The education of our residents and ourselves is of prime importance, so thank you for giving me the opportunity to deliver a lecture that is of prime importance not only to myself, but all of us, and a topic rarely discussed in an open forum. As indicated on this slide, why did I select this topic? I very carefully attached the title of it to “Societal needs as far as our education is concerned”, in a manner that will be evident as I move along in this presentation. As a vehicle for trying to determine where we should go, we do need to look at the past briefly to determine how we got where we are, and examine what we have accomplished for some clues as to where we need to go in the future. I do not pretend to know the answers, even though I will present a very confident and definitive talk. Please understand that this presentation is an invitation for you to debate and discuss this topic for the betterment of our specialty overall. My goal is to facilitate an atmosphere of discussion and debate, which hopefully as our leaders in education, which you represent, will influence our training programs to allow our specialties to really achieve excellence. My message is going to be very simple when this is finished, that I’m going to weave you around a variety of topics. Please understand, at the bottom of all of this is, are we training people to achieve excellence, and are we training and encouraging programs to be creative?

As president for the past 1.5 years, of the medical staff at the University of California at San Francisco, I and we have been inundated with regulatory authorities, including inspections by ACGME a couple of years ago both at an institutional and a departmental level. JCAHO this past year, and CMS. What are their examples of the most important questions that we at UCSF had to answer? I’ll give you a couple of examples. They were; do we have our post operative notes written in all our charts? Are all of our anesthetic carts locked when there’s no one there? No one, whether it be ACGME, CMS, or JCAHO, ever asked in what areas have we achieved excellence, and in what areas have we been creative? During the inspection of our residency, for example, I was desperate to tell them how proud we were of our critical care rotation, only to realize that the inspector placed more emphasis on whether all of our post operative notes had been signed properly.

With regard to anesthesia training and education, what has the emphasis on competencies achieved? What have all the enormous documentation requirements achieved? My hypothesis is that this has been very successful by raising the bottom third of our programs to somewhere in the middle. I would say sincerely, congratulations. Is there a danger that the lack of emphasis on excellence is really lowering the upper third of our residencies to the mean?

So the question naturally is, are our regulations and documentation requirements stifling creativity and achievement of excellence? Are we planning and educating for the future? The mere nature that I’m asking these questions means that I have serious doubts. What can we learn from the past? I think a couple of slides from the past would be quite helpful. Back in the 50’s when I started to appear on the scene as a resident, it was amazing to the public that somebody could actually take somebody that was dead and revive them, now that’s the way resuscitation headed by Peter Safar was viewed. From UCSF, John Severinghaus’ contributions to measuring blood gases was important to all of medicine. There are a lot of people responsible for critical care medicine and starting intensive care units. They are mostly anesthesiologists, such as Henrik Bendixin. How about John Bonick’s emphasis on multidisciplinary pain clinics?
In the long run, he was proven correct. John Lundy, an anesthesiologist, started the first blood bank. These are some of the reasons I got so excited about anesthesiology. It wasn’t just about anesthesiology, but it was the contribution that anesthesiologists made to medicine overall. I thought that was exciting as a young person trying to decide into what specialty to enter. So, most certainly critical care, pain, education, administration, and research, should be considered as academic components of a group. Can anesthesiology still be a profession without creative education? I am using the words creative education and research, of which I will define a bit later. Considerable conceptual evidence suggests that without creative education, and without research, the profession of anesthesiology is in danger of becoming a trade union. If so, who cares? What is the difference between a profession and a trade union? I think the definition is very clear. A trade union is often defined as a collection of skilled workers who deliver a service or product. Is that what we are? Or, are we a profession, which is a group of individuals who also deliver a product just like a trade union, but also develop, i.e., creative education and research, and make decisions as to how and what the product is to be delivered. Are we doing that now? Are we losing that right so to speak, as a profession? There have been several learned individuals who postulated at the fact that the practice of medicine as a profession has dramatically decreased in the last ten years. Historically, the practice of medicine has been based on professional autonomy with regard to scientific and clinical knowledge. However, in the last 20 to 30 years, the autonomous position of society overall, has been perceived by governments and autonomists in many countries as an impediment to an economically sound and responsive healthcare delivery system. The result is that the previously enjoyed professional autonomy by our forefathers, in all specialties, not just anesthesia, is now being invaded by a variety of government, economic, corporate, political agencies, such as JCAHO, CMS, and to some extent, ACGME. Their efforts to raise the bottom third, without proper attention to facilitating the creativity and excellence achieved by the upper third, is dangerous. The challenges and problems posed by these groups usually demand attention to short term responses and solutions, leaving little time or energy for long term decisions.

