New England College of Occupational and Environmental Medicine

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# NECOEM Reporter

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## Upcoming Events of Note

*NECOEM Save the Dates:*

*March 10* ***"Ankle and Foot Complaints in the Workplace"*** *Liberty Mutual Institute for Safety, Hopkinton, MA*

*March 17,* **"Beyond the Front Line and the VA: Occupational Medicine and Primary Care Issues Related to Deployment in Iraq and Afghanistan"** *Connecticut State Medical Society, New Haven, CT*

*May 13* **"Redefining Workplace Upper Extremity Overuse Disorders: Prevention and Treatment",** Cumberland Club, Portland, Maine

September 11 **"Cardiovascular Disease and Firefighters",** Old Sturbridge Village

**December 2-3 NECOEM Annual Conference, Newton Marriott**

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**Podcasts in OEM, Book Raffles**

***www.necoem.org***

***AOHC, Orlando, May 2***
***www.acoem.org***

**"Preventing and Treating Biological Exposures: A Colloquium for Occupational Medicine, Infectious Disease and Emergency Medicine Professionals."** Hotel Marlowe, Cambridge, Massachusetts, June 14-15, 2010. This conference is sponsored by ACOEM; American Biological Safety Association; the Centers for Disease Control; the Eagleson Institute, and the Elizabeth R. Griffin Research Foundation. For more information, go to www.eagleson.org , email eagleson@eagleson.org or call (207) 490-1076.

**"Forces of Change:New Strategies for the Evolving Health Care Marketplace" April 20-23, 2010, Boston, MA**
contedu@hsph.harvard.edu
617.384.8692

# The Lead-Exposed Worker: New Challenges for the Occupational Physician

Leslie A. Walleigh MD, MPH

The recently published and widely cited "Recommendations for Medical Management of Adult Lead Exposure" pose a challenge to the role of the occupational physician. For most full-time occupational physicians, patients are referred to their practice by employers. Employer referrals are often for the purpose of compliance with the medical surveillance requirements of OSHA standards. But, as is the case with the two lead standards, when compliance with the OSHA standard is not adequate to protect the health of the worker, what should be the role and responsibility of the occupational physician?

There are two OSHA lead standards: the General Industry Standard for lead (1910.1025) issued in 1979, and the Construction Standard for lead (1926.62), issued in 1993. Although the medical surveillance requirements of the two standards differ slightly, both require biological monitoring of workers exposed to airborne lead above an action level of 30mcg/m3 for 30 days or more per year. The Construction Standard also

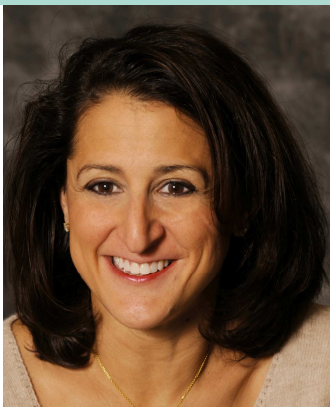
requires biologic monitoring with the performance of certain tasks, even in the absence of exposure assessment. The overall goal of biological monitoring in each standard is to keep the worker's blood lead level (BLL) below 40mcg/dl. When a

*(Continued on page 2)*

# What's new in Hernia Repair?

**Lisa Ferzoco, MD, FACS**

There are an estimated 5,000,000 patients with hernias each year in the United States with a 10 percent lifetime risk of groin hernia. Given this fact, an estimated one million patients seek treatment annually. These figures translate into an estimated five million work days lost each year. A hernia is defined as a weakness or tear in the abdominal wall fascia (the strength layer of the abdomen) where the peritoneum and abdominal contents protrude in a balloon-like peritoneal sac. Hernias tend to occur through areas of weakness in the fascia, and several sites are more prone to hernia than others. These include the umbilicus, sites of prior incisions, and in the groin and femoral regions.



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*Lead (Continued from page 1)*

worker's blood lead exceeds a certain level, he or she is "medically removed" from exposure to airborne lead above the action level.

