Robert A. Veselis

Professor of Anesthesiology, Department of

Anesthesiology, Weill Cornell Medical College,

New York, NY

- Vice Chair for Research
- Department of Anesthesiology & Critical Care

Medicine

- Memorial Sloan-Kettering Cancer Center

1275 York Ave., New York, NY

BIOGRAPHY AND AREAS OF RESEARCH:

Dr. Veselis received his MD degree from the University of Toronto, anesthesia training at Duke University, North Carolina, and Critical Care Fellowship at University of Virginia, Charlottesville. Dr. Veselis has spent most of his career at MSKCC, developing a research program focused on mechanisms of the amnestic actions of anesthetic drugs, as investigated in healthy human volunteers. Recently Dr. Veselis has focused on more clinical aspects of cognition in the peri-operative period, including delirium, anesthesia related outcomes, pediatric sedation, and neuromonitoring. He is currently

Vice Chair for Research in the Department of Anesthesiology/Critical Care Medicine.

Michael Wang

TOPIC: Awake paralysis – the heart of AAGA PTSD

BIOGRAPHY AND AREAS OF RESEARCH:

Michael Wang is Emeritus Professor of Clinical Psychology in the College of Medicine, Biological Science and Psychology, University of Leicester UK, and Honorary Consultant Clinical Psychologist in Anesthesia, Critical Care and Pain Management at Leicester Royal Infirmary UK. He is a former Chair of the

Division of Clinical Psychology of the British Psychological

Society. He has worked as a clinical psychologist for more than

35 years, treating patients with PTSD, anxiety disorders, depression, obsessional compulsive disorder, and in particular, psychological problems arising from unplanned anesthetic and surgical incidents.

Anthony Messina, MD, MSPH, MBA is a retired Adjunct Professor of Healthcare Management at the Jindal School of Management, University of Texas at Dallas and anesthesiologist.

AM: So, I'd like to add one thing. So… (0:16/14:25)

MW: Mm-hmm (0:18/14:25)

AM: Your knowledge of memory and the impact of various anesthetic drugs on it, is you know you're one of the world's experts on it. So, you have an understanding as you just painted in terms of the different pathways that are intact even with overwhelming doses of anesthetics. That has influenced you tilting towards safety rather than persistent, to use the term, persistent lack of response, or persistent lack of wakefulness, or persistent lack of unconsciousness. We use those terms in anesthesia much more loosely than your expert knowledge uses them. So, what's important I think for the listener to understand that your positions are based on your scientific studies, which are much deeper than your understandings of how anesthesia impacts the brain, than the ranking file anesthesiologist in their trenches. (0:19/14:25)

RV: Well that's true, and my expertise is the explicit memory, the memory we usually think of as memory, anesthetic drug effects on that. The issues about the emotional memory, implicit, unconscious, subconscious memory. That's certainly not my area of expertise in terms of my research, but of course I'm familiar with it from the literature regarding memory systems, but I agree in terms of the general practicing anesthesiologist… their depth of understanding of memory system may not be as deep, but I think that's changing with education. And that's why until we have more data, that can support clinical practice. I think we should restrict descriptions of these events into more neutral terms that don't carry additional meaning to people not in the field. (1:09/14:25)

MW: Okay. (2:12)

AM: So, one last thing. So, I have to offer myself as a… (2:13/14:25)

RV: Mm-hmm. (2:16/14:25)

AM: as an example of recovered memory, or however. I get that I don't use the terms precisely, but…so, the way I came to it was, I had an anesthetic when I was very young, between 5 and 7 years of age. I had about 5 surgeries when I was young, and on the last one, I was basically when I could figure out what had happened. I was paralyzed and awake on induction and for skin incision, and felt like I was suffocating. And when they did the skin incision, the pain was unbelievable, and then I fell asleep. (2:19/14:25)

RV: Mm-hmm. (2:48/14:25)

