Biography
Dr. Elliot Krane is a Professor of Anesthesiology, Perioperative, and Pain Medicine at the Stanford University Medical Center. Dr. Krane attended medical school at the University of Arizona, and subsequently trained in pediatrics, anesthesiology, and pediatric anesthesiology and critical care. After completing his training, he moved to the University of Washington in Seattle, where he started one of the first pediatric pain services in the United States. Dr. Krane has served in many leadership roles, including chairing hospital steering committees, directing hospital-based pain programs, and advising the US FDA and international pain organizations. He holds board certification in Pediatrics, Anesthesiology, Pediatric Anesthesiology, Critical Care Medicine, and Pain Management, and is a Fellow of the American Academy of Pediatrics.

Dr. Krane has received the Physician’s Recognition Award in both Anesthesiology and Pediatric Critical from the American Medical Association, the Poster Award from the Vienna International Congress on Anesthesiology and Perioperative Care, the Jeffrey Lawson Award for Advocacy in Children’s Pain Relief from the American Pain Society, and the Ellis N. Cohen Achievement Award from the Stanford University Department of Anesthesiology, Perioperative and Pain Medicine. He has also been the recipient of grants from the Mayday Fund, the NIH, the American Medical Association, the Washington State Society of Anesthesiologists, the Diabetes Research and Education Foundation, and the American Society of Anesthesiologists as well as many pharmaceutical companies to assist them in new drug development for the treatment of pediatric pain.

Interview Abstract
Dr. Elliot Krane begins the interview by describing his early career and observations that pain in pediatrics was not meaningfully managed. After Dr. Krane took a position at the University of Washington, he developed his career path at the intersection of pediatrics and pain/anesthesiology. At his post in Seattle, Dr. Krane worked within a small, close knit pain department that were at the “world’s nexus of [Starbucks] coffee and pain management,” where he helped advance early pediatric pain practices.

Dr. Krane then describes in depth some of the barriers he encountered, such as the myth that children did not meaningfully experience pain, and the role of emerging technology, like the pulse oximeter and the use of portable ultrasound technology, that helped reinforce his practice as an anesthesiologist. Dr. Krane also described some barriers in other departments resisting the practices of pain management—sometimes if the pain services are used at all, they will be called too late to significantly help the patient.

In the future, Dr. Krane would like to see palliative and pain management services more integrated into the “hospital ecosystem,” where the palliative and pain teams are engaged sooner, when they can be most effective.
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<td>Do not resuscitate order</td>
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<td>Home Box Office</td>
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# Interview Roadmap

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Bryan Sisk: Today is November 13, 2019. I am Bryan Sisk and I'm in St. Louis, Missouri interviewing Dr. Elliott Krane over the telephone for the Pediatric Palliative Care Oral History Project. Dr. Krane is in Menlo Park, California. Thank you, Dr. Krane for joining me today. To get us started could you just tell me about how your mind turned toward pediatric pain as a career focus.

Elliot Krane: I started off—well I did my medical school education in Tucson, Arizona. And Bryan can you hear me okay? I'm talking on a new— is the quality of the sound okay? I'm using a new Airpod which I've never used before, I just brought it yesterday, so I don't know what sounds like.

Bryan Sisk: So far so good.

Elliot Krane: Okay, so I went to medical school in Tucson, Arizona, I was interested in pediatrics from the start. I remember doing, now we're talking about the 1970s so that was a long time ago, the late 70s. So, I remember doing a rotation on pediatric surgery with a couple of really good pediatric surgeons. And I just remember seeing kids in a kind of pain, infants and small children, and it just wasn't managed very thoughtful I would say. Which isn't to blame the practitioners, it's just the tools were not there.

So fast forward, I did a pediatric residency, anesthesiology residency, and then a fellowship in pediatric anesthesiology and all of those were in Boston. I started off with an interest in critical care and went going into anesthesiology as a pathway to that specialty. But then I shifted it to be a pediatric anesthesiologist specifically and interested in critical care. So, I just continued to observe poorly treated pain and was interested in learning how to improve the situation.

So, the end of 1983, the December of '83 when I finished my fellowship training, I took my first faculty position at the University of Washington where I did my clinical work at the Seattle Children's Hospital. It turns out that, and I was not really aware of this before I arrived in Seattle. Seattle was the nexus of pain management in the world; just sort of like it was the nexus of coffee. When I arrived in Seattle there was one Starbucks on the entire planet; it was at the big open air farmer's market, which was called the Pike Place Market, and that's where Starbucks was born.

And so just as Seattle was the nexus for coffee culture at that time, and I was seriously into coffee, it was also the nexus for pain
management. The Department of Anesthesiology in Seattle was found in the late 1960s. Prior to that time, anesthesiology was a subsection of the Department of Surgery. So, the first chair of the department of anesthesiology was a man named John Bonica, B-O-N-I-C-A. And John had gone to medical school in San Francisco, he was a veteran of the second World War, went to medical school in San Francisco where he put himself through medical school as a professional wrestler; his moniker was the Masked Marvel.

Oh my God.

