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Healthcare Digital future

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In the year 2016 almost 2017, we are in a time now where the digital world is booming, now almost any and everything is becoming digitized and more advanced than the year before. The future of healthcare is on the rise and in my opinion I think with the help of a few digital improvements, an even better system in healthcare can emerge. Although a number of clinics and hospitals have now already chosen to use digital tools such as going paperless, meaning beginning to go mobile. Which gives patients the option to keep up with their medical records, make appointments/ cancel appointments and even get refills for their prescriptions all on their mobile phones. Sounds pretty cool and very convenient to have all your medical information accessible with the click of a button on your phone or iPad doesn't it? Well that's because it is! And this kind of advances in the healthcare industry it can only get better.

In fact According to an article on techrepublic.com "The health care industry will see a 21% increase in IT jobs by 2020, according to research by the University of Chicago. Across all health care sectors, there is a demand for creative, thoughtful uses of health informatics, mobile technology, cloud systems, and digital diagnostics"

Which is why I decided to focus on my creative and thoughtful idea of how the usage of technology can turn the future of healthcare to that greater place. I will be discussing the future of ultrasounds for pregnant women. I chose this topic because, I think continuing to generally improve things that are so precious and important to us health wise will make life a little easier. From my own experience as a first time mom, that moment of getting your first ultrasound is a special moment. Because you're so eager to get that tiny glimpse of your little one for the first time before he/ she actually gets here.

Seeing your baby on the ultrasound for the first time is something every woman expecting, looks forward to during her pregnancy. Becoming a mom definitely brought a few things into perspective such as ultrasounds. I never thought so much of it before until I had my first one. As I was looking I couldn't make out what I was looking at, it was hard to identify until the women explained and has to show me what was what. So in my mind I thought, in what way can this experience be less hard to recognize what your looking at, without the person having to explain it to you? As I continue I will explain my hypothesis of what ultrasounds can possibly become in the future.

At this point in ultrasounds yes we have a few good options already, and over time they have done a good job discovering ways to better the ultrasound experience for mothers and families. But before we get started in saying how they can better it, let's begin with what is an ultrasound exactly? It's not only a place where you find out if you're having a girl or boy but According to webMd "Ultrasound images have many uses during pregnancy. Early on, they may be used to determine due dates, reveal the presence of twins or other multiples, and rule out ectopic

pregnancies. They also are valuable screening tools in helping to detect potential problems, including some birth defects, placental issues, breech positioning, and others.” Which explains why ultrasound are so important for moms to get so they can see what's going on inside that belly.

For pregnancies ultrasounds have indeed become more advanced we have 2D, 3D and 4d now . 2D is the traditional ultrasound exam that uses a transducer over the abdomen to generate 2-D images of the developing fetus. There's no color, nor can you see any facial features it's just the basic view of the body . 3D uses special designed probes and software to generate 3-D images of the developing fetus. It more developed then 2D and you get to see a better picture of your baby. Last but not least we have 4D which is the most advance and it used special designed scanners to look at the face and movements of the baby prior to delivery. But I think we need more !!!

What I think will eventually happen is ultrasounds will not just be an image of your baby but actual real footage being looked at . How would it be done you asked ? The doctor will have a micro camera which will be inserted in the woman vaginally, painless of course and he will be able to actually have real images on screen. This will offer color fetal photos and more revealing than ever about what life is like in the womb. I also think moms would love this because of they did want to know how their babies would look, with this real footage ultrasound they get to see how their babies actual faces, how cool would that be ?

According to science.howstuffworks.com article “The Future of Ultrasound” it states that “One exciting new area of research is the development of ultrasound imaging combined with heads-

up/virtual reality-type displays that will allow a doctor to "see" inside you as he/she is performing a minimally invasive or non-invasive procedure such as amniocentesis or biopsy.” This shows I'm not the only person who believes that the ultrasound procedure will only become more advanced in the near future .

