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Table of Contents

December 2019
Volume 43, Issue 12

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

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From the Managing Editor

Dear Loyal Readers of the *AARC Times*,

It's been more than a year since the decision to end the print version of the AARC Times was made. To be honest, the decision could have likely happened much sooner, but we were hesitant to do so. The data were clear and had been for a while. People who were renewing their membership were opting for the digital option of the magazine from a rate of 60/40 three years ago to almost 80/20 today. But how does one make such a monumental decision that impacts something that has become part of your DNA and has become its own brand? It wasn't easy . . . I can assure you of that.

We were concerned that a large percentage of our members were Baby Boomers . . . loyal members, some with memberships that extended over 30 or even 40 consecutive years. We knew this segment of our membership were faithful readers who got great joy out of the tactile feel of the magazine in which pages would be turned between sips of coffee. And it was for these reasons that we waited as long as we possibly could to make the inevitable decision to move to a digital publication.

But we also realized that while the magazine is a valuable member benefit, it's not the paper that makes the magazine — it was and still is our world-class content that brings people back month after month. Whether the article is written by Debbie Bunch (AARC's staff writer of more than 40 years), Tony DeWitt in his monthly legal column, or a slew of expert authors contributing clinical content that allows you to do your job better, our content is an industry leader in serving you, the respiratory therapist. As a result, publication leadership knew that if we waited for every Baby Boomer to retire before making the decision we'd be light years behind in delivering a contemporary product to our newest of members who embrace technology and consume written content in digital media. So in strategic fashion, we pulled the trigger and the day has finally arrived — our last printed magazine of the AARC Times.

This day is filled with emotion . . . melancholy, reservation, curiosity, and excitement. You name the emotion, and someone on the publication team is probably experiencing it. We're entering a world of the relative unknown. I say "relative" because we have been publishing digital issues of the magazine for more than 10 years, but the paper edition has always been the backbone of the magazine. So, where do we go from here?

Some people reading this may think this letter is a eulogy of sorts, but it's far from it. In fact, we're really excited about the direction the magazine is going. The evolution of the magazine to a digital publication allows the AARC to do so much more with the content we deliver to you. No longer are we dependent on print deadlines that required us to constantly work 3–4 months ahead. Now we can be nimbler and more flexible in delivering real-time content. And if truth be told, a strategic planning committee is meeting monthly at the executive office to identify ways in which we can continue to curate incredible content through a host of other media channels. So stay tuned because there could be more changes coming that will enhance your reading and learning experiences with the magazine.

In closing, I'd like to take just a moment to set the stage for this final edition. We wanted to make this issue "special" because, quite frankly, it is deserving of being so. As you peruse the magazine, you'll quickly realize that this edition is unlike any you've ever read before. This final printed issue is our "Alpha and Omega" issue. If you're reading this letter within the first 30 seconds of picking up the magazine, you're likely reading our Omega segment — the last printed issue. But if you flip the magazine over and invert it, you will see that the back half of the issue is our Alpha segment — a reprint of our first issue ever published. We felt it important as we commemorate the print magazine that you see where it came from, how far it's come, and where it's going. For our younger members, enjoy the history lesson of the AARC! For our long-time members? Have fun walking down memory lane!

But that's not all. All of our published content this month will serve as a look forward . . . a look into the future. Just as the printed edition of the magazine looked to the future and embraced change, so too will our profession. So, sit back, enjoy, and take a look into the crystal ball of what the next 10 years of respiratory care may look like. Will significant changes happen just like with the magazine? Will the profession evolve to baccalaureate entry into practice? Will the RRT become mandatory for licensure? Will artificial intelligence applications wean patients from mechanical ventilators for us? These and other questions may or may not be answered in this issue, but one thing is certain . . . change is inevitable, and for most of us, it will be a really good thing.

Enjoy your reading!

Douglas S. Laher, MBA, RRT, FAARC
Managing Editor; *AARC Times*

REQUEST FOR PROPOSALS

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Changing Times
Growing & Evolving with the Profession

by Thomas J. Kallstrom, MBA, RRT, FAARC

It was a prolific Bob Dylan who in 1964 wrote and performed the ballad *The Times They Are A-Changin'* (sorry about the pun but I just could not help myself), and that could not be truer than as it is today. After this issue and 41 years, the *AARC Times* will no longer be published on paper; however, it will still be available electronically. The decision to stop printing was essentially made by our members who, in overwhelming numbers in the past few years, have opted to read the *Times* on their smartphones or computers, leaving a very small minority who preferred a paper copy.

There are a lot of great memories that I personally have of the *Times*, as I am sure many of you do as well. Interestingly, since joining the AARC I was able to appreciate the intricacies of how this magazine came together every month. A lot of work goes into its preparation that I had never appreciated. The *Times* team has been led by Doug Laher as managing editor and Marsha Cathcart, who was its editor since 1989 and who retired as this last print issue was put in place. Marsha and her team, along with great writers like Debbie Bunch and of course our many volunteers, make the *Times* relevant and contemporary.

Change is a good thing, and as we respiratory therapists all know, we are faced with endless changes in our day-to-day responsibilities. It is probably safe to say that all of us have worked with someone who resists change, opting to do things as they had always done. Usually that approach results in a dead-end. As I look back on my career and the many acquaintances I've worked with through the years, I saw many who seemed satisfied in passing nebulizers and not advancing their clinical acumen. Don't get me wrong, aerosol delivery is an integral part of what we do, but there is so much more that we can offer as clinicians along with it.

about the author...

Thomas J. Kallstrom, MBA, RRT, FAARC, is executive vice president of the ARCF and executive director of the AARC.

Change is our friend, and in our profession it is coming fast and furious — if we are to survive, we need to embrace it head-on. If you don't believe me, take a look at our latest issue paper focusing on 2030 and the expectations of the RT entering the profession. Ultimately, we need to be graduating RRTs with a bachelor's degree from the start, and that is what the issue paper aspires to in the coming years. I believe it is clear that what we do and the expectations placed upon us exceed the level of a CRT or two-year graduate. Without doubt, all two-year grads should aspire and pursue post-haste their bachelor's degree as they start their career. Even if there are no local programs, getting a bachelor's degree can be accomplished through many online programs. In our last human resource survey, we found that the majority of hospitals pay for education for their employees. One hundred percent of my academic funding came from my employers, so I know it can be done. There really is no excuse.

During my tenure at the AARC and for the last 73 years, the AARC has fought for your rights to practice. As an association, we fight daily for you to pass legislation aimed at enhancing access to respiratory therapists, but we are stopped before we can even get started because the RRT/BS is not the entry-level requirement nationally for professional licensure. At the same time, sadly, we see some in our profession who would prefer to keep things as they are or even reverse course.

The challenges are out there, and unless we are ready to present our best and brightest at a minimal level of RRT with a bachelor's degree, we risk our future and sadly our patients' futures as well. As a profession we are looking to protect and expand the role of the respiratory therapist. We are also limited if we do not have the membership numbers. Today only one in three practicing respiratory ther-

apists are AARC members. I encourage you to help us increase those numbers so that our presence can be even more powerful.

So, we come to the end of an era in the print publication of the *Times*, but just as we push our professional respiratory therapists to a higher level, we too expect the *Times* to evolve as it should. I kind of think of it as *AARC Times* 2.0. ■

Legal Transitions

by Anthony L. DeWitt, JD, RRT, FAARC

If there were a poster boy for "transitions," I'm pretty sure my picture would be there, front and center. At 64 years of age, my work life literally defines the term transition, that being a "passage from one state, stage, subject, or place to another."[1]

I started my work life as a janitor. In the eighth grade I cleaned a jewelry store on the weekends, sweeping, mopping, taking out the trash, and cleaning the all-important display windows and cases. It taught me respect for the bars that are meant to keep fingerprints off glass doors, and the value of newsprint as a cleaning tool.

While I was a student at Wagner High School in the Philippines, and as a military dependent, I could not work. I earned spending money by working as a photographer for the school newspaper, attending dances (free admission as a member of the press) and taking photos of happy couples. I sold the prints for spending money (this was back when you had to develop both the film and the print).

After graduating from high school in 1973, I entered military service, finishing as a combat medic in 1980 and determined to become a health professional. I decided on Respiratory Care, and by 1982 I had my RRT credential, thanks in part to a novel program offered at Creighton University. I spent 13 years as a therapist, ending my run in 1993 to become an attorney. I've had three employers: the Missouri court system, a Kansas law firm, and the firm I currently work for, Bartimus, Frickleton, Robertson, Rader, PC. I have transitioned here, too: I now work part-time, 20 hours a week, and I spend the remainder of my time writing. I have several published books at this point.

Throughout my career as a lawyer, I have seen the law change in a great number of ways, most of which benefit health care professionals while limiting the right to sue of patients and family members. In most states, there is a cap on non-economic damages (i.e, pain and suffering), and family members must have affidavits from health care professionals in order to file their medical negligence actions. These benefit health care workers by limiting the number of frivolous lawsuits. The damages caps, however, often hurt the patients by limiting what they and their families can recover. For example, a patient injured in a car accident in Missouri can sue the other driver for an unlimited amount of pain and suffering. But the same patient injured by a health care worker, even if it results in total paralysis, can recover no more than $750,000 in non-economic injuries. And even economic injuries are limited in many states by the amount paid by insurance. Because many insurance companies have "subrogation agreements," this often means the patient gets a very small amount of the money the jury gives him. And, interestingly enough, the jury is never told about these after-the-verdict deductions.

But on the positive side, nearly every state now has licensure for respiratory professionals, a step above where we were in 1980 when I came into the profession. These laws protect the public from reckless and undisciplined providers, but sometimes not until the damage is done. Exhibit 1 is Efren Saldivar, the therapist in Glendale, California, who killed at least six patients as a respiratory practitioner. Licensure laws limit mobility for respiratory professionals, however, and it is often easy to run afoul of these statutes when changing jobs.

about the author...

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

Legal professionals can usually practice as a lawyer in almost any other state through a procedure called pro hac vice, which basically means “for this case.” The lawyer can associate with a local lawyer and ask the court for permission, which is rarely denied. Some states have sought these same kinds of compacts for health care professionals, and I look for this to be one of the many different areas of growth in health care law.

Another area of the law that blossomed during my career has been the False Claims Act. This federal statute allows someone with inside information to tell the federal government when their employer is stealing government money. Soon after taking my job as an attorney, I was contacted by a therapist who blew the whistle on a large health care provider and received more than three million dollars as a reward through this federal program. Recoveries since 1986, when Congress substantially strengthened the civil False Claims Act, now total more than $59 billion.[2] The vast majority of that amount is composed of health care funds recovered from cheats and scofflaws who overbilled the government for services or provided worthless services. As an example, in 2009 a young dental assistant named Adam Abendano blew the whistle on a company called Kool Smiles. The company was billing Medicaid (the federal program for the poor) for unnecessary dental procedures. Although it took him nine years to do it, he received a substantial award from the government for his trouble.

Currently there are dozens of hot-button issues dealing with immigration, firearms, discrimination, and constitutional law that face our nation’s highest court. These issues are significant in that they have the potential to impact the entire country. You can count on that court making significant and controversial decisions in the future.

In the fantastic movie "The Princess Bride," the lead character Wesley tells the Princess: “Life is pain, Highness. Anyone who says differently is selling something.” While there is some independent truth in that statement, it is perhaps more accurately rephrased as “life is transition.” The only constant in life is change, and change is either bad or good depending on your reaction to it. As the profession moves forward, the changes that occur in the law and in the profession will have a significant impact on your life. Noted existential psychologist Vicktor Frankl said, “The last of a man’s freedoms is his ability to choose his reaction to a given set of circumstances.” Exercise your freedom as therapists to make your profession better tomorrow than it is today. That is the kind of transition we can all support.

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Clinical Perspectives

Respiratory Care: A View of the Future with an Eye on the Past

by Dean R. Hess, PhD, RRT, FAARC

Nearly four decades ago, I graduated from college with no idea what I would do with that degree. Needing a job, I interviewed at the local hospital, and I was hired as an on-the-job trained inhalation therapist. One day I had no idea what an inhalation therapist was, and the next day I was one! Little did I know that this would become my lifelong career, nor did I have any idea what would lie ahead. Now I use a retrospectoscope to inspect the past and make predictions of future practice. Following are some musings of what I expect will be important to future practice.

Evidence-based practice

Perhaps nothing has affected health care delivery more in the 21st century than evidence-based practice. This will continue and has the potential to strongly impact respiratory care. Unfortunately, too much of today's respiratory care practice is not based on high-quality evidence. This will be increasingly scrutinized. The time will come, sooner rather than later, when we will not be reimbursed for practice that is not deemed evidence-based. In the early days of my career, we adopted practices because they made sense or because a company introduced a new device. This was done with no regard to cost and with little regard for outcomes. Not only will future practice need to be evidence-based, but that evidence will demand attention to long-term patient-important outcomes. For example, it will not be sufficient that a device can increase lung volume after a single treatment session in post-operative patients. Rather, it will be necessary to show that the treatment affects longer-term outcomes such as hospital days.

Adoption of evidence-based medicine will demand that every respiratory therapist can read and assess the evidence. We must be the clinical leaders and skilled consumers of the literature. We cannot wait for others to identify best practices in respiratory care. We must provide evidence-based leadership in all areas of respiratory care. This will be one of the distinguishing characteristics of the new breed of therapists, who are not just technicians implementing physician orders.

Therapists will also need to become more involved in establishing the evidence guiding our practice. We will need a new fleet of advanced-practice therapists who have post-graduate degree training and obtain funding to conduct high-level studies. We will need to be intimately involved in establishing the evidence supporting our practice, rather than relying on others for that.

Cost containment

In the early days of my career, the focus was on reimbursement rather than cost. The more procedures we billed, the more revenue was generated – regardless of whether those procedures were beneficial to the patient. In those days, the respiratory care department was a cash cow for the hospital, and intermittent positive pressure breathing (IPPB) was the cash crop.

Evidence and cost determine value: value = evidence/cost. Note that low-evidence therapy has low value unless the cost is very low. On the other hand, a high-cost therapy might have high value it the evidence supporting its use is high. Thus, a strategy to curtail cost is to limit low-value therapy. Professional practice will increasingly demand that we advocate high-value therapies and abandon those of low value.

The issue of cost will become acute as society moves toward universal coverage. Many persons who do

about the author…

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not currently have access and coverage likely have respiratory diseases. When they enter the system, costs are likely to increase, demanding high-evidence, high-value therapy. Respiratory therapists will find themselves in the role of gatekeeper, limiting therapies to those of proven value. By the way, this is not rationing of care — it is value-based care.

Precision medicine

In many ways, therapy is prescribed crudely. We administer therapies based on the best response for the population of patients rather than for the individual patient. Consider PEEP titration for patients with ARDS, inhaled steroids for patients with asthma, or bronchodilators for patients with COPD.

In the future, therapy is likely to be more precise on the basis of an individual's phenotype, genotype, and endotype. This will involve the use of biomarkers, such as might be collected in blood or exhaled breath (think exhaled nitric oxide in asthma, as an example). We use physiologic markers like pulse oximetry. We favor therapies that improve arterial oxygenation, with limited regard to the long-term harm that might accompany that treatment. In the future, we might collect an exhaled breath sample (e.g., gas, condensate, sputum), subject that to a bioassay, and use the results to identify the level of PEEP that balances benefit and harm and results in the highest probability for a good outcome. A similar approach might be used to determine the best biologic for the chronic management of asthma, COPD, and other lung diseases.

Autonomy

For much of the lifetime of respiratory care as a profession, the physician wrote the orders and the therapist administered the therapy. The assumption was that the physician knew what was best for the patient and the therapist knew how to best technically follow physician's orders. There are many reasons why this model is antiquated. Over the years, respiratory therapists' education and training grew, and the expanded sophistication of respiratory care surpassed physicians' ability to be expert in all aspects of this and other areas of their practice.

The result was the development of protocols whereby respiratory therapists were assigned autonomy to direct an aspect of the patient's care. Using such protocols, the therapist rather than the physician determines the approach to airway clearance, the ventilator setting to achieve lung protection, or the timing and completion of a spontaneous breathing trial. Unfortunately, however, the penetration of protocols has been less than ideal. The stressors of evidence-based practice and costs of care (i.e., value) will demand that therapists increasingly implement assess-and-treat approaches as are currently afforded to other allied health professionals.

Technology

The sophistication of respiratory care technology has increased exponentially over the past 20 years. Much of this is the result of microprocessor control of devices. Back in the 1970s and early 1980s, I required my students to disassemble, reassemble, and calibrate a Bird Mark 7. We altered the ventilator circuit with valves and bags to create intermittent mandatory ventilation. Those days are, for good reason, long past. We have largely evolved from the days of troubleshooting, calibrating, and jury-rigging equipment. Today and in the future, the role of the respiratory therapist is that of matching the technology to the patient — troubleshooting patient response rather than troubleshooting devices. Consider patient–ventilator synchrony. That term was not part of our vocabulary in the days of the Bird Mark 7, but today, and in the future, the respiratory therapist is expected to make appropriate ventilator adjustments to

maximize synchrony. In the future, the therapist will be increasingly expected to be the expert in matching the therapy to the patient. To succeed in the future, we must shed the monikers "neb jockey" and "knob turner."

Devices will also become increasingly connected. With a smartphone in hand, health care will increasingly be administered remotely. The respiratory therapist will be able to monitor and adjust patient care remotely. This will involve everything from smart inhalers to ventilator settings. The burgeoning field of telemedicine and the e-ICU is in its infancy. In the future, this will likely impact the practice of respiratory care in important ways. If we are to remain relevant, we must be attuned to the advances in this area and position ourselves to be part of this care-delivery model.

Care across the continuum

It should be obvious to all that care today is often fragmented. Respiratory care is provided in the ICU by one therapist, who hands off to the respiratory therapist in the stepdown unit, who hands off to the therapist on the ward, who hands off to the therapist in the long-term care facility, who hands off to the therapist working for the home-care company. The therapist working the day shift hands off to the night shift who hands off to yet another therapist on the next day shift. No one is looking at the big picture. The result is suboptimal care, bounce backs, and overuse of hospital care. Best care in the future will demand that someone, preferably a respiratory therapist, will manage the big picture, with the goal being consistency of care and minimization of high-cost hospital care.

Summary

One thing can be said with certainty — the future will be different than the present or the past. The best preparation is to be knowledgeable, flexible, and a change agent. Best practice is to be a respiratory therapist at the forefront of change and never be that therapist who resists change. The successful therapist is the one who grows with changes in practice. Those who cannot embrace change will fall to the side along the road to the future. ■

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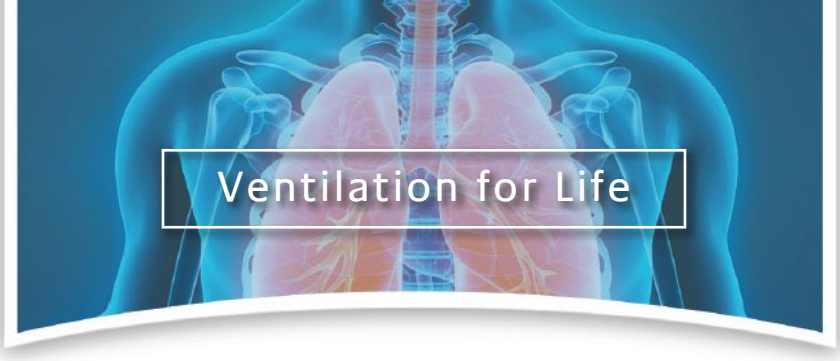

Mechanical Ventilation in the Year 2030

by Robert L. Chatburn, MHHS, RRT, RRT-NPS, FAARC, and Eduardo Mireles-Cabodevila, MD

"In the year 2525, if man is still alive
If woman can survive, they may find…"
Zager and Evans, 1969

The little black bag

First, to set the stage, we will paraphrase a famous short story of science fiction written by Cyril M. Kornbluth and published in 1950:

"In the future, humanity has split into a small minority of super-geniuses, those of normal intelligence, and a much larger group of dimwits." A physicist from the future accidentally sends a highly automated medical kit into the past (our present). It ends up in the hands of an unprepared soul, who, in the process of demonstrating its marvels, suffers horrendous consequences. The moral of the story: when the servant becomes the master, we will reach disaster faster.

The singularity

The Singularity Is Near: When Humans Transcend Biology is a 2005 non-fiction book about artificial intelligence and the future of humanity by inventor and futurist Ray Kurzweil. In 2012, Ray Kurzweil became a Director of Engineering at Google, leading a team of engineers who are developing machine intelligence and natural language understanding. Kurzweil likes to talk about the "law of accelerating returns," which predicts an exponential increase in technologies like computers, genetics, nanotechnology, robotics, and artificial intelligence. In this context he describes the "singularity" as a hypothetical point in the future when technological growth becomes uncontrollable, resulting in inconceivable changes to human civilization. When this happens, Kurzweil says that machine intelligence will be infinitely more powerful than all human intelligence combined. Kurzweil believes that the singularity will occur by approximately 2045, well within the lifetime of more than 50% of the current U.S. population.

about the authors…

Robert L. Chatburn, MHHS, RRT, RRT-NPS, FAARC, is the respiratory therapy clinical research manager at the Cleveland Clinic, as well as an adjunct professor at Cleveland Clinic Lerner College of Medicine of Case Western Reserve University.

Eduardo Mireles-Cabodevila, MD, is the medical intensive care unit director and simulation and advanced skills center medical director at the Cleveland Clinic, as well as an assistant professor at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University.

Rise of the machine

What does all this have to do with mechanical ventilation? The authors have a combined health care experience of well over half a century. During that time, we have used at least six generations of ICU ventilators (Figure 1). Invoking a simple metric, like the number of modes offered by each generation, the growth in complexity is approximately exponential. This growth has necessitated the creation of a taxonomy for modes of ventilation,[1] just as a taxonomy is needed for drugs,[2] medical errors,[3] and even human diseases.[4] Ventilator design engineers are starting to use artificial intelligence tools (e.g., fuzzy logic, rule-based expert systems, artificial neural networks) to create modes that simulate human decision making.[5-7] Machine learning and mathematical simulation have recently been developed to detect patient–ventilator synchrony problems,[8] to improve clinical decision support systems,[9-13] and even to create a fully automated life-support system.[14] A "brain–computer interface" has actually been proposed for the control of mechanical ventilators![15] Needless to say, our educational

system has not evolved at the same rate, resulting in a significant knowledge gap that grows daily.

Our predictions for the near future — 2030

What will be the role of the human in medicine in 2030? If the trends in other areas (e.g., communications, television, and computers) continue, there is no doubt that it will be "less human and more machine." Let's set a couple of scenarios. On one extreme, there is our own medical ICU, a quaternary, highly-rated academic institution with extreme complexity and variability of disease. We have 15 different roles, fulfilled by humans, to make our unit work. The number of tasks to ensure safety and enhance recovery can't be performed by a single individual. It requires a very large and expensive team. Now, contrast this with a lower resource setting, with limited access to human and health care resources. The team may only be one person. Under these two vastly different scenarios, technology can enhance care and bridge deficiencies. In the resource-rich environment, technology will supplant roles; it makes economic sense. In the resource-poor environment, technology will provide the unavailable roles; it makes social sense. In a similar fashion, we can also think about situations where mechanical ventilation is needed, from home ventilation for a patient with neuromuscular disease or a patient in a ventilator liberation facility, to the sickest patient on the brink of death from respiratory failure. Technology can provide safety, comfort, and liberation along with the appropriate guidance for meeting each need.[16]

Indeed the environment, patients, and situations are complex, and it may seem impossible to overcome the complexity. However, technology has done this time and again. Just think about the phone and how you communicated as a child, and see where we are today – there is no cable, no limits where you can call, and now you can video chat while hiking the highest mountain. The barriers to artificial intelligence, telemedicine, and better patient interfaces are disappearing. The time for this reality is at hand.

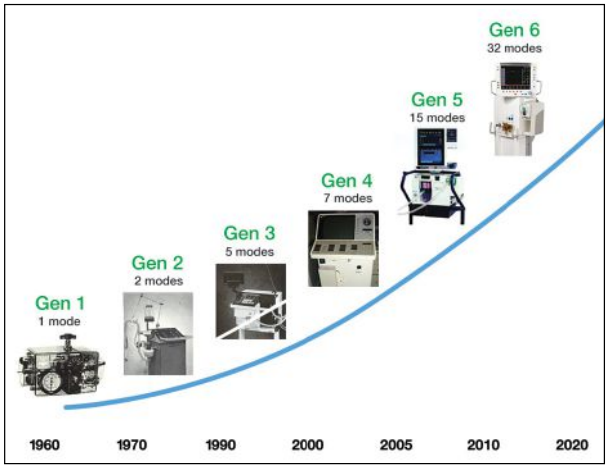

Figure 1. Exponential growth in ventilator complexity over the last 6 decades.

We make three general predictions for 2030:

Automated modes will dominate markets. Yes, at some point we will stop resisting. Their entrée will be their ability to minimize patient time on mechanical ventilation, even without convincing evidence of improved clinical outcomes. Ventilators with "intelligent targeting systems" (i.e., using tools of artificial intelligence such as fuzzy logic, rule-based expert systems, and artificial neural networks)[11] will have effects on the exposure to health care, cost, and outcomes. These are easy metrics to trend, and they will drive the development, adoption, and use of new technology. Indeed, our hospital tried that with SmartCare, but even that is a dinosaur compared to what we can do now. And yes, to the chagrin of many, the dominant breath sequence will be intermittent mandatory ventilation. We assert that mandatory breaths and spontaneous breaths will live together, under the direction of intelligent targeting schemes.[17]

All devices will have to speak to each other. The market will push for interconnectedness. Devices that do not interact with each other will lose market share. The push will come from the wasted time spent charting (if nothing else). Humans will be unable to keep up with the amount of data (we know you sympathize with this). We are now at a point where we are spending more time transcribing data from one screen to another than providing direct care for our patients.[18] Devices, including mechanical ventilators, will have to open their firewalls to the electronic medical records if they want to survive.

Respiratory therapists must acquire skills for the new millennium. Training respiratory therapists for the present is a given, but the real focus must be on preparing them with the skills needed for the future. The literacy and comprehension of the RT needs to match the technology, and this can't be driven by industry — it must be driven by our RT programs. Telemedicine is here, and RTs need to learn and adopt this to provide needed services like therapy, diagnosis, support, and so on. Unless we rise to the level of knowledge enabling us to mine big data, embrace artificial intelligence, and understand interconnectedness, respiratory care as we know it today will become extinct.

(Continued on page 17)

ONCE-DAILY
YUPELRI®
revefenacin inhalation solution
Relief that matters

FOR THE DAILY STRUGGLES OF COPD

The FIRST AND ONLY once-daily nebulized LAMA, for a full 24 hours of lung function improvement[1]

Proven 24-hour control[1]
Consistent improvement in trough FEV_1 vs placebo over 24 hours on days 84/85[1,2]

The primary endpoint was change from baseline in trough (predose) FEV_1 at day 85 vs placebo: YUPELRI demonstrated a statistically significant difference vs placebo in study 1 (146 mL, *P*<.0001 [YUPELRI, n=189; placebo, n=191]) and study 2 (147 mL, *P*<.0001 [YUPELRI, n=181; placebo, n=187]).[1,2]

In study 1, LS mean changes from baseline in FEV_1 ranged from 55.8 mL to 240.4 mL in the YUPELRI group, and from -113.6 mL to 59.6 mL in the placebo group. In study 2, LS mean changes from baseline in FEV_1 ranged from 19.8 mL to 148.5 mL in the YUPELRI group, and from -176.4 mL to -13.0 mL in the placebo group.

In studies 1 and 2, a prespecified exploratory analysis using serial spirometry was performed on a substudy population (YUPELRI, n=89; placebo, n=83) over 24 hours on days 84/85. In a pooled analysis, YUPELRI demonstrated consistent improvement in trough FEV_1 vs placebo over the 24-hour period.

Demonstrated safety profile[1]
Refer to the Important Safety Information below for additional information

Once-daily dosing[1]
Administered with any standard jet nebulizer with a mouthpiece

Up to 100% of patients with Medicare Part B are expected to be covered*
Permanent J-CODE J7677

*This is not a guarantee of coverage. Site of care will determine coverage. Check with your patient's insurance provider for coverage rules and restrictions. In certain limited instances, YUPELRI may be covered through a patient's Medicare Part D pharmacy benefit.

Indication

YUPELRI® inhalation solution is indicated for the maintenance treatment of patients with chronic obstructive pulmonary disease (COPD).

Important Safety Information

YUPELRI is contraindicated in patients with hypersensitivity to revefenacin or any component of this product.

YUPELRI should not be initiated in patients during acutely deteriorating or potentially life-threatening episodes of COPD, or for the relief of acute symptoms, i.e., as rescue therapy for the treatment of acute episodes of bronchospasm. Acute symptoms should be treated with an inhaled short-acting $beta_2$-agonist.

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

YUPELRI should be used with caution in patients with narrow-angle glaucoma. Patients should be instructed to immediately consult their healthcare provider if they develop any signs and symptoms of acute narrow-angle glaucoma, including eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema.

Worsening of urinary retention may occur. Use with caution in patients with prostatic hyperplasia or bladder-neck obstruction and instruct patients to contact a healthcare provider immediately if symptoms occur.

Immediate hypersensitivity reactions may occur after administration of YUPELRI. If a reaction occurs, YUPELRI should be stopped at once and alternative treatments considered.

The most common adverse reactions occurring in clinical trials at an incidence greater than or equal to 2% in the YUPELRI group, and higher than placebo, included cough, nasopharyngitis, upper respiratory infection, headache and back pain.

Coadministration of anticholinergic medicines or OATP1B1 and OATP1B3 inhibitors with YUPELRI is not recommended.

YUPELRI is not recommended in patients with any degree of hepatic impairment.

Please see Brief Summary of Full Prescribing Information on the adjacent pages.

Learn more at YUPELRIHCP.com

References: 1. YUPELRI [package insert]. Morgantown, WV: Mylan Specialty L.P.; May 2019. **2.** Data on file.

Mylan® Theravance Biopharma

YUPELRI® (revefenacin) inhalation solution, for oral inhalation

Initial U.S. Approval: 2018

FULL PRESCRIBING INFORMATION

INDICATIONS AND USAGE

YUPELRI inhalation solution is indicated for the maintenance treatment of patients with chronic obstructive pulmonary disease (COPD).

CONTRAINDICATIONS

YUPELRI is contraindicated in patients with hypersensitivity to revefenacin or any component of this product.

WARNINGS AND PRECAUTIONS

Deterioration of Disease and Acute Episodes

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

YUPELRI is intended as a once-daily maintenance treatment for COPD and should not be used for relief of acute symptoms, i.e. as rescue therapy for the treatment of acute episodes of bronchospasm, 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 YUPELRI 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 YUPELRI beyond the recommended dose is not appropriate in this situation.

Paradoxical Bronchospasm

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

Worsening of Narrow-Angle Glaucoma

YUPELRI 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 if any of these signs or symptoms develops.

Worsening of Urinary Retention

YUPELRI 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 healthcare provider immediately if any of these signs or symptoms develops.

Immediate Hypersensitivity Reactions

Immediate hypersensitivity reactions may occur after administration of YUPELRI. If such a reaction occurs, therapy with YUPELRI should be stopped at once and alternative treatments should be considered.

ADVERSE REACTIONS

The following potential adverse reactions are described in greater detail in other sections:

- Paradoxical bronchospasm *[see Warnings and Precautions]*
- Worsening of narrow-angle glaucoma *[see Warnings and Precautions]*
- Worsening of urinary retention *[see Warnings and Precautions]*
- Immediate hypersensitivity reactions *[see Warnings and Precautions]*

Clinical Trial 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 YUPELRI safety database included 2,285 subjects with COPD in two 12-week efficacy studies and one 52-week long-term safety study. A total of 730 subjects received treatment with YUPELRI 175 mcg once daily. The safety data described below are based on the two 12-week trials and the one 52-week trial.

12-Week Trials

YUPELRI was studied in two 12-week replicate placebo-controlled trials in patients with moderate to very severe COPD (Trials 1 and 2). In these trials, 395 patients were treated with YUPELRI at the recommended dose of 175 mcg once daily.

The population had a mean age of 64 years (range from 41 to 88 years), with 50% males, 90% Caucasian, and had COPD with a mean post-bronchodilator forced expiratory volume in one second (FEV_1) percent predicted of 55%. Of subjects enrolled in the two 12-week trials, 37% were taking concurrent LABA or ICS/LABA therapy. Patients with unstable cardiac disease, narrow-angle glaucoma, or symptomatic prostatic hypertrophy or bladder outlet obstruction were excluded from these trials.

Table 1 shows the most common adverse reactions that occurred with a frequency of greater than or equal to 2% in the YUPELRI group and higher than placebo in the two 12 week placebo- controlled trials.

The proportion of subjects who discontinued treatment due to adverse reactions was 13% for the YUPELRI-treated subjects and 19% for placebo-treated subjects.

Table 1: Adverse Events with YUPELRI ≥2% Incidence and Higher than Placebo

	Placebo (N = 418)	YUPELRI 175 mcg (N = 395)
Respiratory, Thoracic and Mediastinal Disorders		
Cough	17 (4%)	17 (4%)
Infections and Infestations		
Nasopharyngitis	9 (2%)	15 (4%)
Upper respiratory tract infection	9 (2%)	11 (3%)
Nervous System Disorders		
Headache	11 (3%)	16 (4%)
Musculoskeletal and Connective Tissue Disorders		
Back pain	3 (1%)	9 (2%)

Other adverse reactions defined as events with an incidence of ≥1.0%, less than 2.0%, and more common than with placebo included the following: hypertension, dizziness, oropharyngeal pain, and bronchitis.

52-Week Trial

YUPELRI was studied in one 52-week, open-label, active-control (tiotropium 18 mcg once daily) trial in 1,055 patients with COPD. In this trial, 335 patients were treated with YUPELRI 175 mcg once daily and 356 patients with tiotropium. The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled 12-week studies described, with the exception that concurrent LABA or LABA/ICS therapy was used in 50% of patients. The adverse reactions reported in the long-term safety trial for YUPELRI were consistent with those observed in the placebo-controlled studies of 12-weeks.

DRUG INTERACTIONS

Anticholinergics

There is potential for an additive interaction with concomitantly used anticholinergic medicines. Therefore, avoid coadministration of YUPELRI with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic adverse effects *[see Warnings and Precautions]*.

Transporter-Related Drug Interactions

OATP1B1 and OATP1B3 inhibitors (e.g. rifampicin, cyclosporine, etc.) could lead to an increase in systemic exposure of the active metabolite. Therefore, coadministration with YUPELRI is not recommended *[see Clinical Pharmacology.]*

USE IN SPECIFIC POPULATIONS

Pregnancy

Risk Summary

There are no adequate and well-controlled studies with YUPELRI in pregnant women. Women should be advised to contact their physician if they become pregnant while taking YUPELRI. In animal reproduction studies, subcutaneous administration of revefenacin to pregnant rats and rabbits during the period of organogenesis produced no evidence of fetal harm at respective exposures approximately 209 times the exposure at the maximum recommended human dose (MRHD) (on an area under the curve [AUC] basis) *(see Data)*.

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.

Data

Animal Data

In an embryo fetal development study in pregnant rats dosed during the period of organogenesis from gestation days 6 to 17, revefenacin was not teratogenic and did not affect fetal survival at exposures up to 209 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

In an embryo fetal development study in pregnant rabbits dosed during the period of organogenesis from gestation days 7 to 19, revefenacin was not teratogenic and did not affect fetal survival at exposures up to 694 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

Placental transfer of revefenacin and its active metabolite was observed in pregnant rabbits.

In a pre- and postnatal development (PPND) study in pregnant rats dosed during the periods of organogenesis and lactation from gestation day 6 to lactation day 20, revefenacin had no adverse developmental effects on pups at exposures up to 196 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

Lactation

Risk Summary

There is no information regarding the presence of revefenacin in human milk, the effects on the breastfed infant, or the effects on milk production. However, revefenacin was present in the milk of lactating rats following dosing during pregnancy and lactation *(see Data)*.

The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for YUPELRI and any potential adverse effects on the breastfed infant from YUPELRI or from the underlying maternal condition.

Data

Animal Data

In a PPND study *[see Pregnancy]*, revefenacin and its active metabolite were present in milk of lactating rats on lactation day 22. Milk-to-plasma concentration ratios were up to 10 for revefenacin and its active metabolite.

Pediatric Use

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

Geriatric Use

Based on available data, no adjustment of the dosage of YUPELRI in geriatric patients is necessary.

Clinical trials of YUPELRI included 441 subjects aged 65 years and older, and of those, 101 subjects were aged 75 years 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.

Hepatic Impairment

The systemic exposure of revefenacin is unchanged while that of its active metabolite is increased in subjects with moderate hepatic impairment. The safety of YUPELRI has not been evaluated in COPD patients with mild-to-severe hepatic impairment. YUPELRI is not recommended in patients with any degree of hepatic impairment. *[see Clinical Pharmacology]*.

Renal Impairment

No dosage adjustment is required in patients with renal impairment. Monitor for systemic antimuscarinic side effects in COPD patients with severe renal impairment. *[see Clinical Pharmacology]*.

OVERDOSAGE

An overdose of YUPELRI 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 YUPELRI at a once-daily dose of up to 700 mcg (4 times the maximum recommended daily dose) for 7 days was well tolerated.

Treatment of overdosage consists of discontinuation of YUPELRI along with institution of appropriate symptomatic and/or supportive therapy.

NONCLINICAL TOXICOLOGY

Carcinogenesis, Mutagenesis, Impairment of Fertility

Two-year inhalation studies in Sprague-Dawley rats and CD1 mice were conducted to assess the carcinogenic potential of revefenacin. No evidence of tumorigenicity was observed in male and female rats at inhaled doses up to 338 mcg/kg/day (approximately 35 times the MRHD based upon summed AUCs for revefenacin and its active metabolite). No evidence of tumorigenicity was observed in male and female mice at inhaled doses up to 326 mcg/kg/day (approximately 40 times the MRHD based on summed AUCs for revefenacin and its active metabolite).

Revefenacin and its active metabolite were negative for mutagenicity in the Ames test for bacterial gene mutation. Revefenacin was negative for genotoxicity in the *in vitro* mouse lymphoma assay and *in vivo* rat bone marrow micronucleus assay.