And there have been great photographs of John in a wrestling pose, crouched over, arms out. He was not a tall man, he was pretty short; but, boy, he was stocky and muscular. And he was wearing this mask over his eyes like Zorro. [laughs] I guess he took a lot of punishment in the ring.

So, later on as a physician he was working in Tacoma, Washington as an anesthesiologist and was recruited to become the first head of the anesthesia department. He had a keen interest in pain management and he basically birthed the specialty; to put together a multidisciplinary pain clinic, which included neurosurgeons, psychologists, and psychiatrists, physical therapists and wrote the first textbook on pain management, which is still sort of their bible.

So, I arrived in Seattle in 1983 and interested in pediatrics then but had no clue about what to do about it really. And I found myself there; there I was in the middle Seattle, and a member of the department of anesthesiology. The chairman there was now Tom Hornbein and John Bonica had retired just a few years earlier but still showed up at work, had an office at the university in the department of anesthesia and came to work every day, and was still working in the pain clinic. And there was this robust service for managing pain at the university hospital, with an acute pain arm and a chronic pain arm.

So, then I'm at the Children's Hospital, but my academic appointment at the university and my lab is at the university, and I'm at the Children's Hospital. The anesthesiology department was then was run by a private practice, but I was the fourth metastasis from the university over there. So, there was a private practice of eight or 10 people and I was a university pediatric anesthesiologist over there; and as I said, the fourth one.

Well, the first metastasis from the university was a man named Donald C. Tyler, and Don was also interested in pain. So, all four
of us university folk, we ran the intensive care unit. So, the four of us were intensive care physicians and also operating room anesthesiologists; and the four of us all shared the same office and, so, we were all very close professionally and socially.

But Don was interested in pain as I was, and Don had trained at the University of Washington under John Bonica. So, the two of us got together and formed a pain service at the Children's Hospital and started, in an organized fashion, seeing patients in the clinic and treating pain as best we could.

We would just make trips over to the university when we liked, we did what we thought was right. When we ran up against the problem that we didn't know what to do with, we would go over to the university and talk to John Bonica or talk to the other people on the pain service and we'd say, well here's the situation, what do you think we should do; and we saw the pain service grow from that point on.

I'm not sure—it was either the first or the second pediatric pain service in the United States. Chuck or Charles Berde, B-E-R-D-E, started one at Boston Children's the same year, which was about 1984, 1985. I'm not sure who started it in the earlier month. But Charles, Chuck started doing the same thing in Boston. And, so it physically grew from there.

Now because we worked really closely with the oncology service in Seattle, we would round with them every day, it was just a matter of time before we started seeing patients at the end of life or patients whose care kind of shifted to palliative care, comfort care, rather than curative care. We tried our best to try to take care of those patients and started using advanced interventional technique like implanted catheters in the spine and things of that sort thing to care for them.

Later, in 1994, eleven years later, I had moved to Stanford where I was recruited to be the first head of pediatric anesthesiology there for the new children's hospital they just opened the previous year. And so, transplanted a pediatric pain service to there and got it started. There was a doctor there who subsequently went to Boston who was already doing his best to take care of pain but then there wasn't an organized multidisciplinary service.

There was a nurse practitioner, a nurse, but not a nurse practitioner, who was interested in pain. But with their collaboration, put together a multidisciplinary service with psychology and physical
therapy, et cetera, at the Stanford Children's Hospital, called the Packard Children's Hospital. So that's how I got interested in pain. It just simply grew and grew and there was no training then, so, I just learned it on the fly. I, you know, trial and error, experiential training, things of that sort. And now we have a very robust pain service, there's many services around the country, and that's just how I got into it.

Bryan Sisk: Wow. I can honestly say I did not think that professional wrestling was going to come up today. [laughs]

Elliot Krane: Yeah. The reason that John Bonica got focused on pain management was because he had so much pain himself from the punishing injuries that he took both as a soldier and then later as a wrestler.

Bryan Sisk: Fascinating. If I could turn back just briefly to the late 70s when you were talking about your pediatric surgery rotation. You talked about how you saw a lot of kids in pain and then you talked about how there weren't the tools. I'm curious, what was the awareness of the pain? Was everybody aware of it or did some people—

Elliot Krane: No.

Bryan Sisk: —not notice it? What was it like on the ground?

Elliot Krane: Well, in newborns, there was a common mythology that newborns did not experience pain, but they didn't have the neural mechanisms to really experience it. And as far as younger children go, the mantra was, they didn't really experience pain the same way we did, they have less pain. They might have cried a lot but that was behavioral and they didn't remember it. And there was a pervasive fear of using opioids because people were afraid that children would stop breathing if you give them opioids.

And then also the only way that opioids were administered was on an as-needed basis by intermuscular injection. So other drugs were, I don't even think Tylenol was on the market yet. There really weren't any nonsteroidal anti-inflammatory drugs available except for aspirin, and that wasn't very effective. And then aspirin could only really be given orally, and a lot of children were not allowed anything orally before or after surgery.