In the General Industry Standard, medical removal protection (MRP) is required when a single BLL is ≥ 60mcg/dl, or the average of the last three BLL's or the last six month's BLL's is ≥ 50mcg/dl. In the Construction Standard, medical removal protection is required with a confirmed BLL of ≥ 50 mcg/dl. In both standards, an individual may be returned to exposure above the action level when two consecutive BLL's are ≤ 40 mcg/dl.

The MRP thresholds in the OSHA standards are based on the assumption that a lifetime working exposure to lead that does not result in persistent BLL's above 40 mcg/dl will not result in significant adverse health effects. A growing body of epidemiological evidence has challenged this assumption, raising concerns in particular over the adverse health effects of cumulative lead exposures, as well as the harm posed to reproductive outcomes by acute exposures. Responding to these concerns, a federally-funded, Association for Occupational and Environmental Clinics (AOEC)-sponsored panel of experts began meeting in 2003 to develop health-based guidelines for the management of lead exposed adults. The resulting guidelines, "Recommendations for Medical Management of Adult Lead Exposure," were published in March, 2007 in Environmental Health Perspectives as part of a "mini-monograph" on lead. The guidelines (Table 1) and surveillance recommendations (Table 2) are intended primarily to prevent the adverse effects of chronic exposure on blood pressure, renal function, and cognitive function, as well as the adverse effects of acute exposure on reproductive outcomes.

**Table 1. Work Associated with Lead Exposure**

| Industry Type | Work Activities |
|---|---|
| General Industry | Lead production or smelting<br>Battery manufacturing or recycling<br>Brass, bronze, or lead foundries<br>Metal radiator repair<br>Scrap metal handling<br>Recycling of lead-sheathed cables<br>Lead soldering<br>Firing ranges<br>Ceramics manufacturing<br>Machining or grinding metal alloys containing lead<br>Plastics manufacturing |
| Construction Industry | Sanding, scraping, burning, or disturbing lead paint<br>Demolition of old structures<br>Welding or torch cutting lead-painted metal<br>Abrasive blasting<br>Construction or repair of bridges, water towers, tanks, roofing<br>Lead abatement<br>Painting – residential or commercial<br>Renovation or remodeling structures built before 1978<br>Welding on metal structures |

Paying greater attention to the adverse health effects of lead may pose a challenge to "business as usual" in many occupational medicine practices in at least three scenarios: the lead exposed worker undergoing biological monitoring for OSHA compliance; the lead exposed worker referred for reasons other than OSHA compliance whose employer is legally bound to provide medical surveillance but has not been doing so; and the lead exposed worker whose exposure doesn't exceed the OSHA action threshold, but who is still potentially at risk from that exposure.

In the past, for the lead exposed worker undergoing biological monitoring a lab result showing a blood lead of 30mcg/dl might arrive with a pile of labs to be reviewed by the occupational physician. Unless there is a chart available with a note indicating some underlying medical concern, the lab result might just be initialed and passed off to the office staff to inform the employer, since the result is less than 40 mcg/dl. Under the published recommendations, it would seem prudent to at least evaluate this worker for underlying medical conditions and to have a discussion regarding the health effects of lead exposure. Workers may be concerned about their lead exposure, but most would not want to be removed from exposure if their wages or benefits were thereby threatened. Fortunately, both OSHA standards, with almost identical language, do allow for some physician flexibility in monitoring and controlling worker exposure beyond the BLL's requiring MRP.

"In addition to the above blood lead level criterion, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above 30 ug/$m^3$. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations."

"Recommendations may be

***Hernia*** *(Continued from page 1)*

Contributing factors in the formation of hernias include conditions that result in excessive weakness of the abdominal wall fascia, or factors that lead to increased intra-abdominal pressure. Advancing age, malnutrition, cigarette smoking, chronic corticosteroid use and prior surgical incisions all result in weakness of the abdominal wall. In the general population intra-abdominal pressures can be increased in conditions such as ascites, obesity, chronic cough or constipation. With particular relevance to occupational factors, repeated heavy lifting will also increase intra-abdominal pressures. In reality, the development of abdominal herniation is usually a result of a combination of these factors.