There were no effects on male or female fertility and reproductive performance in rats at subcutaneous revefenacin doses up to 500 mcg/kg/day (approximately 30 times the MRHD on an mg/m^2 basis for revefenacin).

PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use) with each new prescription and refill.

Not for Acute Symptoms

Inform patients that YUPELRI is not meant to relieve acute symptoms of COPD and extra doses should not be used for that purpose. Advise patients to treat acute symptoms with an inhaled, short-acting beta$_2$-agonist such as albuterol. Provide patients with such medicine and instruct them in how it should be used.

Instruct patients to seek medical attention immediately if they experience any of the following:

- Decreasing effectiveness of inhaled, short-acting beta$_2$-agonists
- Need for more inhalations than usual of inhaled, short-acting beta$_2$-agonists
- Significant decrease in lung function as outlined by the physician

Tell patients they should not stop therapy with YUPELRI without healthcare provider guidance since symptoms may recur after discontinuation.

Paradoxical Bronchospasm

As with other inhaled medicines, YUPELRI can cause paradoxical bronchospasm. If paradoxical bronchospasm occurs, instruct patients to discontinue YUPELRI.

Worsening of Narrow-Angle Glaucoma

Instruct patients to 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 healthcare provider immediately if any of these signs or symptoms develops.

Worsening of Urinary Retention

Instruct patients to be alert for signs and symptoms of urinary retention (e.g. difficulty passing urine, painful urination). Instruct patients to consult a healthcare provider immediately if any of these signs or symptoms develops.

Instructions for Administering YUPELRI

It is important for patients to understand how to correctly administer YUPELRI using a standard jet nebulizer [see Instructions for Use]. Instruct patients that YUPELRI should only be administered via a standard jet nebulizer. Patients should be instructed not to inject or swallow the YUPELRI solution. Patients should be instructed not to mix other medications with YUPELRI.

Patients should not inhale more than one dose at any one time. The daily dosage of YUPELRI should not exceed one unit-dose vial. Inform patients to use the contents of one vial of YUPELRI orally inhaled daily at the same time every day. Patients should throw the plastic dispensing vials away immediately after use. Due to their small size, the vials pose a danger of choking to young children.

REV-2019-0194

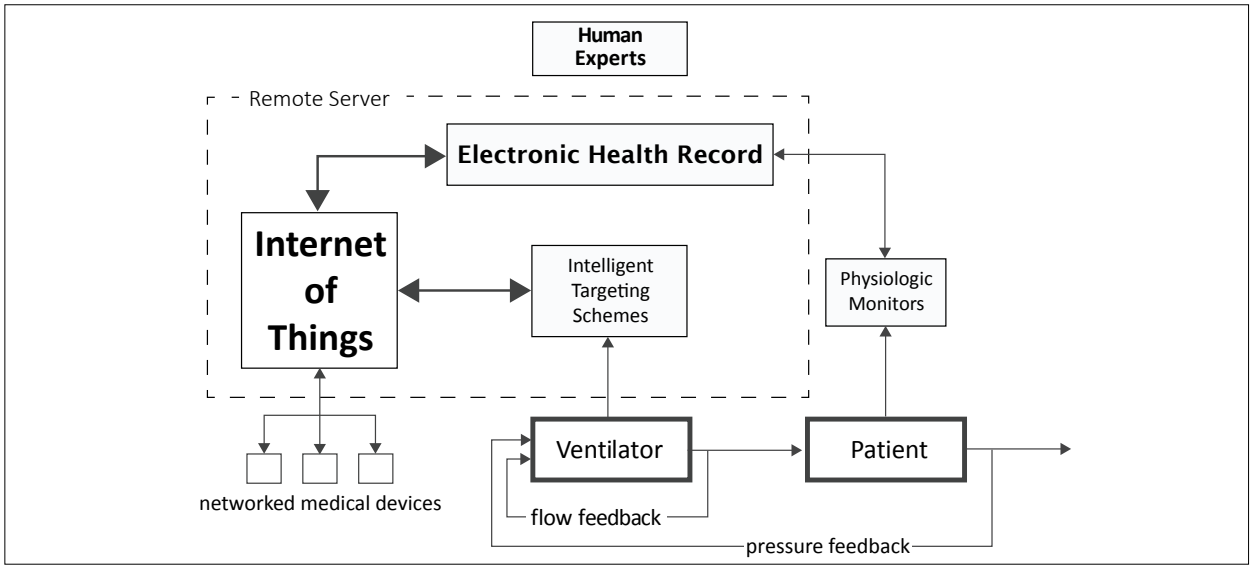

Figure 2. Schematic of the ventilator of 2030.

(Continued from page 14)

A vision of the far future — 2040 and beyond

If you want to achieve extraordinary results, put a bunch of engineers in a room and explain something to them that "can't be done." Indeed, much technical development can be envisioned to improve ventilator technology. For example, the weakest link in the mechanical ventilator system is the patient circuit. Think about it — we have a $30,000 ventilator connected to a priceless patient with $1.75 worth of plastic tubing. That crude tubing is responsible for a host of gas delivery and monitoring errors, not the least of which involves humidifying the cold, dry supply gas. We have the available technology (if not the affordable technology) to deliver water molecules with the precision that we deliver nitrogen and oxygen molecules. The delivery circuit could conceivably be a durable, temperature-controlled, permanent part of the ventilator itself, with maybe six inches of disposable plastic connected to the artificial airway (assuming such an airway is still needed).

In every area of our lives, artificial intelligence is empowering complex automation, connecting medical devices (and just about everything else) to the "Internet of Things" (i.e., interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data). Eventually, the mechanical ventilator may become little more than a black box with one control switch (on/off) and one simple display (connect/disconnect the patient). Every other vital function of a mechanical ventilator will be controlled by artificial intelligence from a central server. From this vantage point, machine-learning algorithms will process data from all mechanical ventilators, all the time, turning an endless stream of continuous data into ever more effective information (Figure 2). At that point, humans will not be required to "manage" the ventilator any more than they will be required to drive their cars to work. This event will be the "singularity" for the respiratory care profession.

"Hey Google, is my patient ready to be disconnected from the vent?" ■

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Chronic Disease Manager

Evolution and Future

by William (Bill) F. Galvin, MSED, RRT, CPFT, AE-C, FAARC

Statement of the problem

The problem with chronic disease management lies in its very name. It is chronic, meaning it is long-standing in nature and is not a disease or condition that occurs overnight. It developed over time — years of less-than-healthy lifestyle behaviors and/or genetic predispositions given to us by our ancestors. This article will briefly address the history and evolution of chronic disease management, the forces driving its present state, and projections for its future.

about the author...

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The Past

History and evolution of disease management movement

Disease management is rooted in case management, a collaborative process that assesses, plans, implements, coordinates, monitors, and evaluates the options and services required to meet an individual's health needs.[1] Case management is employed for a single high-risk, high-cost patient who experiences repeated hospital admissions and thus commands the attention of a case manager, who assembles a team of specialists (physicians, nurses, respiratory therapists, social workers, etc.) who all focus their skill and expertise in alleviating the symptoms and pathophysiology of a single patient's condition. This is extremely costly and labor-intensive, and tremendous resources are expended.

The term disease management is similar but differs in that a group or subpopulation of individuals with common signs and symptoms are identified, evaluated, stratified by level of severity, provided treatment plans (i.e., using evidence-based practice guidelines), and afforded specialists trained to track and treat the disease or condition.[2] Disease management was first initiated by the pharmaceutical industry and later managed by organizations. Both were attempting to resolve the 80/20 rule — the view that 80% of the health care cost is borne by 20% of patients.[3] Both groups recognized that a relatively low number of individuals with multiple chronic conditions were responsible for the greatest share of health care expenditures. Chronic disease management is therefore rooted in two forces: cost and morbidity.

The Present

Rising health care costs

Health care cost is front and center on the minds of all stakeholders — politicians, purchasers, plans, payers, providers, and patients. In 1960, we spent approximately 5% of our gross domestic product (GDP) on health care. In 2018, this grew to an alarming 18.2%.[4] Total annual expenditures and per-person expenditures during these same time periods grew similarly from approximately $27.3 billion to $3.67 trillion and $147 to $11,393, respectively (Figure 1).[4] There is grave concern that these figures will grow to unsustainable levels. So, what is the cause of these alarming costs, and what can be done to tackle the problem and reverse these trends?

Multiple chronic conditions

The cost of health care is embedded largely in the substantial number of chronic conditions. The most common chronic conditions consist of high blood pressure, high cholesterol, arthritis, diabetes, heart disease, chronic kidney disease, depression, chronic obstructive pulmonary disease, and Alzheimer's disease, to name but a few.[5] The percentage of Medicare beneficiaries that have these common chronic conditions

(Continued on page 22)

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Year	Total Health Care Expenditures (in billions)	Expenditures/ Person (in thousands)	Expenditures as Percentage of GDP
1960	27.2	.147	5.2
1970	74.9	.356	7.2
1980	255.8	1,110	9.2
1990	724.3	2,854	12.5
2000	1,377.2	4,878	13.8
2010	2,600	8,417	17.9
2018	3,675	11,193	18.2
2020	4,416.2 (projected)	13,142 (projected)	19.2
2026	55,696 (projected)	16,168 (projected)	20.0 (projected)

Figure 1: Total health care expenditures, expenditures per person, and expenditures as a percentage of gross domestic product (GDP)[4]

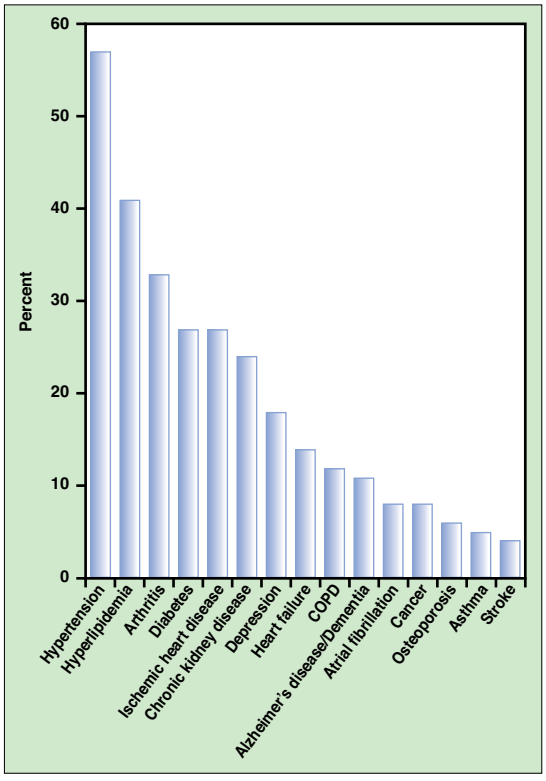

Figure 2: Common chronic conditions among Medicare fee-for-service beneficiaries in 2017[5]

(Continued from page 20)

is illustrated in Figure 2. However, the more compelling statistics are the percentage of individuals with multiple conditions. Figure 3 shows that while 40% of the U.S. population had no chronic conditions, 60% had at least one, 42% had more than one, and an astounding 12% had five or more chronic conditions.[6] It is these latter few groups that contribute to escalating health care cost and warrant the attention of the health care industry if we are to get serious about resolving our health care problems.

Morbidity

We have seen a major shift in disease patterns. Years ago, we dealt with infectious disease. With the discovery of antibiotics and infection-control measures, infectious disease has been largely eradicated in this country. Replacing them are chronic, debilitating lifestyle diseases (Figure 4), and these lifestyle diseases are spurred by many of the chronic conditions noted above. It is interesting to note that, back in the 1800s, people lived to be approximately 37 years of age — fast-forward to 1900 and life expectancy increased to 47. Today life expectancy is approximately 75 years of age. While it may appear that we have come a long way, we know that the human species can be optimized to around 120 years of age (the longest, scientifically documented person was Jean Calumet who lived to be 122). We clearly have a great deal of ground to cover.

Determinants of health

What determines our health status? What factors determine whether we are healthy or ill? Even more fascinating, what can we do to optimize our health and longevity? Let's tackle the first question. There are numerous theories and factors but one of the more popular ideas was proposed by Blum[7] and entails the following four factors: genetics, environment, health care system, and lifestyle (Figure 5). Blum proposed that biology or genetics represented approximately 20% of our health care status and is a result of our genetic make-up, inherited

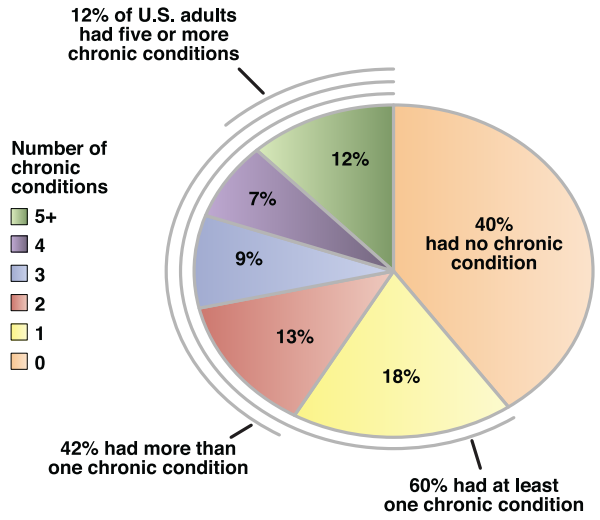

Figure 3: Percentage of U.S. adults with chronic conditions in 2014, by number of chronic conditions[6]

and passed down from our parents and grandparents. Unfortunately, there is little that we can do to control this factor. A second factor is the environment — simply stated, this entails the air we breathe, the water we drink, etc. and is currently the subject of considerable debate. A third factor is the health system itself, which entails how (and if) one accesses or uses the health care system. The fourth is lifestyle, which represents a hefty 50% of this concept. It is particularly telling that much of what determines whether we are ill or healthy is represented by our daily behaviors: tobacco use, activity and dietary patterns, alcohol, microbial agents, motor vehicles, sexual behavior, etc.

Another emerging model is the social determinant model.[8] It is a variation of Blum's model and consists of socioeconomic factors, the physical environment, health behaviors, and health care (Figure 6).

A major difference between these two models is that the social determinant model places considerable emphasis on socioeconomic factors (i.e., education, job status, family/social support, income, and community safety). It is interesting to note that socioeconomic factors and the physical environment represent 50% and is suggested to be traced to one's ZIP code. In fact, the World Health Organization defines social determinants as the conditions in which people are born, grow, live, and age as well as the wider set of forces and systems shaping the condition of one's daily life.[9] Additionally, *Healthy People 2020* indicates that health starts in homes, schools, workplaces, neighborhoods, and communities.[10] Both models support the notion that health is multifactorial but that the individual and society collectively command enormous influence on its presence and resolution.

The Future

The quest for compression morbidity

There are numerous concepts and opinions for resolving the chronic disease dilemma. One such suggestion is the concept of "compression morbidity." Compression morbidity is precisely what it sounds like — shortening the length of time that an individual is ill as illustrated by the shaded areas in Figure 7.[11] The top figure (blue) illustrates a theoretical view of one becoming ill (morbid) at the age of 55 and dying at the age of 75. In this scenario, they would experience 20 years of illness and thus significant use of the health care system. And one should

Leading Causes of Death 1900	Leading Causes of Death 2017
Pneumonia	Heart Disease
Tuberculosis	Cancer
Diarrhea and enteritis	Chronic Lower Respiratory Disease
Heart Disease	Unintentional Injuries
Stroke	Stroke
Liver Disease	Alzheimer's
Injuries	Diabetes
Cancer	Influenza and Pneumonia
Senility	Nephritis, Necrotic Syndrome, Nephrosis
Diphtheria	Suicide

Figure 4: Leading causes of death in the United States, 1900 and 2017

Statistics for 1900 from Centers of Disease Control and Prevention. Control of infectious diseases, 1900-1999. Morbid Mortal Wkly Dis. 1999;45: 621-629. Statistics for 2017 from National Center of Health Statistics. Health, United States, 2017: With special feature on mortality. Hyattsville, MD.

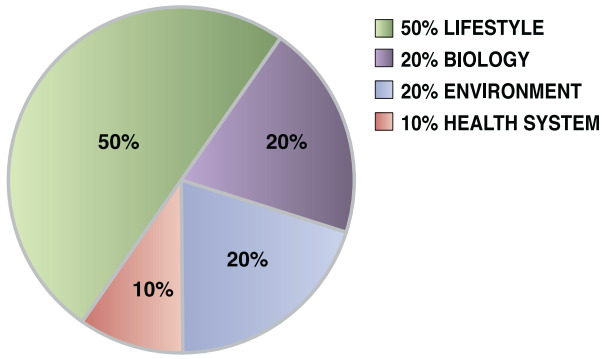

Figure 5: Determinants of health[7]

keep in mind that this illness is largely a result of chronic conditions (e.g., hypertension, high cholesterol, etc.) noted above. The middle scenario (green) represents what happens if one simply extended life to, say, 85 years of age. While they would live longer, they would also experience more years of illness (expand morbidity to 30 years of illness). The bottom scenario (yellow) is more desirable as it would postpone sickness to, say, 75 years of age and give one a shorter period of illness (approximately 10 years) and quite possibly a better quality of life. It seems reasonable to say that most people would prefer the latter scenario: live a long, meaningful, and productive life, die suddenly and nontraumatically, perhaps in their sleep having golfed with a best friend, gone fishing with their kids, or attended a grandchild's recital in the days leading up to their demise. One's quality of life would certainly surpass one's desire to simply have a larger quantity of years. Thus, the quest for compression morbidity is a highly desirable and sought out theory by individuals as well as gerontologists.

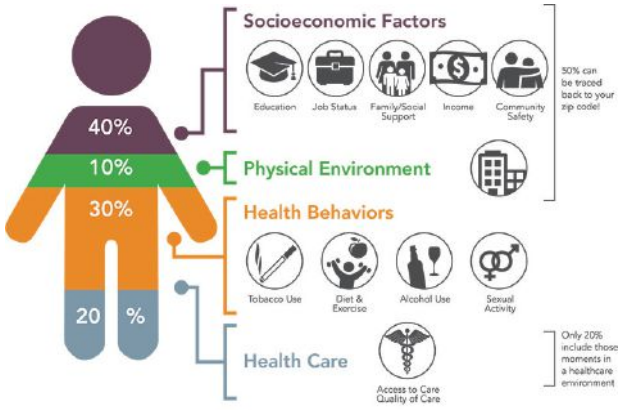

Figure 6: Social determinants of health[8]

Optimizing health — lessons from centenarians

Another innovative idea for the future of chronic disease management lies in identifying and analyzing the lifestyle behaviors of our longest-lived — our global centenarians. Blue Zones[12] is a project undertaken by the American Aging Society and National Geographic in which regions and cultures throughout the world were studied to determine the places where people lived to be over 100 years of age (centenarians). It was interesting to find that five Blue Zones — areas where people lived to be over 100 years of age, and at a rate 8–10 times greater than others in the world — were discovered. The areas were Okinawa (Japan), Sardinia (Italy), Loma Linda (California), Nicoya (Costa Rica), and Ikaria (Greece). What was it that people in these regions did that resulted in their remarkable longevity? Figure 8 illustrates the nine factors considered significant in influencing longevity.

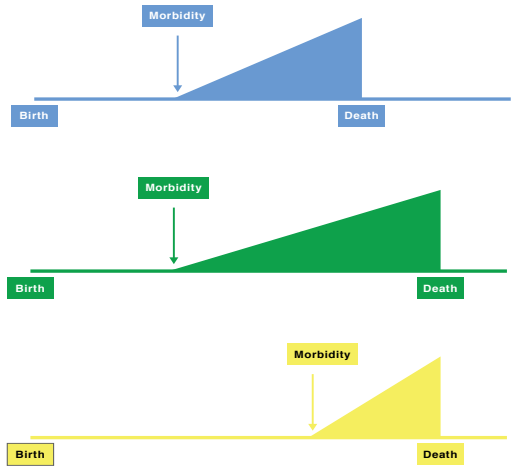

Figure 7: Morbidity compression[11]

While the nine factors are seemingly quite simple, putting them in the context of the culture, beliefs, and norms of their region will aid in a better understanding of their role and value. It should be apparent that quality of life and not just quantity of years should be our quest. Allow me to briefly explain some of the key points of the nine factors considered at the core of optimizing health and longevity.

Move Naturally: It is important to note that we are not talking about exercise per se, but rather incorporating movement in our daily, everyday life. It's not about marathons, pumping iron, or running on a treadmill, but about engaging in regular, low-intensity, physical activity, often as part of a daily work routine. For example,

1. Move Naturally
2. Know your purpose
3. Kick back
4. Eat less
5. Eat less meat
6. Drink in moderation
7. Have faith
8. Power of love
9. Stay Social

Figure 8: Nine essential factors for longevity[12]

Sardinian males are mostly shepherds, which entails miles of hiking every day. Okinawans garden for hours every day and are constantly standing up and sitting or kneeling down as they grow fresh and wholesome food for their tables. Adventists take nature walks, which is a religious ritual and part of their Saturday Sabbath. The point is that these individuals are constantly prompted to move and to minimize life's conveniences (e.g., remote controls, snow blowers, powered lawnmowers, etc.).

Know Your Purpose: This means having a purpose and direction in life. It can be a very powerful essential that can provide up to seven years of additional life expectancy. The Okinawans call it "ikigai," and Nicoyans call it "plan de vida," which translates to "why I wake up in the morning." It's what you live for — a mother's love for her infant child, Mother Theresa's quest to care for the sick, a Holocaust victim's desire to survive, etc.

Kick Back and Relax: Stress leads to chronic inflammation and is associated with every major age-related disease. Long-lived people have routines that shed stress. For example, Okinawans take a few moments each day to remember their ancestors. Adventists pray and have Saturday Sabbath. They create "a sanctuary in time" where they focus on God, family, and nature. Ikarians take a nap, and Sardinians do happy hour. Kicking back entails taking time to relieve stress, so pause to watch a brilliant thunderstorm, rock in a hammock, or stare at a colorful rainbow.

Eat Less: Blue Zoners eat their smallest meal in the late afternoon or early evening, and they don't eat any more the rest of the day. Okinawans practice the 2,500-year old Confucian mantra, "Hara hachi bu," which means they remind themselves to stop eating when they are 80% full.

Eat Less Meat: Beans, including fava beans, black beans, soy beans, and lentils, are the cornerstone of most centenarian diets (serving size 3–4 oz.). Meat, mostly pork, is eaten on average only five times per month.

Drink in Moderation: People in all Blue Zones (except Adventists) drink alcohol moderately and regularly. Moderate drinkers tend to outlive non-drinkers. Sardinians drink 1–2 glasses/day (preferably Sardinian Cannonau wine) with friends/family and often with food.

Belong: All but five of the 263 centenarians interviewed by Blue Zones belong to some faith-based community. The denomination doesn't seem to matter, but attending faith-based services (on average four times a month) can add 4–14 years of life expectancy.

Loved Ones First: Centenarians in the Blue Zone put their families first, meaning keeping aging parents and grandparents nearby or in their homes. They commit to a life partner. They invest in their children with time and love, and they generally are more likely to receive care from them when the time comes.

Stay Social: The world's longest-lived chose (or were born into) social circles that support healthy behaviors. Okinawans created "moais" — groups of 5 friends that are committed to each other for life. Research from the Framingham Studies shows that smoking, obesity, happiness, and even loneliness are contagious, and if your closest friends are obese, there is a strong likelihood that you will be as well. The point is that the social networks of long-lived people have favorably shaped their health behaviors.

The future of chronic disease management

The future of disease management lies in abandoning our treatment-oriented model of health care and replacing it with a health-promotion/disease-prevention model. The goal should be to reduce the duration of disease or illness — to compress morbidity. We can attack the issue on numerous fronts, and there is no doubt that we will continue to employ traditional and innovative approaches, such as Big Pharma, telemedicine, genetic testing, computerization, medical metrics, scanning devices, artificial intelligence, biotechnology, etc. However, at the very core of successful disease management will be the human element of creating a partnership between patients and providers. Individual patients must take responsibility and ownership of their personal health. Health care providers must gain a deeper appreciation of the psychology of health, such as motivational theory and issues of compliance. It is critical that we understand what makes a person willing and able to respond to appropriate and effective interventions

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and that we attack the barriers preventing individuals from implementing these healthy lifestyle practices.

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Predicting the Future of Respiratory Care for Geriatric Patients

by Mary Hart, MS, RRT, AE-C, RCP, FAARC, FCCP

When I was asked to write this article about my prediction of what respiratory care for geriatric patients might look like in 20 years — me being a Baby Boomer — my first thought was of "The Jetsons!" It was a 1960s popular primetime cartoon show that featured George Jetson and his family living in a utopian future. Each week, the show followed the Jetson family through their daily lives, exposing us to flying cars, living in homes in the air, moving sidewalks, robots, and futuristic communication devices. They even had a robot for a maid, and their dog Astro talked! George's boss visited him on a "Big Screen" where they talked instead of just using a telephone. That was so many years ago, and while we still don't have all the conveniences they had and our technology isn't quite there yet, we are getting really close! At this point, you're probably wondering how this cartoon relates to health care for the older adult in the next 20 years.

If you think about it, we already have watches and other wearable devices that tell us when to breathe and when to stand or how much activity we've completed for the day. What if we had a robot dog, a "smart dog," that was our health companion and could communicate and use logic? Many people live alone today and rely on service animals to help them with medical issues. This "smart dog" could remind them to take their medication and track their adherence, measure vitals, monitor sleep, etc. — all the while being a "companion" and carrying on general conversations or going on walks with them. Think about how much more information there would be immediately available for any health care decisions if we had "smart dog" monitoring and decision making.

What about that "Big Screen" — could a health care provider use it to educate a patient, similar to what we are attempting to do now with telehealth?

Before we get too far down the road with ideas and predictions, let's take a look at what the aging population may look like in the future.

about the author...

Mary Hart, MS, RRT, AE-C, RCP, FAARC, FCCP, is Director of Research at Allergy & and Asthma Network. As a respiratory therapist she has a range of experience and expertise including management, pulmonary rehabilitation, chronic disease management, patient advocacy and research.

What health and aging agencies say about the aging population today

For the first time in history, most people can expect to live into their 60s and beyond. By 2050, the world's population aged 60 years or older is expected to total two billion, up from 900 million in 2015. The U.S. population is aging rapidly. By 2030, 71 million Americans, which is about 20% of the population, will be 65 or older. This is due to the Baby Boomer population.

A longer life brings with it opportunities not only for older people and their families, but for societies as a whole. Some people use the prospect of additional years to pursue new activities, such as furthering their education, traveling the world, starting a new career, or pursuing a long-life passion. Older people can contribute in many ways to their families and communities. Yet the extent of these opportunities depends on their health. If people can experience these years in good health and have a supportive environment, their ability to do things they value will not be much different than those of a

younger person. If their years are dominated by a decline in health, be that physical or mental capacity, this will have a negative impact for older people and society.

Because there is diversity in age — some 80-year-olds have physical and mental capacities similar to many 20-year-olds — the public health response must address this wide range of older people's experiences and needs. Older people are often stereotyped as frail and dependent, as a burden on society. Public health and society as a whole, need to address these ideas, which can lead to discrimination, affect the way policies are developed, and restrict the opportunities older people have to experience healthy aging.

The Baby Boomers are at high risk for complex health problems, chronic illness, and disability. They will continue to be the heaviest users of health care. Currently, older adults account for an enormous portion of health care including hospitalizations, primary care physician office visits, home care, and nursing home care. With this population doubling in the next 30 years, every medical specialty will have an increase in their older patient base. Society is faced with great challenges regarding health and social services, and thus gerontology represents the future of health care.

Let's get to a few of my predictions for geriatric care in the future.

Prediction #1: Technology will take us to places we never imagined.

I believe the "Big Screen Doctor" (or "Big Brother," as Baby Boomers might call it) will be common in the delivery of care for geriatric patients. The use of artificial intelligence (AI) will become routine: an AI health care provider will make immediate evidence-based decisions on the basis of symptoms and an assessment done anytime and anywhere. The use of small, portable diagnostic testing will be available at a finger's touch. Reliable technology will provide testing through televisions, phones, computers, and wearable devices. We will be living in the SMART WORLD! Not only vital signs, but lung ultrasound,pulmonary function, sleep studies, body scans — all will be done remotely. I don't want to say AI will take the place of a health care provider; rather, we will have AI to help provide us with information that will be immediately available on every device and tremendously enhance our ability to evaluate and treat patients effectively in a timely manner. We are already seeing it move in that direction with videoconferencing and telehealth visits using these devices in patients' homes. Because technology will be so far advanced from today's world, every detail about the patient will already be known to the health care provider.

Respiratory therapists will be included in the team of experts that will provide the evidenced-based care and research information for the "intelligence" built into the AI devices. More RTs will become researchers and information technology experts in the field of pulmonary medicine, with specialty training, such as gerontology. Today most respiratory therapists' practice from the bedside. The future will be much broader and will include a Respiratory Advanced Practitioner and designers of fashionable, intelligent clothing and "smart dog" devices. Imagine that!

Prediction #2: Pulmonary rehabilitation will finally get the spotlight it always deserved!

As noted above, the Baby Boomer population is growing, and they are predicted to use a tremendous amount of health care resources. Although we say we have focused on preventive care in the past, we really haven't been able to make much of a difference in those with chronic lung disease due to smoking or environmental exposure. Cigarette smoking doesn't have an immediate impact on lung function, and so people don't think it affects them. Symptoms due to lung disease come on gradually and usually are not perceived until they are over 50 years old. When they do seek medical attention, the damage is already advanced. From research we know that pulmonary rehabilitation has been shown to be very beneficial for people with chronic lung diseases. It hasn't been used to its potential, however, mainly because of poor reimbursement. I believe pulmonary rehabilitation will become a "Star in the Spotlight" for the Baby Boomers who end up with COPD in the near future.

Today pulmonary rehabilitation, generally directed by RTs, is usually performed at a hospital or out-patient facility where patients mustcome to a gym for two or three days a week for several weeks. However, many programs close due to financial reasons, and there are very few in rural areas of the United States. Having to travel to a place for pulmonary rehabilitation can be a burden for patients due to travel distance, cost,

transportation, and even conflicts with employment, as many people continue to work past retirement age.

What if pulmonary rehabilitation was supported and reimbursed accordingly by Medicare and insurance companies? I predict it will be funded by some entity, and that we will see "pop-up pulmonary rehab sessions" in neighborhoods, traveling vans/buses of RTs trained in pulmonary rehabilitation throughout the nation, and internet-based pulmonary rehabilitation with AI, to document patient outcomes. Specialty training and credentialing for RTs and a team of chronic disease specialists will be needed to support this evolving program and overall care. It will be a great time for RTs who love to work with COPD and geriatric patients. Lots of Baby Boomers smoked….lots of things. Hopefully, the future looks different for the other generations. The big question is how do we prevent this for the future generations?

Prediction #3: Keeping the golden years golden: taking responsibility and staying active.

I believe there will be more focus on healthy living for older adults as they move into the golden years. People are already taking more responsibility for their health. There are all types of activities for older adults at Senior Centers, gyms, churches, and other places where they socialize. Taking responsibility may simply mean getting out of the house, treating depression that may occur with aging and chronic disease, and maintaining a healthy lifestyle. More seniors are already finding ways to be healthier, both physically and mentally. How will it look in the future?

Staying active is very important for everyone, but even more so as we age. I predict that social venues for Baby Boomers will grow and change in the future. We will see yoga classes and water exercise classes in every neighborhood, and social activities that include biking and hiking and traveling the world together will be common. City and state government policies may even support some of these "Golden" activities or offer incentives for them to participate. There will be a need for Golden Activity Program directors who hold degrees and training that includes health care to lead these events – maybe a team of advanced practitioners.

Families of older adults and society as a whole will also become more responsible in caring for the aging population and helping them maintain their independence for as long as possible. Many will have chronic illness complicated by comorbidities and will require much more care than others. We must address this, too. Most people don't want to be placed in a "home" at the end of their life. With all the advancements in technology, will families be able to keep their loved one at home for end-of-life care? Will the "smart dog" become the "smart watchdog" to allow aging individuals to stay with family instead of being placed in a "home?"

The future holds the answers. I've tried think outside the box a little and make a few predictions based on what I see taking place in health care now with a focus on the older adult. Let's continue to be creative, keep the patient as the main focus, get involved in research, and take respiratory therapy into the future! ■

Future Predictions for Sleep Medicine

by Jessica Schweller, MS, APRN-CNP, RRT, RRT-SDS

When looking back at sleep medicine 30 years ago, it's easy to see that the field has truly evolved. Back then, tracheotomies were common practice and CPAP was the new kid on the block. Nasal masks were the norm and nasal pillows had not established a presence in the market. The only humidification option was a detached cool pass-over, and heated humidification was a rarity. There were no downloads or smart chips, just total clock hours on the machine. Machines were big and bulky, and they had limited capabilities. The only diagnostic tool was a polysomnogram. Today, as sleep medicine continues to grow, screening, diagnostics, and treatment have taken a giant leap into the future. Technology has driven many of the evolutions we have witnessed, and these will continue to thrive into the next generation. Patients have options now when it comes to treatment, and the advances have allowed us to shift our focus from testing and diagnostics to the treatment and management of sleep disorders. This article will take you into the possibilities of what the future holds for sleep medicine in the next 10 to 20 years.

about the author...

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Evaluation and testing

Smart watches, smartphones, apps, and other devices have become a part of everyday life for most people. As the future of sleep medicine evolves, the possibility exists that smart devices will become an integral part of the diagnostic procedure for patients.[1] Advancements in breathing detection and home monitoring can allow a patient to self-screen prior to seeking evaluation. Modern beds will come with built-in sleep-monitoring devices that report snoring and restless sleep, along with observed apneas, to your smart device, and you will be able to share this with your provider for possible diagnostic criteria. Insurance companies will embrace this technology due to cost effectiveness and may begin covering more smart devices for patients as part of their benefits. Current "smart" beds are now able to adjust when snoring is detected, so in the future we can expect that our beds will be able to do so much more when it comes to evaluation and reporting. If a patient suspects that he or she may have sleep apnea, all they will have to do is activate a setting on their smart device and it will track, record, and assist in diagnosing sleep-disordered breathing. There will be more EEG monitoring from remote devices, and sleep staging may become something that even lay persons start to evaluate from home. Home portable sleep testing broke the ground for less invasive diagnostic tools, and this is only going to get easier in the future. Technology will allow for the option of cameras built into smart devices in the home to be able to view the patient as necessary during the study, thus expediting diagnostics and treatment. This technology can also be used to assess the efficacy of certain therapies.

Artificial intelligence may potentially take over scoring of sleep studies, thus providing sleep clinicians more time at the bedside and allowing better differential diagnosis as precision medicine improves. This will improve the time it takes a physician to score a sleep study and allow them more opportunity for clinical duties. Although this could eliminate the need for some sleep technicians in the lab or clinic, such advancement could allow RTs and sleep technicians to work in other roles in sleep medicine; for example,

their skill sets could be enhanced to provide more education and management of treatment in the clinic or sleep center. This type of technology will also allow for more real-time diagnostics in the form of sending notifications to the ordering physicians during the sleep study. As the artificial intelligence device senses an abnormality or severe apnea episode, it can alert the physician on call.

Genetic testing is currently being done to help evaluate for narcolepsy and cataplexy, and in the future there will be testing that can predict the possibility of obstructive sleep apnea.[2] With genetic mapping, one can evaluate the possible predisposition for a sleep disorder. As we learn more about genetic testing, other tests will be available to primary care providers and other specialists for screening, similar to screening for diabetes and certain cancers.

Treatment

CPAP has been the first-line therapy for sleep apnea treatment for decades, but adherence to therapy has been minimal.[3] Adherence can vary based on the patient's experience, settings, interface, and comorbid conditions. Although CPAP masks and machines continue to improve, alternative therapies have emerged and are showing more data to support equality in efficacy. Another prediction is that CPAP will become a lower-tier option for treatment when it comes to sleep apnea, and more evolution of hypoglossal nerve stimulators and other neurostimulators will emerge. This will allow patients the freedom of not depending on electricity for therapy and finding an option that would minimize the burden for a mask and hose.

Oral appliance therapy will continue to improve, and new technology will allow mandibular advancement devices to evolve as an ideal form of therapy. The current efficacy rate is generally 60–100% and continues to rise. Having smart technology to monitor the efficacy of these devices will improve adherence with these devices along with perceived and objective sleep quality.

One negative prediction that may be forthcoming in sleep medicine is the impact of a more sedentary lifestyle on sleep quality and sleep disorders. As we see the population becoming more obese and sedentary, the risk for cardiovascular disease will increase. With the increase in cardiovascular disease, sleep apnea and insomnia may become more prominent. Along with these comorbidities comes depression, which then perpetuates a vicious cycle that is not easily discontinued. Also, as technology continues to advance and our lifestyles incorporate more and more stimulation before bed (smartphones, computers, and television), insomnia can increase. As consumers, we can improve our sleep quality with small changes in behavior. The hope would be to see more devices come with improved blue light blocking technology to improve an individual's ability to decrease stimulation when using these devices. One can also foresee an increase in insomnia medication as pharmaceuticals continue to capitalize on the market. We have seen an evolution in treatment modalities for insomnia, with online programs, applications, and other live options for cognitive behavioral therapy for insomnia.

Just as sleep aids will continue to evolve, stimulant therapy will also see a turn for the better. We currently have a limited number of medications approved by the FDA to treat narcolepsy and hypersomnia, but there are already several new options emerging on the horizon.[4] These new medications provide options for patients who seek assistance in wake promotion but have been limited to what is currently available. As more and more understanding of how narcolepsy and hypersomnia occur develops, improvements in treatment options will continue to emerge. There will be longer-acting medications with fewer side effects hitting the market. Another potential for treatment may be neurostimulation for hypersomnia.

Conclusion

Just when we think sleep medicine has reached its peak in evolution, our future brightens with new possibilities that may arise. As technology continues to expand, so do our options for evaluation and treatment. More options for diagnostics will lead to more patients coming forward for evaluation of sleep disorders. Providing patients with more than one option for treatment of sleep apnea may improve adherence to therapy, no matter what modality the patient may choose. Medication research and development will continue to provide options for patients who may have been refractory to treatment in the past or have increasing symptoms of both insomnia and hypersomnia. Continuing to promote a healthy lifestyle with daily exercise and good dietary choices should be an ongoing discussion as well because this can improve comorbidities that may lead to sleep disorders. Ongoing research regarding the implications of sleep-disordered breathing and comorbidities can help guide our discussions regarding education and management of sleep disorders, not only with new

patients but also with those already diagnosed. As sleep medicine evolves, the RT's role will expand to allow for more effective evaluation, treatment, and education in sleep disorders. ■

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We Appreciate Our 2019 *AARC Times* Article Reviewers!