Finally, think of the psychology involved in this. Think of yourself of maybe four-year-old, five-year-old; you've have painful surgery, broken bone or, you know, an appendectomy or exploratory
surgery in your chest or something, and you're in pain. So, what do you do is that you cry, and you holler unless you have the verbal ability to say, "I'm in pain," or as a four-year-old would "I have an owie." So, what does a nurse do? The nurse trots over to the locked medicine area and pulls out a syringe of morphine and trots back over to the bedside and jabs a needle in your butt and pushes the morphine into your buttock, and that hurts. Right? And kids are afraid of needles and they're afraid of shots.

So, the kid complains, cries, gets a shot in their bottom as a reward for their crying. Now the reward, which is analgesia, is separated from the event of getting the shot by 20 or 30 minutes. So, from a psychological point of view, the child is punished for crying and complaining, and the analgesia is far enough away in time that psychologically the child is unable to link the pain relief with the pain of the injection, which are totally separate events in that child's life. They have no way of understanding if I get a shot, and I wait patiently for 30 minutes, I'm going to feel better. What they understand psychologically is I got a shot and it was a punishment for crying.

Now, that scenario only has to play itself out another couple of times before that behavior, crying or verbalizing pain, becomes extinguished, because every time the child cries or says they have pain, they're punished by a shot. But they don't associate the relief with the shot, because they only associated relief with, "If I cry, I'm going to get pain relief." What they get psychologically is that, "If I cry, I get a shot."

It's the same thing as putting a rat in a box with a lever. If the rat pushes the lever, they get an electrical shock from the grid on the floor, and 30 minutes later a food pellet will drop out of the slot. So, what the rat learns after two or three pushes, think of the rat as first having been conditioned at home; if they cry, they get a reward, and food pellet.

In the infants or a child's case, if they cry, they get picked up and they get held by their mother and they get comforted, and that's the reward for crying. So, the child learns that expressing discomfort is rewarded by being comforted. But in the hospital, the reward for expressing discomfort is pain, a shot.

In the rat's case, so the rat learns to push the button, or lever, in the cage, because every time he pushes down that lever, he gets a pellet of food. But now algorithm changes, the paradigm changes. And now all of a sudden, every time the rat pushes, he gets a
painful shock on his feet, and 30 minutes later a pellet of food drops down. What do you think that rat's going to do? After two or three shocks, he's going to figure out that every time he pushes that button, he gets shocked, and that's the end of pushing the button.

So, consequentially what happened in the 1960s and the 70s with children is that every time they cried and then they learned pretty quickly to stop crying. And they'd sit there, kind of withdrawn catatonically in pain, but they don't cry or express that pain because they've learned every time, they do they get punished.

So, that creates an illusion to the nurses and the doctors. The doctor comes in the next day after surgery to make rounds, and the child there curled up in a fetal position not crying. And the surgeon figures, oh, you know, children don't have very much pain because if this were an adult, he'd be complaining like hell to me right now. So, it created this mythology that children don't seem to have very much pain after surgery, and that's what it was like.

That connects a lot of dots from the history I've been reading through. How were you able to see through this in the late-70s and early-80s? It seems like you were in the same scenario.

It wasn't just me. There was an evolution of nurses and pediatricians and surgeons to a certain extent and a lot of the anesthesiologists in which this phenomenon just became recognized that, in fact, children do have pain. And there was research that was done showing that children had pain. There was a lot of anatomical and physiologic research that was done on animals showing that the neural—and also on humans—showing that the neural pathways that are necessary for the experience of pain are mature at birth or are mature well before birth in premature infants.

You can demonstrate microscopically that the nerve connections are there in the periphery and the spinal cord. The nerve connections in the spinal cord then go into the stem of the brain. The connections between the midbrain and the cortical part of the brain where consciousness and emotions exist are present after about 26 or 28 weeks of gestation, and then the EEG is mature at 28 or 30 weeks. So, the mature patterns in the EEG clearly indicate fetuses at that age as having conscious thoughts as much as a baby can; they're experiencing comfort and discomfort.

There is anatomical and physiological, electro-physiological research that's demonstrated that this idea that the neural pathways
are not mature was wrong. There are people making observations that children that are having pain, and there're behavioralists looking at what I just described to you showing this behaviorally is wrong.

In the meanwhile, also, the safety of giving these drugs intravenously was recognized. So, the paradigm changes so that both for adults and for children, no longer are intramuscular injections considered to be an acceptable alternative. But the safety and effectiveness of giving these drugs intravenously becomes recognized.

And then what becomes recognized is that the request for pain relief becomes much more frequent if it's just put in intravenously, both for children and adults, than if it given intramuscularly because adults don't like getting shots either. But at some point, adults will take a shot, whereas children will never accept a shot. So, it doesn't matter how much they're suffering, even if they're 13 years old and capable of pretty mature reason, they're still not going to—if they're hurting and you say, "Okay, I've got this shot I'm going to give you," they're still not going to accept the shot. No matter how much you reason with them and say, "Look it'll make you feel better." "No fucking way," you know. "It's going to hurt; I don't want it."