Groin hernias are frequently attributed to workplace injuries. A thorough understanding of groin anatomy is necessary to appreciate the pathophysiology of groin herniation. The inguinal canal is roughly 4 centimeters in length and located two to four centimeters cephalad to the inguinal ligament. This anatomic region extends between the superficial and deep inguinal rings and contains the spermatic cord and its neurovascular components in men, and the round ligament in women. The "floor" of the inguinal canal is the transversalis fascia, with the "roof" or the superficial layer comprised of the external oblique muscle. The inferior border of the inguinal canal is the inguinal ligament, which is comprised of the lowermost portion of the external oblique aponeurosis. Hesselbach's triangle is the area of the groin in which hernias occur, and is bounded laterally by the inferior epigastric vessels, medially by the lateral border of the rectus muscle, and inferiorly by the inguinal ligament. Several cutaneous nerves are encountered during inguinal hernia repair and can be the source of pain encountered with groin injury or hernia, or in the postoperative period. The ilioinguinal nerve travels through the inguinal canal, along with the spermatic cord, and supplies sensation to the lateral aspect of the scrotum and medial thigh. The iliohypogastric, and genitofemoral nerves may also be encountered during open hernia repairs, while the lateral femoral cutaneous nerve is more likely to be encountered during laparoscopic repairs.

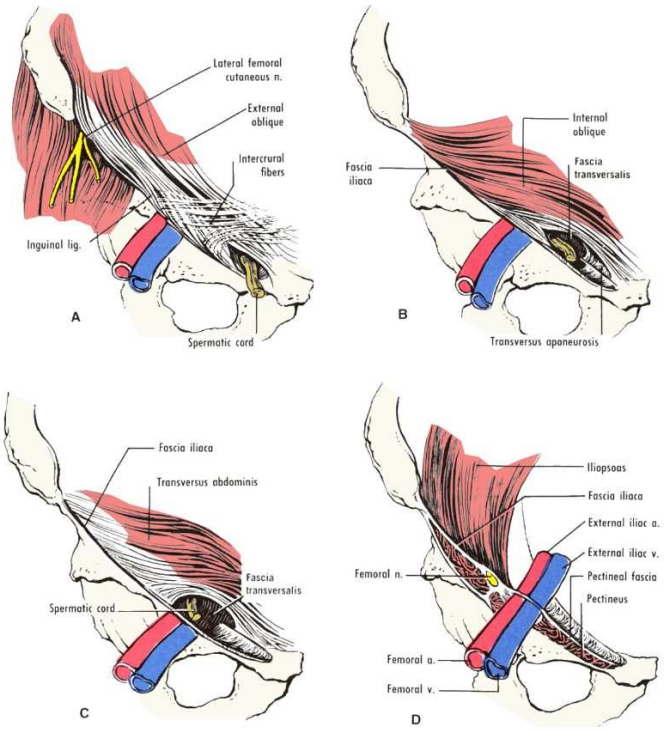


**Photo from: www.dartmouth.edu/humananatomy**

Indirect inguinal hernias have a congenital component due to testicular descent along the processus vaginalis. These hernias originate lateral to the inferior epigastric vessels, and travel through the inguinal canal along with the cord contents. Given the embryologic origin, these hernias are less likely to be the result of work-related injuries. Direct inguinal hernias emanate through a weakness in the floor of the inguinal canal. This is functionally a result of thinning of the transversalis fascia. These hernias are more likely to develop in men over the age of 40, and are more likely to be a result of lifting injuries. This being said, however, whether direct or indirect, the surgical repair is the same.

Upon initial examination, a full history of the episode related to the injury should be elicited. The type of incident, as well as the severity and location of the pain are important in differentiating types of groin injury from hernias. The temporal relationship of the pain to the incident can also be important in determining causality of hernias. Also particularly important is the past medical history, including any history of groin pain or prior hernia repairs. Finally, non-investigational factors that predispose to hernias should also be elucidated. These include obesity, steroid use, chronic coughing or constipation, presence of ascites or signs of prostatic hypertrophy, leading to straining on urination. The examiner should inquire about any nausea, vomiting, or obstipation if incarceration or strangulation is suspected.

