

Mayo Clinic's Approach to an Integrated Safety Program

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Introduction

Mayo Clinic in Rochester, Minnesota, combined with Saint Mary's Hospital and Rochester Methodist Hospital, creates the largest integrated medical center in the world, providing comprehensive diagnosis and treatment in virtually every medical and surgical specialty. More than 350,000 patients with diverse background and medical issues seek answers at Mayo Clinic each year.

Mayo Clinic in Rochester employs over 30,000 employees while occupying over 15 million square feet of hospital, laboratory, and office space. Approximately 80 percent of the patients who come to Mayo Clinic seek outpatient services, with the remainder 20 percent inpatients.

The mission of Mayo Clinic is to inspire hope and contribute to health and well-being by providing the best care to every patient through integrated clinical practice, education and research. Mayo Clinic's primary value is the "needs of the patient come first." To achieve success with Mayo Clinic's mission, employee safety and health must be of upmost importance and fully integrated in all of Mayo Clinic's functions and operations. The following reviews Mayo Clinic's Health and Safety program management structure and how it has achieved success in developing an effective Safe Patient Handling Program, Safety Training Systems, and Hazardous Chemical Information Management System.

Structure of Mayo Clinic's Health and Safety Program

Mayo Clinic's Health and Safety program achieves management commitment and employee involvement within a committee structure, similar to its Operational and Quality functions. Responsible for monitoring all aspects of environmental health and safety programs, issues and concerns is the Environmental Health, Safety, and Security Subcommittee (EHSSS). EHSSS is chaired and vice-chaired by three medical physicians; including a radiologist and medical school professor, the medical director of environmental, health & safety, and the medical director of occupational medicine.

Reporting to the EHSSS are the following committees:

- Physical Environment Committee: Oversees and maintains the Environment of Care, Emergency Management and Life Safety Codes Management Plans as required by the Joint Commission on Accreditation of Healthcare Organizations.

- Bloodborne Pathogen Exposure Reduction Committee: Provides assistance for acquiring, evaluating, recording, tracking, and promoting safe products and practices to reduce the bloodborne pathogen risk to Mayo Clinic patients, employees and staff.
- Hazardous Chemical Management Committee: Facilitates the development and provides ongoing oversight of policies, procedures, standards and guidelines to address cradle-to-grave management of hazardous chemicals at Mayo Clinic.
- Radiation Safety Committee: Assures proper use of radiation conducted in the patient practice for protection of patients and visitors, research subjects and employees.
- Emergency Management Committee: Oversees emergency mitigation, preparedness, response and recovery plans developed and tested to address foreseeable emergency situations from natural, technological or human events.
- Safe Patient Handling Committee: Establishes a safe patient handling program to reduce injuries to nurses and other direct patient-care workers by minimizing manual lifting of patients through the utilization of permanently installed overhead ceiling lifts and portable safe patient handling equipment.
- Department/Area Safety Committees: Tasked with activities related to safety training, accreditation, compliance incident risk reduction, and maintenance of a safe environment of care. Twenty-one Department/Area Safety Committees represent areas such as Supply Chain Management, Research and Clinical Laboratories, Pharmacy, Nursing, Environmental Services, Respiratory Care, and Facility and Utility Operations. Each Department/Area Safety Committee defines its charter, membership, and meeting schedule. Each committee is represented by management and employees along with a safety coordinator from the Occupational Safety organization. Employees may volunteer to serve on the committee or be elected by their peers. Membership on committees is in accordance with the Minnesota OSHA's AWAIR act.

Supporting Mayo Clinic's Department/Area Safety committees and operations are three professional safety teams: Occupational Safety, Radiation Safety, and Emergency Management.

Occupational Safety is managed by a safety manager (CSP) with four safety coordinators (CSP), two industrial hygienists (CIH, PhD), two ergonomists (CPE, PhD), two safety associates (OHST) and two safety technicians.

Radiation Safety is managed by a radiation manager (CHP), two health physicists (CMHP, CHP), two health physics associates (RPT), and three safety technicians.

Emergency Management is managed by an emergency manager (CEM), a safety coordinator (CSP) and three emergency management associates (CPP, CEM).

