COMMENTARY

Tackling the imposter phenomenon to advance women in neurology

Melissa J. Armstrong, MD, MSc, and Lisa M. Shulman, MD

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Correspondence
Dr. Armstrong
Melissa.Armstrong@neurology.ufl.edu

Abstract

Recent literature documents that women comprise an increasing proportion of the neurology workforce but still lag behind male counterparts in publications and promotion. There are many reasons for gender disparities in neurology including family responsibilities, different career goals, lack of mentorship, cultural stereotypes, lack of institutional funding, biases, and professional isolation. Another contributing factor receiving relatively little recognition is the imposter phenomenon. This review highlights recent literature on gender differences in neurology, the definition of the imposter phenomenon, and research on the imposter phenomenon in academic medicine. Approaches for managing the imposter phenomenon are described including personal, mentoring, and institutional strategies. Further research is needed to understand the frequency of the imposter phenomenon at different levels of seniority and optimal strategies for prevention and management.

Women comprise an increasing proportion of the neurology workforce, accounting for 37% of full-time neurology faculty,[1] 31.5% of US-based American Academy of Neurology (AAN) neurologist members,[2] and 48% of neurology residents.[1] Men continue to outnumber women at all academic faculty ranks at top-ranked academic neurology programs, however, with the difference increasing with advancing rank even when controlling for years since medical school graduation.[3] Such differences are also seen across US neurology departments. In 2015, there were more women than men instructors (54%) but less female representation at the assistant (45%), associate (35%), and full (19%) professor levels.[1] Women at top-ranked neurology programs also have fewer publications than men at all academic ranks.[3] Although female first and senior authorship has significantly increased in 3 high impact factor neurology journals over the past 35 years, the percent of first (24.6%) and senior (18.1%) female authorship still lagged significantly behind males in 2015.[4]

Both articles[3,4] and an associated editorial[5] postulate various reasons for these discrepancies including family responsibilities, different career goals, lack of same-sex mentorship, cultural stereotypes, lack of institutional funding, biases in research grant and manuscript review processes, and professional isolation. It is critical to identify and address these systemic barriers to women's careers in neurology in both academics and private practice. One potentially important contributor that is often overlooked is the "imposter phenomenon" (IP).

Department of Neurology (MJA), University of Florida College of Medicine, Gainesville, FL; and Department of Neurology (LMS), University of Maryland School of Medicine, Baltimore, MD.

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It is critical to identify and address these systemic barriers to women's careers in neurology in both academics and private practice.

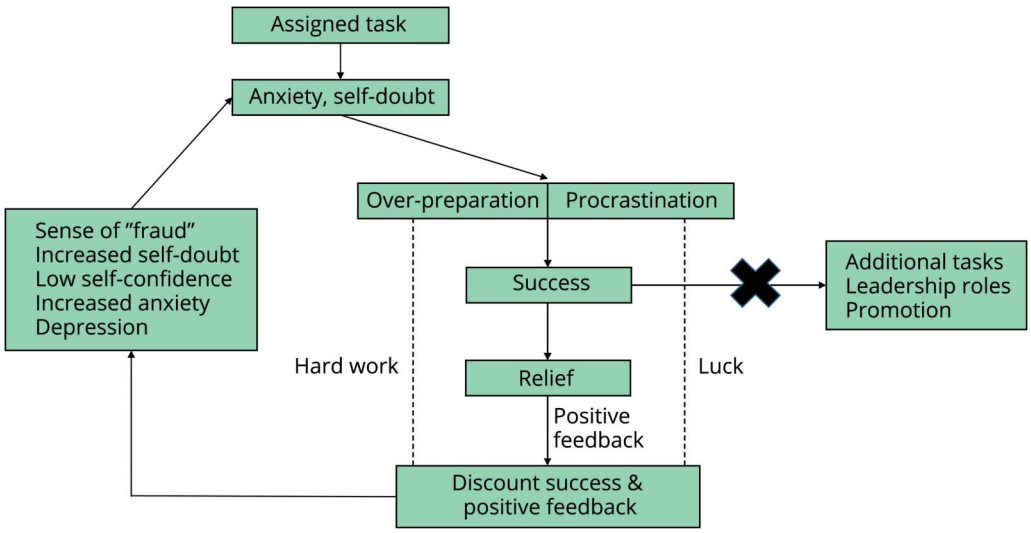
IP is a pattern of chronic feelings of inadequacy and self-doubt associated with a fear of being discovered as a "fraud." With IP, a person believes that he or she has fooled others into thinking they are competent.[6] Such feelings occur even in the setting of achievement and success.[7,8] Most people feel like imposters at times,[9] but individuals with IP have an exaggerated and irrational inability to internalize a sense of accomplishment.[6,9] This leads to a cycle of maladaptive behaviors (e.g., extreme overpreparation or procrastination) that perpetuates the perceived fraudulence. Because individuals with IP discount success as due to luck or hard work rather than their own abilities, they are less likely to accept or pursue competence-related opportunities (figure).[6] In this manner, women in neurology may be less likely to achieve higher academic faculty appointments or publication in higher tier journals in part because they feel inadequate for such opportunities and do not pursue them.

