

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Safe Shops Program

Boston Public Health Commission

What is Personal Protective Equipment?

- Equipment that will protect you from health or safety risks at work
- It can include:
 - Safety helmets
 - Gloves
 - Safety glasses/goggles
 - Welding masks and gloves
 - Ear plugs
 - High-visibility clothing
 - Safety footwear
 - Respiratory protective equipment (RPE)

What Hazards Exist in an Auto Shop?

- Noise pollution
- Chemical liquids - oil, gasoline, antifreeze, etc.
- Solvents – cleaners, paints, thinners, etc.
- Heavy metals – lead, etc.
- Corrosives – acids and bases/caustics
- Asbestos
- Dust
- Temperature extremes
- Physical injury risks – sharp-edged metal, etc.
- Crushing injury risk – falling products, cars on lifts, etc.

Why is Personal Protective Equipment Important?

- Even when following the rules and regulations, and using safe work practices, hazards to your health and safety can still remain
 - Chemicals can enter your body and can lead to poor health.
 - You may be injured through your work
- How chemicals get into your body:
 - Inhalation/breathing
 - Skin and eyes
 - Injection/a cut
 - Ingestion/eating

Chemical Harms on Health

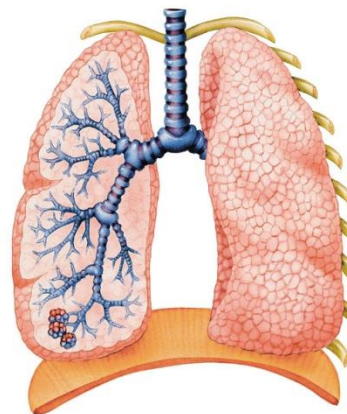
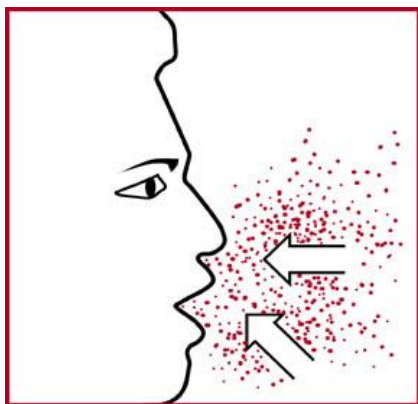
- Some chemicals can make you sick immediately or within days
- Others can build up and make you sick over months or years of exposure
- There is a dose-response relationship between chemical exposure and illness. The more chemicals you're exposed to, the more likely you are to get sick, and the worse your symptoms might be.

How Can These Hazards Affect My Health?

- Short term:
 - Rashes and skin irritation
 - Eye irritation
 - Dizziness
 - Nausea
 - Drowsiness
 - Headache
 - Injuries
 - Death
- Long term:
 - Lung diseases and asthma
 - Heart disease
 - Liver and kidney damage
 - Nerve damage, memory loss, neurological changes
 - Reproductive effects
 - Skin damage
 - Cancer
 - Hearing loss

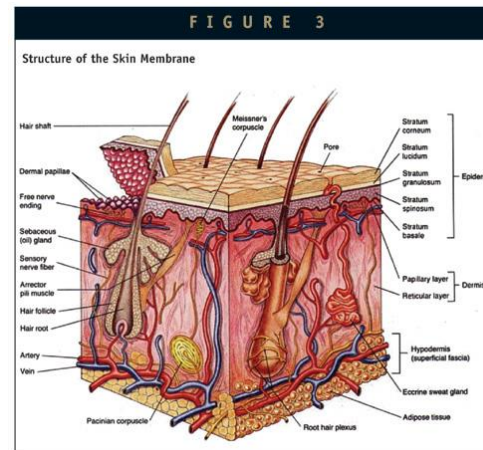
Inhalation (Breathing)

- The easiest way for chemicals to enter your body is through your mouth and nose
- When chemicals enter your mouth and nose, they can easily travel to your lungs
- Chemicals can
 - Build up in your lungs and damage them or irritate them,
 - Can be absorbed into your blood and carried to other organs/parts of your body



