OSEH Occupational Safety & Environmental Health

UPDATE

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H1N1 Symptoms, Treatment, Transmission

The Office of Emergency Preparedness (OEP) would like to reinforce some key information related to H1N1 symptoms, treatment, and transmission.

The U.S. Centers for Disease Control and Prevention defines flu-like illness as : A fever of 100.4 F (38.0 C) or greater, plus a cough or sore throat and possibly other symptoms such as runny nose, body aches, headaches, chills, fatigue, vomiting or diarrhea.

It is important to note that most of those who become ill are getting mild to moderate cases of the flu and recover fully in about a week, without any medical intervention.

The CDC recommends the following approach to treating the flu on university campuses:

- Isolation until 24 hours after the ill person is free of fever (100 degrees F) without using fever-reducing medications. In most cases this will require an isolation period of three to five days. This new recommendation is a reduction from the previous seven-day isolation period. Isolation helps the ill person recover faster and helps to prevent the spread of the flu.

- Treatment of ill individuals with the prescription drug Tamiflu is recommended only if there is an underlying health condition (severe asthma, diabetes, HIV disease, immune deficiency) or the individual is considered high risk (pregnant, over age 65). University Health Service physicians will not prescribe Tamiflu for students who do not meet the CDC guidelines.

Keeping hands clean is one of the most important steps we can take to avoid getting sick and spreading germs to others. It is best to wash your hands with soap and warm water for 20 seconds. In addition, individuals may want to use an appropriate alcohol or non-alcohol based hand sanitizer when soap and water are not available. Alcohol based hand sanitizers should contain at least 60% alcohol and non-alcohol based sanitizer should contain .13% benzalkonium chloride.

More specific details on hand hygiene can be found on the CDC website at this link http://www.cdc.gov/handhygiene/ .

Finally, help reduce the spread of germs by covering your cough. Influenza viruses are primarily spread from person to person by inhaling droplets from the cough of ill people. This spread can be limited by staying at least 6 feet away from the coughing person, and by encouraging the person to cover his or her mouth and nose when coughing, thereby limiting droplet spread.

Safety Coordinator Conference

Mark your calendars!!!

July 13th, 2010

Safe Handling of Pyrophoric Chemicals

Earlier this year a young woman at UCLA tragically lost her life while performing a procedure requiring the use of tert-butyllithium (t-buli). This chemical is pyrophoric and can ignite spontaneously when it comes in contact with air.

Many pyrophoric chemicals are also water-reactive, reacting vigorously with water or high-humidity, often igniting upon contact. Some of the details of how the incident occurred are not known. However, it is a known fact that she was not wearing a lab coat, which may have saved her life.

When working with a pyrophoric chemical like t-buli, it is essential that a standard operating procedure (SOP) be developed by the laboratory. All persons working with the chemical must be familiar with the proper procedures for handling and use.

Even those people not working with the chemical, but working in the lab, should understand the hazards involved when someone is handling a pyrophoric chemical. This serves two purposes: they will be aware of proper handling procedures and can correct a lab mate that may not be following them, and they will know what to do should an accident occur.

At no time should anyone ever work alone in a lab when handling pyrophoric chemicals. Direct supervision is critical during all transfers of pyrophoric chemicals until the experienced scientist deems the employee can perform the procedure safely and is competent to work with the chemical.

A well-written SOP will contain information on how to perform a procedure to obtain a good research result, as well as how to do that procedure safely. The necessary personal protective equipment must be specified. When working with any chemical, it's not enough to state "gloves, glasses and lab coat" are required – especially when working with a pyrophoric chemical. The appropriate glove and lab coat materials for working with pyrophoric chemicals are critical.
The proper personal protective equipment (PPE) for working with pyrophoric chemicals includes a lab coat, safety glasses with side shields or goggles, and gloves.

While a Nomex lab coat is most desirable, a 100% cotton lab coat can be satisfactory. Polyester (or mixed-fiber) lab coats are much less desirable, due to their synthetic nature. Nomex gloves, while fire-resistant – are impractical due to their bulk, and may actually increase the hazard of accidental spillage of the chemical. Nomex flight gloves provide more dexterity and would offer good protection for the hands. It should go without saying that pants and shoes – no shorts or sandals – are always to be worn when working in the lab regardless of the chemicals being handled. Clothing made of flammable synthetic materials (such as nylon, polyester, spandex, etc.) are not to be worn when handling pyrophoric chemicals; some experts (e.g. Dr. Neal Langerman) believe this should extend to undergarments as well.