It is useful to examine the patient in both the standing and supine position. When standing, Valsalva's maneuver or coughing will elicit a bulge palpable upon digital pressure through the external inguinal ring in the presence of an indirect inguinal hernia. Palpation over the region of the inguinal canal may elicit a diffuse bulge, suggestive of a direct hernia. Transillumination will help to differentiate a hernia from a hydrocele. In the supine position, the hernia should again be palpated

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***Hernia*** *(Continued from page 3)*
to determine whether the hernia is reducible, and if not, whether it is strangulated. In the presence of strangulation, additional signs will likely be present, including redness and warmth of the skin overlying the hernia, abdominal distention, high-pitched or absent bowel sounds, and elevation of the white blood cell count. If an irreducible or strangulated hernia is encountered, immediate surgical evaluation is appropriate to avoid the potential of ischemic hernia contents. Finally, examination of the area below the inguinal canal, and medial to the femoral vessels as well as the contralateral groin, should be performed to determine the presence of femoral hernias or bilaterality.

Not infrequently, patients can present with groin pain with no identifiable hernia. Other causes of groin pain are numerous, and can include intra-abdominal pathology, as well as musculoskeletal injuries, either locally, or referred from lumbar spinal injury or disc disease. Intraabdominal pathology can include acute appendicitis, diverticulitis, and urinary tract pathology. Non-hernia musculoskeletal injuries are numerous, and can include hip joint pathology, such as osteoarthritis, cartilaginous injuries or labral tears, ligamentous injuries or muscular strains, as well as inflammatory conditions such as tendinitis, bursitis or osteitis pubis. Given the varied nature of these diseases, appropriate history and physical exam is essential. When diagnosis is still in doubt, radiologic studies such as plain X rays, CT scan or MR may be useful.

Repair of essentially all inguinal hernias is recommended. The natural history of unrepaired hernias is that of enlargement over time, which can lead to more difficult repair, as well as increased incidence of complications, including recurrence. In addition, the presence of strangulation can convert an easily treatable condition into a potentially life-threatening condition. Several studies have documented factors that increase the risk of strangulation, and these include short duration of the hernia, femoral location, and advanced age[1]. The true risk of strangulation, however, is unknown.

There are two main options for hernia repair. The open technique has been performed for 100 years, with minimal changes until recently. Initially, techniques were aimed at primary closure of the hernia defect. Traditionally, these repairs required a 1-3 day hospital stay, and a recovery period of 4-6 weeks. Over time, we have found that these techniques of closure under tension led to increased pain, and unacceptably high recurrence rates. In 1989, the Lichtenstein tension free hernia repair was introduced, and has become the most commonly performed method of open inguinal hernia repair. The central feature of this repair is placement of a synthetic mesh material over the unrepaired hernia defect. The mesh is secured into place at the pubic tubercle and anteriorly, with care taken to avoid neurovascular structures. The placement of mesh in the preperitoneal space allows for the pressure of the intra-abdominal contents to further hold the mesh in place. Given that the defect is not repaired under tension, patients experienced significantly less pain, and return to full physical activity sooner.

Polypropylene mesh is the most commonly used mesh material, and, until recently, remained largely unchanged since its introduction in the late 1950's. In recent years there have been several changes to the construction of prosthetic meshes. These have been developed in part due to shrinkage of mesh along with scar plate formation, that can lead to discomfort, foreign body sensation and recurrence. Though traditional poly-propylene meshes are still widely used in hernia repair today, there has been a movement toward reduced mass of mesh including thinner mesh filaments, and larger pore size, that provide for more natural abdominal wall compliance while still resulting in a secure repair with a material that is substantially stronger than the native abdominal wall. Additional advances in mesh construction include the development of bilayer meshes, with an absorbable adhesive barrier designed to maintain optimal ingrowth, while preventing adherence of the underlying viscera to the mesh.

