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Upcoming Events!
Save the Date:
October 14
Quest Diagnostic Lab, Marlborough, MA
Late afternoon Tour and Presentations, An inside look at a fully automated laboratory, dinner and speakers

NECOEM and MaAOHN Annual Conference 2015
December 3 and 4
“In the Trenches — Tips, Tools and Pearls for the Occupational Health Professional”
Speakers and registration at www.necoem.org

A Visit to the Animal Refuge League of Greater Portland:
Cat and Dog Bites and Compassion Fatigue
By Susan Upham, MD, MPH

It is a sunny April day outside, but as I enter the Animal Refuge League (ARL) of Greater Portland the lights are dimmed. The Center is closed to the public today and it is a calm setting. Then, I hear a repetitive mournful meowing coming from the nearby “ready for adoption” cat room, containing numerous metal cages, two high, and am immediately confronted with mixed emotions surrounding the problem of unwanted domestic animals. The statistics are staggering. The ASPCA reports that there about 13,600 animal shelters nationwide. Approximately 7.6 million companion animals enter shelters each year; approximately 3.9 million are dogs and 3.4 million are cats.

This local ARL employs about 40 personnel. Here the staff experience what might seem like everyday dog and cat bites. However, improper medical management can lead to severe and potentially life threatening infectious disease complications. Today’s visit is focused on further discussion of their experience with bites and how they prevent them. We also spend time talking about compassion fatigue and how shelters cope with this problem in their workforce.

Animal shelter employment poised for growth in the U.S.
It is unclear how many workers are employed in animal shelters in the U.S. The Bureau of Labor Statistics reports their data in the category of “nonfarm animal caretakers” which includes workers in kennels, animal shelters, zoos, circuses and aquariums. In 2014, national employment estimates for this job category were

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Travel Medicine
Ice Pick to the Face on an Airplane: Demystifying Sinus Barotrauma
By Thomas Luna, MD, MPH, FAsMA, FACOEM

The editors of The NEOEM Reporter recently received the following question:
“I have a patient who must travel by air fairly frequently but he often gets excruciating sharp pains in his face toward the end of the flight. What could this be — and how do we manage it?”

This sounds like classic sinus barotrauma; quite common in aerospace medicine but infrequently encountered elsewhere. This is pain in one of the paranasal sinuses which occurs due to differences in air pressure within the sinus compared to the nasal airway. I encountered this frequently in my military aerospace medicine practice but I also had the misfortune to be introduced to it most rudely as a patient myself.

Prior to medical school, I was flying normally in a Boeing 707-equivalent aircraft. About 10 minutes into our descent for landing I had quick onset of excruciating sharp pain on one side of my forehead. It was constant, without radiation. It was like someone had taken an ice pick, plunged it into my head and was now proceeding to twist it this way and that. I grabbed my head, slumped over in my seat and called for help. I was nearly incapacitated with pain. The pilot was informed and our

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161,820. The job outlook for this industry is good, with employment growth expected to be faster than the average for all occupations, with one estimate indicating a 23% increase between 2010-2020. This translates into more opportunities for the OEM clinician to encounter workers with bites and other injuries related to the field.

Bite prevention starts with behavioral assessment of each animal when they enter the shelter.

Prevention of bite injuries takes several forms: behavioral assessment, personal protection, environmental management (signage, specialized cages to reduce physical contact with the animal such as guillotine-gated cages and “ferile boxes”) and other tools, such as gloves, nets, and “clamshell” catchers. Jess Townsend, the Director of Operations, leads me into an office and we are followed by a little black and tan dog wearing a blue sweater. She shows me the latest behavioral video of a bull terrier. He seems friendly enough and likes his toys, but when a plastic hand is introduced and reaches for the toys, he bites it hard. This is an example of a Safer Assessment that looks for “resource guarding” and can be used to assess the bite risk of an animal. The problem in this case is that Ms. Townsend is not sure whether the dog simply thought of the hand as another toy or if it was a true resource guarding reaction. These tests are not perfect in predicting this unwanted behavior, so she will need to spend time determining what the next best step for evaluation will be.