Safe Patient Handling

In 2007, the Minnesota legislature passed the Safe Patient Handling Act.

“By July 1, 2009, every clinical setting that moves patients in the state shall develop a written safe patient handling plan to achieve by January 1, 2011, the goal of ensuring the safe handling of patients by minimizing manual lifting of patients by direct patient care workers and by utilizing safe patient handling equipment.”

Requirements include:

- Written safe patient handling program, which includes:
 - Purpose and Policy Statement
 - Procedures to include
 - Risk Assessment
 - Acquisition of safe patient handling equipment
 - Training
 - Facility Renovation/Change-analysis
 - Program evaluation
- Safe Patient Handling Committee

Success in Mayo Clinic’s Safe Patient Handling Program required the commitment and involvement of all affected groups: occupational safety, ergonomics, clinical areas (inpatient and outpatient services), general services, linen and central services, facility maintenance and operations. These groups came together and developed the Safe Patient Handling Committee and oversaw the implementation and maintenance of the Safe Patient Handling Program. The committee maintains the criteria for the purchase, use and maintenance of safe patient handling aids and equipment. It also establishes, monitors, and recommends, as appropriate institutional, policies and practices for safe patient handling, including space planning. The Safe Patient Handling Committee established two subcommittees to effectively implement equipment management and employee education and training.

One of the challenges to an effective Safe Patient Handling Program is providing patient handling equipment that is readily accessible. While permanent ceiling lifts are the preferred equipment, and being installed during remodels or new construction; on an interim basis, portable patient lifting devices were obtained. Since space is always a premium in the hospital setting, storing portable patient handling equipment while allowing it to be readily accessible is a significant challenge. Equipment storage is being addressed by a centrally managed equipment process and multiple storage strategies including unit/building storage, request process from a central pool, and satellite storage.



Permanent ceiling lifts is the long term patient handling equipment solution, but has to be implemented in a manner that made logistical and economical sense. Occupational Safety conducted risk analyses of the patient handling operations to determine high risk areas where ceiling lift installation should receive priority installation. Also, Mayo Clinic’s Facility Project Services were engaged to implement patient handling overhead lifts in new and remodel clinical projects.


Currently 8 patient care units (196 beds) and their respective corridors have installed overhead lift systems. Additionally 4 patient units (119 beds) are being installed in 2011. Mayo Clinic's Facility Maintenance Operations have also been engaged to provide load testing and regular maintenance of all patient lift devices. Each ceiling lift and lifting attachments have been bar-coded for maintenance tracking purposes.

For both ceiling and portable patient lift systems, the healthcare providers required training and education to effectively and safely operate the lifting equipment. Education programs were developed by Mayo Clinic's Occupational Safety department and train-the-trainer programs were rolled out to area education coordinators and department supervisors. In turn, the education coordinators and supervisors provided training to their employees. A website was also established to provide ongoing resources, tips and alerts for safe patient handling.

Sling Inspection

Slings must be inspected before each use to ensure the patient remains safe throughout the lift.

 Acceptable	 Unacceptable
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Figure 1: Safe Patient Tips.

To track the effectiveness of patient handling equipment, any incidents, near misses or injuries resulting from the use of patient lifts are reviewed by the department supervisor and the safety coordinator. Root cause analyses are performed and recommendations made to prevent a recurrence of an event. All patient handling incidents are summarized and categorized by Occupational Safety and reviewed by the Safe Patient Handling Committee. On average, staff injuries related to patient handling have declined 60% on units with overhead ceiling lifts.

Managing Education - Safety Training Systems

At the foundation of safe employee behavior is an effective training and education program. Whether it's the proper donning of slings for patient lifts, applying a guard over a needle, or operating a forklift, employees must receive education before the task is performed and at required frequencies to maintain proficiency. Although education modules, classroom and online, had already been developed and made available to Mayo Clinic's 30,000 employees, supervisors were always challenged with assigning their employees the required training and tracking their completion. Since education programs have varied frequency requirements (one time, annual, every three years), this further complicated the supervisor's task. In 2010, Mayo Clinic met this challenge by engaging its Information Technology group to develop an in-house Safety Training System (STS). The Occupational Safety, Infection Prevention and Control, Emergency Management and Radiation Safety organizations developed over 50 education modules, decided on required attendance frequencies, and assigned module owners.

