



# Is Respiratory Compromise The New “Sepsis”? : The Benefits of Early Detection Through Continuous Patient Monitoring

## **Wong:**

Thank you for listening to the Health and Safety Podcast. I'm Michael Wong founder and executive director of the Physician-Patient Alliance for Health and Safety. PPAHS has often advocated the need for clinicians to address respiratory compromise, a subject that we have often discussed in reference to patients who have had adverse events or deaths due to opioid-induced respiratory depression.

The Physician-Patient Alliance for Health and Safety would like to thank Medtronic for their generous support of this clinical education series. Through the financial support of Medtronic, PPAHS can offer this education series with full independent control over all programmatic and editorial aspects of the series, including selection of clinicians to be interviewed, discussion topics, and questions asked.

As a global leader in medical technology, services and solutions, Medtronic improves the health and lives of millions of people each year. Medtronic believes its deep clinical, therapeutic and economic expertise can help address the complex challenges — such as rising costs, aging populations, and the burden of chronic disease — faced by families and healthcare systems today. But, Medtronic can't do it alone. That's why Medtronic is committed to partnering in new ways and developing powerful solutions that deliver better patient outcomes.

To help us better understand what is respiratory compromise, and why clinicians and their health care facilities should care about respiratory compromise and adopt clinical practices to prevent respiratory compromise, today, I'm speaking with Dr Jeffery Vender.

Dr. Vender is emeritus chair of anesthesiology at NorthShore University HealthSystem. Dr Vender has served as the president of the Illinois Society of Anesthesiologists and the American Society of Critical Care Anesthesiologists. Both Jeff and I are members of the clinical advisory committee of the Respiratory Compromise Institute. Jeff is the representative for the Society of Critical Care Medicine. The Respiratory Compromise Institute can best be described as a coalition of medical and safety organizations devoted to

raising awareness about respiratory compromise. Dr. Vender is chairman of this clinical advisory committee, so we are honored to hear from Jeff about the Respiratory Compromise Institute and what he hopes the Institute will achieve.

Welcome to the podcast Jeff.

**Vender:**

Thank you.

**Wong:**

For the listeners not familiar with you or your work could you give us a brief introduction about yourself?

**Vender:**

I'm a clinical professor of anaesthesiology and critical care at the University of Chicago, School of Medicine-Pritzker School of Medicine. I'm an anesthesiologist, intensive care trained physician, who works in a large, university-affiliated hospital system in Chicago.

**Wong:**

Excellent. Today we're talking about respiratory compromise and the Respiratory Compromise Institute. To get everyone listening on the same page, let's start with your own definition of respiratory compromise or, if you'd prefer, the definition that the Respiratory Compromise Institute uses.

**Vender:**

Clearly there are multiple definitions out there, but the one that I have typically employed, and the Respiratory Compromise Institute has used, defines respiratory compromise as a state in which there is a high likelihood of decompensation into respiratory failure and/or death, but, in which specific interventions - be it therapeutic and/or monitoring - might prevent or mitigate this decompensation.

**Wong:**

Thanks, Jeff. As I mentioned previously, respiratory compromise often occurs with the administration of opioids. However, your description of respiratory compromise includes non-opioid situations. Could you please describe some examples of respiratory compromise that may not involve, or be associated with, opioid administration?

**Vender:**

There are numerous situations where patients with underlying pulmonary disease are in very chronic, but stable conditions. And, for a multitude of reasons, either a therapeutic intervention, the administration of pharmaceutical agents, in particular sedative agents and/or narcotics, as you've alluded to, or an underlying disease, like pneumonia, can make this stable respiratory condition and move it down the spectrum of patho-physiologic deterioration into respiratory compromise.

