

INVITED PERSPECTIVE

**NUCLEAR MEDICINE ADVANCED ASSOCIATES: PHYSICIAN
EXTENDERS IN NUCLEAR MEDICINE – NOW IS THE TIME**

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ABSTRACT

The Nuclear Medicine Advanced Associate (NMAA) has evolved into a valuable member of the imaging team since its inception in 2008 to 2020. Data show that NMAAs perform key services including supervision, interpretation, protocoling adjunct studies, and management duties freeing Nuclear Medicine physicians to concentrate on more complicated and time intensive responsibilities. Additionally, the profession has gained ground in recognition by the Nuclear Medicine Technology Certification Board (NMTCB) with the advent of a formal NMAA certification examination and recognition guidelines for institutions interested in establishing NMAA educational programs. Actions are underway for the creation of new NMAA programs with pathways to enhance and expand student recruitment. A special task force is established by the Society of Nuclear Medicine and Molecular Imaging (SNMMI) Advanced Associate Council (AAC) to raise the visibility of the advantages of the physician extender within the practice setting. Practicing NMAAs list duties that they perform that are beyond the scope of Nuclear Medicine Technologists.

KEY WORDS

Nuclear Medicine Advanced Associate, NMAA, Nuclear Medicine Technology Certification Board, NMTCB, Nuclear Medicine Education

Multi-level healthcare is rapidly becoming a standard operating mode in most of clinical specialties. Mid-level providers such as nurse practitioners (NP) and physician assistants (PA) are working along with physicians across the country providing mid-level care, allowing physicians to be more productive and focused on high-level care. The transition to multi-level care was slower in imaging specialties, particularly in nuclear medicine. However, as the volume and complexity of nuclear medicine diagnostic and therapeutic procedures is increasing, it is easy to foresee that mid-level providers will be essential for the future of nuclear medicine. In order to facilitate transition of nuclear medicine to multi-level care, it is important to advance the opportunities for training and employment of mid-level providers in nuclear medicine.

Within Society of Nuclear Medicine and Molecular Imaging (SNMMI), Advanced Associate Council (AAC) has been a primary advocate for midlevel providers in nuclear medicine, focusing on training, practice, and job opportunities. At the 2018 mid-winter meeting in Orlando, SNMMI Board of directors accepted the AAC proposal and endorsed Nuclear Medicine Advanced Associate (NMAA) as fulfilling the physician extender role in nuclear medicine. The first NMAA class graduated in 2010. Since that time, a total of 16 NMAAs have been credentialed by the Nuclear Medicine Technology Certification Board (NMTCB). NMAAs are evolving into a vital arm of nuclear medicine practice. NMAAs currently work in varying capacities within general nuclear medicine, nuclear cardiology, PET/CT, and radionuclide therapy. The needs of the workplace have defined how and where they practice. NMAAs, by virtue of their training as nuclear medicine technologists and mid-level providers, have been extremely flexible if meeting practice needs.

NMAA EDUCATION

The initial NMAA training program was established as a consortium at the University of Arkansas for Medical Sciences (UAMS), with St. Louis University, University of Missouri, and later, the Medical College of Georgia, and was operational from 2008-2018. The program closed due to several institutional reasons, but the sixteen graduates continue to work as intended in a variety of nuclear medicine practice settings.

Though their numbers are few and currently no training program exists, new efforts to bring on a resurgence are underway by the SNMMI AAC. It's worthy of mention, that Physician Assistant (PA) programs took 15 to 20 years for wide acceptance within health care, starting first in the early 1960s, and not really gaining

broad acceptance until the early 1980s. A shortage of physicians was the impetus behind the branding of the PA. Implementation has proven that PAs provide a much needed, cost effective expansion of providers, especially in rural and underserved settings.(1) The decline in dedicated Nuclear Medicine and Molecular Imaging physicians emphasizes the need for the same options to maintain and grow the ever-expanding nuclear market.