Skin Absorption

- Chemicals can also enter your body through your eyes, nose, and skin, especially if you have a cut or wound
- This happens when your skin is in direct contact with a chemical, either a liquid, mist, or dust
- Once a chemical passes through your skin, it can get into your blood and be carried through the rest of your body
- Can result in:
 - Skin and eye damage from chemical splashes and fumes,
 - Irritation or cuts/scrapes from particles (dust, metal chips, etc.)
 - Burns from steam
 - Burns from UV/infrared radiation



Injection

- Common accidents include stepping on a nail or being pricked with something sharp
- Chemicals may enter your body through this cut, and travel around your body through your blood

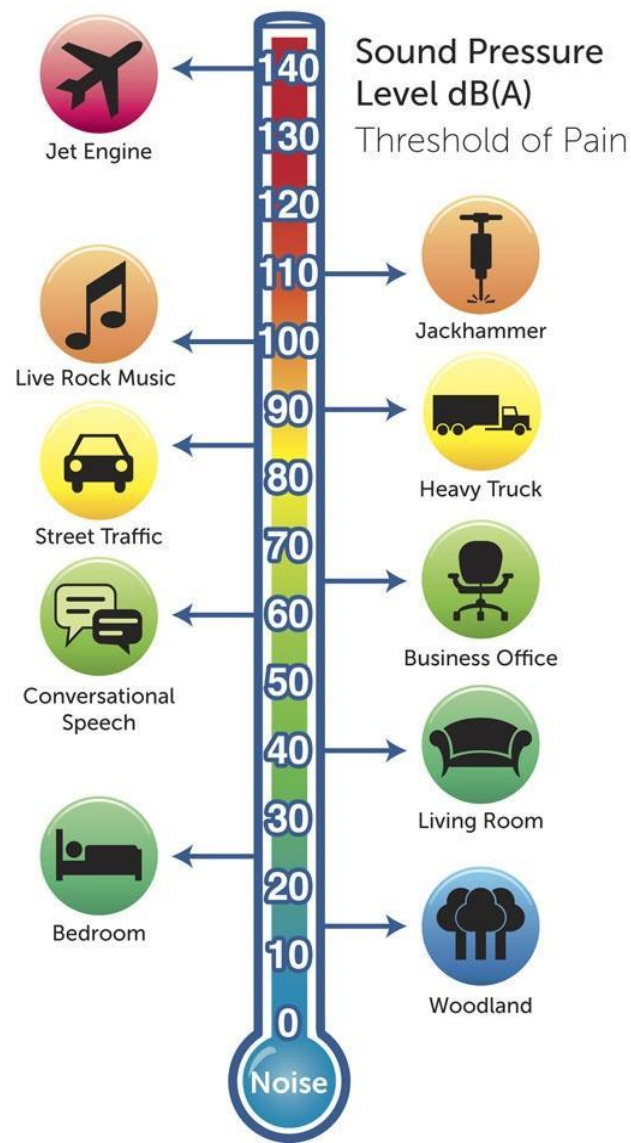




Say What!?

