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1. Frat JP, Thille AW, Mercat A, et al. High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure. *The New England Journal of Medicine* 2015: DOI: 10.1056/NEJMoa1503326.
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AARC Strategic Plan

The American Association for Respiratory Care has a Strategic Plan that includes its Mission and Vision Statements for 2015–2020.

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American Association for Respiratory Care

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Ventilation for Life

Prone Positioning in Moderate ARDS

by Thomas Piraino, RRT

The use of prone position therapy for the management of patients with acute respiratory distress syndrome (ARDS) is not a new concept. Randomized controlled trials (RCTs) of prone positioning for mechanically ventilated human subjects with ARDS have been published over the past 20 years, each one attempting to improve on the methods of the previous.[1-5]

Early study outcomes related to oxygenation demonstrated oxygenation improvement but no survival benefit. Meta-analyses of prone positioning, however, found a survival benefit in patients with greater ARDS severity, particularly when lung-protective ventilation was used.[1-4,6,7] The Proning in Severe ARDS Patients (PROSEVA) study published in the *New England Journal of Medicine* by Guerin et al. (2013) is the most recent RCT for prone positioning among mechanically ventilated adults being treated for moderate to severe ARDS.[5] In this RCT, subjects were randomized to receive lung-protective ventilation with prolonged sessions of prone positioning (16 consecutive hours) or lung-protective ventilation without prone positioning. There was a 50% reduction in 28-day mortality and a significantly lower ICU and hospital mortality for subjects who received prone positioning. The results of this study have caused a heightened interest in the use of prone positioning.

about the author...

Thomas Piraino, RRT, is the clinical specialist for mechanical ventilation for the Centre of Excellence in Mechanical Ventilation at St. Michael's Hospital in Toronto, Ontario.

The physiological rationale for prone positioning

For an in-depth review of prone positioning, including physiology, I recommend the review published in RESPIRATORY CARE by Richard Kallet.[8] However, for the purpose of this article, I will focus on two general concepts. First, pleural pressures while in the supine position are lower in the non-dependent regions (ie, along the chest) and higher in the dependent regions (ie, along the spine). When a patient is in the prone position, the spine is now the non-dependent region. Second, we have more lung tissue along our back and lower lobes, as well as a higher perfusion. Why are these two things important? Having lower pleural pressures along the spine in the prone position means that the same ventilator pressures will result in higher transpulmonary pressure in the lower lobes where there is more lung tissue and higher perfusion. Higher transpulmonary pressure is required for lung recruitment, and lung recruitment results in better ventilation to these areas. The gas-to-tissue ratio increases, and ventilation-perfusion is more uniform.[8-10] Improvements in gas exchange result from improvements in ventilation-perfusion matching, and lower airway plateau pressures may result from lung recruitment and tidal volume delivered to a larger lung surface area.[5]

Classifying ARDS — Berlin Definition

When the PROSEVA study began, the ARDS definition at the time was the American-European Consensus Statement definition, which separated acute lung injury (PaO_2/FiO_2 201–300 mm Hg) from ARDS ($PaO_2/FiO_2 \leq 200$ mm Hg), but there was no accepted definition for "severe" ARDS.[11] A previous multicenter, double-blinded, placebo-controlled RCT trial (ACURASYS) used $PaO_2/FiO_2 \leq 150$ mm Hg as criteria for severe ARDS when comparing cisatracurium, which is a neuromuscular blocking (NMB) agent, to placebo. This study showed lower mortality and increased ventilator-free days when using cisatracurium for 48 hours early in the management of severe ARDS.[12] Therefore, the PROSEVA trial used this PaO_2/FiO_2 cut-off for their severe ARDS inclusion criteria.

The currently accepted definition of ARDS is the Berlin Definition.[13] It uses PaO_2/FiO_2 ratio to quantify the severity of ARDS as mild (previously called acute lung injury), moderate, and severe ARDS (Table 1). However, this definition was not published until 2012, at which time the PROSEVA study was already enrolling subjects.

Table 1. PaO2/FiO2 ranges used in the Berlin Definition of ARDS

Mild	Moderate	Severe
201–300 mm Hg	101–200 mm Hg	≤ 100 mm Hg

Note: PaO2/FiO2 is only part of the ARDS criteria. Timing, chest imaging, and origin of edema are also considered. PEEP ≥ 5 cm H2O is also required for ARDS criteria.

If you apply the Berlin Definition to the subjects in the PROSEVA study, it is clear that those who met the criteria for moderate ARDS (PaO_2/FiO_2 100–150 mm Hg) were included (Figure 1). According to the supplementary data provided by the PROSEVA study group, 48% of the subjects were in the moderate ARDS category.

Figure 1.
The quartile ranges of PaO2/FiO2 for moderate and severe ARDS per the Berlin Definition. The boxed area represents the ranges included in the ACURASYS and PROSEVA studies.

When should prone position therapy be used?

If you consider patient outcomes, the PROSEVA study provides the best example of when prone position therapy should be used. Meta-analyses may differ on when prone positioning should be used, but these analyses included studies with a large degree of heterogeneity in their methods.[6,7,14] As already mentioned, 48% of the subjects in the PROSEVA study had moderate ARDS according to the current Berlin Definition. In addition, prone positioning is considered protective in patients at risk of acute cor pulmonale.[15] On the basis of this information, prone position therapy should be considered in patients with moderate ARDS, particularly with $PaO_2/FiO_2 \leq 150$ mm Hg.[16,17]

How long should prone position therapy be used?

The PROSEVA study used prone sessions of 16 consecutive hours. The purpose was to spend the majority of the time when the $PaO_2/FiO_2 < 150$ mm Hg in the prone position; PROSEVA protocol required subjects to be turned from prone to supine for four hours before returning to prone position therapy, provided they didn't desaturate and have to return to the prone position sooner. Meta-analyses confirm that prolonged therapy sessions are needed to achieve any benefit from prone position therapy.[6,7,14] Considering the PROSEVA study used 16 hours as their target and demonstrated the largest benefit compared to other trials, it is reasonable to use a goal of 16 hours in the prone position.

When should prone position therapy be discontinued?

The results of prone position therapy may take multiple prone sessions to reach the target effect. In the PROSEVA study, if the PaO_2/FiO_2 was > 150 mm Hg after eight hours in the supine position, the patient was not placed back into the prone position.[5] In this study, patients received an average of four prone sessions before they no longer met criteria for prone position therapy. However, prone position therapy should be discontinued if any adverse event occurs while prone.

Contraindications to prone position therapy

RTs may prospectively identify patients who "meet" the Berlin Definition of ARDS and criteria for prone position therapy consideration, but we must also consider contraindications, such as hemodynamic instability (defined as systolic blood pressure < 90 mm Hg, despite fluid and vasopressors); hemorrhagic shock; unstable spine, femur, or pelvis fractures; facial trauma or surgery within previous 15 days; open chest or unstable chest wall; and pregnancy.

Other considerations

Although it was not written into protocol, the majority of the subjects in the study were receiving NMBs as part of their treatment (ie, 82.3% of supine patients and 91% of prone patients). It is unclear whether the use of NMBs had a synergistic effect that contributed to the improved outcome compared to previous studies for prone positioning (Table 2). Therefore, using NMBs for 48 hours early in management of moderate to severe ARDS ($PaO_2/FiO_2 \leq 150$ mm Hg) should be considered when using prone position therapy.[16,17]

Table 2. Tidal volume and NMBs used in major studies of prone positioning

Study	Tidal Volume (mL/kg PBW)	% of Patients Receiving NMBs
Guérin et al. (2013)[5]	6.1	87%
Taccone et al. (2009)[4]	8.0	Not reported
Mancebo et al. (2006)[3]	8.5	45%
Guérin et al. (2004)[2]	7.9	21%
Gattinoni et al. (2001)[1]	10.3	Not reported

PBW = predicted body weight; NMB = neuromuscular blocking agents

Preparation	
☐	Patient meets criteria for ARDS with a $PaO_2/FiO_2 \leq 150$ mm Hg
☐	Patient has NO contraindication for prone position therapy
☐	Gather clean sheet, new ECG leads, and support gel pads/pillows
☐	Minimum of 5 staff members (1 at head of the bed, 2 on each side of the patient)
☐	Flatten bed, lower side rails, remove head board, and remove any supportive pad/pillows
☐	Position the patient's arms at their sides
☐	Organize lines/tubes/drains to prevent patient from lying on them in the prone position
Procedure	
☐	Ensure airway is held secure by the staff member at the head of the bed for the entire procedure
☐	Slide the patient to one side of the bed
☐	Tuck the bed sheets under the side of the patient, and place a clean sheet and lifter in its place
☐	Tuck the hand nearest to the center of the bed under the patient's hip
☐	Remove ECG electrodes/cables
☐	Turn the patient first on to their side and ensure all lines, tubes, drains are secure
☐	Place supportive pads/pillows perpendicular to the patient at the level of the upper chest and at the hips
☐	Place patient onto the pads/pillows in the prone position
☐	Place new ECG electrodes on the patient's back and connect ECG cables
☐	Position the head to one side and place it on a supportive pillow. Ensure there is no pressure on the eyes and that the ears are not folded.
☐	Position the arm on the side the patient is facing with the hand in front of the face. Position the other arm along the side of the body with the palm facing up. Place pillows under the lower legs and ensure the toes are not touching the bed
☐	Raise the side rails
☐	Turn the head to the other side and reposition the arms every 2 hours.

Figure 2. A sample checklist for ensuring safe practice when initiating prone position therapy.

Safety and prone positioning

When it comes to safety using prone position therapy, experience is key. In 2004, the same author of the PROSEVA study published the largest prone-positioning trial to date in *JAMA*.[2] In that study, the adverse events were higher in the group that received prone position therapy. These events included facial pressure sores, selective intubation, and endotracheal tube obstruction. However, in the PROSEVA study, they found no difference in adverse events. Experience and adherence to a strict protocol minimized risk.[5]

The role of respiratory therapists

RTs play an extremely important role in the management of mechanically ventilated patients, particularly those with ARDS. RTs not only need to be aware

COMING SOON

Lonhala™ Magnair™

(glycopyrrolate) Inhalation Solution

25 mcg/1 mL

The **first and only** nebulized LAMA for COPD

including chronic bronchitis and/or emphysema

INDICATION

LONHALA™ MAGNAIR™ (glycopyrrolate) is an anticholinergic indicated for the long-term maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

COPD=chronic obstructive pulmonary disease; LAMA=long-acting muscarinic antagonist.

IMPORTANT SAFETY INFORMATION

LONHALA MAGNAIR is contraindicated in patients with a hypersensitivity to glycopyrrolate or to any of the ingredients.

LONHALA MAGNAIR should not be initiated in patients with acutely deteriorating or potentially life-threatening episodes of COPD or used as rescue therapy for acute episodes of bronchospasm. Acute symptoms should be treated with an inhaled short-acting $beta_2$-agonist.

As with other inhaled medicines, LONHALA MAGNAIR can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with LONHALA MAGNAIR, it should be treated immediately with an inhaled, short-acting bronchodilator; LONHALA MAGNAIR should be discontinued immediately and alternative therapy instituted.

Immediate hypersensitivity reactions have been reported with LONHALA MAGNAIR. If signs occur, discontinue LONHALA MAGNAIR immediately and institute alternative therapy.

LONHALA MAGNAIR should be used with caution in patients with narrow-angle glaucoma and in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort,

For additional information, please see the Brief Summary of Prescribing Information on the following pages. Please see full Prescribing Information and Patient Information for LONHALA MAGNAIR at www.sunovionprofile.com/lonhala-magnair.

Learn more about a new nebulized COPD therapy at
sunovionprofile.com/lonhala-magnair

Handset is 2.4 x 4.7 inches. Controller is 1.6 x 4.6 inches. Assembly required.

blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema) and of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Patients should be instructed to consult a physician immediately should any of these signs or symptoms develop.

The most common adverse events reported in ≥2% of patients taking LONHALA MAGNAIR, and occurring more frequently than in patients taking placebo, were dyspnea (4.9% vs 3.0%) and urinary tract infection (2.1% vs 1.4%).

LONHALA solution is for oral inhalation only and should not be injected or swallowed. LONHALA vials should only be administered with MAGNAIR.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

Lonhala™ Magnair™
(glycopyrrolate) Inhalation Solution

Lonhala™ Magnair™

(glycopyrrolate) Inhalation Solution

For oral inhalation use

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Please see package insert for full Prescribing Information, including Patient Information.

INDICATIONS AND USAGE

LONHALA™ MAGNAIR™ is an anticholinergic indicated for the long-term maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

CONTRAINDICATIONS

LONHALA MAGNAIR is contraindicated in patients with a hypersensitivity to glycopyrrolate or any of the ingredients.

WARNINGS AND PRECAUTIONS

Deterioration of Disease and Acute Episodes

LONHALA MAGNAIR should not be initiated in patients during acutely deteriorating or potentially life-threatening episodes of COPD. LONHALA MAGNAIR has not been studied in subjects with acutely deteriorating COPD. The initiation of LONHALA MAGNAIR in this setting is not appropriate.

LONHALA MAGNAIR should not be used as rescue therapy for the treatment of acute episodes of bronchospasm. LONHALA MAGNAIR has not been studied in the relief of acute symptoms and extra doses should not be used for that purpose. Acute symptoms should be treated with an inhaled, short-acting $beta_2$-agonist.

COPD may deteriorate acutely over a period of hours or chronically over several days or longer. If LONHALA MAGNAIR no longer controls symptoms of bronchoconstriction the patient's inhaled, short-acting $beta_2$-agonist becomes less effective; or the patient needs more inhalations of a short-acting $beta_2$-agonist than usual, these may be markers of deterioration of disease. In this setting, a re-evaluation of the patient and the COPD treatment regimen should be undertaken at once. Increasing the daily dose of LONHALA MAGNAIR beyond the recommended dose is not appropriate in this situation.

Paradoxical Bronchospasm

As with other inhaled medicines, LONHALA MAGNAIR can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with LONHALA MAGNAIR, it should be treated immediately with an inhaled, short-acting bronchodilator; LONHALA MAGNAIR should be discontinued immediately, and alternative therapy instituted.

Immediate Hypersensitivity Reactions

Immediate hypersensitivity reactions may occur after administration of LONHALA MAGNAIR. If signs suggesting allergic reactions occur, in particular, angioedema (including difficulties in breathing or swallowing, swelling of the tongue, lips, and face), urticaria, or skin rash, LONHALA MAGNAIR should be discontinued immediately and alternative therapy instituted.

Worsening of Narrow-Angle Glaucoma

LONHALA MAGNAIR should be used with caution in patients with narrow-angle glaucoma. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema). Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

Worsening of Urinary Retention

LONHALA MAGNAIR should be used with caution in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

ADVERSE REACTIONS

Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

The LONHALA MAGNAIR safety database included 2379 subjects with COPD in two 12-week efficacy studies and one 48-week long-term safety study. A total of 431 subjects received treatment with LONHALA MAGNAIR 25 mcg twice-daily (BID). The safety data described below are based on the two 12-week trials and the one 48-week trial.

12-Week Trials

LONHALA MAGNAIR was studied in two 12-week placebo-controlled trials in 431 subjects with COPD, treated with LONHALA MAGNAIR at the recommended dose of 25 mcg, twice daily. The population had a mean age of 63 years (ranging from 40 to 87 years), with 56% males, 90% Caucasian, and a mean post-bronchodilator forced expiratory volume in one second (FEV_1) percent predicted of 52% of predicted normal value (20%-80%) at study entry. The study population also included subjects with pre-existing cardiovascular disease as well as subjects with continued use of stable long-acting bronchodilator (LABA) +/- inhaled corticosteroid (ICS) and ipratropium bromide background therapy. Subjects with unstable cardiac disease, narrow-angle glaucoma, or symptomatic prostatic hypertrophy or bladder outlet obstruction were excluded from these studies.