The *AARC Times* staff offers our sincere thanks to the people who took time to review the clinical articles in our publication throughout this year. Your special expertise and dedication to the respiratory care profession were critical to our ability to publish informative articles for the respiratory care professional. Thank you, reviewers!

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EVOLVING ALONG WITH THE PROFESSION

How we went from a news and features publication to one that covered clinical topics, too

by Debbie Bunch

Next July, *AARC Times* will celebrate 43 years of continuous publication. Forty-three doesn't seem like a momentous anniversary, but for us, it will be, because 2020 marks the first year that we will be an all-digital magazine.

December is our last month in print, and as we look forward to a brave new future beginning in January, we are taking a few moments to reflect back on all the ways we've grown as a publication as respiratory care has grown as a profession. Nowhere has that been more evident than in the clinical arena — an area we really didn't even cover until we entered our third decade.

Finding our clinical side

Did you read that right? *AARC Times* did not always cover clinical topics? That's right — we did not. When the magazine was established in July 1977, our founders envisioned a publication that would stick to Association news and feature stories about people working in the field, leaving the clinical side to Respiratory Care. When we did talk about clinical issues, we basically looked at changes that needed to be made on the organizational front to deal with them.

A good example occurred in that very first issue. Take a look at the cover and you'll see a young and somewhat bewildered RT with four arms, each of them holding a piece of equipment representing a specialty area in the field. The cover copy summed it all up nicely — "The Evolution of a Clinical Specialist" — and the accompanying story was a Q&A with the members of a new committee established by the NBRC to assess the need for specialty examinations in the profession.

It was a brand new concept at the time, but one that leaders in the field felt was sorely needed as the profession continued to adapt to advances in medical care. By the late

1970s, intensive care units were commonplace in hospitals, new units were being established to care for premature infants, pulmonary function testing was becoming more and more sophisticated, and pulmonary rehabilitation programs were on the rise. As the '70s gave way to the '80s and '90s, it was clear that other specialty areas needed RTs as well, including home care, transport, and sleep. The advent of the 21st century has seen therapists stepping into clinical specialty roles in the areas of disease management, patient education, and patient navigation as well.

All this diversification meant Respiratory Care was publishing more and more original research as well, and thus had less and less space for the informative articles it previously featured on clinical topics. By the time *AARC Times* came to the end of its second decade, it was evident to all that our original "news and features only" concept just wasn't getting the job done and our readers needed much more from us than we were giving them. AARC leaders decided that *AARC Times* could and should pick up the slack in clinical coverage — and that is exactly what we did.

Coming full circle

Our first foray into the clinical arena began in earnest in the late '90s, with the publication of articles aimed at providing working therapists with a broad overview of new developments in care and technology. Advances in oxygen therapy? We found someone to cover them. New modes on critical care ventilators? We had experts who could break them down for RTs. Innovations in aerosol therapy devices? Our stories let everyone know how they worked and what they offered patients.

While we still left the publication of peer-reviewed research studies to Respiratory Care, we realized that there was plenty of room to examine the key clinical issues of the day and bring clarity to new technology and new techniques to our readers in columns ranging from Clinical Perspectives to Ventilation for Life to Chronic Disease Manager and more. In an ever-changing profession like respiratory care, there was no end to topics to cover, and many of those topics we've covered over and over again because the treatments and modalities have continued to change and improve over the years.

We come full circle in this final print edition of *AARC Times* with articles by leading respiratory therapists who take a closer look at what they believe the future holds for the profession and their areas of specialization. Together they reflect a message of transition and growth — similar to the transition and growth being experienced by the magazine as we move into our next era with the all-digital edition.

But one thing won't change. As we have for the past 20+ years, we will continue to offer insights into clinical topics important to the profession and its patients. Indeed, with the all-digital format we'll have even greater opportunities to keep respiratory therapists informed about new developments because we'll be able to share even more detailed information via hyperlinks to charts, graphs, and other sources.

New and richer reading experience

Couple that increased interactivity with all the other advantages of a digital format, and it all adds up to a richer reading experience for AARC members. We'll end this article with a quick look at what the digital publication offers —

- A colorful and clickable format — pick the article you want to read and up it will come. Hit the "Back" button to go back and read more.
- Easy reading on any device, thanks to our web-based format.
- Access to past issues from the front page. Just scroll down to see earlier editions in the same colorful, clickable block format.
- No time to sit down and read? No problem! Just click on the "Audio" icon at the top of each article to catch up on *AARC Times* during drive time or down time at home.
- You'll find a "Print" icon at the top of each article page, too. So if reading on paper is a habit you want to maintain, you easily can.
- Want to share articles with friends and colleagues? Links to social media make it easy, or you can use the "Email" icon to send specific articles directly to those you feel would benefit from reading them.
- You can catch up with other AARC news and information right from the front page of *AARC Times* as well — links at the top of the page will take you to everything from AARC News to Industry News to Member Services and more.

So if you've always gotten the print edition of *AARC Times* and are not sure you will really like the all-digital concept, read this final issue on paper and then go to AARC.org and click on "AARC Times" in the menu on the bottom of the page to experience the same issue in the digital format. We think you'll agree — all-digital opens the door to exciting new possibilities for the magazine and its readers, not just in terms of the clinical topics we cover, but for all of the other great content you've come to expect from us as well. ■

OUR TOP 25

AARC Times staff share 25 of their favorite covers over the past 42 years

by Debbie Bunch

Since the very beginning, one of the biggest questions those of us on the *AARC Times* staff have faced each month is what to put on the cover of the magazine. Sometimes the answer has been obvious — for example, we have always known our AARC Congress issue would feature a photo of the Congress venue, that the issue featuring the story on the winner of the current year's Jimmy A. Young Medal would feature a photo of the winner, and in more recent times that the annual report issue would shine the spotlight on a number of AARC members in our "We Are AARC" series.

But on many other occasions, what to put on the cover hasn't been so clear. Maybe we had a couple of articles that were cover story-worthy and a debate ensued as to which one to choose. Maybe someone sent us a fantastic photo that we decided just had to have a story to go along with it so we could put it on the cover. Maybe we had a great story that didn't really lend itself to a photo of a real RT or real patient and we turned to our graphic artists to find a "concept image" to convey the message readers would find in the article.

Whatever the situation, though, the cover was always paramount because we knew it would be the first thing our readers would see when they pulled the print magazine out of their mailboxes or picked it up from the breakroom table at work. We had to get it right, and for the most part, we think we did.

As we say goodbye to print with this issue of the magazine, we thought it only fitting to sit down with the bound volumes we have in the AARC Executive Office and look back at all of our covers over the past 42½ years to see which ones have stood the test of time. These 25 covers popped out for us, and we want to share them with all of you here. ■

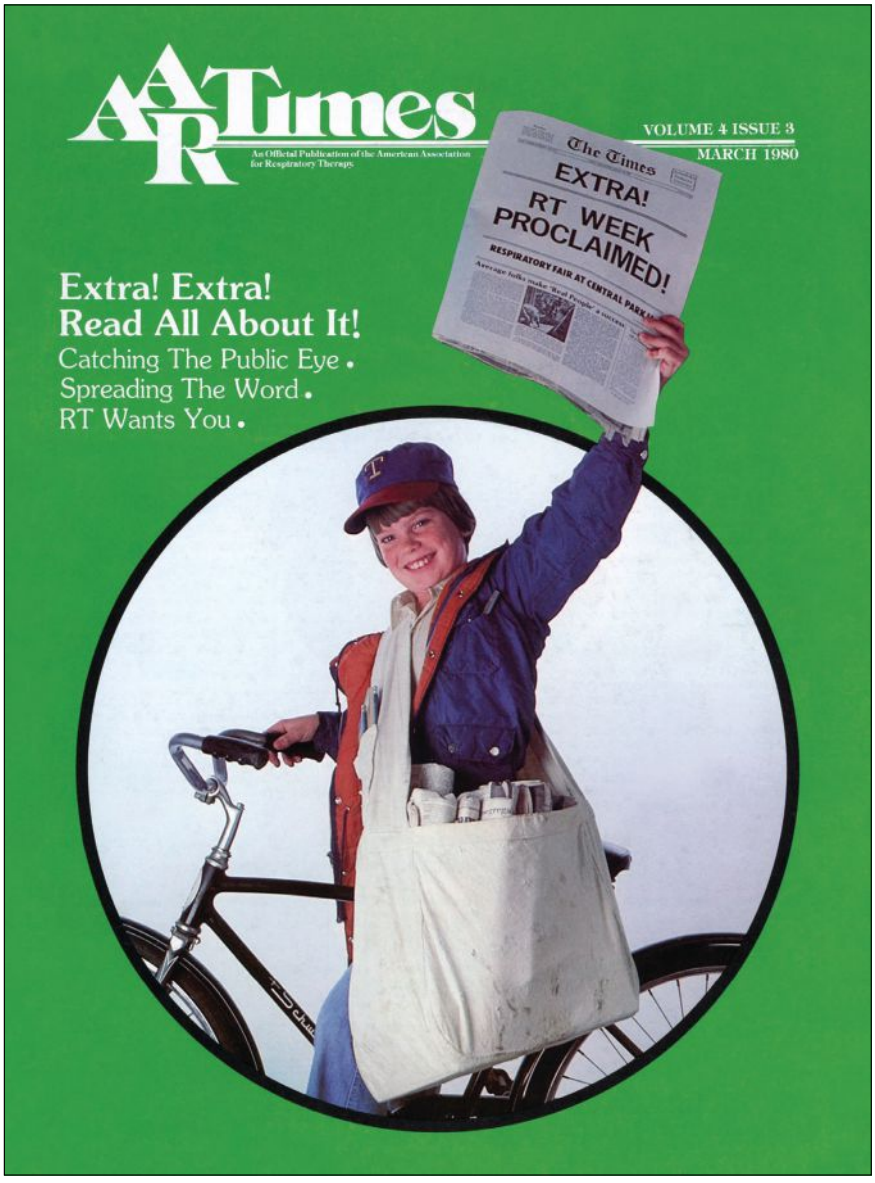
NOV 1978

The profession was in the midst of a manpower shortage back in the late 1970s and this story outlined the problem and how managers were attempting to cope with it.

OCT

1979

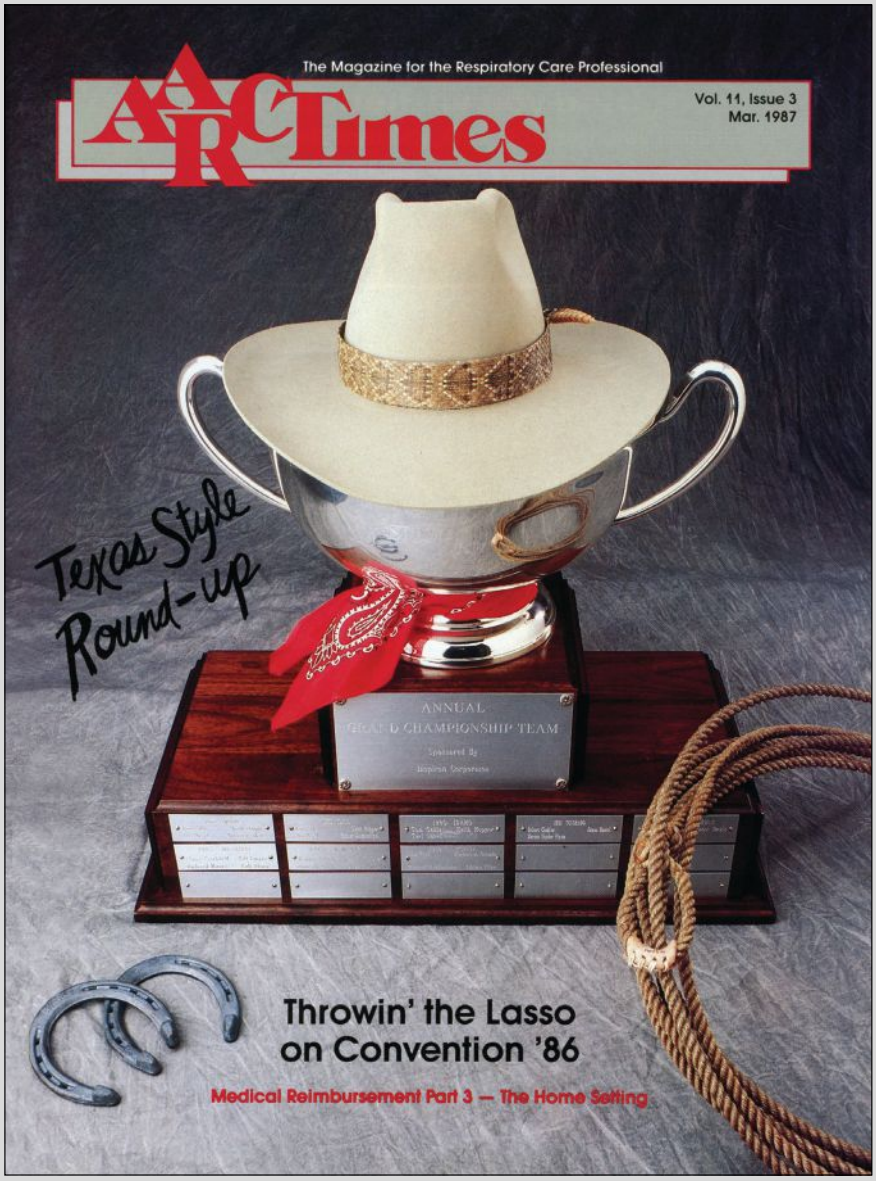
Highlighting the AARC Congress has been a long-standing tradition for *AARC Times*.



MAR

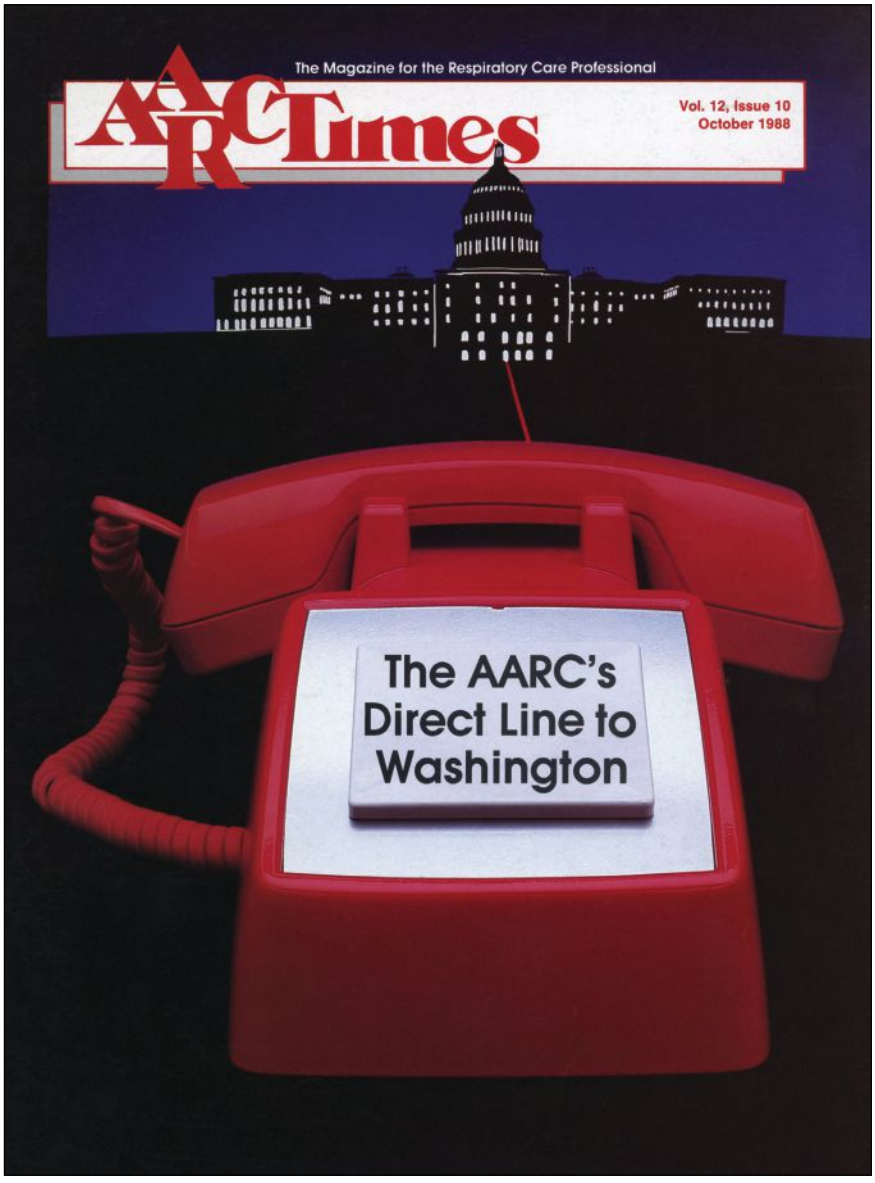
1980

National Respiratory Care Week wasn't officially proclaimed until 1982, but we were thinking ahead in this cover story about all the ways we were raising awareness of RTs.



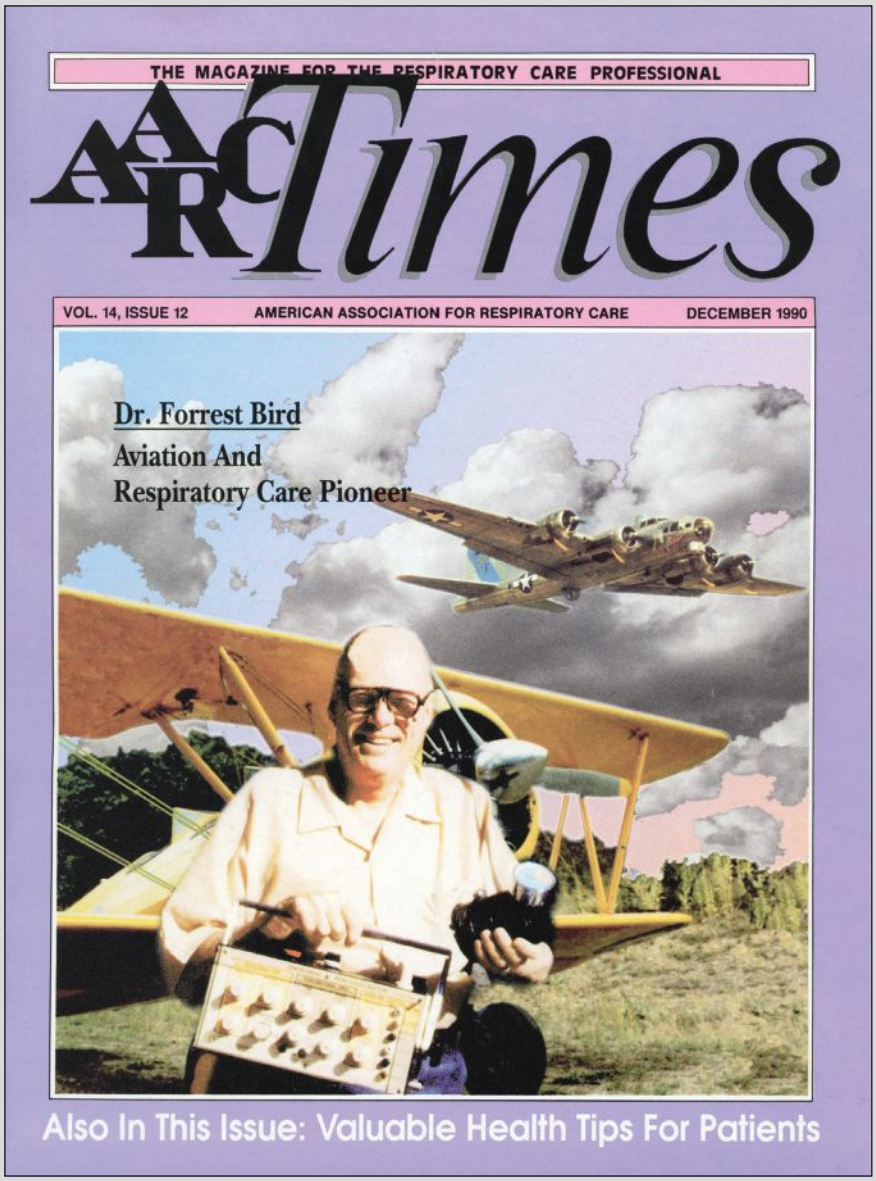
MAR
1987

The Sputum Bowl and everything else about our annual meeting had a decidedly Texan flare at our 1986 Congress in Dallas.



OCT
1988

This article chronicled a day in the life of our director of legislative affairs in Washington, D.C.

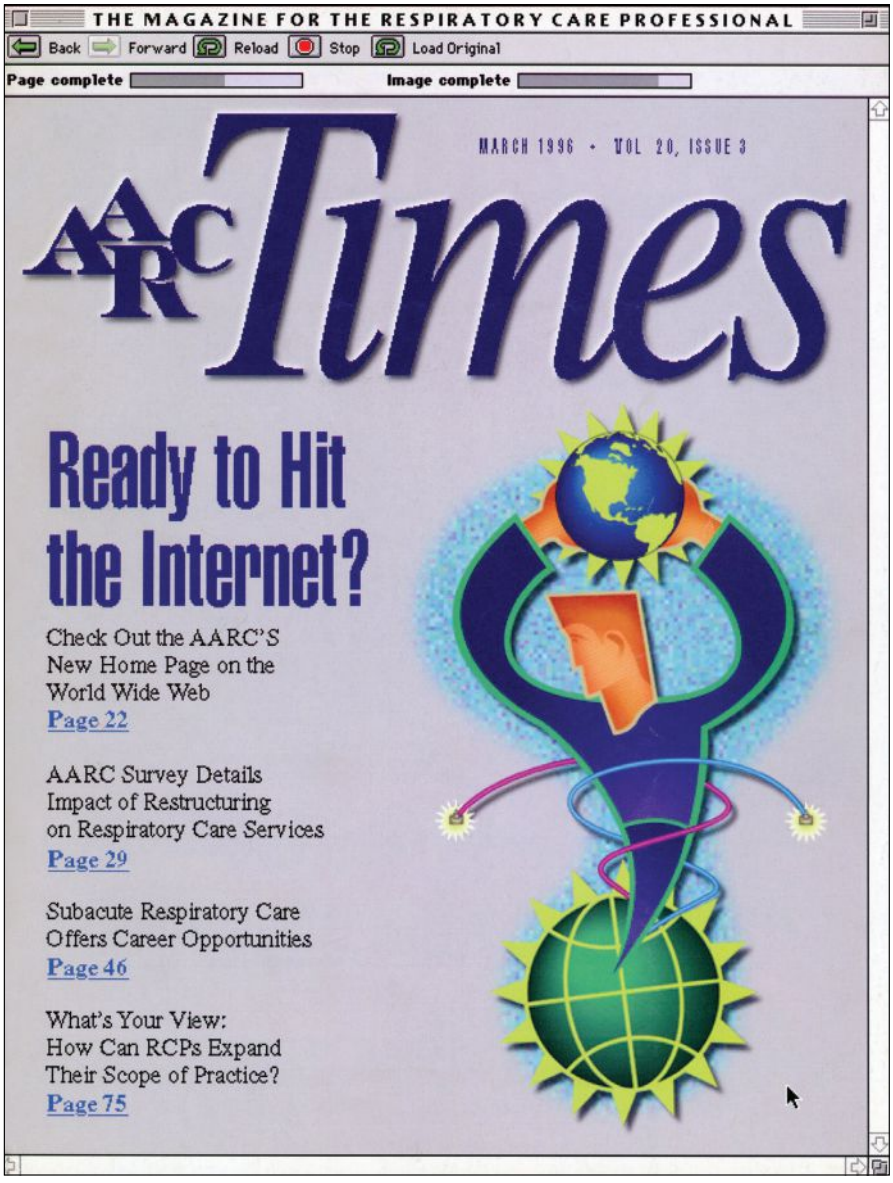


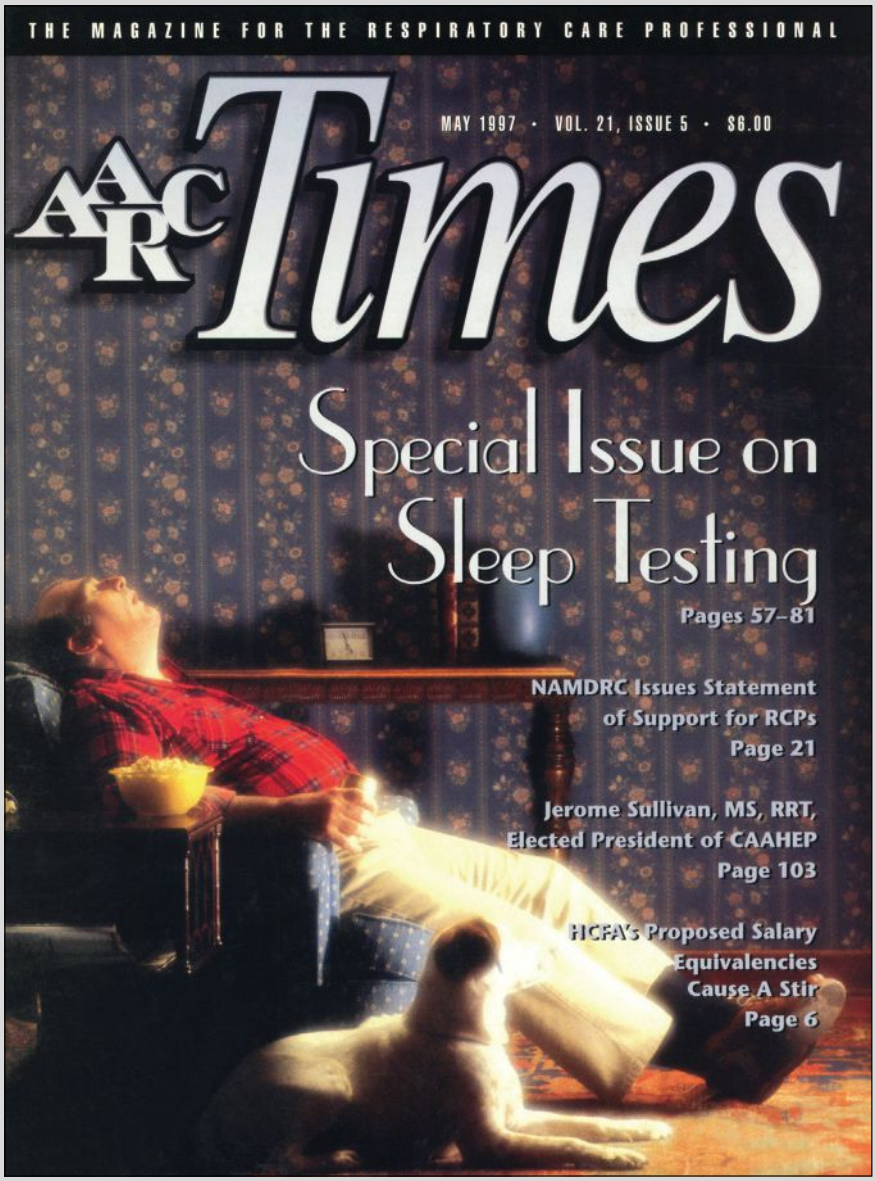
DEC
1990

Forrest Bird has long been a legend in respiratory care and this story explained why.

MAR
1996

Our first foray into the brave new world created by the World Wide Web was a harbinger of great things to come.





MAY 1997

Sleep was still a relatively new frontier in respiratory care back in the 1990s and we covered the latest developments in this special issue.

OCT
1997

The AARC turned 50 in 1997 and we were there to report on the journey we took to get to the mid-century mark.

OCT
2001

9/11 rocked the nation, and we were there to find out how RTs were affected and how they helped their communities in the aftermath.

NOV
2001

What was RRT George Beck doing on this cover? Floating around in NASA's "vomit comet" as part of his research into the physiological effects of space travel.

JAN
2005

RTs who staff the emergency medical services vehicles that bring definitive care to patients were profiled in this edition.

NOV 2005

Tom Petty, MD, was beloved by everyone in the profession for his unwavering dedication to patients suffering from chronic lung disease.

AUG
2006

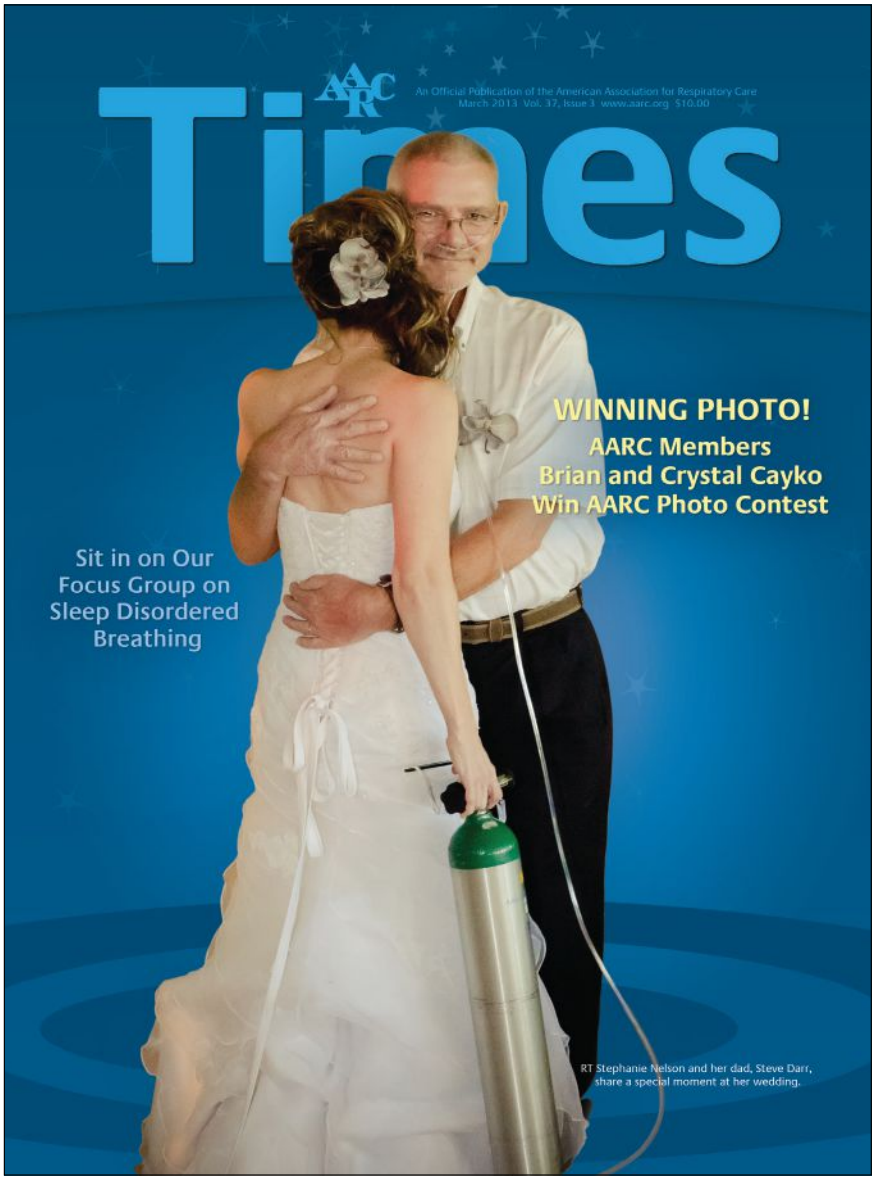
Nebraska therapists explained the role they were playing in their hospital's state-of-the-art biocontainment unit.

JAN
2007

This little girl represented thousands of others who were receiving compassionate care from RTs.

JAN
2011

Supplemental oxygen was not about to keep this little lady from enjoying her life.



MAR
2013

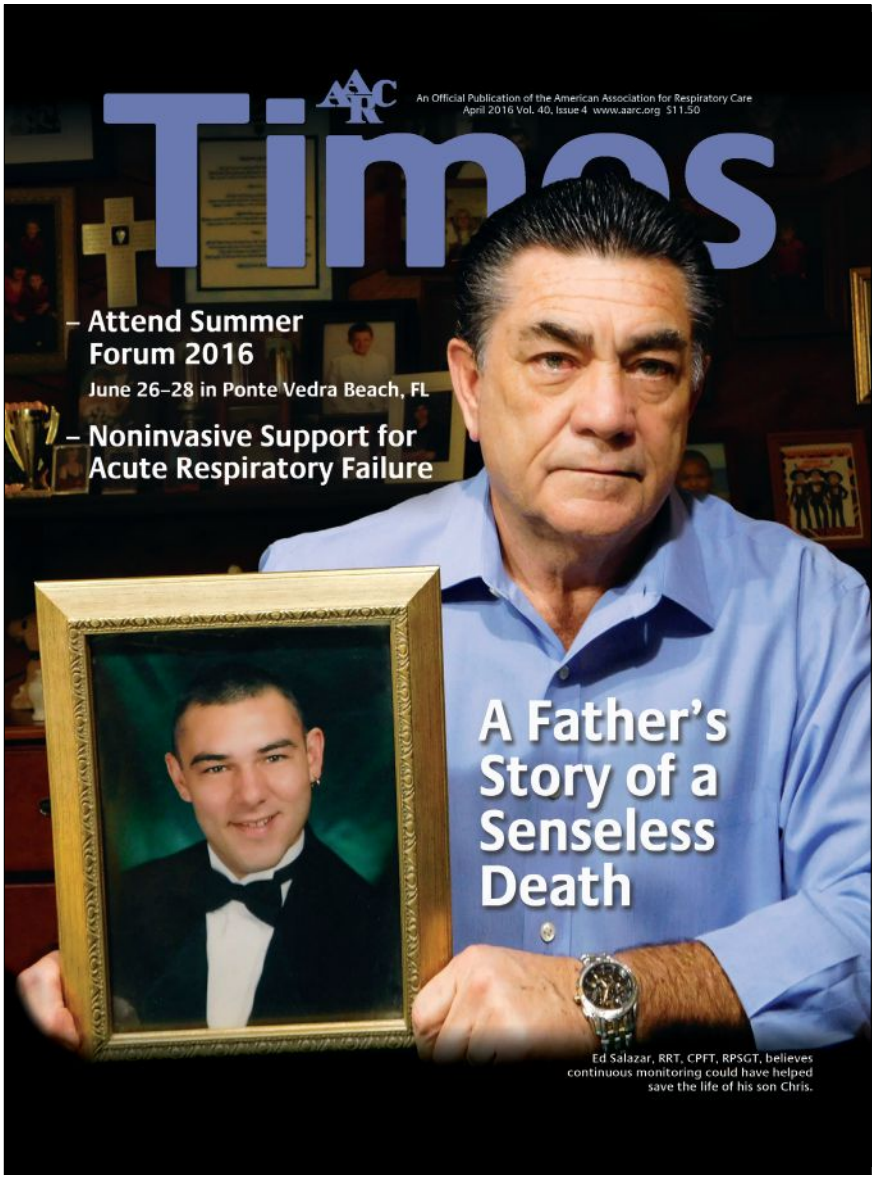
Is there anything better than seeing a dad overcome his respiratory condition well enough to dance with his daughter at her wedding? Our 2012 photo contest winners didn't think so.

JAN
2016

Our 2015 Closing Ceremony speaker explained all the ways RTs were making a difference in her care.

APR
2016

Patient safety went into the spotlight in this heart-wrenching article about the unnecessary death of the son of an AARC member.



MAR
2017

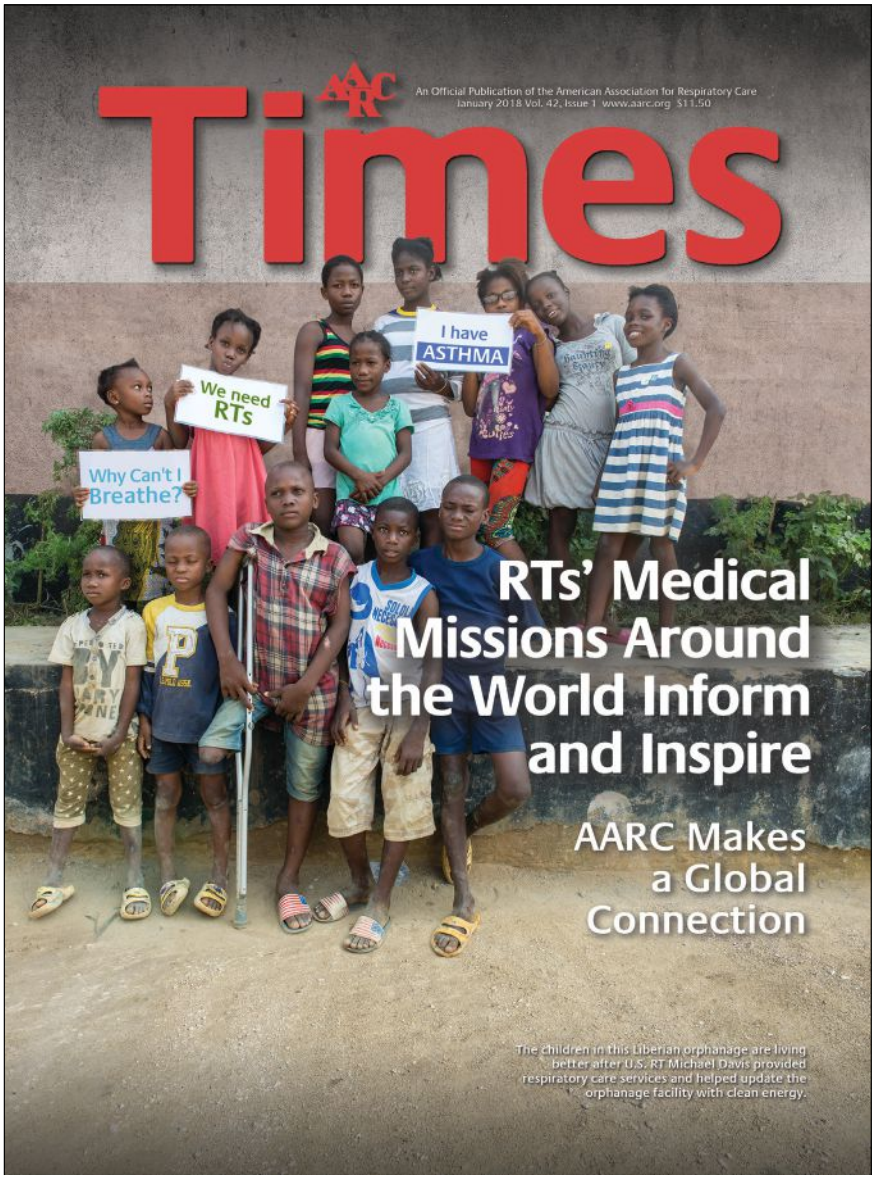
The profession's commitment to diversity took center stage in this issue.