But if you give it intravenously, which is painless, then they'll continue to ask for it. Then this device called patient-controlled analgesia was introduced oh, I guess, in the late 1980s. Then people just started extending it down to younger and younger ages and it became recognized that if the patient just has a push button and can self-administer the medicine and they get much better analgesia and it's perfectly safe. There was just an evolution of knowledge and technology and then pediatrics generally speaking is always about five years or a decade behind what's being done in adults. So, after it became established as standard of care in adults and people like me look at it said, "well, geez, you know, we should do these standards here in the Children's Hospital." We start using it with teenagers and then we pushed it down to 11 and 10-year old's and then push it down as low as we can go, and then it becomes standard practice there as well.

[00:22:43] **Bryan Sisk:**

One thing I find it interesting throughout of all this history is the fear of opiates that we talked about and it seems from talking to you and also reading through a lot of articles, that it was really a palpable fear. But what's interesting to me is that it's also a very reversible issue of—it seems like if there's a question of can this
relieve pain without causing somebody to go apneic? And you mess up, you breathe for them until it wears off. What was it that allowed people to kind of make that jump? Was it, like you said, that it had to happen in adults or was there some other seminal moment that said it's okay to try this in kids?

Elliot Krane:

Well, it's definitely worrisome. There are individuals who are more susceptible to respiratory depression and then there're also the errors that can be made, pumps can be misprogrammed, the wrong drug could be put into a syringe, or something and they you can wind up—so, yeah, it's reversible if you're standing right there and get to the patient fast enough. But if the patient is—if like the nurse delivers an IV dose narcotic and walks away from the bedside, who’s to hear the patient stop breathing? So, the other important piece I think that was part of this evolutionary process was margin. So, the pulse oximeter came into use in the mid-1980s. The Nelcor Company brought it to market, it was actually a Stanford anesthesiologist who invented it and founded the Nelcor Company. It was introduced as a commercial product in about 1984, 1985 and its use was, at first just by anesthesiologists as an operating room monitor, and its utility as an operating room monitor became rapidly established, there was nothing else like it. It was an early warning system that there was trouble.

It was only a matter of time then before this migrated out of the operating room into the recovery room, and the pulse oximetry became, at first in the mid-1980s it became, within one or two years of its introduction, the standard of care in the operating room. It would have been a deviation of the standard of care, would have been malpractice, to do an anesthetic without one.

And then, it migrated from, it became so obviously important, it migrated into the recovery room and then it entered the intensive care units and it became standard to use the pulse oximeter in the intensive care unit continuously, 24/7 on patients, and also in the recovery rooms.

And then, it started to migrate out of there and into the routine floors. And now, every child in the hospital, in our hospital and other hospitals, are monitored so vigorously with pulse oximeter whether they need it or not. And so that made the administration of intravenous opioids much, much safer, because now the nurse can administer the opioid and walk away or the patient could self-administer it using a patient controlled analgesic device and those are inherently fixed, but I'll go into that in a second, and then walk away and there'd be a monitor that would alarm if the oxygen level
dropped. And, it's not a late alarm it's an early warning. Respiratory depression doesn't occur like falling off a cliff; it kind of sneaks up on patients. So, they start to hypoventilate before they really apneic and as they hyperventilate their oxygen saturation number falls from 99 to 95 and 92. Now, they're still perfectly safe at 92. They're on their way to a catastrophe but they're driving towards the cliff but they're still half a mile away. So, at that point, the nurse can go and say the child is over sedated and difficult to arouse, and then can do something, can apply oxygen, can call somebody, can give naloxone or something like that.

So, it's an amazing early warning device, and probably one of the most important lifesaving devices that's been brought into medical practice since I was in medical school. It's probably saved more lives than anything I can think of. And, more importantly, it saved more brains because if you resuscitate somebody and they've had hypoxic brain damage and you've now got somebody who's brain damaged who is going to live another 30 years, which is perhaps even bigger, bigger tragedy.

So, I got off on an aside a second ago, and I can't remember what that was. Oh, yes, patient-controlled analgesia. So, the other brilliant thing about patient-controlled analgesia is that the patient when they're experiencing pain, pushes a button and they get a little mini dose. So, it used to be that somebody, if we just talk about somebody who's the size of an adult, previously the nurse would give 5 or 10 mg of intramuscular morphine. And then when it became more common to give intravenous morphine, the nurse would give 5 or 10 mg intravenous morphine, but that's a really good dose, and sometimes patients would stop breathing.

But then, with patient-controlled analgesia, now what we would do, and that 5 or 10 mg dose, would then reduced—about a milligram an hour of morphine.

And, so, with patient-controlled analgesia, patients would now be able to self-administer half a milligram of morphine, and they could do that as often as every 10 minutes if they wanted to. So, the machine is programmed with what's called a lockout interval and doesn't allow the patient to give themselves another dose of morphine for 10 minutes or whatever the lock interval is established to be. And the reason for that is you want them to get the full affect of last dose until they give themselves another dose, so they don't keep stacking doses.
You also program a one hour maximum in, it could be one, one and a half, two milligrams, to prevent the patient from going too far. But the major safety benefit is as I said, as patients begin to get a little bit too much opioid, what do they do? They fall asleep. And if they fall asleep, they stop pushing the button, and then the blood level drops down. So, that was, I think, the really brilliant safety mechanism. I don't think it was necessarily thought of at that time.

