Are You Ready for Winter?

Working in the Cold

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Ergonomics and Snow Removal

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SNOW, SNOW, SNOW

- Buffalo, NY 2014

Outline

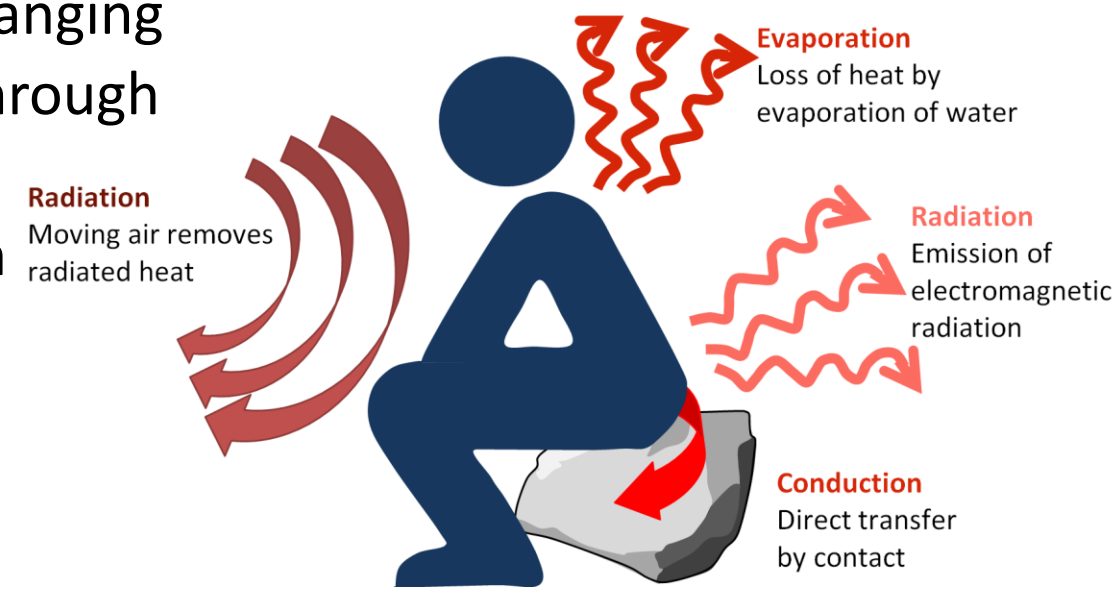
- Working in the cold
  - Thermoregulation
  - Acute and chronic health effects
  - Hypothermia and cold injuries
  - Prevention controls
- Ergonomics and snow shoveling
  - Preparing yourself for the task
  - Picking the right shovel
  - Snow weight
  - Tips to protect yourself
  - Using a snowblower
- Summary

Background

- As Canadians, we are accustomed to shoveling snow and being outdoors in the winter.
- For many of us:
  - We shovel to
    - get out of the driveway,
    - To keep our driveway clean and safe for pedestrians
  - We are outside to
    - Get to work
    - Recreation
- But, for others:
  - It is a job requirement

Types of Heat Loss

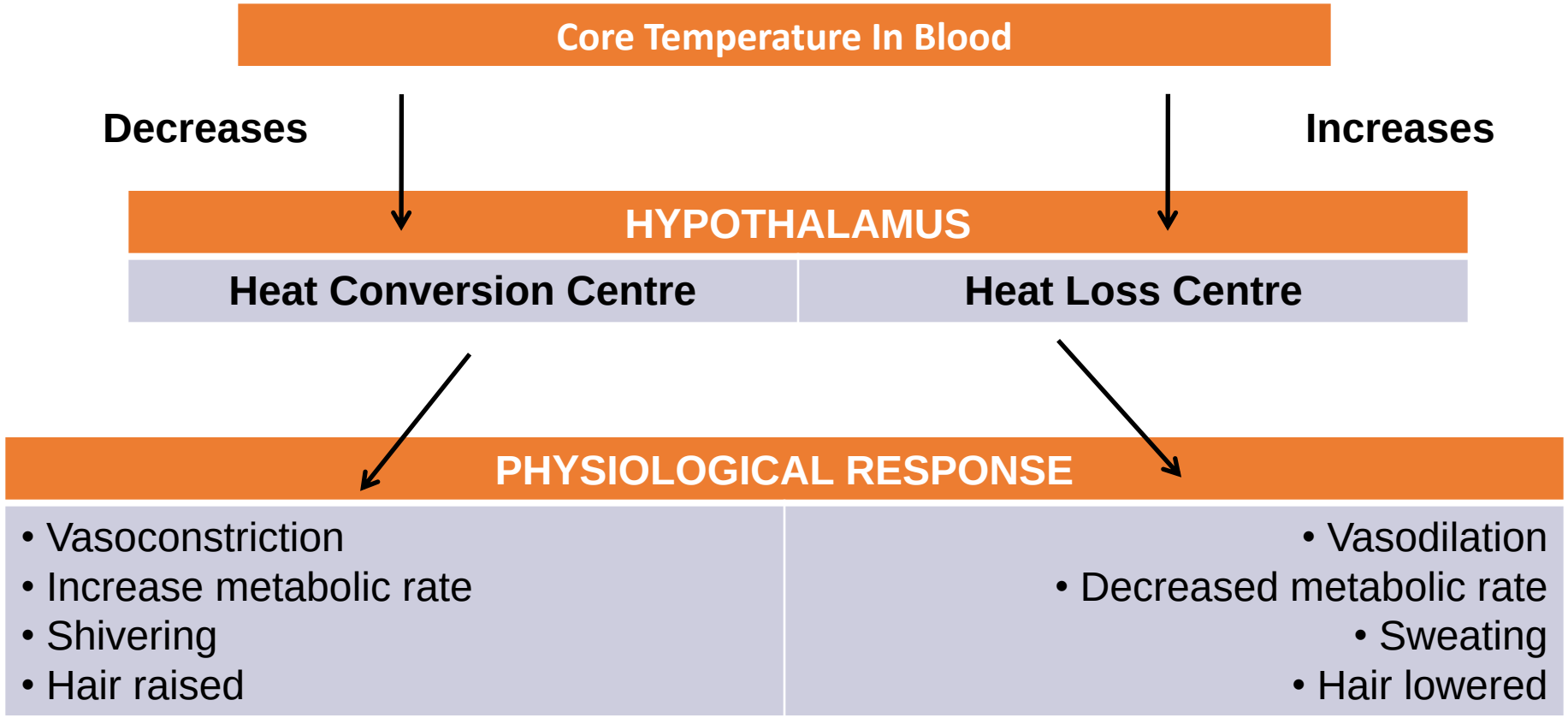
- *Radiation* – Heat is lost to the environment due to a temperature gradient. There is a difference in air temperature and body temperature.
- *Conduction* – Heat loss through direct touch with a cold object. Heat loss is the greatest when in direct contact with cold water (25 times more heat lost).
- *Convection* – Heat is lost from the body to the surrounding air as air moves across a surface. Dependent on air speed; with increased wind speed there is greater heat lost.
- *Evaporation* – Loss of heat due to water changing from a liquid to a gas. This is accomplished through sweating and breathing. Evaporation of heat also causes the body to lose fluids, which can lead to dehydration.



