

Introduction to the *JOEM* Supplement Nanomaterials and Worker Health

Medical Surveillance, Exposure Registries, and Epidemiologic Research

This issue presents selected articles from the Nanomaterial Workers' Health Conference held in Keystone, Colorado, July 21 to 23, 2010. The conference addressed three critical and related topics: medical surveillance; formation of exposure registries; and the conduct of epidemiologic research. Each topic was introduced with a plenary session followed by group breakout sessions to obtain input from the approximately 120 attendees. This supplement issue of the *Journal of Occupational and Environmental Medicine* includes selected peer reviewed articles from the conference and summaries of the breakout sessions.

The conference was initiated with a general session, and there are articles that provide an overview of the topics (Schulte and Trout) and describe lessons from air pollution particulate epidemiology (Peters et al) and the state-of-the-art of nanotoxicology (Castranova), both of which contributed to the initial concern about potential hazards of nanomaterials. The opening session also included an overview of medical surveillance in the context in which occupational physicians must regularly work and at a time when uncertainties about hazards and risks make decisions about medical surveillance of workers difficult (Nasterlack).

After the opening session, the conference began addressing each of the critical topics beginning with medical surveillance. There is an overview article on the various component elements of medical surveillance, which distinguishes individual surveillance from population surveillance (Trout). This is followed by three examples of nanomaterial workers surveillance programs: one in university research laboratories (Sng et al); the second in a small thriving start-up company (Gause et al), and the third in a multinational corporation that produces more than 50 different nanomaterials (David et al). This is followed by a summary of the surveillance breakout sessions (Fischman et al). Also included is an article that illustrates the role of state agencies in tracking emerging hazards such as those that could occur from nanomaterials (Roisman et al).

In the exposure registry session, the history, utility, and critical issues of exposure registries are described (Schulte et al) and an example from the World Trade Center Registry is presented (Cone and Farfel). Also, experiences collecting registry-type data in the synthetic fiber industry are presented as lessons that may be useful in considerations of registries for nanomaterial workers (Marchant and Crane).

The epidemiological research session begins with a commentary on epidemiologic challenge for studies of occupational exposure to engineered nanomaterials (Eisen et al). Aspects of future epidemiologic studies are addressed in five articles. Two are from feasibility studies of carbonaceous nanomaterial manufacturers and users who describe the nature of the materials, the size of the workforce (Schubauer-Berigan et al), and the extent of preventive control use (Dahm et al). Since cross-sectional and prospective studies utilizing biomarkers have been identified as useful approaches to identify potential adverse effects in workers, two papers are presented that describe some of the most promising biomarkers that may be used in these studies (Li and Nel; Eardley et al). This is followed by a summary of the breakout session on issues in designing strategies for studies of nanomaterial workers (Laney et al).

Meanwhile, as society waits for the results of epidemiologic research, it is still possible to assess risks to workers. To illustrate this, there is an article describing how animal data for carbon nanotubes can be modeled to assess risks (Kuempel). This is followed by an article illustrating how the Environmental Protection Agency has used the Toxic Substance Control Act to assess occupational risks (Sayre et al).

Finally, two articles summarize the conference. One is a pioneering effort by French government investigators to develop a program to register nanomaterial workers, conduct medical surveillance, and initiate epidemiologic research (Boutou-Kempf et al). The other is a reflection that Dr William Halperin gave to close the meeting (Kreider and Halperin). Dr Halperin has more than 30 years of experience addressing the surveillance and epidemiologic research of workers at risk, and he applied that experience to nanomaterial workers and how we may avoid the mistakes of the past while dealing with this emerging technology.

The organizers are grateful for all who participated in the conference and wrote the articles included in this issue. As Dr Halperin noted, someday society may look back on the early stage of nanotechnology and ask whether appropriate caution was taken. This conference and the resultant articles may contribute to an affirmative answer to society's question.

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