

Program-Level Assessment: Annual Report

Program Name (no acronyms): Nuclear Medicine Technology Department: Clinical Health Sciences
Degree or Certificate Level: BS College/School: Doisy College of Health Sciences
Date (Month/Year): August 2023 Assessment Contact: Crystal Botkin

In what year was the data upon which this report is based collected? 2022-2023

In what year was the program's assessment plan most recently reviewed/updated? The current plan was reviewed/updated in July 2023.

Is this program accredited by an external program/disciplinary/specialized accrediting organization or subject to state/licensure requirements? Yes, Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)

If yes, please share how this affects the program's assessment process (e.g., number of learning outcomes assessed, mandated exams or other assessment methods, schedule or timing of assessment, etc.): As required by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT), all program level outcomes are assessed each year.

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please provide the complete list of the program's learning outcome statements and **bold** the SLOs assessed in this cycle.)

PLO #1: Students will demonstrate the Jesuit value of "Cura Personalis" as they perform diagnostic imaging procedures.

PLO #2: Students will demonstrate effective communication when speaking with both patients and other healthcare professionals in the nuclear medicine department.

PLO #3: Students will use knowledge, facts, and data to assess problems and find solutions as they relate to nuclear medicine imaging and Computed Tomography (CT) procedures.

PLO #4: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.

PLO #5: Students will exhibit professional characteristics expected of nuclear medicine technologists.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail, identify the course(s) in which they were collected, and if they are from program majors/graduates and/or other students. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

ALL NMT artifacts of student learning are from NMT program majors ONLY.

PLO #1

NMT 4700 NM Clinical Practicum I/ Critical Reflection Assignment #1

A written critical reflection assignment served as an artifact to assess this PLO. Each student is given a prompt to respond the Jesuit values and how they are reflected in the clinical setting (see Appendix for assignment prompt and grading rubric).

This course meets at clinical affiliate sites in the St. Louis Metropolitan Area.

NMT 4800 NM Clinical Practicum II / Program faculty observation during 2nd rotation clinical visits

The NMT program faculty complete a form (see appendix) for each student clinical visit during the 2nd rotation of the clinical phase of the NMT program. The form is completed based on notes, observations, and discussion with clinical preceptors about Jesuit values. In addition, the NMT program faculty use standardized questions for each topic and clinical visit to objectively assess the students on each clinical visit (see appendix). These visits occur in February each year.

This course meets at clinical affiliates sites in the St. Louis Metropolitan Area.

PLO #2

NMT 4960 Capstone in Nuclear Medicine / Capstone Presentation

The NMT capstone is a basic research assignment which includes both oral presentation and paper. The presentation portion of this assignment is used to assess this PLO (see appendix for assignment prompt and grading rubric).

This course meets on the Saint Louis Campus.

NMT 4900 NM Clinical Practicum III/Final evaluation questions regarding effective communication skills in patient interaction

The NMT program faculty conduct oral, comprehensive evaluations of each NMT student during the last month of the program. During this evaluation, the students are assessed for the ability to provide effective communication skills regarding patient interactions. These evaluations occur in April/May each year.

These courses meet at clinical affiliate sites in the St. Louis Metropolitan Area.

PLO #3

NMT 4350 Nuclear Medicine Information Systems / Case Study Project (Written)

This case study project serves as an artifact for this PLO. Each student is given an assignment prompt to evaluate an assigned case study. This assignment is used to demonstrate the ability to apply the skills and knowledge of processing and evaluating nuclear medicine exams based on the knowledge and skills learned in this course. (See Appendix for assignment prompt and assessment rubric)

This course meets on the Saint Louis Campus.

NMT 4430 Emerging Technologies / Case Study Presentation (Oral)

The presentation of interesting nuclear medicine exams is used as an artifact for this PLO. Each student is given an assignment prompt to identify 2 different nuclear medicine exams to present in class. One of the cases is assigned by the course instructor and the other is chosen by the student. The oral presentations are completed toward the end of the semester and are used to demonstrate the students' ability to build on the knowledge obtained in class, by providing "real" cases seen in the clinic and conveying knowledge to their peers in the class.

This course meets on the Saint Louis Campus.

PLO #4

NMT 4000 NMT Procedures I/ Clinical Simulation/Role-Playing

Based on the content covered in the course, the course instructor assigns each student nuclear medicine procedure(s) to portray a technologist and/or patient perspective. The assessment rubric (see Appendix) is used to guide the students on the specific areas the students must explain during the role-playing exercise. The students are paired up and provide explanation to a classmate and/or course instructor. This exercise provides the opportunity for the students to begin to translate didactic knowledge into clinical practice before beginning clinical practicum rotations.

This course meets on the Saint Louis Campus.

NMT 4340 NMT Procedures II/ Clinical Simulation/Role-Playing

Based on the content covered in the course, the course instructor assigns each student nuclear medicine procedure(s) to portray a technologist and/or patient perspective. The assessment rubric (see Appendix) is used to guide the students on the specific areas the students must explain during the role-playing exercise. The students are paired up and provide explanation to a classmate and/or course instructor. This exercise provides the opportunity for the students to continue to translate didactic knowledge into clinical practice for more advanced procedures while in the clinical practicum rotations.

This course meets on the Saint Louis Campus.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during last month of clinical practicum

The NMT program faculty conduct oral, comprehensive evaluations of each NMT student during the last month of the program. During this evaluation, the students are required to translate didactic knowledge into clinical practice.

These courses meet at clinical affiliate sites in the St. Louis Metropolitan Area.

PLO #5

NMT 4700 NM Clinical Practicum I/ Clinical visit evaluation during 1st rotation of clinical practicum

The NMT program faculty complete a form (see Appendix) for each student clinical visit during 1st rotation in the clinical phase of the NMT program. The form is completed bases on notes, observations, and discussion with clinical preceptors about professional behavior. These visits occur in Sept-Dec each year.

These courses meet at clinical affiliate sites in the St. Louis Metropolitan Area.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during the 4th rotation of clinical practicum

The NMT program faculty complete a form (see Appendix) for each student clinical visit during 4th rotation in the clinical phase of the NMT program. The form is completed bases on notes, observations, and discussion with clinical preceptors about professional behavior. These visits occur in April/May each year.

These courses meet at clinical affiliate sites in the St. Louis Metropolitan Area.

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

PLO #1

NMT 4700 NM Clinical Practicum I / Critical Reflection Assignment #1

Each of the critical reflection assignments were evaluated by the course instructor using an assessment rubric (see Appendix). The instructor provided a summary of the student scores to the program director. In addition, the program director identified students scoring ≥ 10 out of 15 **AND** providing appropriate examples of “cura personalis” in the clinic as achieving the ranking of “knowledge” or higher.

The program director then reviewed the assessment rubric contents to determine whether the rankings and descriptions are appropriate for this artifact.

NMT 4800 NM Clinical Practicum II / Program faculty observation during the 2nd rotation clinical visits

The NMT faculty collected the visit forms (see Appendix) and notes from the third rotation visits which occur in February of each year for the students enrolled in this course. The program director reviewed the data, including the pass/fail status of the visit. The comments were reviewed to assess each students’ ability to convey the concepts discussed during the visit. In addition, the program director sought comments/noted which relate to Jesuit values of “cura personalis” on each of the visit forms. If such comments were identified this was marked as achieving the ranking of “application” or higher.

PLO #2

NMT 4960 Capstone in Nuclear Medicine / Capstone Presentation

Each of the student presentations are evaluated by NMT program faculty and/or clinical preceptor(s) using an assessment rubric (see Appendix). The student presentations and evaluations took place in person during a scheduled presentation date. The NMT program director reviewed the completed evaluations and used section “D. Preparation and Presentation” on the grading rubric to assess the communication skills of the students. Per the assessment rubric of this assignment, students who score a 3 or less are not well prepared and their presentation is faulty. Therefore, the program director identified students scoring 4 or greater in this section as achieving the ranking of “application” or higher.

NMT 4900 NM Clinical Practicum III / Final evaluation questions regarding effective communication in patient interaction

The NMT program faculty conduct oral, comprehensive evaluations of each NMT student during the last month of the program. During this evaluation, the students are required to convey effective communication skills for patient interactions in the field of nuclear medicine. The NMT faculty provide a pass/fail status for this evaluation.

The development of a rubric is not yet complete. The NMT faculty are hopeful to have a rubric for assessment beginning Spring 2024.

PLO #3

NMT 4350 Nuclear Medicine Information Systems / Case Study Project (Written)

Each of the student projects were evaluated by the course instructor using an assessment rubric (see Appendix). The instructor provided a summary of the student scores to the program director. After reviewing the rubric for this assignment, the program director identified students scoring $\geq 80\%$ as achieving the ranking of “knowledge” or higher. Per the assignment rubric, a score of 80% puts the students in the category of “Complete, good detail”. Using the assessment rubric, “knowledge” ranking indicates the ability to “identify errors in an imaging study.” This course provides the first opportunity for NMT students to review imaging studies, therefore “knowledge” is an appropriate ranking.

NMT 4430 Emerging Technologies / Case Study Presentation (Oral)

Each of the student projects were evaluated by the course instructor using an assessment rubric (see Appendix). The instructor provided a summary of the student scores to the program director. After reviewing the rubric for this assignment, the program director identified students scoring $\geq 8/10$ for each case as achieving the ranking of “application” or higher. Using the assessment rubric, “application” ranking indicates the ability to “interpret data presented in an imaging case study.” This course provides the opportunity for NMT students to practice the connection of didactic knowledge with clinical practice presenting normal and abnormal nuclear medicine imaging cases and identifying why each case is a such, therefore “application” is an appropriate ranking.

PLO #4

NMT 4000 NMT Procedures I / Clinical Simulation/Role Playing

Each of the student projects were evaluated by the course instructor using an assessment rubric (see Appendix). The instructor provided a summary of the student scores to the program director. After reviewing the rubric for this assignment, the program director identified students scoring $\geq 11/15$ as achieving the ranking of “knowledge” or higher. Using the assessment rubric, “knowledge” ranking indicates the ability to “recall facts and theories relating to nuclear medicine technology.” This course provides the first opportunity for NMT students to practice the connection of didactic knowledge with clinical practice by simulating the technologist/patient roles, therefore “knowledge” is an appropriate ranking.

NMT 4340 NMT Procedures II / Clinical Simulation/Role Playing

Each of the student projects were evaluated by the course instructor using an assessment rubric (see Appendix). The instructor provided a summary of the student scores to the program director. After reviewing the rubric for this assignment, the program director identified students scoring $\geq 12/15$ as achieving the ranking of “application” or higher. Using the assessment rubric, “application” ranking indicates the ability to “relate facts and theory to the practice of nuclear medicine technology.” This course provides the second opportunity for NMT students to practice the connection of didactic knowledge with clinical practice by simulating the technologist/patient roles, therefore “application” is an appropriate ranking.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during 4th rotation of clinical practicum

The NMT program faculty conducts oral, comprehensive evaluations of each NMT student during the 4th rotation of the clinical practicum. During this evaluation, the students are required to translate didactic knowledge into clinical practice. The NMT faculty use a pass/fail status for this evaluation.

The development of a rubric is not yet complete. The NMT faculty are hopeful to have a rubric for assessment beginning Spring 2024.

PLO #5**NMT 4700 NM Clinical Practicum I / Clinical visit evaluation during the 1st rotation of clinical practicum**

The NMT faculty collected the visit forms (see Appendix) and notes from the first rotation visits which occur in February of each year for the students enrolled in this course. The program director reviewed the data, including the pass/fail status of the visit. The comments were reviewed to assess each students' ability to convey the concepts discussed during the visit. In addition, the program director sought comments/noted which relate to professional characteristics on each of the visit forms. If such comments were identified this was marked as achieving the ranking of "application" or higher.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during the 4th rotation of clinical practicum

The NMT faculty collected the visit forms (see Appendix) and notes from the first rotation visits which occur in February of each year for the students enrolled in this course. The program director reviewed the data, including the pass/fail status of the visit. The comments were reviewed to assess each students' ability to convey the concepts discussed during the visit. In addition, the program director sought comments/noted which relate to professional characteristics on each of the visit forms. If such comments were identified this was marked as achieving a ranking of "synthesis."

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

PLO #1**NMT 4700 NM Clinical Practicum I / Critical Reflection Assignment #1**

An average of >85%, 8/8 (100%) of the NMT students scored $\geq 10/15$ on the critical reflection assignment. This was after the course instructor gave the students the opportunity to rewrite their reflection based on instructor feedback.

In digging deeper, the program director reviewed the examples of "cura personalis" and found that indeed all students could appropriately identify aspects of this Jesuit value. However, they missed points in other areas, for example, "incorporate perspectives" and "future impact."

The target was met for this artifact. The NMT program faculty will evaluate the need to increase the required score in future years if warranted.

NMT 4800 NM Clinical Practicum II / Program faculty observation during 2nd rotation clinical visits

An average of >85%, 8/8 (100%) of the NMT students did identify aspects of the Jesuit value "cura personalis" during their clinical visit with NMT faculty.

