

Words: 1,396

Raymond Damadian's Innovation of the Magnetic Resonance Imaging Scanner

In 1971, Raymond Vahan Damadian invented the first Magnetic Resonance Imaging (MRI) scanner. The MRI scan is a medical imaging procedure that uses a magnetic field and radio waves to take pictures of a body's interior (betterhealth.vic.gov.au). The MRI scanner has saved millions of lives since its creation by being able to diagnose patients with diseases or injuries such as cancer, strokes, aneurysms, and spinal cord abnormalities (riverview.org). Damadian's new contributions and innovations to the advancement and creation of the MRI scanner have made it the "most powerful and reliable diagnostic tool in medicine," while also "revolutionizing the practice of medicine" by giving doctors an "invaluable tool" to see inside of the human body (Sarfati, 2006), (Lemelson, 03:47- 03:54).

Born to an Armenian family in Queens, New York, Damadian dedicated his life to detecting cancer after witnessing his grandmother die from breast cancer. After graduating with a degree in mathematics from the University of Wisconsin–Madison in 1956, he went to the Albert Einstein College of Medicine where he received his medical degree (Winans, 2018). Then, in 1971, he invented the MRI as a professor at the SUNY Downstate Medical Center (Winans, 2018).

Damadian's invention of the MRI scanner has positively changed society, saving lives globally. Without the MRI scanner, numerous types of diseases and illnesses would go undetected, causing many people to not receive proper treatment, therefore leading to death or worsened conditions. The MRI scanner allows radiologists to catch a disease or injury in its early stages when it is still treatable, giving the patient a better chance of survival and recovery.

Damadian's creation of the MRI scanner has paved the way for a new generation of scientists to improve upon it and create new technologies that will assist it in detecting diseases and injuries.

Damadian innovated the hypothesis that cancerous cells could be differentiated from non-cancerous ones using magnetic resonance (gehealthcare.com). Damadian set out to develop an instrument "that can be used to scan the human body externally for early signs of malignancy," envisioning that the "detection of internal tumors during the earliest stages of their genesis [could lead towards]... the total eradication of this disease" (Dharampaul, 2018). Before Damadian created the MRI, magnetic resonance was being studied within different chemicals. This form of science was called nuclear magnetic resonance (NMR), which was originally demonstrated in 1945 (gehealthcare.com). By using NMR technologies, Damadian then attempted to use it on human tissues and during that process, realized that there was a significant difference in the magnetic signals sent between normal tissues and cancerous ones (Winans, 2018).

Damadian's next step was to build the MRI scanner and test out his hypothesis. However, acquiring the funds to build the MRI scanner was not an easy task. After the National Institutes of Health denied him a grant, Damadian wrote a personal letter to President Richard Nixon, asking him to take action (Treacy, 2014). President Richard Nixon then offered him a small grant (Treacy, 2014). However, after President Nixon's resignation in 1974, Damadian had no funds left (Treacy, 2014). Damadian then decided that his next option for acquiring funds for the construction of the MRI scanner would be to somehow form a relationship with people involved in the next presidential administration, the Carter administration (Treacy, 2014). He was able to become friends with Jimmy Carter's Cousin, Hugh Carter, and was later able to make an appeal for research funds, successfully acquiring it that way (Treacy, 2014).

In addition to having a difficult time acquiring funds, Damadian was also met with criticism from his peers. Some of his fellow conservative peers believed that "the very idea of scanning the body [using an MRI scanner] for cancer [would] be science-fictional" (Treacy, 2014). Following this process, the first MRI body scan was conducted on a human on July 3, 1997, the first person being one of Damadian's graduate students, Larry Minkoff. After the scan, Damadian and his partner, Dr. Michael Goldsmith, named the machine "Indomitable," referencing their struggle to develop the MRI scanner (Winans, 2018). Without Damadian's discovery, it would not be known that diseases like cancer could be detected by an NMR scanner (Winans, 2018).

Armenian-founded innovations that are as significant and life-changing as Damadian's shows Armenians everywhere the brilliance of our people. Damadian himself knew that the thought of creating a machine that would be able to scan the whole human body was absurd and far different than anything that had ever been created in the medical field at the time. He has stated that the idea was "kind of preposterous," but that he "had hope" that it would be possible to create (Wehrum, 2011). Damadian's words should be what any other Armenian needs to hear if they are having doubts about the decisions they are making. If Damadian was able to create something as big and remarkable as the MRI scanner while facing resistance and having limited resources and funds, any other Armenian can, too (Dharampaul, 2018). Damadian had a drive, a passion. If other Armenians have that same drive and passion, they could achieve and create anything. It gives the Armenian community, and especially Armenians studying science, the confidence to pursue their goals—the confidence to create something new in the world—the confidence in themselves to achieve success.

