Title: Upholding the Tripartite Mission in Times of Crisis: Purpose and Perseverance in the COVID-19 Pandemic

Submission type: Commentary

Authors: Taylor Standiford\textsuperscript{1}, Andrew Shuman\textsuperscript{2}, David Fessell\textsuperscript{3}, Michael Brenner\textsuperscript{4}, Carol Bradford\textsuperscript{5}

Affiliations:

\textsuperscript{1}Taylor Standiford, B.S.
University of Michigan Medical School,
Ann Arbor, MI
standifo@med.umich.edu

\textsuperscript{2}Andrew G. Shuman, M.D.
Department of Otolaryngology – Head & Neck Surgery, University of Michigan Medical School,
Ann Arbor, MI
shumana@med.umich.edu

\textsuperscript{3}David Fessell, M.D.
Department of Radiology, University of Michigan Medical School,
Ann Arbor, MI
fessell@med.umich.edu

\textsuperscript{4}Michael J. Brenner, M.D., F.A.C.S.
Department of Otolaryngology – Head & Neck Surgery, University of Michigan Medical School,
Ann Arbor, MI
mbren@med.umich.edu

\textsuperscript{5}Carol R. Bradford, M.D., M.S.
Department of Otolaryngology – Head & Neck Surgery, University of Michigan Medical School,
Ann Arbor, MI
cbradfor@med.umich.edu

Correspondence
Michael J. Brenner, M.D., F.A.C.S.
Associate Professor of Otolaryngology – Head & Neck Surgery
University of Michigan Medical School
1500 East Medical Center Drive/ 1903 Taubman Center SPC 5312
Ann Arbor, MI 48104
mbren@med.umich.edu
(734) 936-9178

Keywords: Research, Education, Patient Care, COVID-19, pandemic, safety, healthcare workers
**Author Contributions**

<table>
<thead>
<tr>
<th>Author Name</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor C Standiford</td>
<td>Substantial contributions to the conception and design of the work; Drafting the work and revising it critically for important intellectual content; Final approval of the version to be published; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</td>
</tr>
<tr>
<td>Andrew G Shuman</td>
<td>Substantial contributions to the conception and design of the work; Drafting the work and revising it critically for important intellectual content; Final approval of the version to be published; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</td>
</tr>
<tr>
<td>David Fessell</td>
<td>Substantial contributions to the conception and design of the work; Revising it critically for important intellectual content; Final approval of the version to be published; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</td>
</tr>
<tr>
<td>Michael J Brenner</td>
<td>Substantial contributions to the conception and design of the work; Drafting the work and revising it critically for important intellectual content; Final approval of the version to be published; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</td>
</tr>
<tr>
<td>Carol R Bradford</td>
<td>Substantial contributions to the conception and design of the work; Revising it critically for important intellectual content; Final approval of the version to be published; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</td>
</tr>
</tbody>
</table>

**Funding:** None  
**Conflict of Interest:** None
Abstract

Academic otolaryngology has historically comprised a tripartite mission of research, education, and clinical care. This mission is greatly strained by the COVID-19 pandemic. Research labs are fallow, surgical cases are deferred, and clerkships are cancelled. Otolaryngologists are adapting to new circumstances ranging from virtual patient care to urgent procedures in protective gear to deployment to provisional field hospitals. Amid these operational challenges, the specialty is demonstrating extraordinary resilience and grit, discovering new ways to serve learners, colleagues, and communities. Statements from leaders in otolaryngology reveal selfless acts and purposefulness. Necessity has spurred innovation in education, science, and novel models of care. Paragons strike notes of hope, inspiring us to persevere and serve. This commentary explores the present challenges and offers a vision for upholding the academic mission.
Introduction

Leaders of academic medicine deeply value the tripartite mission of education, research, and clinical service;\(^1\)\(^2\) and, the COVID-19 pandemic has presented unprecedented challenges to it. The academic mission, already strained by technology, regulations, and payment models,\(^3\) is particularly vulnerable in the present crisis. Massive outlay of resources is needed to care for critically ill patients while ensuring the safety of physicians and staff.\(^4\) This urgent and necessary prioritization of the clinical mission risks undermining research and education. This commentary reveals how our institutions can endure and evolve with determination, courage and leadership.