Training in the proper handling of pyrophoric chemicals, necessary PPE and emergency procedures must be provided by the Principle Investigator or other high-level competent scientist. All training must be documented in the chemical hygiene plan.

There are many good resources to assist in the development of a SOP for safe handling and use of pyrophoric chemicals. One such resource is a technical bulletin by Sigma-Aldrich, AL-134, Handling and Storage of Air Sensitive Reagents.

For questions and guidance in preparing a SOP, contact your OSEH representative at 647-1143.

Laboratory Safety Training "No Shows"

OSEH provides a mandatory "baseline" safety training for all new research staff three times each month. It is extremely important that research staff and Primary Investigators new to the University of Michigan attend this important orientation and receive the informational tools it provides.

An emerging trend has been noted by OSEH in the attendance of new research staff. The number of registered participants who do not show up for training, "no-shows", has been increasing.

Without this important training, researchers may be uninformed or misinformed about particulars such as:

- The expectations for safety performance in U-M research laboratories.
- Proper procedures for accumulating and disposing of hazardous waste.
- The "do's and don'ts" of handling human body substances and what to do if you're exposed.
- When respiratory protection is necessary and how to acquire a fitted respirator.
- Procedural plans and safety manual availability.
- Safety procedures for chemical spill emergencies or fire.
- Proper use of engineering controls such as fume hoods and biological safety cabinets.

This safety orientation gives new researchers clear, concise, and up-to-date information on these and dozens of other topics that are critical to their smooth and successful transition into the U-M research environment.

Primary Investigators should have training certificates for everyone working in their laboratory on file for OSEH to review during laboratory inspections.

OSEH tracks no-shows and randomly notifies supervisors and departmental administrators when a scheduled attendee does not show-up for the training.
Primary Investigators and research department administrators are encouraged to communicate to new recruits the mandatory nature of this training, and arrange for them to receive this instruction as early as possible in their career at U-M -- don't be a "no-show".

Principles of Green Chemistry: Enhance Energy Efficiency

Green chemistry is one of the hottest topics in the education community today for various reasons including environmental sustainability, protection of public health and cost savings. OSEH has been actively collaborating with a number of interested teaching and research groups on campus to apply principles of green chemistry to reduce the impact on our environmental footprint. Green methods are sweeping across educational institutions like never before.

We discussed the twelve principles of Green Chemistry in a previous OSEH Update. One of these principles is to increase energy efficiency when designing experiments for teaching or research. Application of microwaves in organic reactions can be efficiently used when compared with conventional reflux heating. In the latter procedure, more heat energy is necessary while water is consumed for reflux condensers. Furthermore, increased reaction times are required for conventional methods. Teaching undergraduate microwave chemistry has never been easier. With a low cost bench top microwave system and established methods, you are ready to teach. Reactions can be carried out from multiple stations using a single microwave system, ideal for a teaching laboratory.

From the data below it is clear that the microwave technique can be applied in organic reactions to save energy, time and other resources such as water to reduce our environmental impact.

If you are interested in introducing Green Chemistry principles in your laboratory, please contact Dr. Sudhakar Reddy at 763-4568 or via email at redv@umich.edu.

The following table shows advantages of microwave technology over conventional reflux heating for a few reactions typically taught at the undergraduate level:

Experiment Type	Reflux Conditions	Microwave Conditions
Diels-Alder	90 minutes in DMF	10 minutes in Water
Williamson Ether Synthesis	60 minutes in Water	10 minutes in Water
Aldol Condensation	23 hrs in Water	15 minutes in Water
Bromination	45 minutes in HOAc	8 minutes in HOAc
Hydrolysis	34 hrs in MEOH/Water	15 minutes in MeOH/Water

Thoughts from the Director

By Terry Alexander

If you just returned to campus this month you probably noticed a lot of activity centered around preparing for the H1N1 flu onslaught. If you were here over the summer, you were likely part of that process which consumed a tremendous amount of time from people all across campus. A big "Thank you" to everyone who helped out! We are all in the same boat on this one and it takes a team effort to make sure we get through it smoothly and without sinking. We seem to be holding our own and the cases of flu have been pretty mild so far. I encourage everyone to get their flu shots, both seasonal and H1N1, as they become available.

Enough about the flu. Everything else is moving forward in a pretty typical start of school. We have the new students and staffing learning the system, the scramble to make sure everyone gets the right safety training, construction continues as what appears to be normal for us -- everywhere we turn, and the football team is off to a great start. Let's make sure we all have a great semester; live, work, and learn safely. Fall is upon us so get out and enjoy.

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