

## Stefanos N. Kales MD, MPH, FACP, FACOEM

Dr. Kales is the Chief of Occupational Medicine at Cambridge Health Alliance, a teaching affiliate of Harvard Medical School (HMS), where he is a Professor of Medicine. He is also Professor & Director of the Occupational Medicine Residency at the Harvard TH Chan School of Public Health (HSPH).

Dr. Kales has engaged in occupational/environmental health activities on five continents as a clinical expert, investigator, educator and leader; making continuous academic contributions with over 250 publications, regular editorial work and stimulating trainees to conduct and publish research. He is also consulted regularly by government agencies and colleagues throughout North America and beyond regarding the health of emergency responders, fatigue and sleep disorders in safety-sensitive occupations, carbon monoxide poisoning, and other toxicology and workplace issues.

As a **clinical innovator and researcher**, Prof. Kales has been quite productive in several areas within the field of OEM. <u>First Responder</u> <u>Cardiovascular Health and Disease</u>: his team has performed the most extensive collection of epidemiologic studies regarding cardiovascular disease (CVD) among first responders, including seminal contributions on the risk of on-duty cardiovascular events. By applying a novel approach to a previously unsolved, three-decade old

question- Why are almost half of on-duty deaths among US firefighters due to sudden cardiac death (SCD)?- they demonstrated the first definitive statistical associations between strenuous job tasks and SCD (2003). We then re-confirmed these findings in a much larger, landmark study in the *New England Journal of Medicine* (2007). In 2014, in the *British Medical Journal*, they extended and cross-validated these findings to the risk of SCD in the course of policing. They have also identified lifestyle risk factors (e.g. smoking, obesity and uncontrolled hypertension) which interact with occupational exposures and the workplace environment to increase individual responders' susceptibility to CVD. Moreover, they have demonstrated that in addition to obstructive coronary artery disease, left ventricular hypertrophy and cardiomegaly are major underlying causes of SCD in these populations.

Their body of work has greatly influenced national and international thinking regarding fitness for duty among public safety workers, and the need for improved wellness programs and risk factor control. They published a "state of the art review" on blood pressure and emergency responders in the *American Journal of Hypertension* (2009), which along with previous work has begun to change occupational blood pressure standards for public safety personnel. Additionally, they have published several other "state of the science" reviews. Their paper in *Cardiology in Review* (2011) has become the standard reference on this topic, and a 2015 NIH-sponsored translational meeting, used this article to organize its agenda. This publication track record, ongoing competitive Federal grants and frequent speaking engagements at US and international events have made Dr. Kales the world's foremost expert on cardiovascular disease and its prevention among police and fire personnel. Accordingly, he was invited to contribute an editorial on this topic by *Circulation*.

<u>Clinical Toxicology</u>: After 9/11/2001, Dr. Kales led the development of a Chemical Terrorism Guide and other materials for the American College of Physicians. He expanded this "toxidrome-based" approach (syndrome-based recognition of chemical toxins) with a 2004 *New England Journal of Medicine* review on Chemical Emergencies. As an extension of my work in this area, he was invited by the World Health Organization to assist in determining the impact of household carbon monoxide poisonings in Europe and in setting carbon monoxide indoor air quality guidelines.

Another important toxicology focus is heavy metal exposure. After diagnosing several "sentinel" cases of lead intoxication due to Ayurvedic (traditional Indian) remedies, Kales' team contributed to a national series in the Center for Disease Control's *Morbidity Mortality Weekly Report* (2004). This led them to direct investigations of heavy metal prevalence in

Ayurvedic medications in the US marketplace producing two original articles in *JAMA* (2004 and 2008), and an invited editorial in a leading Indian medical journal which triggered regulatory changes by the Indian and Canadian governments and various local US health departments.