EDUCATIONAL RECOGNITION

In addition to the establishment of a standardized credentialing examination, in recent years, the SNMMI AAC has worked closely with the NMTCB to create a robust pathway for the regeneration of the NMAA career. To this end the NMTCB developed a position paper in support of the NMAA. NMTCB believes the NMAA is an important addition to the nuclear medicine field and will continue to grow as other physician extenders have in parallel fields. NMTCB also believes these advanced technologists will need the validity and quality of certification and recertification that the NMTCB can provide. NMTCB will continue to support the NMAA certification program and NMAA certificants. By continuing on this course, NMTCB's intent is to help spur recognition of the NMAA in those various states that already use the NMTCB certification as a gold standard for legitimization in other areas of nuclear medicine as well as promoting unparalleled quality in the nuclear medicine arena.

One change from previous NMAA program requirements is the elimination of the requirement for NMAA applicants to be practicing NMTs. This factor greatly limited those who might be interested in admission to NMAA programs and restricted recruitment. New guidelines allow for training at the Masters level for new NMT grads who will receive a greater number of NMAA clinical hours, similar to that of medical residency training. Proposed training extends the amount of training previously offered under the Arkansas NMAA program.

Additionally, to encourage and support the creation of new NMAA educational programs, the NMTCB worked with the SNMMI AAC to create program recognition guidelines to help institutions looking to implement NMAA programs have a framework for establishing new programs. Table 1.(2) These guidelines include recommendations for content, admissions standards, format, location, program resources, and clinical standards:

NEW NMAA PROGRAM INITIATIVE

Currently, there is a new program in the early stage of development at the University of Alabama in Birmingham (UAB). Currently in the formative stages of the approval process is a proposed Graduate Track option to go along with the Master of Science in Nuclear Medicine Technology Entry – Level Program. This Graduate Track would allow graduates of the UAB MSNMT Program an avenue for advanced practice as a Nuclear Medicine Advanced Associate. The hope and expectation that a program can be designed in a way that BS educated students can take advantage of this track and be able to apply to the program. Because it is in the early stages, full details are not yet available. Faculty at UAB are aiming for a Fall 2021 start but this could be delayed. Unfortunately, the way academia works it takes time to bring new programs, tracks and offerings to fruition. Signs are hopeful at this time.

NMAA PRACTICE SURVEY

In order to better understand the opportunities and challenges of NMAA practice, AAC recently conducted a survey. While the numbers are small (sixteen total), all sixteen responded to the survey. The results demonstrate NMAA practice beyond the scope of the Nuclear Medicine Technologist and are helpful for future planning. (Table 2.)

NMAA PRACTICE

These data clearly show that NMAAs are involved in all aspects of NM and Molecular Imaging practice, including supervision, and to a lesser extent preliminary interpretation. While this information is useful, it only reveals a few quantitative aspects of NMAA practice. NMAAs have also provided some qualitative analysis with the broad effect on a quality of daily NM operations. It is in these pearls that the real value of the NMAA is revealed.

As indicated in Table 2., NMAAs are performing advanced duties within clinical practice settings, to include, but not limited to supervising and interpreting studies. This is only one of indications of how their careers have lent value to today's imaging environment. In qualitative response, NMAAs have reported a wide variety of expanded duties that were resultant from their formal didactic education as well as

their clinical internships. NMAA internship included experience under the supervision of physicians in cardiac, general nuclear medicine, therapeutic, and PET settings. NMAAs were mentored by physician preceptors in all aspects of medical management. The experience was very similar to that received by medical residents. Since graduation and entry into NMAA careers, they have reported evolution into a wide variety of responsibilities, many carved out by the need defined by their individual practice settings.

In a separate anecdotal polling NMAAs, were asked to describe their daily practice activities that they felt entered into advance practice. In actual NMAA practice, many of the responsibilities reported by NMAAs are differentiated from responsibilities of NMTs, and fall into the realm of what are traditionally considered as physician duties. Table 3. Furthermore, NMAAs have moved into Directorships and Supervisory positions previously reserved for NPs and PAs. Comprehensive educational content in healthcare management that is part of the NMAA curriculum has prepared graduates to manage practices using evidence-based data and to apply information in the area of medical informatics. These are areas that are not currently the purview of NMT educational programs.

