

NECOEM *Reporter*

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Upcoming Events

Fall 2012: Aerospace Medicine,
Pease Air Force Base,
www.necoem.org

**NECOEM/MaAOHN
Annual Conference 2012
The Science and Practice of
OEM: from Injury and Illness
to Health and Wellness
November 29 and 30
Newton Marriott Hotel,
Newton, MA**

**Health and Productivity
Michael Chernew, PhD
Neck Injuries/Treatment
Jim Rainville, MD
Recent Respiratory Illnesses
David Christiani, MD
Knee Injury/Treatment/Exam
Tom Gill, MD
Opioids, Wellness,
Legal Challenges in H & P,
Non-Compliant Workers,
Diabetes at Work
International Medicine,
Harriet Hardy Awardee
Jonathon Borak, MD
WBP Excellence Lecture
Dean Hashimoto, MD, JD
and much more**

**New for 2012:
Thursday Dinner Reception
Poster Session
www.necoem.org**

Technological Health Care Solutions

Joseph Sliwowski, MD

Health Care Overview

PROVIDERS

The financial success for a physician practice is being transformed based on ability to provide evidence based care, influence patient behavior and creatively tailoring the treatment plan at an individual level. Currently physicians

are working harder and making less. Over 25% physicians would leave health care if given an opportunity to do so. Electronic Medical Record systems cause a 25% decrease in efficiency. Technological tools offer the possibility of increasing physician revenue per hour, improving customer relationships, lowering risk of malpractice and offering

a more balanced lifestyle for clinicians. Accountable Care Organizations and Medical Homes are in trial phase for evaluating the effectiveness of the new outcomes-based payment model.

PAYOR

Payers of health care are drawing a line in the sand regarding rising direct

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Noise and Hearing Loss: The Role of the Occupational Clinician

Peter M. Rabinowitz, MD, MPH

Scope of the problem

Exposure to potentially damaging noise is one of the most common occupational hazards, with millions of U.S. workers exposed on a daily basis. Not surprisingly, hearing loss due to occupational noise exposure, i.e. noise induced hearing loss or NIHL, is one of the most prevalent occupational conditions, causing as much as 16% of the global burden of dis-

abling hearing loss in adults. Occupational clinicians have central and critical responsibilities for the diagnosis, management and prevention of NIHL and other noise related conditions, including their role as Professional Supervisors of the audiometric testing component of hearing conservation programs. Yet many occupational clinicians have limited training in hearing loss issues, and

may feel unprepared when faced with complex cases, including work-relatedness determinations. Acquiring a basic knowledge of noise as a hazard and noise induced hearing loss as a disease and then using the tools of occupational medicine including medical surveillance for cases and taking good exposure histories can go a long way toward a competent ap-

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Tech Solutions (Continued from page 1)

medical costs. Health care reform bill as of 2014 allows for 30 % of health care premiums to be based on healthy behavior change of its members. In 2011, the average incentive by employer to do "the right thing" is \$450. There is a growing market for ways to objectively track this change, e.g., blue tooth accelerometer.

PATIENTS

The population of the US is getting fatter, more sedentary and more stressed despite a plethora of informational venues of how to lead a healthy lifestyle. Combined with the aging baby boomers, an untenable financial health care burden is mounting. Health care costs are being increasingly shifted to the individual. Deductibles of \$4000 per person is becoming increasingly common. \$ billions are spent on Jenny Craig, fitness clubs, self-help books and nutritional supplements. These have been ineffective in counteracting the wealth of available fast food, the allure of sedentary multi-media or the vicious cycle of consumerism-debt-stress.

PARETO OPTIMAL OPPORTUNITY

The spine and joint \$800 billion problem in US is representative of an opportunity for win-win-win for providers, payers and patients. The \$800 billion is divided into \$500 billion for direct medical spend and \$300 billion for indirect, e.g., lost time. Current health care reform is focused on reducing the \$500 billion medical bill. Hence, the high resistance to change. What if the provider payment also in-

cluded performance on reducing the \$300 billion? The employer would lower their health care premiums while having a more productive workplace. If physicians lowered musculoskeletal health care costs by 10% and lowered indirect by 30%, this would equate to \$80 billion in savings. If physicians received 50% of savings, the physicians would get a net \$10 billion more than currently receiving. The patients would have a health care system that values medical and functional outcomes.

