Great job, Howard, thank you very much. We are going to move on to my talk which is Transradial PCI in STEMI: Improving Outcomes. And I just want to start by a little introduction in the sense that when I talk to physicians at other centers you know we talk about how it's received when we say we are going to go to a transradial approach. I can tell you when I went out to Passavant and I told the group out there that on weekends I'm on call we are going with radial approach for a primary PCI. I got no eye rolling, I got people saying okay how can I learn, what do I need to do, how can I help you? So you guys have been great, and then with respect to the Presby cath lab staff Dr. Cohen went through all of the early eye rolling so by the time I came in and said I was going to do that you guys have been great as well. So this is near and dear to my heart and I'm going to show you why I feel so strongly about this.

So I want this - this is one of the turning point questions for just the interventional cardiologists in the room. If you are doing primary PCI I want to know what percentage of your primary PCI cases are treated with a transradial approach. We are going to have another question for the nurses and staff. I'm hoping since we are at a transradial symposium this is going to be a high number. I'm a little worried about the answer here. Okay, can we close the polling please? Okay, so it's good, we have a wide range here, so it's good to see that.

Okay, so the next question is if you are a nurse/technologist or a noninvasive cardiologist at your institution if they perform primary PCI how many are performed at that institution? Okay. So good to see. Next year we are going to ask this same question and we are going to see all of those bars shifted to the right.
Okay, so I just want to step back and talk about the refining of primary PCI, what have we learned over the last 10 to 15 years? Well I think this landmark publication in 2006 really pushed us with respect to door to balloon times, we realized that we could cut mortality from around 7% down to 3% if we get patients treated quickly and with restoration of coronary blood flow. So I think we had a rapid adoption of that technique. And then subsequent to that Dr. Stone published this trial, the HORIZONS-AMI Trial, that showed us that bleeding is very important and we heard that earlier this morning. It's an independent predictor for mortality.

So when we looked at the patients who were treated with Bivalirudin alone they had lower mortality rates than patients who were treated with Heparin plus glycoprotein 2B3A inhibitors. Now this is not really a radial trial but we'll get into a little subgroup from this that looked at those radial patients in a minute here. So when I was doing my fellowship we were using a fair amount of glycoprotein 2B3A inhibitors and you know I would talk to other fellows and say you know we've got this huge hematoma up there, and it was just - it seemed to be very prevalent and no one seemed to really care about it. But after HORIZONS-AMI we saw that then all of a sudden the glycoprotein 2B3A use really dropped. So what's the next big step in primary PCI? And I think it's really the bleeding avoidance strategy which specifically is a transradial approach. Can that lead to improved outcomes by lowering mortality? So we can always show these images which are very concerning. All of us I'm sure in this room have been involved in these particular patients and really as we've discussed with Dr. Gilchrist really saying that any time you puncture the common femoral artery there is a chance that a patient could develop a life threatening retroperitoneal hemorrhage.
So what are the numbers? What are we doing right now? So this comes from an analysis of the NCDR registry, Senior Author Dr. Rau, and you can see that when this was looked at initially in 2007 primary PCI from a transradial approach was about 1%. We are still only up to 6% in 2011 so we are hoping that that curve continues to have an uptick to it. And to no surprise you can see that depending on the institution there are variabilities. The majority of institutions are doing very few and it's really only a handful of centers that are doing more than 50%.

So we want to dispel myths right because a lot of nay sayers have reasons why we shouldn't be doing this and one of the big ones is fluoroscopy time as Dr. Cohen just showed us that yes there may be some increased fluoroscopy time in very beginners but as you get through this and start having more experience the fluoroscopy times certainly are reduced. And then this NCDR evaluation you can see the fluoroscopy times really in all of these centers over 500 participating in this showed that fluoroscopy times were inconsequentially increased. What about contrast usage? It was actually less in the transradial group. And then how about lesion success right, getting the patient treated appropriately? Can see equal amounts in both arms and door to device times yes maybe slightly longer by 4 minutes, but again well below that metric of 90 minutes.

So where are we right now with the major studies looking at primary PCI? Well the first one we know was published in 2011, the Rival Trial. That actually started out as the current OASIS7 Trial which was looking at Clopidogrel usage in ACS patients in higher doses. And then it sort of morphed into this transradial study because certain centers were noticing patients seemed to be doing
better if they were treated from a transradial approach as opposed to a transfemoral approach. So if you look at the overall outcomes of MACE there was a significant improvement or benefit from the radial approaches compared to the femoral approach. And we'll talk about - so as I said this was an overall ACS trial, 2000 of the 7000 patients were SEMI patients and we'll talk about those patients in just a minute.

This was then followed by the Rifle Trial in 2012, 1000 patients and you can see here there actually was - there was significant improvement in MACE rates but no difference in cardiac death. But the one big criticism about this trial was that there was 75% glycoprotein 2B3A inhibitor use and less than 10% Bivalirudin use so the question was no - it's really not consistent with current U.S. practices so this was an international study so some people have criticized that part of it.