The proportion of subjects who discontinued treatment due to adverse reactions was 5% for the LONHALA MAGNAIR-treated subjects and 9% for placebo-treated subjects.

Table 1: Adverse Reactions with LONHALA MAGNAIR ≥ 2.0% Incidence and Higher than Placebo

	Placebo (N=430) N (%)	LONHALA MAGNAIR 25 mcg BID (N=431) N (%)
Dyspnea	13 (3.0)	21 (4.9)
Urinary Tract Infection	6 (1.4)	9 (2.1)

Other adverse reactions defined as events with an incidence of ≥ 1.0% but less than 2.0% with LONHALA MAGNAIR but more common than with placebo included the following: wheezing, upper respiratory tract infection, nasopharyngitis, oedema peripheral, and fatigue.

48-Week Trial

In a long-term open-label safety trial, 1086 subjects were treated for up to 48 weeks with LONHALA MAGNAIR 50 mcg twice-daily (N=620) or tiotropium (N=466). The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled efficacy studies described above. The adverse reactions reported in the long-term safety trial were consistent with those observed in the placebo-controlled studies of 12 weeks. Adverse reactions that occurred at a frequency greater than that seen in either active treatment dose in the pooled 12-week placebo controlled studies and ≥ 2.0% were: diarrhea, edema peripheral, bronchitis, nasopharyngitis, pneumonia, sinusitis, upper respiratory tract infection, urinary tract infection, back pain, headache, Chronic Obstructive Pulmonary Disease, cough, dyspnea, oropharyngeal pain, and hypertension.

DRUG INTERACTIONS

Anticholinergics

There is a potential for an additive interaction with concomitantly used anticholinergic medications. Therefore, avoid unnecessary co-administration of LONHALA MAGNAIR with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic effects.

USE IN SPECIFIC POPULATIONS

Pregnancy

Risk Summary

There are no adequate and well-controlled studies in pregnant women. LONHALA MAGNAIR should only be used during pregnancy if the expected benefit to the patient outweighs the potential risk to the fetus. Women should be advised to contact their physician if they become pregnant while taking LONHALA MAGNAIR. In animal reproduction studies, there were no teratogenic effects in Wistar rats and New Zealand White rabbits at inhaled doses approximating 1521 and 580 times, respectively, the maximum recommended human daily inhalation dose (MRHDID) based on an AUC comparison.

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

Labor or Delivery

The potential effect of LONHALA MAGNAIR on labor and delivery is unknown. LONHALA MAGNAIR should be used during labor and delivery only if the potential benefit to the patient justifies the potential risk to the fetus.

Animal Data

Developmental studies in Wistar rats and New Zealand White rabbits in which glycopyrrolate was administered by inhalation during the period of organogenesis did not result in evidence of teratogenicity at exposures approximately 1521 and 580 times, respectively, the MRHDID of LONHALA MAGNAIR based on a comparison of plasma AUC levels (maternal doses up to 3.8 mg/kg/day in rats and 4.4 mg/kg/day in rabbits).

Glycopyrrolate had no effects on peri-natal and post-natal development in rats following subcutaneous exposure of approximately 1137 times the MRHDID of LONHALA MAGNAIR based on an AUC comparison (at a maternal dose of up to 1.885 mg/kg/day).

Lactation

Risk Summary

There are no data on the presence of glycopyrrolate or its metabolites in human milk, the effects on the breastfed infant, or the effects on milk production. However, in a study of lactating rats, glycopyrrolate was present in the milk. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for LONHALA MAGNAIR and any potential adverse effects on the breastfed infant from LONHALA MAGNAIR or from the underlying maternal condition.

Data

Glycopyrrolate (and its metabolites) was detected in the milk of lactating rats following a single intravenous injection of 4 mg/kg of radiolabeled glycopyrrolate.

Pediatric Use

LONHALA MAGNAIR is not indicated for use in children. The safety and efficacy of LONHALA MAGNAIR in pediatric patients have not been established.

Geriatric Use

Based on available data, no adjustment of the dosage of LONHALA MAGNAIR in geriatric patients is warranted. LONHALA MAGNAIR can be used at the recommended dose in elderly patients 75 years of age and older.

Of the total number of subjects in clinical studies of LONHALA MAGNAIR, 41% were aged 65 and older, while 8% were aged 75 and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

Renal Impairment

No dose adjustment is required for patients with mild and moderate renal impairment. The effects of renal impairment on the pharmacokinetics of glycopyrrolate have not been studied.

Hepatic Impairment

No dose adjustment is required for patients with hepatic impairment. The effects of hepatic impairment on the pharmacokinetics of glycopyrrolate have not been studied.

OVERDOSAGE

An overdose of glycopyrrolate may lead to anticholinergic signs and symptoms such as nausea, vomiting, dizziness, lightheadedness, blurred vision, increased intraocular pressure (causing pain, vision disturbances, or reddening of the eye), obstipation or difficulties in voiding.

In COPD patients, orally inhaled administration of LONHALA MAGNAIR at a total daily dose of 200 mcg for 28 consecutive days (maximum of 1 mg) was well tolerated.

PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use).

❋sunovion

Manufactured for:
Sunovion Respiratory Development Inc.,
a wholly-owned subsidiary of Sunovion Pharmaceuticals Inc.,
Marlborough, MA 01752 USA

To report suspected adverse reactions, call 1-877-737-7226.
For customer service, call 1-888-394-7377.

of evidence-based practice, but they must also advocate on behalf of the patient to ensure that these practices are implemented when appropriate. To improve the safety of prone position therapy, RTs should collaborate with other health care providers to develop a procedure checklist grounded in evidence-based science to ensure all measures are taken to keep the patient safe (Figure 2).

Summary

The evidence is clear that prone position therapy improves survival in adult patients with ARDS. Prone position therapy is often considered an adjunctive therapy that is utilized when all other options are exhausted. However, in the PROSEVA study, prone position therapy was used early in the course of ARDS in subjects with $PaO_2/FiO_2 \leq 150$ mm Hg. There are currently only three interventions that have been shown in a RCT to improve survival in ARDS patients: (1) the use of low tidal volume, (2) the use of NMBs in patients with $PaO_2/FiO_2 \leq 150$ mm Hg or less, and (3) prone position therapy.[5,12,18] The PROSEVA study combined all three of these interventions in its experimental group by using low tidal volume, prone positioning, and NMBs (NMBs in 91% of prone patients), to improve patient outcomes.[5] RTs should be aware of the evidence and advocate for their patients to ensure that the best evidence is used to guide decisions that aim to improve patient care and outcomes. ■

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Can't We Do Better for Our Patients?

by Thomas J. Kallstrom, MBA, RRT, FAARC

As we plow into 2018, we are faced with opportunities as well as challenges as a profession. We know that health care is rapidly changing and that, both from a national perspective and from every local perspective, the voices of our pulmonary patients and the respiratory therapists who care for them must be heard loud and clear. Let me review two of the important issues that we will continue to focus on this year.

Telehealth

Our efforts to include respiratory therapists in any telehealth legislation introduced in this session of Congress have been successful. We are excited there are three telehealth bills that include RTs as telehealth practitioners. Our goal has always been to ensure that RTs are included in the Medicare statute, and this is a great start to achieving that goal. However, it's only the first step. We need to garner additional co-sponsors for these bills, and that's where your help is needed.

HR 2550, the Medicare Telehealth Parity Act, was re-introduced shortly after our visits to Capitol Hill last year. This bill was the first to include RTs and their services, as well as remote monitoring for patients with COPD, in telehealth legislation. As of this writing (January 15, 2018), there are only 22 co-sponsors, while in the previous session there were as many as 67.

There are two other bills that include the respiratory therapist and respiratory care services, which we also support:

- **H.R. 2291:** The Helping Expand Access to Rural Telemedicine (HEART) Act includes critical access hospitals and rural health clinics as telehealth sites and covers remote monitoring for patients with congestive heart failure and COPD, including evaluation and management of each condition.
- **H.R. 766:** The Telehealth for Individuals Residing in Public Housing bill provides coverage of respiratory care and other therapy services as part of a five-year pilot program for public housing residents.

What does this mean for you? We need all concerned members, non-members, patients, friends, and family members to help us garner more attention for these bills. The first step is to write your congressional representative with an "ask." We have an automated process on the AARC website that will identify your representative and send an automatically generated email in just a few easy steps (http://capwiz.com/aarc/issues/?style=D). There are a number of request emails that can identify you as a respiratory therapist, a respiratory therapy student, a physician, a caregiver, or a supporter/friend of the profession.

We are only focusing on the House of Representatives at this time. To gain support for companion legislation in the Senate, our lobbyists will be scheduling meetings with influential senators and committee members.

In early May, we will bring together a contingent of respiratory therapists, physicians, caregivers, and patients who will join us as we walk the halls of Congress and seek support in person. Putting this "ask" in the form of a written communication is a great way to keep our request front and center. In fact, in April 2018, the AARC will direct a full-fledged campaign under the leadership of Past-President Frank Salvatore, RRT, MBA, FAARC. You can keep abreast of our actions by checking the AARC's website, and we ask you to please take part in this effort to gain co-sponsors for these important telehealth bills. Help us get the word out to your colleagues and others regarding the importance of making this happen in 2018.

While it may be too soon to speculate on another success, we have been approached by key majority staff on the House Ways and Means Committee to develop a time-specific telehealth pilot program that would include only RTs as telehealth practitioners.

about the author...

Thomas J. Kallstrom, MBA, RRT, FAARC, is executive director of the AARC.

In December 2017, AARC President Brian K. Walsh, PhD, RRT-NPS, RRT-ACCS, RPFT, AE-C, FAARC, along with AARC Associate Executive Director of Advocacy and Government Affairs Anne Marie Hummel, and our lobbyists, met with key majority and minority staff of the committees of jurisdiction over the telehealth bills that include RTs, as well as a few of the bills' co-sponsors, to garner their support for a proposed pilot outline that will focus on chronic disease management services furnished by RTs via telehealth. At the conclusion of the meetings, there was very positive support for such a program.

Our lobbyists will continue to meet with Capitol Hill staff to develop the pilot program in more detail and to determine next steps. The idea of a pilot project is appealing because it can be crafted in a way to keep costs down in anticipation of what the Congressional Budget Office may project in the way of costs to the Medicare program. Stay tuned for updates on this exciting development!

Oxygen post discharge

It is interesting to note that our government seems to stumble when it comes to making sure that patients who require certain respiratory devices actually receive them. Over the past several decades, especially since the inception of competitive bidding, Medicare has consistently reduced post-discharge oxygen reimbursement. The amount that is allowed has dropped to a point that many in the durable medical equipment (DME) business have limited what they can offer to patients. Sadly, this has resulted in less-than-adequate post-discharge delivery systems, and some DME companies have gone out of business as a result.

We have reported in the past the concern about this pattern from our patients, the end users, but this concern has grown steadily. A recent survey of those using supplemental oxygen therapy found significant dissatisfaction.[1] In total, 1,926 responses were analyzed. Most of the patients who took the survey required oxygen 24 hours a day. Of particular note, when looking at ongoing self-assessment, less than 30% of patients used pulse oximetry to adjust flow rates.[1]

According to the patients who took the survey, 65% indicated that their oxygen saturation was not checked at the time of set up. This is not a particularly surprising finding given that only 8% of respondents reported that a clinician provided education at the time of equipment set up; 64% indicated that a non-clinician (eg, the equipment delivery person) provided training, while the remaining respondents reported having no training or education at all. When it came to patients' perceptions of whether they felt they were prepared to operate the equipment, one third of the respondents reported feeling "very" or "somewhat" unprepared to operate their equipment.[1]

After the initial set up, 51% of the patients reported oxygen problems, with the most frequent being equipment malfunction, a lack of physically manageable portable systems, and a lack of portable systems with high-flow rates. Most respondents (44%) reported limitations in activities outside the home because of inadequate portable oxygen systems. Patients living in areas with competitive bidding programs reported oxygen problems more often than those who did not (55% vs. 45%; $P = .025$). Respondents reporting oxygen problems also experienced increased health care resource utilization.[1]

Unfortunately, the professional services of a respiratory therapist are not covered by Medicare, nor are pulse oximeters, although both seem to be an essential component in the management of post-discharge patients who require oxygen in their homes. The Centers for Medicare & Medicaid Services has a guide, last updated in 2016, that provides a complete overview regarding post-discharge oxygen.[2] This guide also provides additional links to valuable information you may find helpful. Let's fulfill our duty to be an advocate for our patients — they really need us. ■

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Tattooed Magoo

by Anthony L. DeWitt, JD, RRT, FAARC

And it's a real beauty,
A Mexican cutie,
How it got here I haven't a clue.

"Margaritaville," by Jimmy Buffett

If I had a nickel for every time I heard "I'm going to tattoo 'Do Not Resuscitate' on my chest," I would likely have more than a dollar. It's a glib response to a serious end-of-life situation: what do you do when you are not able to make your wishes known? As evidenced by the reported confusion at the University of Miami hospital, a tattoo is likely not the best way of making these end-of-life wishes known.1 While it is novel, it has serious drawbacks.

First, there is the rare and embarrassing tattoo that is not explained away by inebriation. In one epic story from World War II, an Army sergeant, who groused with his Navy cohorts about how awful the Navy had treated him, found out his drinking buddies had a sense of humor. He awoke from a long night of drinking with a battleship tattooed across his chest along with the words "God Bless the Navy." Second, and perhaps as important, while people may change their minds, tattoos are permanent. Thus, a tattoo is unlikely to be the best answer to the issue of how to make your wishes known, particularly if you change your mind (or sober up).

Often as a result of accident or injuries, patients arrive in the emergency department unconscious and with no identifying information. Sometimes it takes hours to track down information about relatives, and even then, that information may be outdated or incorrect. In one case, a nurse reported to the physician that the patient's wife expressed a do-not-resuscitate order for her husband, only to find out later that the woman was in fact the patient's ex-wife. As a result of similar mix-ups—except, perhaps, in small towns, where people and relationships are widely known—most hospitals require some proof of a legal relationship before they allow a third party to make decisions on end-of-life care.

For many people, it is rare that they travel very far outside their home county or parish. They may obtain all of their health care at one hospital in a city or region. In that case, a simple fix is to record a durable power of attorney for health care, along with a document expressing end-of-life wishes (sometimes erroneously called a "living will") with the local recorder of deeds. This document can be easily located and retrieved, and the fact that it is recorded gives it some legal status. Taking that one step further, sending a copy to the medical records department or the emergency department of the local hospital is another good step. It identifies your wishes to the people most likely to be faced with determining what to do in an emergency. Most hospitals have protocols to address advanced directives.

But what about people who travel, whether for business or for vacation? How do those folks communicate their wishes in an emergency? One way is through an emergency alert bracelet. The MedicAlert Foundation offers medical identification that not only lets hospitals know about allergies and medical conditions, but can also provide health information that includes advanced directives. In this way, someone who is a thousand miles from home, but equipped with a medical information bracelet, can inform caregivers of her peanut allergy and of her desire that everything be done to keep her alive.

about the author...

Anthony L. DeWitt, JD, RRT, FAARC, is an attorney and a partner in the firm Bartimus, Frickleton, and Robertson, PC, and resides in Opelika, AL. He has also published two books and numerous legal journal articles. This article is not a substitute for legal advice.

Another approach is to purchase a microSD card and store a PDF of your advanced directive on it. Then put it back in the case it came in, label it EMERGENCY ID, and secure it in your purse or wallet. It is an excellent idea to avoid putting financial information on such an ID, however, to prevent a pickpocket or thief from gaining access to your protected health information.