How to Deliver the Solution?**Mobile App: Instant Access/Triage/Education/Outcome Tracking**

A mobile app would be a great way to deliver early education, comparative effective care analysis, and longitudinal tracking of clinical outcomes. For example, a "fear factor" frequently develops during an episode of acute, severe low back pain. With a brief "red flag" questionnaire via a mobile app, the person could be reassured that although painful, there is no serious underlying pathology. Education can be given that activity of any kind is the key to recovery. If medical treatment is needed, the pain level, functional status and type/amount of

treatment could be entered by patient. The medical evidence could be explained through a health care game which is proven to be the best way to learn. An aggregate dashboard through a secure "cloud" of thousands of back pain patients that cuts across EMR barriers could be published within the mobile app. Improvement in outcomes and reduction of back pain costs could be the intended consequence.

Hyperlinked Social Networks

Behavior change per BJ Fogg, Fortune magazine's appointed guru in this field, does not have to be hard. The web and mobile offer the ability for socially prompted habit formation. Make it easy, for example, walk 7 minutes. Do this until it becomes routine. People will generally expand their walking activity specially when being monitored in a fun way by their peers. This concept works well in other areas of wellbeing such as career or relationships.

Tracking Devices

The number of areas that can monitor someone's bodily function or behavior continues to grow exponentially- brain waves, food choices,

social network characteristics, locations traveled... When combined with an understanding of intrinsic motivators (sense of purpose, trust, hope, control and belonging), the beginning of a "virtual" representation or "avatar" of oneself begins to form. On a more basic basis, these type of profiles are formed by Facebook, Google and many others. This more in depth

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Optimal Health Care System

- Payer-Provider-Patient: Monetary Win-Win-Win
- Measurable Longitudinal Behavior Change
- Measurable Clinical Outcomes
- Instant Accessibility
- Transparent Comparable Effectiveness of Care
- Self-sufficiency of patient
- Transportability of medical information
- Individualized to patient's profile and goals
- Prevention focused

profile, which can be analyzed through sophisticated agent-based software, provides an opportunity to help guide a person to their desired goals. A trusted, secure platform is needed. This profile should be owned by the person and not sold to 3rd party influencer.

Virtual Studio

The technology is available to create a full immersion virtual studio at any location. Live, on demand interactive group exercise, education, Mind-Body work, group medical visits and plethora of other activities on demand. When combined with technology such

as X box connect, an offsite yoga instructor can assess technique at multiple sites. Somatic Functional Therapy developed by Ramon Nunez, Ac. from the Henry Ford Integrative Medicine Center is an prime example of scalable, validated form of pain relief that can be offered to thousands virtually. The virtual studio can be customized to the population.

The triple play of healthcare where the payor, provider and patient all benefit from health care change is possible. Both direct and indirect costs can be measured (e.g. Human Factor Analytics), monitored and

results reported. The savings of total health care costs can be shared. Technology can help provide method for decrease in health care utilization while improving quality of life through tracking, educational gaming, social nudges for healthy behavior change and an accessible, transformable environment for wellness.

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Professionals Health Program – A Fitness for Duty Process

Sally Garhart MD

Taking care of patients over a lifetime is both physically and emotionally challenging. Physicians and health care providers often put patients' needs ahead of their own and may have an inadequate support system for themselves. If personal or professional stresses continue, problems may ultimately appear, sometimes in the form of substance abuse or disruptive behavior. When this is discovered, who is responsible for deciding if that provider is able to perform his or her job safely and effectively?

Professional Health Programs or PHPs appeared in the late 1970s in response to an AMA paper, "The Sick Physician" (JAMA 1973; 223(6): 684-7). The early PHPs provided a supportive approach to help physicians with primarily substance abuse by relying on peer volunteers who

themselves had prior substance abuse issues. Regulatory boards saw the value in such a supportive environment because they were cost effective, non-litigious and successful in returning many providers to practice. They were concerned however that public safety might be jeopardized without formal regulations. Over the years state Boards began supporting their state PHP financially and often established state statutes for monitoring and reporting of non-compliance in return for allowing the practitioners to maintain their licenses. Many state programs such as New Hampshire formalized the process, eventually adding mental health, aging and disruptive behavior to the list of monitored conditions. Most states also require adherence to the American Medical Association's Ethics Stan-

dards. Each state however is unique in how they deal with these issues.

I became interested in the concept of physician health after writing and passing a Fitness for Duty policy for the medical staff at Southern New Hampshire Medical Center where I was the medical director of Occupational Health Services. My position there ultimately led me to serving on the medical society's Committee for Physician Health where I helped write the prototype of the current Board of Medicine/PHP agreement. As the medical director of the New Hampshire PHP (a part-time position) since 2002 I utilize my Medical Review Officer certification as well as my

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Noise (Continued from page 1)

proach to this important and challenging condition.