After this assessment review cycle, the program director did confirm that NMT faculty made notes on the visit form about aspects of "cura personalis" discussed with the student and clinical supervisors. Although the specific "cura personalis" term may not have been used, other terms, such as, "technologists are helpful", "student is good with patients" were noted. A question regarding the identification of "cura personalis" is part of the standardized questions that are used by NMT program faculty when visiting students in the clinic.

The target was met for this artifact.

PLO #2**NMT 4960 Capstone in Nuclear Medicine / Capstone Presentation**

An average of >85%, 8/8 (100%) of the students scored ≥ 4 in section D. Preparation and Presentation of the assessment rubric.

The target was met for this artifact. The target was not met last year due to small cohort numbers, but has trended back up, therefore no changes will be made at this time. NMT program faculty will continue to monitor this to look for trends in the future.

NMT 4900 NM Clinical Practicum III / Final evaluation questions regarding effective communication in patient interaction

An average of 100% (8/8) of the students could convey effective communication skills for patient interactions in the field of nuclear medicine. This fact is based on patient care and communication questions asked by the NMT faculty member who performed the oral evaluation.

The benchmark was met for this artifact. The NMT faculty used standardized patient care and communication-based questions (see appendix) which were chosen randomly for the student to respond to during the final evaluation. The faculty member who performed the final evaluation made notes on the observations and appropriate responses of the student.

PLO #3**NMT 4350 Nuclear Medicine Information Systems / Case Study Project (Writing Based)**

The students are paired up for this project. Therefore, there were 4 groups of students, hence the difference in the numbers from previous data.

An average of >85%, 4/4 (100%) of the students received score of $\geq 80\%$ ranking of "knowledge" or higher. Deficient areas identified by the instructor were in text citations and normal and abnormal organ function. One group of students received 80% and had additional deficient areas identified including the section on augmented drugs. This information will be considered and shows areas which may be improved upon for the next time the course is offered.

The students are paired up for this project. Therefore, there were 4 groups of students, hence the difference in the numbers from previous data.

NMT 4430 Emerging Technologies / Case Study Presentation (Presentation Based)

An average of <85%, 8/8 (100%) of the students received a score of $\geq 8/10$ and achieved a ranking of "application" or higher.

The program target was met for this artifact. The NMT program faculty are evaluating the rubric and prompts for this assessment. Areas have been identified to add/change to make the assessment more meaningful and add an item related to CT imaging to the rubric for the Spring 2024 offering of this course. This will meet a new JRCNMT accreditation standard which went into effect August 2022.

PLO #4**NMT 4000 Nuclear Medicine Procedures I / Clinical Simulation/Role Playing**

An average of >85%, 8/8 (100%) of the students received a score of $\geq 11/15$ and achieved a ranking of "application" or higher. Although the benchmark was met, 3/8 (38%) of the students failed to introduce themselves or provide proper identification of the patient during this exercise.

This exercise is developmental in nature and allows the students the opportunity to simulate the connection of didactic knowledge in the clinical setting. The course instructor spends time with each student reviewing the areas of weakness through the grading process. In addition, the students do not have to opportunity to complete this exercise again for the same nuclear medicine exam, therefore, progress within this course is not feasible. Progress should be noted from this course to NMT 4340 NM Procedures II, then finally NMT 4900 NM Clinical Practicum III where the PLO is measured once again, and a high ranking is expected.

The benchmark was met for this artifact. The NMT students have consistently met or exceeded the benchmark. Evaluation of raising the benchmark will be considered within the next assessment cycle.

NMT 4340 Nuclear Medicine Procedures II / Clinical Simulation/Role Playing

An average of >85%, 8/8 (100%) of the students received a score of $\geq 12/15$ and achieved a ranking of “application” or higher.

This is the second time this exercise has been done to evaluate the students in the connection of didactic knowledge in the clinical setting. The course instructor spends time with each student reviewing the areas of weakness through the grading process. Progress should be noted for this course from NMT 4000 where the PLO was measured, and a higher ranking is expected. All students received full points for introducing themselves and properly identifying the patient, which is an improvement on the evaluation in the previous course.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during 4th rotation of the clinical practicum

An average of >85%, (8/8) (100%) of the students could translate didactic knowledge into clinical practice in nuclear medicine. This fact is based on the passing option given by the NMT faculty member who performed the oral evaluation. Progress to “synthesis” level should be noted for this course from NMT 4340 where the PLO was measured and second time, and the highest ranking of “synthesis” is expected. As the students are completing the NMT program, the clinical visits in the 4th rotation are assessed using case-based competencies through standardized questions. Currently, a “passing” grade indicates the “synthesis” ranking and the visit notes indicate the students are ready to be an entry-level technologist and complete their certification process.

The benchmark was met for this artifact.

The NMT faculty used standardized questions to evaluate the translation of didactic knowledge to clinical practice with all students. The development of a rubric is not yet complete. The NMT faculty are hopeful to have a rubric for assessment beginning Spring 2024.

PLO #5

NMT 4700 Clinical Practicum I / Clinical visit evaluation during 1st rotation of clinical practicum

An average of >85%, (8/8) (100%) of the students did identify examples of professional characteristics during the clinical visit with NMT faculty.

After this assessment review cycle, the program director confirmed that NMT faculty made notes on the visit form about aspects of professional characteristics discussed with the student and clinical supervisors. The following comments were noted on the visit form and identify professional characteristics, “student is catching on quickly”, “student is willing to jump in” and “student is good with patients” were noted.

The program used the specific question to the visit form to ensure proper documentation.

The benchmark was met for this artifact. The target was met for this artifact. The NMT program faculty will evaluate the need to increase the benchmark in future years if warranted.

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during 4th rotation of clinical practicum

An average of >85%, (8/8) (100%) of the students did identify examples of professional characteristics during the clinical visit with NMT faculty.

The NMT faculty used standardized questions to evaluate the translation of didactic knowledge to clinical practice with all students.

The program director confirmed that NMT faculty made notes on the visit form about aspects of professional characteristics discussed with the student and clinical supervisors. The following comments were noted on the visit form and identify professional characteristics, “student is ready to work”, “student feels like they are competent in many nuclear medicine procedures”, “I would hire this student” were noted.

The benchmark was met for this artifact. The NMT program faculty will evaluate the need to increase the benchmark in future years if warranted.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you? Address both a) learning gaps and possible curricular or pedagogical remedies, and b) strengths of curriculum and pedagogy.

PLO #1

Critical Reflection Assignment #1

The writing prompt and example provided to the students has been helpful in specifically identifying the students’ knowledge of the Jesuit value “cura personalis”. Consideration of increasing the score required to meet benchmark will be evaluated by NMT program faculty, as the current score is consistently met.

Faculty Observation during the 2nd rotation clinical practicum

The standardized questions used by NMT faculty assists in consistently noting “cura personalis” by the student and/or clinical supervisors in the clinical setting. Therefore, this artifact shows progression into the ranking of “application” or higher as outlined in the attached rubrics.

PLO #2

Capstone in Nuclear Medicine Presentation

The analysis of the results from this artifact, the assignment prompt and rubric have provided the students ample information to complete the capstone presentation as expected at this point in the NMT program. The NMT faculty and clinical preceptors work together to ensure the students have ample projects and understanding of the desired outcomes of this assignment and how it relates to the clinical setting.

Final evaluation questions regarding communication in patient interaction

The NMT curriculum change, and standardized questions have afforded the opportunity to measure this artifact more consistently. However, the development of rubric to assist with removing subjectivity is in progress. The NMT faculty anticipate the use of such rubric by the next assessment cycle.

PLO #3

Case Study Project (Writing Based)

The analysis of the data has shown that the assessment rubrics used to grade the assignments used in this PLO are appropriate. In addition, the course instructor will try to identify ways to pinpoint the in-text citations, normal and abnormal organ function as well as augmented drugs and provide additional instruction and support for the students in these areas.

Case Study Presentation (Presentation Based)

The results of this artifact show that the students have ample information to provide the necessary information about the cases they are presenting. However, as the field of nuclear medicine continues to change and grow, new areas are identified to include as part of the case study artifact. The NMT program faculty are evaluating the rubric and prompts for this assessment. Areas have been identified to add/change to make the assessment more meaningful and add an item related to CT imaging to the rubric for the Spring 2024 offering of this course. This will meet a new JRCNMT accreditation standard which went into effect August 2022.

PLO #4

Clinical Simulation/Role-Playing

The analysis of the results from this artifact, the assignment prompt and rubric have provided the students ample information to complete the clinical simulation exercise as expected at this point in the NMT program. The new NMT curriculum, which commenced during the 2022-2023 academic year, has provided additional opportunities for NMT students to complete additional clinical simulation exercises. This provided insight to the progression of knowledge and synthesis of clinical application of didactic knowledge. The students are not evaluated 3 times throughout the NMT curriculum.

Clinical visit evaluation during the 4th rotation of clinical practicum

The purpose of the clinical visits is to provide program faculty evidence of the student's ability to connect didactic knowledge to clinical practice through their experiences in the clinic. The standardized questions used for clinical visits have been deemed useful in consistent student evaluations and documentation by NMT faculty. The standardized questions will be monitored continuously to adapt to the ever-changing field of nuclear medicine as it applies to didactic and clinical education of the SLU NMT students.

PLO #5

Clinical visit evaluation during the 1st rotation of clinical practicum AND Clinical visit evaluation during 4th rotation of clinical practicum

The analysis of these artifacts is less subjective with the development and use of standard questions which are asked of every student during their visit based on the topic discussed. Progressive terms/comments were identified and show progression from "application" to "synthesis". The need for rubrics is being assessed by the NMT faculty and will be implemented for the next assessment cycle if deemed necessary.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss the results and findings from this cycle of assessment?

Discussions between the NMT program director and program faculty were had during the data collection and analysis of all PLO's and the data associated with them. The report was reviewed and discussed by the NMT faculty prior to submission of the annual report in August 2023. The NMT

program director and faculty worked together to adjust the NMT assessment plan based on the reorganization of artifacts during final course development for the new curriculum and courses.

This assessment report and updated plan are also shared with the NMT Advisory committee at our annual meeting in August.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies

- Course content
- Teaching techniques
- Improvements in technology
- Prerequisites
- Course sequence
- New courses
- Deletion of courses
- Changes in frequency or scheduling of course offerings

Changes to the Assessment Plan

- Student learning outcomes
- Artifacts of student learning
- Evaluation process
- Evaluation tools (e.g., rubrics)
- Data collection methods
- Frequency of data collection

Please describe the actions you are taking as a result of these findings.

This is the first assessment cycle with the new plan and adjustments have already been made to accommodate the changes in the field of nuclear medicine, accreditation requirements and the swapping of assessments within new NMT courses. The NMT program director and faculty will continue to discuss potential additions and changes to the assessment PLO's, artifacts, and rubrics within the NMT courses. The updated plan is included in the assessment materials submitted.

If no changes are being made, please explain why.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years as a result of previous assessment data?

Th use of standardized questions for clinical visits has been deemed useful for more objective evaluation of the clinical visits. Continuing to monitor course specific assessments, adjusting to accreditation requirements, and the continual change that occurs in the field of nuclear medicine.

B. How has the change/have these changes identified in 7A been assessed?

The NMT faculty had detailed discussions and the adjustment of assessments within courses during final development met their purpose and could be properly assessed.

C. What were the findings of the assessment?

PLO #5

Clinical visit evaluation during the first 2 months of clinical practicum AND Clinical visit evaluation during 7 months of clinical practicum

There is a need for a rubric for the final evaluation which occurs in the 4th rotation of the clinical practicum and will be used during the next assessment cycle.

D. How do you plan to (continue to) use this information moving forward?

Moving forward, the NMT program will continue to evaluate all five PLO's each assessment cycle, as required by the NMT program accreditation agency, the Joint Review Committee on Nuclear Medicine Technology Education Programs (JRCNMT). The assessment process and outcomes will be used in to inform changes within the courses and the overall NMT program. The NMT assessment plan and report are also shared with the NMT advisory committee to provide discussion and input from the committee regarding changes to the NMT program curriculum and its courses.

IMPORTANT: Please submit any assessment tools (e.g., artifact prompts, rubrics) with this report as separate attachments or copied and pasted/appended into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document. Thank you.

