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From:
Sent: Wednesday, April 23, 2008 5:33 AM
To: NIOSH Docket Office (CDC)
Subject: Draft nano surveillance
Attachments: peer review.doc; Edinburgh University charitable status

Sorry to be late
Here is my peer review and cv –I sent the conflicting interests form previously

Textbook 'Particle Toxicology' Edited by Ken Donaldson and Paul Borm - http://www.amazon.com/Particle-Toxicology-Ken-Donaldson/dp/0849350921

Visit the site for the Capetown Particle Toxicology meeting http://fineparticles.co.za/

INTERIM GUIDANCE FOR THE MEDICAL SCREENING OF WORKERS POTENTIALLY EXPOSED TO ENGINEERED NANOPARTICLES

November 2007

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention

National Institute

Docket NIOSH-115

Peer review comments o f

The recommendations are summarised as follows

- Take prudent measures to control exposures to engineered nanoparticles.
- Conduct hazard surveillance as the basis for implementing controls.
- Consider established medical surveillance approaches to help
- assess whether controls are effective and identify new or unrecognized problems and health effects.

The recommendations are prudent and sensible- control exposure, conduct assessment of those jobs that carry the greatest risk of exposure and use established surveillance schemes.

The problem of identifying risk and allocating it specifically to engineered NP is difficult for a number of reasons. Most people's major exposure is likely to be from combustion-derived NP even if its only on the way to work, never mind in the workplace if there are diesel generators or some other combustion source. This makes it difficult to establish the relative role of manufactured NP.

There are unlikely to be any 'new' disease produced by engineered NP except for the remote possibility of brain effects. If the PM10 (combustion-derived nanoparticle-driven) experience is anything to go by then NP will affect susceptible individuals (airways disease and cv disease). Of these the cv risk is greatest and the mechanism is not well understood. Workers in the engineered NP industry who have cv disease (many of the older men) could be especially at risk. There may be types of engineered NP that especially impact on the cv system , i.e. they especially translocate to the blood, be potent at causing lung inflammation, have effects in the vascular wall or affect heart rat variability; so there needs to be vigilance.

As regards the brain the story is similar – there may be NP that especially tropic to the brain; ongoing hazard research will be important in the context of identifying such types of NP and providing forewarning.

One of the greatest risks ,seem to me , to be the risk of asbestos effects from high aspect ratio nanoparticles (HARN) that could act analogously to asbestos. The long lagtime from exposure to diagnosis for mesothelioma, the hallmark tumour of asbestos exposure, could be a real problem if it translates to HARN effects. It could be 40 years until we see mesothelioma in workers exposed to HARN and during that time ongoing exposure could be building up a real epidemic. Regulation of fibres is the only dust that relies on counting particles (fibres) rather than weighing them and not all HARN might be visible by the existing asbestos methodology which is based on phase contrast light microscopy. Therefore special attention might be given to this area. In the document emphasis is placed on single wall carbon nanotubes whilst most industrial use is likely be multiwall carbon nanotube in the first instance at least. More research is urgently need on the asbestos-like hazard of HARN to feed back to industry to provide proper risk assessment.

23/04/08