TRAINING COURSES LIST				
Training Course Name	Target Audience	Frequency	Pathlore Classes	Content Manager
Information Technology (IT) Outage Procedures	Patient care staff who use the MICS elec ...	One time only	Information Technology (IT) Outage Proce ...	
Isolation - Inpatient and Infectious Agents	Employees who enter isolation rooms. Th ...	Every 12 months	Isolation Inpatient- Online Module	
Isolation - Outpatient and Infectious Agents	Employees who care for or come in contac ...	Every 12 months	Isolation- Outpatient Areas - Online Mod ...	
Lockout - Tagout	Employees engaged in maintaining, servic ...	Every 12 months	Lockout Tagout - Online Module, Lockout ...	
Manual Instrument Cleaning	Staff responsible for removing soil and ...	Every 12 months	Manual Instrument Cleaning - Online Modu ...	
Medical Laser Safety	Employees that 1) operate laser emitting ...	Every 12 months	Medical Laser Safety - Online Module	
Order Picker	Employees that operate an order picker.	Every 36 months	Order Picker - Online Module, Order Pick ...	
Pallet Jack	Employees that operate a pallet jack.	Every 36 months	Pallet Jack - Online Module, Pallet Jack ...	
Point of Use Training	Staff at the point of use who handle reu ...	Every 12 months	Point of Use Training- Online Module, Po ...	
Portable Lift	Patient care staff who use portable lift ...	Every 36 months	Portable Lift Equipment	

Figure 2: Partial Training Courses List.

From the list of online courses, supervisors can then choose the training their department employees are required to take based on the job hazards. From the subset of selected courses, the supervisor then assigns the training to their employees.

EMPLOYEE TRAINING ASSIGNMENTS						
Employee Name	Job Title	Training Courses				
		Hazardous Substances - Laboratories	Core Infectious Agents	Emergency Preparedness Plan	Fire and Evacuation Exercises	
Name	Hist Technologist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Name	Pathology Dev Technician	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Name	Histology Technician	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Name	Lab Asst-DLMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Name	Histology Technician	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Figure 3: Example of Training Assignments.

After the training courses are assigned, the employees receive an email notification of the required training and a 'link' to the training course. Once the education is completed, STS updates the employee's training records. If the training is not completed, online reminders and notifications will be automatically generated to the employee and their supervisor. With STS's Compliance Reports, the supervisor can quickly see a visual snapshot of their employee's records and his/her department's compliance status.

MY COMPLIANCE REPORTS - ALL EMPLOYEES						
Reporting Unit: 55003 - Histology Laboratory Ap-DLMP						
Enter Reporting Unit ID: <input type="text" value="55003"/> <input type="button" value="Go"/>						
● Compliant ● Expiring Soon ● Not Compliant U Unassigned						
Employee Name	Job Title	Training Courses				
		Hazardous Substances - Laboratories	Core Infectious Agents	Emergency Preparedness Plan	Fire and Evacuation Exercises	
Name	Hist Technologist	●	●	●	●	
Name	Pathology Dev Technician	●	●	●	●	
Name	Histology Technician	●	●	●	●	
Name	Lab Asst-DLMP	●	●	●	●	
Name	Histology Technician	●	●	●	●	

Figure 4: Compliance Report.