MAY
2017

Our special tribute to the only RT known to have died on the battlefront.

DEC
2017

The Indiana Society for Respiratory Care went above and beyond to wow attendees who came by their booth at AARC Congress 2017.

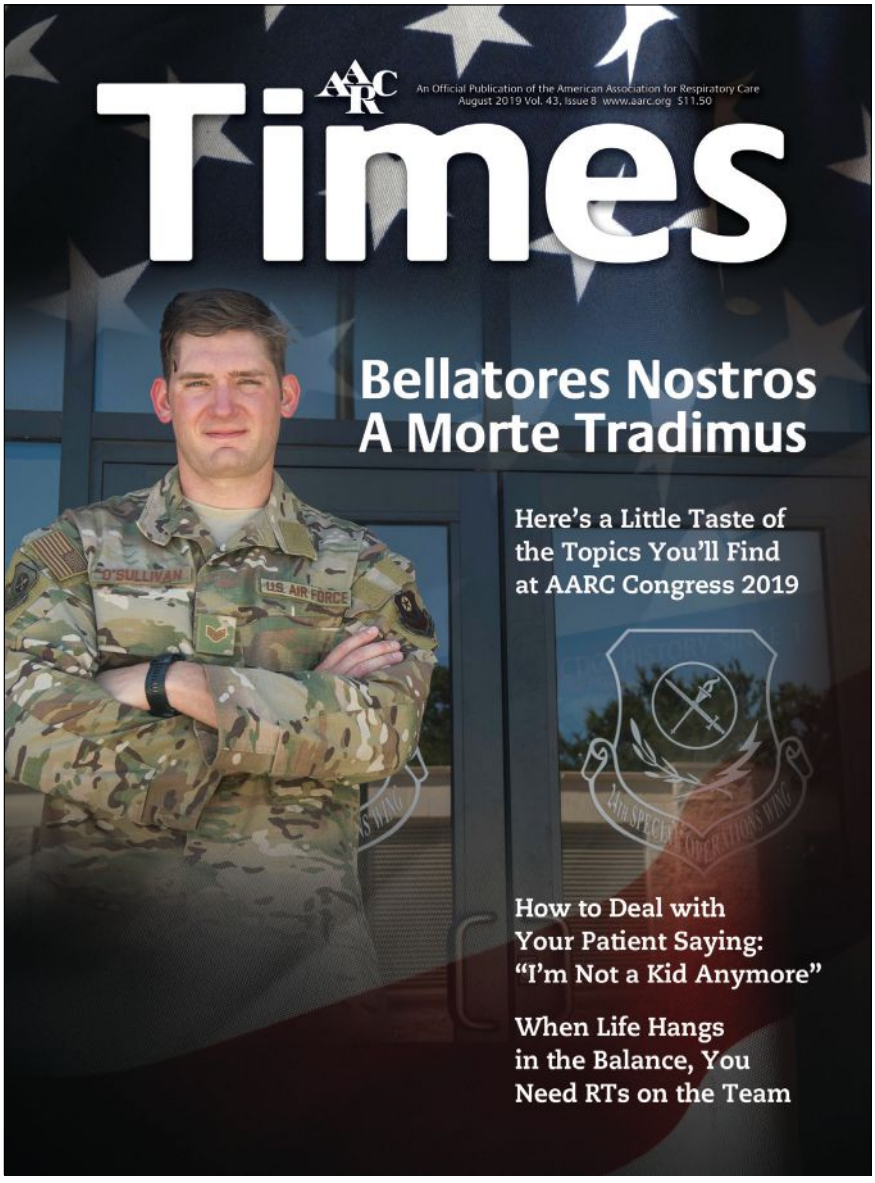


JAN
2018

These African children are among the many who have been helped by RTs who volunteer their time for medical missions to nations in need.

FEB
2018

Helping patients and families cope with end-of-life discussions was the focus of this issue.



AUG
2019

Staff Sgt. Joshua O'Sullivan provided an inside look at the RT's role on the Air Force's Special Operations Surgical Team.

RC Currents

IN THE NEWS

Cannabis Production May be Adding Pollutants to the Air

Now that marijuana is legal in several states, cannabis-growing facilities are proliferating. Could they be adding to the problem of air pollution? According to new research out of the Desert Research Institute (DRI) and Washoe County Health District in Reno, NV, the answer may be yes.

Investigators visited four cannabis-growing facilities in Nevada and California to learn more about the chemicals they emit into the atmosphere during the cultivation and processing of the plants and to evaluate the potential impact on urban air quality. At each facility, the team found high levels of strongly scented airborne chemicals called biogenic volatile organic compounds (BVOCs), which are naturally produced by the cannabis plants during growth and reproduction. At facilities where cannabis oil extraction took place, researchers also found very high levels of butane, a volatile organic compound that is used during the oil-extraction process.

"The concentrations of BVOCs and butane that we measured inside of these facilities were high enough to be concerning," explained lead author Vera Samburova, PhD, associate research professor of atmospheric science at DRI. "In addition to being potentially hazardous to the workers inside the cannabis-growing and processing facilities, these chemicals can contribute to the formation of ground-level ozone if they are released into the outside air."

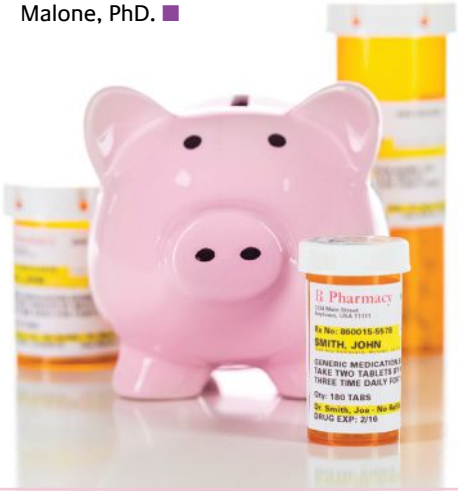
At one of the four facilities, the researchers measured emission rates over time to better identify the ozone-forming potential of each individual plant, with results showing that the BVOCs emitted by each cannabis plant could trigger the formation of ground-level ozone at a rate of approximately 2.6 g per plant per day. While the significance of this number has yet to be determined, Dr. Samurova and her colleagues feel strongly that their findings have raised questions that warrant further study. The study was published in a recent edition of the *Journal of the Air & Waste Management Association*. ■

Contribute to the AARC "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 aarc.org/go/transitions. Please provide any information about the member's recent death, such as an obituary, so that we can share it with our members and pay tribute. ■

Prescription Drug Costs Drop for Consumers

Medicare Part D and the Affordable Care Act have put a dent in prescription drug costs for patients, report University of Arizona researchers publishing in *Value in Health*. They found that while the cost per prescription increased from $38.56 in 1997 to $73.34 in 2015, the out-of-pocket costs dropped from $18.19 to $9.61. More than 90% of prescription purchases were covered by medical insurance by 2015. "The results of this study suggest that for many individuals the cost of obtaining medications has declined owing to the ubiquitous prescription drug benefits that accompany private and public health insurance," said study author Daniel C. Malone, PhD. ■



Value of Pediatric Sleep Study Called into Question

In 2012, the American Academy of Pediatrics recommended that pediatricians screen children who snore regularly for sleep apnea and refer children suspected of having the condition for an overnight in-laboratory sleep study. The group also recommended adenotonsillectomy based on the results of the test. Researchers from Maryland and Texas believe the pediatric sleep study may be an unreliable predictor of who will actually benefit from the surgery.

The researchers analyzed findings from the 398 children, 5–9 years old, who participated in the Childhood Adenotonsillectomy Trial (CHAT), a randomized trial published in 2013 that compared adenotonsillectomy to treat sleep apnea with watchful waiting. Seventy-nine percent of the children who had the surgery had a normal sleep study seven months later, but so did 46% of those who had watchful waiting. In addition, the resolution of sleep apnea, as determined by sleep study results, did not correlate with improvements in the majority of outcome measures, including behavior, cognitive performance, sleepiness, and symptoms of attention deficit hyperactivity disorder. Those who had early adenotonsillectomy did however have improved symptoms, quality of life, and behavior. The study was published in *Pediatrics* last fall. ■

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 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 heather.willden@aarc.org. ■

Menthol Flavors May Be Carcinogenic

A new study in JAMA Internal Medicine adds to the evidence that menthol or mint flavors in e-cigarettes and smokeless tobacco pose risks to the people who use them. Researchers from Duke Health have found high levels of a potential carcinogen called pulegone that is used to provide the menthol or mint flavor in these products. Pulegone has been banned from use as a food additive by the FDA, but the government agency has yet to regulate the chemical's presence in either e-cigarettes or smokeless tobacco products. "Our findings suggest that the FDA should implement measures to mitigate pulegone-related health risks before suggesting mint- and menthol-flavored e-cigarettes and smokeless tobacco products as alternatives for people who use combustible tobacco products," said Sven-Eric Jordt, PhD, a professor in the department of anesthesiology at Duke and lead author of the study. ■

RACISM MAY IMPACT ASTHMA CONTROL

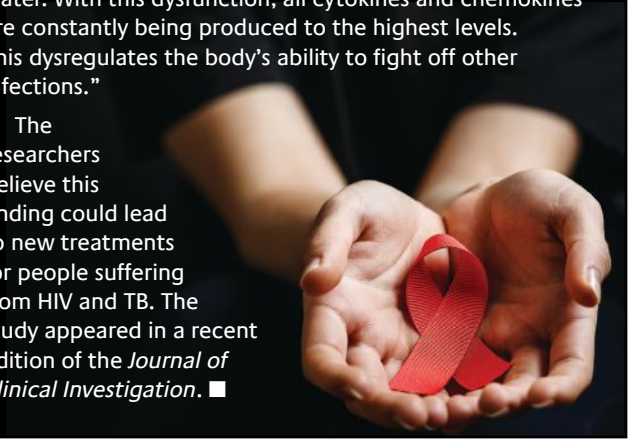
Does racism figure into asthma control in children? According to a new study, it might. Investigators asked 31 African-American parents/guardians of kids with asthma about their experiences with racism, then correlated their responses with the degree of asthma control seen in their children. Results showed children of parents or guardians with high negative scores related to racism were more likely to have decreased asthma control. Forty-seven percent of these children had previously required hospitalization for asthma, and 27% had required intensive care support during an asthma hospitalization. The study appeared in a recent edition of the *Annals of Allergy, Asthma and Immunology*. ■

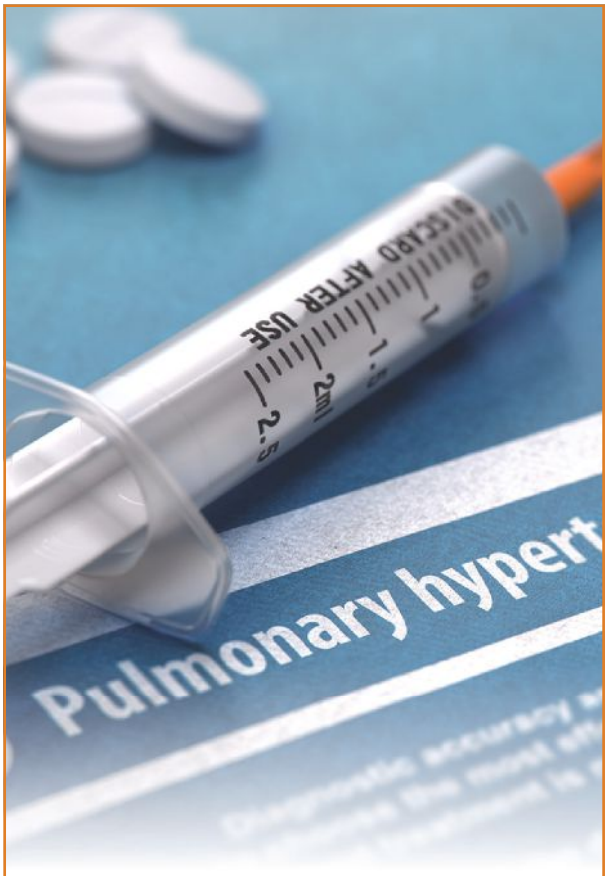
Why HIV Patients Are Prone to TB Too

Researchers from the Texas Biomedical Research Institute believe they have discovered another reason why HIV and TB make for such a deadly combination. The investigators note that the scientific community has long assumed the reason people with HIV are more likely to develop TB is a depletion of immune cells called CD4+ T cells. However, their study, which was conducted in rhesus macaques, suggests lung-specific chronic immune activation — a dysfunction of the immune pathways that generate cytokines and chemokines to fight off pathogens — is responsible for the progression of disease.

"It's like all the taps and faucets in your house are turned on full blast all the time," said study author Deepak Kaushal, PhD. "You are going to lose a lot of water. With this dysfunction, all cytokines and chemokines are constantly being produced to the highest levels. This dysregulates the body's ability to fight off other infections."

The researchers believe this finding could lead to new treatments for people suffering from HIV and TB. The study appeared in a recent edition of the *Journal of Clinical Investigation*. ■





Protein Could Be New Target for PAH Drugs

A molecular pathway that contributes to the development of pulmonary arterial hypertension (PAH) has been discovered by researchers at Cincinnati Children's Hospital Medical Center.

Their study targeted a protein called Eyes Absent 3 (EYA3), which promotes vascular remodeling and has been implicated in PAH. When EYA3 was deactivated in transgenic mice using CRISPR gene-editing technology, the lung arteries in the mice were significantly protected from vascular remodeling. When the investigators tested pharmacological inhibition with previously identified drugs that target the EYA3 pathway, significant reversal of vascular remodeling was seen in laboratory rat models.

More study is needed before the strategy could be tried in humans, but the researchers believe it holds promise for patients with this difficult to treat lung condition. The study was published in a recent edition of *Nature Communications*. ■

Resistant Hypertension Linked to OSA

Obstructive sleep apnea (OSA) may be complicating hypertension in people who suffer from both conditions, find international researchers publishing in the *Annals of the American Thoracic Society*.

Their study looked at 284 patients between the ages of 18 and 75 in Spain, Singapore, and Brazil. All were diagnosed with resistant hypertension, defined as needing three or more drugs to keep blood pressure under control. Among the findings —

- 83.5% of patients with resistant hypertension had OSA, including 31.7% with mild OSA, 25.7% with moderate OSA, and 31.5% with severe OSA.
- OSA was slightly more likely in men than women, 86.3% vs. 76%; however, men were twice as likely to have severe OSA.
- As the severity of OSA increased, ambulatory blood pressure increased, particularly at night.
- The average nighttime ambulatory blood pressure was 5.72 mm Hg higher in those with severe OSA compared to those without OSA.

The investigators note that, because the study was not a randomized, controlled trial, it cannot prove cause and effect. But they believe it does show that patients with resistant hypertension should be tested for OSA. ■

GENETIC LINK FOUND BETWEEN INFLUENZA, HEART DAMAGE

Working in a mouse model, researchers from The Ohio State University have discovered a link between a genetic mutation, influenza, and heart irregularities that could one day improve the care of people suffering from the flu.

The investigators looked at mutations in a gene called IFITM3 that are known to increase the risk of flu hospitalizations and deaths in people. The gene is responsible for making a protein critical in the earliest stages of the human immune response, mounting a defense that creates difficulty for viruses trying to invade cells.

"By knocking out this gene in mice, and infecting them with various strains of flu, we were able to show that this gene's absence increases the chances of heart abnormalities — decreased heart rate and irregular heartbeat — and death," said study author Jacob Yount. "There's been no known link between this gene and flu-related heart complications until now."

The study also found varying degrees of flu-related heart abnormalities depending on the virulence of the flu strain. The most harmful flu they tested led to highly erratic heart rhythms, lasting heart damage, and a greater chance of death. A moderate strain resulted in reversible, temporary heart abnormalities. When gene-deficient mice were given the weakest of three flu strains in the study, heart irregularities weren't seen.

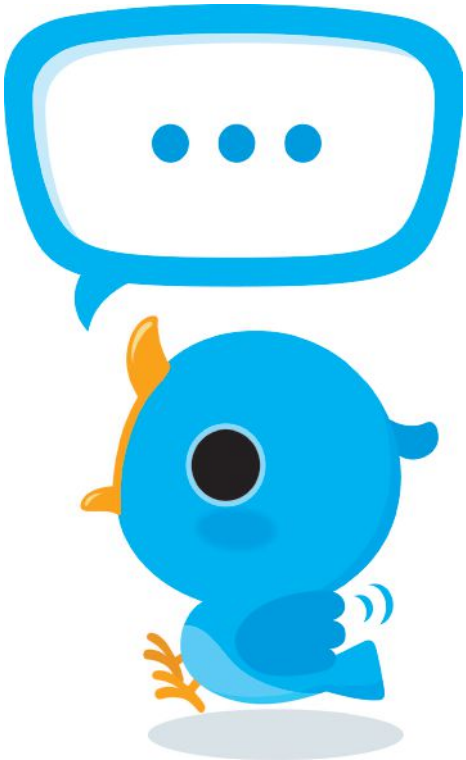
"It's exciting to now have a model to help us answer more questions about why flu is causing these heart problems and to test drugs that might help people," Yount said. "For now, there's no treatment that specifically focuses on the cardiac complications from the flu." The study appeared in a recent edition of the *Proceedings of the National Academy of Sciences*. ■

SINGLE GENE LINKED TO IPF

Johns Hopkins researchers who combed through the entire genetic sequences of a patient with idiopathic pulmonary fibrosis (IPF) and 13 of the person's relatives have found a coding error in a single gene that is likely responsible for a rare form of the disease and the abnormally short protective DNA caps — called telomeres — on chromosomes long associated with it. The error, which was found in the DNA sequence of the gene ZCCHC8, decreases by half the production of a protein needed to keep telomeres at a critical length. The researchers believe the flaw likely will become part of a small but growing list of diagnostic markers for so-called short-telomere syndromes. They reported their findings in a recent edition of *Genes & Development*. ■

Twitter Study Suggests JUUL is Addictive

Are people becoming addicted to JUUL use? University of Pittsburgh School of Medicine researchers used Twitter to find an answer to that question. The team created search filters within Twitter's Filtered Streams interface to collect data on all available tweets matching the terms "juul," "juuls" and "juuling," as well as their hashtag equivalents, between April 11, 2018, and June 16, 2018. A data set of 1,986 tweets underwent final analysis by two independent coders. Of these tweets, 21.1% were coded as being related to dependence (335 tweets), nicotine effects (189 tweets), quitting JUUL or withdrawal, or both (42 tweets). The study was published in a recent edition of *Drug and Alcohol Dependence*. ■



Yet Another New Way to Smoke

A new study in *Environmental Science & Technology* has taken a closer look at another new type of "cigarette" coming on the market: the "heat-not-burn" device.

The product tested in the study is not yet available to purchase in the United States, but it was authorized for sale by the FDA in April 2019. The "smoking" component of the product is a cigar-shaped electronic holder unit that stores and charges inside a hand-sized case. To use the device, the user inserts a tobacco "heat stick" (resembling a short, thin cigarette) and presses a button to activate the heater. The interior of the stick — a rolled sheet made of processed tobacco, glycerin, and other additives — heats to between 180 and 220 degrees Celsius. At these temperatures, the nicotine and other chemicals have evaporated, rather than burned, and are inhaled through the filter in the mouthpiece as an aerosol.

The device is being touted as delivering a "clean," nicotine-laden vapor that contains fewer irritant and carcinogenic chemicals than a conventional cigarette and thus is a less harmful option for tobacco users. However, when researchers from the U.S. Department of Energy's Lawrence Berkeley Lab examined two types of emissions produced by the device — mainstream emissions (the chemicals present in the aerosol and inhaled by the user) and sidestream emissions (the aerosolized chemicals that emanate from the device but are not inhaled by the user, analogous to the smoke coming off the tip of a lit cigarette) — they found emissions yields for 26 known irritants and carcinogenic compounds, including acrolein, acrylonitrile, benzene, crotonaldehyde, phenol, and pyridine. According to the team, consuming 20 heat sticks a day — equivalent to a pack a day of conventional cigarettes — would deliver doses of acrolein, benzene, acetaldehyde, and formaldehyde comparable to or higher than health-based exposure limits set by the state of California. ■

Predicting Lung Damage in 9/11 First Responders

9/11 first responders are known to be at risk for lung disease. Researchers from NYU School of Medicine have found that chemicals made as the body breaks down fats, proteins, and carbohydrates can predict which first responders will be affected. Their study linked 30 of these metabolites to increased protection against obstructive airway disease (OAD).

The study was conducted among 14,000 9/11 first responders who, due to health regulations, had their lung function tested before the disaster, after it took place, and every year since. All underwent blood samples to test for 594 common metabolites found in the human body. The researchers then identified those most closely tied to first responders who showed no signs of OAD. The presence of specific metabolites was predictive with 93.3% accuracy.

Now the team hopes to develop a blood test that can be used to screen disaster victims and first responders after toxic exposure, identifying people at least and at greatest risk of developing lung disease. They also believe that the identification of these metabolic predictors may help people take advantage of drugs, dietary changes, and regular exercise to protect themselves from toxic particles created by fire and smoke. The study was published in a recent edition of *Scientific Reports*. ■

Greater Use of Probiotics Could Reduce RTI Costs

According to systematic reviews conducted by an international group of investigators using data from the Cochrane Collaborative and York Health Economics Consortium (YHEC), probiotics use is associated with a reduced number and duration of respiratory tract infections (RTIs), antibiotic courses used, and days absent from work. The economic model was devised by the researchers to estimate the cost savings of general use of probiotics in the United States. In the Cochrane scenario, the analysis showed that if everyone in the United States took probiotics, health care payers would save $373 million in medical bills associated with RTIs in one year. In the YHEC scenario, generalized probiotic use could save $784 million per year in averted productivity loss related to absence from work due to illness. The study appeared in Frontiers in Pharmacology earlier this year. ■

New Naming Convention Falls Short in the NICU

A new naming convention for newborns in the NICU that was mandated by The Joint Commission after a study showed it could reduce the risk of wrong-patient orders by more than 36% still isn't getting the job done for twins, triplets, and other multiples, report New York investigators who analyzed more than 1.5 million electronic orders placed for 10,819 infants in six NICUs within two New York City hospital systems. The new convention calls for more unique temporary names for newborns, such as "Wendysboy," rather than the traditionally used "Babyboy" or "Babygirl."

The study found the risk of wrong-patient order errors was nearly doubled for multiples compared with singletons, and it grew with the increasing number of siblings receiving care in the NICU. For example, an error occurred in one in seven sets of twins and in one of three sets of triplets and quadruplets. The findings were consistent across study sites despite differences in patient populations and electronic health record systems.

"Our study suggests that the safeguards now commonly used to protect against medical errors in the NICU setting are not sufficient to prevent misidentification and medical errors among multiple-birth infants," said study author Jason Adelman, MD, MS, from Columbia University Vagelos College of Physicians and Surgeons. The study was published by *Pediatrics* earlier this year. ■

Vaping Linked to Emphysema

New research from investigators at the University of North Carolina School of Medicine suggests that vaping may lead to the same kind of cellular responses found in smokers who suffer from emphysema. The team measured levels of three key protease enzymes in lung fluid sampled from nonsmokers, smokers, and vapers. Immune cells in the lungs are known to secrete these enzymes at higher levels in reaction to cigarette smoke, and this chronic over-activity leads to the kind of damage seen with emphysema. In this study, levels of all three proteases were significantly elevated in both smokers and vapers but not in nonsmokers, suggesting that vaping, like smoking, may promote emphysema. The study appeared in a recent edition of the *American Journal of Respiratory and Critical Care Medicine*. ■

Improving Survival for Lung Transplant Patients

Lung transplants help people survive lung disease longer than they would without a transplant. But statistics show that the average lung transplant recipient only lives another six years. New research out of the University of Maryland School of Medicine suggests an infrequently used drug regimen could significantly improve those prospects.

First, the investigators found that the immunosuppression cell cycle inhibitor sirolimus offered an almost two-year survival benefit over the most commonly used cell cycle inhibitor mycophenolate mofetil (MMF). The benefit was driven by fewer deaths from chronic rejection, infections, and cancer. Sirolimus plus tacrolimus, which is commonly used in lung transplant recipients, was associated with a better median survival compared to MMF plus tacrolimus, 8.9 years vs. 7.1 years.

The group that came out with the highest survival consisted of patients who were given sirolimus plus tacrolimus for maintenance therapy without induction therapy, which is usually given in a high dose for a short duration at the time of transplantation. These patients lived over three years longer on average than patients receiving MMF maintenance with induction therapy. The study was published in *JAMA Network Open*. ■

Strange But True...

Morphing monitors? Biomedical researchers are working on a new branch of flexible, stretchable electronics, opening the door to reconfigurable electronic platforms for wearable devices that can transform in shape and size dynamically as bodies change, or relocate from one area of the body to another. The investigators envision a day when these devices can be used for drug delivery, health monitoring, therapeutic healing, implants, and soft robotics. ■

Industry Watch

NIAID grant targets influenza vaccines

The Center for Vaccine Development and Global Health at the University of Maryland School of Medicine has been awarded a contract from the National Institute of Allergy and Infectious Diseases (NIAID) to test improved seasonal influenza vaccines and to conduct controlled human influenza challenge studies for the NIAID Collaborative Influenza Vaccine Innovation Center. The center's ultimate goal is to develop a universal vaccine to protect against emerging influenza strains as well as to improve current seasonal vaccines.

Wistar Institute receives NIH grant

The Wistar Institute has received a $4.6 million grant from the NIH in support of innovative research to tackle antibiotic resistance. A Wistar team led by David B. Weiner, PhD, is advancing a novel, nontraditional approach to combat multidrug-resistant ***Pseudomonas aeruginosa*** that is based on a synthetic DNA technology called DNA-encoded monoclonal antibodies (DMAbs). In a recent study, Dr. Weiner and his colleagues demonstrated that these DMAbs can effectively control multidrug-resistant ***P. aeruginosa*** infection in mice. The grant will allow for the extension of those studies.

Cincinnati Children's to serve as Data Coordinating Center for LungMAP

The NHLBI has named Cincinnati Children's Hospital Medical Center as the new Data Coordinating Center for LungMAP, an open-access resource for human lung data. The five-year, $8 million grant will support information-sharing to help researchers better understand human lung development, ultimately leading to advancements in pulmonary care. "LungMAP has the unique opportunity to develop highly sophisticated computer models of developing lungs, and to compare normal and diseased lung tissue in children," says Peter White, PhD, lead investigator and director of the Division of Biomedical Informatics. "We can then use these models to test novel therapies, such as new drugs, devices, and tissue-engineering methods that can improve patient outcomes.".

Traveling Flu Crew

DispatchHealth, an on-demand provider of advanced medical care, is sending its Traveling Flu Crew to homes across the country this flu season to help treat the millions of people who will contract the illness. As soon as a person suspects they are sick, they can contact DispatchHealth to have a team of medical professionals arrive at their home in less than two hours to administer a rapid flu test, diagnose the patient, and if necessary, provide intravenous fluids and prescribe medication. Each medical team consists of either a physician assistant or nurse practitioner, along with a medical technician and an on-call physician. DispatchHealth's Traveling Flu Crew will expand to 17 cities by the end of 2019.

E-cigarette researcher joins Rutgers

Michelle Jeong, PhD, has joined the Rutgers School of Public Health's Department of Health Behavior, Society, and Policy as an assistant professor and will also be a member of the school's Center for Tobacco Studies. Dr. Jeong is a behavioral scientist who bridges communication theory and public health outcomes to conduct tobacco regulatory research. Her newly awarded NIH K01 grant will support her work monitoring the potential for youth exposure to e-cigarette marketing and examining the impact of specific e-cigarette marketing features on youths' perceptions and use intentions.

Phase 2 trial on Pulmazole gets underway

According to Pulmatrix, Inc., the first patient has been dosed in the Phase 2 trial evaluating Pulmazole, an inhaled iSPERSE formulation of the antifungal itraconazole in development for the treatment of allergic bronchopulmonary aspergillosis (ABPA) in patients with asthma. The randomized, double-blind, placebo-controlled trial will evaluate the efficacy and safety of three dose levels of Pulmazole administered daily for 28 days in approximately 64 patients. "We believe that Pulmazole has the potential to change the standard of care for patients with ABPA and asthma by providing a treatment option that prevents the dose-limiting side effects seen with oral antifungal treatments and improves upon the known efficacy

of oral itraconazole by delivering significantly more drug to the lungs than can be achieved with oral dosing," said Pulmatrix CEO Ted Raad.

Bayer teams up with Boston hospitals to fight chronic lung disease

Bayer and the founding members of Partners HealthCare, Brigham and Women's Hospital and Massachusetts General Hospital, have launched a joint lab to research new drug candidates to treat chronic lung diseases. The lab will host scientists from all three parties, and Bayer is investing more than $30 million to fund joint research projects over the next five years. "We strongly believe that this model will significantly accelerate the pace of discovery toward the goal of getting new therapies from the lab to patients safely and efficiently," said Paul Anderson, MD, PhD, senior vice president and chief academic officer at Brigham and Women's Hospital. "This collaboration provides the opportunity to integrate novel findings directly into the drug development pipeline, thus speeding up the time to move a new treatment into the clinic."

MU SOM receives achievement award for asthma program

The Amercan Board of Medical Specialties (ABMS) has named the University of Missouri School of Medicine (MU SOM) as this year's ABMS Portfolio Program™ Outstanding Achievement in Quality Improvement (QI) Award recipient. The MU SOM Multi-Specialty Portfolio Program was selected based on the QI excellence it demonstrated in its implementation of the Asthma Ready® Communities (ARC)-sponsored Asthma Care Accelerator (ACA) Extension for Community Healthcare Outcomes (ECHO®) QI project, an inner-city initiative seeking to decrease the rate of uncontrolled asthma. The ACA initial pilot resulted in increased use of inhaled corticosteroids with improved disease control and decreased risks. ACA is now available across the entire state of Missouri.

Cumberland Pharmaceuticals, receives FDA Orphan Drug Grant funding for DMD drug

Cumberland Pharmaceuticals, Inc., has received FDA Orphan Drug Grant funding for a new Phase 2 clinical program on the clinical development of ifetroban for the treatment of cardiomyopathy associated with Duchenne muscular dystrophy (DMD). Based on preclinical findings, the FDA has cleared Cumberland's application to study ifetroban in DMD patients who are seven years of age and older. The company has also been awarded just over $1 million in funding from the FDA through its Orphan Drug Grant program to support a Phase 2 DMD clinical study. It's the first DMD clinical study approved for FDA Orphan Product Development funding.

Survey says OSA sufferers prefer Bongo Rx

According to a recent Qualtrics Survey conducted among more than 200 people with mild to moderate sleep apnea, more than 70% said that, when given the choice, they would prefer to try the FDA-cleared Bongo Rx over traditional CPAP therapy to treat their sleep apnea. The Bongo Rx is a small, discreet nasal device that requires no machine, mask, hose, bulky headgear, electricity, or battery power. "I feel the results of this Qualtrics Survey reflect that mild to moderate OSA sufferers want a simple and effective alternative to traditional CPAP," said Bongo Rx President Bruce Sher. "It's gratifying that years of effort by our team to develop the Bongo Rx have yielded such a great outcome."

ALA, Anthem celebrate smoking cessation victories

The Smoking Cessation for Low-Income Housing Residents project has allowed the American Lung Association (ALA) to help more than 10,000 residents of public housing quit smoking through enrollment in an evidence-based tobacco cessation program. Funded by the Anthem Foundation, the philanthropic arm of Anthem, Inc., the project offers quit-smoking support services through the ALA's Freedom From Smoking® program for residents affected by the implementation of the U.S. Department of Housing and Urban Development's smoke-free housing rule. "Residents' desire to quit is evident through the extremely high enrollment and completion rate we saw throughout this initiative," said ALA National President and CEO Harold Wimmer. "So many more Americans living in smoke-free housing have now also quit smoking and are living healthier lives."

Versatop Therapeutics awarded NIAID contract to study influenza vaccine

Versatope Therapeutics, Inc., has been awarded a contract with the National Institute of Allergy and Infectious Diseases (NIAID) worth up to $17.9 million over five years to advance Versatope's universal influenza vaccine candidate. The NIAID contract will support Versatope's goal of producing an influenza vaccine designed to protect against multiple strains using extracellular bacterial vesicles. NIAID funding will support manufacturing, stability, and human clinical studies to demonstrate safety and tolerability in healthy volunteers. ■

Brief submissions and photos for this column may be sent to Communications Manager Heather Willden at heather.willden@aarc.org.

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THE 2019 AARC CORPORATE PARTNERS

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 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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Reflections on 42+ Years of *AARC Times* Magazine: The Inside Story

by Marsha Cathcart

The time has finally come to stop the printing press, put to bed the final, printed version of *AARC Times*, and begin the digital-only publication of the magazine, starting with the next issue.

Now that I have retired, the AARC has asked me to provide reflections on *AARC Times* magazine, from both a historical and a personal career perspective, and to provide some behind-the-scenes trivia about our long journey in print before the magazine converts to our all-digital format next month.

The "People Magazine" of respiratory care

From the very beginning, the AARC leadership wanted *AARC Times* to be less of a clinical publication than the science journal Respiratory Care, and instead be an additional membership benefit for the respiratory care professional. Our mission has been to include a mixture of news about the profession and the Association, RT success stories, and human interest stories about RTs and their patients. In fact, the very first issue in July 1977 featured a story by Staff Writer Debbie Bunch, who visited a Dallas hospital RT providing special care to a preemie with breathing problems. You just can't go wrong launching a magazine with a baby story!

The editors of *AARC Times* have always made sure that our stories have showcased the ingenuity, wisdom, and wonderful nature of respiratory therapists as extraordinary caregivers who develop special bonds with their patients and go the extra mile to deliver respiratory care. Many of these stories practically dropped in our laps, given to us by you, our members, but other stories required journalistic leaps by Debbie, as well as the magazine's three editors over our 42-year span in print: Mary Lynn Gage, Sherry Milligan, and me. Trained and educated in journalism and the humanities, we searched for interesting story ideas, tracked down leads, and used our contacts to help enlighten AARC members on important topics.

From the beginning, Debbie has carried most of that load, consistently providing our readers with excellent articles that have tugged the heartstrings and inspired RTs. Truly the longest-employed person with the AARC, Debbie is one of a small group of people who helped develop and launch *AARC Times*.

All the editors had to do was give her a snippet of a story idea or pass along a tip from someone, and she would go get the story, and then submit a real gem. Although she is not an RT herself, her great talent for writing RT-focused stories has been the heart of *AARC Times*. We're fortunate that Debbie continues to write for the magazine today.

The publishers and managing editors of our magazine have always been respiratory therapists, but from the beginning they recognized the importance of employing degreed journalists, writers, and editors as the movers and shakers in the department and ensuring they had the creative freedom to search out and develop stories that would accentuate the positives of the profession,

about the author...

Marsha Cathcart joined the AARC staff in 1977 and served as the editor of *AARC Times* from 1989 to 2019. An Honorary Member of the AARC, she is now retired and resides in the Dallas area.

Mary Lynn Gage

Debbie Bunch

Marsha Cathcart

recognize and explain important trends, and pinpoint for readers where the jobs were. That meant working directly with respiratory care professionals who had a story to tell and then sticking to basic journalistic principles and the magazine's established content style.

Back stories

The earliest *AARC Times* issues were produced on a shoestring budget and on the fly by our skeleton crew in the Publications Department, but somehow we always made the monthly printer's deadline. Our antiquated production tools were laughable. In the beginning, we had to print out strips of paper containing columns of type from a crude pre-computer word-processing system that had no memory. Countless times we had to retype a whole story when something went awry, like when the Dingbats font made everything go haywire and hung up the machine. Columns of type on special paper hung on the wall prior to going to layout and design, where the artists added art and photos and pasted them with hot wax on a large cardboard sheet tacked to a drafting table (two drafting tables, to be precise, manned by our paste-up artists at that time, Donna Knauf and me).

Donna was the first on our staff to provide real style to the appearance of our articles, hand-drawing special illustrations for many of the articles. Trained in drawing techniques as a catalogue artist, she worked at the AARC for more than 35 years before taking her retirement, lending her artistic talent to *AARC Times* and other AARC projects involving artwork. Over the years, her command of publishing computer programs to make the art pop carried us through many an article. She also created many *AARC Times* covers, sometimes humorous and at other times poignant. Donna also found some very talented graphic artists to work with her, one being Jeanette Chawdhury, who heads up the AARC Marketing and Communications Department today. Donna worked with Jeanette to do a total redesign for *AARC Times* with what they called a real simple design to promote ease of reading.

As a side note, my early days with the magazine as a paste-up artist for the magazine were thankfully short-lived (boy, was I awful at it!). I moved over to the editorial side of the department and left Donna and her crew to manage the art. My background was in journalism, so it was a better fit.

Around 1984, *AARC Times* Managing Editor Ray Masferrer, RRT, FAARC, introduced our Publications Department to a new thing called the Macintosh computer, and life suddenly changed.

In the mid-1990s, we graduated to producing computerized in-house magazine pages with equipment that required photo-development chemicals to process the pages for print. There was always a pungent odor in the office when we were nearing deadline day! In the 2000s, we moved up again to a much better, easier way to provide the magazine content to the printer using all the new design technology that Macintosh computers provided. That continues today, with the MarComm Department at the helm, producing great in-house content for the Association.

A few of my experiences

Looking back, I feel kind of like Forrest Gump, showing up on the sidelines of important events of the respiratory care profession, such as the development of the Clinical Practice Guidelines and respiratory care protocols, expansion of the RT's involvement in new areas of respiratory care (e.g., managed care and the physician extenders role), and the beginnings of the international respiratory care phenomenon.

