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When we are asked to name some of the most influential technological and scientific innovations of modern times, we often think of smartphones, smartwatches and artificial intelligence. We might be tempted to bring up different programming languages like C++, Python and Java. Some may even go as far as naming Jonas Salk's polio vaccine from 1955 or the Pacemaker. If you ask me, the most obvious answer is radiology. One of the most commonly used fields of modern science, it serves as the uniting force between technology and medicine, allowing the medical field to keep up with an ultramodern society. Though it is often overlooked, it has changed the lives of most of the world's population. The sudden disappearance of radiology from our world would draw attention to its importance; the medical field as we know it would be much less efficient and effective.

Radiology is defined as the science of diagnosing and treating medical conditions using imaging. Its roots go as far back as the year 1895, in which German scientist William Conrad Röntgen used small rays, which he named "X-rays" and knew little about, to produce shadows of the bones in his wife's hand. Within just a few years, Röntgen's X-ray imaging method had become widely accepted as a way to diagnose common issues like bone fractures. However, X-rays were only used frequently in the decades to follow, after the technology which it required became more accessible to hospitals (Howell, 2016). Since then, X-rays have become a regular part of patient care.

Radiology doesn't just include X-rays; it has also evolved to include other types of scans that are useful in treating and diagnosing illnesses. CT, or computerized tomography, is often ordered for patients who may need more than just a simple 2-D X-

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ray. CT scans combine images taken from various angles to produce cross-sections of the body for a more detailed look into patients (Mayo Clinic, 2018). Positron emission tomography, or PET scans, can show how organs look and function by detecting how much radiation a radiotracer emits. Unlike regular X-rays, they create colorful images (Brazier, 2017). These are just a few forms in which radiology can appear in a medical setting. Without radiology, there would be no way to carry out many of these tests.

Radiology helps a wide range of people who seek medical attention. One such group of people is cancer patients. People who have cancer often don't show obvious external signs of illness. Although some cancers, such as melanoma and basal cell carcinoma, can be initially detected through physical examinations, others, like malignant brain tumors, require scans to be detected. In September 2019, my family realized the importance of radiology through my grandfather. Initially thought to have tuberculosis, he was ordered a CT scan when his TB tests came back as negative twice. After finding large tumors in both his lungs and confirming them to be malignant through a biopsy, my grandfather was subsequently diagnosed with stage 4 large cell lung cancer. If radiology had not existed, my family, like many others, would never have known that someone so close to us has cancer, and we would not be able to provide him with the care he needs today. Clearly, radiology has shaped diagnosis in oncology.

Another group of people who are commonly affected by radiology is women. The most well-known reason for a female to encounter radiology is pregnancy. Obstetricians and gynecologists use ultrasounds to confirm pregnancy, determine a baby's due date, diagnose early disorders like Down syndrome, and track unusual fetal conditions- all of

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which help decide what precautions must be taken to keep women (and babies) safe through pregnancy and delivery (Horsager-Boehrer, 2018). A second common use of radiology in women's health is breast cancer diagnosis. Many women receive regular mammograms to check for and monitor unusual growths (American Cancer Society). However, gynecologists also use ultrasounds to diagnose other conditions. Some illnesses that ultrasounds can help diagnose are polycystic ovarian syndrome, or PCOS, and endometriosis. Personally, radiology helped me discover that I have a large ovarian cyst. While the cyst does not currently alter my daily life, I am grateful that radiology helped find it at an early stage. Large ovarian cysts like mine can rupture after reaching a certain size and cause ovarian torsion, which is painful and requires emergency medical attention because it can result in the loss of the ovary altogether. Without radiology, women's health would not be easy to care for, and many women would be put in danger, whether it be during pregnancy or on a daily basis for other conditions. Radiology urges women to take care of their bodies and empowers us to become more medically involved.

While radiology is often disregarded as a minor step in patient care, it serves a larger role in our lives. It helps keep people safe by diagnosing dangerous conditions and allowing doctors to better understand the human body. A world without radiology would be one that is medically inefficient and ineffective: there would be no way to examine simple bone fractures, diagnose complex cancers, or even predict a baby's due date. Doctors would resort to the 19th-century ways of basing their knowledge of internal anatomy on cadavers and guessing patients' diagnoses. Technology in the

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medical field would be underdeveloped compared to that of the rest of society, leaving medicine as an outdated branch of science instead of the cutting-edge field that it is today.

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