



**Stony Brook University Hospital**  
 Environmental Health & Safety  
 Policy & Procedure Manual



Title: **Hand Tools and Portable Power Tools**

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**PURPOSE:** To ensure that all hand and portable power tools are used properly, safely and in accordance with all manufacturer's guidelines.

**SCOPE:** Hospital wide.

**DEFINITIONS:**

**Hand Tools:** tools that are manually operated and powered by human force such as screw drivers, pliers, wrenches, and cutting shears, etc.

**Pneumatic Tools:** tools that are powered by air, such as air wrenches, air grinders, spray guns, and air fasteners.

**Power Tools:** tools that are manually operated and powered by electricity, air, gasoline, diesel, or explosives.

**PROCEDURES:**

**I. Responsibilities**

A. **Environmental Health and Safety (EH&S)** is responsible to:

1. Assist supervisors in identifying hazardous conditions in regards to hand/power tools;
2. Provide safety awareness training, as needed; and
3. Review this policy to ensure compliance with current regulations.

B. **Facilities and other Departmental Supervisors** affected by this policy are responsible to:

1. Anticipate work hazards and ensure that safeguards are utilized;
2. Replace damaged tools and/or taking tools out of service;
3. Ensure that tools are being properly maintained by instituting an inspection program; and

4. Ensure employees are trained to use tools properly and in accordance with the manufacturer's instructions.

**C. Facilities and other Departmental Employees** affected by this policy are responsible to:

1. Anticipate work hazards and ensure that safeguards are utilized;
2. Conduct routine inspections to ensure that tools are properly maintained;
3. Report to their supervisor any tool that needs to be replaced;
4. Follow all safety guidelines for the use of hand/power tools and according to manufacturer's instructions; and
5. Participate in any training provided.

## **II. General Safety Precautions**

- A. Employees who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the appropriate equipment needed, including Personal Protective Equipment, to protect them from the hazard. Refer to EH&S Personal Protective Equipment Policy, Policy 7-2.
- B. All hazards involved in the use of power tools can be prevented by following some basic safety rules:
1. Keep all tools in good condition with regular maintenance;
  2. Use the right tool for the job;
  3. Examine each tool for damage before use;
  4. Operate according to the manufacturer's instructions;
  5. Utilize the proper protective equipment; and
  6. Participate in safety training.
- C. Employees and employers have a responsibility to work together to establish safe working procedures. If a hazardous situation is encountered, it shall be brought to the attention of EH&S for evaluation and corrective action. Additionally, only hospital employees shall use hospital hand/portable power tools.

### III. Hand Tools

- A. Hand tools are non-powered and include tools from axes to wrenches. Common hazards posed by hand tools result from misuse and improper maintenance. Examples include the following:
1. Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other employees;
  2. If a wooden handle on a tool such as a hammer or an axe is loose, splintered, or cracked, the head of the tool may fly off and strike the user or another worker;
  3. A wrench shall not be used if its jaws are sprung, because it might slip;
  4. Impact tools such as chisels and wedges are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying;
  5. Employers shall caution employees that saw blades, knives or other tools be directed away from aisle areas and other employees working in close proximity. Knives and scissors shall be sharp. Dull tools can be more hazardous than sharp ones;
  6. Appropriate personal protective equipment (e.g., safety goggles, gloves) shall be worn due to hazards that may be encountered while using portable power tools and hand tools;
  7. Safety requires that floors be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools; and
  8. Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum or wood shall be used.

### IV. Power Tools

- A. Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic and power-actuated.
- B. The following general precautions shall be observed by power tool users:
1. Never carry a tool by the cord or hose;
  2. Never remove prongs from extension cords;
  3. Never stand in or near water when using tools;
  4. Never “yank” the cord or the hose to disconnect it from the receptacle;
  5. Keep cords and hoses away from heat, oil and sharp edges;
  6. Replace all frayed and/or damaged extension cords. Do not try to tape cords;

7. Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits and cutters;
8. All observers shall be kept at a safe distance away from the work area;
9. Secure work with clamps or a vise, freeing both hands to operate the tool;
10. Avoid accidental starting. The worker shall not hold a finger on the switch button while carrying a plugged-in tool;
11. Tools shall be maintained with care. They shall be kept sharp and clean for the best performance. Follow instructions in the user's manual for maintenance, lubricating and changing accessories;
12. Maintain good footing and balance;
13. The proper apparel shall be worn. Loose fitting clothes, ties or jewelry such as bracelets, watches or rings, which can become caught in moving parts shall not be worn; and
14. All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use".

## **V. Guards**

- A. Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment shall be guarded if such parts are exposed to contact by employees.
- B. Guards, as necessary, shall be provided to protect the operator and others from point of operation, nip points, rotating parts, flying chips and sparks.
- C. Safety guards shall never be removed when a tool is being used. For example, portable circular saws shall be equipped with guards. An upper guard shall cover the entire blade of the saw. A retractable lower guard shall cover the teeth of the saw, except when it makes contact with the work material. The lower guard shall automatically return to the covering position when the tool is withdrawn from the work.

## **VI. Safety Switches**

- A. The following hand-held power tools shall be equipped with a momentary contact "on-off" control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than two inches in diameter, disc and belt sanders, reciprocating saws, saber saws and other similar tools. These tools also may be equipped with a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
- B. The following hand-held powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs two inches or less in diameter;

grinders with wheels two inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks quarter inch wide or less.