But the brilliant safety mechanism of this whole idea is that, the patient will fall asleep before they give themselves too much. And so, it turned out to be a very safe standard to use and very safe for children for exactly that same reason, children will just doze off. The only thing one has to be aware of in children and beware of in children, is that in children's cases, we have a couple of well-meaning parents in the room. And sometimes the patient will doze off and the parent—you then lose that mechanism that safety backstop. So, you just have to counsel the parents, "Don't touch. Let the patient push the button, but it's not for you to push."

And then the other revolution that really occurred, and I can take partial credit for this, was as an anesthesiologist, I was really very interested in using nerve blocks and other regional anesthesia techniques and spinal catheters for treating pain. And I did that as best I could with the technology that was available and published some stuff on it, and just developed a bit of a reputation around the country as being kind of one of the leaders or innovators doing that. But what really allowed that technique to take off, I would say about maybe 10 years ago, maybe a bit more, was ultrasound technology.

Previously, ultrasound technology, ultrasound imaging was restricted to radiologists. The equipment and they all had the technique the skillset and the equipment were big and bulky like an extra machine, so it lived in the radiology department.

But then the manufacturers of ultrasound started miniaturizing the equipment. Soon, they had equipment that was no larger than a brief case to be carried around outside of the radiology department and moved to different locations, and an anesthesiologist started figuring out that they could image nerves. Now that they could image it, that they could see a nerve, they could much more precisely direct a needle over to the nerve and also much more accurately avoid hitting things with a needle that you didn't want to hit because you could see them too, like blood vessels and bone.
So, we started, we, the anesthesiologists, started using this ultrasound technology. We started buying new stuff. As the stuff became miniaturized, also, it became a lot cheaper. So, now it didn't cost $100,000 to buy an ultrasound machine, it costed $10,000, so the price became accessible to anesthesiologists in departments and we just started doing ultrasound directed techniques. So those were just ideal for the management of pain in all children, not just in palliative care. So that was kind of another revolution that occurred during my lifetime that dramatically changed an anesthesiologist's work; a pain doctor's work.

Wow. So, what do you think were the biggest challenges from the 80s on as these acute and chronic and comprehensive pain management was developing, what were the biggest challenges as this specialty was developing?

I would think the biggest challenges were being accepted and supported by surgeons, surgeons being the biggest creators of pain. So, their the source was most of our business. And they were very skeptical in some areas, especially back east where they tend to be older and stodgier. And you would hear things like, "Hey, I've been doing this for 20 years the same way. Why should I change? What I've been doing has been pretty good." So, it was an evolutionary process. And some surgeons were more accommodating than others sometimes. I remember in Seattle, for example, we might have a room with four children in it. And all four children might be recovering from urologic surgery, but one of them was being managed by the pain service because the surgeon accepted us, and was pain free after surgery.

The other three children were writhing and unhappy because the surgeon didn't allow us to do maybe what we wanted to do in the operating room and didn't involve our service in the management of pain after surgery. So, they're very uncomfortable and the one patient that we're managing is very comfortable, and they're in the same room. So, what do you think is going to happen when the parents of the uncomfortable children are observing the comfortable child? They're going to say, "I don't get it. Why is my kid getting hurt?" And they're going to complain to the surgeon or maybe to the hospital. “How come this kid gets that, but my kid doesn't. I'm paying the same money.”

And so some of surgeons involved were accepting our technology and our techniques, our methods, on their own, and some of them had to be dragged to it, kicking and screaming because the administration told them to, and sometimes they just kept getting
beaten up by parents because they saw that. The same thing happened when I came to Stanford.

So the other group of recalcitrant physicians, and this is as true today as it ever has been, and I know this because I talk to people all over the world in palliative care and in pain management, and I hear the same thing from everybody, no matter what country they live in; the oncologists are very, very refractory, ironically. From a social psychology point of view, I'm not sure why that is but I have my hypothesis. But oncologists have been very, very slow in accepting pain management for their patient in palliative care.

I think one problem is a branding problem. It's unfortunate that palliative care is called palliative care. Because in everybody's mind, palliative care means, "Okay, I quit, we're going to let him die." And that's not what it means at all, of course, but that's the association it has. If they had called it something else back in the day, maybe the pathway would have been a little bit easier to navigate, but it is what it is.

But the same evolution has been true, that I've observed since 1994 when I came to Stanford. When I came to Stanford, the hematologists were still forcefully holding kids down to do spinal taps. And these kids need spinal taps sometime two or three times a month when they presented with a malignancy and then once a month after that for a couple of years, and they're painful. And they don't know how to do a painless spinal tap. It is possible to do them painlessly, but they don't know how. So, they literally are hold the kids like wrestlers held down, pinned down, sometimes giving them a little bit of sedation and sometimes not, and sticking a needle in their spine.