Artifact Descriptions and Rubrics for PLO 1

PLO #1

NMT 4700 Clinical Practicum / Critical Reflection Assignment #1

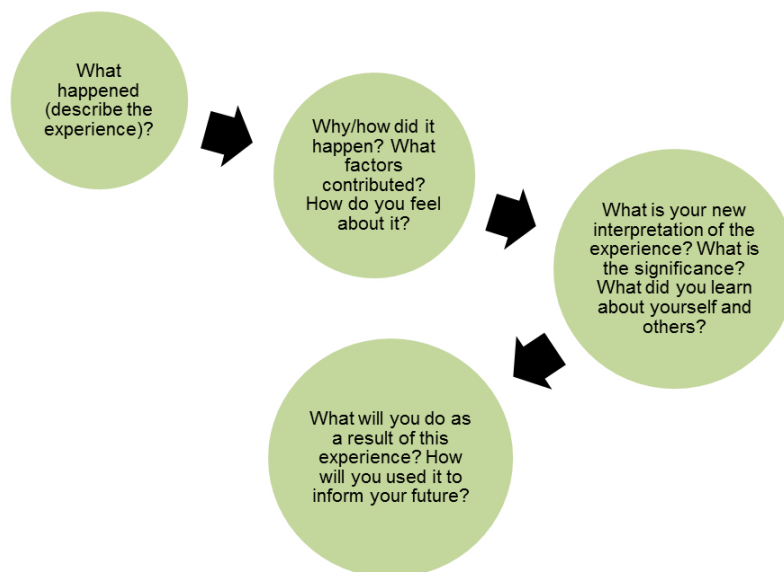
A written critical reflection assignment served as an artifact to assess this PLO. Each student is given a prompt to respond the Jesuit values and how they are reflected in the clinical setting.

SAINT LOUIS UNIVERSITY

Nuclear Medicine Technology Program

Critical Self-Reflection Journaling Assignment

Critical self-reflection refers to the most important learning experience. It means reassessing the way we have posed problems, our own meaning perspectives, and reassessing our own orientation to perceiving, knowing, believing, feeling, and acting.



As another form of communication between faculty and student, NMT students are required to make regular written comments and reflections on experiences in the clinical areas in a critical reflection/journal entry. **The student is required to turn in one entry per rotation.** These reflections are to describe experiences in the clinic. They are not designed to be written about personal topics or issues.

The entries should be uploaded to Canvas by 5pm on the due date found in eValue Program Calendar.

Entries are to be 1-2 pages in length. Please use template provided on Canvas to type these entries. They should be singled spaced and in 14pt Arial font.

Prompts for each critical reflection:

Rotation #1: Due 11/28/2022

Jesuit values

What are the Jesuit Values?

How have you seen “Cura Personalis” reflected in the clinical setting?

These entries should NOT be written during clinical time.

These entries will not be shared with the clinical personnel.

Critical Self-Reflection Journal Form

Student Name:

Date:

Rotation:

Clinical Site:

Critical Self-Reflection Journal Form/Rubric

Student Name:

Date:

Rotation:

Clinical Site:

	0- Beginner	1-Developing	2-Accomplished	3-Advanced
Identifies and Summarizes Issue(s) <input type="checkbox"/>	Does not identify or summarize issue(s).	Minimally identifies and summarizes issue(s).	Identifies and summarizes issue(s). Explores some aspects of the issue(s).	Identifies and summarizes issue(s) comprehensively. Explores all aspect of the issue(s).
Gathers facts and evidence related to issue(s) <input type="checkbox"/>	Only uses facts or evidence present at the onset of the issue. Does not seek out additional information. Considers all information as factual.	Seeks and gathers minimal information related to issue from one or fewer sources, or inappropriate sources. Understands the difference between facts and opinions.	Seeks and gathers ample additional information from a variety of sources. Seeks both facts and opinions.	Generates comprehensive set of facts/evidence based information from a variety of sources. Distinguishes between facts and opinion when presenting evidence
Incorporates perspectives <input type="checkbox"/>	Does not consider the other points of view when approaching issue(s)	Approaches issue(s) based off of personal perspective and majority/popular points of view	Approaches issue(s) based off of other people's perspectives and consulting a few resources	Utilizes all resources and perspectives available when approaching issue(s)
Draws Conclusions <input type="checkbox"/>	Does not draw conclusions or formulates conclusions inconsistent with evidence and perspectives	Formulates some conclusions consistent with some evidence but lacking in depth and scope	Formulates conclusions consistent with most evidence	Formulates conclusions consistent with a wide range of evidence
Identifies impact on future <input type="checkbox"/>	Does not identify implications or consequences to self or others. Does not acknowledge impact of issue on future.	Identifies implications and consequences of issue(s) to self. Identifies potential effect on future.	Identifies implications and consequences of issue(s) to self and others. Identifies concrete examples of change in future.	Comprehensively identifies implications and consequences of issue(s) to self and others and makes connections to specific ways in which the future will be affected.
Total:				

Nuclear Medicine Technology

Critical Self-Reflection Grading Rubric

	0- Beginner	1-Developing	2-Accomplished	3-Advanced
Identifies and Summarizes Issue(s) <div style="border: 1px solid black; width: 20px; height: 20px; text-align: center; margin: 5px auto;">3</div>	Does not identify or summarize issue(s).	Minimally identifies and summarizes issue(s).	Identifies and summarizes issue(s). Explores some aspects of the issue(s).	Identifies and summarizes issue(s) comprehensively. Explores all aspect of the issue(s).
Gathers facts and evidence related to issue(s) <div style="border: 1px solid black; width: 20px; height: 20px; text-align: center; margin: 5px auto;">2</div>	Only uses facts or evidence present at the onset of the issue. Does not seek out additional information. Considers all information as factual.	Seeks and gathers minimal information related to issue from one or fewer sources, or inappropriate sources. Understands the difference between facts and opinions.	Seeks and gathers ample additional information from a variety of sources. Seeks both facts and opinions.	Generates comprehensive set of facts/evidence based information from a variety of sources. Distinguishes between facts and opinion when presenting evidence
Incorporates perspectives <div style="border: 1px solid black; width: 20px; height: 20px; text-align: center; margin: 5px auto;">3</div>	Does not consider the other points of view when approaching issue(s)	Approaches issue(s) based off of personal perspective and majority/popular points of view	Approaches issue(s) based off of other people's perspectives and consulting a few resources	Utilizes all resources and perspectives available when approaching issue(s)
Draws Conclusions <div style="border: 1px solid black; width: 20px; height: 20px; text-align: center; margin: 5px auto;">3</div>	Does not draw conclusions or formulates conclusions inconsistent with evidence and perspectives	Formulates some conclusions consistent with some evidence but lacking in depth and scope	Formulates conclusions consistent with most evidence	Formulates conclusions consistent with a wide range of evidence
Identifies impact on future <div style="border: 1px solid black; width: 20px; height: 20px; text-align: center; margin: 5px auto;">2</div>	Does not identify implications or consequences to self or others. Does not acknowledge impact of issue on future.	Identifies implications and consequences of issue(s) to self. Identifies potential effect on future.	Identifies implications and consequences of issue(s) to self and others. Identifies concrete examples of change in future.	Comprehensively identifies implications and consequences of issue(s) to self and others and makes connections to specific ways in which the future will be affected.
Total: 13 /15				

How about people outside of NMT in the hospital? What do they do or experiences you have seen? How about family members or other caregivers?

Also, do you think this will change and grow as you continue to learn more? Do you think you will ever 'master' this level of patient care?

Site Visitor's Report

(Question 2)

Site Visitor Comments	
Assessment of student's progress and performance:	<p>Rotation: 2023 Rot 2 Week 8 Evaluator: Sarah Frye Time Period: 2023 Rot 2 Week 8 Toni stated that Hannah is doing a good job and has no recommendation for her right now.</p>
	<p>Rotation: 2023 Rot 3 Week 6 Evaluator: Sarah Frye Time Period: 2023 Rot 3 Week 6 Ejda stated that Hannah is doing well. She is catching on well and does a good job talking with patients.</p>
Competency Evaluation:	<p>Rotation: 2023 Rot 2 Week 8 Evaluator: Sarah Frye Time Period: 2023 Rot 2 Week 8 Hannah did a great job discussing Instrumentation and Renals. She answered all the standard visit questions plus several more.</p>
	<p>Rotation: 2023 Rot 3 Week 6 Evaluator: Sarah Frye Time Period: 2023 Rot 3 Week 6 Hannah did well discussing PET, radiopharmacy, and radiation safety. She was able to answer all the standard visit questions plus several more.</p>
Recommendations for next visit:	<p>Rotation: 2023 Rot 2 Week 8 Evaluator: Sarah Frye Time Period: 2023 Rot 2 Week 8 (1) PET - this includes PET instrumentation, PET radiopharmaceuticals, and CT in the capacity of PET/CT (2) Radiopharmacy / Radiation Safety - this encompasses both subjects mostly how they overlap - think signage, dose limits, packages, QC, regulations, dosimetry, and similar. Will I ask about stuff from either topic - yes - but this will be broad topics. So, for example, will I ask about making radiopharmaceutical kits - yes - but only one or two from what we learned.</p>
	<p>Rotation: 2023 Rot 3 Week 6 Evaluator: Sarah Frye Time Period: 2023 Rot 3 Week 6 The next visit is the group visit on SLU's campus. Sarah will email with instructions about 1 week prior to this visit. It will most likely require the students to come prepared with questions they have for their instructors in order to be ready for that final visit.</p>

Site Visit Grading (Question 3)

Student brought books and organized notes for visit.

NO	YES
0	>> 1.00 << 2

Count: 2	Non-Zero Count: 2	Average: 1.00	Std Deviation: 0.00	Min: 1.00	Max: 1.00
Answer Value	Answer Choices	Answer Count	Percent of All Answers		
0	NO	0	0.00%		
1	YES	2	<div style="width: 100%; height: 10px; background-color: green;"></div> 100.00%		
2		0	0.00%		


Student was able to locate information in notes and/or books. (Question 4)

NO	YES
0	>> 1.00 << 2

Count: 2	Non-Zero Count: 2	Average: 1.00	Std Deviation: 0.00	Min: 1.00	Max: 1.00
Answer Value	Answer Choices	Answer Count	Percent of All Answers		
0	NO	0	0.00%		
1	YES	2	<div style="width: 100%; height: 10px; background-color: green;"></div> 100.00%		
2		0	0.00%		


Student was prepared to discuss any exams they had observed, participated or performed. (Question 5)

NO	YES
0	>> 1.00 << 2

Count: 2		Non-Zero Count: 2		Average: 1.00		Std Deviation: 0.00		Min: 1.00		Max: 1.00	
Answer Value	Answer Choices	Answer Count	Percent of All Answers								
0	NO	0	0.00%								
1	YES	2	 100.00%								
2		0	0.00%								


Student illustrates understanding of exams discussed. (Question 6)

NO	YES	
0	>> 1.00 <<	2

Count: 2		Non-Zero Count: 2		Average: 1.00		Std Deviation: 0.00		Min: 1.00		Max: 1.00	
Answer Value	Answer Choices	Answer Count	Percent of All Answers								
0	NO	0	0.00%								
1	YES	2	 100.00%								
2		0	0.00%								

Student's eValue record is up to date. (Question 7)

NO	YES	
0	>> 1.00 <<	2

Count: 2		Non-Zero Count: 2		Average: 1.00		Std Deviation: 0.00		Min: 1.00		Max: 1.00	
Answer Value	Answer Choices	Answer Count	Percent of All Answers								
0	NO	0	0.00%								
1	YES	2	 100.00%								
2		0	0.00%								

Pass/Fail Site Visit Grade


(Question 8)

Did this student complete 4 of the 5 items above?

If so, mark: PASS

If not, mark: FAIL

FAIL	PASS	
0	>> 1.00 <<	2

Count: 2		Non-Zero Count: 2		Average: 1.00		Std Deviation: 0.00		Min: 1.00		Max: 1.00	
Answer Value	Answer Choices	Answer Count	Percent of All Answers								
0	FAIL	0	0.00%								
1	PASS	2	 100.00%								
2		0	0.00%								

Additional comments? (Question 9)

Rotation: 2023 Rot 2 Week 8
 Time Period: 2023 Rot 2 Week 8
 We also discussed jobs, time off, resumes, and research. Keep up the good work, Hannah.
 Evaluator: Sarah Frye

Rotation: 2023 Rot 3 Week 6
 Time Period: 2023 Rot 3 Week 6
 We discussed a little bit about our personal lives, the rest of the semester, applying for jobs, and what is next.
 Evaluator: Sarah Frye

Saint Louis University
Nuclear Medicine Technology Program Site Visit Required Questions
Topic: Bone Scans

Student: _____

Clinical site: _____

Date: _____

1. What is the prep for a whole body bone scan?

2. What are the indications for doing a whole body bone scan? What are the indications for doing a 3-phase bone scan?

3. What radiopharmaceutical(s) are injected for a general nuclear medicine bone scan? What radiopharmaceutical(s) are injected for a PET bone scan? Add what is the method of localization?

4. What does 'SPECT' stand for? Discuss the pros and cons of a SPECT bone scan?

5. What is the main reason (or a few of the main reasons) for doing a 3-phase bone scan? What do all the images show if a bone scan is positive in a 3-phase bone scan?

Only need to ask these questions ONCE per visit:

- A. Ask for a response to the following statement of ALL students:
Give an example of how you portray “cura personalis” in the clinical setting.

