

Laboratory: Dr. Estrada's Uses of Medical Radiation

(created by Christine Brooms and Laura Sonnichsen, Parkland College, revised by Virginia Lehmann and Laura Sonnichsen)

Report Requirement: Directions on how to write up the lab report can be found in the report section of the lab. You should write your answers into a word processing program and save the file either as a Rich Text Format (.rtf), Word document (.docx or .doc) or PDF file (.pdf). Submit the file in the drop box for Lab – Medical Radiation.

Labs not submitted in the appropriate drop box or in the correct format will *not* be graded.

Report Scoring: 20 points total. Questions valued as marked.

Goals:

- To gain exposure to real medical uses of radiation
- To think critically about real medical uses of radiation
- To express oneself in a clear and concise manner

Materials Needed:

No extra materials needed - internet lab

A note from Dr. Estrada:

I'm glad to offer you this opportunity to see if nuclear medicine is right for you. With the start of the new season, we always have lots of patients with new problems. I'd like for you to act as my assistant to help me explain various procedures and techniques to the patients. Before I unleash you on the real patients, I would like you to devise a scenario that may occur to gain practice. Your task is to come up with a medical scenario that could use nuclear medicine and explain it to a few patients.

Best wishes,

S. Estrada

Background

As you have read in this Module, radioactivity can be applied in the medical field as a treatment (think chemotherapy) or as a diagnosis tool (think PET scans). Additional background information can be found in the *What is Nuclear Medicine?* brochure from the Society of Nuclear Medicine (www.snm.org). A copy of the brochure can be found on the Introduction page for this lab.

Academic Honesty Reminder

As was stated in the syllabus – “All answers must be in your own words. If you work with a lab partner, your data (numbers) may be the same, but all written responses must be done individually. If you obtain information from any outside source, it must be properly cited, and the information should be paraphrased, not directly quoted. Any question that is not answered in your own words or that is not properly cited *will cause you to receive a zero for the question.*” If your information comes from your job experience, please include a statement after your final paragraph as the citation.

Procedure

You will be creating a medical scenario in which a medical condition is diagnosed and/or treated with nuclear medicine. Your scenario must include the use of **TWO radioactive isotopes**. You may discuss the use of two for either diagnosis or treatment, or you may discuss the use one for diagnosis and one for treatment.

The style of the report is a typed transcript of your discussion with your patient. Be sure to include all aspects asked for below.

1. Pick *one* medical condition which interests you.
2. Research what nuclear medicine techniques are used with the condition. (A short list of common nuclear medicine techniques is given at the end of the lab)
3. Choose a diagnostic and/or a treatment technique, with, at a minimum, two total radioisotopes.
4. Write the scenario in which you as a medical professional are talking with the patient. Speaking at a level that a person with a high school diploma can understand, convey the following information to the patient:
 - Give an explanation of what you suspect might be wrong with the patient, including the symptoms that led you to your suspicion and a brief medical discussion of the condition. **(2 points)**
 - Explain what radiographic technique(s) and isotopes you plan on using to diagnose and/or treat the patient. Be sure describe the radioisotopes (including the type of radiation, any special equipment needed – for example imaging equipment, tell how the technique works, and explain why the technique/isotopes will be useful/helpful.) **(8 points)**
 - Explain the risks that will be associated with the radiation and how it will affect them during and after the hospital visit (i.e. will it make them sick, any adverse effects, what will be done to prevent any problems, do they have to avoid people, etc.) I will be looking for specific discussion of radiation risks – if there are none, you need to say so and explain briefly why. **(2 points)**
 - Pretend that the procedure is over and you have the results. Explain what the results are and what they mean. **(2 points)**
5. In addition to the scenario, please write another paragraph describing why you found the case you selected to be so interesting. Personal experience? Relates to your job or your aspirations? Something you always wanted to know more about? **(2 points)**

6. Remember, the style of the report is a typed transcript of your discussion with your patient. Be sure to include all aspects asked for above. If you do not have two radioactive isotopes with corresponding nuclear medicine technique(s), you will lose a large number of points. Remember to use simple terms and language to talk with a patient who may not have much medical knowledge of his or her own. You will be penalized if you exceed 1000 words. **(2 points)**
7. Finally, make sure that you cite your work! Use in-text citations to indicate all information that came from a source other than yourself. *Citations will not be part of the overall word count!* **(2 points)**

Sample Typed Transcription of a Discussion

Note: Do NOT use this as an example of an appropriate technique – your technique must use nuclear radiation AND you must be able to indicate the radioactive isotope(s) used. This example is only to indicate the format you should use.

Dr. V: Well, Sue, the symptoms you have described, pain in the right hip and difficulty walking, in conjunction with difficulty moving your right leg various directions during my exam and your history of osteoporosis, have me thinking that you may have a broken hip.

Sue: What? But I didn't fall.

Dr. V: Sue, hips can break without falling, especially with osteoporosis. I am ordering an X-ray to see if there is a break.

More on Citations

It is recommended that you use in-text citations to indicate which information comes from what source. Use numbers to cite a source (either a superscript, i.e. ¹ or italicized in parenthesis, i.e. (1)) directly after the end of the information from a particular source. If there are more than 3 sentences from the same source, you should cite at least twice (after each set of about 3 sentences).

The last page of your lab report should be a references page (titled "References"). The references should be listed in order of appearance and numbered. The number in front of the reference should correspond to the number you used in the text (it should be the same!). If you use a source multiple times, you don't need to include it in your reference list multiple times – simply reuse the reference number. You may use APA, MLA or ACS formats for references.

Some helpful references on citations & references:

- Numeric citations: http://library.leeds.ac.uk/homepage/92/numeric_citations (University of Leeds)
- Numeric citations: https://www.e-education.psu.edu/styleforstudents/c5_p12.html (Penn State)
- Citations & References: https://www.e-education.psu.edu/styleforstudents/c5_p12.html (University of Worcester)

Helpful resources

Dictionaries

Encyclopedias (such as [Encarta](#) and others)

Specialty websites (such as [WebMD](#), [Society of Nuclear Medicine](#), and others)

Textbooks from other courses you have taken

Short interviews from medical professionals

Some Typical Nuclear Medicine Techniques

Positron Emission Tomography (PET)

Single Photon Emission Computed Tomography (SPECT)

Gamma Camera/ Scintigraphic Imaging

External Radiation Therapy

Brachytherapy

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