*ASPCA SAFER® Aggression Assessment is a predictive, consistent method for evaluating the probability of canine aggression in individual dogs. The seven-item assessment generally takes no more than 10 minutes per dog to complete. Source: http://aspca.org/safer*

An animal new to their facility undergoes a behavioral evaluation to assess their aggressiveness and other characteristics that may help in matching them to a new owner. The prime concern is whether the animal will be safe with human interaction. Whether a behavior will transfer to a home setting cannot always be predicted. Interestingly, some behaviors seen in the shelter do not translate to home behaviors. The experience of being in a shelter and in a cage can alter an animal’s behavior, so they try to account for this in their evaluations.

This shelter also utilizes the ASPCAs “Meet Your Match” (MYM) program. This is a unique program which assesses the animal’s behaviors and preferences and then attempts to match them to adopter’s characteristics. It is like an E-Harmony program for shelter animals!

A different approach is used for evaluating cats. Initial impressions from handling the cat often correlate to their bite risk. The staff also assess cat personality with the ASPCA Felinality Assessment. Like the MYM program, this research-based cat behavior and interest assessment is used to match the cat to a potential adopter. Per the ASPCA, studies of this program have found that it promoted a 40-45% increase in adoptions and reduced animal returns by 45-50%.

Staff are trained to be aware of animal body language and respond appropriately if there appears to be a risk of aggression. They are trained in special animal handling procedures, such as the appropriate approach to controlling a dog fight, or how to get in and out of a run when the animal’s behavior becomes threatening.

Environmental management is critical to keeping workers safe. Signage is used everywhere in the shelter to inform staff of health risks, personality traits, and other individual needs of the animal.

With some animals, complete avoidance of contact can be achieved by the use of specialized cages which are partitioned by guillotine style doors. These can be opened and closed by a pulley outside the cage, allowing the animal to be separated into one side of the cage so that the other side may be entered safely by a worker.

Volunteers are restricted from interacting with certain animals.

Ms. Townsend informed me that humans are the greatest transmission vectors of infection between animals, so all her workers wear new gloves when each animal is handled. Other protective devices include thick, long arm gloves, gowns, masks, and foot protection (booties) depending on the risk.

Animal bites occur periodically in spite of these preventive measures. In Ms. Townsend’s experience, cat bites seem to cause the most infections - so much so that her bitten workers are sent for care urgently. When asked, “from your perspective, what would you like the occupational medicine clinicians to know?” Her response is “never let them go without an antibiotic!” She has seen several cases where the clinician did not prescribe preventative antibiotics, and every case developed a severe, complicated infection. This

![A thick long arm bite glove is helpful to reduce bite wounds.](image)

Quarantined animals are often placed in double guillotine cages. For cats, ferile boxes are available to achieve the same noncontact effect.

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descent was greatly slowed. I was told to Valsalva but that did no good. I was given some Afrin and after about 10 minutes my pain eased a bit and we landed. I was told to use the Afrin over the next 24 hours and take ibuprofen. Aside from some mild hay fever symptoms I had been feeling fine prior to the onset of pain. My ears had been a little slow to clear but responded to swallowing. It was a horrible experience; I am extremely grateful that it has not recurred. However, it has made me extra sympathetic to those who have had similar experiences.

As we rise in altitude the ambient air pressure decreases. The air in our sinuses and middle ears then has a relative higher pressure. This normally equilibrates without difficulty with air flowing from the sinuses, out their ostia (also referred to as osteomeatal complex), and into the nasal airway and ambient environment. For the middle ear this occurs via the Eustachian tube. On descent from altitude the opposite should occur but this process is more likely to encounter problems. As we descend from altitude the ambient air pressure increases and there is relative negative pressure – a relative vacuum – within the sinuses and middle ear. The Eustachian tube serves as a one-way valve which can be forced open by swallowing or by a forceful Valsalva maneuver; this provides some voluntary control over the opening of the Eustachian tube and equilibration of pressure and relief of ear pain on descent. There is no similar voluntary control over the sinus ostia. The flow of air into and out of the sinuses is more passive and Valsalva maneuvers are unlikely to be of benefit. Obstruction of the ostia by mucosal edema or a mass such as a polyp or neoplasm can readily cause difficulties in the passage of air. Obstruction may occur on ascent but is much more frequent on descent. Sinus barotrauma seems to occur most often in the frontal sinuses.