- B. Complete a visit form including evidence of effective communication (i.e. How does the student explain the particular exam to the patient?) and understanding of “cura personalis” in the details of the form.
(Give thought to the level of communication and understanding of “cura personalis” based on when this visit is done. i.e. Rotation 1 vs. Rotation 4)

I confirm that the student answered these questions appropriately. Any questions or concerns about these questions was discussed and addressed with the student during this visit.

PD and/or CC Signature	PD and/or CC Printed Name	Date
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- C. **Ask for a response to the following statement of ALL students:**
Give an example of how you portray “cura personalis” in the clinical setting.

- D. **Choose at least 3 others from the list below to assess patient communication in the clinical setting.**
(Pay attention to eye contact, confidence, and response to consider students ability to communicate effectively as an entry-level technologist)

- E. **Complete a visit form including evidence of effective communication and understanding of “cura personalis” in the details of the form.**
(give thought to the level of communication and understanding of “cura personalis” based on this being the FINAL assessment)

NMT Artifact Descriptions and Rubrics for PLO 2

PLO #2

NMT 4960 Capstone in Nuclear Medicine / Capstone Presentation

The NMT capstone is a basic research assignment which includes both oral presentation and paper. The presentation portion of this assignment is used to assess this PLO (see Appendix for assignment prompt and grading rubric).

NMT Student Presentations and Papers

When: TDB

Time: 1:30 PM

Where: DCHS

Each student is to write a 4-5 page paper (cover the topic) and also summarize the paper in a **10-15 minute** presentation on the above date. **Papers are not to be read!** The audience assembled for the paper presentation will be the clinical supervisors and physicians from each of the affiliated hospitals. Students should dress business casual for the presentation. **PowerPoint's must be submitted to Crystal Botkin by TBD, 2023.**

Topics should not be a rehashing of what was presented during the first semester. The topics should include some form of **investigative research** related to nuclear medicine technology. The topic should be of interest to you. Topics will be assigned on a first come, first serve basis. No topic will be duplicated. You must clear your topic through Crystal Botkin before charging ahead with your research. Please confirm your topic by March 2023.

PowerPoint or Prezi should be utilized to get your points and ideas across. Please be prepared to answer questions by our audience. Your ability to convey your knowledge of the approved topic will be considered in the grading process. Handouts are suggested and work should be your own. Papers should be typed and include any references and bibliographies. The format of the papers is not dictated. Many students choose to write in journal article format.

Any questions please contact Crystal Botkin at 977-8592.

NMT INVESTIGATIVE PAPERS SCORE SHEET

STUDENT: _____

Paper should be investigative; with the student gathering data, analyzing it and coming to a conclusion. If the paper is informative only, take points off. Length should be 4-5 pages and should have a bibliography. If no bibliography, no research was done – take points off.

Did writer define objective of paper? 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Adequate research done 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Was the paper investigative? 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Was data documented? 1 2 3 4 5 6 7 8 9 10

Was rationale based on data collected? 1 2 3 4 5 6 7 8 9 10

Was conclusion based on data? 1 2 3 4 5 6 7 8 9 10

Grammar / punctuation / neatness 1 2 3 4 5

Length of paper 1 2 3 4 5

Bibliography 1 2 3 4 5

Overall interest of subject 1 2 3 4 5 6 7 8 9 10

Comments:

Total Score: _____

NMT Student Capstone Presentation Evaluation:

1) Note: scoring methodology: Grade on criteria as indicated below, from 5 to 1. Use whole numbers.

2) **Scoring is as follows: 5 = excellent; 4 = very good; 3 = good or average; 2= below average, 1 = poor.**

3) Evaluation categories below are listed in descending merit: 5 is highest, 1 is least.

A. Project, global:

5 Project was a basic or primary scientific analysis of a subject important to nuclear medicine performed using background, hypothesis, methods, data acquisition, analysis, discussion, conclusion.

4 Project involved data gathering or surveys and involved analysis, but lacked one or more of background, hypothesis, methods, data acquisition, analysis, discussion, conclusion.

3 Subject examined in only a descriptive manner, but discussed new methods or materials AND subject is relevant to nuclear medicine.

2 Subject was a review of previous material familiar to the audience.

1 Subject had little relevance to nuclear medicine and of little merit.

6 Content:

5 Excellent scientific paper, student demonstrates good understanding of nuclear medicine science. Has hypothesis/premise, methods, results, analysis, conclusion, all with good merit.

4 Project reflects an understanding of science of nuclear medicine, has a good knowledge of the subject, presentation has hypothesis (or premise), methods, results, analysis, conclusion.

3 Project shows some understanding of subject matter relevant to nuclear medicine, but only average in respect to methods, results, analysis, conclusion.

2 Project has minimal relationship to nuclear medicine science, had minimal discussion or analysis hence, minimal understanding of subject matter.

1 No discernable science presented, little understanding of nuclear medicine science, little or no discussion or analysis or rational conclusion.

7 Scientific Merit

5 Project is of significant scientific merit and worthy of submission for publication.

4. Project shows good merit, but lacks in complete novelty. Yet, worthy of presentation at a local or regional meeting.

3. Project demonstrates some originality and attempt at discovery, but somewhat lacks in its achievement due to effort or complexity of subject.

2 Project was a good idea at the start, but failed to achieve its goals and better luck next time.

1 Project unoriginal, generally plagiarized, lacking rational thought and best kept in a locked file.

D. Preparation and Presentation

5 Student is well-prepared, understands the subject matter, focused on the relevant material.

4 Student is prepared but presentation is weak, i.e. rushed, too jocular, marginally educates audience.

3 Student is somewhat prepared but presentation is faulty (slides out of order, computer problems).

- 2 Presentation is marginal, subject matter obscure, images not relevant, audience restless and confused.
- 1 Presentation put together with minimal effort, material uncoordinated, slides show unorganized.

ChatGPT and its Current Use in Nuclear Medicine

Jacob Hamblen

Saint Louis University

NMT 4910

Sarah Frye

Abstract

Artificial intelligence language models are a type of machine learning algorithm that is specifically designed to understand and generate human language. They have been integrated in our lives whether realized or not. For example, Siri and Alexa, commonly known from Apple products and Amazon products respectively, use language models to interpret our words, and shape them into actions. ChatGPT is an AI language model developed by OpenAI for various applications, including patient education in nuclear medicine (NM). The AI system was used to evaluate the responses around NM questions and procedures for both patients and physicians. The objective of using the current state of AI is to see where the limitations of the system are, and what part of the patient care experience is better suited to help physicians and patients alike to make the most informed decisions possible. The results showed that ChatGPT excelled in giving information about NM procedures for patients. However, the language model's usefulness is limited for physicians as its diagnosis was typically very close to what the physician diagnosed the patient with but not confident enough to use it for physician consultation. Nevertheless, ChatGPT or other secure medical-specific AI language models will shape healthcare in unison with physicians in the upcoming years as more data is available to train the systems.

Introduction

ChatGPT is an artificial intelligence (AI) language model developed and launched by OpenAI in 2022, giving human-like responses and interactions to the user.¹ It was created for many applications, from creating apology letters and recipes for food to more specific questions such as “What is the patient's outlook with elevated troponin levels and a normal ECG?” In the context of nuclear medicine (NM), it has the potential to be used as an assistant for the patient to know the details of their exam and answer any questions about it. Current questions patients have been typically asked on WebMD, a health information website that gives access to articles and news for medical conditions.² The language model used in ChatGPT is like human text and is comparable to WebMD’s information to patients. ChatGPT also has potential in physician-asked questions; used in unison with the physician's own opinion to create a better outlook for the patient's care when doing a NM study. As the chatbot is updated over time, the applications will continue to grow. The objective of using the current state of AI is to see where the limitations of the system are, and what part of the patient care experience is better suited to help physicians and patients alike to make the most informed decisions possible.

Methods

As part of this research, the AI system was used to qualitatively evaluate the responses around NM questions and procedures. For the physician and technologist perspective, ChatGPT was given a case study involving a NM procedure. With the information given, the AI was prompted to come up with a diagnosis. Its answer was then qualitatively compared to the physician’s diagnosis and outlook. For the patients’ side of healthcare, ChatGPT was asked to explain NM procedures and preparations for a VQ scan, a myocardial perfusion study (MPI), and a bone scintigraphy. WebMD was used to compare versus ChatGPT for common information given about NM procedures.

Results

Prompt to ChatGPT- VQ Scan: “A 26-year-old Caucasian man with no history of disease was admitted to Gazi University Emergency Department after he had a syncopal episode in his home. The patient was in his usual good state of health until he suddenly collapsed while standing and lost consciousness for approximately five minutes. He recovered spontaneously but was extremely weak and dyspneic. He was also diaphoretic and tachypneic, but denied any associated chest pain or palpitations. No tonic-clonic activity was witnessed, and he experienced no incontinence. The patient was a computer programmer and he had been working 18 hours a day without rest periods for a month. On admission, physical examination revealed a diaphoretic and dyspneic patient without focal neurologic findings. His heart rate was regular but tachycardic at 128 beats/minute, his blood pressure was 126/72 mmHg without orthostatic changes, and his respiratory rate was 32 breaths/minute. The room air oxygen saturation was 90%, and arterial blood gas analysis in room air revealed hypoxemia ($PO_2 = 58$ mmHg) with an elevated alveolar-arterial oxygen gradient (A-a O_2 gradient). Examination of his head and neck was normal. The results of chest wall examination revealed reduced breath sounds bilaterally at the lung bases. The findings of heart and abdominal examinations were unremarkable, but on examination of his legs, deep venous thrombosis (DVT) was noted in his left leg, with a positive Homans' sign in the left leg and the left calf measured 3 cm more than the right one. Levels of serum electrolytes, glucose, blood urea and creatinine, and complete blood counts were normal. Results of a computed tomographic scan of his head were negative for bleeding, aneurysm or an embolic event. Chest X-ray was clear. An electrocardiogram showed a regular rhythm consistent with sinus tachycardia; there were Q and T waves in lead III and an S wave in lead I. A

ventilation-perfusion scan demonstrated an unmatched segmental perfusion defect.⁴ What do you suspect is the diagnosis?

ChatGPT Response- VQ Scan:

- Based on the patient's clinical presentation, laboratory and radiological findings, the most likely diagnosis is pulmonary embolism (PE) with deep venous thrombosis (DVT) in the left leg as a contributing factor. PE is a serious medical condition that occurs when a blood clot, typically originating in the lower extremities as a DVT, travels to the lungs and obstructs blood flow to the pulmonary vasculature. This can lead to a range of symptoms including dyspnea, tachypnea, tachycardia, chest pain, cough, hemoptysis, and syncope. The presence of a perfusion defect on ventilation-perfusion scan supports the diagnosis of PE in this case.
- The patient's prolonged work hours without rest periods may have contributed to the development of DVT, as prolonged immobilization and decreased mobility are known risk factors for thromboembolic events. The presence of a positive Homans' sign and significant calf size difference between the legs further support the diagnosis of DVT.
- Overall, the combination of dyspnea, tachycardia, hypoxemia, elevated A-a O₂ gradient, bilateral basal lung crackles, and the presence of DVT suggest the diagnosis of PE. It is important to promptly initiate treatment with anticoagulation therapy to prevent further complications and reduce the risk of recurrence.⁸

Prompt to ChatGPT- Bone Scan: “We present the case of a previously healthy 38-year-old Caucasian woman who presented to our hospital's emergency department with a six-day history of severe sharp and burning right heel and foot pain with inability to bear weight. She had no antecedent trauma or systemic symptoms. The pain was referred distally along the medial and

lateral plantar aspect of her foot into the toes, with exacerbation at night and with ambulation. A physical examination revealed a warm localized swelling around her medial malleolus with no overlying erythema. Her ankle movements were normal but her subtalar joint movement was painful and restricted. A neurological examination confirmed altered sensation over the plantar surface of her foot and toes. Tinel's sign was also noted to be absent along the course of her posterior tibial nerve. Our patient's inflammatory markers were raised (white cell count at 12.2×10^9 cells/L [neutrophils = 11.0] C-reactive protein at 194 and erythrocyte sedimentation rate at 59), while her autoimmune antibody titres and blood cultures were found to be normal. Initial plain radiographs were unremarkable, while a magnetic resonance imaging (MRI) of her hindfoot demonstrated an increased calcaneal signal intensity on the T2/STIR-weighted images, with a tense effusion of the subtalar joint. Bone scanning confirmed the presence of isolated increased uptake of radioisotope in the calcaneus on blood pool and delayed phases.”³ What do you suspect is the diagnosis?

ChatGPT Response- Bone Scan:

- Based on the patient's symptoms and diagnostic findings, the most likely diagnosis is calcaneal osteomyelitis with subtalar joint involvement. Calcaneal osteomyelitis is a rare condition that results from hematogenous spread of bacteria to the calcaneus bone, which can cause localized inflammation, swelling, and pain. It can also cause destruction of bone tissue and lead to the formation of an abscess or sinus tract.
- The patient's symptoms of severe sharp and burning pain, with inability to bear weight and exacerbation with ambulation, suggest a localized source of inflammation in the foot. The physical examination findings of warm localized swelling, altered sensation over the plantar

surface of the foot and toes, and restricted subtalar joint movement support the diagnosis of osteomyelitis with subtalar joint involvement.