But perhaps the most important thing anyone can do when it comes to making their wishes about end-of-life care known is to sit down with friends and family and have that discussion. No one wants to talk about the "what if" when that "what if" could mean someone they love is likely to die. We spend most of our adult lives trying to forget that fact. But adults understand the need to be direct and forthcoming on the subject. While a person's wishes for their worldly goods and the disposition of those goods is set out in a will that is administered slowly and carefully through the courts after a person's death, that document will not come readily to mind when you're in the emergency department and unable to communicate. You do not want a son or daughter having to make that end-of-life decision in a vacuum, and everyone who has worked more than a month in a hospital has seen that very situation. A son or daughter, sometimes who had to fly back home suddenly, is now faced with deciding what to do about an unconscious and unresponsive loved one.

This is a point you should not overlook: It is our last important duty on this earth to make sure that the ones we love know first of all that we love them, and second of all, that it is okay to let us go when medical care is futile.

So do not delay. Call that family meeting today if your children are above the age of 16. Maybe they will never need to hear the words, but if you've worked in health care, you know the odds are not in favor of that. Make your wishes known, and make sure your children and loved ones know you love them no matter what. Life is short. Regrets last a lifetime. ■

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For patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema

POWER

of a LABA/LAMA combination

FULL

audiovisual feedback each time a dose is inhaled

INDICATION

UTIBRON™ NEOHALER® (indacaterol and glycopyrrolate) is a combination of indacaterol and glycopyrrolate indicated for the long-term, maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

Important limitations: UTIBRON NEOHALER is not indicated to treat acute deteriorations of COPD and is not indicated to treat asthma.

IMPORTANT SAFETY INFORMATION

WARNING: ASTHMA-RELATED DEATH

Long-acting beta$_2$-adrenergic agonists (LABAs) increase the risk of asthma-related death. Data from a large placebo-controlled US study that compared the safety of another LABA (salmeterol) or placebo added to usual asthma therapy showed an increase in asthma-related deaths in patients receiving salmeterol. This finding with salmeterol is considered a class effect of all LABAs, including indacaterol, one of the active ingredients in UTIBRON NEOHALER.

The safety and efficacy of UTIBRON NEOHALER in patients with asthma have not been established. UTIBRON NEOHALER is not indicated for the treatment of asthma.

All LABAs, including indacaterol, are contraindicated in patients with asthma without the use of a long-term asthma-control medication; UTIBRON NEOHALER is also contraindicated in patients with a history of hypersensitivity to indacaterol, glycopyrrolate, or to any of the ingredients.

UTIBRON NEOHALER should not be initiated in patients with acutely deteriorating or potentially life-threatening episodes of COPD or used as rescue therapy for acute episodes of bronchospasm. Acute symptoms should be treated with an inhaled short-acting beta$_2$-agonist.

sunovion

Powerful bronchodilation with UTIBRON™ NEOHALER® (indacaterol/glycopyrrolate)

- **>230 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in two trials (primary end point)**[1]
  - 262 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in Trial 1
  - 231 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in Trial 2
- **Reduction in rescue medication use all day and night with twice-daily UTIBRON NEOHALER vs placebo (secondary end point)**[1,2]
  - UTIBRON NEOHALER is not a rescue inhaler and is not indicated to treat episodes of acute bronchospasm
- **Whirring noise during inhalation confirms correct placement of the capsule in the chamber**[1]
- **Clear capsule design allows patients to visualize any medication left in the capsule and inhale all of the remaining dose**[1]
- **UTIBRON capsules are for oral inhalation only and should not be swallowed**[1]

Sunovion Answers is there for your patients with support and answers. Call 1-844-276-8262 for more information.

Visit www.UTIBRON.com to learn more.

AUC, area under the curve; FEV_1, forced expiratory volume in 1 second; LABA, long-acting $beta_2$-adrenergic agonist; LAMA, long-acting muscarinic antagonist.

UTIBRON NEOHALER should not be used more often, at higher doses than recommended, or in conjunction with other medicines containing LABAs as an overdose may result. Patients who have been taking inhaled short-acting $beta_2$-agonists on a regular basis should be instructed to discontinue their regular use and to use them only for symptomatic relief of acute respiratory symptoms. Clinically significant cardiovascular effects and fatalities have been reported in association with excessive use of inhaled sympathomimetic drugs. Patients using UTIBRON NEOHALER should not use another medicine containing a LABA for any reason.

Immediate hypersensitivity reactions have been reported with UTIBRON NEOHALER. If signs occur, discontinue immediately and institute alternative therapy. UTIBRON NEOHALER should be used with caution in patients with severe hypersensitivity to milk proteins.

As with other inhaled medicines, UTIBRON NEOHALER can produce paradoxical bronchospasm that may be life threatening. If paradoxical bronchospasm occurs following dosing with UTIBRON NEOHALER, it should be treated immediately with an inhaled, short-acting bronchodilator; UTIBRON NEOHALER should be discontinued immediately and alternative therapy instituted.

STUDY DESIGN

The efficacy and safety of UTIBRON NEOHALER was established in two 12-week pivotal trials and one 52-week safety trial.[1,2]

For additional information, please see the Brief Summary of Prescribing Information, including BOXED WARNING, on the following pages.

Please visit www.SunovionProfile.com/UTIBRON for full Prescribing Information and Medication Guide.

References: 1. UTIBRON NEOHALER [prescribing information]. 2017. **2.** Data on file. FLIGHT2 and FLIGHT1 clinical study reports. Sunovion Pharmaceuticals Inc.

utibron™ neohaler®

(indacaterol/glycopyrrolate) inhalation powder 27.5 mcg/15.6 mcg

utibron™ neohaler®

(indacaterol/glycopyrrolate) inhalation powder

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Please see package insert for full Prescribing Information, including Patient Information.

INDICATIONS AND USAGE

UTIBRON™ NEOHALER® is a combination of indacaterol and glycopyrrolate indicated for the long-term, maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

Important Limitations of Use: UTIBRON NEOHALER is NOT indicated for the relief of acute bronchospasm or for the treatment of asthma.

CONTRAINDICATIONS

UTIBRON NEOHALER is contraindicated in patients with asthma without use of a long-term asthma control medication.

UTIBRON NEOHALER is contraindicated in patients who have demonstrated hypersensitivity to indacaterol, glycopyrrolate, or to any of the ingredients.

WARNINGS AND PRECAUTIONS

WARNING: ASTHMA-RELATED DEATH

Long-acting beta$_2$-adrenergic agonists (LABAs) increase the risk of asthma-related death. Data from a large, placebo-controlled U.S. study that compared the safety of another LABA (salmeterol) or placebo added to usual asthma therapy showed an increase in asthma-related deaths in patients receiving salmeterol. This finding with salmeterol is considered a class effect of all LABAs, including indacaterol, one of the active ingredients in UTIBRON NEOHALER.

The safety and efficacy of UTIBRON NEOHALER in patients with asthma have not been established. UTIBRON NEOHALER is not indicated for the treatment of asthma.

Data from a large, placebo-controlled U.S. study in asthma patients showed that LABAs may increase the risk of asthma-related death. Data are not available to determine whether the rate of death in patients with COPD is increased by LABAs.

A 28-week, placebo-controlled U.S. study comparing the safety of another LABA (salmeterol) with placebo, each added to usual asthma therapy, showed an increase in asthma-related deaths in patients receiving salmeterol (13/13,176 in patients treated with salmeterol versus 3/13,179 in patients treated with placebo; RR 4.37, 95% CI 1.25, 15.34). The increased risk of asthma-related death is considered a class effect of the LABAs, including indacaterol, one of the ingredients in UTIBRON NEOHALER.

No study adequate to determine whether the rate of asthma-related death is increased in patients treated with UTIBRON NEOHALER has been conducted. The safety and efficacy of UTIBRON NEOHALER in patients with asthma have not been established. UTIBRON NEOHALER is not indicated for the treatment of asthma.

Deterioration of Disease and Acute Episodes

UTIBRON NEOHALER should not be initiated in patients with acutely deteriorating or potentially life-threatening episodes of COPD. UTIBRON NEOHALER has not been studied in patients with acutely deteriorating COPD. The initiation of UTIBRON NEOHALER in this setting is not appropriate.

UTIBRON NEOHALER should not be used for the relief of acute symptoms, i.e., as rescue therapy for the treatment of acute episodes of bronchospasm. UTIBRON NEOHALER has not been studied in the relief of acute symptoms, and extra doses should not be used for that purpose. Acute symptoms should be treated with an inhaled, short-acting beta$_2$-agonist.

When beginning UTIBRON NEOHALER, patients who have been taking oral or inhaled, short-acting beta$_2$-agonists on a regular basis (e.g., 4 times a day) should be instructed to discontinue the regular use of these drugs and use them only for symptomatic relief of acute respiratory symptoms.

When prescribing UTIBRON NEOHALER, the healthcare provider should also prescribe an inhaled, short-acting beta$_2$-agonist and instruct the patient on how it should be used. Increasing inhaled beta$_2$-agonist use is a signal of deteriorating disease for which prompt medical attention is indicated.

COPD may deteriorate acutely over a period of hours or chronically over several days or longer. If UTIBRON NEOHALER no longer controls the symptoms of bronchoconstriction; the patient's inhaled, short-acting beta$_2$-agonist becomes less effective; or the patient needs more inhalation of short-acting beta$_2$-agonist than usual, these may be markers of deterioration of disease. In this setting, a re-evaluation of the patient and the COPD treatment regimen should be undertaken at once. Increasing the daily dose of UTIBRON NEOHALER beyond the recommended dose is not appropriate in this situation.

Excessive Use of UTIBRON NEOHALER and Use with Other Long-Acting Beta$_2$-Adrenergic Agonists

As with other inhaled drugs containing beta$_2$-adrenergics, UTIBRON NEOHALER should not be used more often than recommended, at higher doses than recommended, or in conjunction with other medications containing LABAs, as an overdose may result. Clinically significant cardiovascular effects and fatalities have been reported in association with excessive use of inhaled sympathomimetic drugs. Patients using UTIBRON NEOHALER should not use another medicine containing a LABA for any reason.

Paradoxical Bronchospasm

As with other inhaled medicines, UTIBRON NEOHALER can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with UTIBRON NEOHALER, it should be treated immediately with an inhaled, short-acting bronchodilator; UTIBRON NEOHALER should be discontinued immediately and alternative therapy instituted.

Immediate Hypersensitivity Reactions

Immediate hypersensitivity reactions have been reported after administration of indacaterol or glycopyrrolate, the components of UTIBRON NEOHALER. If signs suggesting allergic reactions occur, in particular, angioedema (including difficulties in breathing or swallowing, swelling of tongue, lips and face), urticaria, or skin rash, UTIBRON NEOHALER should be discontinued immediately and alternative therapy instituted. UTIBRON NEOHALER should be used with caution in patients with severe hypersensitivity to milk proteins.

Cardiovascular Effects

Indacaterol, like other beta$_2$-agonists, can produce a clinically significant cardiovascular effect in some patients as measured by increases in pulse rate, systolic or diastolic blood pressure, or symptoms. If such effects occur, UTIBRON NEOHALER may need to be discontinued. In addition, beta-agonists have been reported to produce ECG changes, such as flattening of the T-wave, prolongation of the QTc interval, and ST segment depression, although the clinical significance of these findings is unknown.

Therefore, UTIBRON NEOHALER should be used with caution in patients with cardiovascular disorders, especially coronary insufficiency, cardiac arrhythmias, and hypertension.

Coexisting Conditions

UTIBRON NEOHALER, like all medicines containing sympathomimetic amines, should be used with caution in patients with convulsive disorders or thyrotoxicosis, and in patients who are unusually responsive to sympathomimetic amines.

Worsening of Narrow-Angle Glaucoma

UTIBRON NEOHALER should be used with caution in patients with narrow-angle glaucoma. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema). Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

Worsening of Urinary Retention

UTIBRON NEOHALER should be used with caution in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

Hypokalemia and Hyperglycemia

Beta$_2$-adrenergic agonists may produce significant hypokalemia in some patients, which has the potential to produce adverse cardiovascular effects. The decrease in serum potassium is usually transient, not requiring supplementation. Inhalation of high doses of beta$_2$-adrenergic agonists may produce increases in plasma glucose.

In patients with severe COPD, hypokalemia may be potentiated by hypoxia and concomitant treatment, which may increase the susceptibility for cardiac arrhythmias.

In 2 clinical trials of 12-weeks duration evaluating UTIBRON NEOHALER in subjects with COPD, there was no evidence of a treatment effect on serum glucose or potassium.

ADVERSE REACTIONS

Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, the adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in clinical trials of another drug and may not reflect the rates observed in clinical practice.

The UTIBRON NEOHALER safety database included 2654 subjects with COPD in two 12-week lung function trials and one 52-week long-term safety study. A total of 712 subjects received treatment with UTIBRON NEOHALER 27.5 mcg/15.6 mcg twice daily (BID). The safety data described below are based on the two 12-week trials and the one 52-week trial.

12-Week Trials

The incidence of adverse reactions associated with UTIBRON NEOHALER in Table 1 is based on two 12-week, placebo-controlled trials (Trials 1 and 2; N=1,001 and N=1,042 respectively). Of the 2040 subjects, 63% were male and 91% were Caucasian. They had a mean age of 63 years and an average smoking history of 47 pack-years, with 52% identified as current smokers. At screening, the mean post-bronchodilator percent predicted forced expiratory volume in 1 second (FEV_1) was 55% (range: 29% to 79%), the mean post-bronchodilator FEV_1/forced vital capacity (FVC) ratio was 50% (range: 19% to 71%), and the mean percent reversibility was 23% (range: 0% to 144%).

The proportion of patients who discontinued treatment due to adverse reactions was 2.95% for the UTIBRON NEOHALER treated patients and 4.13% for placebo-treated patients.

Table 1. Adverse reactions with UTIBRON NEOHALER (greater than or equal to 1% incidence and higher than placebo) in COPD patients

Adverse Reaction	UTIBRON NEOHALER 27.5/15.6 mcg BID (N=508) n (%)	Indacaterol 27.5 mcg BID (N=511) n (%)	Glycopyrrolate 15.6 mcg BID (N=513) n (%)	Placebo (N=508) n (%)
Naso-pharyngitis	21 (4.1)	13 (2.5)	12 (2.3)	9 (1.8)
Hypertension	10 (2.0)	5 (1.0)	3 (0.6)	7 (1.4)
Back pain	9 (1.8)	7 (1.4)	2 (0.4)	3 (0.6)
Oropharyngeal pain	8 (1.6)	4 (0.8)	8 (1.6)	6 (1.2)

Other adverse reactions occurring more frequently with UTIBRON NEOHALER than with placebo, but with an incidence of less than 1% include dyspepsia, gastroenteritis, chest pain, fatigue, peripheral edema, rash/pruritus, insomnia, dizziness, bladder obstruction/urinary retention, atrial fibrillation, palpitations, tachycardia.

52-Week Trial

In a long-term safety trial, 614 subjects were treated for up to 52 weeks with indacaterol/glycopyrrolate 27.5 mcg/15.6 mcg twice-daily, indacaterol/glycopyrrolate 27.5/31.2 mcg twice-daily or indacaterol 75 mcg once-daily. The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled efficacy trials described above. The adverse reactions reported in the long-term safety trial were consistent with those observed in the placebo-controlled trials of 12 weeks.
Additional adverse reactions that occurred with a frequency greater than or equal to 2% in the group receiving indacaterol/glycopyrrolate 27.5 mcg/15.6 mcg twice-daily that exceeded the frequency of indacaterol 75 mcg once-daily in this trial were upper and lower respiratory tract infection, pneumonia, diarrhea, headache, gastroesophageal reflux disease, hyperglycemia, rhinitis.