NMAA JOB RECOGNITION

In order for NMAAs to fully benefit from their advanced training and most optimally contribute to healthcare, official NMAA job recognition by key stakeholders at the national level will be ultimately necessary. In this regard, the AAC is forming a task force to organize this effort. It should be noted that the NMAA Roles and Responsibilities are accepted and approved by the American College of Radiology (ACR) (3) and the SNMMI by resolution in 2019. In the beginning of 2019, NMAAs collectively worked together to make a case to the Nuclear Regulatory Commission (NRC) to be recognized as Authorized Users (AUs) albeit a limited scope. While they made a compelling case, the NRC was not ready to proceed at the time. During this time, the AAC began working with a lobbyist who has had experience lobbying for medical imaging. It was believed NMAA might achieve recognition as part of the Medicare Access to Radiology Care Act (MARCA bill). The American Society of Radiologic Technologists (ASRT) and the American Registry of Radiologic Technologists (ARRT) had been lobbying for the Radiologist Assistant (RA) to receive Medicare reimbursement for certain exams and recently had success in getting further than they ever had in the past. The NMAA language crafted was not focused

on reimbursement, but rather recognition, which was felt would be easier to adopt and accept given the low volume of practicing NMAAs and reduce the number of those in potential opposition. The ASRT and ARRT had invested great time and money into their lobbying effort. Because of the delicate nature of this endeavor for the RAs and the difficulty of advancing the bill to this point they did not feel it would be prudent to try to insert any new language in the bill at that time. The AAC did honor their request and expressed our support for the RA. The MARCA bill has since been stalled in legislature due to other high profile, time consuming issues. There have been some ideas for additional lobbying efforts, one of which was to try to insert the NMAA through the VA system. It's already known from the failed attempt from the SNMMI-TS and the ASRT that national licensure is a difficult effort and this is why the current focus is on state licensure. Several initiatives are underway. The second was to target states where there are NMAAs AAC members.

OBSTACLES

While the NMAA initiative has a positive and encouraging outlook, it depends on several factors that may be limiting to forward movement. The major factor would be the ability to assure implementation of a new program, such as the one in under development at UAB. Additionally, adequate marketing to program directors and students enrolled in NMT educational programs, as well as interested working NMTs is necessary to create recruitment efforts and enrollment in new programs. Also support from the SNMMI and the medical community is needed to establish understanding of the value of the NMAA within the practice setting. Greater efforts for NMAA visibility is absolutely imperative to move the profession forward.

CONCLUSION

In conclusion, the NMAA initiative is alive and well and moving forward. NMAAs are now SNMMI-recognized physician extenders in nuclear medicine, with diverse, flexible, and effective roles in nuclear medicine diagnostic and therapeutic procedures and nuclear medicine management. The efforts to create a robust education and employment opportunities are underway.

AAC and NMTCB encourage your interest and inquiry. Please visit AAC web site at <https://www.snmmi.org/AboutSNMMI/Council.aspx?ItemNumber=6562> and take a look of

our Fall 2019 Newsletter. To be involved with this exciting future, please feel free to contact any or all of the following leaders in the field:

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DISCLOSURE

No potential conflict of interest relevant to this article was reported.

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01/08/2020. [<http://www.nmtcb.org/documents/NMAA-Educational-Program-Recognition-Guidelines-Final-2019.pdf>]

3.,ACR Digest of Council Actions 2019-2020· ACR Resolution Endorsing The Statement “Nuclear Medicine Advanced Associate – Roles and Responsibilities”. (Page 66 Section II, Item 10). Accessed Online 01/10/2020

[<https://www.acr.org/-/media/ACR/Files/Governance/Digest-of-Council-Actions.pdf>]

Table 1. Program Recognition Guidelines (2)

Program Recognition Guidelines

1. Program Location: The sponsoring institution of a NMAA Program must be accredited by a recognized regional, national and/or state agency and be legally authorized to provide a program of postsecondary education. All academic affiliates must be accredited by a recognized regional, national and/or state agency.

