

Medical advancements due to technology



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There has been much advancement in the medical field due to the advancement in technology. These advancements could allow humans to not only live a longer life but also a life with healthier years. So the question is can society take to the idea of not only living a longer but also to the process of living a longer life? In this paper, I will be talking about the medical advancements we have thanks to the advancements in technology and what these medical advancements could mean to society.

I will also be touching base on how society may feel about the process we are taking to live longer by looking at how similar issues are dealt with in today's society. In 2002, a Japanese scientist named Makoto Nakamura made the discovery that the droplets of ink in a standard inkjet printer are about the same size as a human cell which is between ten micrometers and one hundred micrometers.

In 2008, Nakamura had adapted the technology of the inkjet printer and created a working bioprinter that can print out biotubing similar to a blood vessel. The 3D bioprinter allows scientist to place cells of almost any type into a 3D pattern. The bioprinter is already capable of growing arteries and its creators, according to gizmag. com (Quick, December 15, 2009, 3D Bioprinter to create arteries and organs, gizmag. com), say that “ arteries ‘ printed’ by the device could be used in heart bypass surgery in as little as five years. Meanwhile, more complex organs such as hearts, teeth, and bone should be possible within ten years”.

The bioprinter includes two print heads, one for placing human cells and the other for placing a hydrogel, scaffold, or support matrix. The cells of what is being regenerated will need to be used by the device for printing: building an

artery requires arterial cells for example. Since the patient's own cells are being used to make the new organ, the new organ will not be rejected by the body. Researchers can place liver cells with a co-printed scaffold, or form adjacent layers of epithelial and stromal soft tissue that grow into a mature tooth. Ultimately, the idea would be for surgeons to have tissue on demand for various uses, and the best way to do that is get a number of bioprinters into the hands of researchers and give them the ability to make three dimensional tissue on demand," said Keith Murphy, the CEO of one of the bioprinter's founding companies; Organovo.

So as wonderful as this bioprinter sounds, what does this all mean and how will this printer impact society? First the positive; now patients can get an organ without the need of a donor, because the bioprinter is using the patient's own cells, the patient doesn't need to take medications to help the body to accept the new organ, and ideally, surgeons will have tissue on demand for their patients. The negatives; the bioprinter will be coming at a price so the average Joe will not be able to afford this kind of luxury treatment and will have to continue waiting for a donor and the big negative would be a growing disregard for health.

I will be elaborating more on that last statement near the end of the paper. Another medical advancement that also happened in 2008 was some Swedish scientist at the Karolinska University Hospital grew a trachea from scratch. Scientist created a Y-shaped framework for a new trachea, modeling it after the specific shape of a patient's trachea.

The form was made of polymers that had a spongy and flexible texture and stiff rings around the tube that mimicked the structure of a human trachea.

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The form was then bathed in a solution containing the patient's stem cells "to get the cells to grow on the sponge material," said David Green, President of Harvard Bioscience (Melnick, July 8, 2011, Cancer Patient Gets World's First Artificial Trachea, healthland. time. com) The windpipe was originally grown for a thirty-six year old man with late stage tracheal cancer when conventional treatment including chemotherapy, radiation, and surgery failed.

This breakthrough sends another message, in my opinion, than just being able to fight back diseases and that is if you do anything that harms your body, it's okay to do because science can undo what you have done to your body; like smoking. A man spends many years smoking and as a result ends up with cancer of the lung. Science now says " That's okay! We can make you a new lung; a better lung! " How would that mindset affect society? That what you were once afraid to touch for sake of your health can now, not only be touched, but can be abused without consequence? There are positives about this new medical breakthrough though.

Dr. Paolo Macchiarini, known as the pioneer in engineered trachea transplantation, plans several more synthetic trachea implants. One implant is for a nine month old infant, adopted from Korea, who was born without a windpipe and breathes through a hole in her esophagus. In a case like that, the surgeon plans to use a biodegradable polymer scaffold that will dissolve over time as it's replaced with the child's own cartilage. A non-biodegradable scaffold, like the one the thirty-six year old man has, would not grow with the child so the scaffold has to be biodegradable. Thanks to nanotechnology, this new branch of regenerative medicine, we are now able to produce a custom-

made windpipe within two days or one week,” says Professor Macchiarini. The next medical advancement came in 2009; The “ Spider Pill”. The Spider Pill is a remote controlled, pill-sized robot that has a camera, moving leg, and was created to scan for cancer in the stomach or colon.

This Spider Pill had evolved to a flea-sized drone in 2010 that helped with blindness. These medical advancements will allow preventative “ maintenance” on the body. The cybernetic hand also came out in 2009 which led to artificial skin that can feel and prosthetic limbs that look and feel real in 2010. These medical advancements will allow more of a healing for the patient after a loss of limb. A lot more ‘ rejuvenating’ medical advances came out including the Cell Scrubber in 2010, and bioengineering blood vessels and growing organs in 2011.

The reason why I call this ‘ rejuvenating’ medical advances because, just like the bioprinter and trachea, there can be an increase disregard for your health with these medicines. The impact on society would be extreme with these kinds of medical advancements. Why or How? With being able to grow new organs, one can now do drugs and put their body through harm without fear. Once fear is taken away, complacency happens and once complacency happens, there’s nothing to keep humans in check.

The conclusion I came to is there are many positives about these advancements and the impact will be huge. Now there is hope where there was no hope. Now there are possibilities to “ turn back the clock’ on your life and your body. Now you can look at the hand of card life gave you and give life some cards back for better cards. This could allow humans to live longer lives even if when they were not thinking in the best interest of their body

their whole life. This can also take away fear from what you do to your body so people may be daring to do more.