Many people might be worried about will this Harm the baby? It wouldn't hurt the baby at all, just as women have to get vaginal exams by the ob-gyn which don't hurt the baby, as well as trans-vaginal ultrasounds already, it would be the same process with no harm done. According to whattoexpect.com the article states that “ there will be plenty of opportunities to take photos and make memories when your baby is born. So In the meantime, you should keep ultrasounds to a minimum and look forward to the day you can see your baby in person” but not all people want to wait for that long, which is a big reason women and families look forward to ultrasounds. Of course they want to know of their babies are healthy but the biggest reason I feel is to be able to see your baby.why wait 9months of you can sneak a peak with an ultrasound?

According to ultrasoundtechniciancenter.org one big concern was in fact will any danger be caused to the fetus. But even with the 3D and 4D ultrasounds no show of harm as been detected . They talk about how Keepsake ultrasounds use 3d and 4d ultrasound imaging not for necessarily medical purposes but for emotional and personal reasons. The vaginal camera insertion will more so be for those same reasons as well, to view and take pictures of the unborn baby and to determine its gender. Those moments of finding out the sex of a child are very special to families so I think it should be the most fulfilled moment with the best equipment possible.

It's proven that such a intimate ultrasound creates a great bonding experience for mother and child, and can increase healthy outcomes by motivating mothers to take better care of themselves during pregnancy.

Although 4D does a great job showing movement because, you are seeing your baby doing things in real time for example opening and closing his eyes and sucking his thumb. The image isn't real footage, I would want it to be real footage as if you took a picture of the baby with a camera. I think this development would be so cool to see how your baby is living in there and see his real features, like eye color, whether he has hair, things you can't really tell from the other ultrasounds we have right now. In the images below are pictures in order from left to right of 2D, 3D and 4D ultrasounds. Although the features have defiantly became better detailed the images aren't in real color. improved image quality equals better diagnostics!!

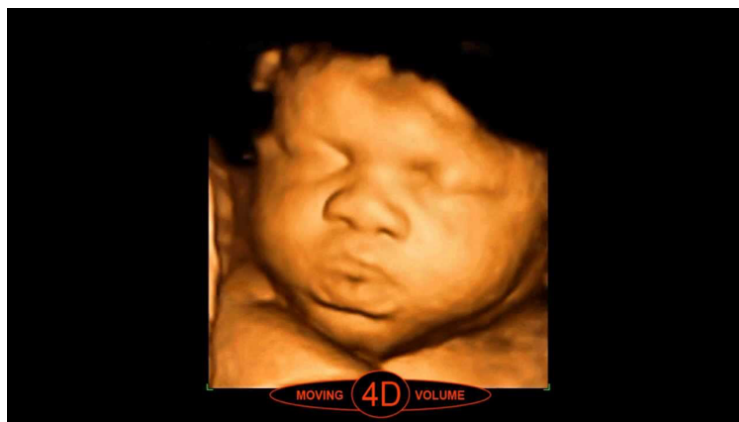
2D ultrasound is the traditional method used for years. They provide flatter, two-dimensional, black and white images of your baby.



3D ultrasound is an advanced method which captures a true, three-dimensional image of your baby, often allowing the ability to see specific facial features and well-defined formation



4D ultrasound is an actual moving three-dimensional image of your baby in utero. Actions such as yawning, turning and even subtle movements can be seen. There have even been cases where expectant parents watched as their child sucked their thumb and peacefully slept!



Real-D(my prediction) is similar to 4D but the picture you will see will be real footage, as of you are recording a baby with a camera.



According to the article image quality, patient safety and the future of 3D ultrasound on auntminnie.com , “the rise of 3D/4D ultrasound will decrease the use of other modalities, many of which confer radiation to patients. This is the future that awaits the ultrasound market: more true images shown in 3D/4D to provide less experienced doctors with the best image quality to help them to make a fast, accurate diagnosis. All with a technology that delivers no radiation, is mobile, and gives the patient a more comfortable experience” this explains how's the more advance the image becomes the better it is for physicians . The process of the camera ultrasound would work like this, the baby will still be assed using the 2D traditional ultrasound, and once the physician is sure that the baby is healthy me in a good position for the actual imaging the advanced ultrasound will be switched on .