My dominant theme is that the key to the profession of anesthesiology is to control their intellectual foundation, including new developments. Historically we have solved problems and developed a foundation of knowledge around these problems. A quote that I like to use, is published by Vandam about a pharmacologist named Saulter who stated that “professions that do not live by service alone, but rather by the words of wisdom, which issue out of the mouths of those few demi-gods who in every generation, lead and inspire the multitude of the professional associates.” He further states, as indicated on this slide, that without creative education, research, and vision, professions die. How can we avoid that fatal pathway?

Let’s take a quick look at the future and make it a little bit dramatic. As you know, there have been a number of learned individuals that have tried to predict what the future of medicine will be. The following is one possibility for the year 2025; there will be no anesthesiologists in the operating rooms. All anesthesia will be remotely controlled in ICU by pulmonary medicine. While this is one extreme view, the specialty of anesthesiology could be weakened in the future. So, now let’s be a little bit more optimistic in the year 2025; hospitals will primarily be ICU’s and procedures with no general beds. Except for surgery, anesthesia will provide all the care in the hospital. Anesthesia is a dominant specialty because it controls hospitals’ critical care units, pain management, and bio-terrorism protection, in one way or another. Will anesthesia choose to
be weaker, or will it dominate? And you might begin to think I’m overreacting, but I’ll give you a well known specialty, which you are all familiar with, which over a three or four year period of time, has had dramatic changes – and that’s Vascular Surgery.

What will the future of the operating room be? This slide appeared on the cover of U.S. News and World Report about a year ago, talking about the future of robots in operating rooms. So what is a surgical robot? They come in a variety of different sizes and shapes, but basically, it’s a collection of servant tools called manipulators which receives digital instructions from the surgeon. By the way, this was conceptually described recently in the New England Journal of Medicine. Basically, robots have hands that have more digits than we have, and have the flexibility and moving in directions that we can’t. It will be easy to teach in the future, because the robot will not need all those different airways to secure endotrachial intubation. So, in any event, it’s estimated that by 2009, 30,000 prostate glands for example, will be removed by robots in the United States. Robots can turn their hands 360 degrees. They have more flexibility. So the benefits are, shorter hospital stays, quicker recoveries, and less blood loss.

The program of the 2006 American College of Surgeons Meeting predicted that the operating rooms of the future take advantage of robotic techniques; the current goals are to develop an operating room with no people, only the patient, in which the surgeon controls the intuitive surgical robot, etc. This will free scrub nurses to more intelligently challenged duties than simply passing instruments. If we continue, no human interaction will be required for complete data capture and integration of automatic vigilant systems, complete integration of the surgical equipment, anesthesia machines, and monitors and fusion pumps for a single answer. Everything there was on the program of the American College of Surgeons except the last sentence, which I added, because they didn’t mention anesthesia. They just said there would be no human beings in the operating rooms. Surgeons will do what critical care units already can by managing patients remotely. Is this just surgeons and an anesthesiologist, myself, irrationally speculating? I don’t think so. I will read this slide at the bottom. By 2030, all surgical anesthesia will be administered and monitored by computers, with no need for professional medical supervision beyond a surgeon. Please don’t shoot the messenger. This is what was in The New York Times. So, can anesthesia be given without an anesthesiologist? Right now we have airplanes that fly around with no pilots, which can shoot people.

As we go on, there are many groups that are planning ahead (eg. 20-50 years, etc). So what is anesthesiology doing? We need long range planning; we need to update/re-define our intellectual foundation. Technology will continue to advance. Should we react or should we lead? We must resist reacting, but lead society to the future. Is our educational system in a place to respond to the future? Will competencies, and the various JCAHO, CMS regulations do it? I think we must go beyond these basic regulations. The status quo is unsatisfactory.

So, when we pull this all together, the anesthesiologist in the future can and should provide preoperative evaluation, operative and procedural (radiology) anesthesia dependent on the technology that we’ve already talked about for procedures, all post-operative care, including pain, critical care, and in summary, provide all the care in the hospital. Of course, this does not include chronic pain and other responsibilities that we currently meet.

