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Socioeconomic Disparities in Cancer Care

In a short web story by “The Baseline of Health Foundation” they reference an article in the New York times written by a man named George Johnson. In this article the author discusses an ongoing debate about the seemingly sudden rise in cancer diagnoses worldwide. Some say it is the result of the myriad number of carcinogenic toxins never before seen in the history of mankind that have been released into the environment by the kiloton. There are also those that believe this surge in cancer occurrence is due to the fact the medical community has relatively recently become aware of cancer and better able to diagnose the disease than previous doctors. George Johnson’s position was on the middle ground he believed that increasing rates of cancer were both a result of new carcinogenic substances in the environment and the exponential increase in medical technology and knowledge. Whatever the sudden increase in cancer is due to it concerns us all.

Cancer is the second leading cause of death in America and has the potential to become number one! According to “CNN Health” cancer already became the leading cause of death among Hispanics in 2009(Scutti, 2016). This alarming statistic is the

reason a price has been placed on cancer's metaphorical head and just about every drug and research institution has dedicated itself in some way to finding a cure. Unfortunately this reward is paid by families struggling with the disease whether they can afford to or not. This point brings me to brings me to the focus of my project; many say cancer is a “blind disease”. That it doesn't know rich or poor, that it affects everyone despite their background. This in some ways is true, there is no amount of money in the world that will prevent a person from developing cancer. Cancer doesn't care what car you drive or what home you live in, cancer is random and unpredictable. Though cancer doesn't care how much money you make drug companies and treatment centers do! How much one can afford to spend on his or her disease can have a dramatic affect treatment options; for this reason quality of care within cancer is drawn heavily down economic and socioeconomic lines. For those in the upper class cancer can be a simply treated chronic disease, for those in lower economic classes the same disease is a death sentence.

I find this phenomena very intriguing and in order to learn more about it I have decided to make identifying the disparities in cancer care the focus of my project. One specific disparity I will go into more detail about is the difference between proton therapy and traditional radiation therapy. From the historical origins of their use to the highly complex physics at their base. Onward I will discuss the differences between the proton gantry and the traditional linear accelerator which is the most common device used to treat tumors. I will discuss the reasons that the linear accelerator is still widely used

despite its debilitating side effects. My goal will be to explore the benefits of Proton therapy and the disadvantages of traditional radiation therapy. In addition will try to find the patient, physician, and corporate perspectives on proton therapy and the inequalities in cancer care. I want to know how people feel about the subject and how they believe things can change for the financially disadvantaged cancer fighter.

This fascination comes from an experience I had in the Texas Medical Center in Houston Texas. During the course of an internship I had with MD Anderson; a worldwide leader in cancer medicine and research. I witnessed the treatment of one or two patients with a malignant tumor. The patient I remember most was an African American man around the age of sixty with a cancer affecting his vocal cords. He walked in very briskly, immediately we noticed darkened skin tissue around his neck from previous treatments. The other participants in the program and I greeted the man as he walked past. In obvious pain, the man greeted us as well in a raspy voice caused by the deterioration of his vocal cords; despite this he still smiled and appeared cheerful. With the help of a Radiation Therapist he set himself up on a large machine not completely housed in the relatively small room. The machine was called a gantry and this specific variety was powered by a linear accelerator which creates high energy x-rays that damage cancer cells. However the machine came with side effects, one of which we had just witnessed first hand; the darkened flesh around his neck were burn scars from the intense radiation.

Once our patient was set up properly on the gantry we left the soon to be irradiated area and followed the radiation therapist to a room behind a lead wall and door. From there we watched the patient receive treatment on a display. While in this room we discussed how this patient could return to work in so much pain, it was revealed to us that the patient could not return to work and that treatment required him to rest. From there the question of how payments could be made by someone that can't work were raised. This question stuck with me and was called to mind once again after visiting MD Anderson's Proton Therapy Facility.