- The patient's raised inflammatory markers, including an elevated white cell count, C-reactive protein, and erythrocyte sedimentation rate, further support the diagnosis of a bacterial infection. The absence of erythema suggests a low-grade infection or an infection that has been present for several days. The MRI findings of increased calcaneal signal intensity and a tense effusion of the subtalar joint are consistent with the diagnosis of osteomyelitis with subtalar joint involvement. The bone scan results also support the diagnosis, as increased uptake of radioisotope in the calcaneus on blood pool and delayed phases is a sensitive and specific finding for osteomyelitis.
- Early diagnosis and treatment with antibiotics are essential in managing calcaneal osteomyelitis to prevent the spread of infection and minimize tissue damage. In some cases, surgery may be necessary to remove any infected tissue or bone.⁸

Prompt to ChatGPT- Myocardial Perfusion: “CN, a 55-year-old man, sought assistance due to a long life history of agoraphobia related to bridges, tunnels, and traffic. He rarely left his house alone. In the previous weeks, he had experienced spontaneous panic attacks even at home. These attacks were characterized by chest pain, dizziness, sensation of suffocation, and paresthesia. The day he came to the panic experiment, the patient scored 5 points on the VAS-A before the test. After the test, the patient scored 6 points. At PSS, he reported mild chest pain, palpitations and dizziness, but he denied that he had experienced a panic attack. In the pre-challenge phase, his HR was 78 bpm. At twenty seconds, it increased to 89 bpm, decreasing to 83 bpm at minute one. His baseline BP was 140×80 mm/Hg. This value changed in 20 seconds, increasing to 160×90, up to 190×100 in a minute, when his double product reached the peak value of 15.770 bpm × mm/Hg.

The oxygen partial pressure (PO₂) did not change after the test (Table 1). The ECG did not change after the test, but SPECT images analyzed by two nuclear cardiologists demonstrated a reversible myocardial perfusion defect in the mid antero-septal segment.”⁹ What do you think the diagnosis?

ChatGPT Response- Myocardial Perfusion:

- Based on the symptoms and diagnostic tests described, the diagnosis for CN could be panic disorder with panic attacks and comorbid coronary artery disease. The agoraphobia related to bridges, tunnels, and traffic, as well as the spontaneous panic attacks with symptoms of chest pain, dizziness, sensation of suffocation, and paresthesia, are characteristic of panic disorder. The increase in heart rate, blood pressure, and double product during the experiment are consistent with a physiological stress response.
- The SPECT images showing a reversible myocardial perfusion defect in mid antero-septal segment suggest that the patient has coronary artery disease, which is a risk factor for panic attacks. Panic attacks can be triggered by physiological stress, and individuals with coronary artery disease may experience panic attacks due to the fear of cardiac events or the perception of a life-threatening situation. It is important to evaluate and manage both conditions to provide the best possible outcomes for the patient.⁸

For the patients' side of healthcare, ChatGPT was asked to explain NM procedures and preparations for multiple different nuclear medicine studies. WebMD was used to compare versus ChatGPT for common information given about NM procedures. Each study was asked the same prompt, “What can I expect from a nuclear medicine ___ scan?”

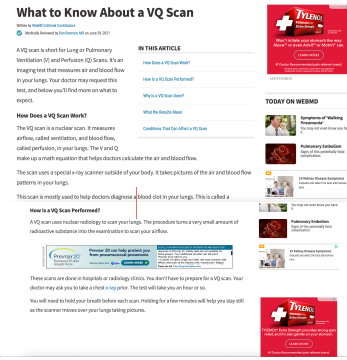
A VQ scan, also known as a ventilation-perfusion scan, is a medical imaging test used to evaluate the blood flow and airflow in the lungs. It is commonly used to diagnose pulmonary embolism, which is a condition where a blood clot travels to the lungs and obstructs blood flow.

During a VQ scan, two types of scans are performed: a ventilation scan and a perfusion scan. The ventilation scan uses a radioactive gas, usually xenon or technetium, which is inhaled by the patient. The gas fills the air sacs in the lungs, and a special camera detects the distribution of the gas in the lungs. This provides information about the airflow in the lungs.

The perfusion scan uses a radioactive substance, usually technetium, which is injected into a vein in the patient's arm. The substance is carried by the blood to the lungs, where it is detected by the same special camera used in the ventilation scan. This provides information about the blood flow in the lungs.

The results of the ventilation and perfusion scans are then compared to determine if there are any areas of the lung that have normal airflow but reduced blood flow, or vice versa. These differences can indicate the presence of a blood clot in the lungs.

VQ scans are generally safe, although they do expose the patient to a small amount of radiation. The test is noninvasive and usually takes about an hour to complete.



(7)

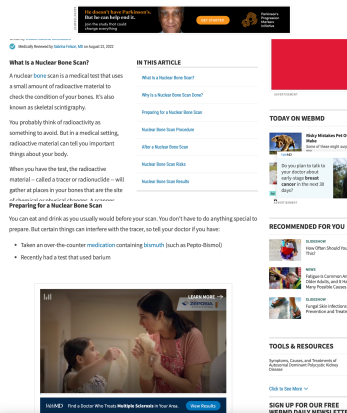
A bone scan is a medical imaging test that is used to diagnose and monitor conditions that affect the bones, such as cancer, infections, and fractures. To prepare for a bone scan, here are some general guidelines to follow:

- Consult with your doctor: Before scheduling a bone scan, you should consult with your doctor about any medical conditions or medications that you are taking that could affect the results of the scan. Your doctor may advise you to stop taking certain medications before the scan.
- Dress appropriately: On the day of the bone scan, you should wear comfortable, loose-fitting clothing without any metal fasteners or zippers. If you have any metal objects in your body, such as implants or pacemakers, you should inform the technician before the scan.
- Avoid eating and drinking: You may be advised to avoid eating and drinking for several hours before the scan. This is to ensure that your bladder is empty before the scan, which can improve the quality of the images.
- Stay hydrated: It is important to stay hydrated before the scan. Drinking plenty of water can help to flush any excess radioactive tracer from your body.
- Bring a list of medications: If you are taking any medications, it is a good idea to bring a list of them with you to the appointment.

Dress appropriately: On the day of the bone scan, you should wear comfortable, loose-fitting clothing without any metal fasteners or zippers. If you have any metal objects in your body, such as implants or pacemakers, you should inform the technician before the scan.

Avoid eating and drinking: You may be advised to avoid eating and drinking for several hours before the scan. This is to ensure that your bladder is empty before the scan, which can improve the quality of the images.

Stay hydrated: It is important to stay hydrated before the scan. Drinking plenty of water can help to flush any excess radioactive tracer from your body.

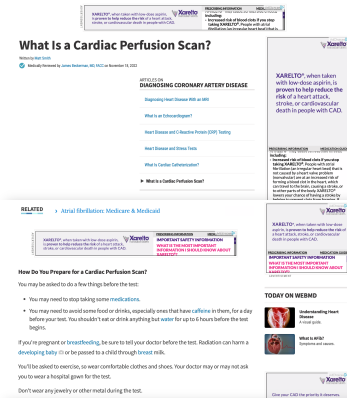


(6)

A nuclear medicine stress test, also known as a myocardial perfusion imaging (MPI) test, is a type of diagnostic imaging test that helps doctors evaluate how well the heart is functioning. Here's what you can generally expect from a nuclear medicine stress test:

- Preparation: Before the test, you will be asked to avoid eating or drinking for several hours. You should also avoid caffeine and smoking for at least 24 hours before the test. You may need to stop certain medications, so it's important to follow the instructions of your doctor.
- Injection of radioactive tracer: During the test, a small amount of radioactive tracer will be injected into your vein. The tracer is usually a radioactive form of a substance called thallium or technetium. This tracer will travel through your bloodstream and into your heart muscle, where it will collect in areas that have good blood flow.
- Resting images: After the tracer has been injected, you will be asked to lie down on a table and remain still while a special camera takes pictures of your heart at rest. This may take about 15-30 minutes.
- Stress test: You will then undergo a stress test, which can be either an exercise stress test (usually on a treadmill or stationary bike) or a chemical stress test (with medication that makes the heart work harder). The stress test will usually last around 8-12 minutes, and your heart rate and blood pressure will be monitored throughout.
- Post-stress images: After the stress test, you will be asked to lie down again while the camera takes additional pictures of your heart. This may take another 15-30 minutes.
- Analysis of results: A trained radiologist or nuclear medicine specialist will then analyze the images to determine how well blood is flowing to different parts of your heart. Areas that are receiving less blood flow may indicate that there is a blockage or other problem with the blood vessels in the heart.

Overall, the nuclear medicine stress test is a safe and noninvasive test that can provide valuable information about the function of your heart. However, it's important to discuss any concerns or questions you may have with your doctor before the test.



(5)

Discussion

Patient use of ChatGPT excelled in giving information for each of the three scans. Its explanation of how the tracer would be administered, how long the uptake and scan of the radiopharmaceutical would take, as well as even positioning of the patient. For the MPI, the AI did well to explain what the test was for, as well as proper NPO instructions. The VQ scan was

explained in detail, discussing both ventilation and perfusion. The bone scintigraphy was explained well, but improper preparation; telling the patient in back-to-back bullet points to both avoid drinking water prior to the test but also to stay hydrated. WebMD provided information on the studies, but in a disorganized and cluttered manner. It was not concise and had unneeded information. Navigation of the website took searching through ads and other formatting issues. Physician case studies for ChatGPT were variable, the case study information from a patient who collapsed and lost consciousness was accurately diagnosed as a pulmonary embolism presenting as syncope. However, the bone scintigraphy was not completely accurate. ChatGPT believed the patient had calcaneal osteomyelitis presented with subtalar joint involvement. The real diagnosis was calcaneal osteomyelitis presented with acute tarsal tunnel syndrome. The language model struggled the most with the MPI case presented, a patient with panic attacks triggering ischemia. The AI believed it to be a combination of panic disorder and comorbid coronary artery disease.

Conclusion

Utilization of the AI language model can be done much sooner for patients than physicians, if not now. Descriptions of NM studies were favorable to current information given on WebMD. In the present state of ChatGPT, its usefulness is limited for physicians. The diagnosis given was typically very close to what the physician diagnosed the patient with. However, “close” will not be good enough in its current state to confidently be used for physicians to confer with. Although it has its limitations, ChatGPT or a secure, medical-specific AI language model will be shaping healthcare in unison with physicians in the upcoming years once more data is available for it to read, and the systems continue to improve.

Bibliography

1. Q.ai - Powering a Personal Wealth Movement. What is chatgpt? how AI is Transforming Multiple Industries. Forbes. <https://www.forbes.com/sites/qai/2023/02/01/what-is-chatgpt-how-ai-is-transforming-multiple-industries/?sh=30832309728e>. Published February 3, 2023. Accessed February 17, 2023.
2. About WebMD. WebMD. <https://www.webmd.com/about-webmd-policies/default.htm>. Accessed February 17, 2023.
3. Baghla DPS, Shariff S, Dega R. Calcaneal osteomyelitis presenting with acute tarsal tunnel syndrome: A case report. *Journal of Medical Case Reports*. 2010;4(1). doi:10.1186/1752-1947-4-66
4. Demircan A, Aygencel G, Keles A, Ozsoylar O, Bildik F. Pulmonary embolism presenting as syncope: A case report. *Journal of Medical Case Reports*. 2009;3(1):7440. doi:10.4076/1752-1947-3-7440
5. Editorial Contributors WMD. Cardiac perfusion scan: Stress test for your heart. WebMD. <https://www.webmd.com/heart-disease/cardiac-perfusion-scan-facts>. Published 2022. Accessed April 21, 2023.
6. Editorial Contributors WMD. Nuclear bone test: Purpose, procedure, results. WebMD. <https://www.webmd.com/a-to-z-guides/nuclear-bone-scan>. Published 2022. Accessed April 21, 2023.
7. Editorial Contributors WMD. Why a VQ scan? this type of radiology imaging checks for Clots. WebMD. <https://www.webmd.com/lung/what-to-know-vq-scan>. Published 2021. Accessed April 21, 2023.
8. OpenAI. Chat.openai.com. ChatGPT. <https://chat.openai.com/>. Published 2022. Accessed April 21, 2023.

9. Soares-Filho GL, Mesquita C, Mesquita E, et al. Panic attack triggering myocardial ischemia documented by myocardial perfusion imaging study. A case report.

International Archives of Medicine. 2012;5(1):24. doi:10.1186/1755-7682-5-24

INVESTIGATIVE PAPERS SCORE SHEET

STUDENT: Jacob Hamblen

Paper should be investigative; with the student gathering data, analyzing it and coming to a conclusion. If the paper is informative only, take points off. Length should be 4-5 pages and should have a bibliography. If no bibliography, no research was done – take points off.