Promoting service, research, and education

This pandemic has unraveled the fabric of academic life as we know it. In these tumultuous times, Dr. St. John encourages us to accept these new challenges, engage in crucial conversations with one another, and learn from life’s lessons (Figure 1): Clinical research projects are being halted to avoid risks to participants or to preserve personal protective equipment; innumerable basic science laboratories are rendered inactive to keep research teams physically distanced. However, collaborating and supporting research initiatives has never been more necessary.
One example of how academic leaders across the country are adapting to uphold the research mission comes from Dr. Cherie Ann Nathan (Figure 2). Just as innovative research has required flexibility, so too have educational initiatives across our specialty. Triage of surgical cases and clinics has curtailed traditional experiential learning environments for residents and for medical students; but, leaders in education have adapted and innovated. Otolaryngology programs have responded to this crisis by spearheading multi-institutional residency educational programs involving daily virtual lectures by distinguished faculty, case-based sessions, virtual journal clubs, and individualized oral boards review sessions for senior residents. These creative initiatives underscore our specialty’s commitment to educating the next generation of Otolaryngologists.

**Caring for our patients and coworkers**

There is a moral imperative to protect our most valuable resource in responding to this virus: our people. Dr. Jackler emphasizes safeguarding our healthcare workforce, describing carefully planned measures implemented at Stanford through collaboration and advocacy (Figure 3). There is growing realization that otolaryngologists are particularly susceptible to transmission of the novel coronavirus by virtue of our specialty’s focus on head and neck, mucosal surfaces, and airway. Dr. Vergez, one of our colleagues abroad, shares his personal experience with this virus, relating the ways in which he and his colleagues have emerged from illness with renewed vigor and purpose (Figure 4). Amid these hardships, inspiring international partnerships are taking shape. Neil Tolley implores us to work together to foster scientific progress and support one another (Figure 5).
Embracing diversity and inclusion to promote innovation

The pandemic has led to unprecedented international collaboration spanning countries and continents. Only through embracing diversity can we achieve the creative problem solving necessary to find solutions and maximize impact.\textsuperscript{10} Dr. Duane Taylor explain why diversity is critical to surviving this epidemic and to promoting all three pillars of the tripartite mission (Figure 6). The trying circumstances of COVID-19 have created new partnerships and led to unexpected innovation. Dr. Mary Lynn Moran details selfless acts of the many in our specialty (Figure 7).

Even as the exigencies of the present demand our full attention and effort, it is important to have an eye scanning the horizon. Professor Mark Prince, Chair at University of Michigan, discusses how our core values provide compass by which to navigate this crisis (Figure 8). Concurrent with massive expansion to create capacity for COVID-19 positive hospitalized patients, the research mission can flourish. Commitment to research and innovation, even in time that are inhospitable to science, may reduce harm from the current pandemic and prevent future ones.

Fostering resilience

Persevering through these challenging times will help us to emerge stronger. We will reflect upon this pivotal, defining moment both as individuals and as a profession. How we respond to this pandemic may say more about who we are and what we stand for than the crisis itself,
which is a harsh, but passing storm. We have collectively committed to inclusivity, collaboration, and innovation to better our present as well as our future. Together, we maintain the trifold mission of academic otolaryngology for the benefit of scientists, learners, clinicians, and patients.

**Summary of Figures (callout boxes)**

Figure 1: *Adapting to uncertainty, imperfection, and challenges*

Figure 2: *Importance of supporting young clinician-scientists*

Figure 3: *Ensuring the safety and welfare of our staff*

Figure 4: *Overcoming COVID-19 infection and emerging stronger*

Figure 5: *The profoundly personal effects of the pandemic*

Figure 6: *Stronger together through diversity*

Figure 7: *Selfless acts and newfound innovation*

Figure 8: *Embracing core values, fostering innovation, and promoting civility*

**References**


This manuscript was accepted for publication in Otolaryngology-Head and Neck Surgery.
"COVID-19 has spread to almost every country, infecting many people we know, and many more we do not know. It has filled hospitals and emptied stadiums. It has separated children from their schools and their friends. It has left some families unable to kiss their loved ones goodbye. It has disrupted modern society on a scale that most living people have never witnessed or imagined. A heavy dark cloak now covers our tattered white coats. It is cold, uncomfortable and unfamiliar. Part of what differentiates head and neck surgery is our specialty's regard for itself as a realm of visionary futurists, driven scientists, tireless healers, and innovators who are serving others and making the world better.

And now enter pandemic.