The sinuses are air spaces within the bones of the face. They are lined by respiratory mucosa composed mainly of ciliated epithelium and goblet cells. If there is obstruction of the ostium during the descent the increasingly negative pressure within the sinus causes engorgement of the mucosa, rupture of the mucosal vessels causing hemorrhage into the mucosa and sometimes hemorrhage into the sinus. This is extremely painful – often described as an ice pick sensation, even by those of us who have never used an ice pick. Others have told me that it was more painful than passage of their kidney stones. An aviation otorhinolaryngologist used to tell my residents that the vacuum effect within the sinus was essentially peeling the mucosa off the bone; hemorrhage actually helps to relieve the pressure (and pain) by reducing the air volume within the sinus.

Sinus barotrauma is also referred to as sinus “block” or “squeeze”. Topical nasal decongestants can be effective in relieving sinus barotrauma depending on the cause of the obstruction. They are most likely to be effective if the cause is an upper respiratory infection or an allergy. They are less likely to be effective if the cause is a mass, such as a polyp or neoplasm. NSAIDs are generally sufficient for analgesia once patients are back on terra firma. If there is no clear underlying condition, such as URI, allergies or sinus infection, and this has been a recurring problem, patients should be referred to otorhinolaryngology. Since it is often incapacitating when it occurs, sinus barotrauma is a serious safety concern for pilots. It can endanger the life of the pilot and their passengers. In contrast, though painful, ear blocks are rarely incapacitating. Pilots are not allowed to fly with URIs, sinusitis or untreated allergies.

Dr Luna is board certified in aerospace medicine and occupational medicine. He has practiced aerospace medicine for 25 years and taught aerospace medicine for 19 years. He is a fellow of the Aerospace Medical Association and of ACO-EM. He is in independent practice, based in Portland, Maine.
The Aging Workforce by Joseph Charlot, MD, MPH, FACP

How old will I be when I become an “older” worker? Some say that we are as old as we feel; there is not much consistent guidance beyond that on what constitutes an older worker. Age 55 years and older and age 65 and older are commonly used. The Age Discrimination in Employment Act of 1967 mentions employees 40 years old and older. According to the Bureau of Labor Statistics, 40.5% of the nation’s workforce were comprised of adults ages 55 and older in 2012, up from 29.7% in the year 1992. By 2022, older adults are projected to account for 41.5 percent of the workforce. (See Figures 1,2,3) Cohorts of older Americans are getting larger due to longer life expectancy, aging Baby Boomers and decreased fertility rates. It is important for the Occupational Medicine provider to understand and be equipped to handle the aging workforce.

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suggestion is supported by research (see Recommendations in Table 1.). Cat bite infections can develop rapidly – within a few hours. The problem is that the sharp fangs of the cats inoculate the bite wound with organisms and then the wound closes off rapidly, setting up a perfect environment for infection. She has personal experience with a cat bite in the web space between her left thumb and index finger. Within 2 hours, there was swelling; within 3 hours, redness; and within 4 hours, there was lymphangitic streaking up the arm. She required IV antibiotics for treatment. From a financial standpoint, it is far less costly to treat with oral antibiotics prophylactically than pay for intensive treatment of an active infection.

A “Clamshell” device for capturing cats.

In some shelters where the kill rate is high, the above strains can take their toll on the emotional health of the workers. Ms. Townsend says that in New England there is much less of a problem with animal overpopulation and many shelters minimize euthanization. In other parts of the country, the euthanization rate is extremely high. Ms. Townsend worked in an animal shelter in the mid-Atlantic region where there was a 40-50% kill rate. Her first position at this shelter was at the surrender station, where they took in 15-20 pets per day. She had to tell the owners that if they left the pet, the animal would likely be euthanized that day. She recalls that during her first 6 months at the shelter, she cried at the end of each work day. In her case, she did not develop compassion fatigue, but her personal experience lets her understand why this can happen. Compassion fatigue manifests in many different ways. Some people develop hopelessness and helplessness in their attitude toward their work. Some become numb, callous, and cynical. They erect barriers to protect themselves and sometimes engage in self-injurious behaviors, such as substance abuse. She thinks that this problem likely impacts the industry’s high front line staff turnover rate. On average, these workers quit after about 1 year.