Did writer define objective of paper?	1 2 3 4 5 6 7 8 9 10 11 12 13 14 (15)
Adequate research done.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 (5)
Was the paper investigative?	1 2 3 4 5 6 7 8 9 10 11 12 13 14 (5)
Was data documented?	1 2 3 4 5 6 7 8 9 (10)
Was rationale based on data collected?	1 2 3 4 5 6 7 8 9 (10)
Was conclusion based on data?	1 2 3 4 5 6 7 8 9 (10)
Grammar / punctuation / neatness	1 2 3 4 (5)
Length of paper	1 2 3 4 (5)
Bibliography.	1 2 3 4 (5)
Overall interest of subject.	1 2 3 4 5 6 7 8 9 (10)

Comments:

Very timely and interesting topic. I

learned a lot reading your paper and I'm
sure you learned a lot researching it. I can

see Chat GPT becoming
a useful (and scary)

tool in many different
fields. Great work!

Total Score: 100

PLO #2

NMT 4410 and NMT 4910 Clinical Practicum/Final evaluation questions regarding effective communication in patient interaction

The NMT program faculty conduct oral, comprehensive evaluations of each NMT student during the last month of the program. During this evaluation, the students are assessed for the ability to provide effective communication skills regarding patient interactions.

Example patient communication questions/scenarios

1. What do you do if you suspect one of your patients who is in a nursing home, long-term care facility, or in-home care facility is experiencing neglect or abuse?
 - a. Report it to the Missouri department of health and Senior services and notify your immediate supervisor.
2. I read that I am getting the same thing that is in rat poison from TI-201. How will this affect me?
3. Will this injection give me cancer?
4. How is this different than an X-ray or CT scan?
5. What do you do when you think someone might be suicidal?
 - a. Be sensitive but ask direct questions
 - b. How are you coping with what's been happening in your life?
 - c. Do you ever feel like just giving up?
 - d. Are you thinking about dying?
 - e. Are you thinking about hurting yourself?
 - f. Are you thinking about suicide?
 - g. Have you ever thought about suicide before, or tried to harm yourself before?
 - h. Have you thought about how or when you'd do it?
 - i. Do you have access to weapons or things that can be used as weapons to harm yourself?
 - j. Social work is a great hospital resource want you get their answers.
6. How do you ask an underage girl if she's pregnant while her parents are in the room?
7. A patient has a CT with contrast and a PET/CT ordered on the same day which exam do you do first and why?
8. A patient has a bone density and a nuclear medicine scan the same day which one do you do first?
 - a. Bone density first then nuclear medicine
9. A patient receives an order for two nuclear medicine scans on the same day a lung scan and a HIDA what do you do first?

10. A patient is scared about the total radiation from a diagnostic nuclear medicine exam. How do you calm their fears? Roleplay this with the students and pretend you are the scared patient make them explain it to you.
11. A parent of a 20-year-old patient demands to be told the results of a nuclear medicine study, what do you do?
12. What do you do if a patient refuses to tell you pregnancy status before exam?
13. What are your options if you notice your boss is willfully violating regulations?
 - a. If it's an NRC violation you can contact the local RSO or call the NRC directly
 - b. If it's a joint commission violation you can report it to the joint commission.
 - c. If it's a hospital policy, you can go above your boss.
 - d. "Doin' the right thing is never wrong" Ted Lasso
14. How do you respond to a patient when they question you about the syringe shield or pig, they see you carrying their dose in? i.e. "Are you sure this is safe for you to inject into me?"
15. How do you respond when the patient asks you what you see on their scan? i.e. "What is that I see on the screen?" "Does the scan show that everything is ok with me?"
16. How would you respond to a patient that asks you the risks vs. benefits of having the scan they are scheduled for?
17. What would you do if a patient told you they may be pregnant after already injecting them with the radiopharmaceutical?

Saint Louis University Nuclear Medicine Technology

Trainee Evaluation

Click to print this page directly to your printer.

Once submitted this evaluation will be available for review and for comments to be added by the following roles: Clinical Supervisor and Student.

Evaluator: Sarah Frye - Administrator **Subject:** Professional Phase Student
Activity: 2022 Rot 4 Week 6 **Site:** Mercy Hospital St. Louis
Evaluation Type: Site Visit **Completion Date:** 07/13/2022
Request Date: 07/13/2022
Period: 2022 Rot 4 Week 6 **Dates of Activity:** 07/11/2022 To 07/15/2022
Subject Participation Dates: 07/11/2022 To 07/15/2022

Please select the option that best matches your level of agreement with this evaluation.

Agree Disagree

If you disagree, please explain your reasons below.

Comments entered above may be viewed by your program director or advisor and may be a part of a printed report.

(Question 1 of 9 - Mandatory)

Student Comments	
List of procedures the student has received proficiencies:	STUDENT s currently in his 6th week at Mercy Saint Louis. He has signed off on 12 studies including: 3-phase bones, WB bones, Bones SPECT, gastric emptying, hepatobiliary, lung perfusion, MPI rest and stress, QC flood, QC resolution, renal with Lasix, and RVG.
Issues with teaching and supervision:	none

Site Visitor's Report

(Question 2 of 9 - Mandatory)

Site Visitor Comments	
Assessment of student's progress and performance:	Andy Cooke stated that: "Student has been doing a great job! I asked around the department and nobody had any areas of concern for him, keep up the good work!! He has been picking up on things quickly and able to work as an independent tech at most times. Very impressive."
Competency Evaluation:	Student did great for his final evaluation visit. He had a "day in the lift of" final exam where he discussed all aspects of Nuclear Medicine including specific studies, equipment, patient interactions, safety, physics, radiopharm, etc. We finished his evaluation with 5 role playing questions in which he had to discuss why and how he would do things in one way over another way.
Recommendations for next visit:	None. This was the final evaluation visit.

Site Visit Grading (Question 3 of 9 - Mandatory)

Student brought books and organized notes for visit.

NO	YES
0	>> 1 << 2

Student was able to locate information in notes and/or books. (Question 4 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student was prepared to discuss any exams they had observed, participated or performed. (Question 5 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student illustrates understanding of exams discussed. (Question 6 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student's eValue record is up to date. (Question 7 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Pass/Fail Site Visit Grade

(Question 8 of 9 - Mandatory)

Did this student complete 4 of the 5 items above?

If so, mark: PASS
If not, mark: FAIL

FAIL	PASS	
0	>> 1 <<	2

Additional comments? (Question 9 of 9)

He continues to impress and do a great job in the clinic and in discussions, Keep up the great work, Omar.

Additional Evaluation Comments
Clinical Supervisor Has Not Posted Comments
Student Has Not Posted Comments

NMT Artifact Descriptions and Rubrics for PLO 3

PLO #3

NMT 4350 Nuclear Medicine Information Systems / Case Study Project (Written)

This case study project serves as an artifact for this PLO. Each student is given an assignment prompt to evaluate an assigned case study. This assignment is used to demonstrate the ability to apply the skills and knowledge of processing and evaluating nuclear medicine exams based on the knowledge and skills learned in this course.

Nuclear Medicine Information Systems Mid Term Project Prompt

Group work: You will need to include the following items for each examination. You will answer the questions included in the prompts below based on the .pdf images that are given to you for each assignment. These will most likely be sent via email. You will need to use what you have learned in this course and your other Nuclear Medicine courses so far to answer the questions.

- Indications and contraindications for the examination ordered
- Alternate and/or complementary imaging choices (e.g., ultrasound, CT, etc.)
- Normal and abnormal organ function
- Patient preparation
- Radiopharmaceutical choice, dose, and route of administration
- Adjunctive medications used for this procedure, dose, and route of administration (e.g., CCK, Morphine, etc.)
- Equipment selection (e.g., camera, collimator, etc.)
- Patient positioning
- Acquisition protocol parameters
 - Please list in detail the acquisition protocol for your assigned patient examination.
- Processing protocol parameters
 - All processing protocol parameters should be complete and detailed. (e.g., matrix, type of images acquired, time per frame, etc.)
 - Content should describe the procedure for processing the acquired data for your assigned patient. This includes what images you process, what ROI are used, how the ROI are drawn (this is like what you will be doing individually for each assignment)
- Report critique & analysis – include what is wrong with the study is anything (could be in acquisition or processing)
 - Your critique & analysis should be clearly articulated and specific.
 - It should be concise, accurate, and include any issues, problems or corrections that would be necessary to properly interpret the report.
- Diagnostic findings (what you think is normal or wrong with the patient from this exam)
 - Must be complete and accurate.

- Findings must be described in clear and specific terms.

Hepatobiliary group assignment due TBD by 11:59pm

Individual Work: For each exam used for the group work .pdf images, you will be assigned one to two individual processing assignments to be completed during class time and reviewed by the instructor. These will be completed using the Philips IntelliSpace software.

Hepatobiliary individual assignment due TBD by 12:15pm

Rubric for Capstone NMIS Case Study Evaluation

Points Achievable	Complete, Excellent detail	Complete, Good detail	Incomplete, Some or no detail
Indications & Contraindications	(5)	(4-3)	(2-0)
Alternate and/or Complimentary Imaging Choices	(5)	(4-3)	(2-0)
Normal & Abnormal Organ Function	(5)	(4-3)	(2-0)
Patient Preparation	(5)	(4-3)	(2-0)
Radiopharmaceutical Selection & Administration	(5)	(4-3)	(2-0)
Augmented Drugs	(5)	(5)	(0)
Equipment Selection	(5)	(5)	(0)
Patient Positioning	(5)	(5)	(0)
NMIS Image Acquisition Parameters	(5)	(4-3)	(2-0)
NMIS Processing Protocol Parameters	(10-9)	(8-7)	(6-0)
NMIS Report Critique & Analysis	(25-19)	(18-16)	(15-0)
NMIS Diagnostic Findings	(10-9)	(8-7)	(6-0)
Organization of Case Study & Formatted Correctly	(10-9)	(8-7)	(6-0)

Hannah + Logan

Rubric for Capstone Case Study Evaluation for NMIS Final Grade

Points Achievable	Complete, Excellent detail	Complete, Good detail	Incomplete, Some or no detail
Indications & Contraindications	(5)	(4-3)	(2-0)
Alternate and/or Complimentary Imaging Choices	(5)	(4-3)	(2-0)
Normal & Abnormal Organ Function	(5)	(4-3)	(2-0)
Patient Preparation	(5)	(4-3)	(2-0)
Radiopharmaceutical Selection & Administration	(5)	(4-3)	(2-0)
Augmented Drugs	(5)	(5)	(0)
Equipment Selection	(5)	(5)	(0)
Patient Positioning	(5)	(5)	(0)
NMIS Image Acquisition Parameters	(5)	(4-3)	(2-0)
NMIS Processing Protocol Parameters	(10-9) 10	(8-7)	(6-0)
NMIS Report Critique & Analysis	(25-19) 22	(18-16)	(15-0)
NMIS Diagnostic Findings	(10-9) SF	(8-7) 8	(6-0)
Organization of Case Study & Formatted Correctly	(10-9) 9	(8-7)	(6-0)

several spelling mistakes

94/100

PLO #3

NMT 4430 Emerging Technologies / Case Study Presentation (Oral)

The presentation of interesting nuclear medicine exams is used as an artifact for this PLO. Each student is given an assignment prompt to identify 2 different nuclear medicine exams to present in class. One of the cases is assigned by the course instructor and the other is chosen by the student. The oral presentations are completed toward the end of the semester and are used to demonstrate the students' ability to build on the knowledge obtained in class, by providing "real" cases seen in the clinic and conveying knowledge to their peers in the class.

NMT Student Case Study Grade Sheet

Student Name: _____

Date: _____

Graded By: _____

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam _____

_____ Student explained the proper patient preparation for the exam discussed. (2 pts)

_____ Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

_____ Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

_____/10 Total Score

Case #2 Type of Exam _____

_____ Student explained the proper patient preparation for the exam discussed. (2 pts)

_____ Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

_____ Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

_____/10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Marie Johnson

Date: 5.1.23

Graded By: _____

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam Bone Scan

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam HIDA

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Abby Finn

Date: 5.8.23

Graded By: Shannon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam Parathyroid

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam Gastric Empty

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Carlos Delgado

Date: 5.8.23

Graded By: Sharon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam Gastric Empty

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam Parathyroid

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Hannah Flickinger

Date: 5.1.23

Graded By: Shannon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam MPI Stress

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam FDG PET

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Logan Raterman

Date: 5.1.23

Graded By: Shannon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam VQ

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam myocardial sarcoidosis

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Leila Alsarag

Date: 5.8.23

Graded By: Shanon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam Renal

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam Hepatic Pump

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Nick Underak

Date: 5.8.23

Graded By: Shannon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam 1-131 WB

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam PET/CT PSMA

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Student Case Study Grade Sheet

Student Name: Jacob Hamblen

Date: 5.1.23

Graded By: Shannon Turek

There is a total of 10 points possible for each case study. Please score based on the following criteria.