Minimally invasive hernia repair has developed over the last two decades, and, at the present time, it is estimated that 10 to 15 percent of inguinal hernias are repaired laparoscopically. Tenets of this repair include wide coverage of the inguinal area in the preperitoneal position. Advantages of this approach include potential for decreased pain, less inflammatory response, less scarring and adhesions, and decreased rates of infection. These factors translate to decreased postoperative pain, diminished need for pain medication and more rapid recovery. Despite this, the increased cost of laparoscopic repairs, in conjunction with a large VA study documenting increased recurrence rate has dampened enthusiasm for this approach in the patient with a primary unilateral hernia. [2,3] At the present time, the laparoscopic approach is used predominantly for recurrent hernias and bilateral repairs.

Expected length of stay is day surgery for almost all inguinal hernia repairs. Return to light duty can be expected in 7 days for laparoscopic repair, and 14 days for open surgery. Return to heavy physical labor can, in most cases, be safely accomplished in 4 weeks with laparoscopic repair and six to eight weeks for open repairs.[4]

In summary, the causes of groin pain in the occupational setting

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***Lead*** *(Continued from page 2)*

more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers, and to male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to his or her former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed."[4]

With regards to the wage, benefit, and seniority protections guaranteed under MRP, both standards state:

"During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker had not been removed) for a period of up to 18 months." [5]

Without revealing confidential medical information, the rationale for a decision to recommend MRP, additional protective measures,

*(Continued on page 6)*

**Table 1. Health-based management recommendations for lead-exposed adults [7]**

| Blood lead level (BLL) (mcg/dl | Management |
|---|---|
| <5 | None indicated |
| 5-9 | Discuss health risks.<br>Reduce lead exposure for women who are or may become pregnant |
| 10-19 | As above for BLL 5-9mcg/dl<br>plus: Decrease lead exposure<br>Increase biological monitoring<br>Consider removal from lead exposure to avoid long-term risks if exposure control over an extended period does not decrease BLL to <10 mcg/dl or if medical condition is present that increases risk with continued exposure |
| 20-29 | Remove from lead exposure if repeat BLL measured in 4 weeks remains ≥ 20 mcg/dl |
| 30-39 | Remove from lead exposure |
| 40-79 | Remove from lead exposure<br>Refer for prompt medical evaluation<br>Consider chelation therapy for BLL >50 mcg/dl with significant symptoms or signs of lead toxicity |
| ≥80 | Remove from lead exposure<br>Refer for immediate/urgent medical evaluation<br>Probable chelation therapy |

**Table 2. Health-based medical surveillance recommendations for lead-exposed workers [9]**

| Category of Exposure | Recommendations |
|---|---|
| All lead-exposed workers | Baseline or preplacement medical history and physical examination with baseline blood lead level (BLL) and serum creatinine |
| BLL (mcg/dl) | |
| <10 | BLL every month for first 3 months of placement, or upon change in task to higher exposure, then BLL every 6 months<br>If BLL increases ≥ 5 mcg/dl, evaluate exposure and protective measures. Increase monitoring if indicated.<br>See Table 1 for pregnancy concerns. |
| 10-19 | As above for BLL < 10 mcg/dl, plus:<br>BLL every 3 months<br>Evaluate exposure, engineering controls, and work practices<br>Consider removal (see Table 1)<br>Revert to BLL every 6 months after 3 BLLs<10mcg/dl |
| ≥20 | Remove from exposure if repeat BLL measured in 4 weeks<br>Remains ≥ 20 mcg/dl or if first BLL ≥ 30 mcg/dl (see Table 1) |

***Hernia*** *(Continued from page 4)*

are varied, and a thorough history and examination is necessary to determine the etiology and causality of the pain. Essentially all hernias should be repaired, though incarcerated or strangulated hernias constitute a surgical emergency. All patients with suspected hernia should be referred to a surgeon for evaluation and treatment consideration. For primary inguinal hernias, a tension free repair with mesh should be performed, with mounting evidence to support the use of newer, lighter weight mesh. At the present time, there is no absolute benefit of the laparoscopic approach for primary inguinal hernias, however, many surgeons believe that this is the procedure of choice for recurrent or bilateral hernias.