Postmarketing Experience
The following additional adverse reactions of angioedema and dysphonia have been identified during worldwide post-approval use of indacaterol/glycopyrrolate at higher than the recommended dose. Because this reaction is reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate the frequency or establish a causal relationship to drug exposure.

DRUG INTERACTIONS

Adrenergic Drugs
If additional adrenergic drugs are to be administered by any route, they should be used with caution because the sympathetic effects of indacaterol, a component of UTIBRON NEOHALER, may be potentiated.

Xanthine Derivatives, Steroids, or Diuretics
Concomitant treatment with xanthine derivatives, steroids, or diuretics may potentiate any hypokalemic effect of $beta_2$-adrenergic agonists such as indacaterol, a component of UTIBRON NEOHALER.

Non-Potassium-Sparing Diuretics
The electrocardiographic (ECG) changes and/or hypokalemia that may result from the administration of non-potassium-sparing diuretics (such as loop or thiazide diuretics) can be acutely worsened by beta-agonists, such as indacaterol, a component of UTIBRON NEOHALER, especially when the recommended dose of the beta-agonist is exceeded. Although the clinical relevance of these effects is not known, caution is advised in the coadministration of UTIBRON NEOHALER with non-potassium-sparing diuretics.

Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, QTc-Prolonging Drugs
Indacaterol, one of the components of UTIBRON NEOHALER, as with other $beta_2$-agonists, should be administered with extreme caution to patients being treated with monoamine oxidase inhibitors, tricyclic antidepressants, or other drugs known to prolong the QTc interval because the action of adrenergic agonists on the cardiovascular system may be potentiated by these agents. Drugs that are known to prolong the QTc interval may have an increased risk of ventricular arrhythmias.

Beta-Blockers
Beta-adrenergic receptor antagonists (beta-blockers) and UTIBRON NEOHALER may interfere with the effect of each other when administered concurrently. Beta-blockers not only block the therapeutic effects of beta-agonists, but may produce severe bronchospasm in COPD patients. Therefore, patients with COPD should not normally be treated with beta-blockers. However, under certain circumstances, e.g., as prophylaxis after myocardial infarction, there may be no acceptable alternatives to the use of beta-blockers in patients with COPD. In this setting, cardioselective beta-blockers could be considered, although they should be administered with caution.

Anticholinergics
There is potential for an additive interaction with concomitantly used anticholinergic medicines. Therefore, avoid coadministration of UTIBRON NEOHALER with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic adverse effects.

Inhibitors of Cytochrome P450 3A4 and P-gp Efflux Transporter
Drug interaction studies with indacaterol, a component of UTIBRON NEOHALER, were carried out using potent and specific inhibitors of CYP3A4 and P-gp (i.e., ketoconazole, erythromycin, verapamil, and ritonavir). The data suggest that systemic clearance of indacaterol is influenced by modulation of both P-gp and CYP3A4 activities and that the 2-fold area under the curve (AUC) increase caused by the strong dual inhibitor ketoconazole reflects the impact of maximal combined inhibition. Indacaterol was evaluated in clinical trials for up to 1 year at doses up to 600 mcg. Inhibition of the key contributors of indacaterol clearance, CYP3A4 and P-gp, has no impact on safety of therapeutic doses of indacaterol. Therefore, no dose adjustment is warranted at the recommended 27.5/15.6 mcg twice-daily dose for UTIBRON NEOHALER when administered concomitantly with inhibitors of CYP3A4 and P-gp.

USE IN SPECIFIC POPULATIONS

Pregnancy
Teratogenic Effects: Pregnancy Category C
There are no adequate and well-controlled studies with UTIBRON NEOHALER or its individual components, indacaterol and glycopyrrolate, in pregnant women. Animal reproduction studies were conducted with individual components, indacaterol and glycopyrrolate. Because animal reproduction studies are not always predictive of human response, UTIBRON NEOHALER should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Women should be advised to contact their physician if they become pregnant while taking UTIBRON NEOHALER.

Indacaterol: Indacaterol was not teratogenic in Wistar rats and New Zealand rabbits at approximately 340 and 770 times, respectively, the MRHD in adults (on an AUC basis at maternal subcutaneous doses up to 1 mg/kg/day in rats and rabbits).

Glycopyrrolate: Glycopyrrolate was not teratogenic in Wistar rats or New Zealand White rabbits at approximately 1400 and 530 times, respectively, the MRHD in adults (on an AUC basis at maternal inhaled doses up to 3.83 mg/kg/day in rats and up to 4.4 mg/kg/day in rabbits).

Non-teratogenic Effects:
Indacaterol: There were no effects on perinatal and postnatal developments in rats at approximately 110 times the MRHD in adults (on an AUC basis at maternal subcutaneous doses up to 0.3 mg/kg/day).

Glycopyrrolate: There were no effects on perinatal and postnatal developments in rats at approximately 1100 times the MRHD in adults (on an AUC basis at maternal subcutaneous doses up to 1.88 mg/kg/day).

Labor and Delivery
There are no adequate and well-controlled human trials that have investigated the effects of UTIBRON NEOHALER during labor and delivery. Because beta-agonists may potentially interfere with uterine contractility, UTIBRON NEOHALER should be used during labor only if the potential benefit justifies the potential risk.

In human parturients undergoing Caesarean section, 86 minutes after a single intramuscular injection of 0.006 mg/kg glycopyrrolate, umbilical plasma concentrations were low.

Nursing Mothers
UTIBRON NEOHALER: It is not known whether UTIBRON NEOHALER is excreted in human breast milk. Because many drugs are excreted in human milk, caution should be exercised when UTIBRON NEOHALER is administered to a nursing woman. Since there are no data from well-controlled human studies on the use of UTIBRON NEOHALER by nursing mothers, based on the data for the individual components, a decision should be made whether to discontinue nursing or to discontinue UTIBRON NEOHALER, taking into account the importance of UTIBRON NEOHALER to the mother.

Indacaterol: It is not known whether indacaterol is excreted in human breast milk. Indacaterol (including its metabolites) have been detected in the milk of lactating rats.

Glycopyrrolate: It is not known whether glycopyrrolate is excreted in human breast milk. Glycopyrrolate (including its metabolites) have been detected in the milk of lactating rats and reached up to 10-fold higher concentrations in the milk than in the blood of the dam.

Pediatric Use
UTIBRON NEOHALER is not indicated for use in children. The safety and efficacy of UTIBRON NEOHALER in pediatric patients have not been established.

Geriatric Use
Based on available data, no adjustment of UTIBRON NEOHALER dosage in geriatric patients is warranted. UTIBRON NEOHALER can be used at the recommended dose in elderly patients 75 years of age and older.

Of the total number of subjects in clinical studies of UTIBRON NEOHALER, 45% were aged 65 and older, while 11% were aged 75 and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

Renal Impairment
Based on the pharmacokinetic characteristics of its monotherapy components, UTIBRON NEOHALER can be used at the recommended dose in patients with mild to moderate renal impairment. In patients with severe renal impairment (estimated GFR less than 30 mL/min/1.73 m^2) or end-stage renal disease requiring dialysis, UTIBRON NEOHALER should be used if the expected benefit outweighs the potential risk since the systemic exposure to glycopyrrolate may be increased in this population.

Hepatic Impairment
Based on the pharmacokinetic characteristics of its monotherapy components, UTIBRON NEOHALER can be used at the recommended dose in patients with mild to moderate hepatic impairment. Studies in subjects with severe hepatic impairment have not been performed.

OVERDOSAGE
In COPD patients, doses of up to 600/124.8 mcg UTIBRON NEOHALER were inhaled over 2 weeks and there were no relevant effects on heart rate, QTc interval, blood glucose or serum potassium. There was an increase in ventricular ectopies after 14 days of dosing with 300/124.8 mcg and 600/124.8 mcg UTIBRON NEOHALER, but low prevalence and small patient numbers (N=49 and N=51 for 600/124.8 mcg and 300/124.8 mcg UTIBRON NEOHALER, respectively) precluded accurate analysis. In a total of four patients, non-sustained ventricular tachycardia was recorded, with the longest episode recorded being 9 beats (4 seconds).

UTIBRON NEOHALER contains both indacaterol and glycopyrrolate; therefore, the risks associated with overdosage for the individual components described below apply to UTIBRON NEOHALER. Treatment of overdosage consists of discontinuation of UTIBRON NEOHALER together with institution of appropriate symptomatic and/or supportive therapy. The judicious use of a cardioselective beta-receptor blocker may be considered, bearing in mind that such medicine can produce bronchospasm. Cardiac monitoring is recommended in cases of overdosage.

Indacaterol
The potential signs and symptoms associated with overdosage of indacaterol are those of excessive beta-adrenergic stimulation and occurrence or exaggeration of any of the signs and symptoms, e.g., angina, hypertension or hypotension, tachycardia, with rates up to 200 bpm, arrhythmias, nervousness, headache, tremor, dry mouth, palpitation, muscle cramps, nausea, vomiting, drowsiness, dizziness, fatigue, malaise, hypokalemia, hyperglycemia, metabolic acidosis and insomnia. As with all inhaled sympathomimetic medications, cardiac arrest and even death may be associated with an overdose of indacaterol.

In COPD patients, single doses of indacaterol 3000 mcg were associated with moderate increases in pulse rate, systolic blood pressure and QTc interval.

Glycopyrrolate
An overdose of glycopyrrolate may lead to anticholinergic signs and symptoms such as nausea, vomiting, dizziness, lightheadedness, blurred vision, increased intraocular pressure (causing pain, vision disturbances or reddening of the eye), obstipation or difficulties in voiding.

In COPD patients, repeated orally inhaled administration of glycopyrrolate at total doses of 124.8 mcg and 249.6 mcg once-daily for 28 days were well tolerated.

PATIENT COUNSELING INFORMATION
Advise the patient to read the FDA-approved patient labeling (Medication Guide and Instructions for Use).

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Chronic Disease Manager

LAM Disease: What Is It and Why Should Respiratory Therapists Care?

by Jeffrey Davis, BS, RRT

Lymphangioleiomyomatosis — otherwise known as LAM. I'll bet many reading now are unfamiliar with this rare disease. As a 32-year respiratory therapist (RT), the AARC contacted me to represent our profession at a LAM Foundation event and participate in a workshop in Los Angeles, California, back in November 2017. It was time to do some homework.

LAM is a rare lung disease that primarily affects young women of childbearing age. It is estimated that 250,000 women worldwide have LAM but are unaware of it. To date, researchers have identified 2,500 women who have been diagnosed with the disease. LAM researcher Elizabeth Henske, MD, of Philadelphia's Fox Chase Cancer Center, says, "Other than diseases of the genitals, LAM affects women almost exclusively. Of the documented diagnoses, 99.5% are female, which is higher than even breast cancer with 98% female diagnoses." LAM cells are abnormal cells that grow out of control in certain organs, most frequently the lungs and lymph nodes. Over time, these LAM cells will destroy normal lung tissue.[1] The cause of LAM is unknown, but it is believed to be genetic, caused by abnormal *TSC1* or *TSC2* genes, and the hormone estrogen is thought to be involved because this disease primarily affects women.[2] According to Henske, the exclusivity toward females could be linked to increased estrogen during a woman's childbearing years.[1]

Some of the most common symptoms of LAM include chest pain that worsens with breathing, fatigue, frequent cough, shortness of breath that worsens over time, and wheezing.[2] As a result, LAM can easily be misdiagnosed as asthma, because the respiratory symptoms are similar to an asthma exacerbation. Pneumothorax and chylothorax occur frequently in patients with LAM. Treatment for LAM includes bronchodilator therapy, oxygen therapy, and a medication called sirolimus, also known as rapamycin.[2] Sirolimus has been shown to help regulate the growth of and movement of LAM cells. While sirolimus does not stop the growth of LAM cells, it helps stabilize lung function and reduce the amount of chylothorax. At this time, there is no cure for LAM. As the disease worsens, there is high risk of pneumothorax, and the risk of fatal respiratory failure becomes very real. For some, lung transplantation is the only solution.[2]

Circling back to the LAM Foundation event in November, I had no idea what to expect. The event was an annual education and support conference, known as LAMposium, for patients who are suffering from LAM disease and their families.[3] I met around 100 patients and family members who were looking for support and resources. But most specifically, they were looking for answers. As the disease progresses, there is a greater need for supplemental oxygen. My role was to introduce these patients and families to resources that may help them live a more active and productive lifestyle. Remember, these patients are young, so they still want to remain active. It is challenging, however, to maintain an active lifestyle while depending on an oxygen concentrator that either has a short battery life or is too heavy to tote around because of a larger, longer-lasting battery. Many of the people with whom I spoke shared their desire for portable devices with long battery life that could provide higher flows of oxygen. Unfortunately for these patients, the technology does not yet exist to create a lightweight portable concentrator that delivers high flows of oxygen. Their frustration in the lack of new resources in oxygen delivery was clear for all to see.

about the author...

Jeffrey Davis, BS, RRT, is director of respiratory care services and pulmonary function at Ronald Reagan UCLA Medical Center in Los Angeles, CA.

One big takeaway from the LAMposium was the need for support. As this is a very rare disease, there is a very small circle of support for these patients. The LAM Foundation brings in experts and industry leaders to discuss the state of the disease and ongoing clinical research, and to sit face to face with LAM patients and families to hear their needs and work toward finding a solution. In attendance were physicians who specialize in this disease, as well as RTs from the home care and oxygen industry. These therapists and doctors saw and felt the frustration as they listened to these patients' needs, knowing that the technology is not currently available. These experts provide support for newly diagnosed patients as well as for all levels of affected patients, discussing treatment options and the risk and reward of lung transplantation.

The LAM Foundation provides a wide array of resources for patients, including educational materials, contacts, and support for patients and families. There is an ever-expanding role for RTs, from diagnostic support in physician offices and pulmonary function labs, to educational support in bronchodilator treatment education and airway clearance, to research and development of new technologies. RTs are involved in every aspect of care for patients with this rare lung disease. With social media connections and many written resources, these patients can find what they need to live a healthy and productive life with LAM.[3] ■

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Chicago RTs Want To Make Their Department the Department of Choice

by Debbie Bunch

Rush University Medical Center wants to be the employer of choice for clinicians in the Chicago area. Respiratory therapy managers Keith Roberts, MBA, RRT, CPFT, and Andrew Klein, MS, RRT, RRT-ACCS, RRT-NPS, AE-C, work hard to make their department the department of choice within the profession. The AARC's new Apex Recognition Award fits right into that mindset, so when they learned about it last year, they knew they had to go after it.

New recognition from the AARC boosts stature of RTs at Rush University Medical Center

"We put a lot of effort into creating a highly professional environment that is attractive to clinicians," says Roberts, who serves as department director. "We feel we've made significant strides toward this goal but we continually raise the bar. Ultimately, the level of skill and professionalism we develop translates to outstanding care for our patients."

Klein, an adult critical care specialist and supervisor in the department, believes the Apex award fills a much-needed void in the profession for departments like his that continually go the extra mile. "Respiratory therapists are knowledgeable, educated, experienced, and as valuable to patient care and achieving positive outcomes as other disciplines but are rarely recognized as such," says the AARC member. "We set a very high standard of practice for the respiratory therapists in our department, and this award shows that this level of performance does get noticed and recognized."

Laying the groundwork

Both Klein and Roberts say they started laying the groundwork for the requirements outlined on the Apex application well over a decade ago — long before the award was even envisioned by the AARC. Two key Apex requirements involving credentialing were among the first to be addressed. "Department leadership made a decision 15 years ago to make the RRT the required credential for all staff," says Roberts. "We did not want to be viewed as an employer for those who would not attempt, or could not pass, the RRT. This included a large number of our own staff at the time."