Case #1 Type of Exam HIDA

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

Case #2 Type of Exam myocardial sarcoidosis

2 Student explained the proper patient preparation for the exam discussed. (2 pts)

4 Student explained the exam protocol and proper images that should be acquired for the exam discussed. (4 pts)

4 Student presented at least 2 abnormal studies and explained why they are abnormal. (4 pts)

10 /10 Total Score

NMT Artifact Descriptions and Rubrics for PLO 4

PLO #4

NMT 4000 NMT Procedures I/Clinical Simulation/Role-Playing

Based on the content covered in the course, the course instructor assigns each student nuclear medicine procedure(s) to portray a technologist and/or patient perspective. The assessment rubric (see appendix) is used to guide the students on the specific areas the students must explain during the role-playing exercise. The students are paired up and provide explanation to a classmate and/or course instructor. This exercise provides the opportunity for the students to begin to translate didactic knowledge into clinical practice before beginning clinical practicum rotations.

NMT Procedures Courses

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist

- | | |
|---|-------|
| 1) Properly introduce themselves? 1 pt. | _____ |
| 2) Properly obtain patient identification? 1pt. | _____ |
| 3) Ask patient proper preparatory questions related to the exam? 4 pts. | _____ |
| Food | |
| Drink | |
| Pregnancy | |
| Medications | |
| History and Physical | |
| 4) Have the knowledge to explain the exam to the patient? 4 pts. | _____ |
| 5) Can answer patient questions? 3 pts. | _____ |
| 6) Respond well to feedback and constructive criticism? 2 pts. | _____ |

15

Hepatobiliary
Teila - tech
Hannah - pt

2/17/2022

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food ✓

Drink ✓

Pregnancy ✓ None Breastfeeding

Medications - None

Allergies - Food - no meds - no morphine

Pertinent History pain, vomiting, nausea, surgery, ultrasound ⊕

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

(Disafemin)? - Lie down
CCK - ↓ motion

lots of information

4) Have the ability to answer patient questions? 3 pts.

3

Morphine given? (alternative to CCK)
pain after act? (may have pain - But not away)
fried? → CCK vs. enseric (milesia) not away

5) Respond well to feedback and constructive criticism? 2 pts.

2

15

↑ Voice volume

Lelia / Hannah

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food ✓

Drink ✓

Pregnancy ✓

Medications ✓

Pertinent History ✓

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

15

2/16/22

13

Gastric Empty

Marie

Logan

2/17/2002

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt. *first name*

0

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food ✓

Drink ✓

Pregnancy *NA*

Medications ✓

Pertinent History *- Surgeries?*

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

2

egg - doesn't like? Ask how much?

5) Respond well to feedback and constructive criticism? 2 pts.

2

13

Marie Logan

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

0

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food ✓

Drink ✓

Pregnancy ✓

Medications ✓

Pertinent History ✓

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

- water

- no food in between

4) Have the ability to answer patient questions? 3 pts.

2

- eggs → further inquiry

5) Respond well to feedback and constructive criticism? 2 pts.

2

13

14

GI Bleed

Jacob Taha

Nicholas - Pt.

2/17/2022

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

0

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food

Dr. order? → usually done in registration

Drink

Pregnancy -NA

Medications -none

Pertinent History yes, eye blood in stool

- mentioned surgery?!?

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

- Hx my family?!?

- How do we know it's not you well?

5) Respond well to feedback and constructive criticism? 2 pts.

2 Too much info

14

Jacob Nicholas

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

0

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food

Drink

Pregnancy

Medications ✓

Pertinent History ✓

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

14

13.5

Clinical Nuclear Medicine Course
Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Aabby - tech
Carlos - patient
Markel's
2/17/2022

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

0

2) Ask patient proper preparatory questions related to the exam? 4 pts.

3

Food

> NA

Drink

Pregnancy

NA

Medications

- no

Pertinent History

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

13

Abby / Carlos

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

3

Food

Drink

Pregnancy

Medications

Pertinent History

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

14

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food

✓

Drink

Pregnancy ✓

Medications ✓

Pertinent History ✓

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

- Concise
- good cadence

15/15

Feb - Nick ordered
Cb-pt.
5/6/2022
Via Zoom
Duel Isotope
MB

Tech Carlos / Abby

5/3/22

2nd Trial MPI

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food

> ✓

Drink

Pregnancy - LMP

Medications ✓

Adenosine/dipyridole allergies

Pertinent History - Chest pain

3) Have the knowledge to explain the exam to the patient? 4 pts.

3

details of RadioPharmaceutical - too many details?
↳ redistribution prospective
* getting out of body * (separate bathroom)

4) Have the ability to answer patient questions? 3 pts.

3

5) Respond well to feedback and constructive criticism? 2 pts.

2

↓ details

Be more concise

14/15

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Tech - Hannah/Leila

5/3/2022

Tc^{99m} MPI

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

4

Food ✓

Drink ✓

Pregnancy ✓ *none*

Medications *Beta blockers (arrhythmia)??*

Pertinent History *no chest pain Hx of Diabetes*

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

Can be more concise

4) Have the ability to answer patient questions? 3 pts.

3

No questions

5) Respond well to feedback and constructive criticism? 2 pts.

2

15/15

Very calm and articulate!

Always asked pt. appropriate questions

(Tech-Logan) Marie

5-3-2022

Resting RVG

Clinical Nuclear Medicine Course

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist:

1) Properly introduced themselves? 1 pt.

1

2) Properly obtain patient identification? 1pt.

1

2) Ask patient proper preparatory questions related to the exam? 4 pts.

3

Food

> NA

Drink

Blood tagging time - Good

Pregnancy - How to confirm (She is young!)

Medications - NA

Pertinent History → why history test?

3) Have the knowledge to explain the exam to the patient? 4 pts.

4

Arms over head - good

4) Have the ability to answer patient questions? 3 pts.

3

Never!

5) Respond well to feedback and constructive criticism? 2 pts.

2

14/15

- Concise

- Ask ~~more~~ about history, why history test

PLO #4

NMT 4000 NMT Procedures I/Clinical Simulation/Role-Playing

Based on the content covered in the course, the course instructor assigns each student nuclear medicine procedure(s) to portray a technologist and/or patient perspective. The assessment rubric (see appendix) is used to guide the students on the specific areas the students must explain during the roleplaying exercise. The students are paired up and provide explanation to a classmate and/or course instructor. This exercise provides the opportunity for the students to begin to translate didactic knowledge into clinical practice before beginning clinical practicum rotations.

NMT Procedures Courses

Technologist/Patient Clinical Simulation Rubric

15 pts. possible

Did the student portraying the technologist

- 1) Properly introduce themselves? 1 pt. _____
- 2) Properly obtain patient identification? 1pt. _____
- 3) Ask patient proper preparatory questions related to the exam? 4 pts. _____
 - Food
 - Drink
 - Pregnancy
 - Medications
 - History and Physical
- 4) Have the knowledge to explain the exam to the patient? 4 pts. _____
- 5) Can answer patient questions? 3 pts. _____
- 6) Respond well to feedback and constructive criticism? 2 pts. _____

Student	ID	SIS User ID	SIS Login	IE Root	Accot	Section	Patient Tec
	Points Possible						15
Alsarag, Lei	22436	1216568	lalsarag	canvas.slu.		NMT-4340-01	15
Delgado, C	11047	1073556	cdelgado1	canvas.slu.		NMT-4340-01	15
Finn, Abby	6706	1046184	afinn1	canvas.slu.		NMT-4340-01	15
Flickinger, I	11418	1075459	hflickinger	canvas.slu.		NMT-4340-01	15
Hamblen, J	9874	1061275	jhamblen	canvas.slu.		NMT-4340-01	15
Johnson, M	6628	1079768	mjohnson4	canvas.slu.		NMT-4340-01	15
Onderak, N	6912	1076464	nonderak	canvas.slu.		NMT-4340-01	15
Ratermann	4520	1074751	lratermann	canvas.slu.		NMT-4340-01	15

PLO #4

NMT 4910 Clinical Practicum / Clinical visit evaluation during last month of clinical practicum

The NMT program faculty conduct oral, comprehensive evaluations of each NMT student during the last month of the program. During this evaluation, the students are required to translate didactic knowledge into clinical practice.

Only need to ask these questions ONCE per visit:

- A. Ask for a response to the following statement of ALL students:
Give an example of how you portray “cura personalis” in the clinical setting.

- B. Complete a visit form including evidence of effective communication (i.e. How does the student explain the particular exam to the patient?) and understanding of “cura personalis” in the details of the form.
(Give thought to the level of communication and understanding of “cura personalis” based on when this visit is done. i.e. Rotation 1 vs. Rotation 4)

I confirm that the student answered these questions appropriately. Any questions or concerns about these questions was discussed and addressed with the student during this visit.

PD and/or CC Signature	PD and/or CC Printed Name	Date
------------------------	---------------------------	------

- C. **Ask for a response to the following statement of ALL students:**
Give an example of how you portray “cura personalis” in the clinical setting.

- D. **Choose at least 3 others from the list below to assess patient communication in the clinical setting.**
(Pay attention to eye contact, confidence, and response to consider students ability to communicate effectively as an entry-level technologist)

- E. **Complete a visit form including evidence of effective communication and understanding of “cura personalis” in the details of the form.**
(give thought to the level of communication and understanding of “cura personalis” based on this being the FINAL assessment)

NMT Artifact Descriptions and Rubrics for PLO 5

PLO #5

NMT 4700 NMT Clinical Practicum I/ Clinical visit evaluation during the 1st rotation of clinical practicum

The NMT faculty collected the visit forms (see appendix) and notes from the first rotation visits which occur in February of each year for the students enrolled in this course. The program director reviewed the data, including the pass/fail status of the visit. The comments were reviewed to assess each student's ability to convey the concepts discussed during the visit. In addition, the program director sought comments/noted which relate to professional characteristics on each of the visit forms. If such comments were identified this was marked as achieving the ranking of "application" or higher.

Saint Louis University

Nuclear Medicine Technology Program Site Visit Evaluation Form

Student: _____

Clinical site: _____

Date: _____

Arrival time: _____

Rotation number: _____

Visit number: _____

Student comments:

Procedures and comments on tasks at the clinical site:

Site Visitor's Report:

Assessment of student's progress and performance:

Competency Evaluation:

Issues with teaching and supervision:

Recommendations for next visit:

Grade

PASS / FAIL

___ Student brought books and organized notes for visit.
___ Student was able to locate information in notes and/or books.
___ Student was prepared to discuss any exams they had observed, participated or performed. ___
Student illustrates understanding of exams discussed ___ Student paperwork is up to date.

Signatures:

Clinical Supervisor: _____ Site Visitor: _____

Student: _____ Departure time: _____

**Saint Louis University
Nuclear Medicine Technology Program Site Visit Required Questions**

Topic: Positron Emission Tomography / Computed Tomography (PET/CT)

Student: _____ Clinical site: _____

Date: _____

1. What is the main PET/CT tracer used in oncology studies? How does this tracer localize in cancer in the body? What are the indications for doing an oncology PET/CT study?
2. What is the prep for an FDG-PET scan? Why is the prep important?
3. Tell me about PET and CT QC including but not limited to: normalization scan (performed weekly or monthly), uniformity (blank scan) (performed daily), CT phantom, air calibrations. How do you know the daily PET uniformity scan passes QC?
4. What are the names of the imaging sets that are made during a PET/CT study? How are these made?
5. Name the different PET tracers that are used for dementia studies.
6. Why is Ga68 used in PET?
7. What is the purpose of the CT scan in PET/CT? What are common mAs and keV used for CT as part of a PET/CT scan?

Only need to ask these questions ONCE per visit:

- A. Ask for a response to the following statement of ALL students:
Give an example of how you portray "cura personalis" in the clinical setting.

B. Complete a visit form including evidence of effective communication (i.e. How does the student explain the particular exam to the patient?) and understanding of “cura personalis” in the details of the form.

(Give thought to the level of communication and understanding of “cura personalis” based on when this visit is done. i.e. Rotation 1 vs. Rotation 4)

I confirm that the student answered these questions appropriately. Any questions or concerns about these questions was discussed and addressed with the student during this visit.

PD and/or CC Signature

PD and/or CC Printed Name

Date

NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during the 4th rotation of clinical practicum

The NMT faculty collected the visit forms (see appendix) and notes from the first rotation visits which occur in February of each year for the students enrolled in this course. The program director reviewed the data, including the pass/fail status of the visit. The comments were reviewed to assess each students’ ability to convey the concepts discussed during the visit. In addition, the program director sought comments/noted which relate to professional characteristics on each of the visit forms. If such comments were identified this was marked as achieving a ranking of “synthesis” or higher.