Although we have clearly recognized a significant increase in respiratory complications associated with opioid administration. There are other areas, non-opioid related, that can create respiratory compromise. We view many patients with stable or underlying respiratory conditions whether it be COPD, sleep apnea, or pre-existing patho-physiology were either due to sedative agents, or an acute illness - like pneumonia - can go from a stable condition to respiratory compromise and become at risk for respiratory failure. A classic example of that in my world of anesthesia has been the well-recognized area of non-operating room anesthesia - in particular, as an example, endoscopy suites. We do numerous endoscopy procedures under the administration of propofol or other anxiolytic-like drugs. And there has been a well-recognized increased incidence of sentinel events related to oxygenation and ventilation. Including death.

**Wong:**

So, why do you think it's important for clinicians to recognize respiratory compromise? Or rather put another way, why have clinicians perhaps not recognized respiratory compromise in the past?

**Vender:**

Well, I think we've always appreciated that patients go through a spectrum or transition of physiology, patho-physiology from an acute illness to a debilitated state. And I don't think it's a lack of recognition. I think there's been a lack of understanding of how to monitor better, or to recognize better, those patients at-risk. And, historically monitors we have employed routinely and become very comfortable with, like pulse oximetry have been shown, in many situations, to actually potentially be misleading in some of these clinical situation.

**Wong:**

So what tools would you currently recommend to help clinicians recognize respiratory compromise or should there be the development of new tools.

**Vender:**

The first, and most important thing, is to recognize, especially within sedative procedures, outpatient-based procedures, non-operating room anesthesia, in particular. There is now a recognized - and, this is based on closed claims data - an increased risk of deaths in contrast to operating room anaesthesia. A higher incidence of respiratory complications, many of them related to inadequate oxygenation and/or ventilation. And, one of the reasons for this is, today, the patients that are being given for non-operating room anaesthesia, in particular, are often a higher risk, elderly, and done under sedation.

And many people confuse sedation as a benign introduction of relatively limited-effect drugs, which isn't really true. So, therefore, from a clinician standpoint is to recognise that the drugs we employ as sedative agents can have variable effects on individuals depending on their tolerance and their underlying condition. Secondly, is to understand the dosages and the effects of the particular drugs employed. And the last thing is how to best distract them beyond just clinical assessment of monitoring routine vital signs, like respiratory rate, heart rate, blood pressure. The most common monitor employ historically has been

pulse oximetry, as I alluded to before. But, when you administer pulse oximetry with oxygen therapy, we can often delay the recognition of hypoventilation. And that's why more and more people are beginning to study and look at the utilization of capnography, or CO2 monitoring, in the expired gas to earlier detect depressed respiratory rate and/or apnea, as well as signs of hypoventilation or inadequate ventilation.

**Wong:**

So you've alluded to some of the limitations of pulse oximetry, Would you recommend capnography monitoring as you've outlined?

**Vender:**

Well, in my own practice, understanding there has been a whole change in the guidelines of the utilization of capnography. So, for instance, the American Society of Anaesthesia now mandates, as a standard of care, the utilization of capnography in procedures where sedative or narcotic agents are going to be employed. So, it's become part of our mandate to do this.

**Wong:**

I often hear from hospitals that they're changing practices in the event of an adverse event due to respiratory compromise. Although of course it's always good to hear that change is being made, they are being made after that an adverse event has occurred. What do you think are the biggest impediments to incorporation of monitoring or other tools to recognize respiratory compromise?

**Vender:**

Well, I think like all monitoring tools, there's a cost associated with monitoring that people have to accept and recognize. In addition, there's a familiarity with the utilization, the benefit, as well as the limitations of specific monitors in different clinical situations, which mandates an educational process to employ these. And, in my field of anesthesia, we have become very comfortable with capnography because it's been part of our routine monitoring for several decades. And, as I said, it's always been part of the monitoring standard for use with general anesthesia, but that has been extended today, I believe, for patients who are receiving sedative procedures for any patient administered by an anesthesiologist.

**Wong:**

So you'd recommend continuous monitoring of these patients outside the OR, outside of general anaesthesia?