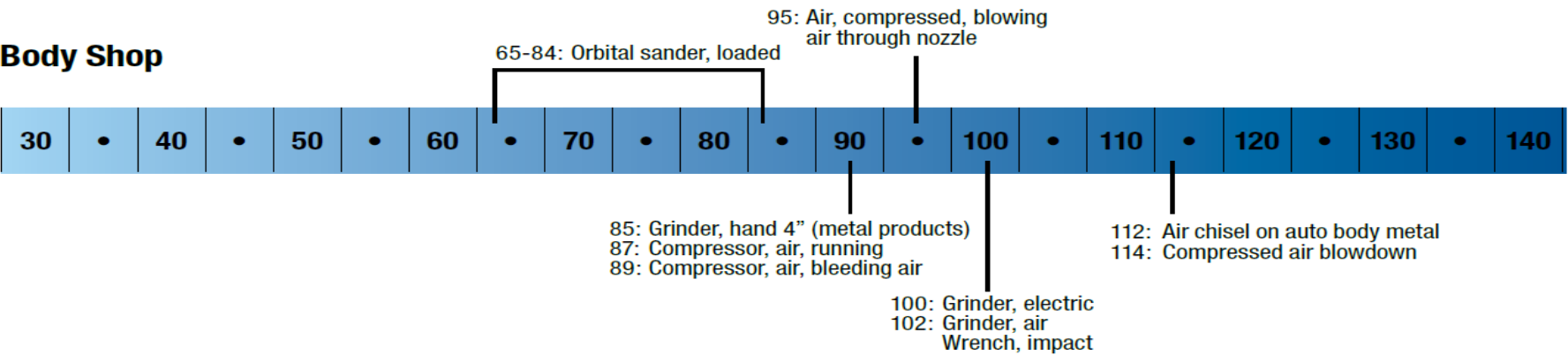
- Prolonged exposure to sounds at high volumes (85 decibels [dB] or louder) can cause permanent hearing loss
- Permissible Exposure Limit (PEL) is the maximum amount or concentration of sound you can be exposed to on the job
- The 8-hour time-weighted-average (TWA) noise exposure of workers cannot exceed 90 dB
- Higher noise exposures are safe for shorter exposure times
 - The PEL for 95 dB is 4 hours
 - The PEL for 100 dB is 2 hours

NOISE THERMOMETER

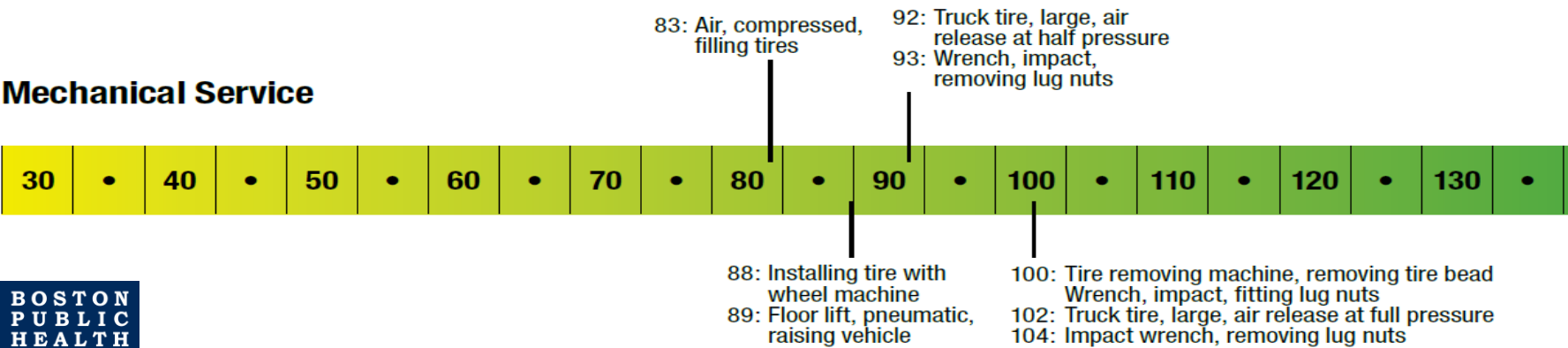


Noise Levels in an Auto Shop

Body Shop



Mechanical Service



Protect Your Hearing!

- Earplugs – Must be sealed snugly and changed often to ensure proper sealing and prevent ear canal irritation



- Earmuffs – Fit over the entire outer ear to form an air seal so the entire ear is blocked and held in place by an adjustable band





Protecting Your Lungs: Masks and Respirators



Respirators

- Particulate ratings exp.95
- Class ratings exp. 1, 2, 3
- Filter type A, B, E, N, R, P, K, AX
- Self-contained breathing apparatus (SCBA)



COLOR	APPLICATION
	Acid Gases
	Hydrocyanic Acid Gas
Green	Chlorine Gas
Yellow	Organic Vapors
Black	Ammonia Gas
Green	Acid Gases and Ammonia Gas
Blue	Carbon Monoxide
Yellow	Acid Gases and Organic Vapors
Blue	Hydrocyanic Acid Gas and Chloropicrin Vapor
Brown	Acid Gases, Organic Vapors, and Ammonia Gases
Purple	Radioactive Materials, Except Tritium and Noble Gases
Black	Pesticides (PLUS a Particulate Filter)
Green	Multi-Contaminant and CBRN Agent
Purple	Any Particulates- P100
Orange	Any Particulate - P95,099,R95,R99,R100
Light Blue	Any Particulates Free of Oil - N95, N99, N100



Protect Your Skin!