Thermoregulation

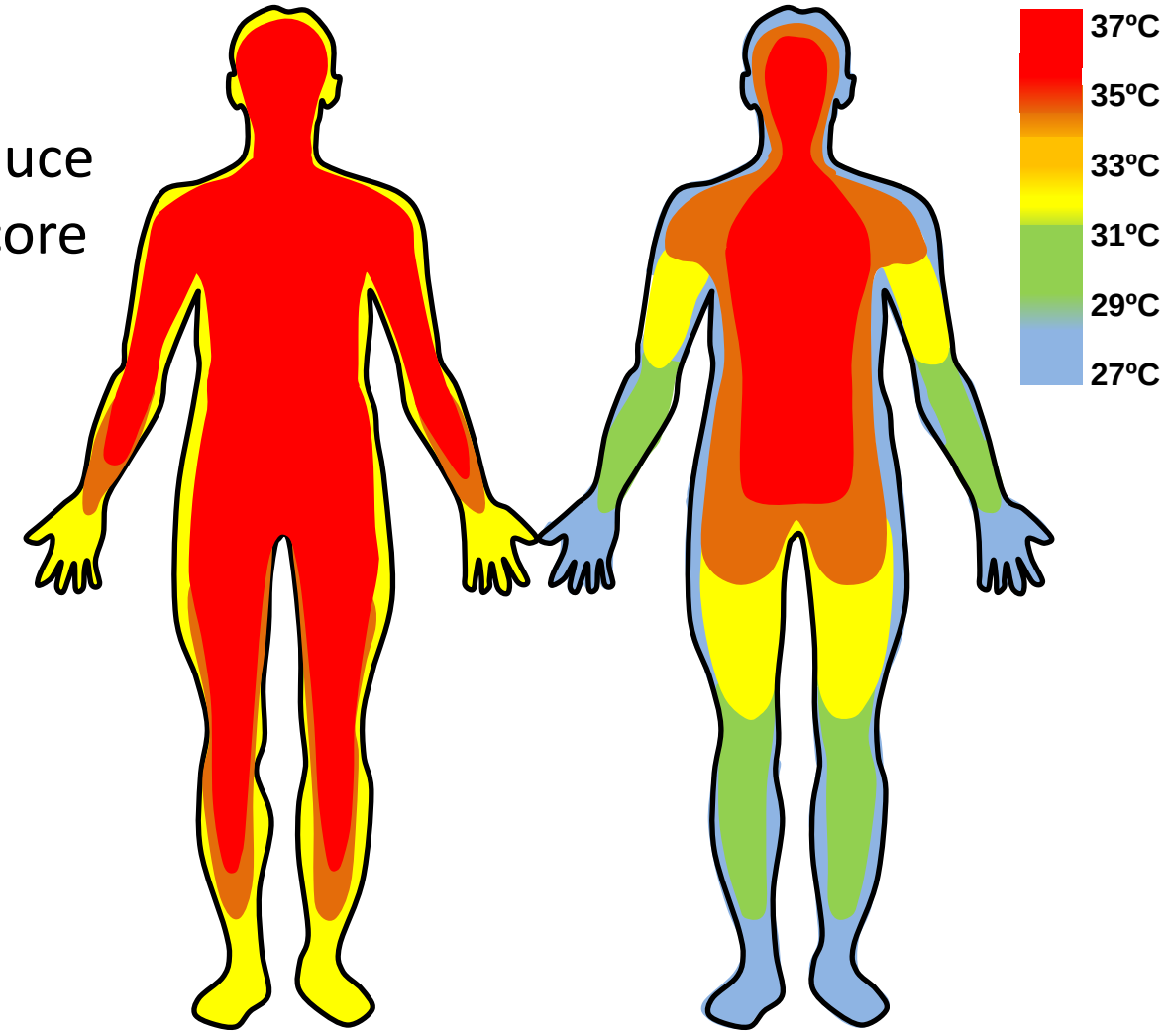
- Despite variations in temperatures, humans can maintain a constant body temperature by balancing heat gain with heat loss.

What happens when you get COLD?



Body`s Response to Cold – Thermoregulation

- Vasoconstriction
  - Arterioles get smaller to reduce blood going to skin to keep core warm