In the days following our experience in the radiology clinics within MD Anderson's main facility we eventually visited their Proton Therapy Center a few blocks away. At the surface it was a seemingly small building with only a couple of parking spots and an unassuming exterior. However the interior was very nicely furnished and decorated with several interactive devices explaining the complex technology below the buildings surface which actually extended several floors below ground. Before entering the lower levels of the facility we were escorted into a room where we watched an informational video on the technology we were about to see. The video basically underlined that MD Anderson was one of the first hospitals to receive one of these new minituratureized synchrotrons from the Japanese company Hitachi and use it for the treatment of tumors. The most striking thing I found about the video was the fact that patients treated with proton therapy were able to return to work the next day. This was the first time I had heard about this and it made me think of the man I had seen with cancer in his throat.

The other thing I found striking was the way proton therapy was advertised. The race and the socioeconomic status of the patients in the video all seemed to be homogeneous. One of patients was a seemingly wealthy elderly man and his wife who loved to take trips on their boat but couldn't because of the man's cancer. It was obvious to me that this treatment was being selectively advertised to the wealthy that could afford the treatment.

Though this marketing strategy makes sense it was still slightly disturbing. The individuals who could theoretically pay for treatment with or without working have the option to do so while those that need to work the most are given a debilitating treatment that makes them unable to work and support themselves. One of the reasons proton therapy is so unaffordable is because it is on the cutting edge of cancer technology and like most new technology its price makes it available only to the very rich. Like I said earlier the machines used for this treatment are very large and complex, in addition only a few companies like "Hitachi" have the resources to build this machinery which must then be shipped to the states. In the end a five treatment room can amount to approximately \$144 million dollars with a treatment cost on average up to \$32,428(Whelan,2009). Compared to the more traditional form of radiation therapy called "Intensity-modulated radiation therapy" which costs \$3million per unit with treatment expenses ranging from \$5,270 to \$14,155(Yong,2016). This is just one of the ways that socioeconomic inequalities can create treatment disparities in cancer care.

Despite being an inferior treatment instrument in the present, the medical linear accelerator was once at the forefront of cancer treatment technology. The medical linear accelerator, lets call it LINAC was the brainchild of Stanford physician Henry Kaplan, MD nearly 50 years ago. Kaplan was one of the first to theorize using high X-ray beams to destroy tumor cells without harming surrounding healthy tissue. He with the help of Ed Ginzton professor of electrical engineering and physics set up the first medical LINAC on the Western Hemisphere in at the Stanford-Lane Hospital in San Francisco. By January 1956 the machine was ready for its first patient, a boy with a tumor in his one remaining eye. By the end of the six week treatment the boys cancer was cured and his sight was saved. This success spurred a revolution in cancer treatment and lead to progressively more powerful and precise devices. Because of the advancements made at Stanford University in the 50's the LINAC became the backbone radiation therapy in cancer treatment and paved the way for more advanced forms of radiation. Today roughly half of all cancer patients are treated with radiation therapy.

The LINAC uses the same technology found in household microwaves(on a much larger scale of course) to accelerate electrons in a part of the accelerator called the wave guide. These electrons are then allowed to collide with a heavy metal target to produce high-energy x-rays which are then shaped to the dimensions of the individual's cancer as they exit the part of the machine called the multileaf collimator.

Though this trend is devastating for all those it affects, it can also be a great opportunity for those interested in health care to make a difference in their community. There are a plethora of career options within the realm of cancer treatment that most people don't know about. As a result these fields are severely understaffed and have a very high demand for employment. It is my goal to help those who are unsure of where in they'd best fit in career devoted to health.

In addition to helping people find an interesting career that they can love and grow in. I'd also like to discuss the disparities that exist within cancer care and the unfortunate disadvantage low income families face when tackling cancer. The focus of my discussion will be mainly directed toward the differences between traditional radiation therapy and proton therapy. In my discussion I will include the cultural discrepancies between the two forms of treatment as well as the science and equipment used in the two very different procedures.

Citation

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