Five years ago, they created a clinical ladder requiring National Board for Respiratory Care specialty credentials for advancement as well. "Hiring the right staff members to form a department of this caliber is always the biggest challenge, and everything else builds off of that," says Klein.

Making those changes required buy-in from hospital administration and physicians, and Roberts says they had to make a business case for them before they could be put into place. Luckily, the department had the full support of the physicians it works most closely with, in part because they are accountable for the care delivered by RTs in the department.

Everyone else had to be convinced. "We presented everything we thought was adversely affecting the de-

The Apex Recognition Award

The AARC developed the Apex Recognition Award to acknowledge the significant contributions of respiratory therapists and highlight best practices in respiratory care that are aligned with evidence-based medicine. The program can also help consumers choose health care facilities that promote patient safety by providing access to respiratory therapists to deliver their care.

Apex recognition is available for acute care hospitals, long-term care facilities, and home medical equipment companies. A complete set of resources is available on the AARC website for facilities that would like to apply for the recognition. Visit http://www.aarc.org/resources/programs-projects/apex-recognition-award/ to learn more about this great award program from the AARC to recognize excellence in respiratory care. Applications for the 2019–2020 Apex award will open in October 2018. ■

partment, and by association, hospital operations: job market, recruiting, vacant positions, turnover, complaints, safety events, nursing and physician opinions, etc.," he says. Those hard, cold facts helped persuade administrators, human resources, and the medical staff that the changes being proposed by the department really were needed to ensure respiratory care at Rush was top notch.

"Part of the challenge is to identify what drives the decisions of stakeholders. Once you do that, you create strategies and messaging and the path becomes easier," says Roberts. He emphasizes, however, that it all takes time, and he advises other managers thinking about going after Apex recognition to bring their patience when working to meet the requirements. "You have to accept that culture change and the personal gratification that comes from it can take years," says the AARC member.

Overall fit also matters

Of course, achieving the level of care they wanted to achieve wasn't just about upgrading credentialing requirements. Says Klein, "I think finding people who not only have the right credentials and degree, but also the right attitude, leadership potential, and overall fit with the rest of the team is the most difficult task."

The managers worked hard to identify those softer skills in job candidates and to build a department of clinicians who have no trouble rising to the occasion. Once they had a department staffed with that kind of RT, the next task was making sure those RTs were presented with the kind of work environment that maximizes and appreciates their skills. "If they don't feel challenged and engaged in what they do, they won't stay and you are back to hiring more employees," warns Klein.

Creating that kind of environment circles back to developing strong relationships with physicians and administrators. Klein recommends working with your medical director to sell other physicians and the hospital leadership on the value of having a strong and committed RT department that adds value and improves outcomes for patients. That's where the freedom to create the therapist-driven, evidence-based protocols that also figure into the Apex requirements comes from.

Sending the right message

Roberts says his staff appreciates the recognition they have received from getting one of the first Apex Awards from the AARC. The hospital newsletter ran a nice article announcing the award that included a group photo of the staff, and he believes the award has helped make other departments more aware of the role that respiratory therapists play in the hospital. "Many managers and administrators don't understand all that is required to deliver quality RT services," says the department director. "It's not that they don't care, but as hospital organizational structures have flattened, they have so much on their plate it is difficult for them."

Alex Muller, MS, RRT, and Josette Jean, BS, RRT, RRT-ACCS, discuss a patient's case.

Apex recognition has put respiratory therapy in the spotlight at Rush University Medical Center.

The Apex award sends the message in a way that anyone can quickly and easily understand. “The Apex Award has allowed us to show our staff that they are one of the elite departments in the country and show the whole organization the value of our department,” says Klein. “I think our staff has such a positive effect on outcomes with so many of our patients, and now the organization is more aware of those contributions.”

Both managers believe the award will eventually pay off when it comes time to recruit new staff — especially as it becomes more widely known in the profession. They are doing their part to get the word out. Says Roberts, “We are currently in the process of creating a new marketing document for recruitment that includes recognition of the award, why it is special, and why a clinician would want to work in a department that has received it.”

It’s all part of a grand design at this hospital, where awards for excellence in nursing, medicine, and other fields are the norm. Now there’s one for respiratory therapy, too. Says Klein, “We see this as part of a strategy to differentiate our department, attract a high-caliber clinician, increase retention, and continue to develop our team.” ■

Ahmad Elshafei, MS, RRT, RRT-ACCS, RRT-NPS, gets ready to perform a bedside procedure.

Sara Murphy, MBA, RRT, RRT-NPS, assesses one of the hospital’s youngest patients.

Tyler Weiss, MS, RRT, RRT-ACCS, AE-C, checks on a trached patient.

Bachelor's Degrees for RTs: PATHWAYS TO EDUCATION

by Ellen Becker, PhD, RRT, RRT-NPS, RPFT, AE-C, FAARC

Several AARC initiatives over the past several years addressed the topic of bachelor's degrees. Two paths for respiratory therapists (RTs) to earn a bachelor's degree are to enroll in an entry-level bachelor's degree program or enroll in a degree advancement program after earning an associate's degree. The degree advancement route to a bachelor's degree has garnered increased attention lately. Both educators and department leaders have key

roles in directing and aiding RTs along this path. The first step to getting started is to understand why a bachelor's degree is important for staff RTs.

Rationale for degree advancement

The list of clinical competencies that emerged from the 2015 and Beyond conferences has been published in Respiratory Care.[1] Later, a multistakeholder taskforce identified when those competencies should be obtained, either at entry into practice or after entering professional practice (http://www.aarc.org/education/educator-resources/competencies-entry-respiratory-therapy-practice, *Accessed December 15, 2017*). The taskforce concluded that practicing therapists need to continue their education after graduation to obtain all of the listed competencies. This need for continuing education after graduation resulted from the growth in the respiratory care profession over the past several decades.

This phenomenon is not limited to the respiratory care field. Across many fields, the list of competencies has grown, so associate's degree programs have gradually increased the total number of semester credits they offer, with some going as high as 99 semester credit hours. This "credit creep" has led many states to limit the total number of credits that can be offered for an associate's degree to a value closer to 60 credits. The rationale for decreasing the number of credits is that students who take a significantly higher number of credits should be awarded a degree that matches the number of credits earned (eg, a bachelor's degree).

about the author...

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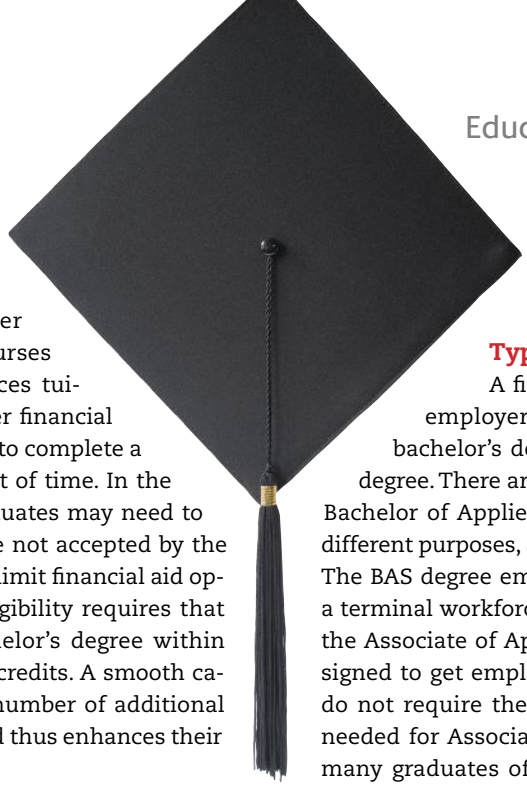
One strategy to expand the credit limit for entry-level respiratory care preparation is to move toward entry-level bachelor's degrees for RTs. Several challenges make it difficult to implement this change quickly. Presently 84% of entry-level respiratory care programs offer associate's degrees. Of the 359 programs that offer associate's degrees, 46% reside in sponsoring institutions that cannot offer bachelor's degrees.[2] Furthermore, respiratory care programs are relatively expensive because they require equipment and high credit hours for the necessary clinical practicums. Also, they tend to have fewer students enrolled compared to programs without a clinical component. These are a few of the factors that make universities with tight budgets less likely to embrace new, expensive programs. The AARC's goal for 80% of RTs to either hold or be actively working toward a bachelor's degree by 2020 hints at another way forward (http://www.aarc.org/aarc-bod-sets-80-bachelor-degree-goal-by-2020, *Accessed December 15, 2017*). Current associate's degree holders can complete a bachelor's degree through degree advancement programs that are designed for the working practitioner.

Educator roles

Faculty for both associate's degree and bachelor's degree programs should collaborate with one another to facilitate this important transition for students. At the associate's degree level, program faculty need to design and publicize career pathways. Students entering two-year programs should be aware of the need to prepare themselves with a



bachelor's degree, the transfer options available, and the courses needed to ease their transfer. Well-designed career pathways limit the extra courses graduates need to take, reduces tuition expenses, allows for better financial aid eligibility, and permits RTs to complete a degree in a reasonable amount of time. In the absence of a pathway, RT graduates may need to retake similar courses that are not accepted by the transfer institution which can limit financial aid options. Federal financial aid eligibility requires that students complete their bachelor's degree within approximately 180 attempted credits. A smooth career pathway minimizes the number of additional courses RT graduates need, and thus enhances their financial aid eligibility.

Faculty from bachelor's degree programs should collaborate with their associate's degree peers to achieve the most effective career-pathway development. The ease of transfer is considered a critical juncture.[3-5] Clear and timely communication with potential transfer students facilitates successful matriculation. Transfer students need to know how transfer credits are evaluated, deadlines for applications, and how the program is delivered (face-to-face, online, or hybrid). Ideally this information is available to transfer students while they are enrolled in an entry-level program. However, the growing number of degree advancement programs makes it possible for seasoned RTs to return to school and earn their bachelor's degree. Degree advancement faculty can share their transfer or articulation agreements widely to facilitate communication with alumni from associate degree programs.

Department leader roles

Respiratory care department leaders play crucial roles in facilitating their employees' moves on the career ladder. The most important role is to highlight and embrace the importance of completing a bachelor's degree. Not only do associate's degree RT graduates gain more content knowledge while earning an advanced degree, but more importantly, they develop skills that have the potential to improve the quality of patient care, as well as safety and outcomes. Some examples include critical thinking skills (decision-making, problem-solving, and reasoning), search skills for bibliographic databases, interpretation skills from critically reviewing the literature, and written and presentation skills. Furthermore, department leaders can assist the movement of their RT staff on career ladders where RTs with advanced degrees utilize their new knowledge and skills to contribute to improved patient care and to advance the profession. Tuition assistance and adjusting work schedules also help RTs who wish to pursue bachelor's degrees.

Type of bachelor's degree

A final theme for education advisors and employers to consider when recommending bachelor's degree programs relates to the type of degree. There are Bachelor of Science (BS) degrees and Bachelor of Applied Science (BAS) degrees. Each serves different purposes, and it is critical to know the difference. The BAS degree emerged in the 1970s and is considered a terminal workforce degree.[6] Workforce degrees, such as the Associate of Applied Science (AAS) degree, were designed to get employees into the workforce quickly and do not require the breadth of liberal arts and sciences needed for Associate of Science (AS) degrees.[7] However, many graduates of AAS programs, RTs included, found the need to pursue bachelor's degrees as their professions have evolved. The BAS degree allows AAS graduates more flexibility to transfer degree credits because it is also considered a terminal workforce degree. The BS degree is more common and is ultimately more versatile. The key message here is to carefully think about long-term career plans. If a bachelor's degree is the final degree desired, a BAS degree may be the best option. However, for RTs who want a graduate degree in their future, it most likely will be best to pursue a BS degree.

Respiratory therapists have many paths to earn bachelor's degrees, including several degree types. Educators and department leaders can make this journey easier. Educators at both the entry-level and degree advancement level should collaborate with each other to create a smooth transition for RTs to further their education. Department leaders can show employees how degree advancement will positively contribute to their workplace and careers, and can highlight helpful employee-benefit programs. ■

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Using Happiness To Enhance
Your Leadership Ability and Your Life

by Scott Reistad, RRT, CPFT, FAARC

Previous generations believed that work was work — and that happiness had little to do with the work environment. In fact, many of you may remember parents or grandparents who hated their work most of their careers, yet they continued to do their jobs. They believed that work was not supposed to be fun. Instead, work was a necessary evil that you tolerated so that you could have a life and a lifestyle. I remember when I shared with my grandfather that I was getting a new job, and he asked me if I had been fired. When I explained that I had not been fired, but that the other position would allow me greater freedom, fun, and learning at work, he looked at me quizzically and could not understand. In fact, he even chastised me in that he believed that, if I had a "good job," I should simply keep it.

ABOUT THE AUTHOR

Scott Reistad, RRT, CPFT, FAARC, is a clinical specialist for Philips Healthcare after being in hospital leadership positions for 31 years. He was selected as the AARC Management Section practitioner of the year by the AARC in 2009 and named a Fellow of the AARC in 2010.

Though we may have believed that it would make sense that employees would do a better job if they enjoyed their workplace, until recently there had been no research to validate this. In 1975, a ground-breaking book was published: *See You at the Top*, by Zig Ziglar. One of his most famous quotes was contrary to many of the beliefs at the time (and to some, even today): "You can get everything in life you want if you will just help enough other people get what they want."[1]

Many asked how this could this be correct. Business is a winners and losers game. Business is about getting to the top ahead of everyone else. Ziglar can't be right, can he? Yet we find that by helping others, by choosing to be happy, and by creating work environments filled with joy and caring, organizational metrics are not only achieved but exceeded.[2]

In general, all people (not just Millennials) want to do the right thing. They want to be respected and recognized, and they want to believe that they are making a difference. In today's workplace, we're discovering that you can have friendships at work, you can help people be successful at work, and it can be just as rewarding to win as a team as it can be to win alone. By implementing this new work belief, you can actually be happy at work.

Therefore, as a leader (I prefer the definition of leader as a person who has followers and has influence versus the traditional definition of having a title), it truly is easier to win if everyone wants you to win. And to the contrary, who wants to "bust their hump" for someone who is not looking out for everyone's best interest? Adam Grant describes how this is an exciting leadership enhancement, as it allows the leader to uninhibitedly partner with staff members by willingly choosing to help them succeed in the endeavors that make a difference to them.[3] As one begins to proactively working to ensure the success of others, then others have the opportunity to reciprocate for you.

Yet today, employees shift from job to job many times for reasons such as "This job is boring" or "I'm not having any fun anymore." In the past, the management adage "Familiarity breeds contempt" was considered sacred. In fact, when I started my career I was coached to avoid getting too close to my staff because they might take advantage of me and I might be seen as having "favorites" at work and end up in trouble.

The current workforce not only expects work to be fun, but they also expect to feel as if they are cared for and that their skills should grow within their job. If these needs are not met, they easily — and without regret or fear — quit their current job and move on to another that they believe will make them happier.

Those who have adopted this action have found this to be true in many situations.

As we observe the high degree of stress in the health care profession today, we see many health care providers who are apathetic, scared, overwhelmed, and overcommitted. The burnout rate among health care leaders is incredibly high due to the chaotic health care world that is affecting everyone. Burnout happens when a person consistently gives more than they are able to replenish in their lives. Many times, individuals choose health care as a profession because they want to make a difference and they want to care for people. Unfortunately, these altruistic beliefs, if not balanced by an equal amount of "selfishness" by the person to purposefully take time to refill their mental/physical/spiritual tank, a person with the best of intentions of wanting to give to others can find themselves with nothing left to give. We have to learn to say "no" at times.

> The current workforce not only expects work to be fun, but they also want to feel as if they are cared for and that their skills should grow within their job.