In Seattle, we put all of those kids to sleep with propofol, short acting anesthetics. And the oncologists were very resistant. I remember very clearly, I came here, and I said, "We should be doing all of your kids with short anesthetics, so they are not traumatized so they don't have psychological damage from this. So, they don't have pain from these procedures. They'll wake up and it'll all be over."

I remember one oncologist whose name I won't mention say, "It wasn't worth the money." You know, "It's going to increase the cost of care." And I tried to point out that the professional fee for that, which probably is one-fifth or maybe one-tenth of the cost of the drugs that they were squirting into the spinal canal. It was adding $200 to a $2000 procedure. Yeah, $200 is $200 but
compared to the costs of what that kid is going consume over two or three years of treating leukemia, it's a drop in the bucket. I just could not convince them. It was a fake argument.

I don't think he really gave a rat's ass about the cost of the procedure he just did not want another physician being called in to the care of his patient. They're very possessive with their patients, and they think they know everything. They think they know everything there is to know about pain relief, about opioid analgesic, about other analgesics. They think that they've been taught everything they need to know in their fellowship, and nobody has anything more to tell them, and they don't want to share responsibility for their patients. They don't want to lose that control.

So, what happened in Stanford was what I observed happening in Seattle. It happened very slowly. Now, every now and then there'd be a kid they just could not handle, absolutely; maybe it was a really large six year old and the nurses were just not strong enough to hold him still, or maybe if the parent moved from Seattle or some other place and said, "you're not touching my kid unless he's asleep." So, then they would call and say okay, "Can you put this kid to sleep?" And we would put the kid to sleep. And the other parents would be noticing how smooth things worked went that child and how terrible it went for their child, and they would start demanding it also. So now at Stanford we do a hundred percent of them under short general anesthetics.

That oncologist is still there and probably wishes we weren't doing that. But most of the oncologists also have realized that what used to take them 30 minutes now takes them five, because they walk into the room, the kid is out cold, positioned, they pop the needle in, they do what they need to do, they take the needle out and they walk out; five minutes maximum.

Whereas before it was like 30 minutes of holding the kid, and they put the needle in and the kid is writhing, and they don't know where the target is, and they miss because the kid is writhing. And they pull the needle out and they stick it in again. It would take 30 minutes to do that procedure.

Now, they can do in half of the day, they can do what it used to take them two days to do. But the oncologists were very, very slow. Compare that story with our gastroenterologist. Our gastroenterologists used to do their endoscopy's and their colonoscopes without anesthesiologists 'till I got to Stanford. And
they would give a little bit of midazolam and a little bit of fentanyl and there'd be a nurse holding the kid down. Then I came onboard and said, why don't let us put this kid to sleep and do it that way. We did that once and they said, "okay, we never want to go back to the old way again. You're taking care of all of our patients." It was in one fell swoop, like overnight they said, "this is so much better. I can focus on what I need to do, and I don't have to worry about if the kid is breathing, what's the dose, should I tell the nurse to give more," or whatever, because they were trying to do two things.

They were trying to sedate the child and do a colonoscopy on a moving target. Now, they come in your room, the kid's asleep on their side, they put that thing in their butt, they do what they do, and they took—it was so much easier, and they realized that immediately. But they just didn't have the ego of the hematologist and oncologists. So, it took years to transition heme/onc [Hematology oncology] into doing all of their procedures under GA [General anesthesia]. But contrast that the GI doctors, it was the next day. They said, "okay, we're done, you're doing them all."

So, I think it's just the culture of hematologists and they continue to have trouble in that culture, and I hear the same thing from my colleagues around the country. I'll get a pain consult and it'll be a terminally ill child and their pain is terrible, and the nature of the consult is, you know the parents—this kid requires so much opioid that they're sleeping all day. And if they're awake, they're in terrible pain. And the parents would like them to be awake before they die, so can you help us. I look at this kid and I think, "Why didn't you call us like 12 months ago? We had pain and discomfort for 12 months, and we could have done something about it. Why didn't you call a month ago, we could have done something like put a catheter in his back and taken away 80 or 90 percent of his pain and he'd be awake to interact, but now, it's too late because he's too sick. He's in the process of dying and he'll also bleed if we put something sharp into his body because he's not getting platelets anymore," or something like that. They often continue to consult us at too late of stage.

Now, it is getting better because over the years, the training received by those interns and then residents and then the fellows, they've seen what we're capable of doing. But it's going to be an evolutionary generational process. So now when one of the attendings on hematology oncology is a 30-year-old new attending who trained either with us or trained at another center like Boston or Seattle or Chicago or whatever and they've seen us, the pain service, and what we can do, not only take care of the cancer
patients, but they've seen us all over the hospital taking care of surgical patients and intensive care patients, *et cetera*, and they know what we're capable of doing. We get the calls at a much earlier stage.