A 2018 American College of Physicians position paper about achieving gender equity in physician compensation and career advancement identified IP as one of the challenges facing women in medicine.[10] The authors described IP as a barrier to the advancement of women in medicine that may cause them to pass up opportunities for career advancement.[10] This is consistent with research outside medicine showing that IP is associated with less career planning, career striving, and motivation to pursue leadership.[11]

IP is well recognized in professions outside medicine and was popularized as "the confidence gap" by journalists Claire Shipman and Katty Kay.[12] Their work highlights how women underestimate their abilities, predict they will underperform, and view themselves less deserving of advancement even when research shows that they perform at the same level as male counterparts. This is in contrast to men, who tend to overestimate their abilities.[12] While frequently highlighted as occurring in women, IP is experienced by both genders.[6,8] It is more common in individuals with perfectionism and neuroticism[6] and may relate in part to family dynamics and social experiences.[6,8]

IP is documented in medical trainees at various levels. In a 1998 survey, 30% of medical, dental, nursing, and pharmacy students scored over the cutoff identifying IP on the Clance Imposter Phenomenon Scale (CIPS). Scale scores were higher in women (57.83 ± 14.89 vs 52.08 ± 13.03, $p < 0.001$), and IP was more common in women than men (37.8% vs 22%, $p < 0.001$). CIPS score was one of the strongest predictors of students' distress, along with perfectionism.[13] IP was even more common in a recent study, occurring in 49.4% of female and 23.7% of male medical students. It was significantly associated with burnout, particularly various components of exhaustion ($p < 0.05$), cynicism, and depersonalization (both $p < 0.01$).[7] In residency, 41% of female

Figure The impostor phenomenon cycle



Individuals with the imposter phenomenon (IP) experience anxiety and self-doubt when facing tasks, leading to maladaptive behaviors. Rather than believing that success relates to self-competence and accepting additional responsibilities, they discount the success as secondary to external factors such as luck or hard work alone. Individuals with IP have fixed beliefs that success does not reflect true abilities, so they disregard positive feedback. This leads to an increased sense of fraudulence and more self-doubt, anxiety, and depression. Adapted from: Sakulku J, Alexander J. The impostor phenomenon. *International Journal of Behavioral Science* 2011;6:75–97.

and 24% of male family practice residents scored above the CIPS cutoff despite the belief that they were well trained. Imposter symptoms correlated highly with anxiety and depression.[14] In a survey of Canadian internal medicine residents, IP occurred in 44% of the sample: 52% women (95% CI 34%–70%) and 32% (95% CI 16%–53%) men.[15]

No identified publications examined IP frequency in medical practice, but interviews with academic physicians about experience with underperformance identified IP as a frequent theme, particularly at times of transition or new professional challenges.[16] In higher education faculty, IP thoughts were moderately prevalent, with the highest levels in untenured faculty.[17] Competitive, stressful work environments, certain personality traits (e.g., achievement orientation, neuroticism, and conscientiousness), and perfectionist tendencies were associated with IP.[17]

Tackling the imposter phenomenon

Strategies targeting IP are part of a multicomponent approach to address women's roles in neurology. How can individuals experiencing IP and leaders in neurology address this phenomenon, not only in women but also in men? Research suggests that opportunities include personal approaches, mentoring, and targeted programs (departmental, institutional, and professional).

Personal approaches

Personal strategies for combating IP come from business[18–20] and nursing[21] publications world but are clearly relevant for individuals in medicine (table).

Strategies for mentors

Mentoring is critical for targeting IP,[7,17] but physicians reported that admitting to IP and IP discussions between mentors and mentees were uncommon.[16] Suggested teaching and mentoring approaches for individuals with IP include frank discussion of IP frequency,[14] providing frequent specific feedback regarding performance,[7,14] avoiding shame-based education,[7] fostering time management strategies,[14] and using programs to enhance self-efficacy.[7] Mentors can also encourage mentees to adopt personal strategies for combating IP (table). Negative feedback should be used cautiously and strategically with individuals with IP because of risks of validating perceived incompetence.[8] Women with IP may exert more effort and perform better after receiving negative feedback,[8] but this strategy may not translate to increased confidence or advancement.[12] Mentorship on the topic of IP is part of the broader role of mentorship for