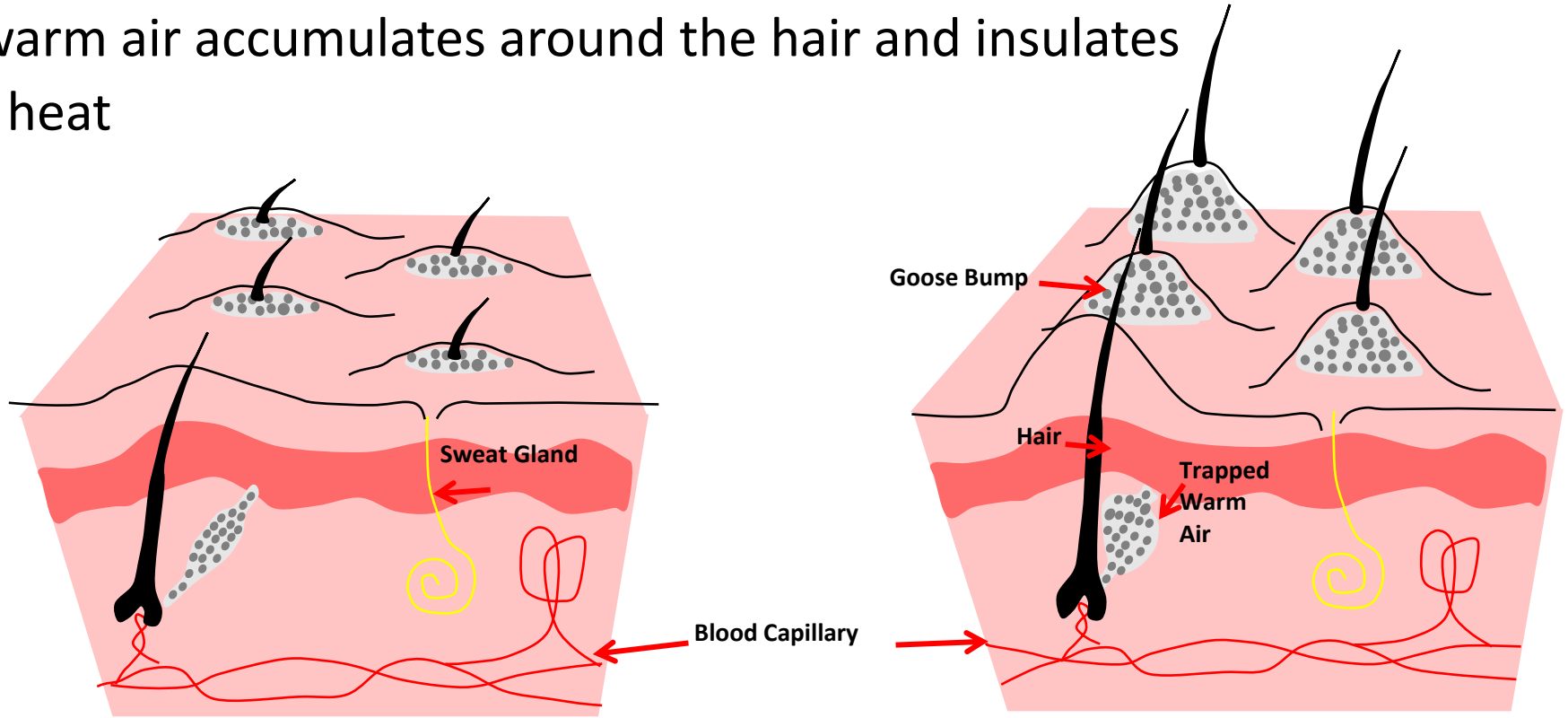


Body`s Response to Cold – Thermoregulation

- Shivering
  - Rapid contraction and relaxing of skeletal muscles

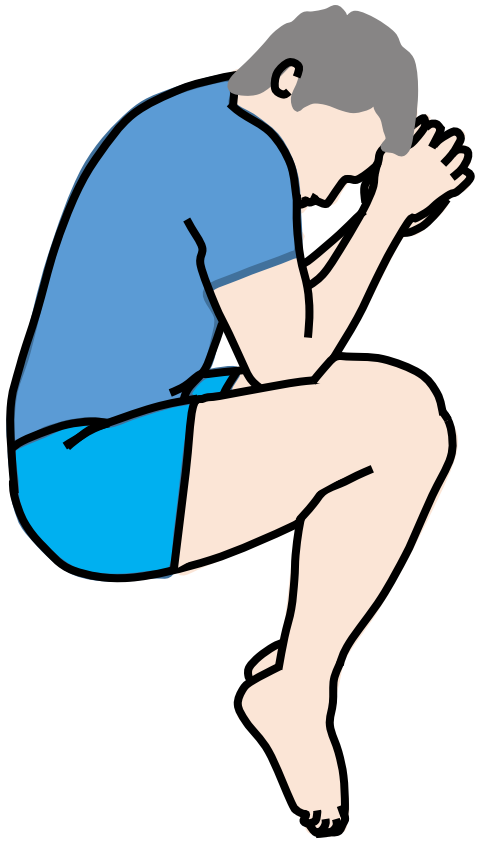
Body`s Response to Cold – Thermoregulation

- Piloerection
  - Hairs on skin pulled up by muscles
  - Layer of warm air accumulates around the hair and insulates
  - Retaining heat



Body`s Response to Cold – Thermoregulation

- Curling Up
  - Making yourself smaller so smaller surface area to loose heat by



Variation in Skin Temperature

- Thermally comfortable individual may have following skin temperature variations (^{o} C)
  - Toes = 25
  - Upper arms & legs = 31
  - Forehead = 34
  - Core = 37

Health Effects

- Acute Effects
  - Within seconds -
    - Cold air cools the skin & upper airways causing a gasping for breathe;
    - Possibly hyperventilation;
    - ↑ heart rate;
    - ↑ BP and constriction of blood vessels of the skin to preserve inner body core temperature
    - This decreases the amount of blood flowing to the skin which decreases the amount of heat lost

Health Effects

- Acute Effects
  - Within minutes
    - Tissues are cooling,
    - Shivering begins (this is one method the body has to warm self up),
    - Neuro-muscular deterioration which will cause a decrease in performance.
    - Frost nip can occur

Health Effects

- Acute Effects
  - Within hours
  - Decline in the ability to perform physical work which can be dangerous to the worker or others.
  - Hypothermia will be apparent and cold injury will occur

Health Effects

- Chronic Effects
  - Days/Months - Acclimatization occurs
  - Years - Possible chronic tissue effects - will exacerbate CTS & HAVS

Cold Injuries – Stages of Hypothermia

Stage	Core Temperature	Signs & Symptoms
1	37.2-35ºC (99 - 95ºF)	Goose bumps, unable to perform complex tasks with hands, shivering can be mild to severe, hands numb
2	35-32.2ºC (95 - 90ºF)	Violent shivering persists, difficulty speaking, sluggish thinking and movements, amnesia starts, unable to use hands, stumbles frequently, difficulty speaking, signs of depression
3	32.2-27.8ºC (90 - 82ºF)	Shivering stops, exposed skin blue, unable to walk, confusion, incoherent/irrational behavior, rigid muscles, semiconscious, loss of awareness of others, pulse and respiration rate decrease, likely heart fibrillation
4	27.8-23.9ºC (82 - 75ºF)	Unconscious, heart beat and breathing erratic, a pulse may not be palpable. Pulmonary edema, cardiac and respiratory failure, death. Death may occur before this temperature is reached.

14.4°C Lowest recorded core temperature for a survivor of accidental hypothermia

Cold Injuries

- Frost nip
  - Mildest type of injury.
  - It is a reversible ice crystal formation on the skin surface.
  - Exposed person is not usually aware that frost nip is occurring because it is usually painless and develops slowly.
  - Affects earlobes, fingers, toes, cheeks, nose

Cold Injuries - Frostbite

- Blood vessels in the skin (especially hands and feet) constrict in cold conditions to preserve core body temperature.
- If for prolonged periods of time, this starves the peripheral tissues of nutrients and their heat supply
  - If over short time period it can be reversed
  - If over a long period of time the cells will die (frost bite)
- Caused by the actual freezing of soft tissue.
- Often seen with extremely cold temperatures and wind.
- Bare skin will begin to freeze at -20 C (28F).
- Exposed areas are most often affected - such as cheeks, ears etc.
- Begins with local swelling and redness, and numbness
- Skin whitens with a waxy appearance and if deep, the skin will feel hard.

Cold Injuries

- Chilblain's
  - Is painful inflammation of small blood vessels in your skin that occur in response to repeated exposure to cold but not freezing air. Also known as pernio, chilblains can cause itching, red patches, swelling and blistering on your hands and feet.
  - Trench foot is a severe form of the disability that happens when your skin is wet and cold (above freezing) for prolonged periods. Skin reddens, then pales. The skin can breakdown and decay, as well as contract infection.
  - 2-3 days following re-warming: + pain, swelling, redness, heat, blistering, possible gangrene. Chronic cold sensitivity, excessive perspiration & excess pigmentation may occur.