**Vender:**

Yes, that's what we are doing that today as part of our routine care, which to be acknowledged, not all professional societies who administer sedative agents for procedural care have adopted that and/or accept that as their dictum.

**Wong:**

So, the Respiratory Compromise Institute. What do you hope will be achieved through this Institute?

**Vender:**

Well you know I think the goal is to try to identify evidence-based medicine that exists in this domain of interest. To example and demonstrate the benefits of more astute opioid and sedative agents. As well as justifying or establishing what are the best techniques to monitor these patients. And then distribute that knowledge to caregivers in a way that we increase awareness and increase adoption.

No different than when the Surviving Sepsis Campaign was developed for sepsis managed. Irrespective of one's perception of the materials provided or the evidence based medicine used, the Surviving Sepsis Campaign markedly increased clinician awareness of the problem for earlier diagnosis, much more acute intervention. And, today, whatever studies we look at the vast majority, even the control groups, for routine care have been markedly better as far as morbidity/mortality than the control groups of studies years gone by. And the reason for that is really just increased better care but more understanding and more awareness. Not necessarily a mandate of what to do.

**Wong:**

So really the Respiratory Compromise Institute should be about awareness building and encouraging earlier intervention in these cases.

**Vender:**

And then the recognition of the magnitude of the problem. As we did and we discussed here today we haven't talked much about opioids, but just looking at the news today the opioid crisis is all over the news. In our world of healthcare delivery it's not a matter of overdoses and or drug availability: it's about the utilization of opioids that have clear impact on the cardiopulmonary system and have variable effect on different individuals based on their underlying clinical condition, and then the marked increase in complications associated with this vast number of patients that are getting opioids that has really driven the awareness in the anaesthesia community. And how do we prevent this problem of opioid-induced respiratory depression in the subset of patients most at risk? How can we better monitor them? Because today we know that in excess probably 13 million cases, or at least that has been reported, in excess in the U.S. alone get patient-controlled analgesia and anywhere from 0.1% to 5% of those - and those are estimates - can suffer respiratory depression from the opioid induced respiratory depression. And this can lead to increased morbidity mortality. So, we need to do a better job of monitoring and understanding the drugs we use in those patients at risk, so we can reduce these complications. And I think the Respiratory Compromise Institute's goal is to make that awareness present among all providers. And that's why this is a collaboration of multiple specialties and multiple clinician groups or organizations, so we can get that word out to everybody.

**Wong:**

What are some of the biggest challenges to driving greater awareness of respiratory compromise?

**Vender:**

Well, driving greater awareness is going to be predicated on getting the information out, number one. But getting adoption of good evidence based medicine, getting people to, one, recognize this is a real problem. Getting people to recognize that a better understanding of what patients are at-risk and why,

and then techniques we can employ be it monitoring, clinical observation to reduce complications is understood and accepted by those providing these agents.

**Wong:**

Hopefully, this podcast will be heard by clinicians and will heed your words and begin to recognize respiratory compromise better and do something to intervene for their patients. Any last words for clinicians that you would advise them of to keep their patients safe?

**Vender:**

Well, I think all clinicians' goals are to deliver safe effective care. There's been a great push to reduce pain almost like a sixth vital sign. But when we do this and we reduce pain, we do it at a cost when we use drugs that impact the respiratory system. And, all we can ask for is for individuals to recognize that via The Joint Commission or other organizations, that they have looked at this problem as something that is preventable to a certain degree - not totally avoidable, there'll always be patients at risk - but to a great degree reduce or prevent it by better monitoring to reduce adverse drug events related to opioids and sedative agents. And it's the recognition that it's a problem that we are all dealing with. And, then a demonstrated a willingness to go read and learn about it through many available resources so you can reduce these issues in your own practice.

**Wong:**

Thank you Jeff for talking about respiratory compromise and why clinicians should be aware of this issue. This concludes our podcast with Dr Jeffrey Vender and thank you for listening to the Health and Safety Podcast.

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