Hazardous Materials Management Information System

Another safety initiative integrated into Mayo Clinic’s “safety culture” is the Hazardous Materials Management Information System (HMMIS). OSHA’s Hazard Communication Standard (29CFR 1910.1200; MN Chapter 5206) has required maintenance of Material Safety Data Sheets for over 25 years. However, obtaining, maintaining, and distributing chemical information has been increasingly challenging for Mayo Clinic as its population, physical size, and laboratory use has increased. Rather than just provide a repository for Mayo Clinic’s 75,000 MSDS’s, a decision was made to integrate an informational technology solution that would provide not only MSDS’s to employees; but also quick snapshots of the chemical hazards, access to standard operating procedures (SOPs) of identified hazards and an easy to use inventory system to track quantities of chemicals categorized by the risk the chemical represents. Currently Mayo Clinic has over 540 supervisors of departments that handle hazardous chemicals with 1150 chemical inventory locations. HMMIS provides supervisors the tool to maintain an accurate inventory of chemicals in their department along with providing safety information of each of their chemicals to the users. For example, a Mayo Clinic Histology Laboratory has 225 different chemicals stored in 8 different inventory locations. An employee working in Histology Lab’s H & E – Special Stains is working with Acetic Acid and needs to determine its hazards for secondary container labeling. The employee accesses H & E – Special Stains inventory location (Figure 5), searches for Acetic Acid (Figure 6) and accesses the Product Information page (Figure 7).

Reporting Unit: 55003 - Histology Laboratory Ap-DLMP ([change](#))

My Inventory Rooms

8 room(s) were found. ([add new location](#))

Name	Location
Flammable Storage Gu11 #1	RO GU 11 93A
Flammable Storage Gu11 #2	RO GU 11 93B
Flammable storage room	RO HI 10 42
Gross Processing Embedding	RO HI 10 36
H & E - Special Stains	RO HI 10 22
Histology Lab	RO HI 10 32
Slide Sorting	RO HI 10 26
Tissue Processors	RO HI 10 32A

Figure 5: Histology Inventory Locations.

Reporting Unit: 55003 - Histology Laboratory Ap-DLMP ([change](#))

My Products

Name, Catalog# or CAS#: Vendor Name:

Risk: Target Organ:

Inventory:

Showing 1 - 25 of 121 products found. ([add new product](#))

ID	Name	Vendor	Inventory	Qty	Units	MSDS
16	Acetic Acid Glacial 100%	EMD Chemicals Inc.	H & E - Special Stains	2.5	L	
72	Acetone	Stockrooms (MIC) Mayo Rochester	H & E - Special Stains	2.0	gal	
53601	ACETONE	Acros Organics/Fisher Scientific	H & E - Special Stains	250.0	ml	
3075	Acid Fuchsin Powder	Sigma Chemical Company	H & E - Special Stains	100.0	gm	
23880	Acridine Orange hemi(zinc chloride) salt (A6014)	Sigma Chemical Company	H & E - Special Stains	20.0	gm	

Figure 6: H & E - Special Stains Inventory.

Product Information (#16)

Name: **Acetic Acid Glacial 100%** Physical State: Liquid
 Vendor: EMD Chemicals Inc. Manufacturer:
 Revision Date: 03/03/2009 MSDS:
 Notes: RC* 08/18/2004 SAR 03/03/2004 UPDATE (AX0073) EMD CHEMICALS (LAWSON)

Product Review Info

Last reviewed By: Reiter, Shirley Last reviewed on: 08/13/2010

Inventory Information

Inventory: H & E - Special Stains Quantity: 2.5 L

Risks

Combustible Corrosive

Target Organs

Eyes Respiratory Tract Skin Teeth

NFPA Ratings

Fire: Ignites between 100 and 200 F

Health: Can cause serious injury

Reactivity: Normally stable

Specific

Figure 7: Acetic Acid Product Information.

HMMIS also provides Mayo Clinic's Facilities Project Services a tool for determining compliance to 'maximum allowable quantity per control area of hazardous materials posing a physical hazard' of the International Building Codes (IBC). Since each chemical in HMMIS has assigned physical risks (e.g. combustible, flammable, corrosive) and inventories are maintained within assigned control areas, quantities of chemicals of each physical risk can be summarized by control area, floor, or building. HMMIS also maintains a table of maximum quantity levels based on IFC requirements. Compliance reports can be generated to determine percent and quantities over/under the maximum allowed quantities.

Summary

Mayo Clinic's "Culture of Safety" incorporates activity intended to benefit both our patients and our employees. Our promise to patients and employees: "In order to be trusted, we must be safe." To achieve our safety goals, Mayo Clinic continues to work towards embedding safety behaviors in all work areas and in all work practices.