In time of pandemic, we need as many visionary leaders as we can inspire and mentor. And they need to come from everywhere. Do not expect perfection; embrace flashes of uncertainty; always keep your eyes on the goal. We need to create environments where people are invited to step forward to help advance the vision and mission and in small and big ways. Let us share our experience, data, and wisdom in publication. It takes a village. Let us keep talking about the issues we face daily. Let us acknowledge the challenges and keep up the dialogue, as we try to better understand. We need to provide ourselves with flexibility day to day, and flexibility in the arcs of these unprecedented weeks. We need to realize that there are times we need off ramps and that, yes, there will be future on ramps.

We all come from different pasts, different upbringings, and childhood homes thousands of miles apart. But the essence of who we are as head and neck surgeons—the passion to be of service and carry forth the mission—is one.

Somewhere in the midst of pandemic and social distancing, the truth is revealed: we are all a part of the beautiful, simple, strong yet sometimes fragile human condition. To borrow a line from the inimitable Atul Gawande: “The pandemic is global; its lessons are, too.”

Maie A. St. John, M.D., Ph.D., FACS
Thomas C. Calcaterra Professor and Chair, David Geffen School of Medicine at UCLA
“The COVID-19 crisis highlighted the importance of research whether it be testing, vaccine development, or treatment. In challenging times, it is all the more important that we support the research mission and the promising young clinician-scientists who are the lifeblood of research innovation in our field. As the COVID 19-pandemic accelerated in March, we needed to decide how to rigorously review over 150 CORE grants, many that explore frontier areas and often lead to NIH funding. Over 60 research leaders in our specialty convened a virtual session over a weekend to review CORE grants from residents, fellows, and early-career faculty. The decision to maintain our standards on research exemplified our specialty’s dedication to research and the pipeline of clinician-scientists.”

Cherie Ann Nathan, MD, F.A.C.S., Jack Pou Endowed Prof. & Chair, Dept. of Otolaryngology/HNS, LSU Health-Shreveport
“In order to ensure that we can meet the needs of our patients, it is imperative that we safeguard the welfare of our colleagues and staff. In the early weeks of the COVID-19 outbreak, there was great uncertainty about the dangers of the SARS-CoV-2 virus. Revelations from colleagues in China and other parts of the world were critical in learning about this new threat. We took a deliberate approach to sharing information as widely as possible, using diverse channels. Advocacy within the institution was critical to ensure appropriate personal protective equipment for patient and staff safety. We also leveraged our laboratory research infrastructure to improve testing, while initiating educational campaigns to promote learning from peer institutions around the world. Through such efforts, our profession has risen to the challenge of the pandemic, ensuring preparedness so that the specialty will be poised to make new advances as we look to the future.”

Robert K. Jackler, MD, Edward C. and Amy H. Sewall Professor and Chair of Otorhinolaryngology, Stanford University School of Medicine
“As the novel coronavirus has spread across the world, it has left an indelible mark on all of Europe, greatly affecting our way of life in France and taking all too many lives. COVID-19 infection has afflicted me personally and also my family and colleagues, who are all recovering. At the time when my own COVID-19 RT-qPCR test was positive, I experienced complete anosmia, which is gradually resolving. While few of us will emerge from this pandemic entirely unscathed, we are getting through this together. Curves are flattening as we overcome this disease, and we are teaching and learning from one another. Even while this dark pandemic has unfolded, I have formed new international friendships and collaborations. Each day we see evidence of the courage and perseverance of our friends and coworkers. From the rubble of this tragedy we can glimpse the promise of a brighter future.”

Sebastien Vergez, MD PhD,
Professor Institut Universitaire Telouse, France
Board member, French Society of Otorhinolaryngology
“Having just completed our first week in lock-down in the U.K. we were notified yesterday of the first death by Covid-19 of an ENT colleague in the United Kingdom, with another presently ventilated. This makes the fight against the virus profoundly personal for Otolaryngology. Our world will change profoundly once this pandemic is over with warning of a potential catastrophe cited in the scientific literature as long ago as 2007!

We must listen to our scientists and the urgency to develop an effective vaccine is only too apparent.

At this time of crisis, we need scientists, clinicians and those from political walks of life to work together in a spirit fraternity and international collaboration. We must listen to what nature is telling us if mankind is to evolve. The loss of what we have, until now, taken for granted has been a hard lesson.”

Neil Samuel Tolley MD, FRCS, DLO, Professor ENT- Head & Neck Surgery, Imperial College NHS Healthcare Trust, London, U.K.
“To get through this global pandemic crisis, we must work together, navigating this difficult challenge with optimism, sound judgment, and commitment to safety. This pandemic has caused loss of life, first and foremost; it has also affected our healthcare teams, staff, and our families — in many cases threatening stability of our practices, whether urban, suburban, or rural. Otolaryngologists’ commitment to the care of their patient has resonated. Our patients, their families, our own families, and communities are relying not only on our knowledge, skills and expertise but also on our good judgment. Difficult decisions rely on experiences and the existing medical data gleaned from a variety of sources, including colleagues in other countries.

