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ISM I

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Diving into Subspecialties

Assessment 4 - Research

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Subject: Interventional Radiology

MLA 8 Citations:

Erinjeri, Joseph P., et al. "Immunotherapy and the Interventional Oncologist: Challenges and Opportunities-A Society of Interventional Oncology White Paper." *Radiology*, 23 Apr. 2019, pubs.rsna.org/doi/full/10.1148/radiol.2019182326.

Assessment:

For this assessment, the main goal was to gain an in-depth understanding of interventional oncology (I.O.), which is a subspecialty of interventional radiology that focuses directly on the diagnosis and treatment of cancer. Additionally, connections were aimed to be made between ideas for the original project uses and interventional oncology and its particular needs. This article was chosen because it provided an in-depth look at the procedures of I.O. and the synthesis between I.O. and immuno-oncology.

Firstly, the main goal for this research assessment was to answer certain previously-held questions about the field of interventional oncology and the roles of interventional radiologists (I.R.) in this subspecialty field. One of those previously held questions was, 'what exactly do

interventional radiologists *do* in interventional oncology?' This question was successfully answered by the article, which listed, in detail, many of the responsibilities and positions held by I.R.'s when dealing with I.O. For example, the article provided information on what interventional oncology was and the different tasks that I.R.'s are required to do in the field, including to "observe patients in the clinic, admit patients to hospitals, serve on tumor review boards and multidisciplinary treatment teams, and have active roles in the diagnosis and management of patients with cancer." The article further continued into even more detailed tasks required of interventional radiologists in I.O. and, throughout the article, listed various roles that I.R. 's must take on in this field as well. This information was, again, able to successfully answer the question and furthered my understanding of interventional oncology and the role of interventional radiologists in it. Another question that was answered was, 'what diseases and procedures are involved in interventional oncology?' This question was also successfully answered as the article listed many treatment options and procedures in the field, including ablations, transarterial chemoembolization, and Yttrium 30 radioembolization, and certain diseases that these treatments are used to treat, including hepatocellular carcinoma and the nature of the cancer disease in general. Thus, this question was also adequately answered. A third question that was considered when reading the article was, 'are there negative health effects to the interventional oncology treatment?' Again, this question was also answered, as it was discovered that certain I.O. therapies can reverse any of the beneficial health effects already done by interventional radiology procedures. Certain procedures can cause more cancer tissue to develop, like in tumor ablation, there appears to be a "potential tumorigenic effect" that can cause the increase of tumors and cancer tissue in the affected areas. Thus, this question was appropriately answered as well, as it was discovered that there are many potential health effects

in interventional oncology treatment procedures. The last question that needed to be answered was, ‘is there any further research that still needs to be conducted in this field?’ This question was also, like the past 3, adequately answered. The article explained that further research still needs to be done to figure out if personalized treatment for each individual’s own organs and body structure is necessary to optimize the treatment. Additionally, the article demonstrated that the issue of tumor stimulation (which causes tumors to grow) as a side effect of I.O. procedures require lots of further research to figure out and solve. Therefore, this question, like all of the other ones, was answered and furthered my understanding of the interventional oncology field.

Another goal for this assessment was to gain some insight on potential ideas for how my original work project can help with interventional oncology procedures in the operating room (O.R.). This goal was only somewhat accomplished. This article mainly focused on an overview of the diseases, treatments, and procedures, with some detail; however, the article did not hone in specifically on O.R. procedures, which my original work idea mainly focuses on. To give a brief summary of my original work, it is a ‘placeholder arm’ attached to the ground in the O.R. meant to be an extra set of hands for the interventional radiologist, like if they need a third hand to hold something, or if they need to leave the O.R. for any reason. So, this article was not the best for accomplishing the goal of getting specific ideas for the original work. However, this article was helpful for an aspect of my original work. Although this article did not go into the detailed specifics of what goes on inside of the O.R. for certain procedures, it provided great background information on interventional oncology procedures that can guide further research or to just serve as a base of knowledge so that future information can be better understood. This article provided topics and information which can be used for brainstorming questions to ask professionals to guide the original work project and to create a basic plan for the original work project.

The last goal for this assessment was to reflect on all of the information consumed and on if there were any surprising facts or exciting pieces of information, or even concerning/disappointing information. To start off, the multitude of negative effects and the desperate need for further research to prevent these negative effects was surprisingly alarming. I had an idea that radiation procedures to kill the tumor cells would have some negative effects, but the fact that ablation can stimulate tumor cells so that they grow in size and number was really shocking. It seems like that would never happen since the treatment is supposed to decrease the cancer cells, not increase them. Additionally, another surprising piece of information was the fact that so much further research is needed to be conducted to improve on techniques and to optimize treatment. It was interesting to discover that the interventional oncology world is still needing to research if personalized treatment in I.O. will or will not optimize the treatment of the patient and that they still need to improve on imaging technology to optimize patient treatment as well. Learning about the trend towards even more advanced medical imaging technology was really interesting, especially when it discussed how the new technology would focus on certain aspects that were important and how it would note microscopic shifts crucial for diagnosis of certain I.O. diseases. Not only was learning about the new medical imaging technology interesting, it was also really exciting because by the time I am a professional interventional radiologist, most, if not all, of this planned medical imaging technology advancements will be available for use and will make the interventional radiology experience more efficient and effective.

In conclusion, all of these goals were answered to a useful extent. These goals included answering previously-held questions about interventional oncology, relating this information to

my original work project, and reflecting on the information learned. Future research will focus on one specific type of interventional oncology procedure and its conduction in the O.R.

Notes:

Immunotherapy and the Interventional Oncologist: Challenges and Opportunities—A Society of Interventional Oncology White Paper