Thank you, Don for those very kind words and thank you to the Section on Critical Care for this award.

I was fortunate to have been a member of the Executive Committee of the Section for many years and it was one of the most rewarding experiences I have had.

- Thanks also as always to Sue Tellez and her support and guidance of this section for so many years.
- Thanks to my family – my brother and sister in law for being here with me today and
- to my colleagues, fellows and former fellows who are here

For my talk today I am borrowing a line from my good friend and everyone’s good friend, Oprah. For those of you who don’t read her magazine, on the last page there is a column of her musings called What I know for Sure.

So this talk today is What I know for sure about pediatric critical care medicine – what I have learned over the past 25 plus years – over 30 if you count the years since I was first introduced to pediatric critical care as a medical student. Since I am a pediatric intensivist and almost by definition we have a fair amount of ADD, these thoughts are somewhat random and are best thought of as bullet points.

- What I know for sure is that pediatric critical care medicine has to be one of the most enriching careers ever. We are taking care of all ages and sizes of patients from
  o the simple straightforward who just need intense monitoring to be sure nothing happens – “think a post op spinal fusion patient “
  o to an otherwise healthy infant or child who gets “something” that with expert and vigilant care they can be expected to recover – “think RSV induced respiratory failure”
  o to a chronically ill infant or child who struggles everyday who gets even more seriously ill “think sepsis in a patient with recurrent cancer”
to acute devastating illness or injury that takes every bit of time, talent, resources
available to pull them through – “think trauma, acute fulminant myocarditis, acute
fulminant hepatitis”

To be able to take care of all these children totally mixed together in one ICU and take
care of their families who are having totally different challenges to deal with and be able
on most occasions to have them leave the unit often heading towards complete
wellness is amazingly enriching. It is as enriching for me today as it was when I started.

- **What I know for sure** is that Pediatric Critical Care Medicine is a team sport

  - At the bedside we must have a “team of dedicated professionals” including
  
    - Nursing both RN and advanced practice nurses,
    - patient care technicians or other nursing extenders
    - respiratory therapists
    - Dietitians
    - Pharmacists
    - Social workers
    - Chaplains
    - Trainees – residents and fellows – who not only learn from and extend the
      attending physician but also keep us on top of our game
    - Families – we have to keep them engaged and participating. We must always
      remember no matter the illness or injury families in an ICU are afraid their child
      is going to die; we may know for sure the child is not but so often they don’t
      know that. These families are as stressed as can be and we must never forget
      that and how it may affect their interactions. They are entrusting us and our
      team with their most valuable possession and we must always honor that trust.
We need to be sure the families are cared for – it may not be physicians directly but we need to have support staff who can. Even remembering small things like cell phone chargers can de-stress some families.

- With the complexity of ICU care in 2010 it is impossible for me to imagine practice without all these team members and I realize I am spoiled by being in a PICU in a tertiary hospital with lots of support available. My wish is for every child requiring ICU care to one day have this level of support wherever they are cared for – that statement is my thinly veiled bias towards ongoing regionalization of PICU care.

- The other piece to the team sport is through our organizations. With the framework of the AAP, the Section on Critical Care has helped drive many agendas an example of which is global CPT codes for billing critical care services in children. That could not have been accomplished without the Neonatalogists blazing the trail and the AAP having expertise and experience with the CPT process. With the help of numerous PCCM practitioners and their personal practice experience the RVU for the codes could be established. Through the AAP and its close relationship to the American Board of Pediatrics and all the sub-boards, we have been at the table with MOC Part 4. The AAP has also recognized the need to provide an alternative to Part 2 lifelong learning and supported the development of PrepICU.

- In addition to the AAP Section on Critical Care we also have our sister society, the SCCM. Here pediatrics is a part of the whole spectrum of critical care medicine. Although we all know how special children are and how special pediatrics is, it is fun and certainly educational to hang out with the adults. There we are exposed to very cutting edge practice and research. Within the
SCCM is housed the College of Critical Care Medicine and yes as Chancellor I will admit to a conflict of interest. Guideline development is the purview of the College and the College continues to produce guidelines for pediatric CCM in addition to adult CCM. Guidelines for Brain Death in Pediatrics is currently under review and should be published within a few months. There are two other guidelines being written specifically for pediatrics. All this work takes team effort by pediatric intensivists

- We need these organizations to provide structure for continuing education and advocacy. These organizations continue to need physician volunteers to keep the ideas flowing and the work done. By working together we have accomplished a lot and it is really the only way to promote our specialty.

- **What I know for sure** is I DON’T KNOW VERY MUCH ANYMORE. The more I practice the more I am convinced we have a lot to learn. A good example is I used to think I knew how blood clotted but now I am pretty sure I don’t. The more we learn about coagulation in our patients on mechanical cardiac support - VAD and ECMO – the more convinced I am “we don’t know nothing”. We are learning that anticoagulation over time in blood being exposed to “plastic” is much more complicated, probably either causes or is affected by inflammation, probably affected by patient genomic variations, etc. We are constantly challenged with new knowledge and the admission we need more knowledge.

- **What I do know for sure** is CHANGE is constant. If you went into critical care medicine and thought your practice wasn’t going to change you are in the wrong field! To take
care of critically ill patients we have to be able to change on very short notice. The care we deliver morphs constantly. It wouldn’t be a critical care talk if I didn’t say “paradigm shift” (defined as certain fine-tuned standards and often has a theoretical background) because that is what this specialty is all about – perhaps more than any other specialty we push the envelop or at least we are there while others are pushing the envelop. We have to be able to let go of what we thought we knew.