1.Rai S, Chandra SS, Smile SR. A study of the risk of strangulation and obstruction in groin hernias. Aust N Z J Surg. 1998 Sep;68 (9):650-4.

2. Butler RE, Burke R, Schneider JJ, Brar H, Lucha PA Jr. The economic impact of laparoscopic inguinal hernia repair: results of a double-blinded, prospective, randomized trial. Surg Endosc. 2007 Mar; 21(3): 387-90. Epub 2007 Jan 19.

3. Neumayer L, Giobbie-Hurder A, Jonasson O, Fitzgibbons R Jr, Dunlop D, Gibbs J, Reda D, Henderson W; Veterans Affairs Cooperative Studies Program 456 Investigators, Open mesh versus laparoscopic mesh repair of inguinal hernia, *N Engl J Med.* 2004 Apr 29;350(18):1819-27. Epub 2004 Apr 25.

4. ODG-TWC Guidelines- Hernia chapter, updated 1/21/2010

*Dr. Ferzoco is the director of the New England Baptist Hernia Center, and general surgeon advisor to Northeastern University Athletics. She specializes in minimally invasive abdominal surgery including gallbladder, intestine, colon, appendix and abdominal wall hernias.*

***Lead*** *(Continued from page 5)*

or increased monitoring based on health concerns should be carefully explained to the employer. In addition, the employer might be encouraged to take advantage of the free occupational safety and health consultation services available through most states' departments of labor. Such a consultation could assist an employer in reducing exposures to all of their employees. Of course, in the competitive world of occupational medicine, even a thoughtful, well-supported recommendation that appears to extend beyond the employer's expectations might be challenged.

Although elevated adult blood lead levels are reportable to public health officials in most states, this is usually for purposes of public health surveillance and policy-making, not individual case management. It cannot be assumed that the public health agency will make recommendations to the employer regarding the individual worker or general exposure controls. In many states, confidentiality requirements prevent the public health agency from contacting an employer without the worker's explicit consent if the communication might even inadvertently identify the worker. The occupational physician who is seeing the worker at the request of the employer is not subject to the same constraints in regards to communications with and recommendations to that employer.

The second scenario occurs when an employee is referred for reasons other than compliance with the OSHA lead standard but in the course of the evaluation it becomes apparent that his or her work activities should be subject to OSHA compliance. This is not a new challenge brought on by the publication of the recommendations, but does take on an increased urgency with the greater understanding of the potential adverse health effects of lead exposure. Although the OSHA lead standards are considered insufficiently protective in regards to the BLL's at which MRP is triggered, in addition to requiring biological monitoring, they do also require the