And then this was followed by the STEMI-RADIAL Trial published in 2014 of which Dr. Bertrand was one of the senior authors. And this looked at 700 patients and you can see here that MACE rates were not statistically different, bleeding rates highly statistically reduced from 7.2% down to under 2% and overall the NACE rates which includes MACE plus bleeding mirrored really the bleeding findings.

So then we've talked about the Matrix findings which were discussed at ACC and overall in this trial there was a statistically significant reduction in BARC bleeding as well as overall mortality.
So if we look at the subgroup analysis of the RIVAL Trial, those patients who were treated for STEMI indications versus those who were treated with non-ST elevation ACS the Kaplan-Meier curve here on the left are the patients who were treated with STEMI and these are the other patients with unstable angina and STEMI. So you can see when we are looking at these 2000 patients it looks like a very favorable effect when treated with the transradial approach over transfemoral. So you have to be careful here because this is subgroup analysis and not prespecified. But clearly this just - this theme keeps coming back over and over again.

So when you look at the multivariant predictors of mortality in RIVAL you can see that there are access site choice was significant as well as the presence or age, so the older you were the more likely you were to die with your STEMI, the presence of diabetes and being a smoker. So we really can't change these factors right, these are patients, this is how they come to us; however this is something that we can change in the treatment of our patients.

So if we look at - there have been many metaanalyses performed, we've seen Dr. Bertrand's metaanalysis. These are actually two others. Again, the theme just keeps coming home that when you look at overall events in the radial arm it always appears to be favored with odds ratios coming in around .6 consistently.

So if we go back to the HORIZONS-AMI Trial these are the 2000 patients - I'm sorry 200 patients who were treated transradial versus 3000 treated transfemoral and if you look every aspect radial wins compared to transfemoral whether we are talking about MACE, NACE, major bleeding or
death or reinfarction. Again have to be somewhat careful about that because it's retrospective analysis. But if we also look at this a little bit differently with respect to the 4 ways the patients were treated whether you received transradial with Bivalirudin, transfemoral with Bivalirudin, transradial with Heparin plus a glycoprotein 2B3A inhibitor versus transfemoral with that same regimen if you look at NACE rates you can see just what we would expect. So the best outcome is in transradial with Bivalirudin and then followed by transradial with Heparin +/- glycoprotein 2B3A inhibitor use and again it's really driven primarily by major bleeding.

So where are we and what's the future? Well there is an ongoing rial that's at 4 Canadian centers looking at STEMI patients, 3000 patients was the goal, I was speaking with Dr. Bertrand during the break and he says that they are having a little bit of trouble, he thinks they may have around 1500 patients at this point. But this is really a direct comparison of transfemoral versus transradial, all patients are going to receive Bivalirudin for the procedural anticoagulation and glycoprotein 2B3A inhibitors are really only used for true bail out situations, so much more consistent contemporary practice.

So if you are thinking of transitioning to a transradial primary PCI approach this comes from the Best Practices which was published by Dr. Rial. There are several criteria that you should adhere to. So initially you should have greater than 100 elective radial first procedures, and you should have low crossover rates of less than 4%. Left radial approach should be strongly considered in patients who have a LIMA graft, consider left radial approach in short elderly patients although I will admit that I don't necessarily adhere to that, I find that from the right radial in primary PCI that's my go to
strategy just really for my orthopedic considerations because I do have a bad back and I like to just have that access on the right hand side.

Access should be obtained within less than 3 minutes, positioning of the guide catheter should take place into the infarct related artery in less than 10 minutes and you should really closely monitor your door to balloon times because we want to make sure that we are not possibly harming our patients if you are slipping past that 90 minute metric, although I'm sure others will alert you if that's the case. And prepping of the femoral access should still be routine for those rare bail out cases.

I had a case about 3 years ago where I had such severe catheter entrapment it was that patient that always has me a little bit concerned, a middle aged woman who was very anxious coming into the procedure, she had some medical knowledge. She was actually one of our echo techs and despite trying to give her significant anxiolytics she was still wide awake during the procedure so she had ST elevations inferiorly, she was quite stable from a hemodynamic standpoint. I looked at the right and left with a Jacky catheter and then when we went to go in to perform primary PCI of the RCA she just had such intense spasm I couldn’t get the Jacky out. So I left the Jacky in place, went down to a transfemoral approach and then perform the PCI and then was able to administer medications up into the subclavian to get the Jacky out at the end of the procedure. But so certainly you know you want to maintain femoral access sites for patients that may then become you know unstable from a cardiogenic shock standpoint that we talked about.
So in conclusion the transradial approach for STEMI patients results clearly in lower access site bleeding and vascular complications. So if for no other reasons this is what should be the preferred approach. There is a strong suggestion that there is a mortality benefit and it has been demonstrated in the randomized controlled trials; however there are some problems with the way those trials were designed I'll admit that and I know Sunil made the bold statement where he said that we don't need more dedicated randomized controlled trials, he's willing to say that the mortality benefit is there and we'll anxiously await the SAFARI-STEMI data. And with proficient operators the time to revascularization is not meaningfully increased and procedural success rates are similar. Thank you.