- Gloves
- Glasses, goggles, face shields
- Clothing
- Boots

Know Your Gloves! Not ALL Gloves are Created Equal



Type	Advantage	Disadvantages	Wear when working with
Natural rubber (Vinyl)	Low cost, good physical properties, dexterity	Poor vs. oils, greases, organics. Frequently imported; may be poor quality	Bases, alcohols, dilute water solutions; fair vs. aldehydes, ketones
Natural rubber blends (Latex)	Low cost, dexterity, better chemical resistance than natural rubber vs. some chemicals	Physical properties frequently inferior to natural rubber	Bases, alcohols, dilute water solutions; fair vs. aldehydes, ketones
Polyvinyl chloride (PVC)	Low cost, very good physical properties, medium cost, medium chemical resistance	Plasticizers can be stripped; may be poor quality	Strong acids and bases, salts, other water solutions, alcohols
Neoprene	Medium cost, medium chemical resistance, medium physical properties	NA	Oxidizing acids, anilines, phenol, glycol ethers
Nitrile	Low cost, excellent physical properties, dexterity	Poor vs. benzene, methylene chloride, trichloroethylene, many ketones	Oils, greases, aliphatic chemicals, xylene, perchloroethylene, trichloroethane; fair vs. toluene
Butyl	Specialty glove, polar organics	Expensive, poor vs. hydrocarbons, chlorinated solvents	Glycol ethers, ketones, esters
Polyvinyl alcohol (PVA)	Specialty glove, resists a very broad range of organics, good physical properties	Very expensive, water sensitive, poor vs. light alcohols	Aliphatics, aromatics, chlorinated solvents, ketones (except acetone), esters, ethers



Clothing



- Make sure you are wearing the right kind of clothing and shoes for the job you are doing
- How much the item covers you (short sleeves vs. long sleeves) matters
 - The more covered you are, the better protected you are from potential health hazards
- The type of material the item is made from matters!
 - Paper-like fabrics: Protect against dust and splashes
 - Cotton and wool (treated): Protect against dust, abrasions, and rough surfaces; adapts well to temperature changes
 - Leather: Protects against dry heat and flames
 - Synthetic materials (rubber, rubberized fabrics, neoprene, plastics):
 - Protect against certain chemicals
 - Bad if working with heat (these materials can burn and melt directly on to your skin)



- Footwear Options:
 - Steel/aluminum/non-metallic toe boots, puncture resistant, oil resistant, slip resistant, electric shock resistant, insulated, water resistant/proof, etc.
 - Support
 - 6" vs 8" boot will protect you from ankle-related injuries
 - The kind of sole insert used will help relieve stress on the feet and back





Protect Your Eyes!

- The right eyewear can protect you from
 - Projectiles – dust, concrete, metal, wood and other particles
 - Chemicals – splashes and fumes
 - Light – bright light from welding, ultraviolet (UV) light, lasers, etc.



- Type of Eyewear

- Safety glasses – protects your eyes
- Goggles – creates a seal of protection around your eyes
- Face Shield – protects your entire face
- Special Protection – for ultraviolet (UV) light, scratch, fog and heat resistant lenses.

How Else Can I Stay Safe?



- Seek **training** for the tools you will be using to ensure you use them correctly and prevent injuries
- **Know the products** you are using, and how they may affect your health
- Use **rubber insulated tools** to prevent electrical shock or for impact protection
- Regularly **inspect your tools and equipment** to ensure they are safe to use.
 - Look for broken pieces, frayed wires and cracked insulation
 - Make sure the equipment is working properly before using
- Keep **tools and equipment clean and store them** in appropriate cases or containers
- **Identify and prepare for potential hazards** before starting a job



Thank You!

- Questions?