We are stronger together. In otolaryngology, harnessing the benefits of diversity has been critically important in responding to the COVID-19 pandemic. As the crisis unfolded, we tapped the skill sets of a wide range of general and specialist otolaryngologists in our academic centers and in the community. Diversity of insight, opinions, and perspectives can lead to better science and to better patient outcomes. As treatment, best practices, and ultimately development of vaccines and medications evolve, the diverse population of our country and our workforce of physicians will enhance scientific impact and outcomes.

Inclusive culture is absolutely critical. It is only through fostering diversity across education, patient care, and research that we access the collective intelligence to surmount obstacles and move forward. This virus knows no racial, ethnic, age-related, gender, or demographic boundaries. We are aware, however, that certain chronic conditions predispose to mortality (heart disease, pulmonary disease, hypertension cancer, immunocompromised). These conditions are disproportionately present in certain racial, ethnic, and socioeconomic segments in the United States. As physicians, our cultural sensitivity should be heightened in how we investigate, manage, and prevent the spread of COVID019 in these at-risk populations.”

Duane J. Taylor, M.D.
President of the American Academy of Otolaryngology – Head & Neck Surgery
“We are facing a situation that challenges us on every level. We are all having to make scary and selfless decisions for the greater good of our community. Our Facial Plastic Surgeons in private practice are shutting down their offices and operating rooms without any guarantee of when or how they are going to be able to support themselves, their staff, and their families.

Our members on the front lines are risking their lives to save others. Many have offered valuable assets – such as ventilators and personal protective equipment – that they will need later, to try to pick up the pieces of what is left of their practices and to save lives. Necessity, being the mother of invention, has brought out creative innovation such as a member who is trying to make ventilators out of windshield wiper motors.

When the instinctive thing to do is hunker down, stock up, and protect home and hearth, individuals are reaching out to see how they can help, regardless of the sacrifice. Organizations that don't always play well together are setting aside their egos and agendas to see how they can find a solution together. Hopefully as a result of forward thinking and selfless action, we can minimize the casualties and get back to the beautiful mundane that we often take for granted.”

Mary Lynn Moran, MD, FACS
President of American Academy of Facial Plastic and Reconstructive Surgery
“At University of Michigan, our culture is anchored by core values of inclusion, engagement, civility, and accountability; these values are a bulwark against the COVID-19 pandemic. Engagement has taken on new meaning as faculty and staff have been redeployed and sign up for the field hospital being built at one of the university athletic facilities. It will expand our capacity by up to 1,000 beds to accommodate the rising tide of patients infected with SARS-CoV-2. Many of our faculty and staff are taking on additional roles in our clinics and providing support to team mates. Biomedical research is also playing a huge role, as our faculty identify, develop, and test innovative treatments for this disease. The work we are doing now not only meets needs of the present but lays the foundation for countering future health crises.

There has been a remarkable uptick in research activity related to COVID-19 at Michigan. Over 500 biospecimens from COVID-19 patients have been collected for collaborative research. Clinical trials are being fast-tracked, with one trial at Michigan examining the promise of Remdesivir as antiviral therapy for COVID-19 patients and another on Sarilumab, an Interleukin-6 inhibitor, that may reduce inflammation in COVID-19. We are collaborating with colleagues in the College of Engineering on many fronts, with investigations ranging from testing new methods for recycling N95 masks to studying the risks associated with using nasal cannula with COVID-19 patients to developing 3D-printed devices that may mitigate ventilator shortages. Through collaboration, we access the power of diversity and teamwork.

As we acclimate to our new way of life, we embrace opportunities for civility, tolerance, and inclusion. Fears and uncertainty that surround us necessitate purposeful open-mindedness. Service is also crucial to our mission. We must strive for an inclusive culture that welcomes diverse perspectives and helps us find meaning and purpose in our work. We reveal who we are through our daily actions, whether donating blood, advancing since science, delivering virtual education, or helping our patient who are in need. By adhering to the highest ethical and professional standards, we prove ourselves worthy of our calling.”

Mark E.P. Prince, M.D., FRCS(C)
Charles J. Krause, M.D., Collegiate Professor and Chair, University of Michigan