Noise and other ototoxic exposures

Noise has been defined as potentially harmful sound. In occupational settings, sound pressure levels are measured in decibels on a logarithmic scale (whereby an increase of 3 dB means a doubling of sound energy), usually using an “A-weighting” adjustment that emphasizes higher frequency sounds. There is general consensus that prolonged exposure to 8 hour time weighted average of noise in excess of 85dBA increases the risk of hearing impairment over time. There is evidence that in some fraction of workers, hearing loss could occur at lower levels as well. The current OSHA standard sets a permissible exposure level (PEL) of 90dBA 8hr TWA and an action level of 85dBA, but the current European Union noise regulation includes action steps beginning at 80dBA. In addition, research on noise exposed workers suggests that at lower or intermittent noise exposure levels, use of hearing protection may be less consistent than at higher noise levels. Therefore, clinicians need to consider the possible role of noise in hearing loss at exposures as low as 80dBA. They also should be aware that there is evidence that co-exposure to ototoxic chemicals such as solvents may increase the risk of hearing loss even at lower noise levels.

NIHL as a Disease

The ACOEM guidance statement on noise induced hearing loss (http://www.acoem.org/uploadedFiles/Public_Affairs/Policies_And_Position_Statements/Occupational%20Noise-Induced%20Hearing%20Loss.pdf) summarizes the key clinical aspects of the condition. These include the fact

that NIHL is sensorineural (caused by loss of sensory hair cells in the cochlea) usually bilateral and symmetric, and develops gradually over time (as opposed to acoustic trauma that is caused by sudden acute exposure to high level noise such as during an explosion). Typically there will be a “notch” in the audiogram (see Figure 1); with the earliest deepest loss occurring in the noise sensitive frequencies around 4000 Hz. Available evidence also suggests that the loss due to noise is greatest during the first 10-15 years of employment, and that the loss due to noise exposure stops when noise exposure stops. The loss of hearing is in the higher frequencies affecting perception of consonants, and resulting in difficulty with speech discrimination. High frequency loss due to aging compounds the problem for older workers. Speech discrimination for a hearing impaired worker becomes even more difficult in the presence of background noise. While this deficit can often be subtle, NIHL has been associated with considerable morbidity, including depression, social isolation, and workplace accidents.

Hearing Conservation and the Clinician as Professional Supervisor

Under the OSHA noise standard (CFR 1910.95), workplaces where employee noise exposures equal or exceed 85dBA for an 8 hour time weighted average must have in place a hearing conservation program. Components of a hearing conservation program include noise assessment and control, training, hearing protection, and annual audiometric surveillance of noise exposed workers. The OSHA standard states that “*a technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist, or physician*”. Other responsibilities of this “Professional Supervisor of the Audiometric Component of

Hearing Conservation Programs” include reviewing “problem audiograms” such as those showing threshold shifts or asymmetric or fluctuating hearing loss or hearing impairment. Professional Supervisors also are responsible for determining work-relatedness, managing medical referrals, and assessing the effectiveness of the overall program. The Council on Accreditation for Occupational Hearing Conservation (CAOHC) offers a Professional Supervisor certification course for physicians and audiologists (http://www.caohc.org/ps_workshop/)

Determining Work-Relatedness of Hearing Loss

The OSHA standard states that when the annual audiometric test shows a 10dB “shift” in hearing thresholds from baseline at the average of 2, 3, and 4000 Hz (significant threshold shift or “STS”), employees must be informed in writing, and counseled, and refit with hearing protection “*unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure*”. The determination of work-relatedness can also affect recording on the company OSHA log as well as the assessment of the effectiveness of the hearing conservation program. A four step approach to this challenging process involves determining:

1. Is the audiometric test valid?
2. Is the employee exposed to potentially damaging noise (or ototoxic chemicals) at work?
3. Is the hearing loss consistent with NIHL, OR is there a medical condition present that can completely explain the loss?
4. Considering Steps 1-3, did a work exposure either cause or contribute to the hearing loss, or significantly aggravate a pre-existing hearing loss?