While this is describing the role of anesthesiology in perioperative medicine (i.e., as described for several years), now it is clear that the hospital of the future will be perioperative and critical care medicine, which could be lead by our specialists. Are you as educators
preparing our specialty for the next ten to twenty years? Should we be lackadaisical? Can we look to see what has happened in Vascular Surgery as an example of how rapidly a specialty can change? The number of open vascular procedures being performed has decreased in the last few years. I would imagine it’s the same thing in all of your hospitals. That specialty has really changed, and is dominated by invasive radiology approaches. They rarely open a body cavity. Can something happen as rapidly in anesthesiology? Probably not, but remember what happened in 1995, with the possibility of a new national health care plan. Remember how the specialty and the number of people going into residencies changed within a few months, based on one Wall Street Journal article.

So, the next question is, are we the only ones who recognize where the future of hospital is going? The answer is no. Certainly the rate at which change is coming is very rapid. There are certain medical, surgical, and emergency physician specialties that are evolving, all of whom want to be the primary care person in the hospital. For example, there are about 10,000 hospitalist physicians now, maybe 15,000, and there will be 30,000 as speculated in 2010. They’re growing like rabbits, and they are ready now. They have a journal that is entirely devoted to saying that they are ready to take over the perioperative period and be the primary physician in the future hospital. Where does anesthesia fit in this picture?

Even in April, 2007, a letter to the editor, “Proceduralists Leading Patient Safety Initiatives.” What does this say? It says that hospitalist type physicians will do all the procedures in the hospital, including arterial lines, central lines, thoracentesis, etc. Where does that leave anesthesiologists? Even surgeons are trying to think ahead, in a rather elementary manner, but they are. This article appeared in 2004 by the Chair of Surgery at The University of Washington. I don’t know whether they’ve achieved these goals, but this is what they have published, and that is, “How can surgery meet the demands of the 21st century?” At least they have tried to have very high goals in their specialty. Whether they will achieve them is a different issue, but they do recognize the need for research, which I found rather interesting. They used a unique disease focused approach, of which surgeons would be the leaders. If this approach persists, where will anesthesiology be?

Is there evidence that we are not achieving excellence? Let me go through these very rapidly, and some of these you know. Mike Todd, who was editor-in-chief of Anesthesiology about the same time as I was editor-in-chief of Anesthesia & Analgesia, said that in about the 1980’s, approximately 70% of the articles in those two journals were from the United States, in 2007, it’s less than 30%. The intellectual creativity in our specialty, as judged by those journals, is declining in the United States. Almost last in NIH funding, just ahead of primary care. Critical care and pain management are trying to separate themselves out from anesthesiology into separate Departments.

In conclusion, I think that there are many recommendations that can be made. Will we be the leaders in perioperative medicine? Surgical and medical hospitalists want to take these responsibilities. Accepting the status quo is a formula to failure and a restriction of our role in medicine overall. Will the anesthesia economic bubble burst? I imagine it will, if we keep graduating as many residents as we are; most residencies in the Country are enlarging their numbers. Diversity and responsibility of our professional opportunities is key to long range success. And so, recommendations; we should be examining where we stand every one or two years, and make professional adjustments. Despite the lag time, we should at least try to plan
ahead educationally. So, there are things that could be done in the next couple of years. Of prime
importance, I think, is making sure we have a diversity of things that we do in medicine, and you
are of prime importance educationally. Are our residencies being designed to do that? Are we
thinking about giving up critical care medicine? Hopefully not. Promote creative research, which
contributes to the welfare of both anesthesia and medicine overall. Augment critical care
fellowships, and encourage anesthesia residents to go into critical care. About 15 to 20 programs
are now ready to train anesthesiologists for the future. What can be done to stimulate them more?
In conclusion, those are the concerns that I have.

