

other opioids, knowledge of expected findings in PS use may aid the clinician in diagnosis. In our case, considering that the urine morphine concentration was 376 times the cutoff value and the hydromorphone concentration was greater than 2.5% that of morphine, the concomitant use of PS with other opioids was the most likely explanation for the abnormal UDS results.

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1. US Department of Justice. SENTRY Watches: opium tea. US Dept of Justice website. <http://www.justice.gov/archive/ndic/topics/sentryWatch.htm>. Accessed August 9, 2015.
2. Smith ML, Nichols DC, Underwood P, et al. Morphine and codeine concentrations in human urine following controlled poppy seeds administration of known opiate content. *Forensic Sci Int*. 2014; 241:87-90.
3. Thevis M, Opfermann G, Schänzer W. Urinary concentrations of morphine and codeine after consumption of poppy seeds. *J Anal Toxicol*. 2003;27(1):53-56.
4. Smith HS. Opioid metabolism. *Mayo Clin Proc*. 2009; 84(7):613-624.
5. Chen P, Braithwaite RA, George C, et al. The poppy seed defense: a novel solution. *Drug Test Anal*. 2014; 6(3):194-201.

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Examining the Burden of Licensure, Certification, and Related Credentialing Costs in Young Physicians

To the Editor: The financial burden of the overall licensure and certification process borne by physicians-in-training, and those who have recently completed their training and are beginning to enter clinical practice, has become excessive.¹⁻⁴ It is worth reminding ourselves that for most new physicians these costs must be managed while concurrently beginning to repay large education debts and incurring the general expenses of becoming established in early family and professional life.

Based on our review and analysis, total estimated expenses and opportunity costs associated with licensure and certification occurring through completion of the first board recertification cycle for physicians is between \$10,000 and \$20,000, depending on specialty, geographic location, and utilization of preparatory courses and materials. When compared with a sample population of advanced nurse practitioners or physician assistants, the difference is staggering. For the same time period, non-physician-practitioner

organizations charge less than \$3000 for their licensing and certification (see the Table). Beyond the fiscal strain imposed on physicians by the mandated expenses, there are associated travel expenses and lost work time associated with examinations and recertification. Furthermore, preparatory expenses (eg, attending preparatory courses, purchasing self-help materials, and additional travel expenses), while not mandatory, are a significant expense shouldered by most young physicians, and these have widely variable (but oftentimes immense) associated costs.

As financial pressures continue to mount for practicing physicians, we must recognize that in this era of ever-changing health care reform and downstream changes in physicians' roles and responsibilities, being a physician in the 21st century is arguably more demanding and stressful than at any time in history. It is our firm belief that contemporary accreditation bodies should not unduly add to the stress and financial burdens physicians encounter. Instead, medicine's credentialing and certification monopolies should transparently assess and report the value of ongoing and new programs (eg, maintenance of

TABLE. Comparison of Physicians and Provider Expenses Associated With Medical Licensing, Board Certifications, Continued Certifications, and Other Expenses^{a,b}

Expense	Internal medicine	Pediatric	Certified registered		
	physician	anesthesiologist	Nurse practitioner	nurse anesthetist	Physician assistant
Medical education training exam(s)	\$3305 ⁵	\$3305 ⁵	\$200 ⁶	\$200 ⁶	\$475 ⁷
State license ²	\$1000 ⁸	\$1000 ⁸	\$200 ⁹	\$200 ⁹	\$125 ¹⁰
Renewal fees (10-y total, eg, AZ) ²	\$4000 ⁸	\$4000 ⁸	\$320 ¹¹	\$320 ¹¹	\$1665 ¹⁰
Drug Enforcement Agency license (3-y license) ³	\$731 ¹²	\$731 ¹²	\$731 ¹²	\$731 ¹²	\$0 ¹²
Board certification ⁴	\$1365 ¹³	\$1550 ¹⁴	\$270 ¹⁵	\$725 ¹⁶	\$350 ¹⁷
Oral board examination ¹⁸	\$0	\$2100 ¹⁹	\$0	\$0	\$0
Subspecialty board certification ¹⁸	\$0	\$1600 ²⁰	\$0	\$0	\$0
Maintenance of certification (per 10 y) ⁵	\$1940 ²¹	\$2100 ²²	\$200 ²³	\$440 ²⁴	\$0
Total	\$12,341	\$16,386	\$1921	\$2616	\$2615

^aElective preparatory expenses, lost wages, and travel expenses are not included. All examination and licensing costs as of September 13, 2015.

^bAll attempts were made to be accurate and up-to-date with fees and licensure requirements. However, given the complex nature of the different medical professions and the variation in requirements based on practitioner type, society, specialty, and geographic location, our calculations are approximations of the true costs.

certification activities), work toward reducing the overall costs of credentialing and recertifying physicians, and seek novel opportunities to support our profession's newest members. Doing so would reduce the overall trend of increasing bureaucracy and costs and allow young physicians to better focus on delivering patient care and becoming health care's future leaders.

Physician shortages are real, and we must minimize ill-constructed financial barriers to a career in medicine or limitations on specialty choice.⁵ Unless credentialing/recertification and other financial and nonfinancial burdens on physicians are remediated in the current period of increasing government-dictated equalization of scopes of practice and payments to physicians versus nonphysician providers, young trainees will increasingly ask, "Why sacrifice to become a physician?"

