Risk Assessment in the Research Laboratory

A laboratory risk assessment is nothing more than a careful examination of what, in your research laboratory operation, could cause harm to people in the immediate area, in the entire facility, or the external environment so that you can weigh whether you have taken enough precautions to prevent harm. Two important things that need to be decided are whether a hazard is significant, and whether satisfactory precautions have been taken so that the risk of injury, damage or loss is small.

Definitions:

Hazard – something that is dangerous and can cause harm; hazards are categorized into three groups: physical, chemical and biological

Risk - the chance of injury, damage, or loss

Chance - the probability of something happening

Certain prerequisites required before attempting to perform a risk assessment include:

- Knowledge of biological, chemical, and/or physical hazards to be encountered
- Understanding of the principles of biological, chemical, and physical safety
- Knowledge of the modes of transmission for the various infectious agents encountered in the laboratory
- Understanding of aerosol production and mitigation
- Knowledge of safety features of your facility
- Knowledge of the type of medical surveillance needed for each employee's job
- Knowledge of institutional requirements under which the laboratory operates (this includes local, state and federal regulations)

Five steps to risk assessment:

- Look for the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done
- Record your findings
- Periodically review your assessment and revise it is necessary

Some factors that influence risk:

- Mode of transmission
- Procedures that produce aerosols
- Nature of the room ventilation
- Availability of containment equipment and/or personal protective equipment
- Severity of the consequences of exposure
- Concentration of the pathogen or chemical
- Volume of the pathogen or chemical
- Availability of medical intervention strategies

Defining risks by understanding them allows laboratorians to make better decisions to reduce them. When we don't have enough facts or are unprepared to face situations involving risk, fear may cause people to overreact, to blow the risk out of proportion. Scientists use knowledge, education, and experience to best estimate the actual risk and plan ways to control or minimize those risks.

For more information on risk assessment, go to:

5 Steps to Risk Assessment at http://www.hse.gov.uk/pubns/indg163.pdf
BMBL Section 5 at http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm
Laboratory Risk Assessment What, Why, and How at http://www.phppo.cdc.gov/nltn/pdf/lrawwh.pdf
BioRAP Risk Assessment at http://www.biorap.org/risk_student.html