2. Program Responsibilities: The program shall be responsible for:

a. Establishing admissions criteria and a curricular plan.

b. Maintaining and documenting effective supervision, coordination and continuing communication with all affiliated academic and clinical institutions to ensure students receive equivalent and adequate instruction and clinical experiences.

c. Initiating a formal affiliation agreement whenever another institution provides academic and/or clinical education to students as part of the professional program.

d. Ensuring that the activities assigned to students in the clinical setting are educational.

3. Program Personnel: The sponsoring institution must provide / insure that there is sufficient administrative, instructional and support personnel for the curriculum and program enrollment. The Program's personnel will include but not be limited to the following:

a. Program Director

b. Medical Advisor

c. Instructional faculty

d. Staff support

4. Program Resources: The sponsor's human, physical, financial and learning resources must be sufficient to support the educational goals and number of students admitted into the program.

5. Clinical Affiliation Sites: All clinical affiliation sites must be accredited by ACR, IAC, or TJC.

6. Clinical Curriculum: The clinical component of the program shall provide an environment for supervised, competency-based clinical education and offer a sufficient and well-balanced variety of nuclear medicine procedures.

(The full PDF copy of the Educational Program Guidelines may be reviewed at the following website: <http://www.nmtcb.org/documents/NMAA-Educational-Program-Recognition-Guidelines-Final-2019.pdf>)

Table 2. NMAA Practice Survey

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| A recent survey of NMAAs in practice provides some quantitative data revealing just how NMAAs practice within today’s busy imaging professions. |
| 33 % of those reporting supervises 16 to >20 Nuclear Medicine Procedures per week, and 25% of those reporting supervise 1-10 NM procedures per week |
| 25% provide Preliminary Interpretation of NM procedure results |
| 19%(provide supervision of 16 to > 20 PET/CT procedures per week |
| 13 % provide Preliminary Interpretation of PET/CT results |
| 19 % provide supervision of 16 to > 20 Nuclear Cardiology Procedures per week, and 25% supervise 1-10 Nuclear Cardiology Procedures per week. |
| 31 % provide Preliminary interpretation to Nuclear Cardiology procedure results |
| 38 % supervise 1-10 Lymphoscintigraphy cases per week |
| 25% supervise 1-10 I-131 therapy cases per week |
| 25% supervise 1-5 Parenteral NM Therapy cases per week. |

Table 3. NMAA Responsibilities

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| Dictate preliminary findings on all general nuclear medicine, nuclear cardiology, and PET/CT exams. Comparable to all mid-level providers, these findings are then over-read by the attending radiologist for final interpretation and signing. Per Vicki LaRue, NMAA at Jewish Health in Denver: “At last count, I touch 90% of all NM studies prior to final sign off by radiologists. Half of my workday (sometimes more) is dedicated to reading.” |
| Contact ordering physicians with critical findings. (This is required per the attending radiologist and then dictated into the report) |
| Protocols all NM studies, utilizing appropriate use criteria, (prescribing doses/images for clinical studies) and verifying clinical correlation and relevance by ordering adjunct imaging studies and labs. Contact ordering physicians to suggest appropriate changes. |
| Perform any necessary clinical workup for NM diagnostic or therapeutic procedures. Including administration of medications that are not within the scope of the technologist. Review medication lists, and answer any patient questions. Direct contact for any technologist questions. This includes “clearing” studies such as VQ scans for PE probability, potential “stress only” myocardial perfusion imaging, and evaluating acceptable myocardial suppression for PET cardiac metabolic evaluation studies. Delegating these responsibilities to a specialized NM physician extender, allows our radiologists to focus on complex cases, oversee invasive procedures, consult with referring physicians, and prepare for case conferences. |
| DXA Study Interpretations. |
| Hepatic Arterial Infusion Pump Access (currently accessing these ports) |
| Theranostics: Patient consults/assessments pre & post treatment for Lutathera, Xofigo, etc (physical exams, overview of labs, pre-dictations for attending MD); assisting with therapy infusions with authorized user. |
| Supervise Stress Tests, provide preliminary report, quickly triage, stabilize, and collaborate with the supervising physician if needed for patient emergency. |
| Sentinel node injection and mapping for the surgeon. |
| NRC Compliance, Supervision of new department openings. |
| Regional Manager of Nuclear Firm. |