I have personally seen how the MRI scanner helps save lives. My aunt was diagnosed with breast cancer in June of 2016. The MRI scanner was able to detect the cancer cells that were present, and because of that, the radiologists were able to see it early enough to treat it and stop it from spreading to other areas of her body. Without the MRI scanner, her cancer may have been diagnosed too late or not diagnosed at all. Seeing how the MRI scanner has helped my aunt makes me feel even more grateful for the contributions made by Damadian in advancing MRI technology. Solely because of the MRI scanner, my aunt's cancer was diagnosed early and she was able to enter remission shortly after. The MRI scanner eased my family's experience in learning about and moving forward with cancer treatments for my aunt. It made my family feel reassured and hopeful that she would be cured, and grateful that my aunt was able to undergo the scan itself to receive her diagnosis. Even in this day and age where it seems that new and even more advanced technologies are being created by the hour, I am still not able to comprehend just how remarkable the MRI scanner is. When I think about the MRI scanner, I think of my aunt and how it was able to save her life. The MRI scanner has the power to completely change a person's life for the better and that is the reason why it is and should continue to be praised by people everywhere; whether that is by the patients utilizing it, doctors and radiologists, or people like me who watch it save lives from the sidelines.

As an Armenian interested in pursuing a career in the medical field, Damadian's innovation of the MRI scanner inspires me greatly. I feel a real sense of kinship with Damadian. I feel a unique connection to him and see myself in him, while also knowing that I am capable of achieving that same success. Seeing how far Damadian's perseverance and determination have taken him makes me even more ambitious in pursuing my own goals. I am also inspired by his bravery and courage. It takes courage to present your ideas to other people, let alone if you are

pitching an idea that most people believe you are not capable of achieving or creating. I have trouble sometimes expressing my ideas to the people around me but I have learned from Damadian to not be afraid of what other people think and to have bravery and courage in everything I do in life.

Armenians have struggled to pursue success in America. Damadian used his knowledge, skills, and innovative ideas to succeed and prove to himself and those around him, including people of Armenian descent, that it is possible to achieve your goals. Damadian's innovation of the MRI scanner has helped millions of people around the world and has positively impacted society, the Armenian community, and myself. This innovation will remain impactful, useful, and inspiring for many generations to come.

Works Cited

- Dharampaul, Shem. "Behind the MRI: Dr. Raymond Damadian." 26 December 2018, www.mrimovie.ca/history.html. Accessed 5 April 2022.
- Lemelson, Jerome, director. Raymond V Damadian, 2001 Lemelson-MIT Lifetime Achievement Award Winner The Lemelson Foundation, 28 Feb, 2009, www.youtube.com/watch?v=m_ghKkLRDI&ab_channel=Foundation. Accessed 7 April 2022.
- "MRI scan." *Better Health Channel*, www.betterhealth.vic.gov.au/health/conditionsandtreatments/mri-scan. Accessed 7 April 2022.
- Sarfati, Jonathan. "Dr. Damadian's vital contribution to MRI: Nobel prize controversy returns - creation.com." *Creation Ministries International*, 21 October 2006, creation.com/dr-damadians-vital-contribution-to-mri-nobel-prize-controversy-returns. Accessed 10 April 2022.
- "Saving Lives with a Large-bore MRI Machine." *Riverview Health*, 1 November 2015, riverview.org/blog/riverview-health-foundation/saving-lives-with-a-large-bore-mri-machine/. Accessed 7 April 2022.
- Treacy, Patrick. "Raymond V. Damadian (1936-) Inventor of the first MRI." 22 September 2014, www.linkedin.com/pulse/20140922004324-31515886-raymond-v-damadian. Accessed 10 April 2022.
- Wehrum, Kasey. "How I Did It: Raymond Damadian | Inc.com." *Inc. Magazine*, 1 April 2011, www.inc.com/magazine/20110401/how-i-did-it-raymond-damadian.html. Accessed 7 April 2022.

“When and why was MRI invented.” | *GE Healthcare (United States)*, 8 January 2019,
www.gehealthcare.com/article/when-and-why-was-mri-invented. Accessed 7 April 2022.

Winans, Jess. “Melville's Dr. Raymond Damadian, Father of The MRI.” *Long Island Press*, 8
January 2018, [www.longislandpress.com/2018/01/08/melvilles-dr-raymond](http://www.longislandpress.com/2018/01/08/melvilles-dr-raymond-damadian-father-of-the-mri/)
[-damadian-father-of-the-mri/](http://www.longislandpress.com/2018/01/08/melvilles-dr-raymond-damadian-father-of-the-mri/). Accessed 7 April 2022.