*(Continued on page 7)*

## State Resources

| State | Adult Lead Program contact | Physician Reporting | Laboratory Reporting | Lead Program Activities | Employer Consultation Services |
|---|---|---|---|---|---|
| Connecticut | Thomas St. Louis, MSPH<br>Occupational Health Program Director<br>(860) 509-7759<br>Thomas.St.Louis@ct.gov | Individuals with bll's<br>≥ 10mcg/dl<br>www.ct.gov/dph/occupationalhealth | Blood leads<br>≥ 10 mcg/dl | Educational materials for individuals with BLLs ³10 mg/dl, physician/ worker/ employer interviews for individuals ³20 mg/dl, worksite investigations and possible OSHA referrals for ³40 mg/dl or worksites with multiple workers ³20 mg/dl. | Connecticut Department of Labor<br>(860)263-6900<br>Connecticut Department of Public Health<br>(860) 509-7759 |
| Maine | Leslie A. Walleigh MD,MPH<br>Program Manager<br>Occupational Disease Reporting System<br>(207) 287-3222<br>leslie.walleigh@maine.gov | Work related bll's ≥25 mcg/dl (intent to lower to ≥ 10 mcg/dl) | All blood leads | Phone Survey and education of all individuals with bll's ≥25 mcg/dl. Selective employer referrals to SafetyWorks! | Department of Labor/ Bureau of Labor Standards<br>SafetyWorks!<br>(1-877-723-3345). |
| Massachusetts | Richard Rabin<br>Occupational Lead Poisoning Registry<br>Massachusetts Department of Labor<br>(617) 969-7177<br>Rick.Rabin@state.ma.us | Physicians required to provide information requested by registry | Blood leads ≥15mcg/dl on individuals ≥ 15 years | Physician interview<br>Worker interview<br>Worksite investigation (selected cases)<br>Medical consultation with ordering physician (selected cases) | Massachusetts Division of Occupational Safety<br>(617) 969-7177 |
| New Hampshire | Suzanne Allison RNBSN<br>Public Health Coordinator<br>(603) 271-4718<br>sallison@DHHS.state.nh.us | Lead poisoning | All blood leads | Informational packet sent to all individuals with bll ≥ 25mcg/dl.<br>Under MOU with OSHA, report employers with employee with bll ≥ 40 mcg/dl | New Hampshire Occupational Safety and Health Consultation Service<br>(603) 271-8590 |
| Rhode Island | James Bruckshaw<br>Program Manager<br>RI Consultation Program,<br>(401)222-7745<br>James.Bruckshaw@health.ri.gov | All blood Lead tests. | All blood Lead tests. | Attempted Physician interview and worker interview to determine if potential worksite exposure. Contact then made with employer, if available, for worksite consultation for those with BLL ≥ 25, or employer referral. | RI Department of Health Healthy Homes and Environment Team Consultation Program<br>(401) 222-7745 |
| Vermont | William Bress PhD<br>Acting CLPPP Coordinator<br>Vermont State Toxicologist<br>bbress@vdh.state.vt.us | All blood Lead tests. | All blood Lead tests. | Survey sent to all individuals with BLLs of 10 or greater. Information packet in development. | Vermont Occupational Safety and Health Administration<br>1-800-287-2765 |

# In Memoriam NECOEM Member Lisa Woody

Lisa Ellen Woody Lisa Ellen Woody, 51, of Guilford, beloved wife of Robert O. McAlister, passed away Jan. 18, 2010, after a 22-month battle with lung cancer. Lisa joined the Connecticut component of the American College of Occupational and Environmental Medicine in January 1993. Lisa received a B.S. in chemistry from Southern Methodist University in 1979 and her MD from the University of Texas Southwestern Medical School in 1983. She completed an Internal Medicine residency at the University of New Mexico Affiliated Hospitals in 1987 and practiced internal medicine for four years before changing her focus to acute care and occupational medicine. She obtained her MPH from the Medical College of Wisconsin in 1996 and her board certification in occupational medicine in 1997. She practiced at the William W. Backus Hospital in Norwich, Conn. from 1992 - 1998 and 2006 - 2009. She practiced at the Loyola University Medical Center in Maywood, Ill. from 1998 - 2006. Lisa loved the mountains where she felt the grandeur and peace of nature were most profoundly expressed and where she was always able to achieve communion with her beloved brother, Bruce Kenyon Woody, both before and after his death. She loved micromanaging her children's lives, quilts, quilting, baseball, and flowers of all kinds, wild and cultivated (but never indoors, where they inevitably became cat food. The family would like to thank the administration, employees, and medical staff of the William W. Backus Hospital who were so supportive of Lisa during her illness. In lieu of flowers, donations in her memory may be made to the National Lung Cancer Partnership, 222 N. Midvale Road, Suite 6, Madison, WI 53705 (or online at www.nationallungcancerpartnership.org) or the Backus Foundation, 326 Washington St, Norwich, CT 06360 (or online at www.backushospital.org/foundation).

***Lead*** *(Continued from page 6)*

use of work practices which both limit the worker's exposure on the job and limit the potential for "take-home" lead.