From the Archives

Editor's Note from October 2001 *AARC Times* (9/11 Issue)

by Marsha Cathcart, former editor of *AARC Times*

Like Pearl Harbor and the Kennedy assassination, the terrorist attack on America last month will forever remind us of where we were and what we were doing when our world suddenly changed.

As we were preparing this issue for the press, we heard that a plane had crashed into a tower at the World Trade Center. Then the whole story of that horrible day began to unfold, AARC office phones began ringing, and respiratory therapists from everywhere "checked in" to ask us what they could do to help victims in New York and Washington. The Association quickly established a special list server for RTs to share their thoughts and feelings about the tragedy, and our web site offered information on donating blood and funds in the aftermath. Soon condolences and well wishes from our international friends and colleagues began pouring in and were promptly posted on the AARC web site.

Staff Writer Debbie Bunch watched the unfolding news stories intently, followed all available leads, and deftly pulled together an article telling the personal stories of respiratory therapists involved at WTC "ground zero" and in Washington. The *AARC Times* staff is especially grateful to several therapists who helped us bring this story and its images to our readers. Robert Fluck, chair of the AARC's Ad Hoc Committee for Disaster Response, quickly connected us with RTs who were on the scene offering medical assistance. Sterling Williams sent us photos he had taken from his bird's eye view of lower Manhattan. Joe Lynott connected us with a photographer who was on the scene when President Bush and the first lady came to his hospital on Sept. 13 to visit patients and staff, including respiratory therapists. Our use of the unique photo on our cover, showing President and Mrs. Bush meeting with the people at Washington Hospital Center, would not have been possible without Joe's help.

Several days into our preparation of the story, we were deeply saddened to learn that a respiratory therapist had lost her husband in the tragedy. Our thoughts are with her and her family during this difficult time and with the many people around the world who were touched by the tragic events of Sept. 11. ■

Marsha Cathcart

Part of my role as the editor of *AARC Times* has been to interact with AARC Congress keynote speakers. Many have left a lasting impression on me, such as the legendary Dr. Forrest Bird, football great Roger Staubach, and former NASA Chief Flight Director Gene Kranz, an aerospace engineer who led the most memorable space missions of our time.

I was fortunate to cover a small regional conference with Christopher Reeve only months after a horrific accident had made him ventilator-dependent. The audience witnessed him emphasizing the great impact his home care respiratory therapist had had on his life. And I will never forget my interviews with the amazing, inspirational quadriplegic Brooke Ellison, as well as activist and author Ralph Nader (over breakfast).

Some of the most memorable articles for me have been those in which we reported tragic events, such as 9/11 and Hurricane Katrina, because we had to work really hard for them, usually under tight deadlines. *AARC Times* has always valued the personal stories about challenging times that RTs have shared with us. The heroics and dedication of RTs to their patients while coping with very difficult situations has always been an important part of *AARC Times*.

We could not have had a 9/11 issue without the help of RTs who connected us with sources for interviews

as well as provided connections to others who would tell their personal experiences of that day. More recently, we were honored to learn that our 9/11 issue of *AARC Times* had been accepted into the archives of the George W. Bush Presidential Library in Dallas.

Disasters aside, the Association has weathered some really trying times throughout the span of *AARC Times*. Diagnosis-related groups (DRGs) became the law of the land in the 1980s, regulating the costs of health care and respiratory care.

When the respiratory therapist's role in clinical laboratories was threatened by an overhaul of regulations in the 1990s, the AARC educated everyone, including government officials, on the RT's expertise in blood gases. Our magazine published a series of articles to keep the membership informed of the impact of the regulations on the respiratory care profession.

That time period also brought a move toward health care reform (back then, it was called "Hillary Care"). Not knowing how things would go, it certainly kept us on our toes, and we produced at least two issues completely devoted to managed care that featured articles by various RT authors who were experts in different areas of respiratory care.

The profession's survival has been a perennial topic in the pages of *AARC Times*, and that continues today with coverage of the RT professional's need for more education to keep up with other allied health professions and to actuate a wider scope of practice.

AARC Times also took almost a whole decade to provide continuing coverage of the threat of hospital restructuring. We interviewed many RT department managers who were successfully protecting their departments, and we even danced with the devil, so to speak, when we interviewed several restructuring companies to learn what RTs would need to do to stay relevant in the changing world of health care.

Amazingly, the CEOs cooperated, and we were able to share some valuable information with the membership.

AARC Times has worked closely with National Institutes of Health leaders and U.S. Surgeon Generals many times throughout the years, staying on top of where Washington was heading and how political agendas could affect the respiratory care profession. We covered many important meetings between officials of the U.S. Bureau of Labor Statistics and AARC representatives, meetings that focused on expansion of the health care workforce and the RT's role in various home care, post-acute and long-term care, ventilator projects, and COPD awareness.

… and yet, we've had a bit of fun

A large portion of *AARC Times* has always been pre- and post-meeting AARC coverage. The staff has enjoyed publishing stories and pictures of RTs having fun at AARC events to show that a meeting was not all lectures and science forums, but also a joyful coming together of professionals and friends from around the world. Pictures of opening-night party conga lines, armadillo races, RT rock band performances, tacky tourist costume contests, and talent shows have added an element of fun to the magazine and demonstrated that we can be both serious and lighthearted.

A couple of years ago, we learned that an RT's boyfriend was planning to pop the big question when she got up to present her Open Forum poster. We were lucky to get the story (and photos!) of the happy couple when the "yes" elicited applause and well wishes from the audience.

Patient connections

AARC Times has promoted lung health and covered patient-advocacy conferences for decades, shining the spotlight on others who have promoted lung health among the public, like COPD patient advocate Grace Anne Dorney Koppel and her husband Ted Koppel, who recently presented the keynote address at the AARC Congress.

I believe our magazine covered COPD before the public ever knew what it was. RTs have promoted COPD awareness for many years, working with anyone who could help on special campaigns to help reduce the impact of COPD.

Your contributions are appreciated

AARC members have made countless contributions to *AARC Times* throughout our history. We have happily published articles submitted by members, and we have

solicited members' help in providing content. We will continue to provide important clinical articles written by respiratory care professionals considered experts in their areas of patient care. Keep your submissions coming!

Thank you, everyone!

I can't end this editorial without thanking my co-workers on the AARC staff who have served as wonderful resources, provided career-building experiences, and afforded me the honor of life-long friendships. I am very grateful to the AARC and its publishing partner, Daedalus Enterprises, for the opportunity to contribute to the profession and, hopefully, to have served respiratory care patients as well.

I often tell people that some of my best friends are respiratory therapists. It has been a great honor to spend my career working with you and serving such an admirable profession. I have loved serving as your editor.

I especially want to thank you, the members, for all your support and friendship.

Please keep reading … this is not the end of *AARC Times* — instead, it's the beginning of an all-digital magazine experience in the evolution of your extraordinary profession. ■

Industry Update

Featuring information on products and equipment from manufacturers

Calendar of Events

AARC & State Society Programs

December 6, 2019
Charleston, SC
2019 SCSRC Coastal Region Education Forum
Contact: Selma Watson selma.watson@gmail.com

December 7, 2019
Abington, PA
2019 PSRC Diagnostics Seminar
https://www.psrc.net/2019diagnosticseminar

December 12–13, 2019
Bonita Springs, FL
2019 Suncoast Pulmonary Symposium
Contact: https://www.fsw.edu/suncoastsymposium

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1. Gailindo-Filho et al. 2015
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AARTimes
An Official Publication of the American Association for Respiratory Therapy.
VOLUME 1 ISSUE 1
JULY 1977

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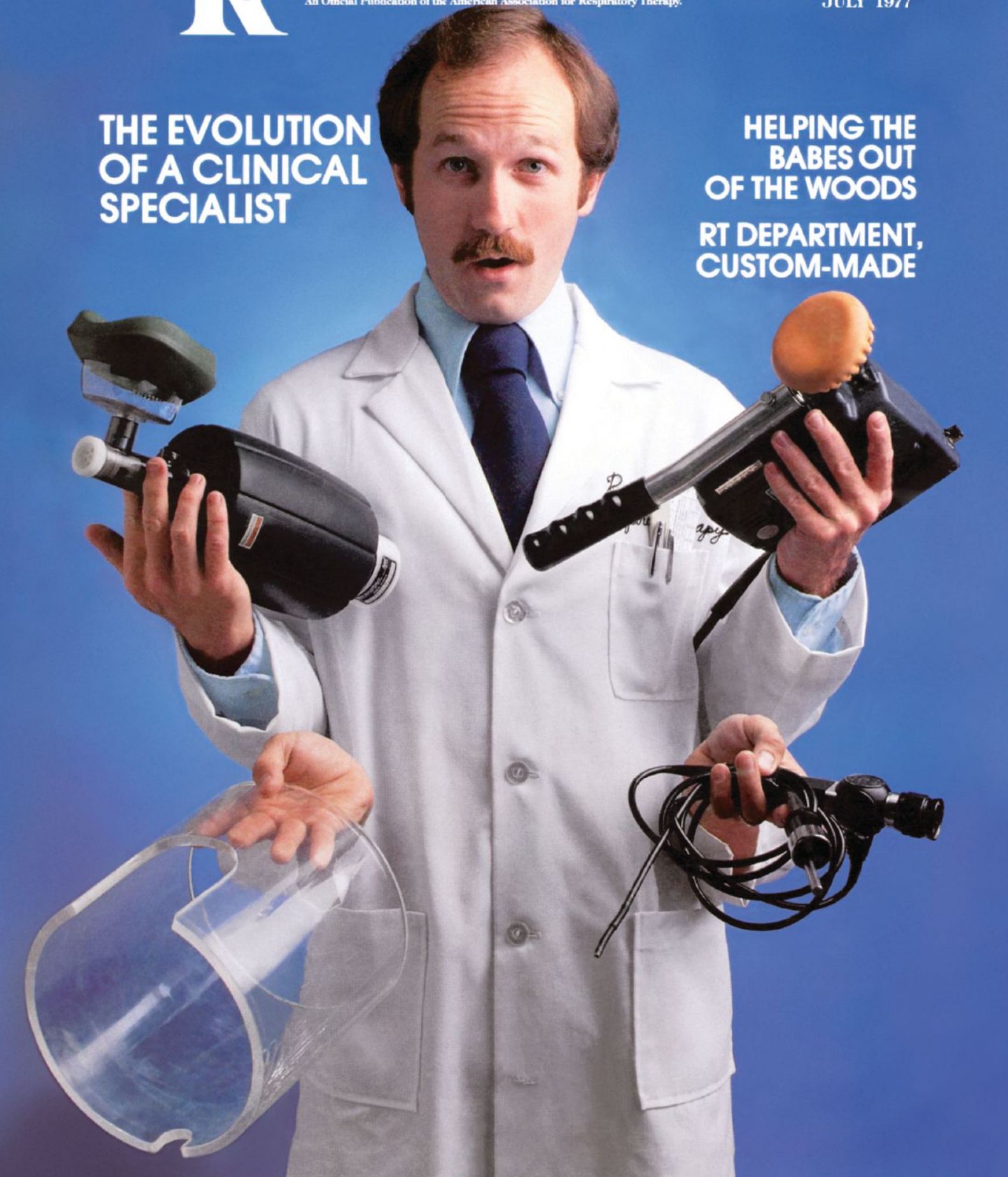

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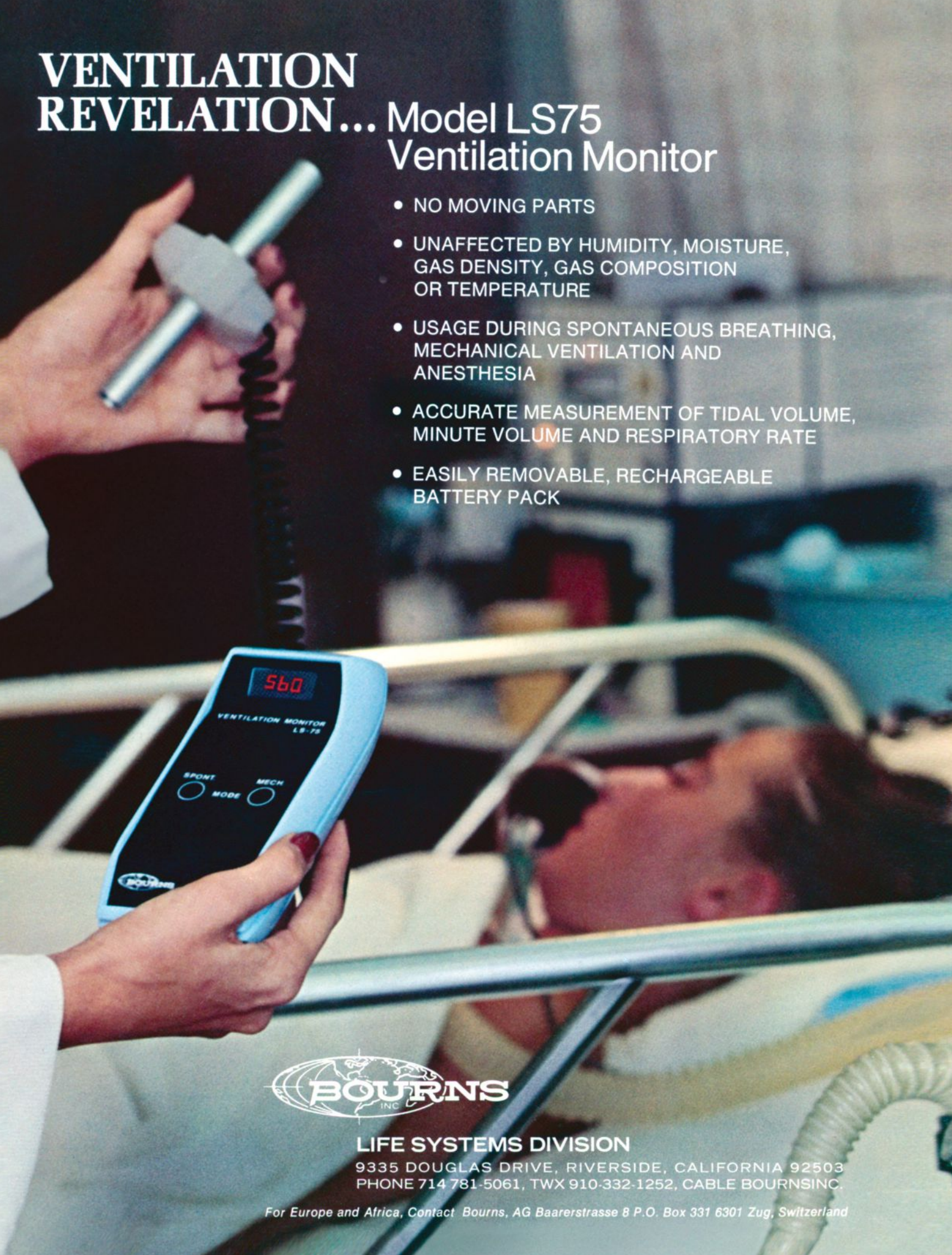

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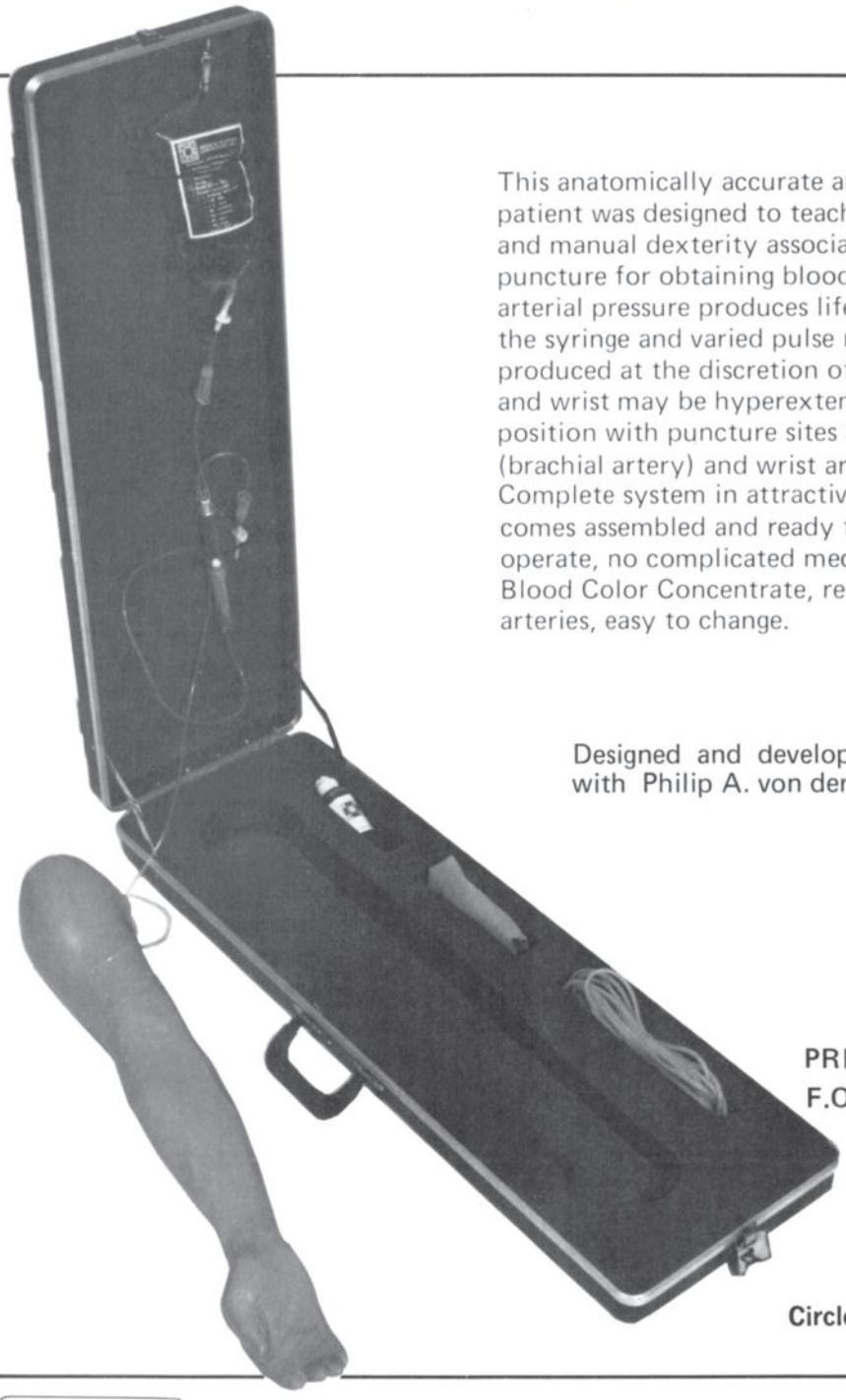

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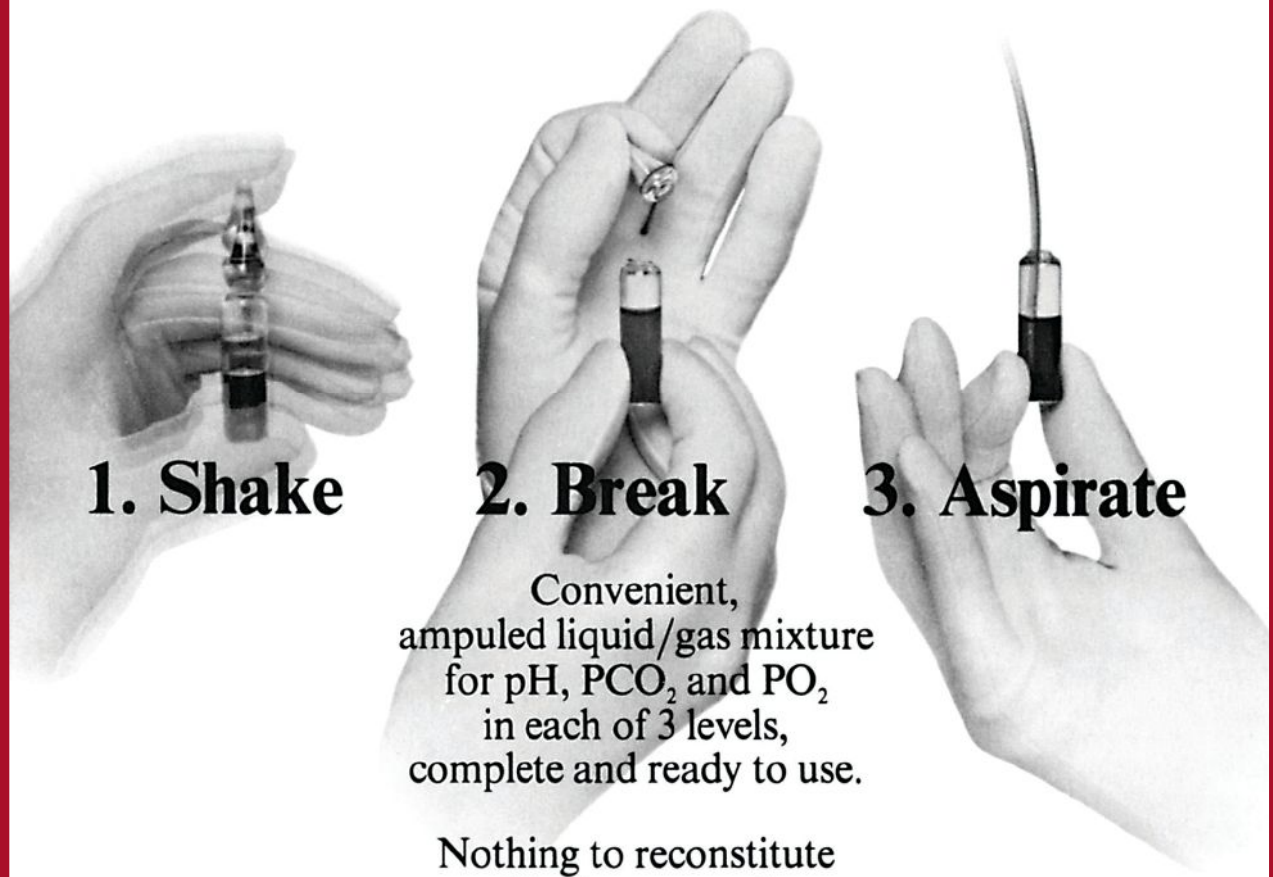

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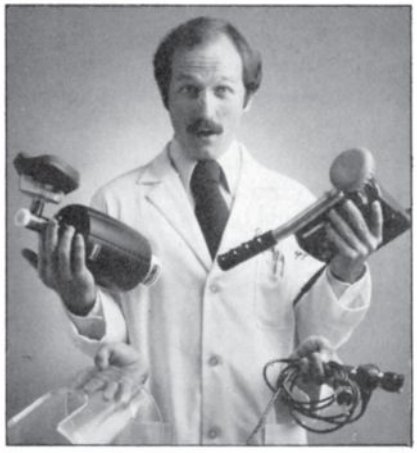
VOLUME 1 ISSUE 1

An Official Publication of the American Association for Respiratory Therapy.

JULY 1977

Features

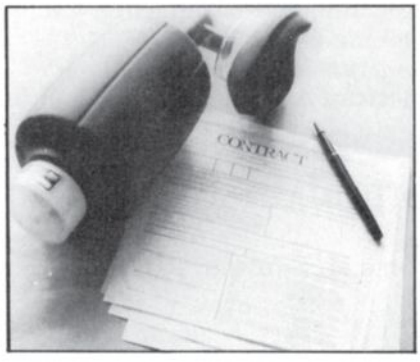


"We will have to meet some minimum criteria to prove that we are worthy of being called specialists."

12

"You just can't deal with kids the same way you deal with adults. . . . Perinatal and pediatrics is a whole different world."

18



"If a contract service company places too much emphasis on revenues and not enough on quality of care, you should continue your search."

22

Departments

Cover

Cover photo by Susan Schelling. Art direction by Mark McDowell.

Application to mail at second-class postage rates is pending at Dallas, Texas.
Postmaster: Send Form 3579 to **AARTimes**, American Association for Respiratory Therapy, 7411 Hines Place, Dallas, Texas 75235.

AARTimes
Coming Soon

Profile of Practice: a report on association projects currently underway to investigate the credentialing process in respiratory therapy.

RT does Compute! A case study of a respiratory therapy department that uses a computer to improve patient care and simultaneously lighten its work load.

Rent-a-Therapist: A California firm adds a new dimension to respiratory care - temporary help service.

How good were **"The Good Old Days?"** One of the first registered respiratory therapists tells it like it was.

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Staff Writer: Debbie Bunch
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AARTimes welcomes the contribution of feature articles and information for the regular departments. All material should be submitted in duplicate, typed double-spaced, and mailed to: **AARTimes**, American Association for Respiratory Therapy, 7411 Hines Place, Dallas, Texas 75235.

Subscriptions: Subscription price for members of the AART is $2.00, included in the annual membership dues. Nonmember subscriptions are available at the following rates: $20.00 per year (12 issues) in the United States; $25.00 per year in all other countries. Single copies, current and back numbers, if available, are $3.00. Write to **AARTimes**, American Association for Respiratory Therapy, 7411 Hines Place, Dallas, Texas 75235.
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Letter From The President

Dear AART Member:

This year the AART has made membership services the number one priority. *AARTimes* is being inaugurated with this issue as a new and dynamic membership service with the hope of bringing all of us closer together as professionals. In today's rapid-transit world where everyone appears to be on a treadmill, good communication among people suffers. *AARTimes* will allow us the luxury of stepping off the treadmill from time to time to reflect on where we have been and where we are headed as a profession.

Articles dealing with management, education, and clinical practice will allow us to share the good and the bad with each other. The AART's national committees will use the publication to report to the members their activities and recommendations. Hopefully you will be able to understand the objectives of the committees more clearly and know where to write to become involved in projects you are especially interested in. The activities of the newly developed specialty sections will be reported to you through articles in this new publication.

The new publication will feature various benefits and services that are available to you as a member. Each month a new benefit or service will be discussed with emphasis on the many new membership services recently developed, such as clinical tours to Europe and discounts on rental cars. Also, *AARTimes* will provide space for members to suggest new services and benefits that the Association should initiate.

Remember, *AARTimes* is a megaphone that will carry your voice coast to coast to twenty-one thousand respiratory therapy professionals. I encourage you to take advantage of this membership service to share your thoughts, projects, and concerns with the rest of the country. The AART would like to receive your contributions to the new publication in the form of articles authored by you or suggestions for possible articles.

The AART is trying hard to bring national leaders and chairpersons back to the people. This new publication is directed at **you,** the member, to help you become more aware of what is happening in your profession. Let me know if it is working or how it can be a better communication tool. Take my word for it - your comments **will** make a difference.

Sincerely,

Thomas A. Barnes, MS, RRT
President

Come Fly With Me

The exhilaration of flying alone for the first time is experienced by thousands of people each year in our affluent society. A boundless joy is rapidly replaced with gripping tenseness when a flight instructor finally says, "Go fly that plane, pal. It's yours. One time around the pattern."

Despite ground school, hundreds of landings, hours of "touch-and-go" practice, and repeated admonitions to relax, the tenseness is still there. The knuckles of your right hand turn white from squeezing the full-open throttle, your left hand on the control wheel is slippery from perspiration, and your legs move rapidly of their own volition, overcompensating on the take-off roll. After an eternity of rolling down the runway, take-off speed is reached. A gentle tug on the control wheel moves the elevator up, the tail section is forced down, the nose lifts, and the new pilot is off to greet the skies!

The analogy may be exaggerated, but we also feel a tenseness and a joy as we publish *AARTimes* and wait to see if it will "fly" and if we can fly it.

Over 21 years ago our respected colleague, James F. Whitacre from Columbia, Missouri, launched *Inhalation Therapy*, now known as *Respiratory Care*. He and his associates had none of the administrative and management bench marks that were available to us as we mapped out the strategy for this first issue of *AARTimes*. We earnestly hope that this new magazine will be a fitting companion to *Respiratory Care* and that it will mature to the point of occupying a valuable place in your professional life. We think it will.

Concurrent to the publication of this first issue, a rather dramatic change in the *AART Bulletin*, our official newsletter, will be taking place. It is our plan to make the *Bulletin* a more effective tool for reporting fast-breaking Association news - moving it beyond the rigid contents dictated by policy, the *Bylaws,* and competition for space. Over the next several months we will be making recommendations for policy changes and *Bylaws* amendments to achieve this plan.

The embryonic staff of *AARTimes* has been working for several months to bring you this book. Under the day-to-day guidance of our editor, Mary Lynn Gage, ably assisted by senior writer, Debbie Bunch, we hope to present to you the "art" of respiratory therapy in a highly enjoyable and readable form.

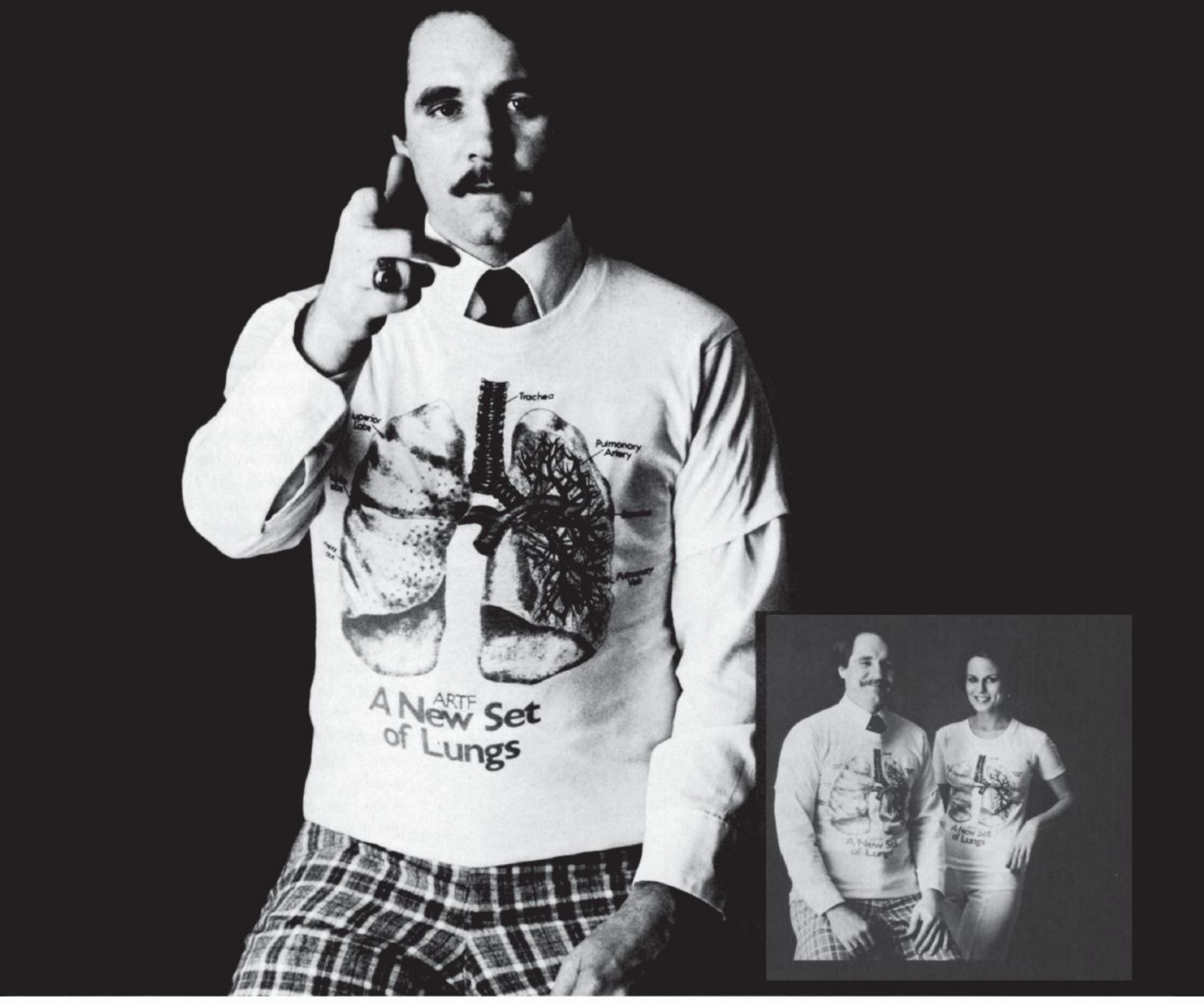
We would be totally remiss if we did not acknowledge with gratitude the matchless contributions of the following: the AART Board of Directors, for making the resources available to us; the Publications Committee under the leadership of Jerry Sullivan, for serving as our editorial review board and providing us with philosophical and practical guidance; Sue Perkins, *Bulletin* editor, who labored over budget preparation and production techniques; Anne Karl and Mike Pierce, staff members, who did the bulk of composition and layout; Nancy Hugley, our advertising manager, who faced the formidable task of selling a product that did not yet exist; and numerous other staff members and volunteers who gave us the benefit of their experience, ideas, and advice. Most especially, we recognize the efforts of Salli Kernaghan, *Respiratory Care* senior associate editor, who contributed her time and ideas to ensure that *AARTimes* will be a success.

Finally, we want to thank the advertisers who appear in this issue. We appreciate their assistance in getting this venture off the ground.

Whether or not *AARTimes* "flies" beyond the holding pattern, to return to my analogy, depends largely on you. Your contributions, critiques, and suggestions will determine its future flight plan.

Robert R. Weilacher
Managing Editor
AARTimes

"A New Set of Lungs" To Help Advance The Art of Respiratory Therapy.



My name is Hugh White ARRT, of the American Respiratory Therapy Foundation. I'm wearing a brand new set of lungs and invite you to do the same.

Lung T-shirts are being made available by the ARTF*. The proceeds will help us to continue our scholarship programs, research grants and ultimately advance our profession.

Lung T-shirts are a great way to let people know what you do, what your job is all about. They're guaranteed conversation starters and in full color. Anatomically accurate, they're also perfect for in-service training. At $5.50, it won't cost you the shirt off your back either.

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Editor's Note

So this is what *AARTimes* is! If you are an avid reader of the AART *Bulletin,* or even if you only occasionally glance at it, you have probably noticed our not-so-subtle promotional pieces, heralding the imminent arrival of something called *AARTimes.*

We are growing to like the name. It took a while to decide how to pronounce it. (We settled on pretending the first A wasn't there and just saying it as one word.) Then we had to decide how to write it, both in longhand and on a typewriter. The choices seemed to be:

AARTIMES
AARTimes
aartimes

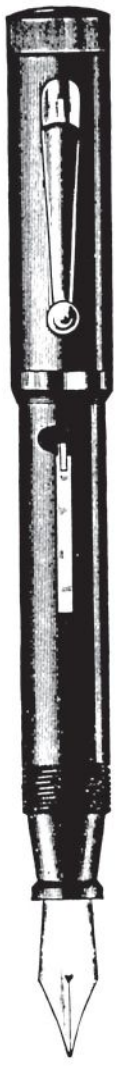
We threw caution to the wind and decided to compromise on the one in the middle.

Of course we could have avoided having to make all these decisions in the first place. We could have chosen a conservative, stodgy title that everyone could pronounce and no one would be interested in. However, we pride ourselves on being innovative and we were seeking a name that would be different and, simultaneously, descriptive.

AARTimes carried the day. We liked the idea of using the association initials and we think that the word "Times" accurately describes the type of up-to-date, newsworthy material that will appear in this new publication. It was only one more logical step that brought us to combining the words into a one-word title that few people can pronounce, but most people will come to enjoy.

We entrusted the design of the magazine logo and the format and artwork to Mark McDowell. He directed the cover photography, designed the layout, and did the illustrations for the **Clinical Specialists** article. Above all, Mark showed great ingenuity and patience in ironing out the bugs that always seem to accompany any new undertaking.

This first issue of *AARTimes* features a wide variety of articles and short pieces. Our cover story, **The Clinical Specialists,** is an interesting interview with the four chairmen of the AART clinical specialty committees. One specialty area, neonatal and pediatrics, is highlighted in an article about Carol Durham and her work with babies at Childrens Medical Center in Dallas, Texas.



The article on **Custom-made RT Departments** describes the work done by contract service companies in respiratory care and explores some of the advantages and disadvantages of using these services. In the next issue of *AARTimes* we will discuss another management tool that has been developed to alleviate the occasional personnel crunches that plague respiratory therapy departments - the temporary help service.

I would like to turn your attention to a feature of this issue sponsored by the Public Relations and Liaison Committee, an **Organizational Chart** of the AART. It is followed by the first of seven flow chart supplements, which will be highlighting the various segments of the organization.

In addition, you should note the inclusion of a reply card from the Career Mobility Subcommittee. The questionnaire is described in a short piece on **External Degrees** and seeks to learn about membership interest in an external degree program.

Scattered throughout the magazine you will find the first regular departments to be established. I encourage you to send us information for these columns and suggestions for other regular features that you might like to see in *AARTimes.*

Our Washington consultant, Mr. Paul Pierce, will be writing about health care legislation in each issue of the magazine. I will be happy to forward to him any ideas that you might have on particular pieces of governmental legislation that you would like to see discussed in his column.

We have plenty of room to grow in this magazine. We would like to do so, and with your help I'm sure that we can. *AARTimes* is a forum for the membership as well as a source of information about issues in health care, education, and management in respiratory therapy. I encourage you to let us know what you are interested in, what information you would like to receive, and what you would like to read in *AARTimes.* Together, we can make *AARTimes* an enjoyable publication, one that you can look forward to receiving. And, who knows, maybe by next issue you'll be able to pronounce it, too.

Mary Lynn Gage
Editor

Paul E. Pierce

Washington Overview

Since Ralph Nader entered the legislative arena declaring that the General Motors product, the Corvair, was a menace to the public, a tide of consumerism has swept the public until now it almost reaches the point of ridiculousness and often infringes upon the rights of citizens to earn a respectable livelihood, even in professions that have been accredited through normal educational channels. Education now seems to have become a target for this movement, and many institutions may have their own accredited systems attacked for not meeting federal standards, which they must help write.

The federal government is supposed to meet the needs of its people, true. However, a government can only produce. It cannot distribute.

Out of this powerful movement now comes a bill which could well affect the education and professionalism of respiratory therapists. Unfortunately, instead of focusing on one problem or one area where there is a flagrant violation of human conduct, this bill takes a broad brush stroke at the entire clinical laboratory system and all of the employees therein.

It is Senate Bill 705, the Clinical Laboratory Improvement Act of 1977, introduced by the ranking Republican member of the Senate Human Resources Committee, where the bill was submitted after introduction by Senator Jacob Javits of New York. At this time, the bill has 19 cosponsors in the Senate.