Frequency of Injuries

- Estimated that 64% of cold-related injuries involve the hand or foot, followed by nose and ears
- WSIB statistics - about 60 cases of cold injury are reported each year

Risk Factors

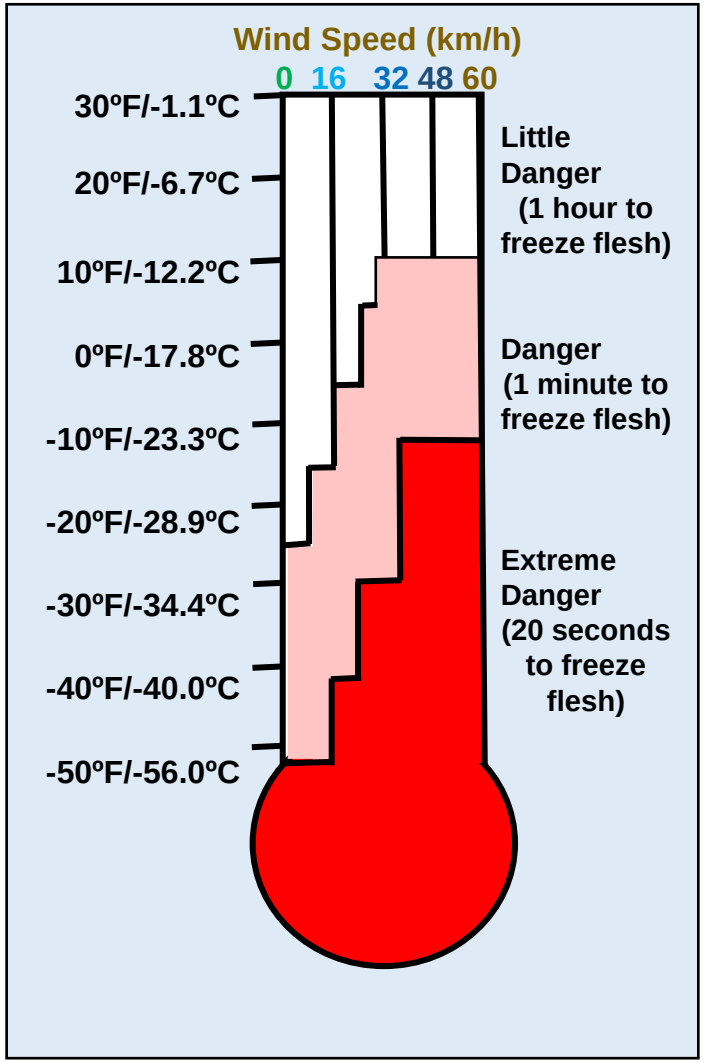
- Age - Older adults have decreased circulation
- Poor nutrition & fatigue - body can be “run down” and less able to protect self from hazards
- Alcohol & Smoking - affect the blood vessels and body’s ability to control temperature. Alcohol is a vasodilator. Smoking is a vasoconstrictor)
- Medications - narcotics, tranquilizers, antidepressants and blood pressure medication, decrease circulation to the skin

Risk Factors for cold stress

- Certain health conditions - such as, diabetes and heart disease or those that affect the circulatory system
- Inadequate tight/wet clothing
- Previous cold injuries – Makes you prone to recurring injury
- Raynaud's phenomenon – Spasms of the blood vessels that results in reduced blood flow and discoloration of the affected area (white to blue to red)

Factors Affecting “Cold” Perception

- **Acclimation**
- **Wind Chill**
- **Physical fitness**
- **Moisture**
- **Activity**
- **Equipment design**
- **Clothing**
- **Time of day**
- **Duration of exposure**



Wind Chill effect

	Ambient Temperature (ºC)										
	4	-1	-7	-12	-18	-23	-29	-34	-40	-46	-51
Wind km/h	Equivalent Chill Temperature (ºC)										
Calm 0	4	-1	-7	-12	-18	-23	-29	-34	-40	-46	-51
8 (5mph)	3	-3	-9	-14	-21	-26	-32	-38	-44	-49	-56
15 (10mph)	-2	-9	-16	-23	-30	-35	-43	-50	-57	-64	-71
24 (15mph)	-6	-13	-21	-28	-36	-43	-50	-58	-65	-73	-80
32 (20mph)	-8	-16	-23	-32	-39	-47	-55	-63	-71	-79	-85
40 (25mph)	-9	-18	-26	-34	-42	-51	-59	-67	-76	-83	-92
48(30mph)	-15	-19	-28	-36	-44	-53	-62	-70	-78	-87	-96
56 (35mph)	-11	-20	-29	-37	-46	-55	-63	-72	-81	-89	-98
64 (40mph)	-12	-21	-29	-38	-47	-56	-65	-73	-82	-91	-100
	Little Danger in less than one hour exposure of dry skin			Increasing Danger Exposed flesh freezes within one minute			Great Danger Flesh may freeze within 30 seconds				

Adapted from ACGIH
Equivalent Chill Temperature requiring dry clothing to maintain body temperature above 36C per cold stress TLV
Suggested guideline for establishing wind velocity if accurate information is not available
5 mph - light flag moves; 10 mph light flag fully extended; 15 mph raises newspaper sheet; 20 mph blowing and drifting snow

Exposure Limits -ACGIH Suggested

Air Temperature	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
- Sunny Sky °C (approx)	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	
-26° to -28°	(Norm Breaks) 1		(Norm Breaks) 1		75 mins	2	55 mins	3	40 mins	
-29° to -31°	(Norm Breaks) 1		75 mins	2	55 mins	3	40 mins	4	30 mins	
-32° to -34°	75 mins	2	55 mins	3	40 mins	4	30 mins	5	Non-emergency work should cease	
-35° to -37°	55 mins	3	40 mins	4	30 mins	5	Non-emergency work should cease			
-38° to -39°	40 mins	4	30 mins	5	Non-emergency work should cease					
-40° to -42°	30 mins	5	Non-emergency work should cease							
-43° & below	Non-emergency work should cease									

Importance to Employers

- Employers need to ensure that their workers are safe from hazards of working in cold conditions
  - Because the cold…
    - Decreases efficiency of workers
    - Decreases mental capacity
    - Increases the number of accidents on the jobsite

Administrative Controls - Education

- Workers and supervisors should be informed about:
  - symptoms of adverse effects of cold exposure
  - proper clothing habits
  - safe work practices
  - emergency procedures in case of cold injury

Administrative Controls - Acclimatization

- The body's ability to get used to the cold temperatures. It is easier for the body to adapt to hot environments rather then cold ones.
  - Should take place gradually over 7-10 days
  - Fit person acclimatize more readily than unfit persons
  - Recommended for new workers and those returning from extended leave

Other Adminstrative Controls

- Provide heat warming shelters
- Self-paced working
  - Encourage self pacing of work rates so that heavy sweating does not occur
- Rest periods in warm setting, using Threshold Limit Values (TLVs) warm-up schedule
- Change clothes to dry ones often
- New employees should become acclimatized and have protective clothing before starting a full work load

Surveillance and Monitoring

- Every workplace where temperature may fall below 16°C should have a suitable thermometer to monitor any further temperature changes.
- For workplaces with temperatures below the freezing point, the temperature should be monitored at least every 4 hours.
- For indoor workplaces, whenever the rate of air movement exceeds 2 meters per second (5 miles per hour) it should be recorded every 4 hours.
- In outdoor workplaces with air temperature below the freezing point (-1^{o}C), both air temperature and wind speed should be recorded.