Obstetric ultrasound has played an important role in the development of diagnostic ultrasound technology. Much of the technological advances in diagnostic ultrasound technology are due to the drive to create better obstetric ultrasound equipment. Again, the better equipment provided, followed by better quality will result in better development. Ultrasounds have continued to grow over time. “ Early in the use of fetal ultrasound, clinicians could actually only get the baby's head but slowly and shortly, with developing expertise, they begin to discern fine structures in the fetus,” according to www.livescience.com/32071-history-of-fetal-ultrasound.

The article also states that, some women report not feeling pregnant until they've seen the ultrasound image, which makes ultrasounds that much more of a bonding experience for the mom and fetus. The article claims that anecdotal evidence suggests that if pregnant women see images of a fetus especially their own they are ultimately less likely to terminate a pregnancy.

Also upon my research I also came across that “With recent significant advances in ultrasound technology, the potential of high-resolution sonography to improve the sensitivity of cancer diagnosis in women with dense breasts has become a matter of interest for breast imagers.” This is according to sciencedirect.com. They also state that, To determine how often physician-performed high-resolution sonography can detect non palpable breast cancers that are not revealed by mammography. Now although this doesn't exactly have relations to pregnancy ultrasounds, the connection here and bigger picture is the advancing of ultrasounds which is my key point Of this paper . In conclusion of this other discovery, its stated that “ In conclusion, “the use of high-resolution sonography as an adjunct to mammography in women with dense

breasts may lead to detection of a significant number of otherwise occult cancers that are no different in size from non palpable mammographically detected cancers.”

There are also a lot of different types of portable ultrasound gadgets that I have also come across, some being thousands of dollars, which doesn't really help the average low or middle class moms. Which brings me to another thought that maybe one day ultrasounds will be able to be done by the mom herself from home. I think there will be small gadgets that will be able to provide information by talking the mother through the process as she's giving herself the ultrasound. The machine will be able to detect everything that normal ultrasounds can detect as well. Picture that? How convenient would that be? As a pregnant woman it's already very annoying and frustrating sometimes to travel, so something like this might just be the thing pregnant women need!

According to an article on readitquick.com called [clarius announces smartphone linked ultrasound scanners](http://readitquick.com) there already has been something sort of close and similar to what I think the future holds. The article says “

Digital healthcare start-up from Canada, Clarius Mobile Health, has announced the ultra-portable Clarius CR Ultrasound scanners which can be linked to a smartphone or any smart device through the Clarius app, available for iOS and Android. The multipurpose ultrasound device helps in point-of-care assessments, especially for lung and chest diseases.” Also that “the Clarius ultrasound device, delivers a high quality, Point-and-Shoot Ultrasound™ image, is wireless, portable and compatible with any Android or iOS-based device, thereby allowing doctors and physicians to take quick scans at the patient's bedside.

This also incorporates a virtual phased array that allows quick scans of the heart” Physicians already have been asking for a portable ultrasound system that works with their iPhone for some time,” said Laurent Pelissier, the Chairman and CEO of Clarius Mobile Health. “The challenge has been to make an affordable device that is small enough to carry around and that also produces great images.

Although it isn't exactly what I imagine, it shows that we for sure have the ability to make something such as that come to life. Look how far technology is already taking us with ultrasounds .not only would something like this give people the freedom to do ultrasounds when ever they want but also these kinds of Mobile scanners that works with mobile apps, also gives physicians the freedom to perform ultrasound exams anywhere, anytime of need be in case of any kind of emergency.its a win win situation for doctors and patients. .

I think my educational guess for the future of ultrasounds will defiantly be in the making in the next 10-20 years.. This is something that not only can change the pregnancy experience forever, but is something that can also make a lot of money because everyone woman would want this version over anyone kind. I think that due to how fast the digital world is advancing and discovering different ways for things to be done, it's very possible for this to become more then just a hypothesis. Of course it will just take a little time and hard work to throughly figure out what kind of camera would be best and most comfortable as well as safe as possible for the mom and fetus. And as for the portable ones the only major concerned would be making it affordable, and accessible, but also maintaining the good quality.