Belle found that as one adopts the belief of helping others succeed and helping their team succeed, the people involved come to know how their work makes a difference and can be more energized to contribute more.[4] In fact, as they and their team succeed, they become re-invigorated and refreshed so that they are happier at work. Maryam found that those who are "burnout-free" see the successes of the team as a source of strength developed by their interdependence on a team.[5]

This leads us to the obvious question posed by Flynn: Why do we underestimate the number of people who are willing to give to us and to help make our lives better and happier?[6]

I am reminded of the camaraderie and extraordinary teamwork exhibited by participants of the Tough Mudder events that are held all across the country. "Race" is not an accurate description of these events, as participants don't necessarily register to win, but instead to find out if they can actually finish. In shifting the focus from winning to simply pushing themselves to finish, the participants willingly and actively help others overcome obstacles to succeed. In fact, there are some obstacles in this kind of event that are nearly impossible to overcome without help. Participants almost universally have fun despite being tired, wet, cold, and even injured. The number of individuals who willingly

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sign up for these races in subsequent years is remarkably high because they compete with their friends and their fellow Tough Mudders to collectively work to overcome the course, not each other.

Why is there so much camaraderie and collegiality during this grueling event? When people ask for help, others often willingly give help; in turn, participants in these challenges lend a hand to fellow competitors because they know they will need help at some point as well. Along the way, everyone wins.

With this in mind, why is the concept of asking for help so rare in the workplace? We have an archaic belief that asking for help shows that we are weak, the old idea that we need to win as an individual instead of as a team. Instead, real life shows that when we ask for help, others are not only willing to help, but they actually want to help. Doing so replenishes them as they can see you succeed, and thus they succeed as they are on the same team. Your success because of the assistance of others sets up the scenario where you will also wish to help others be successful, too. As the momentum of asking and receiving — giving and graciously taking — the work environment can shifts to one of joy and happiness.

Think this sounds too good to be true? Grant[3] extensively reviewed an exercise entitled Reciprocity Rings, which was developed by Wayne and Cheryl Baker at the University of Michigan. Reciprocity Rings works because this method pools the resources of the group for the benefit of the individual, and in having the individual benefit, all participants benefit. For example, in any given department, task force, committee, or work group, each person makes a request of the group. It can be anything meaningful in their professional or personal lives: job leads, critical information or policies, travel tips, introductions to key people, "connections" for you or your kids, recipes, tips on hobbies — it can really be anything as long as it is specific. The group then tries to use their collective knowledge, resources, and connections to fulfill the requests. Everyone in the group is doing their best to help everyone else, and they in turn are also helped. This exercise has been found to create profound bonds between coworkers because by giving to others so they can "win," others give to you so you can "win," too.

Imagine what the workplace would be like if we could harness this power of happiness and teamwork to overcome challenges that are facing our departments. We could profoundly affect not only our staff satisfaction scores, but also our patient outcomes and satisfaction. ■

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Industry Watch

FDA announces new campaign for adult smoking cessation

The FDA has launched an adult smoking cessation education campaign aimed at encouraging cigarette smokers to quit through messages of support that underscore the health benefits of quitting. These messages will be displayed in and around gas stations and convenience stores — retail locations where smokers face a multitude of triggers and that typically feature cigarette advertisements. The "Every Try Counts" campaign targets smokers 25–54 years old who have attempted to quit smoking in the last year but were unsuccessful. The two-year campaign kicked off earlier this year in 35 markets; it features print, digital, radio, and out-of-home ads, such as those seen on billboards.

Vertex to apply for FDA application with its CF drug

Based on results from an open-label Phase III study that showed safety and effectiveness of the cystic fibrosis (CF) drug Kalydeco® (ivacaftor) in children one to two years old, Vertex Pharmaceuticals, Inc., plans to submit applications for the drug in this age group to the FDA and the European Medicines Agency. Kalydeco treats a defect in the *CFTR* gene that causes CF and is currently approved by the FDA for the treatment of patients aged two years and older. The children in this study had one of 10 mutations in the *CFTR* gene.

AstraZeneca, MedImmune receive FDA approval

According to AstraZeneca and its global biologics research and development arm, MedImmune, the FDA has approved FASENRA™ (benralizumab) for the add-on maintenance treatment of patients aged 12 years and older with severe asthma and an eosinophilic phenotype. The approval was based on positive results from an eight-week trial showing more than a 50% reduction in the annual asthma exacerbation rate for patients taking the drug as opposed to those taking a placebo. Other benefits included significant improvement in lung function, a reduction or discontinuation in the use of oral corticosteroids, and an adverse-event profile similar to placebo. FASENRA is not approved for the treatment of other eosinophilic conditions or for relief of acute bronchospasm or status asthmaticus.

RespiraSense monitoring device advances

PMD Solutions has been selected to join the British National Health Service Innovation Accelerator Programme, fulfilling the company's vision of creating a new standard of care regarding in-hospital continuous respiratory-rate monitoring. The company's RespiraSense has been shown to detect patient deterioration up to 12 hours in advance of an adverse patient event, allowing for early intervention and reducing escalations of care and the associated hospital cost. Currently awaiting FDA clearance, RespiraSense is expected to be ready for sale in the United States in 2018. The company anticipates hospitals and urgent care clinics will work to improve the standard of care and create cost savings through the introduction of a new standard of respiratory monitoring.

PARI Pharma receives new drug application

PARI Pharma GmbH, a company focused on the development and commercialization of advanced aerosol-delivery systems based on eFlow® Technology, has announced the FDA approval of its first eFlow closed-system nebulizer, Magnair™, together with Sunovion's Lonhala™ (glycopyrrolate) Inhalation Solution. The drug/device combination received FDA approval under a New Drug Application. "So far, eFlow Technology nebulizers like Altera®, Zirela®, Tolero®, or eRapid®/eFlow® rapid are available to patients suffering from the orphan indication of CF," PARI Pharma President Dr. Martin Knoch was quoted as saying. "With the approval of Lonhala Magnair for COPD, we are bringing a new advancement in nebulizers that are designed to be efficient, silent, and fast to people with COPD."

Boehringer Ingelheim launches study of sequential therapy for NSCLC

Boehringer Ingelheim Pharmaceuticals, Inc., has initiated GioTag, a real-world study to assess the impact of sequential therapy in patients with EGFR mutation–positive advanced non-small cell lung cancer (NSCLC). Data from approximately 190 patients who received tyrosine kinase inhibitors — afatinib in first-line therapy, followed by second-line therapy with osimertinib as part of standard clini-

cal practice — will be analyzed to determine total time on treatment. "This real-world study will help us evaluate the impact of multiple lines of targeted therapies and provide evidence to help inform treatment approaches to optimize outcomes for patients," noted Thomas Lechner, PhD, therapeutic area head of oncology at Boehringer Ingelheim Pharmaceuticals, Inc.

FDA approves GSK drug for EGPA

According to GlaxoSmithKline plc (GSK), the FDA has approved Nucala (mepolizumab) as the first targeted treatment for eosinophilic granulomatosis with polyangiitis (EGPA), previously known as Churg-Strauss syndrome. The approval is based on results from the pivotal, 52-week, Phase III MIRRA study, conducted as a collaboration between GSK and the National Institute of Allergy and Infectious Diseases. Results showed a treatment advantage with mepolizumab in accrued time in remission and the proportion of patients achieving readmission. Adverse reactions were about the same in the treatment and placebo groups. The company reports that all secondary endpoints were met as well.

CF patients receive AffloVests

The Colton Underwood Legacy Foundation and International Biophysics Corporation, the manufacturer of the AffloVest®, have teamed up to provide 50 cystic fibrosis patients with next-generation airway-clearance therapy. The initiative began in January and is delivering one AffloVest to a recipient with CF in every state in the United States. Former NFL linebacker Colton Underwood created the foundation in 2015. It encourages youth participation in athletics and provides resources for research and support of people living with CF.

New lung transplant program

Montefiore Einstein Center for Heart & Vascular Care has received interim approval from the United Network for Organ Sharing to launch a new lung-transplant program. The program is unique in that it is the only one in New York to offer bloodless lung transplants and heart-lung transplants. Both are considered complex procedures requiring a high level of skill. "This is an enormous step for Montefiore and for the growing region we serve," said Robert E. Michler, MD. "In New York State, so many donor lungs are going unused because of limited resources and experience. With our new world-class team, we will be able to save the lives of thousands of people with chronic lung and heart diseases."

Prometic receives PIM designation for IPF drug

Prometic Life Sciences, Inc., has been issued a Promising Innovative Medicine (PIM) designation by the United Kingdom Medicines and Healthcare Products Regulatory Agency for its orally active drug candidate, PBI-4050, as an add-on treatment to nintedanib in patients with idiopathic pulmonary fibrosis (IPF). Prometic describes PBI-4050 as an orally active lead drug candidate with excellent safety and efficacy profiles confirmed in several in vivo experiments targeting fibrosis. "We are proud to have received a second PIM designation in the UK for PBI-4050, following the designation previously received for Alström syndrome," Pierre Laurin, president and CEO of Prometic, was quoted as saying. "We believe PBI-4050 has the capabilities to address various unmet medical conditions such as IPF and Alström syndrome, for which there are severe limitations with the existing standards of care."

Aerogen and Lyomark team up on RDS drug system

Aerogen Pharma is joining forces with Lyomark Pharma to develop a new treatment for respiratory distress syndrome (RDS) in preterm infants. AP-002 is a nasally inhaled surfactant based on a combination of Lyomark's Alveofact® (bovine lung surfactant) and Aerogen's PDAP™ delivery technology. The partners note they expect AP-002 to set a new standard in the treatment of RDS because it will enable surfactant administration via the nose and complement current first-line therapy with nCPAP. Aerogen will adapt Alveofact® for inhaled delivery, and the partners will work together to commercialize and distribute AP-002 around the world.

Bayer's Amikacin Inhale falls short of study goals

According to Bayer, a global Phase III clinical study program investigating Amikacin Inhale in addition to standard of care in intubated and mechanically ventilated patients with Gram-negative pneumonia did not demonstrate superiority over standard of care plus aerosolized placebo. The primary endpoint, survival at days 28–32, was not met. Secondary endpoints were also unmet, including pneumonia-related mortality through days 28–32, early clinical response up to day 10, number of days on mechanical ventilation up to days 28–32, and number of ICU days up to days 28–32. Amikacin Inhale is the development name of an integrated drug-device combination consisting of a specially formulated Amikacin inhalation solution and a proprietary synchronized-inhalation system with a vibrating mesh nebulizer. ■

Brief submissions and photos for this column may be sent to *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org.

Industry Update

Featuring information on products and equipment from manufacturers

For patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema

SUCCESS

of a proven LAMA

FULL

audiovisual feedback each time a dose is inhaled

INDICATION

SEEBRI™ NEOHALER® (glycopyrrolate) is an anticholinergic indicated for the long-term, maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

IMPORTANT SAFETY INFORMATION

SEEBRI NEOHALER is contraindicated in patients with a hypersensitivity to glycopyrrolate or to any of the ingredients.

SEEBRI NEOHALER should not be initiated in patients with acutely deteriorating or potentially life-threatening episodes of COPD or used as rescue therapy for acute episodes of bronchospasm. Acute symptoms should be treated with an inhaled short-acting beta$_2$-agonist.

As with other inhaled medicines, SEEBRI NEOHALER can produce paradoxical bronchospasm that may be life threatening. If paradoxical bronchospasm occurs following dosing with SEEBRI NEOHALER, it should be treated immediately with an inhaled, short-acting bronchodilator; SEEBRI NEOHALER should be discontinued immediately and alternative therapy instituted.

Immediate hypersensitivity reactions have been reported with SEEBRI NEOHALER. If signs occur, discontinue immediately and institute alternative therapy. SEEBRI NEOHALER should be used with caution in patients with severe hypersensitivity to milk proteins.

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Improved symptom control all day and night with twice-daily SEEBRI™ NEOHALER® (glycopyrrolate)

- **>120 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in two trials (primary end point)**[1]
  - 139 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in Trial 1
  - 123 mL improvement in FEV_1 $AUC_{0\text{-}12hr}$ vs placebo at Week 12 in Trial 2
- **Reduction in rescue medication use all day and night with twice-daily SEEBRI NEOHALER vs placebo (secondary end point)**[1,2]
  - SEEBRI NEOHALER is not a rescue inhaler and is not indicated to treat episodes of acute bronchospasm
- **Whirring noise during inhalation confirms correct placement of the capsule in the chamber**[1]
- **Clear capsule design allows patients to visualize any medication left in the capsule and inhale all of the remaining dose**[1]
- **SEEBRI capsules are for oral inhalation only and should not be swallowed**[1]

Sunovion Answers is there for your patients with support and answers. Call 1-844-276-8262 for more information.

Visit www.SEEBRI.us to learn more.

AUC, area under the curve; FEV_1, forced expiratory volume in 1 second; LAMA, long-acting muscarinic antagonist.

SEEBRI NEOHALER should be used with caution in patients with narrow-angle glaucoma and in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema) and of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Patients should be instructed to consult a physician immediately should any of these signs or symptoms develop.

STUDY DESIGN

The efficacy of SEEBRI NEOHALER was established in two 12-week, pivotal trials. The safety of SEEBRI NEOHALER was established in four 12-week lung-function trials and one 52-week, long-term study.[1,2]

For additional information, please see the Brief Summary of Prescribing Information on the following pages.

Please visit www.SunovionProfile.com/SEEBRI for full Prescribing Information and Patient Information.

References: 1. SEEBRI NEOHALER [prescribing information]. 2017. 2. Data on file. GEM1 and GEM2 clinical study reports. Sunovion Pharmaceuticals Inc.

seebri™ neohaler®

(glycopyrrolate) inhalation powder 15.6 mcg

seebri™ neohaler®

(glycopyrrolate) inhalation powder

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Please see package insert for full Prescribing Information, including Patient Information.

INDICATIONS AND USAGE

SEEBRI™ NEOHALER® is indicated for the long-term, maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

CONTRAINDICATIONS

SEEBRI NEOHALER is contraindicated in patients who have demonstrated hypersensitivity to glycopyrrolate or to any of the ingredients.

WARNINGS AND PRECAUTIONS

Deterioration of Disease and Acute Episodes

SEEBRI NEOHALER should not be initiated in patients during acutely deteriorating or potentially life-threatening episodes of COPD. SEEBRI NEOHALER has not been studied in subjects with acutely deteriorating COPD. The initiation of SEEBRI NEOHALER in this setting is not appropriate.

SEEBRI NEOHALER should not be used for the relief of acute symptoms, i.e., as rescue therapy for the treatment of acute episodes of bronchospasm. SEEBRI NEOHALER has not been studied in the relief of acute symptoms and extra doses should not be used for that purpose. Acute symptoms should be treated with an inhaled, short-acting $beta_2$-agonist.

COPD may deteriorate acutely over a period of hours or chronically over several days or longer. If SEEBRI NEOHALER no longer controls symptoms of bronchoconstriction; the patient's inhaled, short-acting $beta_2$-agonist becomes less effective; or the patient needs more inhalation of a short-acting $beta_2$-agonist than usual, these may be markers of deterioration of disease. In this setting, a re-evaluation of the patient and the COPD treatment regimen should be undertaken at once. Increasing the daily dose of SEEBRI NEOHALER beyond the recommended dose is not appropriate in this situation.

Paradoxical Bronchospasm

As with other inhaled medicines, SEEBRI NEOHALER can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with SEEBRI NEOHALER, it should be treated immediately with an inhaled, short-acting bronchodilator; SEEBRI NEOHALER should be discontinued immediately, and alternative therapy instituted.

Immediate Hypersensitivity Reactions

Immediate hypersensitivity reactions have been reported after administration of SEEBRI NEOHALER. If signs suggesting allergic reactions occur, in particular, angioedema (including difficulties in breathing or swallowing, swelling of the tongue, lips, and face), urticaria, or skin rash, SEEBRI NEOHALER should be discontinued immediately and alternative therapy instituted. SEEBRI NEOHALER should be used with caution in patients with severe hypersensitivity to milk proteins.