Accommodation of Hearing Impaired workers and Determination of Auditory Fitness for Duty

As the U.S. working population ages, the prevalence of hearing loss is increasing and occupational clinicians are frequently faced with decisions related to the fitness for duty of a worker with significant hearing loss. While realizing that hearing loss can interfere with perception of warning signals, communication, and overall situational awareness, it can be difficult to determine whether a hearing impaired worker can safely perform a task. Fitness for duty criteria based on audiometric hearing thresholds exist for a number of occupations including air traffic controllers, firefighters, pilots, and commercial drivers, but evidence to support such criteria is scarce. There have been recent calls

for increasing use of functional testing such as the hearing in noise test (HINT) that may better correlate with job ability than audiometry. Related to fitness for duty determinations are decisions about how to accommodate the hearing impaired worker. Such can include installation of visual warnaccommodations ing signals and the use of sophisticated hearing protection devices with level dependent attenuation and communication enhancement allowing for amplification of environmental sounds at lower noise levels, and protection at higher noise levels.

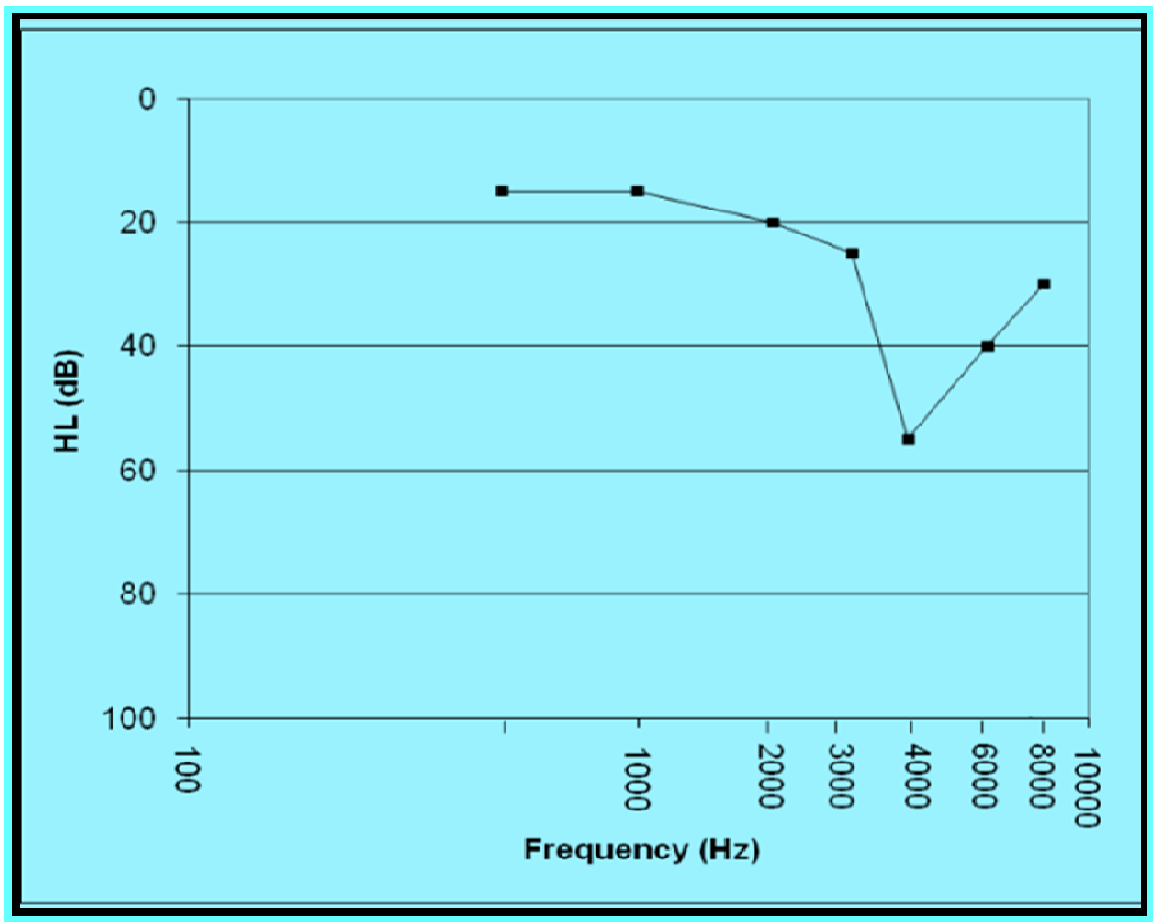
New Directions

There are a number of recent developments in approaches to the prevention of noise induced hearing loss that may further enhance efforts. These include

noise monitoring devices that continuously measure noise exposures inside of hearing protection, allowing a worker to quickly take steps to reduce exposure. Another line of investigation is the use of otoprotective compounds such as antioxidants to prevent or reduce noise induced damage. There is also growing interest in the non-auditory effects of noise, from fatigue to headaches to depression and hypertension, and this may lead to greater impetus to noise control in the future. In all of these efforts, occupational clinicians will continue to play a central role.

