when the medical need for the tracheostomy no longer exists. A common decannulation process involves the sequential downsizing of the tube, often in conjunction with plugging periods leading to eventual decannulation. This process can take several days or weeks and is often dependent on the patient's stability and tolerance of the downsizing and plugging procedures. Another planned decannulation is referred to as the one-step method. This method is more comprehensive and includes endoscopic evaluation of the airway and, if clinically indicated, the subsequent removal of the tube. The one-step procedure is considered more intensive and is often performed in the acute-care setting, followed by 24–48 hours of decannulation monitoring. There are no scientific data supporting one method over the other. Local practice and preferences tend to guide the process.

Accidental decannulation is an unplanned removal of the tracheostomy tube. Such unplanned decannulations can be uneventful or produce a life-threatening situation.⁵ There are no published data on the frequency at which this occurs in the home, but common practice is to provide all long-term tracheostomy patients back-up tubes, including tubes that are 1–2 sizes smaller, to be used in the event the primary tube cannot be quickly re-inserted. Many emergency decannulations are unreported, as patients and caregivers are often successful at replacing the primary tube.

Economic Considerations

One cannot discuss the long-term and home management of patients without allotting some time to discuss the economic/financial issues faced by patients, caregivers, and health care providers. As noted throughout this paper, local practice standards and third-party insurance payer

guidelines often play a major role in formulating the processes and procedures that govern the long-term care of patients with tracheostomies. Medicare, Medicaid, and private insurance providers often set home-medical-equipment coverage rules and supply-limits based on recognized and published standards of practice and the available scientific evidence. In the face of deficient scientific evidence, combinations of local practice standards, along with practical and cost-effective strategies may influence the care and management of patients. Such is the case with long-term tracheostomy care in the home. Physicians, discharge planners, home health nurses, and home-medical-equipment providers need to become intimately familiar with the local and national insurance coverage rules and to develop patient education and care strategies within these constraints and guidelines, until such time as there are sufficient data to alter insurance coverage policy.

Summary

In an era promoting evidence-based medicine, the objective science governing the procedures and outcomes associated with long-term management of patients with tracheostomies is limited. Unfortunately, research resources and the ability to perform effective, controlled studies may be limited and somewhat inhibited by the inherent challenges of managing patients in such uncontrolled environments. A combination of process validation through additional research and expert consensus may be needed to standardize the long-term care of patients with tracheostomies.

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