Welcome to the special edition of the WINM Newsletter for Women in Medicine Month! This month, we would like to honor the contributions of all women who have contributed to advances in medicine, particularly in Nuclear Medicine. Our featured stories this month include a spotlight on FES (F18-fluoroestradiol) PET, written by two outstanding female early professionals in our field. Also highlighted is the application process for SNMMI grants and awards -- we encourage all our women in nuclear medicine to take a look and see whether they or someone they know could be nominated.

Thank you all for your contributions to medicine and to our specialty.

Best,
Joanna

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Top 5 Tips for Your New Role

Jennifer Schroeder

On the first day at my first job as an attending physician -- the medical knowledge from my recent board exam ingrained, my degree certificates framed -- I struggled with how to logon to myriad applications on my office computer. Although, I had been a resident at this institution, things just seemed different. I had literally been working towards this job my whole life, an additional 10 years of training after college, and I felt at a loss. Where was the New Attending Handbook to educate me on how to navigate this role?

After 6 months, I have learned (and contributed!) much in my new role. In particular, I have discovered a few indispensable tools that are underrepresented in the literature given the magnitude of the benefit conveyed. Here, I share my top five tips that may be beneficial to other new attendings:

1. **Ask for help (and discover your allies).** This sounds simple, but it is often overlooked. We all need help at some point; we are only human. From office supplies to office policies, find the person who can point you in the right direction quickly. The worst that can happen is the person/group you are seeking help from doesn’t know or says “no.” Indeed, a “no” is just as helpful to you because it identifies those who may not have the time or inclination to be supportive. It allows you to direct your efforts elsewhere. You find your advocates and mentors among those who say “yes.” Fortunately, colleagues who were well established in their careers took me on as their mentee. I cannot underscore the importance of mentors enough; in fact, that is why it is the sole topic of many papers in many journals, including medical publications.

2. **Make a plan (with promotion in mind).** This could be a daily, weekly, monthly, or yearly plan. It could also be a list of things you want to have accomplished in 5 to 10 years if you are big picture person. The important thing is to write down the end goal, because then you can create a road map toward that goal. No worries if the goal changes, because things will change; that is a certainty of life. Nevertheless, this process will help to organize your thoughts and find a starting place. For example, it is standard for my institution to promote based on peer-reviewed publications with 10 or so being required for the next tier. Therefore, if my goal is to be promoted in the next 5 years, I need about 2 publications per year.
3. **Set up a single calendar (to successfully integrate work and home).** Having one calendar for your life is most efficient. I tried to separate the two hoping to keep my work life from bleeding into my personal life, but was woefully unsuccessful. Rather, I created chaos with missed meetings and broken promises to my family. So merge those calendars and schedule personal time. If you need a weekly date night to reconnect with your significant other, schedule it and do not feel like you have to justify it or give a reason. Prioritize what you need to stay centered and focused. Studies into adult play show that those who engage in regular play activities function better in all aspect of their life, including work. (See Play by Stuart Brown.)

4. **Prepare a set of standard responses (and give yourself time to consider your goals).** Everyone has moments when they are approached with an opportunity to work on a task, such as giving lectures, protocol updates, committee work, crafting papers, etc. I find that having a set of go to comments gives me time to think about the request in terms of my time and my goals. For example, “That is an interesting idea. Let me get back with you on that” or “I am overcommitted right now, but I will add that to my list of future opportunities and get back with you.” Also, standard responses can also help with nonproductive meetings or conversations: “I’m sorry, I need to read out now” or “I have to visit the loo.” It sounds silly, but often you will find this break allows you to refocus your work in a more meaningful manner, even if it is merely to wrap up the conversation.

5. **Be kind to yourself (just as you are to others).** As physicians, we often excel at giving others grace, but can be terrible at extending it to ourselves. We expect a lot from ourselves and can undervalue our contributions. Think about this: If your significant other came to you about a failure at work, you would comfort them. Yet when the roles are reversed, we often scorn our own attempts and devalue others’ opinions of praise or clemency. So the next time you find yourself being self-critical, put yourself in a loved-one’s shoes and hear yourself out.