Engineering Controls

- Radiant heaters may be used to warm workers
- Shield work areas from drafts or wind
- Use insulating material on equipment handles when temperatures drop below 30° F (-1°C).
- Wind barriers : have been found effective outdoors or in freezer rooms to control circulated air
- Refuges : access to warm conditions and warm drinks during rest
- Design of equipment so gloves/mittens do not need to be removed to operate
- Design of workplaces so operators are not required to sit or stand for long periods

Safe Work Practices

- Change out of wet clothing or footwear as soon as you can
- Do not touch cold objects with bare hands
- People who are taking certain medications (blood pressure, narcotics), older age, overweight, have allergies, smoke, or have poor blood flow are more prone to cold injuries and should take extra precautions
- Do not drink alcohol
- Avoid getting clothing or gloves wet with any liquid, such as, gasoline or cleaning fluids, due to evaporation

Safe Work Practices

- For work below -25 ºC follow the work/warm-up schedule (take into account wind speed and air temperature)
- Always work in a buddy system, if you must work outdoors in cold conditions
- Try to work in pairs to keep an eye on each other and watch for signs of cold stress
- Avoid using vibrating tools
- Wear UV protected eyewear (snow glare)
- Drink plenty of liquids, avoiding caffeine and alcohol.
- heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold.

Clothing & Personal Protective Equipment

- Clothing should be worn in multiple layers, which provides better safety than a single “thick” garment
- The air between layers of clothing provides better insulation than the clothing itself
- Several layers also gives you the option to open or remove a layer before you get too warm and start sweating or to add a layer when you take a break
- Successive outer layers should be larger than the inner layer, otherwise the outermost layer will compress the inner layers and will decrease the insulation properties of the clothing.

Clothing & Personal Protective Equipment

- Inner layer should provide insulation and be able to "wick" moisture away from the skin to help keep it dry.
- Thermal underwear made from polyesters or polypropylene is suitable for this purpose.
- The additional layers of clothing should provide adequate insulation for the weather conditions under which the work being done.
- Should also be easy to open or remove before getting too warm to prevent excessive sweating during strenuous activity.
- Outer jackets should have the means for closing off and opening the waist, neck and wrists to help control how much heat is retained or given off.
- Some jackets have netted pockets and vents around the trunk and under the arm pits (with zippers or Velcro fasteners) for added ventilation possibilities.

Clothing & Personal Protective Equipment

- In wet conditions, the outer layer should be waterproof
- Wear a hat, fifty percent of body heat is lost through the head
- Clothing should be kept clean, since the dirt clogs the air cells in the fibers of clothing and destroys its insulating affect
- Clothing must be dry
- For work below –17ºC thin polyester gloves should be worn under protective gloves
- Face protection should be used in extremely cold temperatures, such as a balaclava or hard hat liner

Footwear

- Felt-lined, rubber bottomed, leather boots with removable felt insoles are best for working in the cold
  - leather is porous, allows boots to "breathe" and perspiration to evaporate.
  - Leather boots can be "waterproofed" with products that do not block the pores in the leather.
- If standing in water or slush waterproof boots must be worn.
  - waterproof boots protect the feet from getting wet from cold water but they also prevent the perspiration to escape.
  - Insulating materials and socks will become wet more quickly than with leather boots and increase the risk for frostbite.
- Also, when trying on boots before purchase, wear the same type of sock that you would wear at work to ensure a proper fit.)
- Composite boots conduct the cold less than steel toed boots

Socks

- Wear one pair of thick, bulky socks or two pairs - one inner sock of silk, nylon, or thin wool and a slightly larger, thick outer sock.
- Liner socks made from polypropylene help keep feet dry and warmer by wicking sweat away from the skin.
- As outer sock becomes damp, its insulation properties decrease.
  - Have extra socks available so you can dry your feet and change socks during the day.
- If two pairs of socks are worn, the outer sock should be a larger size so that the inner sock is not compressed.

Socks

- Always wear the right thickness of socks for your boots.
- Too thick, the boots will be "tight," and the socks will loose much of their insulating properties when they are compressed inside the boot.
- Foot would also be "squeezed" which would slow the blood flow to the feet and increase the risk for cold injuries.
- If socks are too thin, the boots will fit loosely and may lead to blisters.

Eye Protection

- Where face protection is used, eye protection must be separated from the nose and mouth to prevent exhaled moisture from fogging and frosting eye shields or glasses.
- Select protective eye wear that is appropriate for the work you are doing, and for protection against ultraviolet light from the sun, glare from the snow, blowing snow/ice crystals, and high winds at cold temperatures.

Surveillance and Monitoring

- To prevent excessive sweating while working, remove clothing in the following order:
- mittens or gloves (unless you need protection from snow or ice),
- headgear and scarf,
- then open the jacket at the waist and wrists, and
- remove layers of clothing.
- As you cool down, follow the reverse order of the above steps.

The DO'S and DON'T'S of Cold Stress

DO

- Cover your hands, feet, face, and eyes
- Continue moving
- Dress in layers of loose, dry, protective clothing
- Take many breaks in warm places
- Eat properly to preserve heat and prevent dehydration

DON'T

- DO NOT consume alcohol or drugs that may change blood flow
- DO NOT enter cold weather conditions after a recent shower or bath

Good and Bad News…

GOOD NEWS

- 15 minutes of shoveling is considered moderate activity
- Good way to keep in shape and to burn extra calories

BAD NEWS

- There has been an increase in both fatal and non-fatal heart attacks in recent years
- People continuously over-exert themselves and are becoming injured

Who should think twice about shoveling?

- Elderly People
- Anyone who has had a previous heart attack.
- People with a history of heart disease, high blood pressure or high cholesterol levels.
- Smokers.
- People leading a sedentary lifestyle.
- People with existing back problems.

Why not buy a snow blower?

- You do not necessarily have to run out and buy a snow blower.
- Not everyone who shovels snow is going to have a heart attack or get injured.
- Snow shoveling can be good exercise when performed correctly and with safety in mind.

Prior to Shoveling

- Avoid caffeine and nicotine
  - Stimulants that place extra stress on the heart (increase heart rate and cause blood vessels to constrict).
- Avoid eating large meals
  - Places extra demands on the digestive system (stomach cramps).
- Drink plenty of water
  - Dehydration is as much of a problem in the winter as it is in summer.