One can readily see that the bill has the support of both political parties and of both liberal and conservative philosophies. Therefore, the bill has a lot of political clout going for it, unless....

The only way such legislation can be amended or stopped is for there to be an overwhelming "grass roots" hue and cry of persons who are more informed about clinical laboratories and their employees than those persons writing the bill.

One of the features of this bill is that it requires the Secretary of Health, Education and Welfare to establish standards under which clinical laboratories and employees must function. He must do this upon consultation with those "in the profession."

Why must Congress abdicate its responsibility to civil servants to write standards? The civil servants probably will not know any more after professional consultation than they did before, if past actions of other federal agencies and regulation writing are indications. And, if the Secretary must consult with those already in the profession in order to write the regulations and standards, then why must the Government get involved in the first place? The whole process seems illogical. It asks professionals to regulate themselves by government standards at their own expense - for it is their tax dollars that will pay for writing the regulations and enforcing compliance. The bill clearly sets out fines and punishment for violations. Furthermore, the compliance officers probably will know very little about the standards they are trying to enforce.

Briefly, the Clinical Laboratory Improvement Act will: (1) require clinical laboratories to maintain appropriate quality control programs; (2) require maintenance of records, equipment, and facilities for the proper and effective operation of such laboratories; (3) require satisfactory performance by such laboratories on periodic proficiency tests developed after the Secretary of HEW consults with professional organizations; and (4) in accordance with the above tests, prescribe qualifications for directors and supervisory personnel of such laboratories, laboratory technical personnel, and **any other laboratory personnel.** These qualifications will not be limited to educational requirements but will include such alternative requirements as appropriate training, experience, and examination standards, including requirements designed to ensure continued competency of laboratory personnel. Furthermore, after consulting with the professionals, the Secretary of HEW will develop job-related proficiency and practical examinations for personnel in clinical laboratories.

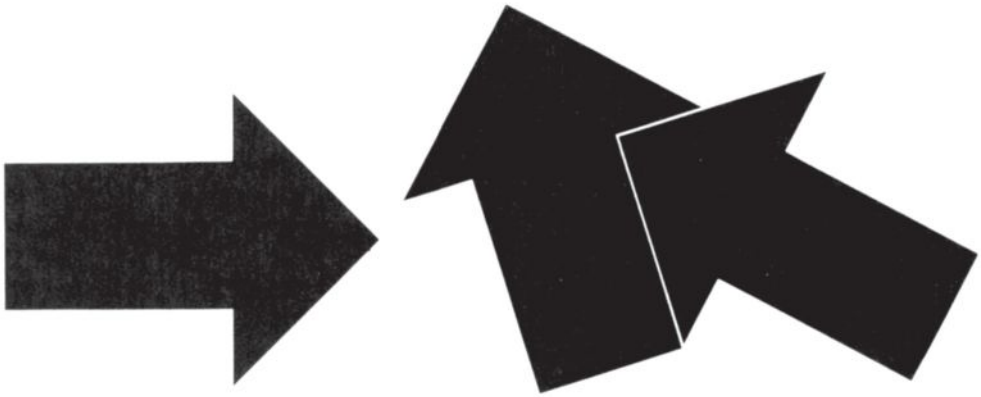
Are there not laws already on the books to take care of persons allegedly committing crimes? Why must professions be policed by civil servants who are going to write the standards for policing the professions only after they have consulted with the professionals themselves? This is the tax waste syndrome flagrant in Washington. If you want to help stop it and want to express your opinion about the Clinical Laboratory Improvement Act, the place to start is with the members of the Senate Human Resources Committee. Hearings have been held on the bill, and it will be reported to the full committee within weeks. Address your letter:

The Honorable John Doe, U.S.S.
Senate Office Building
Washington, D.C. 20510

The committee members to write are: Harrison A. Williams, Jr., Chairman (N.J.); Jennings Randolph (W. Va.); Claiborne Pell (R.I.); Edward M. Kennedy (Mass.); Gaylord Nelson (Wis.); Thomas F. Eagleton (Mo.); Alan Cranston (Calif.); William D. Hathaway (Maine); Donald W. Riegle, Jr. (Mich.); Jacob Javits (N.Y.); Richard S. Schweiker (Pa.); Robert T. Stafford (Vt.); Orrin G. Hatch (Utah); John H. Chaffee (R.I.); S. I. Hayakawa (Calif.).

At Issue

Each month *AARTimes* features an issue of current concern to respiratory therapy practice. Readers are encouraged to respond to these issues. All responses should be sent to the Editor, *AARTimes,* 7411 Hines Place, Dallas, Texas 75235. Selected comments and tabulations will be reported in future issues of *AARTimes.*



Single or Dual Entry

For the past several months, members of the profession have been debating whether or not to continue the current practice of training and credentialing both technicians and therapists. It has been suggested that a single-entry level, generalist position be identified for which schools would develop curricula and for which the NBRT would provide certification. Furthermore, it has been suggested that post-entry specialty credentials be devised for the clinical specialty areas.

☐ I favor the suggestions as alternatives to the present system.

☐ I do not favor changing the present credentialing system to a single-entry level system.

Comments: _____

_____

_____

_____

_____

_____

Name (optional) _____ Address _____

Lugene A. Whitley

Affiliate News

The AART Chartered Affiliates Committee would like to commend the **Ohio** and **Ohio Valley Chapters** for the dedication and hard work which went into merging to form the **Ohio Society for Respiratory Therapy.** These two chapters have long been two of AART's strongest affiliates, with the Ohio Chapter being named Chartered Affiliate of the Year in 1976. This step toward unity will greatly benefit the members in Ohio.

AART members are few and far between in the state of Wyoming, but those few members banded together and have been awarded a charter to form the **Wyoming Society for Respiratory Therapy.** Wyoming was at one time part of the **Colorado Society,** but they felt they could stand on their own and form their own affiliate. The effort that went into the formation of the WSRT proves that strength is not necessarily in numbers alone, but in members who care enough to get involved. Our congratulations and support go to this new affiliate!

It is not only difficult for a respiratory therapy graduate to know where to look for job opportunities, but oftentimes hospital administrators are hard-pressed to locate prospective employees.

The **Oklahoma Society for Respiratory Therapy** saw this need within their state and turned it into a valuable service. Instead of having a classified section in their newsletter, where the editor cannot devote time to just the classified section but must look to the entire newsletter, the OSRT has one person devoting time to one specific area, a monthly *Employment Bulletin.* This idea was initiated on a six-month trial basis with the first bulletin mailing in March. The *Employment Bulletin* is mailed to all OSRT members and to any hospital personnel or respiratory therapy department upon the hospital's request. As a membership service, all member want ads are placed free of charge. To help defer production and mailing costs, a nominal fee is charged for the placement of nonmember want ads and all help-wanted ads.

This sounds like a very worthwhile project, and we hope at the end of the trial period that it proves its value and can be continued on a permanent basis.

This column will, hopefully, appear monthly in this publication. To ensure that it does, we need more input from the chartered affiliates. If your affiliate is working on a project you would like to share with the other affiliates, or if you are having problems in a particular area where input from other affiliates would be of assistance, please write the information down and send it to Lugene A. Whitley, Administrative Assistant, Chartered Affiliates, AART, 7411 Hines Place, Dallas, Texas 75235 or call (214) 630-7180.

How to Resuscitate a Lizard

By Lawrence Bowman, RRT

1. Scoop lizard from pool.

2. Shake out lizard.

3. Massage lizard's torso, applying on and off pressure directly behind frontal legs.

4. Apply mouth to mouth resuscitation to lizard's mouth, breathing slowly and forcefully.

From the January-February 1977 issue of the Central Pennsylvania Chapter's Newsletter.

Donna Frownfelter, RRT

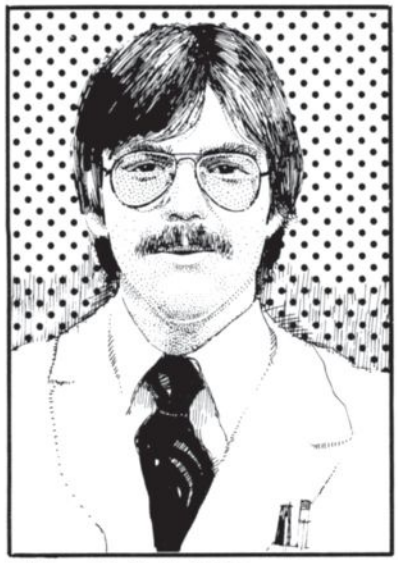
Robert F. Clothier, Jr., RRT

Thomas J. Williams, CRTT, RRT

AARTimes INTERVIEWS THE CLINICAL SPECIALISTS

In November 1976, the National Board for Respiratory Therapy proposed the establishment of a specialty credentialing committee, charged with developing methodologies for the creation of specialty examinations in five areas of specialization. The creation of such a committee strongly underscores a new reality in respiratory care - the rapid, intensive development of specialty areas. Among the areas singled out for study by the new committee were four clinical specialties - critical care, perinatal and pediatrics, cardiopulmonary laboratory technology, and rehabilitation and continuing care.

These areas of specialization have made great technical advances in recent years and are pioneering new areas of respiratory care delivery. In an effort to learn more about each of the clinical specialties, *AARTimes* interviewed the chairmen of the four committees formed by the AART to develop guidelines for these specialty areas. The chairmen were asked to discuss their views on the current status of their specialties and offer some predictions about the future of specialization in respiratory care. The interviews were conducted by telephone, transcribed, and edited for publication in a combined format. This combined interview, presented below, is very informative and will undoubtedly stimulate additional questions and discussions about the new breed of respiratory therapists, the clinical specialists.



William T. Cecil, RRT

Q: What factors contributed to the development of specialization in respiratory care, both in the general field and in your particular area?

A: Clothier: I think I should point out that critical care is a rather broad term. It encompasses four areas, for which we have subcommittees under our critical care committee - intensive care, emergency and trauma care, anesthesia, and circulation technology. Right now, the area of intensive care is the only one in which we have large numbers of respiratory therapists working. The other areas do exist, but the roles of respiratory therapists in them vary widely from hospital to hospital. So I will be applying most of my answers to the area of intensive care.

Critical care evolved, in the whole medical profession, as technology improved and as more specific instruments and apparatus became available to provide more definitive life support and monitoring. People acquired specific skills in the application and utilization of this equipment. I think the same thing generally happened in respiratory care. As more specific respiratory and cardiopulmonary life support equipment became available, respiratory therapists acquired the skills to operate the equipment, acquired the knowledge to go along with it, and began specializing in the care of the critically ill.

A: Williams: I would consider respiratory therapy itself a specialty. The profession evolved because of the necessity for personnel specifically trained in respiratory care to work throughout the hospital. Respiratory therapists obtained this training and helped provide better patient care. Within the last few years, as overall medical care has evolved with new techniques and new equipment, many areas of the hospital in which respiratory therapists work have become specialized. This has forced respiratory therapists to become very adept in a given area.

Specialization in perinatal care developed as hospitals became increasingly aware that, when they admitted a delivering mother, they were admitting more than one person, possibly multiple individuals. The physiology, pathophysiology, and treatment of newborns was markedly different from that of adults. Likewise, in dealing with pediatric patients, everyone realized rapidly that the clinical needs of these individuals required specialized techniques and equipment. Several of the norms for adults just don't fit the newborn and pediatric patient.

A: Cecil: In both respiratory therapeutics and diagnostics, the equipment and techniques have become quite sophisticated and individuals have specialized in these areas in order to apply the techniques properly. Specialization in cardiopulmonary lab technology has developed because there are so many devices available for testing patients, because the techniques are so advanced, and because the number of patients who require these techniques is quite high. Consequently, from a logistics standpoint, we need trained people working full-time in the cardiopulmonary lab.

A: Frownfelter: The big things that come to mind are, first, that the equipment became more complex and more diversified, and second, that the volume of work increased. As specialty areas became more prominent, the need developed for having people work in them on a regular basis to ensure more consistent therapy and more consistent results. In the area of rehabilitation and continuing care, I think specialization developed because what we are doing is so different from everything else in respiratory therapy. We are working with patient education, teaching patients why they are breathing improperly and how they can use their muscles to the best advantage.

In the Rehabilitation and Continuing Care Committee we are studying home care development. Presently, the third party payer system will not pay for respiratory therapy home care. We have been administering a demonstration home care respiratory therapy program, the South Hills project in Pennsylvania, and Blue Cross and third party payers have been involved in the planning of the program. The more they become involved in it, the more they will see that home care respiratory therapy is a necessary health service.

Q: What are the advantages of specialization? The disadvantages?

A: Clothier: In many ways the disadvantages outweigh the advantages. The fairly obvious advantage is that, by specializing, you can have a great deal of knowledge or expertise in a specific area, as opposed to trying to know everything about the whole process. The disadvantages are predominantly economic and depend on how narrow a specialization is. For example, specializing in intensive care is good, but specializing to the degree of having the ability to perform only one small part of the activities required in an intensive care unit is not. From the standpoint of cost, it is better to have a group of intensive care practitioners who have broader ranges of competency so that, with two or three people, you can do all of intensive care. That way, the patient gets the best care for the least cost. Plus, you don't have to have as many different training programs that have to be staffed and equipped.

A: Williams: I think that the advantage of specialization is better patient care.

Robert F. Clothier, Jr., RRT, is an assistant professor of health sciences at Northeastern University in Boston, Massachusetts, and has been a member of the respiratory therapy field for eleven and a half years. He received his Bachelor of Science degree in chemistry from Emory University in Atlanta and has done graduate work in physiology, biochemistry, health sciences, and education. A ten-year member of the association, he has held various offices on the state and local levels and is this year's delegate from Massachusetts.

Thomas J. Williams, CRTT, RRT, is a clinical specialist for Bourns, Inc., in Riverside, California, and also serves as an instructor in the respiratory care department at Loma Linda University in Loma Linda, California. Mr. Williams has been in the field of respiratory therapy for six years. He received his Bachelor of Science degree in biology from the University of Detroit in 1971 and has also taken courses in business and osteopathic medicine. He is currently working on a master's degree in education at the University of San Diego. Mr. Williams has been a member of the association since 1967 and has served on numerous national and state committees.

William T. Cecil, RRT, is supervisor of the pulmonary laboratory at St. Luke's Hospital in Kansas City, Missouri. He received his associate degree in respiratory therapy from Menorah Medical Center and has been in the association for two years. Last year he served on the Board of Directors of the Missouri Society and is currently Speaker of the House of that society. He has been in the field of respiratory therapy for eight and a half years.

Donna Frownfelter, RRT, is director of chest physical therapy and physical rehabilitation at Rush-Presbyterian St. Luke's Medical Center in Chicago, Illinois. She has been a member of the AART since 1970. She received her Bachelor of Arts degree in biology from Northpark College and also attended Northwestern University and the University of Chicago. Ms. Frownfelter has been working in respiratory therapy since 1966 and is also a registered physical therapist.

A specialist has more knowledge and expertise in one area than a generalist. The disadvantages are: 1) it is going to cost more to have a specialist; 2) it is going to take advanced level training to be a specialist; and 3) not everybody is going to be able to afford to take the training or be able to pass the examination to receive whatever credential will be involved. Furthermore, because not everybody will become a specialist, a degree of difference will arise in the profession itself. We will have specialists and we will have generalists, and it is possible that this might make for some bad feeling.

"People want to acquire objective data demonstrating a therapy's effectiveness. This produces a very healthy environment . . . (for) cardiopulmonary laboratory technicians."

A: Cecil: I think there are many advantages to specialization. Through specialization we gain people in the cardiopulmonary lab who are very familiar with the equipment and with the techniques that are used to categorize lung disease. We are better able to apply testing procedures and meet the needs of the patient population. The disadvantages are that specialization will be more expensive and will certainly be more cumbersome from any type of organizational standpoint - from hospital administration to the federal government. We are developing a new job description in a health facility and it is probably not yet recognized by the federal government and may not be recognized by the state government. The job is not recognized by anybody except for the people who are doing it.

A: Frownfelter: The big advantage is that specialization provides more effective patient care. You have someone who is geared to a particular problem and can zero in on it rather than having someone who is a jack-of-all-trades and master of none. The disadvantage is that, a lot of times, a specialized person will develop tunnel vision, concentrating only on his particular area and not realizing what is going on in other fields, or even in other areas of his own field.

Q: How will specialization affect job mobility for the specialist? Will the specialist be limited in the type of work environment available to him?

A: Clothier: It depends on which specialty within critical care we discuss. For example, if a specialist chooses intensive care as a specialty, I don't think he will be limited to a large hospital because virtually all hospitals over 50 or 75 beds have some form of intensive care unit. Specialists in anesthesia would also be of use to almost any hospital. As long as there is a physician present to supervise the administration of anesthesia, these specialists will be useful in any hospital that does surgery. The demand for emergency and trauma care specialists is going to depend on how the community's emergency care system is set up. Circulation technologists may be more limited to larger hospitals because, to some degree, only the larger hospitals are doing the sort of things that we are identifying with that specialty. However, we are looking not so much at developing competency in one of these areas as at developing multiple competency, so that when the workload is down in one specialty area, people can be used in other areas.

A: Williams: A disadvantage of specialization is that it could limit job mobility rather than improve it. For example, hospitals delivering newborn care are now being categorized in different levels. Level one and two hospitals will only care for infants up to a certain point. A baby who gets into difficulty will have to be trans-

ported to a level three hospital, which is where the neonatal specialist would work. These level three hospitals will be the larger institutions, regional centers for newborn care.

One thing we must keep in mind, however, is that a therapist will have had to attain the minimum entry level as a generalist before he can become a specialist, so he can always go back and work in another area of respiratory care. Also, the curriculum for the neonatal and pediatric specialist will probably be very similar to that for the critical care specialist. By getting the neonatal and pediatric credential, a specialist would also get a good chunk of the critical care credential out of the way. I would envision people to be multidisciplined and be able to hold more than one specialty.

A: Cecil: I think that cardiopulmonary lab specialists might be limited to larger hospitals, for a while anyway. All hospitals do not have pulmonary function labs or cardiopulmonary labs. Most of the institutions that have labs and that are capable of meeting the needs of a large patient population are quite large and have become referral institutions in their areas. Smaller community hospitals would probably not have the facilities to be full-service hospitals. Job mobility is going to depend on general physician acceptance. The tests performed, for example, in the cardiopulmonary lab generally require the interpretation of a physician who has specialized in that particular area. These physicians are relatively rare in small communities.

A: Frownfelter: In continuing care and rehabilitation, I think specialization will improve actual job mobility. Right now there are two types of programs dealing with home care that are well accepted in nursing, physical therapy, and social service - hospital-based programs and independent programs. I think we will be seeing the same types of programs for respiratory therapy. The hospital-based programs seem to be the ideal situation. For example, the South Hills home care program is affiliated with nine hospitals and takes referrals from each one. The patient is started with the home care program in the hospital and the respiratory therapist follows the patient into the home to ensure continuity of care. In this situation, the therapist can have more flexibility, being able to work in home care and also rotate back to the hospital to keep in touch with new developments in the field.

Q: What is the current status of specialization in your area in regards to education?

A: Clothier: Presently, most of the education that people receive in any of the critical care specialties is predominantly in-house, on-the-job education or continuing education. Things are beginning to be formalized and will be more formalized as we identify the appropriate role for the respiratory therapist in each of these areas. Then the education programs can begin to formalize training for them. Right now, the use of personnel in the critical care specialties is so varied that it is only practical to train them as they are needed by the given institution.

"Presently, there are no other organizations offering a credential in this area (perinatal and pediatrics). We would be pioneers."

A: Williams: Currently, there are no educational requirements at all for perinatal and pediatrics specialties. Our committee is endeavoring to determine what kind of educational requirements are needed to be a specialist in these areas. We must determine what a therapist should know and what he should be able to do. Most training is now received on-the-job. Some neonatal-pediatrics training exists in school curricula, but it is minimal.

A: Cecil: Right now there are only a few educational institutions in the country that offer programs in the diagnostic aspects of respiratory diseases. The large majority of people who are working in the pulmonary lab are respiratory therapists who have been through an approved respiratory program and have decided, because of special interest in the area, to take on-the-job training in the pulmonary function lab.

A: Frownfelter: At present we have home care and rehabilitation being done primarily by credentialed respiratory therapy personnel. Most of their training in the specialty area is received on-the-job, although some specialized training is received in respiratory therapy programs and through continuing education.

Q: What is the current status of specialization in your area in regards to credentialing?

A: Clothier: There is not really any credentialing for respiratory therapists in critical care areas. There is an organization for circulation technologists that awards a credential, and a therapist who completes the formal requirements imposed by that organization can receive its credential. There is presently no real credentialing for non-physician, non-nurse practitioners in anesthesia except for the physician's assistant credential. For emergency and trauma care, the only credentials are the formal credentials for having completed emergency medical technician or paramedic training programs. The only credential for intensive care personnel is the critical care nurses' credential.

A: Williams: The perinatal-pediatrics committee is in the process of pursuing the credentialing issue with the NBRT to learn how we can credential people as specialists, what the process will be, what kind of exams will be given, and what type of

(continued on page 44)

Joan P. Taylor, BS, RRT
Chairwoman, Career Mobility Committee

In Search Of An External Degree

The AART Career Mobility Committee is currently in search of an external degree, a nontraditional educational program designed to allow practitioners to pursue college credit and degrees without leaving their jobs to return to full-time residential study. The most unique characteristic of such a program will be the emphasis on competency assessment, including respiratory therapy clinical competencies. Ideally, students will be able to pursue the required competencies in each curriculum area through a variety of methods, such as compressed courses, mentor-guided study, or individual learning packages. Students may also be able to demonstrate previously learned skills through credit for experiential learning or credit by equivalency examination.

Other student services, including compressed courses and counseling, might be offered in conjunction with AART state, regional, and national meetings, as well as in cooperation with approved schools and in regional centers throughout the country.

The search for this ideal educational system begins with the careful selection of a fully accredited educational institution. Together with the AART, this college or university will begin to develop the curriculum and delivery methods of external educational programs for respiratory therapists. In order to assist the AART Board of Directors in evaluating the innovations and merits of various institutions, a questionnaire card has been included in this issue of *AARTimes*. This card has been designed to obtain general information about your needs and future educational plans. Some of the terms used on the questionnaire are defined below for additional clarification.

Mentor-guided study, sometimes called "guided developmental experience," refers to a contractual arrangement between student and mentor (instructor) for planned activities and assessments in fulfillment of specified objectives. In mentor-guided study, students actually meet with the instructor(s) to plan individualized programs of study to meet required objectives.

A compressed course is an accelerated learning experience designed to meet specific objectives and competencies. As an example, a three-credit hour course might include four weekend meetings, pre-meeting readings, and six examinations.

Independent study packages are preassembled units of instruction providing an individual learning experience without reliance on others. Usually such learning packages are programmed materials including textbooks, instructional material, and self-assessment forms, all designed to meet specific objectives.

Equivalency examinations are comprehensive assessments of competencies required in each curriculum unit. Students may elect to demonstrate previously acquired competencies through such examinations or may use these assessments to evaluate independent or mentor-planned learning experiences.

To select the right academic institution to help us develop an external degree program, *we need your help.* We must be aware of your needs and goals. If you would be interested in pursuing your educational goals through an external degree program, please complete the attached questionnaire card and mail it today!

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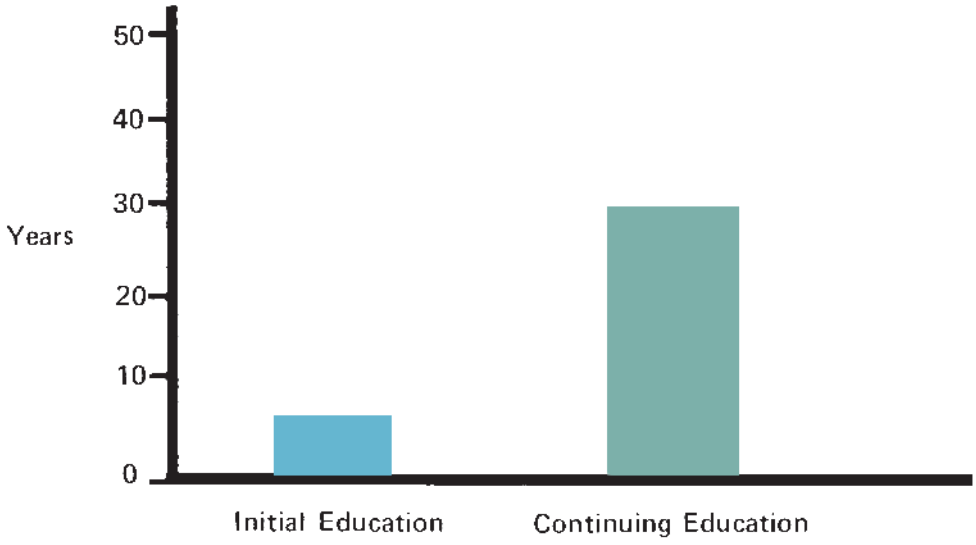

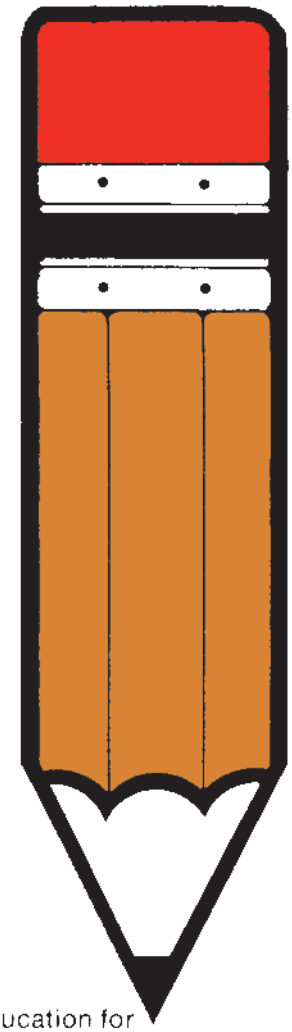

Have you ever stopped to think that the health care practitioner's initial education for job entry has typically required approximately three years of study, all of which has been accurately and completely documented by academic institutions? By the same token most people will spend up to 30 years participating in continuing education activities, most of which could not be documented in the past.

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HELPING THE BABES OUT OF THE WOODS

A day in the life of a perinatal-pediatrics specialist

Article and Photography
By Debbie Bunch

Above: Carol gives Cary chest physical therapy, a major part of her treatment.
Left: Dr. Gerald Moore looks on as Carol gives Cary her IPPB treatment.

Friday, March 11, 1977, was Cary Ann Baily's first birthday. In a way she spent it much like any other one-year-old. Her mother baked a cake, her friends arranged a party, everyone brought presents, and she even had a new dress to wear for the occasion. But unlike other one-year-olds, Cary spent her first birthday in the intensive care unit at Children's Medical Center, in Dallas, Texas. Born with hyaline membrane disease, she has been in the Center since she was two months old.

Cary and the other children who pass through the intensive care unit at Children's are big people in the life of the unit's chief respiratory therapist, Carol Durham. A graduate of a two-year program at El Centro College in Dallas, she has been working in the field of respiratory therapy for three years. Her first job was in the unit at St. Paul's Hospital in Dallas and she has been at the Center for a year. "I liked working at St. Paul's," she said, "but I love it here."

Carol works the 7 a.m. to 3 p.m. shift at the Center and is assigned permanently to the intensive care unit. When I visited her there and asked her to describe her "typical" day, her eyes opened a little wider and her face showed signs of disbelief. "A typical day," she responded. "There isn't one!"

Although the things she does every day - equipment rounds, treatments, change-outs - remain more or less routine, she explained that no day is really typical because the kids in the unit are always changing. "New ones are always moving in and something different is always happening with the ones who stay."

An important part of her day, she said, is spent catching up on the conditions of each of her patients. She reads the charts of each one when she arrives on duty in the morning and also receives reports from the therapists who worked with the children during the night. "Things are just about like this around here," she said, snapping her fingers in quick succession to illustrate. "These kids can crash really fast and then bounce right back."

During my visit Carol was busy giving treatments, which are ordered by the attending physicians and usually done on the frequency of one every few hours, to Cary and another child in the unit, a three-month-old baby boy. "The doctors write the orders," she said, "but we usually decide how to do it." Most of the time, she explained, the interns and residents on duty will simply specify the type of therapy to be given, such as chest physical therapy or IPPB. She and the other therapists will work from those general orders and choose exactly which method to use to administer the treatment.

Carol went on to add that the working relationship between the various health care team members at Children's is very good. "We don't have many problems," she said, "but when something does come up we just sit down and try and work it out." Most of the people working in the unit, she said, try to help each other whenever they can. "We have pretty much set duties here, but there are some things that both we and the nurses can do." She said that there is rarely any problem over the shared responsibilities. Each group is usually happy to receive any help the other can give. "And the nurses are really glad to have the guys around," she added. "They're so good at moving the monitors around - and helping out when it comes time to weigh the children."

In addition to relating well to her co-workers, Carol also tries to establish good communications with the parents of the children in the unit. "We don't sit them down to explain what's going on with their kids," she explained. "We try to keep it on a more casual basis." She usually tells parents about what she is doing to their children while she is actually doing it. This type of approach, she continued, serves to reassure them and to help them get over the fear they have for their children's well-being. It also helps them to gain a better understanding of the treatments that their children are receiving. For example, she said, when a mother first sees chest physical therapy being applied to her child, her reaction is usually one of alarm. "When they see the clapping, they think we're hurting their children," she said. "They want to know what's going on."

(continued)

Carol and Mrs. Gary Baily, Cary's mother, discuss the impending birthday party.

The kind of relationship that Carol has with the parents of her patients was well illustrated when Cary's mother, Mrs. Gary Baily, came into the unit to visit her daughter. The two women met each other in the hallway outside of Cary's room and ended up in a big bear hug. Carol spent a few minutes giving Mrs. Baily a report on Cary's response to her latest treatment and then listened as the mother talked about some of the plans that had been made for the impending birthday party. "We have to get their trust," Carol said later. "It's a lot better for the kids if the parents aren't afraid."

But the most important relationship Carol has to cultivate in her job at the Center is the one she has with the children themselves. Whenever she is giving a treatment, checking the equipment, or simply passing by a crib, she has her attention focused on the kids. She straightens the covers on their beds or smoothes the hair back on their foreheads or holds out a finger for them to grab. And at the same time she is talking to them. When I asked her if such one-sided conversations really mean anything to one-, two-, or three-month-old babies who are hooked up to ventilators and struggling for their lives, her answer was an emphatic "yes." Although she admitted that they may not understand her words, she said that they do understand her intentions. "They know I'm helping them - I'm being gentle with them - even the little babies." According to Carol, that is one of the major reasons why she was attracted to the specialty of perinatal and pediatrics in the first place. "When you're working with adults," she said, "you face the attitude of 'don't touch me.'" The kids, she said, not only do not mind the touching but actually enjoy it. Most of them, she said, grow to love their treatments and even look forward to them for that very reason.

Because she is interested in making perinatal and pediatrics her permanent specialty area, Carol tries to keep up with new advances in the field of respiratory therapy. "I really get involved," she said. "I try to read as much as I can about what's going on." But since most of what is currently being published deals with adult patients, Carol also said that she has to interpret what she reads so that she can apply it to the treatment of children. "You just can't deal with kids the same way you deal with adults," she explained. "Perinatal and pediatrics is a whole different world."

Advances in research, equipment, and technology have made that "whole different world" of perinatal and pediatrics a major specialty area in the field of respiratory care. But the dedication of people like Carol Durham is giving it something equally important. The way they feel about their patients and their jobs is what is making the field an exciting and rewarding area in which to work. But maybe Carol summed it up best when she was trying to describe how she felt about her job at the Center. "You know, I never really thought kids were all that neat," she said, "until I came to work here." ■

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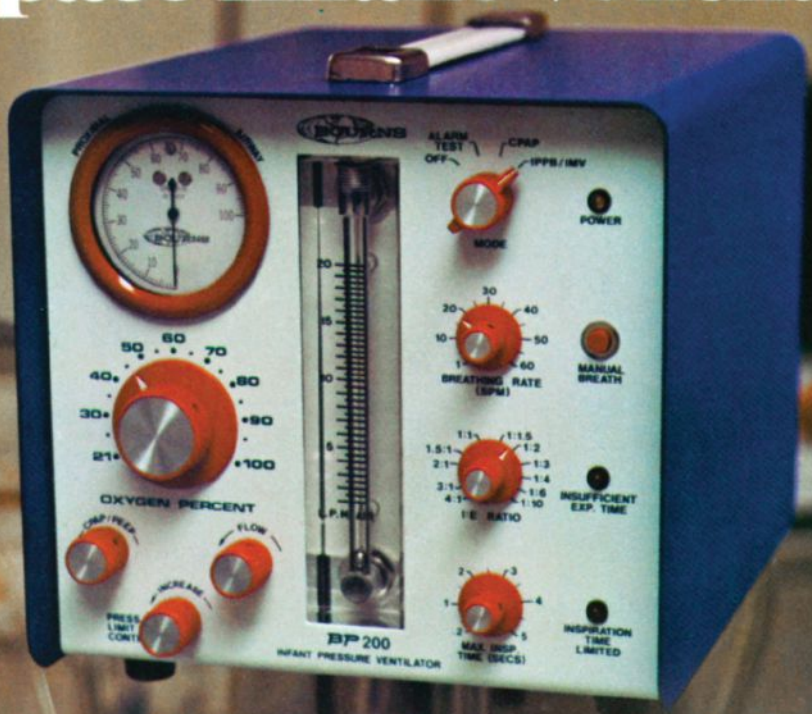

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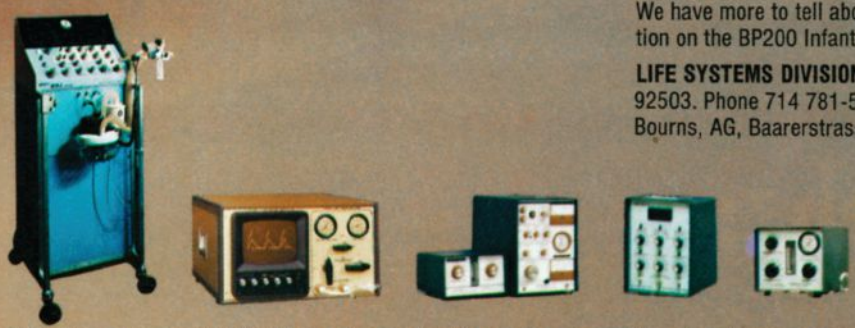

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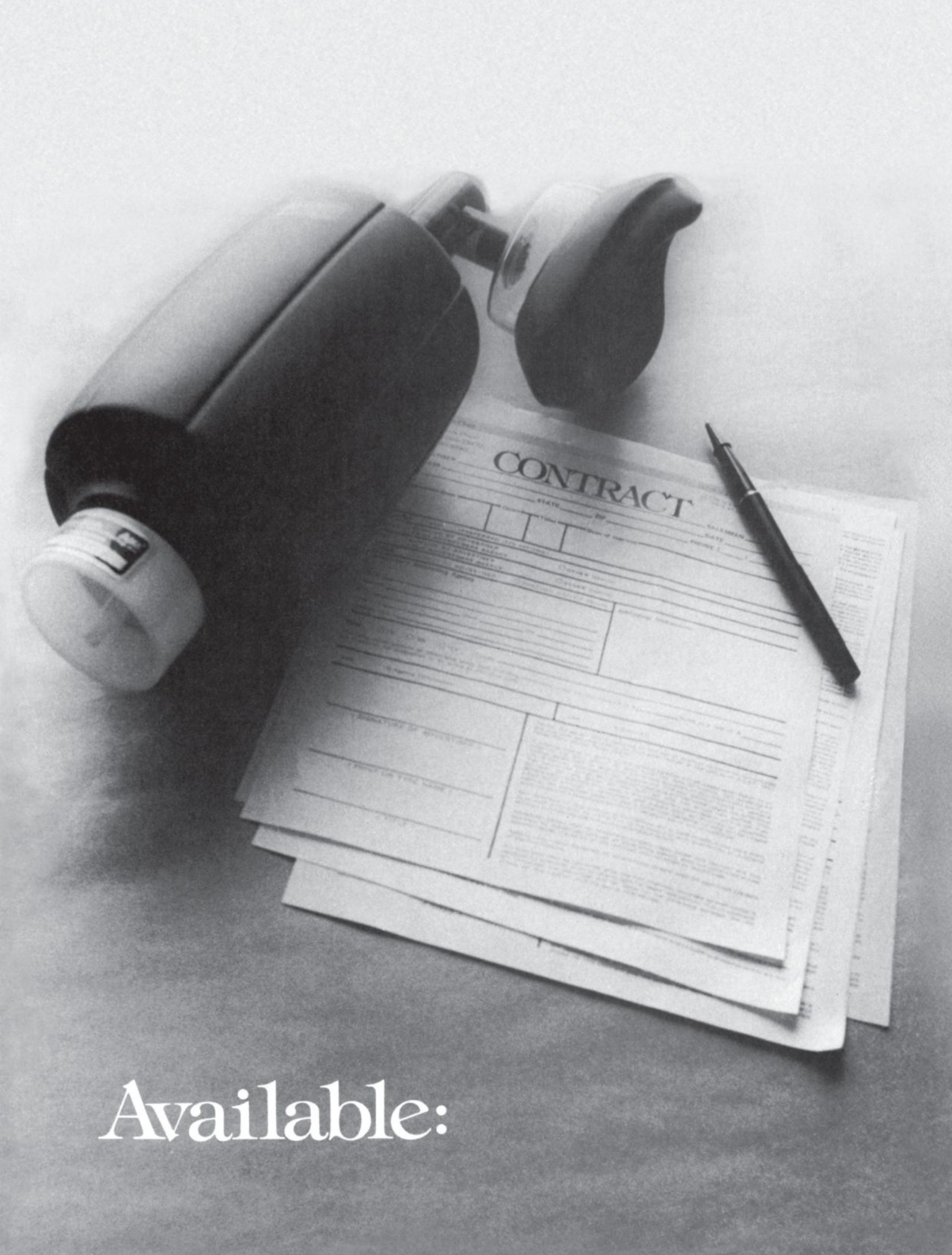

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RT Department, Custom-made

By Salvinija G. Kernaghan

If Hercules had been a modern-day hero, the task of making an "oxygen service" into a full-fledged, productive respiratory therapy department could easily have been added to his legendary twelve labors. And it probably would have been the toughest.