The potential harm to the worker and family of those working with lead without the protections offered by adherence to OSHA-mandated work practices was recently evidenced in Maine when the Childhood Lead Poisoning Prevention Program identified six lead poisoned children from five families where, after finding no lead hazards in the homes, an expanded environmental investigation determined that the children were exposed to lead dust in the family vehicles and in child safety seats. The likely sources of the lead dust were household contacts who worked in high-risk lead exposure occupations. Four of the five household contacts were employed as painters. The fifth was self-employed as a metal recycler. Though their work activities should have subjected them to the OSHA Construction Standard for lead, none of the employed painters was working according to OSHA guidelines or enrolled in a biological monitoring program. After learning of his child's lead level, one of the painters did request that his own physician check a blood lead. His results were 71mcg/dl.

When a concern arises regarding lead exposure in an employee who is working in a high risk occupation but is not in a monitoring program, the physician should discuss the hazards of lead with both the employee and the employer. If the employer has not performed an exposure assessment, the physician can recommend consultative services to perform an assessment to determine whether the work is subject to OSHA requirements. If a concern arises regarding take-home lead, the physician should consider a referral to the state's childhood lead program and/or a discussion with the worker's family physician or pediatrician. For the rare recalcitrant employer who continues to subject employees to hazardous working conditions, a report to the local OSHA office is warranted.

In the third scenario, the occupational physician might be evaluating a worker who is employed in an occupation where lead is used, but where air levels would not be expected to exceed the OSHA action level of 30mcg/$m^3$ and therefore the job would not be subject to an OSHA lead standard. Nevertheless, exposure through inhalation or ingestion might result in enough elevation of the blood lead to be of concern to a woman who is pregnant or planning pregnancy. The potential risks of exposure should be discussed with the woman and her employer, keeping in mind that the employer is under no OSHA mandated

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# NECOEM

NECOEM is a not-for-profit, regional component society of the American College of Occupational and Environmental Medicine, the pre-eminent organization of occupational and environmental physicians, associate and affiliate clinicians.

NECOEM has over 270 physician, associate and affiliate members and is dedicated to preventing and treating occupational injuries and illnesses. NECOEM provides continuing medical education for its members and other clinicians in order to enhance the care that they provide to men and women in the workplace. NECOEM is an advocate for workplace safety, occupational health research, raising public awareness of occupational and environmental health issues, providing guidance on public health policy, and recognizing outstanding achievement by individuals in occupational and environmental health.

*The editorial board welcomes letters to the editor. Write or email to NECOEM at the above address. The editor reserves the right to edit letters for publication purposes.*

Return Service Requested



***Lead*** *(Continued from page 7)*

obligation to evaluate the employee or to maintain her wages, benefits, or seniority if she is removed from lead exposure.

We can all hope that the OSHA lead standards are updated in the near future. In the meantime, in evaluating workers with exposure to lead, we need to be familiar not only with the OSHA standards, but also with the health-based recommendations for management and surveillance that have been developed by our medical colleagues.

[1,3,7,9] Kosnett MJ, Wedeen RP, Rothenberg SJ, Hipkins KL, Materna BL, Schwartz BS, et al. 2007. Recommendations for medical management of adult lead exposure. Environ Health Perspectives 115:463–471.

[2] Medical Removal Protection (MRP) is the required removal of an employee from work with lead exposure above the action level, with maintenance of full salary, benefits, and seniority, until there are two consecutive BLL's of 40mcg/dl or below and the physician authorizes return to the usual work.

[4] OSHA **Construction Standard for lead** (1926.62)

[5] General Industry Standard for lead (**1910.1025**), OSHA **Construction Standard for lead** (1926.62)

[6] CDC. Childhood Lead Poisoning Associated with Lead Dust Contamination of Family Vehicles and Child Safety Seats --- Maine, 2008. MMWR. 2009; 58(32);890-893

[8] Medical conditions that may increase the risk of continued exposure include chronic renal dysfunction (serum creatinine > 1.5mg/dl for men and > 1.3mg/dl for women, or proteinuria), hypertension, neurological disorders, and cognitive dysfunction.

[10] Lead-exposed means handling or disturbing materials with a significant lead content in a manner that could reasonably be expected to cause potentially harmful exposure through inhalation or ingestion.

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