- C. Other hand-held powered tools such as circular saws having a blade diameter greater than two inches, chain saws and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

## **VII. Electric Tools**

- A. Employees using electric tools shall be aware of several dangers: electrocution, burns and slight shocks.
- B. To protect the user from shock, tools shall either have a three-wire cord with ground and be grounded, be double insulated or be powered by a low-voltage isolation transformer. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire shall be attached to a known ground. The third prong shall never be removed from the plug.
- C. Tools shall be shut down before cleaning, repairing or oiling. Disconnect or use Lockout/Tagout Procedures. Refer to EH&S' Control of Hazardous Energy - Lockout/Tagout Program, Policy 3-2.
- D. These general practices shall be followed when using electric tools:
  - 1. Electric tools shall be operated within their design limitations;
  - 2. Gloves and safety footwear are recommended during use of electric tools;
  - 3. When not in use, tools shall be stored in a dry place;
  - 4. Electric tools shall not be used in damp or wet locations; and
  - 5. Work areas shall be well lit, even if this means the operators need to augment the work surface illumination by other appropriate means.

## **VIII. Powered Abrasive Wheel Tools**

- A. Powered abrasive grinding, cutting, polishing and wire buffing wheels create special safety problems because they may throw off flying fragments.
- B. Before an abrasive wheel is mounted, it shall be inspected closely and sound- or ring-tested to ensure that it is free from cracks or defects. To test, wheels shall be tapped gently with a light non-metallic instrument. If the wheel sounds cracked or dead, they could fly apart in operation and shall not be used. A sound and undamaged wheel will give a clear metallic tone or "ring." To prevent the wheel from cracking, the user shall be sure it fits freely on the spindle. The spindle nut shall be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care shall be taken to ensure that the spindle wheel does not exceed the abrasive wheel specifications.
- C. Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee shall never stand directly in front of the wheel as it accelerates to full operating speed.

- D. Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.
- E. When using a power grinder:
  - 1. Always use eye protection;
  - 2. Turn off the power when not in use; and
  - 3. Never clamp a hand-held grinder in a vise.

## **IX. Pneumatic Tools**

- A. Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders.
- B. A hazard encountered in the use of pneumatic tools is getting hit by one of the tool's attachments or by some kind of fastener the worker is using with the tool. Eye protection is required and face protection is recommended for employees working with pneumatic tools.
- C. Noise is another hazard of pneumatic tools. Working with noisy tools (e.g. jackhammers) requires proper, effective use of hearing protection. Refer to EH&S' Hearing Conservation Program, Policy 1-8.
- D. When using pneumatic tools, employees shall ensure they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.
- E. A safety clip or retainer shall be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.
- F. Screens shall be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers or air drills.
- G. Compressed air guns shall never be pointed toward anyone. Users shall never "dead-end" it against themselves or anyone else.

## **X. Power-Actuated Tools**

- A. Power-actuated tools operate like a loaded gun and shall be treated with the same respect and precautions. The use of power-actuated tools is prohibited unless the user has received specialized training, usually by the tool manufacturer's representative.
- B. Safety precautions to remember include the following:
  - 1. These tools shall not be used in an explosive or flammable atmosphere;
  - 2. Before using the tool, the worker shall inspect it to determine that it is clean, all moving parts operate freely, and the barrel is free from obstructions;
  - 3. Employees shall not modify tools;
  - 4. The tool shall never be pointed at anybody;

5. The tool shall not be loaded unless it is to be used immediately. A loaded tool shall not be left unattended, especially where it could be available to unauthorized persons;
6. Hands shall be kept clear of the barrel end;
7. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position and another to pull the trigger;
8. The tools shall not be able to operate until they are pressed against the work surface with a force of at least five pounds greater than the total weight of the tool;
9. If a power-actuated tool misfires, the employee shall wait at least 30 seconds, then try firing it again;
10. If it still will not fire, the user shall wait another 30 seconds so that the faulty cartridge is less likely to explode then carefully remove the load. The bad cartridge shall be put in water;
11. Suitable eye and face protection are essential when using a power-actuated tool;
12. The muzzle end of the tool shall have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool shall be designed so that it will not fire unless it has this kind of safety device;
13. All power-actuated tools shall be designed for varying power charges so that the user can select a power level necessary to do the work without excessive force; and
14. If the tool develops a defect during use, it shall be tagged and taken out of service immediately until it is properly repaired.

## **XI. Hydraulic Power Tools**

- A. The fluid used in hydraulic power tools shall be an approved fire-resistant fluid and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.
- B. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters and other fittings shall not be exceeded.

## **XII. Off-site Facilities**

Contractors at off-site facilities should comply with this policy. For specific concerns at off-site facilities, staff shall notify the Off-site Facility Manager at 4-4380 or the Off-site EOC Coordinator at 4-4066 for assistance.

**INQUIRIES/REQUESTS:** Environmental Health and Safety  
L1-059 HSC  
Zip 8017  
Main Office: 444-6783  
FAX: 444-6845

**RELATED FORMS:**

**RELATED DOCUMENTS:** Personal Protective Equipment, Policy 7-1  
Control of Hazardous Energy - Lockout/Tagout, Policy 3-2  
Hand Tools and Portable Power Tools, Plant Operations M309