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- Nora LM, Wynia MK, Granatir T. Of the profession, by the profession, and for patients, families, and communities: ABMS board certification and medicine's professional self-regulation. *JAMA*. 2015;313(18):1805-1806.
- Teirstein PS, Topol EJ. The role of maintenance of certification programs in governance and professionalism. *JAMA*. 2015;313(18):1809-1810.
- Frake PC, Cheng AY, Howell RJ, Patel NJ. Resident physicians' perspectives on health care reform. *Otolaryngol Head Neck Surg*. 2011;145(1):30-34.
- Frintner MP, Mulvey HJ, Pletcher BA, Olson LM. Pediatric resident debt and career intentions. *Pediatrics*. 2013;131(2):312-318.
- USMLE examination fees. USMLE Exam Fees web site. <http://www.nbme.org/students/examfees.html> and <http://www.fsmb.org/licensure/usmle-step-3/cost-and-fees>. Accessed September 13, 2015.
- Fees & payment. National Council of State Boards of Nursing web site. <https://www.ncsbn.org/1203.htm>. Accessed September 13, 2015.
- PANCE Registration information. National Commission on Certification of Physician Assistants web site. <http://www.nccpa.net/pance-registration>. Accessed September 13, 2015.
- Licensing physicians. Arizona Medical Board web site. <https://www.azmd.gov/FAQ/LicensingPhysicians.aspx>. Accessed September 13, 2015.
- Applications & forms. Arizona State Board of Nursing web site. <https://www.azbn.gov/licensure-certification/applications-forms>. Accessed September 13, 2015.
- Schedule of fees. Arizona Regulatory Board of Physician Assistants web site. http://www.azpa.gov/PA%20Center/Fee_Schedule.aspx. Accessed September 13, 2015.
- License renewal FAQs. Arizona State Board of Nursing web site. <https://www.azbn.gov/faqs/licensure-certification/registered-nurse-practical-nurse/license-renewal-faqs>. Accessed September 13, 2015.
- Application for registration under Controlled Substances Act of 1970 (new applicants only). Drug Enforcement Administration, Office of Diversion Control web site. <https://www.deadiversion.usdoj.gov/webforms/jsp/regapps/common/newAppLogin.jsp>. Accessed September 13, 2015.
- ABIM Certification Exam. American Board of Internal Medicine web site. <http://www.abim.org/exam/cert-cost.aspx>. Accessed September 13, 2015.
- Dates, fees, & registration. American Board of Anesthesiologists web site. <http://www.theaba.org/Exams/Traditional-Part-1/Dates-Fees-and-Registration>. Accessed September 13, 2015.
- Family Nurse Practitioner Certification fee. American Nurses Credentialing Center web site. <http://www.nursecredentialing.org/familynp>. Accessed September 13, 2015.
- National Certification Examination (NCE) Handbook. National Board of Certification and Recertification for Nurse Anesthetists web site. http://www.nbcma.com/certification/SiteAssets/Pages/Program-Administration/NCE_Handbook.pdf. Accessed September 13, 2015.
- Specialty certificates of added qualifications (CAQS). National Commission on Certification of Physician Assistants web site. <http://www.nccpa.net/Specialty-CAQs>. Accessed September 13, 2015.
- Cascardo D. Overcoming the physician shortage: steps to successful physician recruitment and retention. *J Med Pract Manage*. 2014;29(4):223-226.
- Dates, fees, & registration. American Board of Anesthesiologists web site. <http://www.theaba.org/Exams/Traditional-Part-2/Dates-Fees-and-Registration>. Accessed September 13, 2015.
- Dates, fees, and registration. American Board of Anesthesiologists web site. <http://www.theaba.org/Exams/Pediatric-Anesthesiology/Dates-Fees-and-Registration>. Accessed September 13, 2015.
- Enroll, cost & policies. American Board of Internal Medicine web site. <http://www.abim.org/maintenance-of-certification/policies.aspx#program-fees>. Accessed September 13, 2015.
- About MOCA. American Board of Anesthesiologists web site. <http://www.theaba.org/MOCA/About-MOCA>. Accessed September 13, 2015.
- Family Nurse Practitioner Certification Maintain Certification. American Nurses Credentialing Center web site. <http://www.nursecredentialing.org/familynp#maintain>. Accessed September 13, 2015.
- Recertification application frequently asked questions (FAQs). National Board of Certification and Recertification for Nurse Anesthetists web site. <http://www.nbcma.com/recertification/Documents/Recertification%20FAQs%20January%202015.pdf>. Accessed September 13, 2015.

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A Discussion of the Refutation of Memory-Based Dietary Assessment Methods (M-BMs): The Rhetorical Defense of Pseudoscientific and Inadmissible Evidence

To the Editor: We read the well-written editorial of Davy and Estabrooks¹ with considerable interest, hoping that they would "provide empirical evidence rather than rhetoric"² to refute our conclusion that the data generated by memory-based dietary assessment methods (M-BMs) of nutrition epidemiology are pseudoscientific and inadmissible as scientific evidence.² Our hope was in vain as Davy and Estabrooks provided an exemplar of the rhetorical defense of M-BMs and the unacceptable "status quo."

THE REPEATED EMPIRICAL REFUTATION OF M-BMS

In 2013, my colleagues and I demonstrated via 2 independent methods that approximately 55% to 88% of the caloric intake estimates of the National Health and Nutrition Examination Survey (NHANES) M-BMs (1971-2010) were physiologically implausible³ and often "incompatible with life."^{4,p7} Davy and Estabrooks admit that our results are "...well recognized and acknowledged...",^{1,p845} but follow with the contradictory statement "we believe that [these data] reflect a reasonable representation of usual dietary intake."¹ These statements are logical contradictions and demonstrate the failure of nutrition