No matter the job, there is always a steep learning curve when taking on a new role. It is during the early days on the job that you begin to learn the intricacies of practice patterns and personalities within an institution and start to hone your interpersonal skills. Indeed, I hope that I have given a few yet indispensable tips that you can implement quickly and early to help ease the transition and increase productivity and job satisfaction.
SNMMI provides more than $400,000 annually to advance nuclear medicine, molecular imaging and therapy, fund professional development efforts, and promote the next generation of researchers. The SNMMI Grants and Awards Program provides the opportunity for international recognition, highlighting groundbreaking accomplishments within our specialty as well as contributions to the Society at large. Distribution of SNMMI and SNMMI-TS grants, awards, and scholarships is contingent upon available funding. Thank you to our donors who represent the Society’s commitment to advancing nuclear medicine, molecular imaging, and therapy. The SNMMI and SNMMI-TS Grants and Awards program for 2022–2023 will open on or about October 9, 2022.

AMA EdHub Course: Supporting Women in Medicine

This self-paced online CME course identifies the challenges faced by women physicians and health professionals—including gender bias and stereotypes, work-life imbalance and limited opportunities to progress—as well as the accruing impact of these challenges over a lifelong career.
The SNMMI Future Leaders Academy focuses on setting a clear plan for increasing leadership abilities. Members will develop the necessary skills and receive organizational expertise to enhance performance and ultimately evolve into a leader both within the nuclear medicine and molecular imaging community and the SNMMI.

Click here for a preview of the application. The application process will open September 19. The deadline to apply is October 24, 2022.

The Future Leaders Academy will be held January 26-27, 2023, in conjunction with the SNMMI Mid-Winter Meeting in San Francisco, CA. By submitting an application, you are affirming your availability on these dates and your willingness to attend the Academy. If accepted, the SNMMI will cover your airfare, and two-nights hotel. Applicants will be notified of acceptance by December 1.
Novel Breast Cancer Imaging with FES PET
Tasnim Khessib MD and Jagruti Shah MD

The field of nuclear medicine is rapidly evolving in this era of precision medicine with newly emerging radiopharmaceuticals and theragnostic agents to assist in providing targeted diagnoses and therapeutic options in cancer patients. A promising radiopharmaceutical is F18-fluoroestradiol (FES), also known as Cerriana TM, which was FDA approved in 2020 as a PET imaging agent for detecting estrogen receptor (ER) positive lesions in patients with recurrent or metastatic breast cancer.(1)

Approximately 1 in 8 women are diagnosed with breast cancer in their lifetime, and of those, around 70-80% are estrogen receptor positive. (2) FES-PET provides a non-invasive, whole-body assessment of functional ER expression which has been validated as a marker of ER status by both radioligand binding assay and IHC performed on tissue samples.(3) Endocrine therapy is recommended as standard of care for patients with ER+ metastatic breast cancer since it reduces relapse risk and improves survival.(2) However, it may only be effective if the tumor lesions have estrogen receptor expression. Roughly 10-30% of patients with breast cancer can have discordant pathology between the primary tumor and metastatic lesions. There is not only intratumoral (ER + and ER – disease within same lesion) and intertumoral heterogeneity (ER + and ER – disease among different tumor sites at single time point), but also temporal heterogeneity (ER+ tumors over time can become ER-) in ER expression of metastatic lesions across the course of one’s disease. Therefore, one of the important applications for FES PET is to provide a snapshot of ER status of all metastatic lesions in the entire body during a single time point to help guide a personalized treatment plan and select patients who will benefit from endocrine therapy.(4,5) Another application includes assessing ER+ status in lesions difficult to biopsy such as brain metastasis or in challenging cases that cannot be solved with conventional imaging.(6)
FES PET has also particularly proven useful in assessing tumor burden in patients with invasive lobular carcinoma which has historically been difficult to diagnose with current imaging modalities including mammography, ultrasound, MR as well as on FDG PET secondary to its low metabolic activity.(3,7)

Studies have shown an association between FES-positivity and improved patient outcomes with endocrine therapy. Both qualitative and quantitative assessments of FES uptake have demonstrated an ability to predict disease response to endocrine therapy. Linden et al. found that 46% (11 of 24) of patients with FES-positive disease responded to ER-therapy when compared to 0% (0 of 15) of patients with FES-negative disease who responded.(4) A phase II study by Peterson et al. found that 64% (9 of 14) of patients with FES-positive disease responded to endocrine therapy, and again demonstrated that patients with FES-negative disease had minimal or no response to endocrine therapy (5 of 6 demonstrated progression of disease, and 1 of 6 had stable disease at 6 months).(5) A study by Boers et al. found that amongst metastatic breast cancer patients treated with combined endocrine therapy and a cyclin-dependent kinase inhibitor, those with homogenous FES-positive disease had longer median time to disease progression (73 weeks) compared to patients with heterogeneous FES uptake (27 weeks) or FES-negative disease (15 weeks).8 Identifying patients with spatially heterogeneous disease enables clinicians and patients to expect the possibility of decreased response to endocrine therapy and to explore alternative treatment regimens early in the course of treatment when necessary.