Many hospitals - small, rural institutions making up the majority - could sympathize with the hero. They continue to perform some Herculean tasks themselves, working under the pressures of limited resources and endless demands from community and government. The demand for a full-time department of respiratory therapy is frequently among them, especially if a hospital seeks to achieve and maintain accreditation. But to attract the makings of a good department to a place where no such department exists is a study in frustration. It requires the gathering of considerable resources: an efficient department management, a competent staff, and sufficient modern equipment, all primed to execute the orders of a medical staff that knows how and when to apply the various forms of respiratory therapy. Furthermore, these separate units of the formula for success must be developed almost simultaneously. Otherwise, the resources a hospital has managed to attract - a good department head, for example - will very likely be lost for lack of the other working parts.

For a growing number of institutions, the only way out of this failing cycle is to join forces with a respiratory therapy contract service - and a successful way out it is. In effect, this relationship requires the hospital to trade physical space and a certain percentage of its RT department revenues in return for a department that is managed, staffed, equipped, and otherwise operated by the contractor to fill the hospital's demand for respiratory therapy services.

The department at Button Gwinnett Hospital, in Lawrenceville, Georgia, is a good example of the benefits a community can derive when its hospital enters into this kind of relationship with a contract service. This 80-bed institution, operated by the local hospital authority, is about 40 miles from Atlanta. One might expect its relative proximity to a major metropolitan area to be an advantage in attracting a competent staff. Such was not the case, says John Hughes, assistant administrator for patient services. Before 1974, this hospital and its two sister institutions in the Hospital Authority of Gwinnett County (Buford General with 60 beds and Joan Glancy Memorial with 100 beds) could provide little more than an "oxygen administration" service with a staff that was "an offshoot of nursing service." Try as they might, Mr. Hughes recalls, they could not find a registered therapist interested in the job of developing a full-service department for all three hospitals. Even some hospitals in Atlanta faced the same recruiting problem.

For a time, it seemed that the addition of several certified therapists to the department might begin to solve the problem. However, when a chest physician came on the staff in 1973 and was joined by some specialists in internal medicine and cardiology, they quickly came to depend on respiratory therapy services for their patients and to demand increasing sophistication from the staff. Their demands could not be met.

Having explored all other possibilities, Mr. Hughes continues, the hospital authority decided to give contract services a closer look. After serious discussions with five or six different firms, the hospital authority signed a contract with one, and it continues to be satisfied with its decision. Activity in the department has increased greatly, says Mr. Hughes, as is demonstrated by the fact that two registered therapists, four certified therapists, and several aides make up the department's staff, which is employed by the contract company but must comply with the hospital's personnel policies. The firm purchased the equipment that the hospital already had, added the units that were needed, and continues to expand and update the equipment inventory as further needs arise. The department operates two full eight-hour shifts and has on-call coverage for the remaining eight hours of the day.

(continued on page 26)

Photo by Debbie Bunch

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"We know we're providing a reliable and worthwhile service," Mr. Hughes says. Increased revenue from respiratory therapy is only one indication, although an important one. More important to the community is the fact that patients who require respiratory care need no longer be transferred to other institutions or be taken beyond the convenient reach of their families and the care of physicians whom they know. The medical staff maintains control of the quality of care provided to patients in part through the retrospective audit mechanism. However, the physician's most effective control over quality is his own ability to assess the need for care and prescribe it appropriately, an ability that is constantly refined by interaction with a competent, professional respiratory therapy staff and by the continuing education opportunities the contract service provides.

This hospital-contract service relationship has produced remarkable changes, and, to date, an estimated 20 percent of the nation's nongovernmental acute care hospitals have undergone a similar transformation. This is not to say that they have all been highly successful ventures or that all contract service arrangements for respiratory therapy could withstand careful scrutiny and be found beyond reproach. But this claim can also be made by very few hospital-operated RT departments. A more important point is that contract services can assist hospitals to develop their potential for better patient care.

This assistance lies not so much in the equipment a company brings with it, or the personnel (whatever their level of training), or the management system that is backed up with each company's accumulated experience and operating resources. These are essential components, certainly, and if they are properly coordinated, they will set an RT department well on its way to efficient service. To realize its full potential, however, a department must support these basic components with a system of continuing education for all levels of respiratory therapy staff, for nurses and other health care professionals with whom the RT staff must work, and for physicians. Department personnel must have their skills and knowledge constantly refined and updated through inservice education and training. However, a hospital's physicians must be considered an equally important target for education in the current concepts and applications of respiratory care. Without the acceptance and appropriate use of the service by the physician, even the most efficient and best-equipped, contractor-operated department can soon become ineffective. To their own benefit and to the advantage of the hospitals they serve, the more progressive contract service companies realize the importance of this education component and continue to devote considerable resources to the development of their education and training capabilities. As a consequence, service agreements most frequently include inservice programs of varying degrees of sophistication. Inhalation Therapy Services, Inc. (ITS), for example, can offer its clients programs to teach respiratory care techniques to personnel who already have a background in an allied health field, such as emergency medical technology or licensed practical nursing. The training program becomes the responsibility of each department manager, who has at his disposal a basic library of respiratory therapy literature. The program most often consists of classroom teaching in combination with videotape presentations. Each ITS department is supplied with a video playback unit and has access to more than 300 tapes on appropriate topics. The department manager is prepared for his education and training responsibilities through periodic training sessions. His inservice training manual is both a guide for and a record of his activities, and it is the primary tool by which an ITS regional education coordinator can evaluate the effectiveness of a training program at a given institution. Joseph D. Sansone, RRT, a regional director for ITS, realizes the limitations of this kind of training and would prefer some additional mechanism by which each person's acquired knowledge and skills could be evaluated more closely. "But we're talking about 200 hospitals scattered all over the place," Mr. Sansone continues, referring to the number of institutions ITS serves nationwide. To provide custom-made programs with refined evaluation tools for the variety of personnel that undertake the training is very difficult, he says. Therefore, the company has chosen to concentrate some of its energies on developing the evaluation skills of its department managers, and it depends on them to evaluate continuously the training needs of their department staff members.

To attract the makings of a good department to a place where no such department exists is a study in frustration.

At Ventilation Associates, employees are required to complete a certain number of continuing education hours annually, and their yearly employee evaluation includes a review of this participation. To help its employees fulfill this requirement, the company provides commercially available training programs as well as its own self-study textbooks. Some of the companies extend this commitment to staff development by offering their employees reimbursement for formal educational programs in which they might choose to participate. Greene and Kellogg, which is the oldest company in the field with 32 years of service, offers full tuition reimbursement to those employees who decide to continue their formal education and are able to maintain acceptable academic performance.

To orient physicians who are unfamiliar with most forms of cardiopulmonary diagnostic techniques and respiratory care, many contract services either retain physicians on their own staffs to conduct seminars on site or have a corps of physician consultants who can be called upon at the request of a hospital's medical staff. Ventilation Associates, for example, has an arrangement with the

Texas Medical Center by which senior fellows and residents from the pulmonary medicine division deliver presentations and otherwise act as information sources to medical staffs of hospitals served by the firm. Philip Tuttle of Ventilation Associates thinks this is a fair exchange. "It gives the young physician whose prime experience has been in the academic environment some knowledge of the real world and the level of understanding of cardiopulmonary care that he can expect to find in practice," Mr. Tuttle says. "It also gives the physician who has been away from that academic environment for some years the opportunity to find out what goes on there and to apply that knowledge."

For the physician in a rural community, this service is a boon. John Hughes describes the continuing education opportunities for the medical staff in the three hospitals of Gwinnett County. "Roughly 40 to 50 percent of our medical staff is composed of general and family practitioners. Some of them have been in practice for many years. So the scientific sessions at their monthly staff meetings are of great benefit to them. With their busy practices," he continues, "it's difficult for them to get away for any other kind of continuing education programs. So they take their scientific sessions seriously, and ITS (the firm that operates the respiratory therapy department for the three hospitals) has provided them with some excellent programs."

Having established educational programs for the clinical aspects of RT department staff development, contract service companies do not ignore another important component that is basic to the contract service agreement - management skills. Persons employed for department head positions are frequently oriented to each company's management system and policies through an introductory training program. Subsequent training occurs during periodic seminars for which a firm may gather most or all of its managers. Phil Tuttle lists some of the topics discussed at such management training sessions: interpersonal relationships, the application of basic management techniques such as measurement of productivity, the organization of equipment and supply systems, budgeting, and others.

Acquiring a trained manager is only one of the advantages a hospital derives from its relationship with a contract service firm. The on-site management capability is supported by each firm's management network and corporate team. This team often has access to sophisticated management information systems by which it can analyze trends in a given institution's performance, more easily discover unwanted variations, and act accordingly. Before an existing department is taken over by a contractor or a new department is developed, a careful survey is made of the hospital's needs for respiratory care. Lindsay L. Chapin, vice president of Greene and Kellogg, says that his firm has as sophisticated an array of equipment and services as a hospital and its medical staff might want. Many of these services are inappropriate for rural institutions, however, and it would be unnecessarily expensive both for the hospitals and for the firm to provide such services at those sites. As the sophistication of a given hospital staff increases, Mr. Chapin continues, the service agreement can be changed accordingly. This decision most often depends on the demands of the medical staff and the experience of each firm in evaluating physicians' needs and recommending the most appropriate mix of services.

A contract service company's experience also serves a hospital administrator well during the annual labors of budget writing and review. Managers of contractor-operated departments often write two versions of the same budget - one for the hospital administrator and another more detailed one for the contract service management. Hughes annually reviews a budget for the hospitals of Gwinnett County that is essentially a projection of the coming year's fiscal activities in respiratory therapy. The same budget must include much more information when it is presented to ITS management. According to Joseph Sansone of ITS, herein lie some of the potential cost savings of contract services. " We are professional managers of respiratory therapy; many of us are therapists," he says. "We can evaluate better than most administrators can whether a department manager's request for more equipment and staff is justified. We know where the cost savings are, and we know how to use equipment efficiently. When a chief therapist justifies an equipment purchase request only on the basis of numbers of patients, treatments, and so on, that's all the administrator has to go on," Sansone continues. "A professional RT manager adds the extra dimension of knowledge of the therapy to such decisions."

A contract service also adds the dimension of economies of scale, unavailable to most institutions unless they belong to group purchasing arrangements. The hospital thus acquires the opportunity to save from quantity purchasing. Depending upon its contractual arrangements and such other factors as census, it may be able not only to afford more and better equipment but also to take advantage of such time- and labor-saving devices as disposables.

(continued)

The economies of scale a hospital may enjoy under a contract service agreement also apply to personnel recruitment. Few individual institutions can afford to conduct the intensive, nationwide recruitment efforts undertaken by many contract service companies. At least it is safe to say that none of the hospitals that have most need for contract services can recruit personnel on such a scale and on their own.

This cataloguing of advantages might draw a somewhat superhuman picture of contract service companies, so it is well to remember that these companies are not without their limitations. Hospital administrators and medical staffs who are considering establishing such services in their institutions should not assume that RT contractors can solve all of the problems associated with delivery of high quality respiratory care. They must not expect to abandon all of their responsibilities for controlling the quality of care and overseeing the activities that comprise the delivery of services.

Hospital administrators, physicians, and others concerned should not expect, for example, that a contractor can create a well-qualified, ready-made medical director if such a person does not already work on the staff. A contractor can only help find a likely candidate and help him develop his knowledge and skills. A contractor can also not ensure that each department will have a full staff of credentialed therapists and technicians if in the past it has been impossible to recruit them and if there are not sufficient numbers of trained personnel to go around. But many contractors can fill at least the chief therapist positions with a credentialed person and can provide training programs for the rest of the staff to raise care to a higher level than was previously available. Perhaps most important to remember, the contract-operated respiratory therapy department cannot dictate to physicians the kind and frequency of care that they prescribe. Contemporary medical practice being what it is, the physician still retains ultimate responsibility for quality of care and for optimum utilization patterns. Where abuses exist, hospital administration and the medical staff must share the responsibility, if for no other reason than for relinquishing control.

It is essential, therefore, that the choice of a contract service company be made with great care. An important thing to notice is the firm's philosophy, suggests Mr. Hughes. If initial discussions seem to place too much emphasis on generating revenues and not enough on scope and quality of care, it is a good indication that you should continue your search, he says. Lindsay Chapin adds that a company's reputation and good references from its clients cannot be overestimated as telling indicators of its competence and trustworthiness.

Mr. Sansone recommends a careful comparison of the kinds of services and financial arrangements many companies can provide. This is a highly competitive field, he points out, and it is not unusual for an administrator to examine a dozen proposals before he decides on a company. He can use this fact to his advantage. In analyzing financial arrangements, the administrator should not be dismayed at the prospect of turning over to a contractor a greater percentage of department revenues than the hospital currently spends to provide respiratory care. The increased revenues that should be realized by expanding the department under a contract service should net the hospital considerable earnings.

If a contract service company places too much emphasis on revenues and not enough on quality of care, you should continue your search.

The administrator must be careful not to deal with contractors that inflate these earnings with unscrupulous practices, however. Mr. Sansone of ITS warns that a few contractors may still offer financial incentives to their staff members for generating additional revenues, often for care that is unnecessary and sometimes for care that exists only in the patient's record. This problem is often associated with overutilization. Again, dealing with a reputable firm and maintaining control through the medical staff should preclude such abuses.

Contract service companies have long been aware that such abuses have made all contractors - the reputable along with the few unreliable - subject to frequent criticism. Some of the criticism, they maintain, is entirely out of proportion to the facts, and occasionally it comes from sources whose own houses could stand some ordering. Nonetheless, the relatively young industry of respiratory therapy contractors has joined together many of its competing units in an effort to examine its own practices and strive for the elimination of abuses. The Cardiopulmonary Contractors Association (CPCA) was formed in 1974 and currently has some 25 members. One of its most recent activities has been the development of a code of ethics for its members. The principles of this code will also serve as criteria for accepting membership applications in the future.

The CPCA, says Mr. Tuttle, uses somewhat the same criteria for evaluating prospective members as the hospital administrator should apply when examining every contractor's proposal. It is not exactly a scientific process, Mr. Tuttle continues, but it works well if you are careful. "It sort of comes down to Mom and apple pie," he concludes, "because you have to trust your judgment of people. You have to take time to discover whether they're 'good guys,' and to decide if they're the kind of firm you want to do business with for a long time. In this business, only a long-term relationship can benefit both parties."

Editor's Note: The next issue of AARTimes *will carry an article about a rather unusual management tool developed in California, a respiratory therapy temporary help service.*

INTRODUCING
New 30-ml Bronkosol®

(isoetharine HCl 1.0%; phenylephrine HCl 0.25%)

The Preferential Beta$_2$ Inhalant Solution for Aerosolization

- More convenient
- More economical

New 30-ml Bronkosol
(Code No. 1712)

For use in hand nebulizers, aerosolization and IPPB machines.

Also available in 10-ml bottles.
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DESCRIPTION:
Dilabron* (brand of isoetharine) HCl 1.0%
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in an aqueous-glycerin solution containing saccharin sodium with sodium chloride, sodium citrate, sodium bisulfite 0.3%, methylparaben 0.025%, and propylparaben 0.014% as preservatives.

As originally marketed, Bronkosol contained thenyldiamine hydrochloride 0.10%. The present formulation has been revised to delete that ingredient.

Bronkosol is for use in aerosol bronchodilator therapy employing a conventional nebulizer, oxygen aerosolization, or intermittent positive pressure breathing.

ACTION: Isoetharine is a sympathomimetic amine with preferential affinity for Beta$_2$ adrenergic receptor sites of bronchial and certain arteriolar musculature, and a lower order of affinity for Beta$_1$ adrenergic receptors. Its activity in symptomatic relief of bronchospasm is rapid and of relatively long duration. In Bronkosol, the bronchodilator action of isoetharine is combined with the topical vasoconstrictor-decongestant action of phenylephrine to produce relaxation of bronchospasm and shrinkage of swollen mucosal membranes. By relieving bronchospasm, shrinking bronchiolar mucosa and aiding in the expulsion of tenacious mucus, Bronkosol helps give prompt relief and significantly increases vital capacity.

*INDICATIONS: Based on a review of Bronkosol by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

"Probably" effective: for the acute relief of bronchial asthma and other conditions in which bronchospasm is a complicating factor, such as chronic bronchitis or emphysema.

Final classification of less-than-effective indications requires further investigation.

CONTRAINDICATION: Bronkosol should not be administered to patients who are hypersensitive to any of its ingredients.

WARNINGS: Excessive use of an adrenergic aerosol should be discouraged as it may lose its effectiveness. Occasional patients have been reported to develop severe paradoxical airway resistance with repeated excessive use of an aerosol adrenergic inhalation preparation. The cause of this refractory state is unknown. It is advisable that in such instances the use of the aerosol adrenergic be discontinued immediately and alternative therapy instituted, since in the reported cases the patients did not respond to other forms of therapy until the drug was withdrawn. Cardiac arrest has been noted in several instances.

Bronkosol should not be administered along with epinephrine or other sympathomimetic amines, since these drugs are direct cardiac stimulants and may cause excessive tachycardia. They may, however, be alternated if desired.

USE IN PREGNANCY: Although there has been no evidence of teratogenic effects with these drugs, use of any drug in pregnancy, lactation, or in women of childbearing potential requires that the potential benefit of the drug be weighed against its possible hazard to the mother or child.

PRECAUTIONS: Dosage must be carefully adjusted in patients with hyperthyroidism, hypertension, acute coronary disease, cardiac asthma, limited cardiac reserve, and in individuals sensitive to sympathomimetic amines, since overdosage may result in tachycardia, palpitation, nausea, headache, or epinephrine-like side effects.

ADVERSE REACTIONS: Although Bronkosol is relatively free of toxic side effects, too frequent use may cause tachycardia, palpitation, nausea, headache, changes in blood pressure, anxiety, tension, restlessness, insomnia, tremor, weakness, dizziness, and excitement, as is the case with other sympathomimetic amines.

DOSAGE AND ADMINISTRATION: Oral inhalation. Can be administered by hand nebulizer, oxygen aerosolization, or intermittent positive pressure breathing (IPPB). Usually treatment need not be repeated more often than every four hours, although in severe cases more frequent administration may be necessary.

Method of Administration	Usual Dose	Range	Usual Dilution
Hand Nebulizer	4 inhalations	3-7 inhalations	Undiluted
Oxygen Aerosolization†	½ ml	¼-½ ml	1:3 with saline or other diluent
IPPB††	½ ml	¼-1 ml	1:3 with saline or other diluent

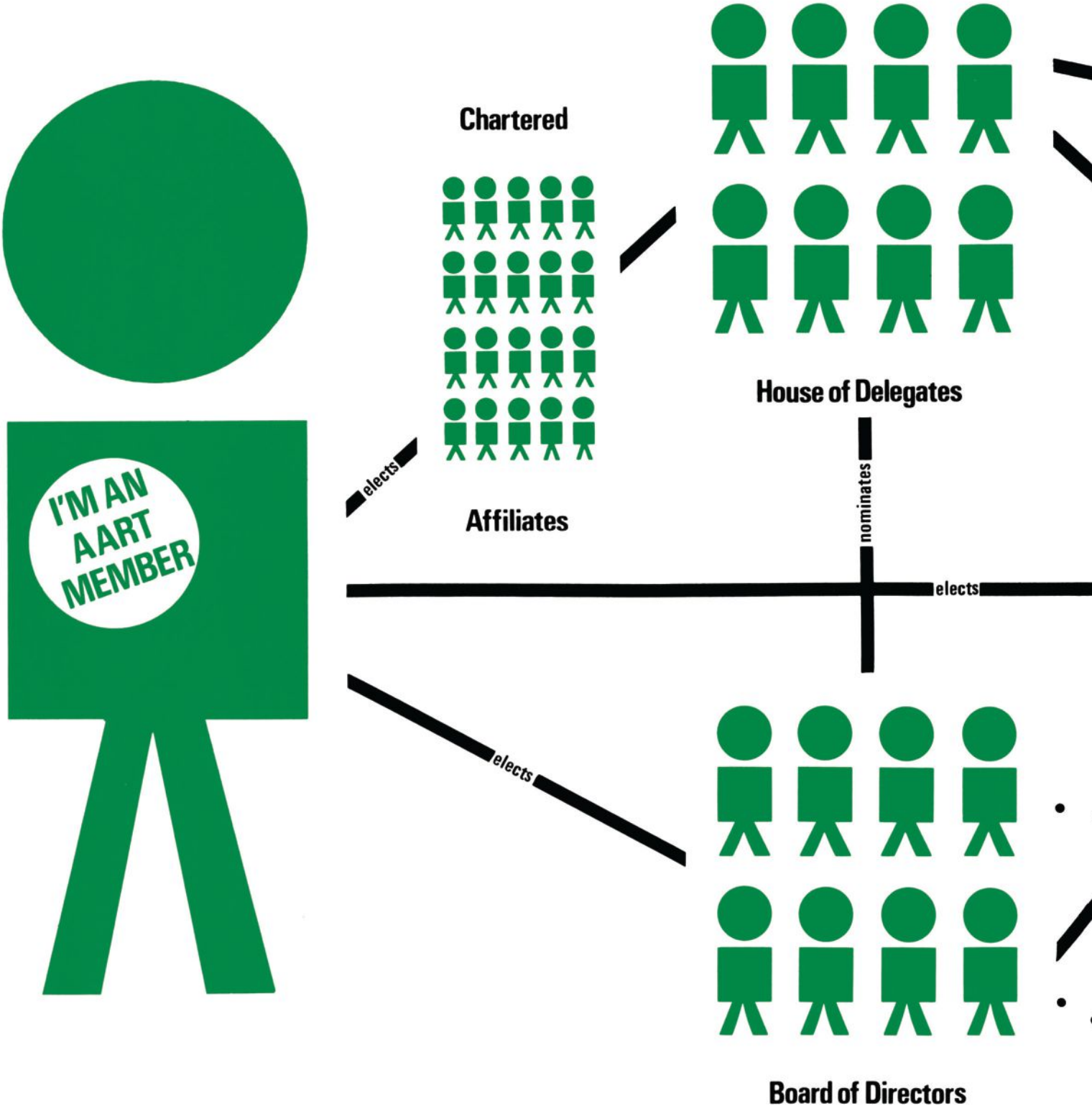
†Administered with oxygen flow adjusted to 4 to 6 liters/minute over a period of 15 to 20 minutes. May be administered simultaneously with other therapeutic agents such as antibiotics or wetting agents.

††Usually an inspiratory flow rate of 15 liters/minute at a cycling pressure of 15 cm H_2O is recommended. It may be necessary, according to patient and type of IPPB apparatus, to adjust flow rate to 6 to 30 liters per minute, cycling pressure to 10-15 cm H_2O, and further dilution according to needs of patient.

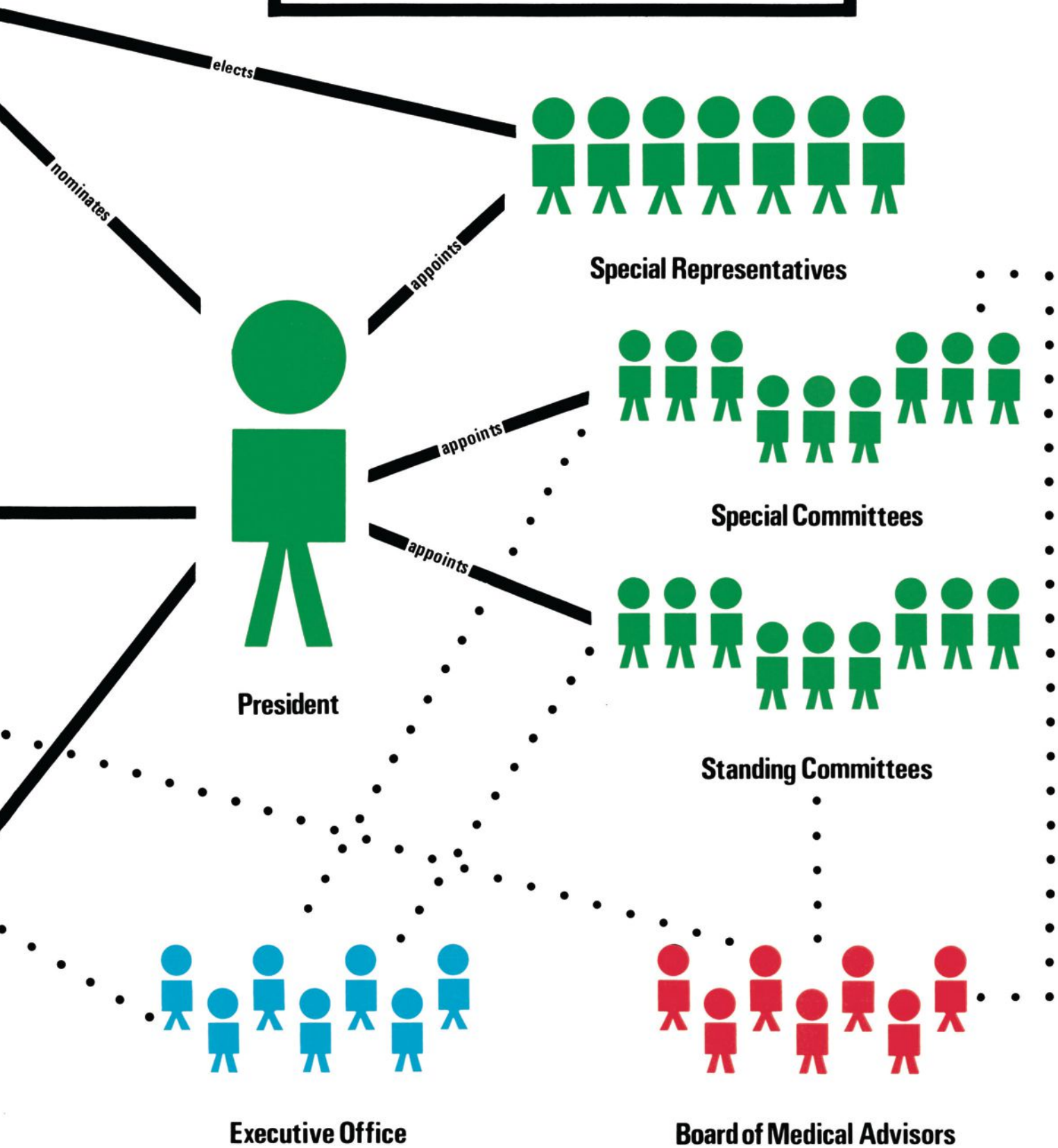
HOW SUPPLIED: Bronkosol* for inhalation—bottles of 10 ml. (Code No. 1711) and 30 ml (Code No. 1712).

BREON LABORATORIES INC.
90 Park Avenue, New York, N.Y. 10016

Circle Reader Reply Card 4


I'M AN AART MEMBER
Chartered
Affiliates
elects
House of Delegates
nominates
elects
elects
Board of Directors

This is a "humanized" version of the AART organizational flow chart, designed for those of you who have always wondered how the AART works but could not face wading through the Bylaws to find out. A more detailed explanation is found in the AART Flow Chart Supplement, beginning in this issue and to be continued. This project is sponsored by the Public Relations and Liaison Committee.



FLOW CHART SUPPLEMENT

As an AART member, you are not just a number in the association or an address to which bills are sent for dues. You **are** the association. The chart on pages 30 and 31 illustrates how the association is operated **by** and **for** members and their professional interests. Working as a group and concentrating on specific projects, we can do more for the respiratory therapy profession than an individual member could do on his own. The Public Relations and Liaison Committee's intent for this series is to clarify the AART organizational flow for you and encourage you to communicate with the appropriate segment when you have ideas or comments.

One of the most important roles played by members of the AART is that of committee member. As noted on the organizational chart, the AART has both volunteer Standing Committees and Special Committees, all of which are staffed by members of the association. The volunteer Standing Committees of the AART are discussed below, in the first of the AART Flow Chart series dealing with the organization that will be appearing in *AARTimes* in the next few months.

The Standing Committees keep the association up-to-date on specific issues which are of interest and concern to the membership. Each committee performs specific duties to acquire information, research problems, and advise the Board of Directors in its particular area of interest. In addition to these regular functions, the Standing Committees receive special charges each year from the President, outlining the objectives to be reached in the year. These committees perform a great volunteer service to the AART in its efforts to maintain its position as a professional health care organization.

The **Budget and Audit Committee** is composed of the executive officers (president, president-elect, vice president, immediate past president, secretary, and treasurer) of the association. The members of this committee are responsible for proposing an annual budget to the Board of Directors and submitting the budget to the House of Delegates for review and adoption.

The House of Delegates elects two Standing Committees, the Bylaws Committee and the Nominating Committee.

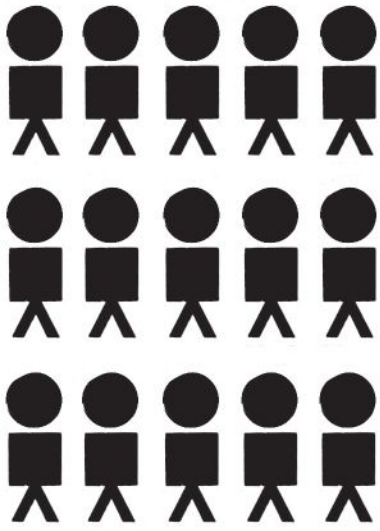
The **Bylaws Committee** receives all proposed amendments to the bylaws from the Board of Directors, the House of Delegates, or the chartered affiliates. These proposed amendments are reviewed and edited by the committee and presented to the House of Delegates and the Board of Directors for review. The proposed amendments are then presented to the membership with the committee's recommendation for action. The Bylaws Committee is composed of the immediate past president and four active members elected by the House of Delegates.

The **Nominating Committee** consists of three active members elected every year by the House of Delegates to prepare a slate of nominees for the following year's election. The slate of nominees includes two candidates each for the offices of president-elect, vice president, secretary, and treasurer. The names of the two candidates for each of the directors to be elected will also be on the slate.

One Standing Committee, the **Election Committee,** is appointed by the Board of Directors. This committee prepares, distributes, and validates all ballots used in association elections. The results of the elections are announced by the committee chairman at the annual business meeting, and the presiding officer at that meeting declares the results of the election. The committee consists of not fewer than three active members.

The President of the AART appoints the members and designates the chairmen of the six remaining Standing Committees.

The **Chartered Affiliates Committee** is composed of the vice president of the association, serving as chairman, and not fewer than three other members. This committee receives applications for new charters, reviews the bylaws and proposed amendments to chartered affiliates' bylaws, and concerns itself with the activities of each affiliate and its relation with other organizations. The 1977 objectives for this committee include assisting affiliates in fiscal planning, reviewing guidelines for an



Outstanding Affiliate Award, and keeping the affiliates informed of projects and activities being undertaken by fellow affiliates.

The **Education Committee** is responsible for acquiring and maintaining educational material for the association; it assists in the dissemination of this material to the chartered affiliates. Several subcommittees have also been appointed to perform specific functions in the areas of career mobility, continuing education, curriculum development, learning resources, and licensure.

The **Judicial Committee** reviews complaints lodged against association members charged with any violations of the AART bylaws or code of ethics. The committee uses the procedure guide approved by the Board of Directors for processing complaints and is charged in 1977 with modifying this guide for use by the affiliates. The committee is composed of no less than four members.

The **Membership Services Committee** evaluates applications for membership and works to identify and provide new membership services. This year the committee is charged with organizing a membership recruitment contest with three different categories - hospitals, schools, and affiliates - and is developing new services aimed specifically at student members of the association. In addition, members of the committee are working to develop promotional items, such as t-shirts and belts that carry the AART logo, and are planning several group travel tours. One member of this committee is from the Board of Directors.

The **Program Committee** consists of six members who are experienced in program planning. With the assistance of a local arrangements committee, this committee prepares the program for the annual meeting. This year the Program Committee is designing specialty programs for the annual convention which can be modified for use at regional meetings.

The **Publications Committee** is responsible for guiding the association in its efforts to meet the communications needs of the membership. Its objectives for 1977 include reviewing the current publications of the association and assisting the chartered affiliates in developing their publications.

The **Public Relations and Liaison Committee** monitors the relations of the AART with the public, hospitals, and other professional health organizations and disseminates information relating to respiratory care. This year the committee has developed public service announcements describing respiratory therapy as a challenging health career. These public service announcements will be broadcast on television stations throughout the United States.

The Peoplewatcher

Carl L. Miller, CRTT, RRT, has been promoted to Technical Director of Pulmonary Services at Polyclinic Hospital in Harrisburg, Pennsylvania. He has been at Polyclinic since April 1973 and worked as Respiratory Therapy Supervisor before his promotion. Mr. Miller was graduated from Washington Technical Institute in Washington, D.C., with an Associate Degree in applied sciences in respiratory therapy. In his new position he will be responsible for a department of 40 people. His duties will include directing the activities of the blood gas lab, pulmonary function lab, and respiratory therapy department.

The Los Alamos Medical Center in Los Alamos, New Mexico, has named **Arnie Saavedra,** CRTT, as its new Director of Respiratory Therapy. Mr. Saavedra was graduated from a two-year respiratory therapy program at the University of Albuquerque in 1974. Before coming to Los Alamos, he worked as Director of Respiratory Therapy at Memorial AT&SF Hospital in Albuquerque.

Carol Alison Crouch, CRTT, has returned to Thomas Hospital in Fairhope, Alabama, and is working as a Shift Supervisor. She has been in the field of respiratory therapy for five years and, for the last year and a half, was employed as a Shift Supervisor at Sun Towers Hospital, in El Paso, Texas.

The Virginia Society for Respiratory Therapy has named **Terring W. Heironimus, MD,** as its new Medical Director. Dr. Heironimus is currently a professor of anesthesiology at the University of Virginia Medical Center in Charlottesville and also serves as Medical Director for Respiratory Therapy at the University of Virginia Hospital and Piedmont Virginia Community College. Before being made advisor to the state society, he was medical advisor for the Blue Ridge Chapter of the VSRT. In addition, he serves as an oral examiner for the National Board for Respiratory Therapy (NBRT) and has written a respiratory therapy textbook, *Mechanical Artificial Ventilation,* which recently entered its third edition.

The Alton Ochner Medical Foundation in New Orleans, Louisiana, has named **Linda Clark,** RRT, as its new Educational Coordinator. In this position, she will be responsible for coordinating the didactic and clinical

education of respiratory therapy students and will also be working to develop a Bachelor of Science program in respiratory therapy at the foundation. Before coming to Alton Ochner she was an instructor at Westark Community College in Fort Smith, Arkansas. Ms. Clark received her Bachelor of Science degree from Louisiana State University in Baton Rouge and was also graduated from a respiratory therapy program at Alton Ochner.

Don Wilson, CRTT, has been promoted to Technical Director of Respiratory Therapy at Harrisburg Hospital in Harrisburg, Pennsylvania. He was graduated from Hampton Institute in Harrisburg with a Bachelor of Arts degree in biology and was previously Assistant Technical Director for Harrisburg Hospital. In his new position he will be supervising a department of 38 people in the areas of the blood gas lab, out-patient clinic, pulmonary function lab, and intermediate respiratory care area.

Taking over as Assistant Technical Director at Harrisburg Hospital is **Lu Fieser,** RRT. She was promoted to the position from Clinical Supervisor and was graduated from Memorial Medical Center in Springfield, Illinois, with an Associate of Arts degree. As Assistant Technical Director she will be responsible for coordinating the technical aspects of the respiratory therapy department.

Bill Mitchell, RRT, is the new Technical Coordinator of Pulmonary Services at Bernalillo County Medical Center in Albuquerque, New Mexico. He came to Bernalillo from Presbyterian Hospital, where he was Technical Director of Respiratory Therapy. As Technical Coordinator he will be responsible for developing and maintaining correct modalities, delineating the roles of the therapist and technician, and evaluating and adapting equipment. Mr. Mitchell received his degree in respiratory therapy from Pima College in Tucson, Arizona.

Wichita State University in Wichita, Kansas, has named **Paul Parker,** RRT, the new Clinical Coordinator for its respiratory therapy department. Before coming to Wichita State, Mr. Parker worked at Wesley Medical Center in Wichita as Coordinator for Neonatal Services in respiratory therapy. He was graduated from Wichita State University with an Associate Degree in respiratory therapy. Responsibilities in his new position will include planning and directing clinical activities for respiratory therapy students.

Mike Blackburn, CRTT, has been named Technical Director of Respiratory Therapy at Presbyterian Hospital in Dallas, Texas. He was graduated from Tyler Junior College with an Associate Degree in applied sciences in respiratory therapy. Before coming to Presbyterian, Mr. Blackburn worked as Technical Director at Medical Plaza Hospital in Fort Worth, Texas. In his new position he will be responsible for a department of 38 people. His new duties include establishing clinical policies and procedures, directing personnel and department activities, and hiring and upgrading staff.

Information for The Peoplewatcher *should be sent to the editor. Photographs are welcomed.*

said, they are only a part of what a member receives for his $30 a year. There are many other benefits to be derived from joining the AART - a long and varied list that covers everything from education to consumer discounts. We won't presume to be able to cover all of them in one article but hope to make a start by highlighting some of the most important and, perhaps, less known.

A Collective Voice

Probably the main reason for the existence of any professional association is to create a collective voice for the individual voices in the field it represents. The AART is no different. It exists to communicate your needs and wishes to groups and organizations that have a direct influence on what you do and how you do it.

The AART list of activities in this area is long. The association represents its members to organizations such as the American Thoracic Society, the American College of Chest Physicians, the American Society of Anesthesiologists, the American Academy of Pediatrics, the American College of Allergists, and the Society for Thoracic Surgeons. The list encompasses 15 associations in all and more are being added every year. In 1977, said Paula Miller, chairman of the Public Relations and Liaison Committee, the association has established initial relations with two groups whose skills in health care are closely related to those of respiratory therapy professionals, the American Academy of Physicians' Assistants and the Emergency Mobile Technician Association.

In addition to representing your interests to other health care associations, the AART also negotiates on your behalf with members of Congress. Robert Weilacher, executive director of the association, reviews all health care legislation before it is voted upon and travels to Washington regularly to talk with legislators and groups involved in health care. To complement these efforts, a Washington-based firm has been employed to monitor day-to-day developments in health care legislation.

Education

The needs and wants of the membership in the area of education are top priorities in the association. The AART currently offers several methods by which its members can acquire or increase their education and has several more programs being developed for use in the near future.