Some shelters offer help in the form of specialized counseling or they send workers to support seminars. At this local ARL, this condition does not seem to be as much of a problem, probably partly because of their extremely low euthanasia rate. It is so low, that they are a designated “no kill” shelter. They integrate “happy time” into the work day via play and socializing time with the animals. Some animals have free range in certain work spaces where they can interact with the workers in an unstructured way. The day to day interplay that goes on between human and animal is its own form of emotional rejuvenation. Ms. Townsend offers the following thoughts. To cope with working at this type of job, “you have to look at the long game and find your personal happy.” Witnessing an animal get adopted...a new home.... (moisture comes to her eyes in discussing this)...is emotional therapy for her.

Compasion Fatigues Among Shelter Workers

Dr. Angelea Panos describes compassion fatigue as a disorder similar to PTSD, except that the symptoms of the caregiver are due to trauma that a client has experienced. Animal shelter workers repeatedly witness emotionally charged circumstances, such as owners surrendering their pets for various reasons – for example, because of poverty or inability to pay for veterinary care for the animal. They also witness animals who have suffered trauma or will be euthanized, sometimes for no other reason than shelter overpopulation.

To OEM clinicians: “...never let them go without an antibiotic!” – J. Townsend (re: cat bites)

Dog bites present somewhat differently, with less frequent infections but more tissue injury and pain. This is because the teeth are larger and the jaws are stronger, imparting a crush injury to the site as well as a skin wound. In these cases, more attention to pain control and musculoskeletal complaints may be needed.

Dr. Susan Upham, MD, MPH is a board certified specialist in occupational medicine. She is co-director of the Bayside Employee Health Clinic in Portland, Maine. Dr. Upham is on the editorial staff of the NEOEM Reporter and has recently been appointed to the NEOEM Board of Directors.
Table 1:   Recommendations for Outpatient Cat and Dog Bite Antibiotic Management


<table>
<thead>
<tr>
<th>Animal Source of Bite</th>
<th>Cat</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of bacterial infection</td>
<td>20-80%</td>
<td>3-18% Not cost effective to treat dog bite wounds with an infection rate of &lt;3%. Only wounds with &gt;5% risk of infection should be treated: those with evidence of infection already in wound, crush injuries, hand/feet/facial/genital injuries, puncture wounds, wounds with bone and joint involvement, patient with comorbid factors, such as immun-</td>
</tr>
<tr>
<td>Length of prophylaxis</td>
<td>5 days</td>
<td>5 days</td>
</tr>
<tr>
<td>Length of RX for active infection</td>
<td>10-14 days ORAL Abx</td>
<td>10-14 days ORAL Abx</td>
</tr>
<tr>
<td>• Superficial wounds</td>
<td>Up to 6 weeks IV ABX</td>
<td>Up to 6 weeks IV ABX</td>
</tr>
<tr>
<td>• Bone or joint involvement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Empiric oral antibiotic therapy for animal bites

• FIRST LINE: Amoxicillin-clavulanic acid 875/125 bid OR 500/125 tid (ADULTS)
• Ampicillin-sublactam IV, if unable to take oral Abx
• PCN ALLERGIC: Doxycycline with or without metronidazole, tetracycline, or ciprofloxacin
• Alternatives: Clindamycin with a fluoroquinolone or clindamycin + trimethoprim-sulfamethoxazole
• PCN RESISTANT PASTEURELLA: 2ND, 3RD, extended spectrum 3RD gen. cephalosporins (ceftriaxone, cefuroxime, cefpodoxime)
• IF SUSPECTED MRSA: Include TMP-Sulfa, doxycycline, minocycline, clindamycin.