Table Personal strategies targeting the imposter phenomenon

Strategy	Discussion
"Name it," acknowledge that IP is normal and common[19,21]	Most individuals will encounter IP at some point in their careers, and for some, this is an ongoing struggle.
Acknowledge when IP thoughts occur and address them honestly[19]	Identify when IP thoughts occur (e.g., "I did not deserve this recognition") and aim for honest appraisal—the patient care was good, the RITE examination score was high, and the department was thoughtful about giving recognition.
Admit imperfection[19,21]	IP is more common in perfectionists. Admit that. Stop targeting perfection, e.g., share projects with collaborators before you are fully satisfied.
Focus on activities and discussions, not self[18]	IP results in part from being overly conscious of oneself; focusing on activities enables greater influence and lessens self-focus.
Identify and reframe self-criticism[18,21]	Intentionally identify critical thoughts and reframe them to be less self-focused; e.g., rather than berating oneself for not knowing a neurologic fact, reframe to ask "how can I get this information?," rather than focusing on a sense of inadequacy, ask "what does success look like in this position?" Reframe negative to positive thoughts.
Take note of achievements and focus on strengths[18–21]	Identify when you accomplish a goal or a milestone. Acknowledge achievements such as submitting grants, not just receiving funding. Know strengths and weaknesses.
Separate self-worth from achievement[18]	While identifying successes is important (above), self-worth that is purely achievement-based leads to despair with perceived mistakes or failures. Foster a sense of self-worth that is based on strengths and values and disconnected from achievement.
Act confident[20]	Acting confident builds self-confidence. This includes dressing well, managing body language (sitting and standing straight and maintaining eye contact), speaking up in meetings, initiating contact, projecting when speaking, avoiding apologies and disclaimers, and expressing views respectfully.
Keep learning[21]	Recognize that you will develop new competencies throughout your career and that it is normal for transitions to be associated with uncertainty; ask for help when needed.
Identify key mentors[21]	Mentors share personal experience, validate the experience of IP, provide specific feedback, and give encouragement.

Abbreviation: IP = imposter phenomenon.

The AAN has educational opportunities such as the "Women Leading in Neurology" program and annual meeting courses promoting women's leadership skills.

women physicians.[10,22] A lack of adequate mentors and role models is one reason women are less likely to enter academic medicine.[23] Sponsorship—support from a senior leader to promote individuals with untapped potential—is another way to advance careers of women in medicine,[24] but women must be willing to accept these opportunities.

Departmental, institutional, and professional programs

Departmental, institutional, and professional programs can target IP to promote careers of women in medicine. Discussing IP is part of some college undergraduate and graduate orientation events and is also promoted for faculty orientation.[25] A 2-week interprofessional educational program and 1-day workshop for clinical nurse specialists resulted in greater understanding of IP and a sense of empowerment.[21] Many departments and academic institutions are developing local programs to advance the careers of women in academic medicine. Educational curricula can promote women's careers and address IP through skill development, mentorship, and networking.

The AAN has educational opportunities such as the "Women Leading in Neurology" program and annual meeting courses promoting women's leadership skills. The AAN also supports female neurologists by providing data on compensation for use in negotiation. Additional suggestions from the AAN's Gender Disparity Task Force include improving transparency, addressing implicit bias, development and support of mentors, promotion of different practice options, funds for small projects, legislative approaches, and further research.[2] The American Association of Medical Colleges has leadership development programs specifically targeting women at different career stages.

Conclusions

Recent publications document positive trends for women's roles in neurology; however, areas of concern remain.[1–4] Identifying and addressing systemic and institutional biases contributing to gender disparities are important, but modifiable personal barriers such as IP deserve recognition and intervention. Research is needed to understand the frequency with which IP occurs at faculty levels—regardless of gender—and the degree to which this may limit professional development and/or contribute to burnout. Optimal strategies for addressing IP require further investigation including identifying whether targeting IP improves outcomes such as career satisfaction and quality of life. Neurologists experiencing IP can strategically modify thoughts and behaviors to help address IP tendencies, but departments and mentors play a major role in identifying faculty members with IP and providing targeted strategies to overcome IP and personalized career development opportunities.

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Appendix Author contributions

Name	Location	Role	Contribution
Melissa J. Armstrong, MD, MSc	University of Florida College of Medicine, Gainesville	Author	Design/conceptualization of the manuscript, analysis/interpretation of concepts, drafting of the manuscript, and revision of the manuscript
Lisa Shulman, MD	University of Maryland School of Medicine, Baltimore	Author	Analysis/interpretation of concepts and revision of the manuscript for intellectual content

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