AM: And I had nightmares of that image for years, but didn't understand it and then I stopped having the nightmares. And then in my like 4th month, it was all over{?unclear word] He [referencing the author, Smith's paper from 1947] (Smith, Brown et al. 1947) wrote what his experience was. I had a panic attack, but didn't remember, I didn't know why. And then when I anesthetized my first child, with my attending, pentothal induction suxx for intubation (Succinylcholine), fasciculations, and the kid went like this (the patient raised his hands a short distance from his neck, indicating that he was choking or having difficulty breathing) when I was about to intubate him. I had a flashback to the nightmares, and said oh my God, that's exactly what happened to me. And you know, what I realized…and then I met Bessel Vander Kolk, (Osterman and van der Kolk 1998, Osterman, Hopper et al. 2001), http://www.traumacenter.org/, when he was coming to some of the meetings in the early to middle phase, and he said… I entered one of his studies. And he said to me: You really need to leave anesthesia, and I said why, because I had filled out all of their questionnaires. He said because your experience in anesthesia has constricted your life experiences, because of the trauma you had as a kid. And when he explained it to me, I understood that he was perfectly correct and the way I reacted to that trauma was, I stopped really dialoging with anesthesiologists. And I went down a pathway, I stumbled into the cardiac anesthesia thing and transesophageal echo thing, and I said to myself given the pushback I had from my peers when I told them of my experience, which wasn't positive. It was kind of like what I learned in the trauma literature, that when you have a victim of volcanoes or terrorism or whatever in a community. The community then embraces you and is very protective of you, but after a while they don't like having you around because you're a reminder of something they can't control, and that's basically how I experienced my career in anesthesia. And I learned not to talk about it. I decided to go down this pathway of doing TEE studies, so that I could establish my credentials in the field, so when it came time to talk about it, people just couldn't dismiss it because I couldn't prove that happened to me as a child. I understood what a lot of the skepticism was [about]. And, what I found, in coming to these meetings and working on the Cochrane review, was, in my attempt to dialogue within the technical language of anesthesia, I came to the conclusion, that for all of the reasons you're pointing out…. The topic is subtle and difficult to identify the issues in terms for all of the reasons your work has suggested, and I've viewed your progression on your position on this as… very important. Because…you're obviously a very nice person, and I don't agree, at all, with amnesia as a postoperative target for defining how to be under anesthesia. But, I can totally get why you feel that way. And to me, that's the challenge that we have in anesthesia and dealing with this issue. Which is, you know, when you do anesthesia every day, you deal with life and death issues, you deal with complicated surgical issues, political issues in the hospital, and there's a lot of peer pressure in anesthesia to kind of define issues in a way that's acceptable to the community. But I feel like there's almost like a community

pressure to downplay, or minimize, or under characterize this whole problem of implicit emotional memory— based on my own personal experience. (2:49/14:25)

RV: Well, um…I mean, I think that's a very nice description of events, and certainly helpful to other people in that situation. I would put to you that it's really not implicit memory, that it was a very vivid awake memory at the time that nobody… (6:06/14:25)

AM: Right, you're right.

RV: corroborated.

AM: But can I…

RV: or took into account.

AM: Well how do you explain how I forgot about it? (6:29/14:25)

RV: Well, you know there's certainly, repression is a big factor and so I think it's a bit different. I don't want to you know nitpick, but I think it's a bit different than… (6:31/14:25)

AM: No like, go ahead, go on tell me.

RV: but I think It's a bit different than implicit memory

AM: But no, but then my response to that is that's still clinically important though. (6:44/14:25)

RV: What I think is important is, when you're with your childhood experience is to have that recognized immediately, and intervene at that point to really help you through that episode. Now if you…so I suspect you really remembered what actually happened during your anesthetic um and… (6:49/14:25)

AM: And I didn't under… so

RV: And you…you didn't

AM: And I didn't understand that…right. So, when I was…what I do remember was wow this is a really awful nightmare. I had no connection… (7:14/14:25)

RV: Exactly

AM: even though it was literal, but I had no knowledge of what happens in surgery.

MW: Well, I think this is kind of what relates to what was said yesterday, which is that the vast majority of children, who probably have episodes of awareness with full recall don't process that experience in the way an adult would, and the consequence of that is that they don't present with the typical emotional sequelae of an adult having had accidental awareness. But as we've said, it's not that the memory isn't there or is somehow ablated, or even repressed. But it is still there, and it takes a cue in adulthood that cause it to come out. I'm just very aware that I have a brother who is a pathologist, and he's now in his 50's, and still to this day about once a month he has a nightmare which basically replays him having a gas anesthetic in the dentist chair. And bas… I won't bore you with the details of it, but that…he has a replay of that experience. I think at that time when he was a kid it probably didn't bother him as much as it does now. Which is to do with the maturation of the CNS and the fact we take on a lot of different forms of knowledge (7:25/14:25)

RV: Right

MW: which then plays the experience of childhood in a different context, and you get different interpretation and different emotional response. (8:53/14:25)

RV: Right, well, and I would also…you may find some parts of the presentation that I'll be doing most interesting, because I think some of the material that I present will speak to some of these issues. So, I think in terms of the scientific studies of all these events we have to be sort of clear on terminology and try to separate out different pathways and not make presuppositions. With an event such as that, no one will know for sure whether it's an explicit memory, whether it's an implicit memory that's broken through or whatever, but in a point, that doesn't matter. Because what matters is what's going on now and how to address the issue, and I think the earlier we can intervene in this type of situation that the better off the patient is. (9:01/14:25)

