Tracheostomy Care: The Importance of Humidification at Home

Joann Miller

"The formation of a tracheostomy significantly alters the patient's respiratory physiology. In bypassing the upper respiratory tract, the patient is more susceptible to changes in humidity and there is a consequential change in the function of the respiratory mucosa. Understanding these changes is fundamental to managing these patients effectively."[1]

In order to reduce and/or prevent the adverse effects of bypassing the upper respiratory tract, the once-effective system for air conduction, warming and moisturizing inspired gases and filtering foreign particles prior to entering the lower airways and the lungs, humidification treatments of the upper airway, especially at home, becomes imperative in managing tracheostomy patients effectively.

Once a tracheostomy is in place, the upper respiratory tract will naturally begin to dehydrate the ciliated mucosa and goblet cells, which will lead to histological changes in the tracheobronchial mucosa, including, destruction of cilia, dehydration to mucous glands, dehydration of upper respiratory epithelium, disorganization of basement membrane, cytoplasmic and nuclear degeneration, desquamation of airway epithelial cells, damage of the lower respiratory epitheluum, and the shifting downward of the Isothermic Saturation Boundary (ISB), which puts the pressure of heat and moisture exchange on the lower respiratory tract, which is not a function the lower respiratory tract. Inpatient humidification is a standard treatment in respiratory management. Unfortunately, this is not always the case in homecare treatment.

"For patients undergoing chemo-radiation, particularly for cancers of the throat and mouth, the problem is even more severe," said Dr Eugene N. Myers, Distinguished Professor and Emeritus Chair of the Department of Otolaryngology of the University of Pittsburgh School of Medicine. "The body normally produces about a quart of saliva each day to aid in digestion and to moisturize the food we eat so we can swallow it. Saliva also keeps mucus membranes moist, so they don't stick together. Radiation destroys the salivary glands and dries up saliva, and the glands usually don't regenerate. Chemotherapy in conjunction with radiation exacerbates these side effects of treatment."

Dr Myers, who has performed more than 10,000 surgeries on patients with tumors of the head and neck, said a typical dose of radiation is estimated to be about 65 Gy, and treatment destroys about 80% of salivary glands. Add chemotherapy and the dosage goes up to about 80 Gy and destroys 90 to 95% of salivary glands. New radiation machines (IMRT) have been designed to overcome this problem, but the results have not been dramatic.

"The swallowing passage, the throat, the pharynx is deprived of this saliva," Dr Myers said. "It makes it very difficult to swallow. If people have proper moisturization of the mucus membranes, then it is more comfortable and the swallowing may be improved."

"Trends towards early tracheostomy in intensive care units (ICU) have led to increased numbers of tracheostomy patients. Together with the push for earlier discharge from ICU, this poses challenges across disciplines and wards. Even though tracheostomy is performed across a range of patient groups, tracheostomy care is seen as the domain of specialist clinicians in critical care. It is crucial to ensure quality care regardless of the patient's destination after ICU."[1] Further, tracheostomy care does not end with discharge, but rather tracheostomy care must transition from across disciplines and wards to Long Term Care (LTC) or homecare and to the patients themselves. It is at this stage, especially in the homecare of the patient, that humidification of the upper airway is – more often than not – considered a treatment which is no longer needed.

Invisible side effects

As noted above, bypassing the upper respiratory tract requires understanding and managing changes caused by the formation of a tracheostomy. Patients and caregivers must manage a plethora of side effects, not least of which is dry mouth and dry nose. Most tracheotomized patients accept "dry nose and mouth" as just one more uncomfortable side effect of having a trach, which can be temporarily eased with the use of a number of products such as artificial salivas, mucopolysaccharide solutions, saliva stimulants or dentifrices.[3] These products temporarily replace some moisture loss but do not replace the once-effective upper respiratory system's functions, specifically the function of constant humidification and moisturization. Humidification of the upper airway is no less important whether a patient is transitioned home, in LTC or is an inpatient. In fact,

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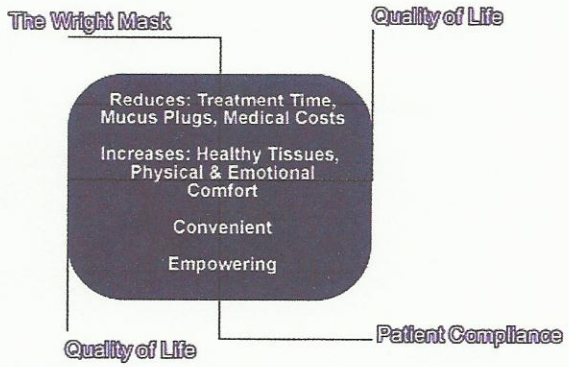

humidification and moisturization is even more important once the patient is discharged from acute care to home or LTC.