Worsening of Narrow-Angle Glaucoma

SEEBRI NEOHALER should be used with caution in patients with narrow-angle glaucoma. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema). Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

Worsening of Urinary Retention

SEEBRI NEOHALER should be used with caution in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

ADVERSE REACTIONS

Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, the adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in clinical trials of another drug and may not reflect the rates observed in clinical practice.

The SEEBRI NEOHALER safety database included 3415 subjects with COPD in four 12-week lung function trials and one 52-week long-term safety study. A total of 1202 subjects received treatment with SEEBRI NEOHALER 15.6 mcg twice-daily (BID). The safety data described below are based on the four 12-week trials and the one 52-week trial.

12-Week Trials

The incidence of adverse reactions associated with SEEBRI NEOHALER in Table 1 is based on four 12-week, placebo-controlled trials in 2908 subjects with COPD. In the total population, 61.2% of patients had moderate COPD and 37.8% had severe COPD. Overall, 62% were males, 90% were Caucasian, and the mean age was 63 years (ranging from 41 to 89 years). In this population, 53% were identified as current smokers with an average smoking history of 48 pack-years.

The proportion of subjects who discontinued treatment due to adverse reactions was 2.4% for the SEEBRI NEOHALER-treated patients and 3.8% for placebo-treated patients.

Table 1. Adverse reactions with SEEBRI NEOHALER (greater than or equal to 1% incidence and higher than placebo) in COPD patients

Adverse Reaction	SEEBRI NEOHALER 15.6 mcg BID (N=951) n (%)	Placebo (N=938) n (%)
Upper respiratory tract infection	32 (3.4)	22 (2.3)
Nasopharyngitis	20 (2.1)	18 (1.9)
Urinary tract infection	13 (1.4)	12 (1.3)
Sinusitis	13 (1.4)	7 (0.7)
Oropharyngeal pain	17 (1.8)	11 (1.2)

Other adverse reactions occurring more frequently with SEEBRI NEOHALER than with placebo, but with an incidence of less than 1% include rash, pruritus, gastroenteritis, hypersensitivity, atrial fibrillation, insomnia, pain in extremity, dysuria, vomiting, productive cough, and diabetes mellitus/hyperglycemia.

52-Week Trial

In a long-term safety trial, 507 subjects were treated for up to 52 weeks with glycopyrrolate 15.6 mcg twice-daily or indacaterol 75 mcg once-daily. The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled efficacy trials described above. The adverse reactions reported in the long-term safety trial were consistent with those observed in the placebo-controlled trials of 12 weeks. Additional adverse reactions that occurred with a frequency greater than or equal to 2% in the group receiving glycopyrrolate 15.6 mcg twice-daily that exceeded the frequency of indacaterol 75 mcg once-daily in this trial were: diarrhea, nausea, upper abdominal pain, fatigue, bronchitis, pneumonia, rhinitis, back pain, arthralgia, dyspnea, and wheezing.

Postmarketing Experience

The following additional adverse reactions have been identified during worldwide post-approval use of glycopyrrolate, the active ingredient in SEEBRI NEOHALER, at higher than the recommended dose. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure. These adverse reactions are: angioedema, paradoxical bronchospasm and dysphonia.

DRUG INTERACTIONS

Anticholinergics

There is a potential for an additive interaction with concomitantly used anticholinergic medications. Therefore, avoid coadministration of SEEBRI NEOHALER with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic effects.

USE IN SPECIFIC POPULATIONS

Pregnancy

Teratogenic Effects: Pregnancy Category C

There are no adequate and well-controlled studies with SEEBRI NEOHALER in pregnant women. Because animal reproduction studies are not always predictive of human response, SEEBRI NEOHALER should only be used during pregnancy if the potential benefit to the patient justifies the potential risk to the fetus. Women should be advised to contact their physician if they become pregnant while taking SEEBRI NEOHALER.

Glycopyrrolate was not teratogenic in Wistar rats and New Zealand White rabbits at approximately 1400 and 530 times, respectively, the MRHD in adults (on an AUC basis at maternal inhaled doses up to 3.83 mg/kg/day in rats and up to 4.4 mg/kg/day in rabbits).

Non-teratogenic Effects:

Glycopyrrolate had no effects on peri-natal and post-natal developments in rats at approximately 1100 times the MRHD in adults (on an AUC basis at maternal subcutaneous doses up to 1.88 mg/kg/day).

Labor and Delivery

There are no adequate and well-controlled human trials that have investigated the effects of SEEBRI NEOHALER during labor and delivery. In human parturients undergoing Caesarean section, 86 minutes after a single intramuscular injection of 0.006 mg/kg glycopyrrolate, umbilical plasma concentrations were low.

Nursing Mothers

It is not known whether SEEBRI NEOHALER is excreted in human breast milk. Because many drugs are excreted in human milk, caution should be exercised when SEEBRI NEOHALER is administered to a nursing woman. Since there are no data from well-controlled human studies on the use of SEEBRI NEOHALER by nursing mothers, a decision should be made whether to discontinue nursing or to discontinue SEEBRI NEOHALER, taking into account the importance of SEEBRI NEOHALER to the mother.

It is not known whether glycopyrrolate is excreted in human breast milk. Glycopyrrolate (including its metabolites) have been detected in the milk of lactating rats and reached up to 10-fold higher concentrations in the milk than in the blood of the dam.

Pediatric Use

SEEBRI NEOHALER is not indicated for use in children. The safety and efficacy of SEEBRI NEOHALER in pediatric patients have not been established.

Geriatric Use

Based on available data, no adjustment of the dosage of SEEBRI NEOHALER in geriatric patients is warranted. SEEBRI NEOHALER can be used at the recommended dose in elderly patients 75 years of age and older.

Of the total number of subjects in clinical studies of SEEBRI NEOHALER, 45% were aged 65 and older, while 10% were aged 75 and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

Renal Impairment

No dose adjustment is required for patients with mild and moderate renal impairment. SEEBRI NEOHALER should be used in patients with severe renal impairment (estimated GFR less than 30 mL/min/1.73m^2), including those with end-stage renal disease requiring dialysis, if the expected benefit outweighs the potential risk since the systemic exposure to glycopyrrolate may be increased in this population.

Hepatic Impairment

No dose adjustment is required for patients with hepatic impairment. The effects of hepatic impairment on the pharmacokinetics of glycopyrrolate have not been studied.

OVERDOSAGE

An overdose of glycopyrrolate may lead to anticholinergic signs and symptoms such as nausea, vomiting, dizziness, lightheadedness, blurred vision, increased intraocular pressure (causing pain, vision disturbances, or reddening of the eye), obstipation or difficulties in voiding.

In COPD patients, repeated orally inhaled administration of SEEBRI NEOHALER at total doses of 124.8 and 249.6 mcg once-daily for 28 days were well tolerated.

PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use).

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Manufactured for:
Sunovion Pharmaceuticals Inc. Marlborough, MA 01752 USA

To report suspected adverse reactions, call 1-877-737-7226.
For customer service, call 1-888-394-7377.

RC Currents

IN THE NEWS

Journal Announces Editorial Changes

Richard Branson, MS, RRT, FAARC, has been named the new Editor-in-Chief of Respiratory Care, the AARC's science journal. He took over the helm earlier this year when his predecessor, Dean Hess, PhD, RRT, FAARC, assumed the managing editor position upon the retirement of long-time Managing Editor Ray Masferrer, RRT, FAARC.

An AARC member since 1977, Branson is a well-known respiratory care researcher from the University of Cincinnati (UC), where he currently serves as professor of surgery emeritus. His major research focus has been on mechanical ventilation and care of the critically injured patient. He has published more than 275 papers in peer-reviewed journals and over 100 book chapters. He has been a key member of the team at UC working to enhance portable ventilators for use by the Air Force's Critical Care Air Transport Teams. He also played an essential role in the AARC's National Ventilator Survey and mass casualty ventilator guidelines.

Branson has served on the Journal's Editorial Board since 1988 and most recently held the position of deputy editor. He received his FAARC designation in 2000 and was named a Life Member of the AARC in 2005. He received the AARC's Jimmy A. Young Medal in 2011. Branson earned his respiratory therapy degree from Christ Hospital School of Respiratory Therapy and his bachelor's degree from the College of Mount St. Joseph. He received his master's degree from George Washington University.

Dr. Hess became editor-in-chief of the Journal in 2008 and is widely credited with enhancing the Journal's stature throughout the world of medical publishing. The number of unsolicited submissions to the Journal skyrocketed during his tenure, and the publication has enjoyed a solid Impact Factor, making it one of the most sought-out journals about respiratory care in the world. In his new position as managing editor, Dr. Hess will provide guidance to Branson and the Editorial Board as they further their mission to ensure that Respiratory Care is the premier journal of its kind.

Prior to his retirement, Ray Masferrer provided that guidance to the Journal as chairman of the AARC Publications Committee from 1972 to 1974, chairman of the Editorial Board from 1974 to 1982, and Managing Editor from 1983 to 2017. He shepherded the Journal through a multitude of changes, including inclusion in Index Medicus in 2000, the introduction of RCJournal.com, and articles published online ahead of print. Masferrer originated the Open Forum in the 1970s and presented the first abstract. He has also been instrumental in planning the Journal Conferences that are held regularly to address key issues of concern in the profession. He will continue to serve as Editor Emeritus and a resource to the Journal's editorial staff throughout 2018 to ensure a smooth transition. ■

Tell Your Story

Every therapist has a story to tell about a favorite or most memorable patient that would interest others in the profession. Maybe it was an "aha moment" when you knew you had made the right professional decision for that patient. Maybe it was when you first realized how much of a difference you were making in the lives of that patient and his family. Or maybe it was just something the patient said or did that made you laugh or cry or just be inspired to be a better RT. Our "Storytellers" column is the place to share them. Send your story to *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org. ■

National Board for Respiratory Care Names Lori M. Tinkler CEO

The NBRC has named Lori M. Tinkler, MBA, as its new chief operating officer. Tinkler, who assumed the position on January 1, succeeds Gary A. Smith, BS, RRT, FAARC, who served in various leadership roles during his 34 years with the NBRC, including 16 years as CEO.

Tinkler joined the NBRC in 1991. Prior to being named CEO, she served as chief operating officer. "There are many opportunities ahead for the respiratory care profession, and I am thrilled to lead the NBRC into the future," says Tinkler. "We have a great team of talented individuals who will continue to provide excellent customer service and create and innovate to ensure the competency of respiratory care professionals."

NBRC Immediate Past President Robert Joyner, PhD, RRT, RRT-ACCS, FAARC, has applauded her appointment. "Without reservation I know Lori's vast knowledge of respiratory care leadership across professional organizations makes her not only the best choice, but peerless in regard to her abilities," he says.

NBRC President Katherine Fedor, MBA, RRT-NPS, CPFT, agrees. "Lori's detailed knowledge of the organization will provide a smooth transition of leadership and preserve the mission of excellence within the NBRC."

Tinkler was named one of the Top 25 Women Who Mean Business in Kansas City by the *Kansas City Business Journal* and served as chair of the Olathe Chamber of Commerce in 2011 and 2012. ■

Contribute to Our "Transitions" Column

The AARC "Transitions" column is devoted to sharing news about the passing of AARC members. You can submit news about your colleagues' recent passing by going to http://c.AARC.org/transitions. Please provide any information about the member's recent obituary so that we can share it with the membership and pay tribute. ■

Share Your Wisdom

Our "Reflections" column is geared especially toward AARC members who have recently retired from the profession. We'd like you to look back at your career or some aspect of it and tell us what it meant to you and why. Funny, sad, inspiring — the door is wide open! So start brainstorming some ideas and then submit your story to *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org ■

Educators: Help Recognize Outstanding Students

The American Respiratory Care Foundation (ARCF) is accepting applications for its undergraduate and postgraduate Education Recognition Awards and is asking RC educators to help get the word out to their students. So check out the list of available awards and then encourage your best and brightest students to apply. The deadline to apply is **June 1**.

The ARCF offers awards to students who are currently enrolled in accredited respiratory care educational programs and to respiratory therapists pursuing advanced degrees. Awards include registration and airfare to attend the AARC Congress in 2018.

To see all the awards bestowed by the ARCF every year, go to the Foundation's grants, awards, and fellowships page at http://www.arcfoundation.org/awards. For more information, contact Crystal Maldonado at crystal.maldonado@aarc.org. ■

NBRC Announces How To Properly Use Your NBRC Credentials

Editor's Note: The National Board for Respiratory Care (NBRC) recently made the following announcement and asked *AARC Times* to publish the information regarding a new way to properly use NBRC credentials.

Respiratory care professionals spend a tremendous amount of time and effort to earn their national credentials, and the NBRC wants to ensure the continued value and meaning of the credential acronyms associated with your hard work. The NBRC's credential designations are federally registered (trademarked) and therefore must be used in the manner in which they were registered. Legally, only those individuals who have passed the respective examinations are authorized to use the credential acronyms.

The NBRC has policies in place to ensure those who misuse or misrepresent themselves using the federally protected designations are disciplined accordingly. Even more importantly, it is essential that the designations be used properly by those who have earned the right to use them so that the NBRC can continue to uphold and renew its federal registrations on these marks. The proper use of each credential is as follows:

- CRT: Chris Smith, CRT
- RRT: Chris Smith, RRT
- CPFT: Chris Smith, CPFT
- RPFT: Chris Smith, RPFT
- NPS: Chris Smith, CRT, CRT-NPS *or* RRT, RRT-NPS
- SDS: Chris Smith, CRT, CRT-SDS *or* RRT, RRT-SDS
- ACCS: Chris Smith, RRT, RRT-ACCS
- Multiple credentials: Chris Smith, RRT, RPFT, RRT-NPS, RRT-ACCS

It is important to note that NBRC credentials are not punctuated with periods.

Additionally, general guidelines have been established for how all academic and professional credentials should be used and listed. An education degree is listed first (highest degree listed first for multiple degrees), as it is a "permanent" credential that can't be taken away except under extreme circumstances. Licensure and state designations or requirements are listed next, as they are required to practice in your chosen profession. Lastly, national certification is sometimes voluntary, and awards, honors, and other recognitions are always voluntary, so these are listed at the end. If multiple certifications are earned, the most recently earned is usually placed last.

The appropriate order in which to list academic and professional credentials is as follows:

1. Highest earned degree
2. Licensure
3. State designations or requirements
4. National certifications
5. Awards and honors
6. Other recognitions

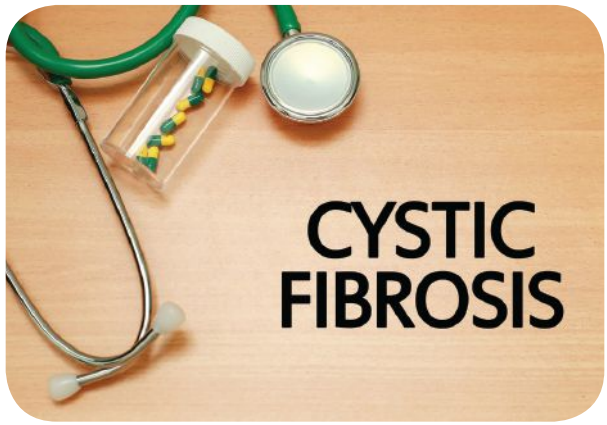
Please help the NBRC continue to ensure the value and meaning of your national credentials and do not allow misuse to undermine the importance of the recognition you've worked hard to earn. ■

NBRC
The National Board for Respiratory Care

Simple Test Could Predict Effectiveness of CF Drugs

New drugs known as cystic fibrosis (CF) transmembrane conductance regulator (CFTR) modulators counteract the effects of mutations in certain CF-linked genes, helping the body's cells maintain the proper level of hydration, which in turn allows mucus to move freely in the lungs and other organs, preventing the buildup of sticky mucus that leaves CF patients prone to infections and other complications.