Prior to Shoveling

- Dress warmly
  - The nose, ears, hands and feet need extra attention in cold weather. Wear a turtleneck, sweater, toque, scarf, face protection, wool socks and waterproof boots.
  - Place a scarf or other face protection over the nose and mouth to avoid breathing cold air.
  - Dress in layers so you can remove a layer as needed.
- Wear proper footwear
  - Boots with slip-resistant soles can help to minimize the risk of slips and falls.

Prior to Shoveling

- Warm-up for 5 to 10 minutes to get the joints moving and increase blood circulation.
  - Aerobic - march on the spot, climb stairs, or go for a quick walk around the block.
  - Stretch - gently stretch the back, arms, shoulders, and legs.
- Be weary of your back – it is very vulnerable when you first wake up.
  - Back muscles stiffen while you sleep. Avoid exerting yourself shortly after getting out of bed.

Suggested Exercises

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Occupational Health Clinics for Ontario Workers Inc.
Prevention Through Intervention

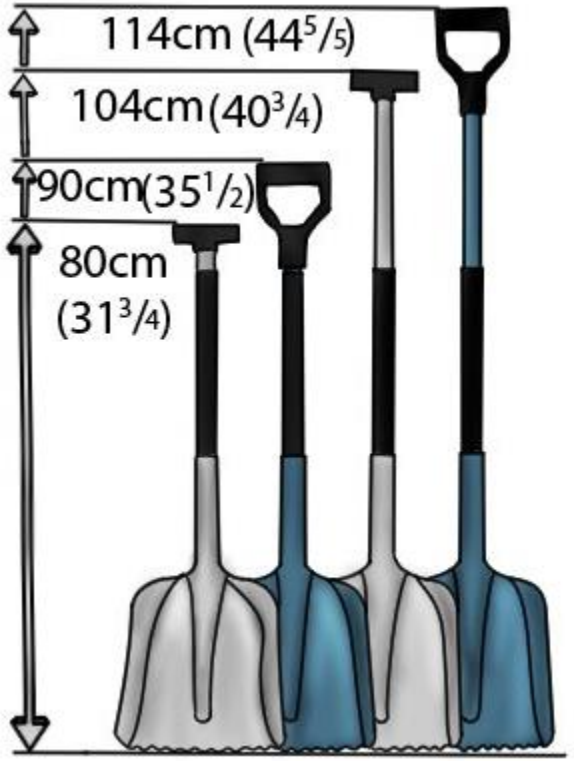
Picking the Right Snow Shovel

The most important features of a shovel include:

- Weight
- Length
- Shaft Type
- Handle Type
- Blade Size & Shape

Picking the Right Snow Shovel

- Handle Length
  - Select a shovel length that reaches mid chest height
  - Incorrect length results in increased bending of the back



Picking the Right Snow Shovel

- Blade Size
  - Flat shovels are better at cutting through deep snowdrifts, such as clearing areas left by a plow.
  - Rounded scoops can push snow, allowing you to make a steady pass down the sidewalk or scoop the snow up to remove it completely.

Picking the Right Snow Shovel

- Blade Material
  - Metal blades
    - Chip through ice and carry heavier loads while holding up to obstacles such as deck screws or gravel.
    - Strong, durable and capable of carrying much more than their plastic counterparts.
    - Weigh considerably more than plastic, however, which can contribute to back strain and tire you out more quickly.
  - Plastic blades
    - Lightweight, flexible and easy to maneuver.
    - Being much lighter than metal blades, they can be handled easily and move quickly.
    - More easily damaged by screws and rocks and are not suited for chipping through solid ice.
    - Snow does not stick as easily to plastic, which can be a big efficiency boost.

Picking the Right Snow Shovel

- Blade Material Continued
  - Combination of a plastic blade with what is called a Wear Strip
    - A piece of metal attached to a the blade. This gives you the strength of the metal edge for ice, but the light weight of the plastic blade.
    - Try to avoid shovels with metal edges when shoveling sidewalks, cracked surfaces, etc.

Picking the Right Snow Shovel

- Handle Material
  - Wooden handles
    - lightweight, strong and durable.
    - Can last many years and are also easy to replace when the time comes.
    - Wood naturally expands and contracts with the weather, so you need to check the screws attaching the handle to the blade periodically to make sure they are tight.
    - Apply a light coating of linseed oil to your wooden handle once per year to keep it strong, supple and water resistant.
  - Fiberglass handles
    - Most durable of the types of handle
    - Much heavier handle, which can cause strain.
    - Not subject to changes due to the weather, will not rust or bend, and is difficult to break.

Picking the Right Snow Shovel

- Handle Material Continued
  - Plastic handles
    - Very lightweight and easy to maneuver
    - If stored indoors, plastic can last many years but constant exposure to sun and moisture can make plastic become brittle, which leads to cracking and breaking.
    - If weight is the most important issue, plastic is the best choice for a snow shovel handle.
  - Metal handles
    - Made of lightweight metal such as aluminum. This makes them very light but also more vulnerable to bending when used under great pressure.
    - Can also rust if not dried off between uses (hanging them out of the weather to dry is sufficient)
    - Relatively inexpensive which can be an important factor.

Picking the Right Snow Shovel

- Use a shovel with a smaller blade for throwing snow (10”-14”).
- Try to avoid shovels with metal edges when shoveling sidewalks, cracked surfaces, etc.
- Use cooking oil, or even car wax to keep snow from sticking to the shovel.

Shoveling Rate

- What is the recommended rate for shoveling?
  - CCOHS recommends a rate of 15 scoops per minute.
  - Shoveling should not last longer than 15 minutes followed by a 2-3 minute break.

Shoveling Weight

- What is the recommended weight to be lifted?
  - High rate of shoveling (15 scoops/min), total weight per shovel should not exceed 5-7 kg (10-15 lbs)
  - Lower rate of shoveling, maximum of 11 kg (approx. 24 lbs).

Approximate Snow Weights

Weight of Snow per Cubic Foot				
	Light/Dry Snow	**Wet/Heavy Snow**	**Compacted Snow**	**Ice**
Snow Density (lb/cu ft)*	***3 lb/cu ft***	***21 lb/cu ft***	***30 lb/cu ft***	***57 lb/cu ft***

If an individual were to clear a 16ft by 30ft driveway covered in one foot of wet snow, they would be moving approximately 4 tons of snow!

Throwing Height & Distance

- The throwing height should not exceed 1.3 meters (approximately 4 feet).
- Optimal throwing distance should be no further than 1 meter (approximately 3 feet). The load and shoveling rate should be reduced if the task requires a longer and/or higher throw.