The general membership is probably most directly affected by the PROCEED program. Professional Recognition of Continuing Education Experience and Development (PROCEED) is a program available to every member of the AART. It is a system in which respiratory care personnel can record their continuing education activities in a permanent national file. Each unit of education that you participate in is recorded on an official transcript and updated as necessity warrants. According to Neal Kelsey, assistant director of education, "its value to you now is in terms of career advancement. Its potential for becoming invaluable to you in the future is great, if plans to require proving health care competencies to state and national governments become realities."

The program also offers flexibility to its members. Instead of offering only established classroom activities for accreditation, PROCEED takes into consideration the busy schedule of the working practitioner and recognizes the value of nontraditional educational activities. Basically, the program is divided into three categories: College/University Credits; Continuing Education Units (defined as ten hours of participation in a continuing education program); and Individual Education Units (defined as one hour of participation in a continuing education activity and awarded for short-term experiences such as reading professional articles, equipment displays, and self–assessment tests). Although all respiratory care personnel may participate in PROCEED, the nonmember pays $30 per year whereas the dues-paying member pays $10 for life.

Other areas of educational benefit currently available to members are the training institutes held at various times of the year across the country. The AART acquires funds for these sessions from the federal government and, so far, has recommended two institutes for approval for 1977. Although basically aimed at the educators, managers, and other specialists in the association, these sessions do have an indirect effect on all members because they help to advance the field of respiratory care as a whole.

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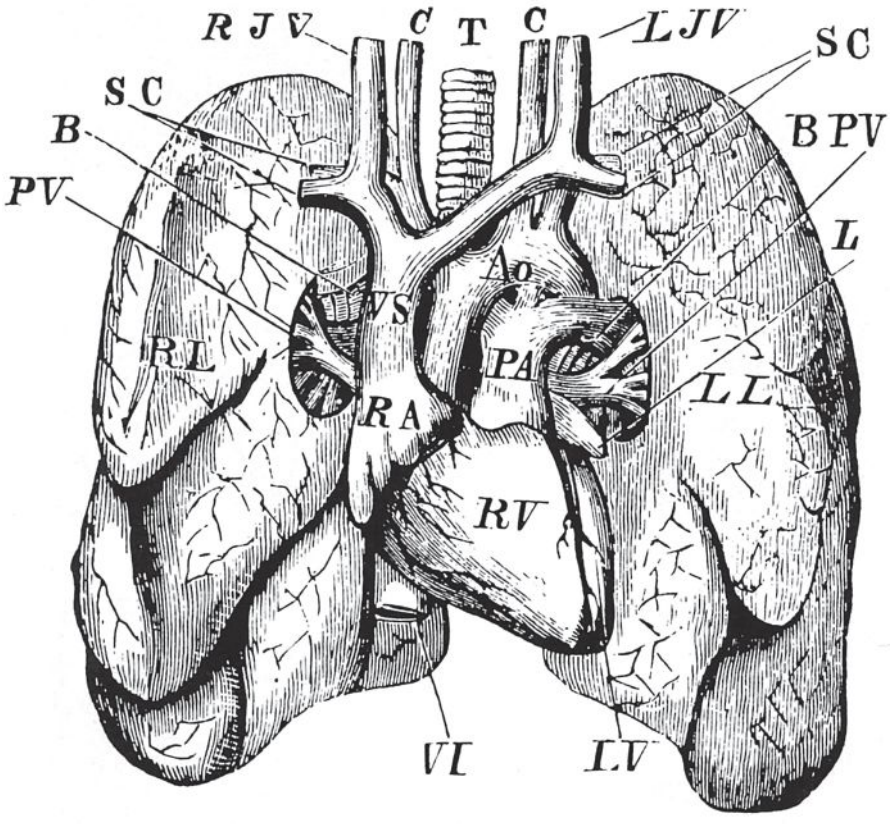
The Correct Answer:

2. A great association.
The AART



by Debbie Bunch

Why should I be a member of the AART?

Almost everyone in the association has asked that question at some time in his/her professional career. Unfortunately, said Oscar Sasson, chairman of the AART's Membership Services Committee, the answer that most people receive usually begins and ends with a description of the publications that the association mails out each month.

Although *Respiratory Care, The Bulletin,* and *AARTimes* are important and valuable membership services, he

said, they are only a part of what a member receives for his $30 a year. There are many other benefits to be derived from joining the AART - a long and varied list that covers everything from education to consumer discounts. We won't presume to be able to cover all of them in one article but hope to make a start by highlighting some of the most important and, perhaps, less known.

A Collective Voice

Probably the main reason for the existence of any professional association is to create a collective voice for the individual voices in the field it represents. The AART is no different. It exists to communicate your needs and wishes to groups and organizations that have a direct influence on what you do and how you do it.

The AART list of activities in this area is long. The association represents its members to organizations such as the American Thoracic Society, the American College of Chest Physicians, the American Society of Anesthesiologists, the American Academy of Pediatrics, the American College of Allergists, and the Society for Thoracic Surgeons. The list encompasses 15 associations in all and more are being added every year. In 1977, said Paula Miller, chairman of the Public Relations and Liaison Committee, the association has established initial relations with two groups whose skills in health care are closely related to those of respiratory therapy professionals, the American Academy of Physicians' Assistants and the Emergency Mobile Technician Association.

In addition to representing your interests to other health care associations, the AART also negotiates on your behalf with members of Congress. Robert Weilacher, executive director of the association, reviews all health care legislation before it is voted upon and travels to Washington regularly to talk with legislators and groups involved in health care. To complement these efforts, a Washington-based firm has been employed to monitor day-to-day developments in health care legislation.

Education

The needs and wants of the membership in the area of education are top priorities in the association. The AART currently offers several methods by which its members can acquire or increase their education and has several more programs being developed for use in the near future.

The general membership is probably most directly affected by the PROCEED program. Professional Recognition of Continuing Education Experience and Development (PROCEED) is a program available to every member of the AART. It is a system in which respiratory care personnel can record their continuing education activities in a permanent national file. Each unit of education that you participate in is recorded on an official transcript and updated as necessity warrants. According to Neal Kelsey, assistant director of education, "its value to you now is in terms of career advancement. Its potential for becoming invaluable to you in the future is great, if plans to require proving health care competencies to state and national governments become realities."

The program also offers flexibility to its members. Instead of offering only established classroom activities for accreditation, PROCEED takes into consideration the busy schedule of the working practitioner and recognizes the value of nontraditional educational activities. Basically, the program is divided into three categories: College/University Credits; Continuing Education Units (defined as ten hours of participation in a continuing education program); and Individual Education Units (defined as one hour of participation in a continuing education activity and awarded for short-term experiences such as reading professional articles, equipment displays, and self–assessment tests). Although all respiratory care personnel may participate in PROCEED, the nonmember pays $30 per year whereas the dues-paying member pays $10 for life.

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are and what we do and serve as a tool to get new people into the field."

Ready for distribution this summer will be a slide-tape package for use in high school and college recruitment programs as well as general public health presentations. The slide package will also be available to members for use in their respective communities.

Two public service announcements will also be available this summer. They will be released to association chartered affiliates for distribution to their local television stations. The announcements depict respiratory therapists and technicians at work in the hospital and as vital members of the health care team. Two follow-up announcements are currently in the developmental stages by the Public Relations and Liaison Committee.

Money Talks

However, no matter what the association is doing in terms of education, liaison work, public relations, and the like, there will always be that nagging portion of everyone's mind that will want to know how the AART is affecting the pocketbook. The association is sensitive to this question and, said Mr. Sasson, has answers for it now and will have more answers for it in the near future. "This is the first year," he said, "that the Membership Services Committee has been given so much responsibility to increase benefits **without** increasing dues."

To give you an idea of what is available to help you cover the cost of your annual dues, we offer a brief description of a few of the money-saving benefits you are eligible for as a member of the AART. Each will be covered in more detail in future issues of *AARTimes*.

1. Group Fare Clinical Study Tours: The association is offering two tours this year, one to Paris and the Alps and one to Peru. Next year, four trips will be offered.
2. Reduced Registration Fees: Members wishing to attend state, regional, or national meetings are eligible for reduced rates - in some cases, half the normal registration fee.
3. Insurance: The association offers its members group rates on both personal and professional liability (malpractice) insurance.
4. Revenue Sharing: Your state affiliate receives $5 of your national dues under the association's revenue-sharing program.
5. Consumer Discounts: The association is looking into offering its members many reduced rates at hotels and restaurants and has already arranged discounts for car rental services.

The List Goes On

As was noted in the introduction to this article, we cannot cover all the benefits the AART offers to its membership in this short space. What the association is doing in areas such as specialization, regionalization, professional standards, technical standards, student activities, licensing, and credentialing are all equally important in terms of membership benefits and will be discussed in future issues of this magazine. What we have tried to do in this article is begin to answer the question, "Why join the AART?" After he spent two days working on membership problems a couple of months ago in Dallas, Oscar Sasson concluded: "We say to the members: 'Look around you. Where would you be and where would the profession be if it weren't for the AART?' That is probably the best membership benefit there is - the gift of a profession of which we can all be proud." ■

Class Notes

One aspect of health care which remains constant is change. All health care practitioners are aware that their professions are continually evolving and becoming more complex as new techniques are developed and new equipment is introduced. To complicate matters even further, professional journals unceasingly publish new reports on existing techniques and predictions about future developments. Often, when faced with a desk overflowing with stacks of unread articles or when a research paper requires you to peruse an ever-increasing number of back issues of a magazine, you could easily shout "Enough!" and demand a moratorium on new literature in the field of respiratory care research.

The surest way to keep abreast of new developments in the field is to read the literature continuously. The dilemma lies in the realization that it is not humanly possible to read every article published in every related publication. One approach to resolving this dilemma is to read secondary sources that summarize the original reports. However, one often finds that, by the time the summaries or review articles on a particular topic are published, the information is out of date for researchers and clinicians. Furthermore, there are literally thousands of health care-related journals, many of which might carry an article of direct interest to your field. How is the working therapist or the student to keep on top of this mountain of information? How can you accumulate the information that you need for a specific task without taking up permanent residence in the periodical section of the nearest medical library?

The National Library of Medicine has attempted to solve some of these problems by publishing their own monthly publication, *Index Medicus*. This terrific research tool catalogues approximately 2500 biomedical journals and selected monographs by subject and author. The materials that are indexed are chosen with the advice of a group of physicians, medical editors, and medical librarians.

Index Medicus appears both as a soft-cover monthly publication and a cumulated annual index. To appreciate fully the amount of information available in this work, you might consult the January issue of any year. In addition to the subject and author sections, you will find sections entitled "Journals Indexed in Index Medicus" and a "Bibliography of Medical Reviews." These sections are interrelated and you will find *Index Medicus* easier to work with if you learn how to use all of its parts.

In January of each year a companion volume of *Index Medicus*, "Medical Subject Headings," is also published by the National Library of Medicine. This volume contains a list of standard, accepted technical terms used in *Index Medicus*. In order to use the subject section of *Index Medicus* most effectively, you should consult this list to ensure that you are looking under the accepted term. "Medical Subject Headings" (MeSH) will list many synonyms and will refer you to the accepted term and any related terms used in the subject section of *Index Medicus*. For example, if you are seeking information to write a paper on the causes of dust-related respiratory diseases, you might consult the MeSH list under "dust diseases," a common term for such ailments. "Medical Subject Headings" carries the listing DUST and instructs you to "see related PNEUMOCONIOSIS," an accepted technical term used in the subject section. All terms listed in capital letters in MeSH are subject headings in *Index Medicus*.

The subject section of *Index Medicus* lists articles on specific topics under the alphabetized subject headings. Under each subject heading, articles contain the following information: original title in English or the English translation of the title (indicated by brackets around the title); first author; journal title abbreviation; volume number; issue, part or supplement; page range; date of issue; and an abbreviation indicating the language in which the article was originally written, if not in English.

In addition to the subject section, each issue of *Index Medicus* provides a section listing articles by the authors' names. Therefore, if you have heard of an author who regularly publishes articles on a particular topic and you want to determine if he has recently written another article on that topic, you can consult the author section of *Index Medicus* for a listing of his most recent publication. The entries in this section supply the same information as those in the subject section, except that they are listed alphabetically by the last name of the first author of the article or monograph.

Should an article listed in either the subject or author sections interest you, you can immediately consult the proper journal and continue with your research. However, if the journal abbreviation provided in the listing is unclear or unfamiliar, you should consult "Journals Indexed in *Index Medicus*." This section appears in the January issue every year and is also published as a separate, companion publication. Here you will find a list of all journals that appear in the index by both full title and abbreviation.

One of the most useful components of every issue of *Index Medicus* is the "Bibliography of Medical Reviews," which lists well-documented reviews and surveys of recent biomedical literature. The bibliography is divided into subject and author subsections, and the subject headings listed are the standard MeSH terms.

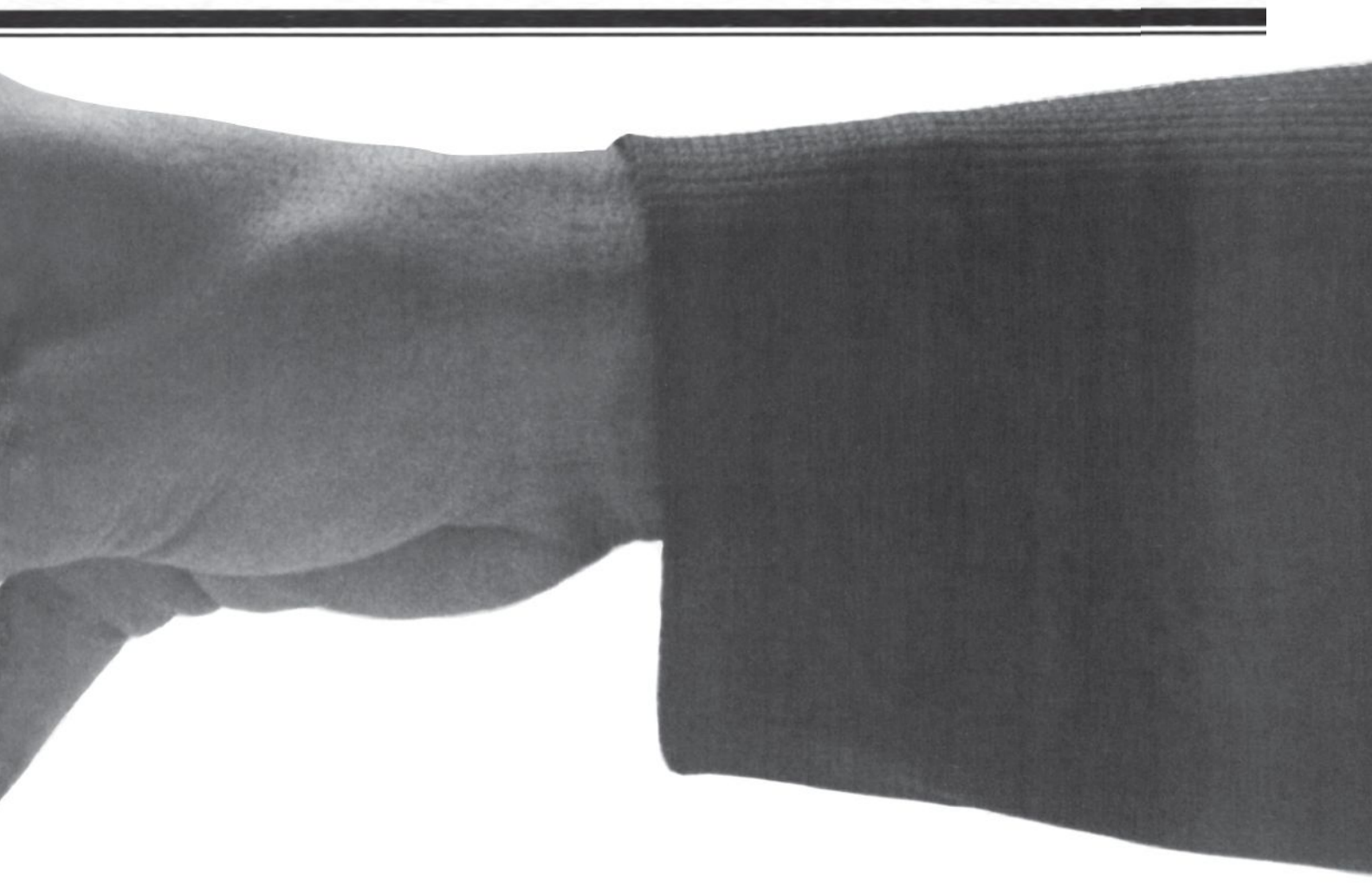
Learning to use the *Index Medicus* properly can save you many hours of aimlessly leafing through journals in search of articles that deal with the topics that interest you. Most librarians are very familiar with the publication and will help you get the most out of *Index Medicus*. And keep in mind that right now, as you read this column, a dozen more journals are going to press with countless articles written to keep you informed about the latest health care developments. *Index Medicus* may be just the tool you need to stay in touch and to keep near the top of that great literary mountain.

By Debbie Bunch

AN OUNCE OF PREVENTION

Educating the public about respiratory diseases

The areas of preventive medicine and patient education are aspects of health care that have been traditionally overlooked by people in the field. In the past, those working in the health professions have primarily limited themselves to the principle of treatment after the fact - in other words, helping people who are already sick to become well. Today, largely due to the strides that have been made in the identification of high-risk groups and home-care methods, this principle is changing. Many members of the health care fields are looking more closely at what can be done both to stop disease before it starts and to educate those with a disease as to how they can best cope with it. The field of respiratory therapy can and should play a major role in this area and, through the AART, is getting a head



start on some of the work that needs to be done. Last year the association developed four projects along these lines. Three of the projects are aimed at educating people in high-risk groups who have an increased potential for contracting respiratory disease. The fourth project examines ways to help those recovering from respiratory illnesses to realize that there are ways by which they can reduce their chances of further attacks.

The projects were funded in June 1975 by the Bureau of Health Education, one of the eight major components of the Center for Disease Control (CDC). The CDC is a governmental agency under the U.S. Department of Health, Education and Welfare and is responsible for protecting the public health of the nation by providing direction in the prevention and control of diseases and other preventable conditions. It is also charged with furthering research, information, and education in the allied health fields.

The AART programs dealing with the general public and high-risk groups cover the areas of known-risk work environments, the agri-industries, and noninvasive mass-screening. The home-care project identifies the parameters of home care for cardiopulmonary cripples and patients recovering from cardiopulmonary insult. The topics were chosen by Robert Weilacher, project director, Ray Masferrer, project coordinator, and an advisory committee consisting of James A. Liverett, RRT, Houston R. Anderson, RRT, James S. Allen, RRT, Sam P. Giordano, RRT, and Linda Tocco, RPT. According to Mr. Weilacher, these topics were decided upon because there are no other known programs currently available that deal with these particular areas.

After the topics for the projects received CDC approval, the association advertised them to its affiliates and asked those interested in producing the projects to submit written proposals. The national office received 17 proposals. Based on these proposals, the advisory committee members chose an affiliate to cover each area. Their decisions were based on the level of interest each state society had shown in the project that it proposed to produce and the ability of that society to cover the area. The contracts were awarded in October 1975 to the affiliates from South Carolina, The Dakotas, Louisiana, and Connecticut.

The Dust Diseases

Although respiratory disease is one of the major health hazards facing people working in the mining, asbestos, cotton, and farming industries, it has historically been one of the least publicized. Pneumoconiosis, a chronic fibrous reaction in the lungs to the inhalation of dust, is a broad term that covers a multitude of occupational diseases. In its various forms it affects almost everyone working in such industries to some extent, but its progress is so slow that, in the past, few people related the disease to the cause. In recent years, however, research into pneumoconiosis has raised the consciousness of many people working in these industries, and demands for preventive measures have been made. The programs developed by the affiliates from South Carolina and The Dakotas were formulated to meet these demands.

The South Carolina Society was charged with designing pulmonary screening techniques for use by a variety of industries that are known to present respiratory hazards to their employees. The project was directed by Linda C. Buddin, RRT. It includes several tools that an industry can use to educate both its employees and health directors about ways to measure and control pneumoconiosis. Part of the program is in notebook form and contains a guide to respiratory surveillance and a guide to establishing a training program in the area. In addition, the project includes a slide-tape package to be used in the training program and a videotape that highlights byssinosis, the form of pneumoconiosis that is caused by the inhalation of cotton dust.

The project developed by the Dakota affiliate deals specifically with respiratory hazards facing people whose work or living environment is allied to the agri-industries. The project, which was led by Sister M. Arthur Schramm, RRT, was designed to identify the hazards involved and to describe indigenous pathology, etiology, and the consequences of permanent lung damage. The Dakota project is presented in both printed and slide-tape forms.

An Alternative Method

Getting the general public involved in preventive health care has never been an easy task. People are usually all for it in principle but, when it comes to doing something about it on an individual basis, most of them are nowhere to be found. The technique currently used for mass-screening, roentgenographic (x-ray) screening, is a valuable method to use in trying to pinpoint people with respiratory disease or with the potential for acquiring respiratory disease. However, this should not be the only technique available. The Louisiana Society project deals with this problem. Under the direction of Angel Alonzo, Jr., RRT, the affiliate has developed an alternative method of mass-screening. Based on literature reviews, interviews with pulmonary physicians, and patient research, Mr. Alonzo and his team have designed a 15 question self-evaluation quiz that, if answered honestly, should identify most people who have or could acquire pulmonary disease.

Getting the general public involved in preventive health care has never been an easy task.

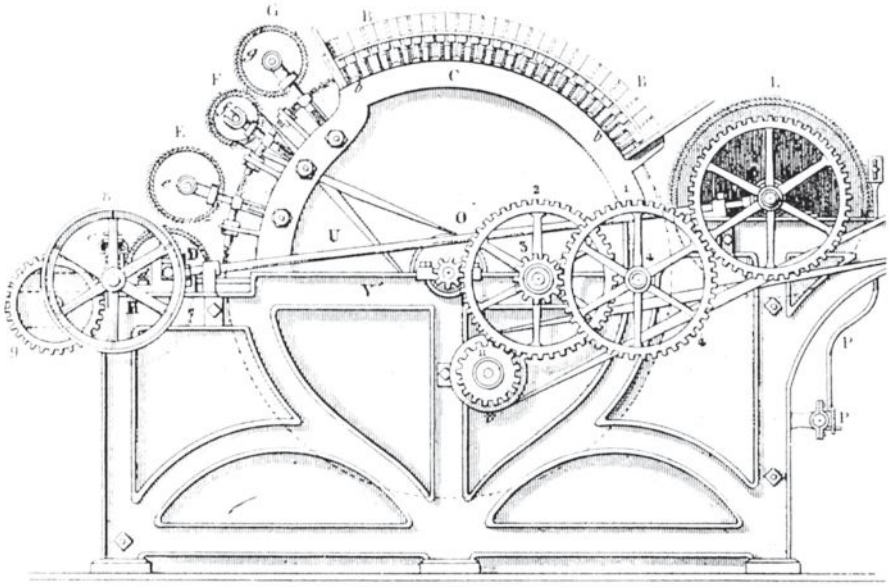
Patient Education

Helping people cope with a disease that is chronic is one of the major unresolved problems facing health care delivery teams today. As most hospitals are not equipped to carry out educational programs for their patients, many people with cardiopulmonary disease leave the hospital with a feeling of confusion and a basic fear of what is wrong with them. The patient's attitude toward his illness is often one of self-pity. Consequently, many patients begin to function well below their maximum capacities.

The project carried out by the Connecticut Society addresses this problem and takes a step towards solving it. Project Director William E. Powers, RRT, and his group have produced five videotapes that should aid in the education of patients with chronic obstructive lung disease (COLD). Topics covered by the films include: the nature of the disease, how to get along with the problems resulting from the disease, how to make the most of breathing exercises and postural drainage, the importance of drugs used, and the use and care of equipment for the treatment of COLD.

All four of the projects were previewed at the 1976 national convention in Miami and were well received. They are currently being reviewed by the association's Public Relations and Liaison Committee and will be made available to association affiliates later this year. In addition, the AART will reproduce the programs for other groups and industries upon request and is in the process of advertising their availability to organizations such as the American Thoracic Society, the American College of Chest Physicians, the American Society of Anesthesiologists, the American Lung Association, the American Cancer Society, and the American Heart Association. Copies of each project will also be included in the Learning Resources Center headquartered in Dallas and, as such, will be available to all AART members. ■

Inside Industry



International Therapeutics, Inc. has started its own manufacturing division, ITI Manufacturing, Inc. They are currently manufacturing an improved chest percussor and will be manufacturing other related products in the future.

Bourns Life Systems Division announced the following appointments:

Brook Bowers has been named Director of Sales. Mr. Bowers joined Life Systems in 1970 as District Sales Engineer for the southeastern United States; since 1972 he has served as Manager of Field Sales.

Paul Smargiassi, who joined Bourns in 1972, has been named Director of Engineering. He and his team are responsible for the development of a number of Life Systems products, including the BEAR 1 Adult Ventilator.

George Kempsell, newly named Director of Manufacturing, has been with Bourns, Inc. since 1967. Formerly working in the Trimpot Products Division of Bourns, Inc., Mr. Kempsell transferred to Life Systems in 1975.

Aerwey Laboratories has announced the addition of five key staff members. The new appointments are part of a previously announced 1977 expansion program for the Arlington, Texas company. **Dr. Lowell D. Zeleznick,** former Director of the Allergy Division of Alcon Laboratories, has been appointed Vice President of Science and Technology. **Thomas Diamont** was named Vice President of Manufacturing. He was formerly a Vice President with Alza Pharmaceuticals. The new director of Quality Assurance, **David B. Weiner,** was most recently the manager of Johnson & Johnson's Bacteriology Laboratory. **Mr. Robert Sherman** was named Vice President of Design and Manufacturing Engineering, joining Aerweys after serving as Manager of Bell and Howell's Japanese operations. **Charles Ozburn,** Supervisor of the new Aerject Unit Dose manufacturing facility, was formerly with Alza Pharmaceuticals.

Information for Inside Industry *should be sent to Nancy Hugley, Advertising Manager. Photographs are welcomed.*

(continued from page 15)

certificate is envisioned. Presently, there are no other organizations offering a credential in this area. We would be pioneers.

A: Cecil: There is one society that offers a credential in the pulmonary lab, the National Society for Cardiopulmonary Technologists. They offer registration to pulmonary function technologists and to cardiovascular technologists. I believe they also offer a combination registration in cardiopulmonary technology. However, I would guess that the number of respiratory therapists who get these credentials is small.

A: Frownfelter: There are really no credentials for home care and rehabilitation people at the moment. One of the goals of my committee is to set up standards and basic requirements for respiratory therapy personnel doing rehabilitation. Before we can get to the area of credentialing, we have to define what rehabilitation is, who can do it, and how it can be done. Right now we do not have any quality control.

Q: What is the current status of specialization in your area in regards to interaction with other health care team members?

A: Clothier: Using the intensive care unit as an example, the interaction depends largely on how the hospital views the roles of the respiratory therapists and the nurses. In some hospitals, respiratory therapists and nurses assume almost equal responsibilities and roles in the intensive care unit; in others, the nurses have very broad roles and respiratory therapists have very narrow technical responsibilities relating only to ventilatory and aerosol oxygen therapy equipment.

A: Williams: In the perinatal-pediatrics departments that I have gone through, I have seen good, open response and communication between nurses and therapists. Any hassles are more patient-care related than equipment operation hassles. The main problems in newborn care seem to be in chest percussion, vibration, and maneuvers that actually involve touching the patient. There is the age-old problem of who is going to do what.

A: Cecil: I think the type of interaction generally depends on internal hospital policy. For instance, there are some hospitals where nurses perform arterial puncture and therapists do not. I've not personally experienced any problems with that situation but I am aware that it occurs in different parts of the country.

A: Frownfelter: Interaction is not something you can make a gross generalization about, at least in home care and rehabilitation. If a respiratory therapy department is strong, it may overpower some of the paramedical programs. If a chest physical therapy or physical therapy department is strong, one of them may overpower something else. In some institutions people get along beautifully and in others they are all doing their own thing and hardly talking. This latter situation is very sad because it can ruin patient care.

"We are looking not so much at developing competency in one of these areas as at developing multiple competency."

Q: How do you foresee the future of specialization in your area in regards to education?

A: Clothier: As the scopes of practice of each of the critical care specialties are defined, formal education for preparing the practitioner will develop and be required for credentialing. The programs that develop will probably require generalist credentialing prior to specialist credentialing, both of which should be attainable through traditional and nontraditional educational programs. However, the most direct route will still be through the formal, structured process. At this time we are probably talking about a two-year entry and a baccalaureate degree specialist, plus whatever other mechanisms are developed for nontraditional, informal education.

A: Williams: I'm uncertain at this point what the educational requirements for the perinatal-pediatrics specialty are going to be. I would recommend that education be handled in all manners that are feasible. External degrees could be a possibility. The key is that students must be able to do clinical as well as didactic work. I want to open up the avenues to everybody to enter specialization. Once someone meets the minimum entry level, he should not be locked out because he cannot go back to school to obtain the information. We must establish a good mechanism coordinating the credentialing body with the development of the programs. There has got to be a high degree of working together.

A: Cecil: I foresee the fields of pulmonary function technology and cardiopulmonary laboratory technology as ending up in educational programs as specialty areas for respiratory therapists to go into after they have completed their two-year programs. As for nontraditional programs, the potential certainly exists for an external degree in these areas.

A: Frownfelter: In respiratory therapy right now people are getting on-the-job training in special areas and considering themselves specialists. I think we have to set some minimum educational requirements and qualifications that people will have to meet to specialize in the field of home care and rehabilitation. I would think that the best way to achieve this is to have people work in the general field for a period of time, perhaps a year, to get a feeling for what respiratory care is

really all about. Then they could enter a graduate specialty program, perhaps an internship, in which the specialist could work with patients and learn in an institution. In either program, clinical work would have to be emphasized.

Q: How do you foresee the future of credentialing in your specialty area?

A: Clothier: As the educational programs develop and the roles are defined, I think credentialing will be required, with specific credentials for each of the areas of critical care. It is hard to predict whether the credentials will be required by the federal or state governments or by institutions.

A: Williams: I would like to see credentialing at the national level, although I think we will see it at the state level. Unfortunately, there is not always reciprocity between states, and I think it would be ridiculous for individual states to say someone is competent to practice as a specialist in a newborn unit in one state but not in another!

A: Cecil: I am not sure at this time how a specialty credential in the pulmonary lab specialty will be applied, because we have not done a lot of developmental work with it yet. I would imagine that the credential will initially include a grandfather clause and will not require people already working in the field to obtain any additional education. I imagine that, after a certain period of time, there will be definite educational requirements that will have to be fulfilled before the specialty examination can be taken.

A: Frownfelter: We will have to see credentialing just to make our position valid. We will have to meet some minimum criteria to prove that we are worthy of being called specialists. Each hospital will probably have its own basic criteria, but we should have national standards to ensure more consistent and higher quality patient care.

Q: How will the development of your specialty area influence interaction with other health care team members?

A: Clothier: With a more specific delineation of the roles of the health care team members, with more formalized or specific training for those roles, and with the acquisition of credentials for each practice, I think we will see greater sharing of responsibility, greater cooperation, and more effective total patient care. I think that this will be especially true once some mandatory credentialing is imposed by either state or national governments.

A: Williams: I think that interaction with other health care team members will improve markedly. People who work with patients are professionals, and professionals always respect another professional who is knowledgeable. Therapists have earned the respect and admiration of nurses and other allied health practitioners and physicians by demonstrating com-

petence in an area. With increased competence, they will be better accepted.

A: Cecil: The interaction of the pulmonary lab technician with other members of the health care team should improve a great deal. We are at a point in respiratory therapy history where people are no longer thinking that IPPB, aerosol therapy, and chest physical therapy are cure-alls. People want to acquire objective data demonstrating a therapy's effectiveness. This produces a very healthy environment that can't help but improve the status of cardiopulmonary laboratory technicians.

A: Frownfelter: Interaction will have to improve. I think what we will see in the future is people becoming more and more multidisciplined, and therefore much more cognizant of what other disciplines are doing. Then we can better coordinate the different roles.

Q: Are there any additional remarks that you care to make regarding specialization in your area?

A: Clothier: I feel it is essential, in the area of advanced or specialty credentialing, that the concept of multiple competency or multiple specialty be considered, if for no other reason than from a financial, cost-effective viewpoint. If we continue to produce ever-increasing numbers of specialists with very narrow scopes of practice, the cost of training and, therefore, the costs of care are going to continue to skyrocket. However, if we train people who are multicompetent, we can use our personnel more effectively and provide better patient care.

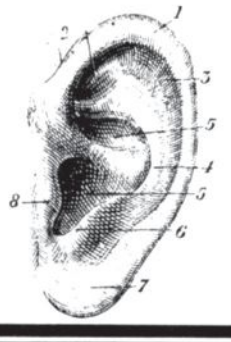
A: Williams: One of the things that the Perinatal and Pediatrics Committee is studying is the possibility of breaking perinatal and pediatrics into two separate specialties. Presently, it is very difficult for us to say whether these are two separate entities or one. Based on preliminary evidence, I would say that it is not going to develop into two separate specialties.

I would urge the membership to correspond with the committee chairmen and state their feelings. We need input from people working in specialization now and from people who think they would like to become specialists. We need input from the membership.

A: Cecil: I feel that the specialty in cardiopulmonary lab technology is just beginning in the sense of an organized group seeking the means to apply some form of quality control over our specialty in the form of a credentialing process, continuing education programs, and traditional training programs. We are in a position now where the future looks very good. We certainly need input from other people who are in the field to determine exactly which direction we should move in.

A: Frownfelter: I would like to emphasize that I think specialization in continuing care and rehabilitation is necessary, but we should not lose track of what is going on in the field in general and what is happening to the roles of people around us. We need cooperation with other fields. That is such an easy thing to say, but it can really make or break anything that we are doing. ■

Speaker's Corner



This column will appear regularly in *AARTimes*, offering information about speakers who are available to address local, regional, and national meetings.

Richard Imbruce, PhD, RRT
Technical Director, Section of Chest Diseases, Norwalk Hospital, Norwalk, Connecticut 06856
Subjects: "Airway Mechanics and the Work of Breathing;" "Cardiopulmonary Monitoring;" "The Effects of Ventilator Waveforms on Cardiopulmonary Function;" "Standards as They Relate to Medical Devices"
Fee: Varies

Carol Miller, RRT
Instructor, Respiratory Therapy Program, Miami-Dade Community College, Medical Center Campus, 4320 North Bay Road, Miami Beach, Florida 33140
Subjects: Death and Dying; Continuous Ventilators; Behavioral Aspects of the Critically Ill; Clinical Instruction and Evaluation; Role of the Community College in the Community; and Instructional Strategies
Fee: $100.00 plus expenses

Thomas J. DeKornfeld, MD
Professor of Anesthesiology and Director, Office of Allied Health Education, Room G-1210 Towsley Center, University of Michigan Medical Center, Ann Arbor, Michigan 48109
Subjects: Respiratory Therapy Education, Accreditation, Credentialing, Legal and Economic Aspects of Respiratory Therapy
Fee: Varies

Steven P. McPherson, RRT
Director, Respiratory Therapy, Tucson Medical Center, Box 6067, Tucson, Arizona 85733
Subjects: Respiratory Therapy Equipment
Fee: Varies

Allan B. Saposnick, RRT
Assistant Professor, Department of Cardiorespiratory Technologies, Community College of Philadelphia, 16th and Spring Garden Streets, Philadelphia, Pennsylvania 19130
Subjects: "Cigarettes and Cancer - There's No Doubt;" Cardiopulmonary Resuscitation; History of Respiratory Therapy - The Rise of the Profession; History of Respiratory Therapy - Equipment and Techniques; and review or refresher lectures on cardiovascular anatomy, respiratory anatomy, humidity and aerosol therapy, and oxygen administration
Fee: $50-100.00 plus expenses

Robert R. Demers, BS, RRT
Research/Teaching Assistant, Division of Pulmonary Medicine, Rhode Island Hospital, 593 Eddy Street, Providence, Rhode Island 02902
Subjects: "Fundamentals of Blood Gas Interpretation;" "Mechanical Aspiration: A Reappraisal of Its Hazards;" "Respiratory Mechanics;" "Etiology, Pathophysiology, and Treatment of Atelectasis;" "Is the Respiratory Therapist an Endangered Species?"; "A Review of Intratracheal Inflatable Cuffs;" "The Systematic Management of Respiratory Failure;" "Ventilation/Perfusion Relations in Health and Disease;" "Evaluation of Various Criteria for 'Optimum PEEP'"
Fee: $100.00 per (hour) presentation

James P. Baker, MD
Professor of Medicine and Director of the Pulmonary Division, Department of Medicine, Eastern Virginia Medical School, 600 Gresham Drive, Norfolk, Virginia 23507
Subjects: Clinical Pulmonary Physiology, Intensive Care Medicine, Respiratory Therapy Education
Fee: Varies, $100-$150.00 per day

To be listed in Speaker's Corner, *please send the following information to the editor: professional affiliation and address, areas of expertise for speeches, fee requested, and a reference.*

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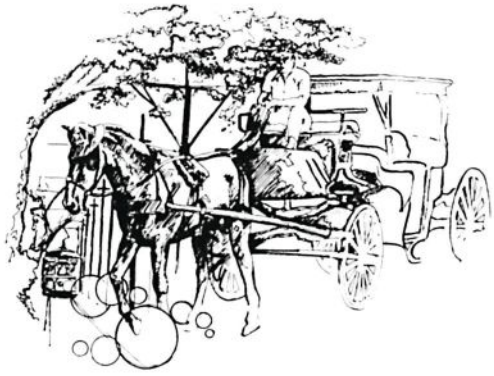

Transportation

Getting around the town — Car, streetcar, horse-drawn carriage, taxi, or foot? Map of the city, tips on airport transportation.

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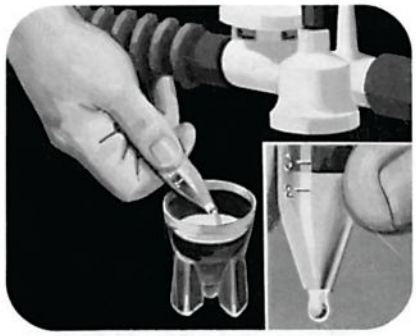

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