But when I'm dealing with 70-year-old oncologists that I've know since I've been at Stanford, it's the same old story. So, anyway its evolving slowly, but it'll probably be another decade or two 'till all the old farts retire. And the same in surgery too. The younger surgeons are much more flexible. At Stanford they tend to all be younger surgeons, but back East that's still a problem in the more established institutions. We have a relatively young children's hospital, so all of the surgeons are pretty young and much more flexible than the grey heads.

Another interesting thing is, about a decade after you were helping to start pediatric pain management, or pain medicine, palliative care in pediatrics started to come on the scene in the early-90s. And there is some overlap, obviously, and there's distinct responsibilities, but there's also overlap. So, how does that interaction between pain teams and palliative care teams developed over the years?

You know, I was really a bystander to that pretty much, because I was not involved with palliative care at Stanford, for more than five or six years I would say. Since maybe 2010 at the earliest. But you're right. In some institutions palliative care and pain care are the same entity. At Minnesota Children's Hospital, for example, you probably know Stefan Friedrichsdorf, or are going to talk to him. So, Stefan is a pain and palliative care doctor, he does both. He runs both services, it's one service, it's pain and palliative care. In other places they're separate. Sometimes the palliative care service is run by an anesthesiologist/pain doctor like in Australia. John, I'm blanking on his last name. But in other places it's run by a nurse, at Stanford by psychologist, sometimes pediatricians or oncologists.

So, it's a really heterogenous specialty in that way. And what one of things that makes it an interesting specialty for me because there's so many different kinds of people who are involved in it; ministers and spiritual leaders and doctors of all different stripes and nurses and physical therapists and nutritionists and there's even a brilliant anthropologist. I don't know if you know of her or have heard of her, but she is somebody you should definitely contact. Her name is Myra Bluebond, have you heard of her?
Bryan Sisk: Yeah, I have worked on some papers with her.

Elliot Krane: Oh, you have. Yeah.

[00:49:11]
Bryan Sisk: She a wonderful person.

Elliot Krane: A wonderful person. And I met her for the first time at a palliative care meeting in Rome, and she's an anthropologist. And I was just fascinated by—that this is a specialty that actually has sociologist/anthropologist working here. She had been in palliative care since the very birthing of that specialty. So, she would have a really long view. The other person that might be of interest to you that you probably also know Barbara Sourkes who runs the palliative care at Stanford Children's. So, she's also been around from the very beginning.

You know, the United States has been very late to the game. Palliative care really was born in England and then I think migrated to Canada because of the close connections to the British Empire, United Kingdom; a lot of doctors and nurses go back and forth between Canada and England and lot of Canadians train in England and a lot of English go to Canada because they just want to move to the western hemisphere. So then, it wasn't long before palliative care moved to Canada, but it was sometime later that it began to have a following in the U.S. So, we're really late to the game here. So, at Stanford, the program started when Barbara Sourkes was recruited from Montreal. And there's a lot of need for pain management within palliative care; pain and symptom management. We do a lot more besides pain management, we also manage a variety of symptoms by giddiness, nausea, and itching and things of sort.

So, one of the physicians on my team is woman named Julie Good and she became, when Barbara Sourkes came, she was very interested in palliative care, trained in it, took the board examination. And she became my service’s emissary on the palliative care team and the palliative care team paid her a portion of her salary, so she was working a day a week for them. They paid for a day a week at a time, but she actually parsed that over the five days; she wasn't just working on Tuesdays or something. She would see a palliative care patient any day of the week. It probably added up to eight hours a week, so they reimbursed her for a day of her time. And then when she went on sabbatical, maybe seven or eight years ago, Barbara Sourkes asked me if I would step onto the team while Julie was on sabbatical. I said, yeah. I would get a lot of consults or calls from Julie. Well, Julie as a pediatrician doesn't
have the interventional skills that I have as an anesthesiologist pediatrician and so, Julie would often see palliative care for consult to then often call me or somebody else in the pain service to do an epidural or something like that, or a nerve block. And we would also cover the palliative care patients and lot on pain services and just round on them. So, we were involved with palliative care at some level and sometimes the consults that comes from somebody else in the palliative care service.

"We're seeing this patient. He's in palliative care. He's got terrible X, Y or Z pain, can you make some suggestions?" We were involved, but then about seven or eight years ago, I stepped onto the palliative care team as Julie was on sabbatical so that there could be still a representative from the pain service, and I never left the palliative care team. And it's something that I enjoyed tremendously because it's so multidisciplinary and I think it makes such an important impact on the lives of patients. And they're not all dying patients, of course. In pediatrics, they are admitting patients in palliative care who have many years of life ahead of them, but they have an incurable disease. We're helping to manage their comfort and their symptoms after the focus moves away from cure.

[00:53:41]

Bryan Sisk:

Well this is perfect. I've actually got one question left and we're coming up to the end of your time. But thinking about these kids who you see suffering from serious illness, whether they're dying or not; if budget politics, all the things you talked about, if none of those were obstacles, what would you ideally want the care for these suffering children to look like in another 10 years?