Finally, FES PET has also been utilized for dose selection and optimization of endocrine therapy in patients with ER+ breast cancer. A phase I dose escalation trial of a new selective estrogen receptor degrader in 2017 utilized FES-PET’s ability to evaluate ER blockade to identify the optimal dosing in patients with ER+ metastatic breast cancer.(9)

The normal biodistribution of FES includes highly ER expressing organs (e.g. uterus) as well as organs involved in its metabolism and excretion such as the liver, biliary system, bowel (through enterohepatic circulation), kidneys, ureters, and bladder. We provide an example from our own institution of how FES PET was used to assess the ER status of the tumor burden and guide therapy selection in a patient with recurrent metastatic breast cancer (Fig 1).

We present a patient with history of ER+ metastatic invasive ductal carcinoma of the breast with progressive disease on first line endocrine therapy. FDG PET performed at the time of progressive disease showed hypermetabolic left pleural metastases and widespread osseous metastases.
Biopsy of a left iliac bone metastasis demonstrated ER− disease which was discordant from primary tumor. The clinical team raised concern for false negative results on bone biopsy. FES PET was ordered as a problem-solving tool to determine the ER expression/heterogeneity across the tumor burden. FES PET showed spatial intertumoral heterogeneity of the ER expression with low or negative ER expression in the osseous metastases and ER− left pleural metastases. These findings impacted patient management as second line endocrine therapy was considered less ideal as next line of treatment and patient was started on chemotherapy.

In conclusion, FES PET has a great potential in the era of precision medicine by serving as a non-invasive biomarker of assessing ER expression, acting as problem solving tool in clinically challenging cases, guiding patient selection for endocrine therapy, serving as a predictive marker for treatment response, and assessing ER blockade.

Figure 1 (A, B, C, D). Illustration of Application FES PET in determining ER status across tumor burden and role in guiding personalized therapy decision. We present a female patient with history of ER+ progressive metastatic invasive ductal carcinoma of the breast on first line endocrine therapy. (Fig. 1A and C) MIP images of FDG PET and axial PET and fused FDG PET/CT images of the chest performed at the time of progressive disease showed hypermetabolic (*) left pleural metastases and widespread osseous metastases. Biopsy of a left iliac bone metastasis demonstrated ER− disease which was discordant from primary tumor ER status. Clinical team raised concern for false negative bone biopsy results. FES PET was ordered as a problem-solving tool and determine ER expression/heterogeneity across tumor burden. (Fig.1B and D) MIP images of FES PET and axial PET and fused FES PET/CT images of the chest showed spatial intertumoral heterogeneity in the ER expression with ER + (arrowheads) and ER −(arrows) expression in osseous metastases (1B) and ER− (arrows) left pleural metastases (1D). These findings of spatial heterogeneity in ER expression across tumor burden impacted patient management. Second line endocrine therapy was considered less ideal as next line of treatment and patient was started on chemotherapy.
The annual Women in Medicine Month webinar, sponsored by the Women Physicians Section (WPS), celebrates women physicians, residents and students.

On **September 23, noon Central**, the WPS will host a special Women’s History Month webinar on gender diversity in leadership. Join us as Sandra Adamson Fryhofer, MD, presenter; Iffath Abbasi Hoskins, MD, FACOG, presenter; Darilyn V. Moyer, MD, FACP, presenter; and Susan Thompson Hingle, MD, moderator, discuss pathways to leadership and share insights on the role of organized medicine in facilitating gender equity.

**REGISTER HERE**

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**Share your achievements with us!**

If you have any good news (professional or personal) related to yourself or women colleagues in the field of nuclear medicine, please forward a photo of you in your office (home office is fine) or clinic along with text describing yourself (name, title, institution) and any accomplishments you’d like to celebrate to winmesnmni.org. We’d love to get to know you and celebrate with you via @women_in_nuclear_medicine on Instagram and @womeninnucmed on Twitter.
The WINM committee is charged with promoting women physicians, scientists and technologists in nuclear medicine and molecular imaging; fostering the development of professional interests; addressing problems encountered in the practice of nuclear medicine; promoting leadership and career development in women; raising awareness of scientific contributions of women in nuclear medicine; recognizing the challenges of balancing career and family; promoting fair and equitable treatment; and improving the climate for women in nuclear medicine in all stages of their careers.

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