**Saint Louis University
Nuclear Medicine Technology Program Site Visit Evaluation Form**

Student: _____

Clinical site: _____

Date: _____

Arrival time: _____

Rotation number: _____

Visit number: _____

Student comments:

Procedures and comments on tasks at the clinical site:

Site Visitor’s Report:

Assessment of student’s progress and performance:

Competency Evaluation:

Issues with teaching and supervision:

Recommendations for next visit:

Grade PASS / FAIL

___ Student brought books and organized notes for visit.

___ Student was able to locate information in notes and/or books.

___ Student was prepared to discuss any exams they had observed, participated or performed. ___

Student illustrates understanding of exams discussed ___ Student paperwork is up to date. ___

Signatures:

Clinical Supervisor: _____ Site Visitor: _____

Student: _____ Departure time: _____

**Saint Louis University
Nuclear Medicine Technology Program Site Visit Required Questions**

Topic: Other procedure: _____

Student: _____

Clinical site: _____

Date: _____

8. What is the prep for this study?

9. What are the radionuclides and adjunct drugs used in this study?

10. What is the method of localization of the radiopharmaceutical?

11. What are the indications for doing this study? What is going on with the patient where this study may be warranted?

12. What are the imaging parameters for this study?

Only need to ask these questions ONCE per visit:

C. Ask for a response to the following statement of ALL students:

Give an example of how you portray “cura personalis” in the clinical setting.

D. Complete a visit form including evidence of effective communication (i.e. How does the student explain the particular exam to the patient?) and understanding of “cura personalis” in the details of the form.

(Give thought to the level of communication and understanding of “cura personalis” based on when this visit is done. i.e. Rotation 1 vs. Rotation 4)

I confirm that the student answered these questions appropriately. Any questions or concerns about these questions was discussed and addressed with the student during this visit.

PD and/or CC Signature

PD and/or CC Printed Name

Date

Saint Louis University Nuclear Medicine Technology

Once submitted this evaluation will be available for review and for comments to be added by the following roles: **Clinical Supervisor and Student.**

Evaluator:	Sarah Frye - Administrator	Subject:	Leila Alsarag - Professional Phase Student
Activity:	2022 Rot 4 Week 6	Site:	Missouri Baptist Medical Center
Evaluation Type:	Site Visit	Completion Date:	10/15/2022
Request Date:	10/15/2022		
Period:	2023 Rot 1 Week 6	Dates of Activity:	10/10/2022 To 10/14/2022

Please select the option that best matches your level of agreement with this evaluation.

Comments entered above may be viewed by your program director or advisor and may be a part of a printed report.

(Question 1 of 9 - Mandatory)

Student Comments	
List of procedures the student has received proficiencies:	Leila has at least 6 performed studies. These include WB bone scans, lympho-B, QC floods, QC resolution, QC COR, and hepato. Shas participated in at least 9 other studies. She has stayed in generals and has not been to see cardiac yet. She spent half a day in PET on day when generals was slow.
Issues with teaching and supervision:	none

Site Visitor's Report

(Question 2 of 9 - Mandatory)

Site Visitor Comments	
Assessment of student's progress and performance:	Bhea and Michelle stated that Leila is doing great. She is learning quickly and jumping in on all studies. She is injecting patients and she is getting better at talking with patients. She even did as much as the QC that she could solo when a technologist has a miscommunication on when to come one morning.
Competency Evaluation:	Leila did a great job discussing hepato and bones.
Recommendations for next visit:	Next visit will not be until December when the second rotation has just started. We will discuss VQs, MPIs, and RVGs/MUGAs.

Site Visit Grading (Question 3 of 9 - Mandatory)

Student brought books and organized notes for visit.

NO

YES

0

>> 1 <<

2

Student was able to locate information in notes and/or books. (Question 4 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student was prepared to discuss any exams they had observed, participated or performed. (Question 5 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student illustrates understanding of exams discussed. (Question 6 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Student's eValue record is up to date. (Question 7 of 9 - Mandatory)

NO	YES	
0	>> 1 <<	2

Pass/Fail Site Visit Grade

(Question 8 of 9 - Mandatory)

Did this student complete 4 of the 5 items above?

If so, mark: PASS
If not, mark: FAIL

FAIL	PASS	
0	>> 1 <<	2

Additional comments? (Question 9 of 9)

We talked about hours and how everything is going so far. We discussed the plan for clinical hours and a little about her time off. We discussed her current courses.

As of the end of September, Leila has 4.5 hours off total. She took off one day and worked extra other days. I will update her on my count of her hours about monthly.

Additional Evaluation Comments

Clinical Supervisor Has Not Posted Comments

Student Has Not Posted Comments

Saint Louis University Nuclear Medicine Technology

Once submitted this evaluation will be available for review and for comments to be added by the following roles: **Clinical Supervisor and Student.**

Evaluator:	Sarah Frye - Administrator	Subject:	Hannah Flickinger - Professional Phase Student
Activity:	2023 Rot 3 Week 6	Site:	VA Medical Center - John Cochran
Evaluation Type:	Site Visit	Completion Date:	03/14/2023
Request Date:	03/14/2023		
Period:	2023 Rot 3 Week 6	Dates of Activity:	03/13/2023 To 03/17/2023
Subject Participation Dates:	03/13/2023 To 03/17/2023		

Please select the option that best matches your level of agreement with this evaluation.

Agreed on 03/14/2023

Comments entered above may be viewed by your program director or advisor and may be a part of a printed report.

(Question 1 of 9 - Mandatory)

Student Comments	
List of procedures the student has received proficiencies:	Hannah has performed 5 different procedures (bone scan, CT QC, MPI rest and stress, and QC floods). She has not had the opportunity to do many other studies. She will spend some time in PET here soon. I also recommended that she tries to do other QC procedures when there are few or no patient exams.
Issues with teaching and supervision:	none

Site Visitor's Report

(Question 2 of 9 - Mandatory)

Site Visitor Comments	
Assessment of student's progress and performance:	Ejda stated that Hannah is doing well. She is catching on well and does a good job talking with patients.
Competency Evaluation:	Hannah did well discussing PET, radiopharmacy, and radiation safety. She was able to answer all the standard visit questions plus several more.
Recommendations for next visit:	The next visit is the group visit on SLU's campus. Sarah will email with instructions about 1 week prior to this visit. It will most likely require the students to come prepared with questions they have for their instructors in order to be ready for that final visit.

Site Visit Grading (Question 3 of 9 - Mandatory)

Student brought books and organized notes for visit.

NO YES

0

>> 1 <<

2

Student was able to locate information in notes and/or books. (Question 4 of 9 - Mandatory)

NO

YES

0

>> 1 <<

2

Student was prepared to discuss any exams they had observed, participated or performed. (Question 5 of 9 - Mandatory)

NO

YES

0

>> 1 <<

2

Student illustrates understanding of exams discussed. (Question 6 of 9 - Mandatory)

NO

YES

0

>> 1 <<

2

Student's eValue record is up to date. (Question 7 of 9 - Mandatory)

NO

YES

0

>> 1 <<

2

Pass/Fail Site Visit Grade

(Question 8 of 9 - Mandatory)

Did this student complete 4 of the 5 items above?

**If so, mark: PASS
If not, mark: FAIL**

FAIL

PASS

0

>> 1 <<

2

Additional comments? (Question 9 of 9)

We discussed a little bit about our personal lives, the rest of the semester, applying for jobs, and what is next.

Additional Evaluation Comments

Clinical Supervisor Has Not Posted Comments

Student Has Not Posted Comments

Nuclear Medicine Technology Assessment Rubrics for all PLO's

****IMPORTANT NOTES:** The ratings, identified by the column headings below, are of increasing complexity moving across the table (from left to right). Students who can demonstrate Jesuit values as they perform diagnostic imaging procedures (that is, meet the “application” rating) must be able to first identify examples of Jesuit values (the “knowledge” rating). Likewise, in order for students to evaluate the use of Jesuit values (the “synthesis” rating), they must identify examples of Jesuit values (knowledge) and provide concrete evidence of the use of Jesuit values (application).

NUCLEAR MEDICINE TECHNOLOGY (NMT)		
Program Learning Outcome (PLO #1): Students will demonstrate the Jesuit value, “Cura Personalis” as they perform diagnostic imaging procedures.		
Knowledge**	Application**	Synthesis**
<ul style="list-style-type: none"> Define the Jesuit value of Cura Personalis. 	<ul style="list-style-type: none"> Examine circumstances in which Cura Personalis has been portrayed in their experiences in the clinical setting. 	<ul style="list-style-type: none"> Develop alternative actions in the use and/or non-use of Cura Personalis in the clinical setting.

NUCLEAR MEDICINE TECHNOLOGY (NMT)		
Program Learning Outcome (PLO #2): Students will demonstrate effective communication when speaking with both patients and other healthcare professionals in the nuclear medicine department.		
Knowledge**	Application**	Synthesis**
<ul style="list-style-type: none"> Recognize the need to adjust conversations and explanations based on the audience. (i.e. use lay terms for patients and technical terms for other healthcare providers) 	<ul style="list-style-type: none"> Apply knowledge during senior capstone presentation and with patients in the clinic. 	<ul style="list-style-type: none"> Revise communication with patients in as they progress in the clinical setting.

NUCLEAR MEDICINE TECHNOLOGY (NMT)		
Program Learning Outcome (PLO #3): Students will use knowledge, facts and data to assess problems and find solutions as they relate to nuclear medicine imaging and Computed Tomography (CT) procedures.		
Knowledge**	Application**	Synthesis**
<ul style="list-style-type: none"> Identify errors in an imaging case study presented. 	<ul style="list-style-type: none"> Interpret data presented in an imaging case study. 	<ul style="list-style-type: none"> Propose solutions to errors found in an imaging case study presented.

NUCLEAR MEDICINE TECHNOLOGY (NMT)		
Program Learning Outcome (PLO #4): Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.		
Knowledge**	Application**	Synthesis**
<ul style="list-style-type: none"> Recall facts and theories relating to nuclear medicine technology. 	<ul style="list-style-type: none"> Relate facts and theory to the clinical practice of nuclear medicine technology. 	<ul style="list-style-type: none"> Evaluate the use of facts and theory of nuclear medicine technology in clinical practice.

NUCLEAR MEDICINE TECHNOLOGY (NMT)		
Program Learning Outcome (PLO #5): Students will exhibit professional characteristics expected of nuclear medicine technologists.		
Knowledge**	Application**	Synthesis**
<ul style="list-style-type: none"> Define professional characteristics of a nuclear medicine technologist. 	<ul style="list-style-type: none"> Demonstrate professional characteristics of a nuclear medicine technologist. 	<ul style="list-style-type: none"> Integrate professional characteristics into practice as a nuclear medicine technologist.

Program Assessment Data Collection Tool

NMT

PLO 4.1 and 4.2

<p>Program Learning Outcome 4: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.</p>									
<p>Assessment Mapping/Tools: 1. NMT 4000 NM Procedures I / Clinical Simulation/Role Playing assignment</p>									
<p>Program Target: An average of 85% of the students will achieve a ranking of "knowledge" or higher using the corresponding assessment rubric.</p>									
<p>Assessment Data Collection & Initial Data Analysis/Person(s) Responsible : Data collected using the corresponding assessment rubric. Responsible Person: NMT Faculty Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.</p>									
<p>Timeline (any 12 month period is acceptable): Every academic year.</p>									
<p>Instructor Instructions: Please enter the number of student artifacts assessment and the number of artifacts which met or exceed the target.</p>									
	n =	# meeting target							
AY 22/23	8	8 100%							
<p>Program Learning Outcome 4: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.</p>									
<p>Assessment Mapping/Tools: 2. NMT 4340 NM Procedures II / Clinical simulation/Role Playing</p>									
<p>Program Target: An average of 85% of the students will achieve a ranking of "synthesis" using the corresponding assessment rubric.</p>									
<p>Assessment Data Collection & Initial Data Analysis/Person(s) Responsible : Data collected using the corresponding assessment rubric. Responsible Person: NMT Faculty Analysis Action Plan: Determined after all data is collected by the faculty and analyzed by the Program Director.</p>									
<p>Timeline (any 12 month period is acceptable): Every academic year.</p>									
<p>Instructor Instructions: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.</p>									
	n =	# meeting target							
AY 22/23	8	8 100%							
<p>Program Learning Outcome 4: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.</p>									
<p>Assessment Mapping/Tools: 2. NMT 4900 NM Clinical Practicum III / Clinical visit evaluation during 4th rotation of clinical practicum</p>									
<p>Program Target: An average of 85% of the students will achieve a ranking of "synthesis" using the corresponding assessment rubric.</p>									
<p>Assessment Data Collection & Initial Data Analysis/Person(s) Responsible : Data collected using the corresponding assessment rubric.</p>									
<p>Timeline (any 12 month period is acceptable): Every academic year.</p>									
<p>Instructor Instructions: Students will demonstrate the ability to translate didactic knowledge into clinical practice as a nuclear medicine technologist.</p>									
	n =	# meeting target							
AY 22/23	8	8 100%							