- When I was in fellowship training under George Lister, a previous recipient of this award, I was taught to ventilate patients with tidal volumes of at least 10 ml/kg the reasoning being at the time that you would keep the lung recruited and hence “more supple”. So I believed – how could you expect gas to get into and out of the lung any other way!

- Learning low tidal volume strategy was hard for me – I had to let go of something I believed in and was taught to me by a very brilliant man and was something I was pretty sure worked. But now there is evidence that strategy results in worse outcomes for patients, that using lower tidal volumes - granted often with higher PEEPs than before – results in less cytokine release, less volutrauma to the lung and ultimately better chance of recovery for the patient

- Now I am a believer

- There are so many more things we thought we knew 25 years ago that are not true now.

- But better still is that there are so many therapies now than 25 years ago – so many changes have occurred to change our practice

  - HIB vaccine – essentially no more Hemophilus influenza meningitis, epiglotitis, and sepsis. Pediatric residents today really cannot rattle off
complications of meningitis like us old dogs could because they just don’t see those complications. I no longer have to be scared when I get a call about a child with “croup” that I am about to put in a helicopter without an ETT because before with epiglotitis you absolutely would not do that and that meant securing a critical airway in obscure and scary places. Gone. We had a case of epiglotitis in a teenager recently in my unit and everyone looked at him like they were looking at a rare bizarre medical case. And to them it was.

• ECMO support – for so many patients either in respiratory failure or hemodynamic failure – I know if conventional support is failing I can put them on ECMO. No it is not the answer to everything but it has saved a lot of lives in the past 20 years. For example when I was in practice early on I was scared to death of status asthmaticus – I had few drugs in my armamentarium and they were scary – Aminophylline and Isoprel. I had seen patients die from asthma. Now the drugs are better, less frightening but even still if they don’t work and inhaled anesthetics don’t work, I can always put the patient on VV ECMO. Whew.

• Norwood Procedure - When I started HLHS was uniformly fatal except for a few patients of Dr. Norwood’s. Now through the teamwork of intensivists, cardiologists, cardiac anesthesiologists, and the skill of CV surgeons these infants are now living. Yes they still have challenges and fill our units postoperatively and some may even end up with cardiac transplants but many also have very good quality of life.

• However SOME THINGS NEVER CHANGE AND NEED TO.
Children still live in dangerous situations – infants still get abused in unstable home environments and die at a frighteningly high rate, adolescents still get ejected from ATVs and cars.

Bacteria still find a way to cause fatal infections best example is Staph aureus. It has morphed and become not only resistant but some strains are more virulent. Staph just doesn’t want us physicians to get too confident about our abilities.

What I know for sure is Pediatric Critical Care Medicine continues to have challenges

- WE HAVE TO CRITICALLY EVALUATE OUR CARE AND “CONTINUOUSLY IMPROVE”. We all believe that. We all want to do better. But we don’t know the best way. I think I know collaboratives of ICUs working together can get a lot done in shorter periods of time. Using bundles of care and checklists improve care. I know that you must have data to know what you are doing so you can improve it. But I also know that data collection, data entry, data storage, and data analysis is expensive and time consuming. Many units have figured out how to do some of this but few places are robust enough yet. I don’t know who is going to pay for it and that needs to be figured out – is it hospitals, is it government, not sure. With our history of playing well together in peds critical care we need to work figure it out.

- There is not enough evidence for best care of our patients– there needs to be more evidence produced thru research and we need to critically evaluate what evidence there is - another time consuming and costly endeavor.
Evidence production is another place where collaboration and team work is effective whether it be through quality improvement initiatives or thru translational and clinical research. The NIH stepped forward with the COLLABORATIVE PEDIATRIC CRITICAL CARE RESEARCH NETWORK but there needs to be more

Dealing with conflicts of interest is a current challenge. We have to figure out a reasonable way to deal with COI. Of course it is not the right thing to have industry influence unduly how we practice but on the other hand we can’t do without industry and the knowledge they bring to the table

An aging workforce is another huge challenge – 1. The question was once asked – is there such a thing as an old intensivist? I think there certainly are plenty of upper middle aged intensivists - I would never say old - who are still enjoying practice and are still relevant at the bedside. But we need to continue to attract medical students and pediatric residents to our field. We must continue to show them the richness of this career. No doubt what got me into pediatric critical care was when I was a third year medical student. My pediatric resident on the wards was Ron Perkin who went on to become a peds intensivist. We were at UT Southwestern and Dan Levin had come to open the PICU at Dallas Children’s – at the time one of the very few PICUs between the coasts. Having that exposure allowed me to find my passion. I know many medical students and residents are scared of critical care practice because of the hours but there are many practice models.

- To attract the best and brightest to our field we need to keep looking at various ways to practice with the appropriate compensation. If we do
continue to move toward more “shift type” work it is mandatory that we figure out handoffs so our very complicated patients are not tossed around between shifts

- The last thing I know for sure is to survive in critical care medicine you must maintain balance. You must attend to it.
  - Pay attention to your family – give them the priority they deserve
  - Pay attention to your health and well being thru rest, exercise, proper nutrition – okay those Krispi Kreme donuts on the morning following a tough night are excused and a plate of brownies after a sad day are excused
  - Have some diversions at work outside the ICU – research, teaching, administration – have a plan for want you do outside the unit that will fill your time and your brain!
  - Have diversions at home – fishing, hiking, shopping, watching baseball or in my case having a backyard full of horses and very spoiled dogs – whatever – you need people and activities to allow your brain and more importantly your heart to recharge.
  - Lastly if you are a spiritual person pay attention to God.

- Thank you for listening to my musings on what I am sure I know and what I don’t know.

The future of our specialty remains bright and encouraging as we keep working toward the best ways to care for our patients. Thank you again to the Section on Critical Care Medicine