Now researchers from the University of Alabama at Birmingham have developed a simple test designed to predict which treatment is most likely to work for each patient. The test analyzes the response of fluid-filled nasospheroids grown from cells taken from the inside of the noses of CF patients to various CFTR drugs to see how the drugs affect their fluid levels. They believe the test, which doesn't require any anesthesia and uses an inexpensive brush to collect the sample, can be used to screen individual nasopheroids to determine which drugs would work against them.



The authors caution that more study is needed before the test is made available. "We have to establish how well this model can discriminate between small changes, and then do studies to see if it will predict for individual patients what their actual clinical outcomes would be," study author Jennifer Guimbellot, MD, was quoted as saying. The research appeared in a recent edition of the *Journal of Clinical Investigation Insight*. ■

Students and Seniors Get Price Breaks on AARC Dues

AARC members who are just starting out in their careers and those who are getting ready to retire can both benefit from exclusive membership offers developed just for them.

The transitional student membership is available to student members who are preparing to graduate. AARC student members who renew their membership at least 91 days prior to graduation will save the most on dues, but savings are available up to 150 days past graduation. Those nearing graduation should look for an email with specific instructions on how to claim this special membership price break or call AARC Customer Service at (972) 243-2272 to participate.

Members age 65 and older who have been AARC members for at least 20 years are eligible to maintain their membership in the Association for just $25 per year. Alternatively, they can pay $200 and become members for life. This digital membership gives these loyal members the chance to stay in touch with everything going on in the respiratory care industry while they're planning for or entering retirement. Members eligible for this senior status can call AARC Customer Service at (972) 243-2272 to learn more about signing up. ■

Individual Performance Affects Patient Safety

According to a new *Patient Safety Primer*, the patient safety field has mainly stressed the need for better systems to promote safer care. This, says the primer, is the "Swiss cheese model" — people aren't to blame; the holes in the cheese made them do it.

The new primer suggests that's not the only explanation and cites supporting statistics. For example, a U.S. study found just 1% of physicians were responsible for 32% of all malpractice claims over a 10-year period.

Clearly, individual clinicians need to take responsibility for the delivery of safe care, and the primer goes on to say that individual performance issues should be addressed through efforts to implement a "just culture" approach that draws boundaries around at-risk behaviors that endanger patient safety and clearly defines the consequences of engaging in those behaviors. The authors also call for greater use of simulation and individualized coaching to reduce adverse effects of certain procedures. The *Patient Safety Primer* was published online by the Agency for Healthcare Research and Quality late last year. ■

Lung Microbiome May Affect CF Exacerbations

Researchers from the Ann & Robert H. Lurie Children's Hospital of Chicago, who used bronchoalveolar lavage to collect specimens from the lungs of people with CF, found that those who suffered from more severe exacerbations had more good and bad bacteria in their lungs than those who suffered from fewer severe exacerbations. Older patients and those with more lung disease or inflammation also tended to have less diversity of bacteria.

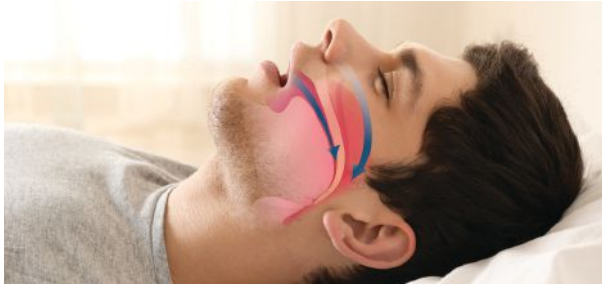
The investigators believe these findings show a clear link between the lung microbiome and CF and suggest they could serve as baseline for future intervention studies on preserving bacterial diversity in the lung as a potential strategy to reduce chronic infections in CF. "We use a lot of antibiotics to treat CF lung disease, which can reduce the number and diversity of normal bacteria in the lung. We do not know whether this decreased bacterial diversity contributes to lung disease in cystic fibrosis or is just a side effect of treatment," study author Susanna McColley, MD, was quoted as saying. "To address this question we could study the effects of giving antibiotics over time, or examine if there are ways to manipulate the bacterial diversity in the lungs with probiotics."

The study appeared in a recent edition of the *European Respiratory Journal*. ■

Can Airway Collapse Be Prevented?

U.S. researchers who used 3-D modeling of uvula vibrational patterns and sound frequencies during snoring found that the frequency of vibrating structures in the airway, including that of the uvula, is crucial in promoting the airway collapse seen in patients with obstructive sleep apnea. The investigators speculate that there may be a threshold in the vibration frequency that triggers the airway collapse, and if they can find a way to suppress the vibration frequency below that threshold, they may be able to eliminate the symptoms seen with snoring or even prevent the airway collapse.

They presented their findings at a recent meeting of the American Physical Society's Division of Fluid Dynamics. ■



Metabolism Makes a Difference

Varenicline can help people quit smoking but has been associated with a number of troubling side effects. A new study out of Vanderbilt University Medical Center suggests a simple blood test may help identify which patients should take the medication and which should not.

The study grew out of previous research in 2015 showing that people who metabolized nicotine normally quit smoking at rates that were twice as high if they used varenicline vs. the nicotine patch, while those who metabolized nicotine slowly quit just as often on either medication. The researchers enrolled 81 daily smokers who agreed to undergo a blood test to see if they were "normal" or "slow" metabolizers of nicotine; 84% of the subjects who received their metabolism information were also willing to follow the recommendations of the blood test: varenicline for normal metabolizers and the nicotine patch for slow metabolizers. These individuals were compared with people in a guideline-based care group, of which only 58% were prescribed medications that matched their metabolism.

"Metabolism-informed care increased the odds of optimized medication matching more than threefold over guideline-based care," study author Hilary Tindle, MD, was quoted as saying. The study was published in a recent issue of *Nicotine & Tobacco Research*. ■

Is It Time To Reconsider the BODE Score?

Researchers publishing in a recent edition of *CHEST* suggest that the BODE score (ie, body mass index, airflow obstruction, dyspnea, and exercise) now used to predict how long a person might survive with COPD should not be used to determine which COPD patients receive a lung transplant.

They arrived at that conclusion after comparing survival data in the original group of 625 patients who formed the basis for the BODE score to 4,300 lung transplant patients who had COPD. Results showed that the BODE score overestimates mortality risk in lung-transplant candidates with COPD, likely due to the fact that these patients have a lower burden of comorbidities and are not active smokers.

"Our research shows that we are often transplanting people who may not actually derive a survival advantage at all, and we may be shortening the lives of some people with transplant," study author Robert M. Reed, MD, was quoted as saying. He notes that about half of all lung transplant patients do not survive past five or six years due to complications of the transplant, and many people with very severe COPD can survive that long or longer without undergoing the procedure. "Obviously, you don't want to transplant people who are likely to live longer if left alone," says Dr. Reed.

The senior author of the paper is Bartolome R. Celli, MD, who originated the BODE score. ■

LOSING COMBINATION

Canadian researchers find children who have eczema or atopic dermatitis (AD) and are sensitized to an allergen when they are one year old are seven times more likely than other infants to develop asthma. They are also significantly more likely to have a food allergy by age three years. However, having AD alone, without sensitization to an allergen, did not significantly increase children's risk of developing asthma.

These findings come from an analysis of data on 2,300 children from across Canada participating in the CHILD Study. "There are certain genetic variants that we know are risk factors for allergy, but genotyping is not widely used in clinical practice, so this research offers health care professionals an alternative method of identifying at-risk children," study author Maxwell Tran was quoted as saying. The study was published in a recent edition of the *Journal of Allergy and Clinical Immunology*. ■

E-cigarettes Are Usually the First Step in Smoking

E-cigarette makers like to tout their products as helping people kick the traditional smoking habit. New research from investigators at the University of Pittsburgh suggests when it comes to young people, e-cigarettes act as a gateway to traditional smoking.

They reached that conclusion after surveying U.S. adults about their tobacco use. Results showed that young adults who used e-cigarettes were more than four times as likely to become traditional smokers within 18 months as young adults who never used e-cigs.

"Our study finds that in nonsmokers, e-cigarettes make people more likely to start smoking," study author Brian A. Primack, MD, PhD, was quoted as saying. "This supports policy and educational interventions designed to decrease the use of e-cigarettes among nonsmokers."

The study was published recently in the *American Journal of Medicine*. ■

Study: ACA Medicaid Expansion Appears To Be Helping People Quit Smoking

The Medicaid expansion seen under the Affordable Care Act has expanded something else, too: the number of people on Medicaid who are quitting smoking. According to researchers from the University of Pittsburgh who analyzed the results of an annual telephone survey of health behaviors conducted by the Centers for Disease Control and Prevention, in the states with Medicaid expansion, 8.1% of the newly covered low-income adults reported that they'd quit smoking in the prior year, compared with 6% in the states without expansion.

The authors note, however, that there is still significant room for improvement because 68.9% of adults say they want to quit but haven't done it yet. The study was published in a recent edition of *Medical Care*. ■

Strange but True…

Bad for the bones: Add musculoskeletal injuries to the growing list of problems caused by cigarette smoking. Researchers who conducted a meta-analysis of studies on military personnel who did and did not smoke found that the risk of such injuries was 31% higher in men who smoked and 23% higher in women who smoked.

Hold the sugar: Pregnant women who consume more drinks sweetened with sugar and high-fructose corn syrup during their pregnancies are significantly more likely to have children who develop asthma between the ages of seven and nine. Children who drink a lot of these beverages when they are age three or younger also have an increased risk of asthma.

Body-on-a-chip: Researchers from the Wake Forest Institute for Regenerative Medicine have come up with a way to connect bioengineered organoids of the liver, heart, and lungs in a closed system to mimic the body's circulatory system. They believe their body-on-a-chip can be used to test the effects of new drugs. ■

Calendar of Events

AARC & State Society Programs

March 7–March 8, 2018
Silverton, OR
Oregon Society for Respiratory Care 2018 Conference
Contact: sascha.christian@salemhealth.org or www.osrcpnw.org

March 20–March 21, 2018
Minot ND
2018 NDSRC Conference
Contact: muncher_4@hotmail.com or www.ndsrc.org

March 23, 2018
Richmond, VA
VSRC Capital City Symposium 2018
Contact: asbmom@live.com or www.vsrc.org

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Developing the Next Generation of RTs Was — and Still Is — My Passion

Larry A. Arnson, PhD, RRT

Upon receiving a bachelor of science degree from Grand Valley State Colleges in Allendale, MI, in the early 1970s, I was accepted into an accelerated associate-degree program in inhalation therapy at Washtenaw Community College in Ann Arbor. Joining the respiratory care staff at Saint Joseph's Mercy Hospital in Ann Arbor, I was fortunate to work with Jeri Eiserman, MBA, RRT, FAARC, as my supervisor. While I was under her direction (she was Jeri Reynolds back then), she assumed responsibility as president of the Michigan Society for Respiratory Care. Jeri later became president of the AARC as well.

As a student, I had the opportunity to meet Dr. Barry Shapiro and hear his presentation on the clinical application of arterial blood gases. Others, like Carl Hammond, MS, RRT, Dr. Jay Finch, and fellow coworkers and classmates, helped guide both me and the profession. Additionally, the director of the department, John Shelton, RRT, FAARC, influenced us to assist staff to attain Registered Respiratory Therapist (RRT) status by taking the NBRC written registry and oral exams.

about the author...

Larry Arnson is keeping his hand in respiratory care by helping new graduates pass their credentialing exams.

Revolutionary times

In those days, my co-workers were either on-the-job-trained RTs, Certified Respiratory Therapy Technicians, or RRTs, and I was involved in their training as well as in the training of individuals from other area hospitals.

These were revolutionary times in that our profession was rapidly evolving. Inhalation therapy became more than just a minor entity. Respiratory therapists were managing aortic balloon pumps, Swan-Ganz catheters, and arterial lines. Physicians were recognizing that RTs were integral members of the critical care team. Therapists developed respiratory care plans to help manage patients in the ICUs, with physician approval.

After relocating to Atlanta, GA, in 1976, I went to work as a clinical instructor at Crawford W. Long Memorial Hospital, now known as Emory University Hospital Midtown, working with students in the Georgia State University (GSU) RT program. This position was offered to me primarily due to my experience with the above-mentioned modalities, which were not yet practiced at this facility. I also served as an adjunct instructor for both GSU and Emory.

Still helping new grads

In 1985, I became the first director of clinical education for the respiratory program at Gwinnett Area Technical School, which later became Gwinnett Technical College. Meeting Dr. Forrest Bird at a conference at Emory University Hospital was a high point in my career.

The majority of my career has focused on the development of exemplary respiratory care professionals and their pursuit of NBRC credentials. Not long ago, I learned that my name and contact information had been shared on a blog advising new grads on who they could turn to for assistance if they experienced difficulty passing the NBRC examinations.

Since retirement this past summer, I have helped a number of recent graduates, especially those who already held the NBRC's CRT credential and were now striving for the RRT. The combination of the CRT Examination and Written Registry Examination into what is now called the Therapist Multiple-Choice Examination

— and the testing of over 20 scenarios that have expanded the Clinical Simulation Examination — have required me to modify my approach to helping these new grads earn their RRT credential.

In addition, I continue to serve on the Georgia Composite Medical Board's Respiratory Care Licensure Board, and I stay involved in the Georgia Society for Respiratory Care (GSRC).

Thankful to have chosen respiratory therapy

Reflecting on the past, I am thankful for all that I have experienced from choosing this health care profession. To name just a few: the knowledge to help patients have healthy outcomes, the gratitude of lifelong friendships, and the enormous joy I have felt from many graduates and nationally recognized practitioners who say, "I don't know how to thank you. Without you, I wouldn't be where I am today." At the GSRC summer meeting, I was presented with the President's Award. This honor was presented by two past graduates who, I am proud to say, have sought to surpass my abilities.

None of this would have been possible without the loving support and encouragement from Marty, my wife of nearly 47 years. Since retirement, Marty and I can now spend more time with our two granddaughters, Audrey and Violet. ■

For Larry Arnson, retirement has meant more time to spend with his wife, Marty, and their two adorable granddaughters, Audrey and Violet.

— 2018 —

Since 1947, the AARC has been leading the effort to advance the science and practices of the respiratory care profession while promoting the highest quality of care for our patients. Collaborating with the respiratory communities at-large, we have successfully advocated at the federal, state and local level for patients, their families, the community, the profession and the respiratory therapist.

The AARC'S CORPORATE PARTNERS

The collaborative efforts between the respiratory care profession and manufacturers in pursuing unique and innovative ways to improve both the quality and outcomes of our patients makes us natural partners in today's ever changing health care continuum.

As health care finances become more strained and patient care becomes increasingly more complex, the mutual challenges become greater for the profession and its industry partners. The inherent synergies of the corporate partner concept are to provide an effective and efficient way to address those needs utilizing our combined skills and resources.

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Measurements

$EtCO_2$ — End-Tidal Carbon Dioxide

RR — Respiration Rate

- > Pocket-sized, self-contained mainstream capnograph
- > Minimal warm-up time and requires no routine calibration[1]
- > Used in multiple environments including pre-hospital, emergency department, operating room, and intensive care unit

EMMA can be used with a breathing circuit to provide CO_2 measurements

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[1] For complete specifications, including measurements, see Operator's Manual.

Caution: Federal (USA) law restricts this device to sale by or on the order of a physician. See instructions for use for full prescribing information, including indications, contraindications, warnings, and precautions.

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