Elliot Krane:

I think you know basically aside from the children that come to the hospital, there's an acute and transient problem like appendicitis or a broken bone or something like that, and that would describe in our hospital a minority of the patients. Almost all the patients are coming in with some kind of a problem which is going to dog them for a long time. Whether it's an organ failure and they're on some kind of organ replacement therapy like dialysis and they heading to transplantation at some time in their life, or cystic fibrosis and they're never going to get over it and their lungs are just going to get worse and worse and worse, but they're good for their 20s or 30s now. When I was a resident, cystic fibrosis patients would be lucky to live to 18. Or, you name it.

The majority of patients that we see in the hospital are patients who are not going to get better anytime quickly, or they'll never get better. And I think these services that palliative care provides,
spiritual support, psychological support, support for siblings or a parent, psychological support for the family members, pain management, symptom management, these are things that all those children need. Not just the children who are dying, but the 10-year old with cystic fibrosis who has 20 years of life ahead of them, but they have all these issues and all these limitations. So I would like to see palliative care become a routine part of the care that every patient gets when they come in the hospital, except for the ones who are coming and going to go home the next day and heal, then go back to school.

In the pain clinic, I see patients with chronic pain, and I know that they're going to continue to have chronic pain probably the rest of their life. I can do what I can do mitigate it, but the rest is all spiritual and psychological, it's coping, it's adjustment. I was listening to Terry Gross from NPR [National Public Radio], who's like the most brilliant interviewer on the planet and she was interviewing—you might want to listen to this, it's kind of interesting. She interviewed Judd Apatow and Judd Apatow, his mentor was the comedian Garry Shandling. And then when Garry Shandling died, Judd Apatow in 2016, he—Garry Shandling was in his 20's when Judd Apatow was a high school student. He just basically mentored him and got him into the entertainment business and they stayed friends and then he cleaned out Garry Shandling's house after Garry Shandling died in 2016 and came across the diaries. I guess Garry Shandling, and I think a few people knew this, was very into Zen Buddhism. He suffered greatly. He was in an accident, a severe car accident at one point in his life, they talk about this in the interview. And there was one quotation that was in his diaries, and Judd Apatow produced an HBO [Home Box Office] special called the Shandling Zen Diaries or something like that. But I would have to go and find and see I can view.

But he talked about living with pain, and the mind and the body. It was just a very interesting quotation. And it was so pertinent to what I do everyday and to what goes on in palliative care. So, I want to go and see if I can stream that HBO special on Garry Shandling. He was a really funny comedian. If you know who he is. Just amazingly self-facing and very, very funny, very funny comedian. After listening to the interview, I went on YouTube and I searched for Garry Shandling. I just watched a bunch of YouTube clips of his performances, and he's a really hilarious guy; but really humble and very, very self-evasive.
He was talking about email spam messages you get for penis enlargement. And he said, you know, "If I get just one more of those email advertisements for a penis enlargement drug, I'm going to go broke." [laughs]. And it was such a wonderful set up, you know, and then this funny punch line comes you know. And you think he's going to say, I'm going to crazy, and he says, I'm going to be broke.

But anyway, to answer your question, I think palliative care right now in my hospital and a lot of places, I think most places, it's viewed as fringe, money losing, sideline. And we get called when nothing else works. I get these calls when I'm on call for palliative care sometimes where completely nonsensical. They go "We want to withdraw care, it's in ICU [Intensive care unit]. This patient has been devastated neurologically and is never going to wake up we want to be in our, you know, but the parents won't agree to it so can you come and"—that's not what palliative care is. As a total stranger, I'm supposed to walk in there and convince them why their child should be DNR [Do no resuscitate order], no. That's not what we're here to do.

So, even today, 2019, we're just misunderstood. People don't understand what it's all about. They think it's our job to convince parents to pull the plug or it's our job just to comfort them. "Can you come and provide some support for the parent while we pull the plug?" Well no, I'm not a minister. I'm not a rabbi or priest you know. I don't know the parents. They're going to be devastated while watching their child die. But I can't walk into their life at this moment in time and just put my arm around them and tell them it's all going to be okay.

Now you know, if I had met them a month ago and established an emotional relationship with them, then I would absolutely be at their side. But we get the most inappropriate consultations from time to time, they just don't get it; or the consultations like from the oncology service come way too late, too late to really help them in a meaningful fashion.

So, I would like to palliative care become a part of the hospital culture, a part of the hospital fabric just like the department of surgery. It would be like, just imagine what life would be like if kids came in with appendicitis and nobody tried to call the surgeons and we did everything and then when the kid was just about to die from a burst appendix, we say, well okay let's call the surgeon. And the surgeons are going to think, geez you should
have called me 72 hours ago. Now the kid's going to die of an infection.

But surgery is now part of the applicable hospital ecosystem. So palliative care should be part of the ecosystem. It should be one of the first things people think about in the hospital and not one of the last things that people think in the hospital. So, there's my answer.

[01:02:30]

_Bryan Sisk:_ Wonderful. This has been phenomenal. Is there anything that you think are big topics that I really missed that I should dig into after this call?

_Elliot Krane:_ No. I think that you hit them all.

_Bryan Sisk:_ Well thank you so much for your time.

[End of Audio]