

REPRODUCTIVE HEALTH OF MEN WORKING WITH BISPHENOL A IN THE UNITED STATES

National Institute for Occupational Safety and
Health
Center for Disease Control and Prevention,
Cincinnati, Ohio



NIOSH MISSION

- to generate new knowledge in the field of occupational safety and health and to transfer that knowledge into practice for the betterment of workers.
- NIOSH conducts
 - scientific research,
 - develops guidance and authoritative recommendations,
 - disseminates information, and
 - responds to requests for workplace health hazard evaluations.

GOALS OF PROPOSED STUDY

- ◉ Determine BPA usage in industry, e.g., which industries and jobs use BPA, which tasks are higher exposed.
- ◉ Assess exposure to BPA among workers in these industries through aerosol and urinary sample collection.
- ◉ Develop air and wipe sampling methods for BPA using HPLC-MS (high performance liquid chromatography mass spectrometry) and LC-UV (liquid chromatography with UV detection).
- ◉ Assess the reproductive health of men exposed to BPA in the workplace. This assessment will include a fecundity (fertility) assessment by evaluating male reproductive hormones and semen quality, questionnaire and erectile measurements.
- ◉ Determine if there is a relationship between BPA exposure and reproductive health.

REPRODUCTIVE STUDIES

- ◉ BPA occupationally-exposed workers had consistently higher risks of self-reported male sexual dysfunction in all domains of male sexual function tested by questionnaire than non-occupationally exposed workers (Li, Zhou, et al, Feb 2010, *Human Reproduction*).
- ◉ An editorial commentary calls for more studies of sexual function of occupationally-exposed men (Sharpe, Feb 2010, *Human Reproduction*).
- ◉ Increased urinary BPA levels showed an association of decreased self-reported sexual function (Li, Zhou, et al, May 2010, *J Andrology*).
- ◉ One concern of the Chinese studies is the subjective nature of questionnaire data. While the IIEF is a validated questionnaire used around the world, including China, the addition of objective measures of erectile, sexual, and reproductive function would help to clarify the association of occupational BPA exposure and possible decrements in male reproductive and sexual function.

ANALYTICAL METHOD

- Currently NIOSH has draft air and wipe sampling methods for BPA using liquid chromatography (LC) with UV detection.
- NIOSH will establish a new air and wipe sampling methods for BPA in air which uses high performance liquid chromatography - mass spectrometry for improved specificity and sensitivity.

METHODS

- Recruit industrial sites that manufacture or use BPA
- Measure exposure of workers
 - Air samples during work tasks
 - Wipe samples near work tasks
 - Urine samples of employees
- Health Assessment
 - Semen quality
 - Blood samples (hormones)
 - International Index of Erectile Function (IIEF) Questionnaire
 - Assess sexual function

TIMELINE

○ FY11

- Recruit workplaces to participate
- Develop sampling method
- Peer review and human subjects review
- Conduct “walk-through” surveys

○ FY12

- Continue “walk-through” surveys
- Conduct “in-depth” surveys

○ FY13 -14

- Continue “in-depth” surveys
- Data analysis, report writing

“Walk-Through Survey - evaluate exposure only

“In-Depth” Survey - evaluate exposure and health of workers using BPA and controls.

NEED BPA WORKPLACES

- ◉ We would like to conduct walk-through surveys at thermal paper sites
- ◉ Please contact me if you would like to participate:

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