ANDREW M ATZ: I think the first thing people need to remember is that kids really are different. So the approval process for drugs, overall, I think most people understand. It gets approved by review of various studies done by the Food and Drug-- the studies are done by a lot of different agencies, and the Food and Drug Administration actually approves the data and says that it's both safe, effective, and generally recommends dosing.

What a lot of people aren't aware of is that all of the-- the majority of that data comes from adult patients. And up until about 20 years ago, there really wasn't even an attempt to try to get the same amount of good information about safety and whether drugs work well and what appropriate doses are in children. So we've been able to use drugs that have been approved for use in adults somewhat guessing on what the right dosing are, but in the last 20 years there's been some significant attention to trying to get that much more systematically studied in the pediatric population.

The attempts to get more data of how good a drug works, whether it works, whether it's safe in children has been tried to be stimulated from a number of different initiatives starting with some federal legislation that really encouraged drug companies to try to do studies, at least to prove safety in children if they wanted to have their drugs eventually administered to children. And that has worked to some degree. It's worked very well for drugs that have just been developed in the last decade.

The challenge has been that the majority of drugs that we use both in pediatrics and adults have been around for a long time. So drug companies don't make much money on generic drugs. So those drugs have been much more difficult to do testing in, because there's no incentive for the drug companies to do this additional testing. So the next step that has encouraged our community to test these drugs have been the federal government has actually provided some grants specifically designed for us to get some real safety and dosing information on commonly used drugs that just didn't have this pediatric data when they were first approved say 20 or 30 years ago.

I think everybody appreciates that we would like development of drugs and development of devices to be more efficient and quickly move to areas where they can be safely delivered and effectively used in children. There are all sorts of barriers to having that happen. And what was nice about this Think Tank is this Think Tank was really, kind of, a first step of what the future

should look like.

So it involved stakeholders from academic medical institutions, like myself, stakeholders from the Food and Drug Administration that ultimately approves drugs for certain indications, representatives from drug companies that are developing new drugs, and most importantly and really in an innovative way, representatives of advocacy groups in pediatrics. What we're really talking about is parents, because in a pediatric trial of any type including a drug trial, you can't actually get consent to participate in this trial from the child. You have to get it from the parent. So this was our-- the first opportunity to bring all of these people together in one room, try to identify what the current barriers are, what's worked, what hasn't worked. And I feel fairly strongly that just putting us all in a room together initiated a much better conversation about where we should go in the future.

There were a number of recommendations. The largest recommendations, honestly, are in the bucket of let's continue to think outside of the box, not rely on study methods that have been done in the past. And one of the things that is difficult is that it's expensive to do drug trials. A simple thing that came out of this is that if you're going to do drug trials in children, the opportunity to get a much better trial with real results comes from something very simple like making sure that you have a pediatric drug that's made into a liquid solution that can be very accurately measured based on the weight of the patient or child, as opposed to a pill, which is a one dose administration.

The other aspect that was really addressed is that there is a lack of pediatric clinical scientists that have a good idea of how to run clinical trials. In fact, I was honored to be on this panel, because I've had a lot of clinical trial experience in pediatrics. And one of the recommendations is that drug companies really probably should start at least entertaining coming to existing networks that involve multiple institutions of pediatric researchers that can provide a larger amount of patients with rare conditions and a infrastructure of pediatric researchers that are used to doing science.

I think if-- the last point it really came out of this that I think Google will really be important is the importance of if you're going to invest a lot of money to try to develop a drug trial, involve the people that you're going to ask to enroll their children in this study. The ability we can as scientists develop a trial that we think is safe answers a lot of the things that are critically important to making sure that the drug works and the drug is safe. But we need to also make sure that the study tasks overall are not so burdensome that it's a real barrier to enrollment of

children in the study. So involving parents early on into designs of trials is something that we have started to use, and we highly recommend for more successful trials in the future.