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Figure 1: The audiometric “notch” of noise induced hearing loss



PHP (Continued from page 3)

board certification in internal, occupational and addiction medicine. When our program became a 501c3 organization in 2008, we decided to offer the same services to other health care provider groups provided the licensing board was willing to fund the services - currently a \$15 per year charge on all licenses collected by the Boards and paid on a quarterly basis to the NHPHP. At present we work with physicians, physician assistants, dentists, and veterinarians. We complete a bid every 2 years to receive the state funding.

In New Hampshire, the majority of our referrals come from the Board of Medicine. The Board then relies on our expertise to assess and recommend non-disciplinary measures for a licensee to determine if there is a need for neurologic, psychological and/or addiction assessment, alcohol or drug treatment, therapy, coaching, education or other therapeutic intervention to restore the licensee's ability to practice medicine in a safe and healthy manner. Our second largest referral source is employers, oftentimes hospitals. There is no charge to a participant to utilize the NHPHP, however the participant pays for all independent assessments, treatments, drug testing, counseling and required CME course work. We also meet with many individuals who do not need monitoring for various reasons and also provide educational programs around the state. Provided there are no Board licensing stipulations, our agreements allow the provider to return to work once we feel it is appropriate. However, if a provider loses a medical license in one state, there is often reciprocal action in all other states.

Each provider that we have worked with over the years has a unique story and problem. Referred providers begin their journey with the NHPHP in various stages of denial or anger. It is well known that physicians are notorious for working when sick and exhausted so many are not receptive to someone questioning their behavior, substance use or mental health. When a participant enters into a monitoring contract with the NHPHP, the licensee agrees to complete the planned treatment and to have his compliance monitored by the NHPHP. We employ the latest drug and alcohol testing available and are not limited to the Department of Health and Human Services testing. The Board then monitors for any contract violation. We credit this approach to a high recovery rate. In fact, the 5-year monitored recovery rate is 79% according to pooled PHP data a 2008 study (McLellan AT, Skipper GE, Campbell M, DuPont RI, Five year outcomes in a cohort study of physicians treated for substance use disorders in the US. *BMJ*. 2008 Nov 4;a2038); the general population has an 18% recovery rate at best. The NHPHP will also provide help if a relapse occurs.

The NH Board strongly encourages self-referral, before a formal intervention is required. Ideally treatment is

more effective when begun shortly after symptoms present but we often we are not involved until a later stage. We speak to the need to be vigilant and to practice prevention.

The NH Professionals Health Programs values healthy providers and is committed to helping providers remain or become effective, mentally healthy colleagues, free of addiction. A simple mnemonic summarizes our common sense mantra: **HALT - Don't let yourself get too *hungry, angry, lonely or tired***. If you think you, a loved one, or your staff think you have a problem then you most likely do, so call your state PHP. Remember that even the caretakers need caretaking. For most doctors, embracing and living the AA Serenity Prayer could save heartache: "God, grant me the serenity to accept the things I cannot change, Courage to change the things I can, And wisdom to know the difference." You don't need to be in recovery to "pick your battles."

I am available to discuss these issues by phone or email.

Sally Garhart MD

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HAZARDALERT UPDATE

**Dear Healthcare Provider:*

Hair stylists who use keratin hair-smoothing treatments on their client's hair are at risk for exposure to formaldehyde, a known asthmagen and carcinogen. This Occupational Lung Disease Bulletin provides a summary of recent FDA

and OSHA actions warning stylists and consumers about the health hazards associated with straightening hair treatments. Despite claims of being "formaldehyde free" many products have been documented to release formaldehyde to the salon environment. To date no cases of work-related asthma (WRA) associated with hair straightening have been reported in Massachusetts. However, nearly 20 confirmed WRA cases reported exposures to formaldehyde in a variety of industries, including healthcare, lumber mills, paper-making, plastics and jewelry box manufacture. If your patients are employed in salons, notify them about the risk of formaldehyde.

REMINDERS: Report cases of WRA to the MA Department of Public Health.