Other Interventions: See guidelines for full details

• Wound management: Clean and debride, as needed
• Check tetanus status
• Rabies assessment
• Analgesia for pain
• Complex, high risk bites: Consider specialty consultation (orthopedics, plastic surgery, neurosurgery, etc.)
• Complete dog bite law requirements with local authorities

Compassion Fatigue (Dr. Angelea Panos) Source: http://www.giftfromwithin.org/html/prvntcf.html

The symptoms of compassion fatigue are similar to those of Posttraumatic Stress Disorder. There is a cynical, discouraged or hopeless attitude about your work or your career that begins to set in. The symptoms are not due to your personal experience, but due to the trauma of others. Caregivers become so overwhelmed by the exposure to the feelings and experiences of their clients, that they themselves experience feelings of fear, pain, and suffering including intrusive thoughts, nightmares, loss of energy, and hypervigilance.

WHO IS IT?

“For the common maxim ‘Nothing in excess’ is one I excessively approve.”

These words were the opinion of a famous and revered historical figure in the field of occupational medicine. Who is it?

Please send responses to Abhijay Karandikar at dr_abhik@yahoo.com
Readers who send in correct responses will be identified in the next issue. The correct answer will be published in the next issue of the NECOEM Reporter.

This section is a series of trivia, facts, figures, etc. related to the field of occupational medicine. If you have any such interesting or fun-filled material, please e-mail it to the associate editor at dr_abhik@yahoo.com. All material should be related to the specialty of occupational and environmental medicine and have an educational, inspirational, historic or other relevant value.
Aging Worker (Continued from page 4)

Other hand, there are some challenges of the older worker to employers: older workers have a higher incidence of chronic disease which may complicate recovery from work related injury and disease; injury recovery may also be negatively affected by the biological effects of aging, such as slower tissue repair and less smooth muscle elasticity. Although the incidence of injury is generally reported to be higher for younger workers, older workers take longer to return to work than their younger colleagues.

Over the years several laws passed to assist older Americans and older workers. It would be prudent for the Occupational Medicine Provider to be aware and understand these Federal laws apply to the older worker.

The Social Security Act of 1935 created “a system of Federal old-age benefits” for workers and their families and was amended in 1965 to provide disability benefits.

The Older Americans Act of 1965 provides critical services—such as home-delivered and congregate meals, family caregiver support, in-home assistance, preventive health services, transportation, job training, protection from abuse and other supportive services.

The Age Discrimination in Employment Act (ADEA) of 1967 is a federal law that protects workers and job applicants age 40 and over from age-based discrimination in all aspects of employment.

The Employee Retirement Income Security Act of 1974 is a federal law that sets minimum standards for most voluntarily established pension and health plans in private industry to provide protection for individuals in these plans.

The Older Workers Benefit Protection Act (OWBPA) of 1990 protects individuals who are 40 years of age or older from employment discrimination based on age and it applies to both employees and job applicants. Medical treatment of the older worker is similar to treatment for workers of all ages; however, there needs to be sensitivity to the possibility of healing slower from their injuries and increased risk of side effects when medications are prescribed because of higher comorbidity in older persons. Besides a good history and physical, an Occupational Medicine provider should review the job description and, if possible, perform a worksite visit to provide an older injured worker appropriate medical treatment, a physical for a new hire or evaluation of a return to work/fitness for duty.

Knowledge of chronic diseases (Harrison’s Principles of Internal Medicine, 18th Edition and/or Up to Date website (www.uptodate.com) and normal recovery times from Reed Group Disability Guidelines (www.mdguidelines.com) are useful. Good communication with employers, insurance companies and patients is always important to explain how older workers are different, such as their slower recovery times.

Older Workers form a unique and growing population of an Occupational Medicine practice. The astute Occupational Medicine provider should be ready to appropriately evaluate and effectively treat the older worker and keep them working as long as they can.

Dr. Joseph Charlot is Medical Director at Saint Francis Center for Occupational Health in Torrington, CT.