Dr. Kales have also published on common clinical scenarios such as: methylmercury over-exposure from frequent consumption of predator fish (e.g., swordfish and tuna); referrals for elevated urine arsenic that almost always result from harmless seafood-related forms of organic arsenates; and the ill-advised use of unconventional "commercial" heavy metals tests by alternative medicine practitioners. His expertise in this area led to an invited "Decisions" review in the *Canadian Medical Association Journal* (2016).

Occupational Sleep Medicine: As one of the first occupational medicine clinic directors to implement objectively-based screening of commercial drivers for obstructive sleep apnea (OSA) in the context of federally-regulated medical certification examinations, publications by the Kales team have demonstrated significant gaps in current regulations that allow operators with undiagnosed/untreated OSA to continue to drive, constituting a significant safety risk. Prof. Kales has lectured at regional, national and international meetings on this subject, and is a recognized international leader regarding occupational OSA screening, including keynote lectures at the Japan Society of Occupational Health; joint activities with the International Association for Traffic Safety Sciences and as the invited senior author of a chapter on OSA in the workplace for foremost sleep medicine textbook, The Principles and Practice of Sleep Medicine. In 2015, he was awarded and completed a National Sleep Foundation contract through Harvard to create a continuing medical education video course on sleep disorders for commercial driver medical examiners and sleep clinicians. Most recently, Dr. Kales was the senior author of the largest and most rigorous study to date of OSA and truck crash risk among commercial drivers (SLEEP 2016). The team demonstrated that drivers who were non-compliant with OSA treatment had a rate of preventable crashes five-fold greater than control drivers matched for driving experience. They also found that fully-treatment-compliant drivers with OSA had a crash rate no different than that of the controls. These new findings and a separate invited commentary in *SLEEP* (2016) have influenced the national debate on federally-mandating the screening of transportation operators for OSA.

Education: Dr. Kales supervises Harvard Chan occupational medicine residents, HMS toxicology, pediatric environmental medicine and contact dermatology fellows, HMS and visiting residents and medical students; participate in several Harvard Chan courses; CME commitments; and speaks/teaches frequently at the local, national and international level. In 2006, he was selected to lead the HSPH Occupational Environmental Medicine (OEM) Residency, Harvard's only preventive medicine residency and a premier US program. Despite constant budgetary challenges, he as been able to attract high-caliber candidates; maintain and expand one of the largest civilian OEM residencies in the US; and has had unprecedented success as a fundraiser, attracting over \$2.25 million in gifts (mostly endowed) to support training. In collaboration with the residency, the CHA OEM division is an internationally recognized center of excellence. Since 2006, at CHA and Chan, they have hosted over 20 trainees from more than ten countries. Dr. Kales' trainees have received many national awards, publish frequently, and have gained leadership and faculty positions throughout the US, Canada, as well as in Europe, South America, the Middle East and Asia. His achievements as a scientist and educator are recognized with prestigious honors: such as the Kehoe Award (2013, American College of Occupational & Environmental Medicine (ACOEM)), the Harriet Hardy Award (2014, New England College of Occupational & Environmental Medicine), and the Excellence in Mentorship Award (2024, ACOEM) among other national and international awards.

<u>Administration</u>: Dr. Kales' hospital leadership as Division Chief, Occupational & Environmental Medicine, and Medical Director of Employee Health is another significant activity. The division coordinates occupational health services for some 4,000 Cambridge Health Alliance employees and external clients. The latter have rapidly grown under Kales' leadership from 60 to roughly 850 entities ranging from municipalities to life sciences companies. The Division provides high quality care to injured workers; maintains workers compensation costs below the industry benchmark; determines the ability of employees with illness/impairment to engage in safety-sensitive functions; and provides expert consultation to human resources and senior administration.

In summary, Prof. Kales has a strong record of clinical innovation, as well as clinical/epidemiologic research expertise, while teaching frequently- locally to internationally- and establishing himself as the leader of important research grants, residency/educational programs and clinical services. He has demonstrated his productivity consistently through publications, sponsored research, editorial work, educational activities, trainee achievements and clinical leadership.