To receive your Bulletin by e-mail, please send a message to occupational.asthma@state.ma.us

Sincerely,

Elise Pechter MPH, MAT, CIH

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Hair straightening with health risks

Hair straightening (or "smoothing") treatments, the most well known of which is Brazilian Blowout, have gained popularity over the last few years. The 90 minute treatment is touted for its success in providing smooth, straight, manageable, humidity-resistant hair that lasts for months. The YouTube video demonstrating the Brazilian Blowout technique has been viewed nearly 400,000 times; it shows repeated use of both a hairdryer and hot flat iron to achieve the desired results.

There is a downside to these treatments—the hair straightening products contain and release formaldehyde with heating. The manufacturers and distributors have denied the use of formaldehyde, but sampling results by

the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH) and researchers have documented its presence. The client is exposed only during treatment, but the stylist and coworkers may provide multiple treatments or work nearby, resulting in additive exposures over a work shift; other clients may also be ex-

posed.²

Formaldehyde

Formaldehyde is a colorless, pungent gas that can cause work-related asthma (WRA). The highly reactive chemical can damage the eyes, cause severe irritation of the eyes, nose and throat, and cause dermal and respiratory sensitization. It is estimated that 10-20% of the population may be sensitized. Formaldehyde is also a known carcinogen. While consumer products may legally contain it, OSHA has a standard designed to protect employees from exposure to formaldehyde on the job. The standard sets limits for air concentrations, and requires labeling and material safety data sheets that describe the hazards if the concentration in the product is 0.1% or more.

Recent history—agencies find formaldehyde

In October 2010, Oregon OSHA (OR-OSHA) reported that they had tested 100 products from 50 salons. Their results showed significant levels of formaldehyde in products labeled "formaldehyde free." OR-OSHA initiated this investigation in response to a complaint from a hair stylist who had nosebleeds, eye irritation and

trouble breathing while using a hair straightening product. Of the products tested, 37 came from bottles of Brazilian Blowout Acai Professional Smoothing Solution, labeled "formaldehyde free." OR-OSHA alerted federal OSHA about these problems. Health Departments in California, Connecticut and Minnesota issued warnings to salon owners, stylists, and clients. And California's Attorney General has filed a lawsuit against the maker, asserting they failed to warn consumers of the health risks.

NIOSH conducted air sampling for formaldehyde during a Health Hazard Evaluation at an Ohio salon in December 2010. One employee applied the treatment to another employee, while the salon was closed. The report (May 2011) stated that six of seven personal breathing zone samples for formaldehyde exceeded the NIOSH ceiling limit of 0.1 ppm. An adjacent stylist, cutting hair, was also exposed to formaldehyde at the ceiling limit.

In August 2011, the US Food and Drug Administration (FDA) issued a warning letter stating that keratin hair straightening treatments could be injurious to users. The FDA

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The mission of the New England College of Occupational and Environmental Medicine is to support the optimal health and safety of workers and workplace environments through educating our members and other health care professionals, encouraging research, workplace safety, and high quality practice, guiding public policy, and promoting the specialty of Occupational and Environmental Medicine.

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Hazard Alert (Continued from page 7)

conducted their own sample analysis of Brazilian Blowout, and found concentrations of formaldehyde ranging from 8.7-10.4%. FDA stated that this product is an “adulterated and misbranded cosmetic.” It contains methylene glycol, which releases formaldehyde, during normal conditions of use. In response, the company denied the assertion, asserting that the formaldehyde was “well below” even the most stringent standards and urging customers to complain to FDA.

While FDA has warned consumers, OSHA recently issued a Hazard Alert for workers in English, Spanish and Vietnamese about the dangers in using these products (September 22, 2011): www.osha.gov/SLTC/formaldehyde/hazard_alert.html

OSHA also has an online factsheet about hair salons
<http://www.osha.gov/SLTC/hairsalons/index.html>

¹www.youtube.com/watch?v=r9KhydvXks8 Accessed 1/5/12.

Pierce JS, Abelmann A et al. Characterization of formaldehyde exposure resulting from the use of four professional hair straightening products. JOEH 2011;8:686-699.

²www.tandfonline.com/doi/pdf/10.1080/15459624.2011.626259

³www.cdc.gov/niosh/hhe/pdfs/HETA_11-0014_Interim_Letter_for_web.pdf

⁴www.fda.gov/ICECI/EnforcementActions/WarningLetters/ucm270809.htm

⁵www.osha.gov/SLTC/formaldehyde/brazilian_blowout_letter.pdf

In order of concentration with largest first: Brazilian Blowout>Global Keratin>Coppola>La Brasiliana in bulk concentration and release to environment.