References:
2. US Census Bureau
4. Adapted from the 2003 Society for Human Resource Management/National Older Worker Career Center Older workers survey
Laurent Benedetti, MD, MPH (OEMR 2015), is from southern France. He attended the University of Massachusetts, Amherst. He wrote his honors thesis on whether Yersinia Pestis could have caused the Black Death in 14th century London and if epidemiologic vectors were in place to sustain the pandemic. Before attending medical school at the University of Massachusetts in Worcester, Laurent volunteered in rural health clinics in Nepal, worked for the National Health Service in England and for the Ministry of Agriculture in France. Laurent completed his residency at the University of Massachusetts, Worcester, in Preventive Medicine and obtained his MPH from the University of Massachusetts, Amherst. During his preventive medicine training, he worked with clinic and hospital task forces to develop innovative practice models to improve patient care delivery. His interest in international health policy prompted his work with the WHO in Geneva, where he helped to publish the QualityRights Tool Kit, a method for countries to improve the quality of their mental health and social care facilities. Current projects include innovations in management of water resources, patient and employee process mapping and safety improvement, health care infrastructure requirements and organizational design in resource-limited settings. Laurent is Board Certified in General Preventive Medicine.

Mason Harrell, III, MD, FS (HSPH MPH 2014, OEMR 2015), hails from Southern California and is a graduate of the U.S. military medical school, USUHS, in Bethesda, Maryland. Prior to medical school matriculation, Mason majored in Spanish at Brigham Young University in Provo, Utah and studied at the University of Alicante, Spain. While at USUHS, Mason investigated Dengue Fever in Iquitos, Peru, and worked for two months in Mexico City at the Federal Hospital. After completing a Transitional Internship at Naval Hospital San Diego, Mason completed the military Humanitarian Medicine course and traveled with a team of physicians to Kampala, Ghana to distribute medical supplies and provide medical aid. Mason was winged a Naval Flight Surgeon in 2010 and served at Naval Air Station Sigonella, Italy as the Base Flight Surgeon and Department Head of Aerospace Medicine. While at Sigonella, he served as NATO medical liaison during the Libya conflict of 2011, and deployed to Uganda with the Marines. So-Cal Mason and his Mediterranean wife are learning to appreciate the Boston winters.

Soni Mathew MD, MBA (OEMR 2015) is a Board Certified Family Medicine Physician, who grew up in the Bronx, New York. He graduated from medical school in South India, and completed his residency training in Family Medicine at Bronx Lebanon Hospital in New York, NY, where he became a third year chief resident. After graduation, Soni served as the Medical Director of the Employee Health Service at Bronx Lebanon Hospital for seven years. This strong practical experience in occupational medicine prepared him to apply to the Complementary Pathway at HSPH. Soni is now HSPH's second trainee to have undertaken this special pathway approved by the American Board of Preventive Medicine. He is completing this program on a full-time basis and will graduate in June 2015. He will then be Board-eligible in Occupational Medicine. Prior to coming to HSPH, Soni achieved a Master's in Business Administration from the University of Tennessee. Soni's hobbies include performance cars and "do it yourself" projects. Soni's motto in life is “work smarter, not harder.”

Erin Teeple, MD (HSPH MPH 2014, OEMR 2016) was featured in our Fall 2013 issue. Erin’s interest in Occupational Medicine developed from her desire to more effectively evaluate and treat musculoskeletal injuries and osteoarthritis, a topic she began to consider during her Orthopedic Surgery Residency and Sports Medicine Research Fellowship at Brown/Rhode Island Hospital. Erin is completing her OEM training over three years through a joint appointment in the OEMR and on the NIAMS T32 Grant held by Drs. Jeffrey N. Katz and Elena Losina in the Orthopedic and Arthritis Center for Outcomes Research (OrACORe) at Brigham and Women’s Hospital. This program will allow Erin to fully pursue her research interests. Erin has published in the areas of cartilage mechanics and osteoarthritis pathophysiology, and she is particularly interested in maximizing functional outcomes in osteoarthritis treatment. Erin graduated with honors from Brown University and received her MD from Brown Medical School. She now lives in Westborough, MA with her husband, a professor of Classics at the College of the Holy Cross in Worcester, and their two children.
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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.