MW: But don't you think also, that pediatrics needs to have a responsibility to make sure that events of the kind that Anthony suffered don't recur. (10:00/14:25)

RV: Well yes, of course, and I think that the drugs we're using now are much better than in those days. (10:11/14:25)

AM: So, one thing…so then I get back to the neuromuscular blockers. Let's just do this issue of spinal cord reflex, it's okay to paralyze because you're not conscious. That whole pathway that Ira Rampil, M.D. kind of made or highlighted, but my view is okay. So, let's say it's spinal cord reflex, but if you don't give more anesthesia, analgesia, doses whatever your choice is. It'll eventually evolve into the patient waking up and trying to jump off of the table, no? (10:17/14:25)

RV: Not necessarily. Once again, there's no set algorithm and sometimes the correct thing may be to use muscle relaxants, but I think you have to go down the list of other things you might want to do and eliminate those before giving more muscle relaxants. (10:46/14:25)

AM: So…but what about the analysis system of….

AM: I know we'll go. I'll wrap it with this one point.

RV: Guess we should've.

AM: So, but you…you don't know what outcome that is from the spinal cord reflex. You don't know which pathway they're going to go—whether they'll eventually wake up if you don't give anything… to jumping up. Don't you have to assume that that's what you want to treat, rather than the neuromuscular blocker because you don't know what the end result if you go unintervened. (11:11/14:25)

RV: Well, I think Michael Avidan makes the nice point that we probably using…people use muscle relaxants more than they need to be used, and anesthesia can be done satisfactorily with fewer muscle relaxants. Once again, I think you know there are no good data to show what should be done in the case of movement. If somebody just moves their arm a little bit, are you going to deepen the anesthesia versus obviously if somebody sits up on the table, that's an entirely different situation. So, I think it's a complicated answer and I think once again, we have no objective monitors of what the movement represents. We just have to use our clinical judgments. (11:29/14:25)

AM: So, would you say…so with Remifentanil and Propofol the first combination of intravenous anesthesia, using it in generic sense. First TIVA, where you don't need muscle relaxants, where you can titrate to lack of movement and still extubate them. Shouldn't that free anesthesiologists into, even though we don't know what pathway that initial hand movement's going to be, shouldn't that lead us to wanting to titrate short acting anesthetics to lack of movement? Since we can't figure out until it happens whether it's an unimportant reflex or a more important regaining, being awake, or conscious, or whatever you want to say? (12:22/14:25)

RV: Well, I think, you point out we need to understand what's going on better than we do now. I think we have a looming problem with muscle relaxants and we need to somehow address how we're going to handle that. For instance, now most of the surgeries uh a lot of the surgeries are robotic surgeries. Surgeons are more and more mummifying the patients for their surgical procedures, having both arms tucked, you know the anesthetist is off in the corner of the room. Surgeons doing robotic surgery are now requesting deeper and deeper paralysis for their robotic procedures. (12:56/14:25)

AM: But shouldn't we subject them to the same outcome measures of the superiority of robotic procedures to standard procedures because of the implications it has for the anesthetic protocols? (13:41/14:25)

RV: Well, yes and I think there's' actually pretty good data to show that there's a significant reduction in postoperative infections, so that's gonna to be a major outcome. That's going to be of great interest to most people. So, I think, in the sense that the train has left the station, so we need to figure out how we're going to deal with our anesthetic management with muscle relaxants and I agree you don't use muscle relaxants unless you need to. But we're going to end up in that situation and we need to figure out an algorithm to give the best patient care in that situation, and I don't know what that is but it's an issue that's coming to the forefront. (13:50/14:25)

MW: Yeah, we better stop.

AM: Great, thank you.

Osterman, J. E., J. Hopper, W. J. Heran, T. M. Keane and B. A. van der Kolk (2001). "Awareness under anesthesia and the development of posttraumatic stress disorder." Gen Hosp Psychiatry **23**(4): 198-204.
Osterman, J. E. and B. A. van der Kolk (1998). "Awareness during anesthesia and posttraumatic stress disorder." Gen Hosp Psychiatry **20**(5): 274-281.
Smith, S. M., H. O. Brown and et al. (1947). "The lack of cerebral effects of d-tubocurarine." Anesthesiology **8**(1): 1-14.

Manuscript transcribed by Vanessa Soto; reviewed by MaW & AM; emailed to Dr Veselis on 11/21/17;