Future Challenges in Respiratory Care

Respiratory care has evolved significantly over the past decade and will continue to evolve especially in the area of tracheostomy care. With the creation and implementation of "trach teams" across disciplines within healthcare centers throughout the world, quality tracheostomy care is becoming the rule rather than the exception. It is estimated that by 2025, more than 1 billion people will be over 60 years of age and many of them will be tracheotomized patients.

One challenge for respiratory clinicians will be to find innovative ways in which to encourage patient compliance prior to transitioning to homecare or LTC. Patient compliance significantly reduces readmissions, thereby lowering healthcare costs while saving valuable clinician time, which can be spent managing new patients, creating new procedures or implementing new innovations.

Another challenge currently facing respiratory care personnel and all healthcare providers is implementing ways in which to improve health outcomes in high-need populations, resulting in "...(A) reducing preventable hospitalizations; (B) preventing hospital readmissions; (C) reducing emergency room visits; and (D) improving health outcomes commensurate with the beneficiaries' stage of chronic illness..."[4] as per the Patient Protection and Affordable Care Act requirements.

Innovations – Post Acute Care

One innovative way to ensure that patients humidify their upper and lower airways once they have been transitioned to homecare or LTC, is by providing them with The Wright Face & Tracheostomy Nebulizing Mask (The Wright Mask). The Wright Mask humidifies the upper and lower airways, simultaneously moisturizing the nose, mouth and trachea. As we have seen, humidification of both the upper and lower airways is critical for tracheotomized patients. It is also a known fact that once patients leave the hospital, non-compliance slowly sets in until such time as the patient requires re-admittance due to complications.

The Wright Mask should be considered along with conventional humdification systems by patients and their respiratory team as they begin the transition to homecare or LTC. The Wright Mask is an innovative use of existing conventional masks, specifically a trach mask and an aerosol face mask connected with an adjustable "Tee," which when attached to a nebulizer and compressor provides humidification through to the trach, nose and mouth simultaneously.

The Wright Mask is a post acute care product. Since it is a homecare product, patients decide when, where and how long they will sit down for a humidification treatment. As an LTC product, The Wright Mask is a convenient disposable humidification tool which seamlessly continues acute care nebulizing treatments while saving LTC staff valuable time throughout their busy work day.

"The Wright System Mask, combining simultaneous humidification of both upper and lower airways, is likely to become a preferred airway moisturization method due to its time efficiency and comfort," said Dr Keith A. Candiotti, Chief of the Division of Perioperative Medicine and Vice Chairman of Clinical Research, Department of Anesthesiology, University of Miami Miller School of Medicine.

The Wright Mask was invented to transition a non-compliant re-admission patient into a compliant comfortable patient able to enjoy a higher quality of life at home or in LTC.

References

1 Billau, C. (2004). Humidification. In C. Russell, & B. Matta, Tracheostomy A Multiprofessional Handbook (p. 156). London*San Francisco: GMM.

2 Parker, V., Giles, M., Shylan, G., Austin, N., Smith, K., Morison, J. and Archer, W. (2010), Tracheostomy management in Acute Care Facilities – a matter of teamwork. Journal of Clinical Nursing, 19: 1275-1283. doi: 10.1111/j.1365-2702.2009.03155.x

3 Artificial Saliva: • Orajel or Vaseline and glycerin swabs • Entertainer's Secret (KLI Corp) spray • Glandosane (Kenwood/Bradley) spray • Moi-Stir (Kingswood Labs) spray • Moi-Stir Oral Swabsticks (Kingswood Labs) swabs • Optimoist (Colgate-Palmolive) spray • Saliva Substitute (Roxane Labs) liquid • Salivart (Gebauer) aerosol • Salix (Scandinavian Natural Health & Beauty) tablets • V. A. Oralube (Oral Dis. Res. Lab) liquid • Xero-Lube (Scherer) spray Mucopolysaccharide Solutions: • MouthKote (Parnell) spray Saliva Stimulants: • Natrol Dry Mouth Relief lozenges Dentifrices: • Biotene Dry Mouth Toothpaste • Biotene Gentle Mouthwash • Biotene Dry Mouth Gum • Oralbalance Longlasting Moisturizing Gel• Biotene Dry Mouth Kit

4 Healthcare Reform Bill H.R. 3590 Patient Protection and Affordable Care Act; pg 26 Sec. 2717 - Ensuring The Quality Of Care; pg 30 Sec. 2718 - Bringing Down The Cost Of Health - Care Coverage; pg 764 Sec. 3024 - Independence At Home - Demonstration Program; pg 775 Sec. 3025 - Hospital Readmissions Reduction – Program; pg 1053 Sec. 3501 - Health Care Quality Improvement - Programs