Historically, we have succeeded, mainly because of creative anesthesiologists,
pharmacology, and technology. And so, despite the lag time in changing our training, we can
diversify now to meet the future; we should indeed try to do that. So, the opportunities of the
future; most patients will be procedural, but sicker in some places. Who will do the preoperative
evaluation? Hopefully preoperative evaluation clinics will be managed by anesthesiologists. The
PACU, who will do it? There are many ICU’s in many places, postoperative care, including pain,
who will do it? Critical care, we’re preferred, but will we step up to the plate? Do we need to be
a profession? The answer is yes. I’ve tried to address the profession vs. a trade union concept. If
research is important to our specialty, what should we do in the future? These, I think are
absolutely crucial.

So, finally, getting into some specific recommendations that I’d like to make, I think we
need educational flexibility. Certainly, neurology and medicine are doing it. For example, they
emphasized shortening their required training time, to allow more time for those who can
specialize and be leaders in various aspects of medicine and neurology. They are more specific in
designing their training; they don’t make everybody go through the same training program.
Dedicate our educational system so we can produce creative leaders; allow programs to achieve
excellence; do not bind all programs in to all these rules and regulations. Create a system were
programs are allowed to be creative, they’re allowed to be flexible; you should monitor them to
make sure they meet certain standards with their ideas, but allow them to be creative. Demand,
instead of, are your post operative notes signed, that they show you where their program has
done something creative. Show me what you’ve done to achieve excellence. Pay more attention
to the top residents in your program, in addition to what you are already are doing in trying to
bring the bottom up to the medium. Allow programs to develop think tanks to be creative in
meeting the future

Financial investment; I learned that as a first year resident, with regard to financial
investment, this had a major influence on my thinking about how our specialty should go. The
year before I was a first year resident, the first ICU at UCSF was started. To have
anesthesiologists taking care of our sickest patients was impressive to me. I thought that was
fantastic. Yet there was no way to compensate professional fee income in critical care units in
those days. We were going to run the ICU, and we would sacrifice financially in order to do that.
So, I think if we spread that principle, our specialty will succeed. I realize that it’s very difficult
to get that compensation, in some places, hospitals will support it, some not, but we have to do
that. Do what is beneficial to the specialty despite the cost. Diversity of responsibility will
increase power, and anesthesia will succeed if you do that.
We have been very proud of The Institute of Medicine, 2000 publication, To Err is Human, which praised anesthesiology for reducing the morbidity and mortality in surgical anesthesia. I agree, we should be proud. Yet, why is this accomplishment such a problem? It’s because society will not provide funding or resources to something that is not a problem. We need to emphasize the total role that anesthesia plays in perioperative medicine. Furthermore, the absence of growth in our intellectual content, which education, research, and you, provide, gradually pushes us to a trade union status that I mentioned previously. The evidence is clear in the United States and a few other countries that the role of anesthesia in medical science overall has been decreasing. In some cases this has been because of the dominating need to get people in the operating room and deliver care, and that’s true at UCSF I might add. So, we must define what society’s pressing problems are. Our political leadership needs to stop celebrating that we do not harm patients. We need develop a vision for dramatically improving perioperative outcomes; support a divine mission that society really needs. How can we be a vital part of providing solutions for society? Will structural changes in our training help us provide answers to the important questions society has? I think that is exactly the question you need to address as a society. I would think however, that more than structural changes are needed, and so, what is needed?

Alex Evers and I wrote an editorial in 2007 Anesthesiology earlier this year, entitled “Can we get there if we do not know where we are going?” Let’s reconstruct this editorial, and that’s what I’ve done. I would put it this way, we in anesthesia, can get there, when we in anesthesia do know where we are going in research, education, and creativity. I would submit that we need to encourage excellence and creativity. So, without vision, research, and creative education, as I indicated before, professions die. If you disagree with me, then this talk is an outstanding success; if you come and argue with me, then this is a success. That’s what I really want because debate and passion will guarantee our specialties success. You have seen and heard my vision, and now, you know what it is. So, we need long range planning and vision. We need it in our residencies. We need it to update or re-define the intellectual foundation of our specialty, and our contribution to society. We must rid ourselves of the trade union approach to medicine, which we are evolving into. What will happen 20 years from now? Those of you that have heard me talk before, I have a very similar ending, but it is very apropos to your society, because it is education and research that concerns me the most. I can most assuredly tell you that five miles from where we are right now, I will be sitting, with my buddies, at the golf course, when I am 85 years old, hoping to see that you have pushed anesthesia into an area that I could never have dreamed of with regard to creativity and contribution to medicine overall. Thank you very much for this opportunity.