Proper Shoveling

Occupational Health Clinics for Ontario Workers Inc.
Prevention Through Intervention

Proper Shoveling

Proper Shoveling

Improper Throwing

Proper Throwing

“Ergonomic” Designs

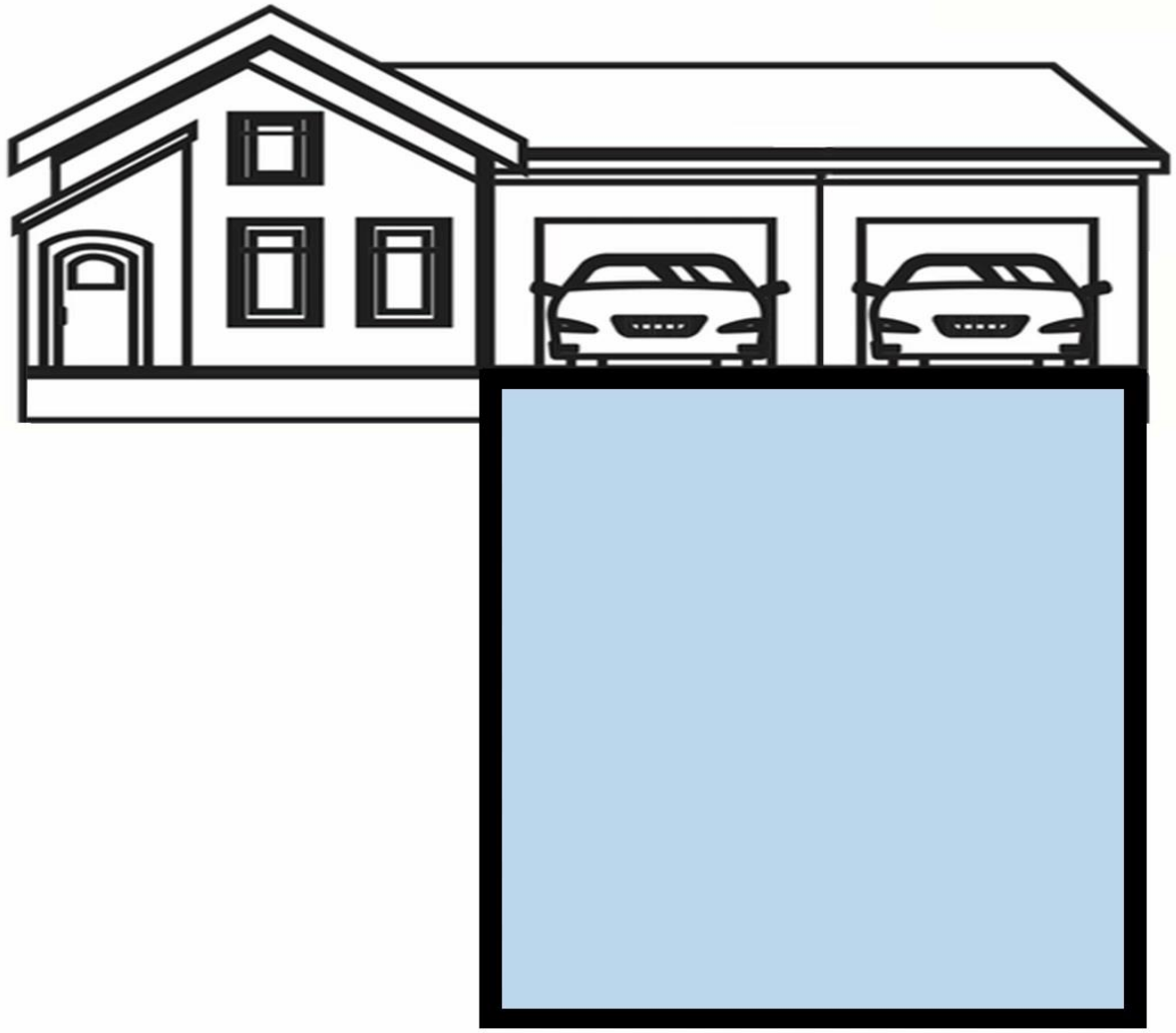
Wovel in Use

Wovel in Use

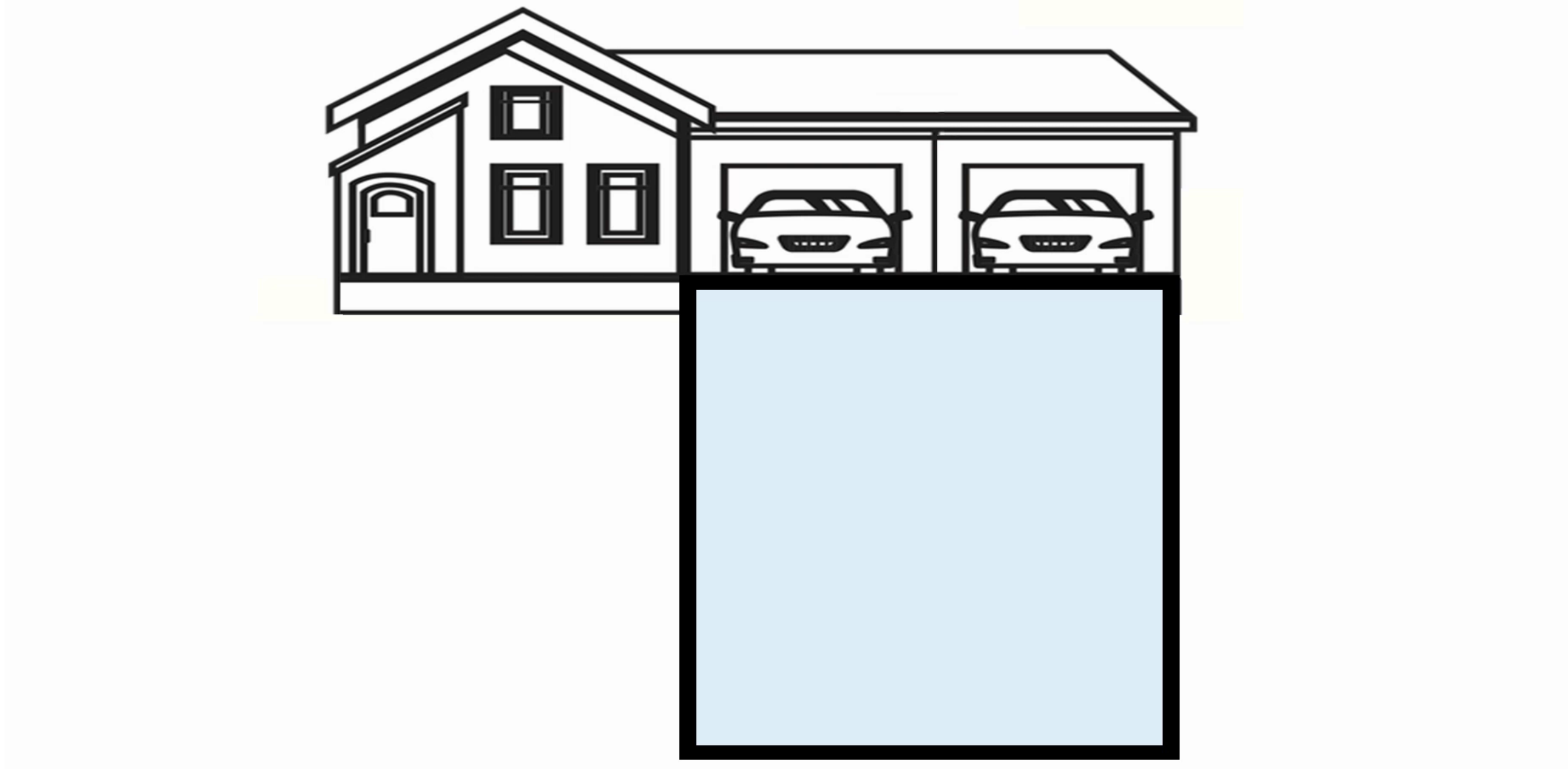
Wovel in Use

More Tools

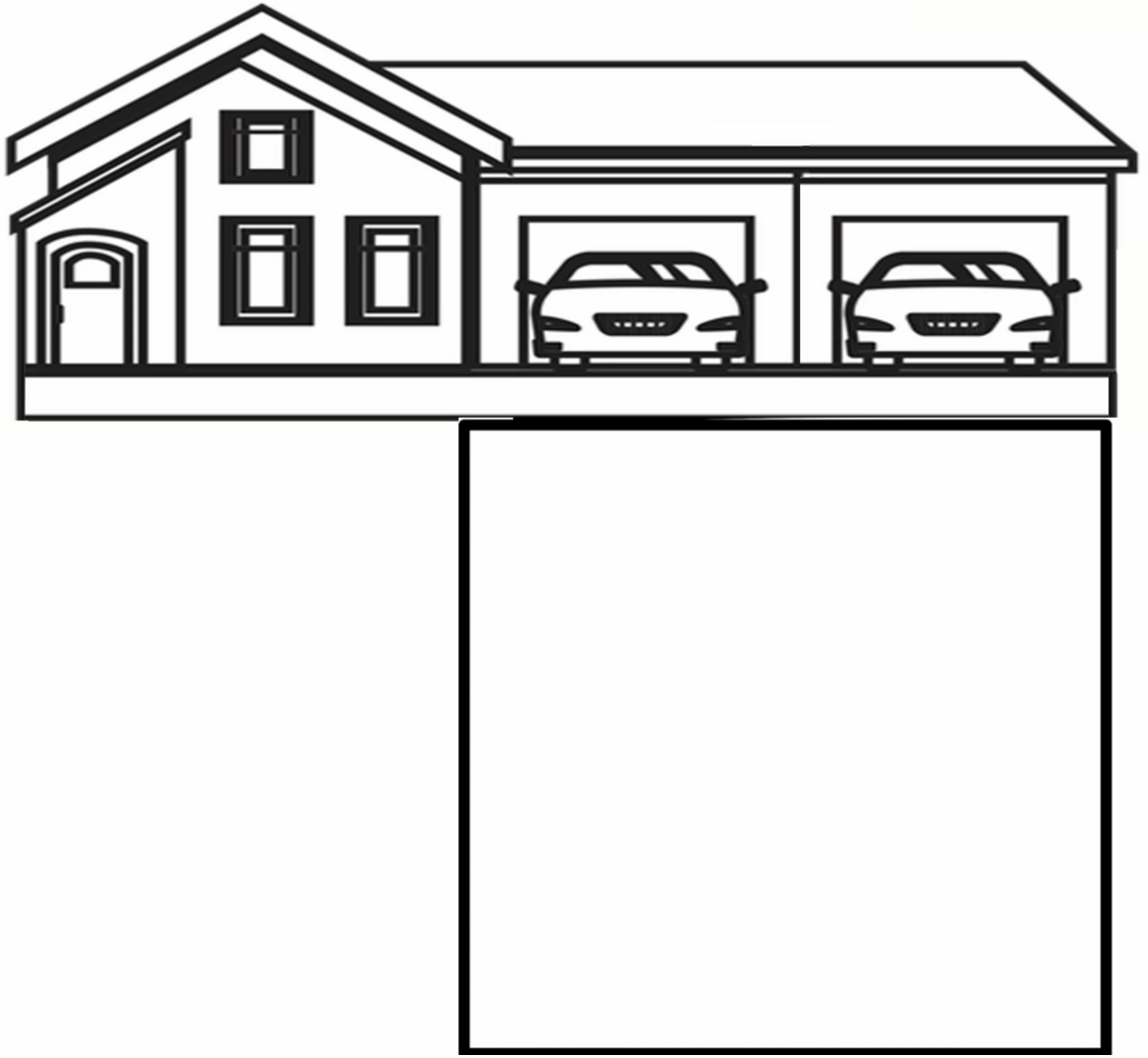
Shoveling Light Snow



Shoveling Heavy Snow



Snow Blower Use



Heart Attacks

- Watch for signs of a Heart Attack. Many people die from heart attacks because they did not seek medical attention quickly enough. Be familiar with the signs and symptoms of a heart attack.
- If you experience any of the following symptoms, stop shoveling and contact your physician immediately, or call 911.
- Shortness of breath and difficulty breathing (#1 sign)
- Nausea
- Sweating (i.e. cool, clammy skin)

Heart Attacks

- Pain
  - Sudden pain or discomfort that does not go away with rest. The pain may feel like: burning, squeezing, heaviness, tightness or pressure
  - The pain may be in the chest, neck, jaw, shoulder, arms or back
  - Tingling, pain, or numbness in the left arm.
  - Chest pain or discomfort that is brought on with exertion and goes away with rest
  - In women, pain may be more vague

Helpful Hints

- Clear snow early and often.
  - During a large snowfall, shovel frequently. DO NOT wait for all of the snow to fall before shoveling.
  - Fresh snow is fluffy, light, and easier to move than heavily packed or wet snow.
- Pace yourself.
  - Start out slowly and take breaks often – DO NOT rush to clear all of the snow at once.
  - Try pushing and lifting during large snowfalls in small layers (i.e. shovel an inch or two, rest, and repeat).

Helpful Hints

- Watch your footing.
  - Stand with your feet hip width apart for balance and keep the shovel close to your body.
  - Avoid throwing snow too far when it is slippery.
- Push, rather than lift.
  - Push snow with a wide blade shovel.
  - When you have to lift, use a small blade shovel.
- Use your legs.
  - Half fill the shovel, bend with knees, keep back straight and lift with legs.
  - Walk to where you want to place the snow.

Helpful Hints

- Avoid awkward throwing postures.
  - DO NOT throw snow over your shoulder or to the side.
  - If you need to move the snow to one side, reposition your feet to face the direction the snow will be moved.
  - Do not reach back to push snow (i.e. walking backwards while pushing or lifting snow).
- Watch for ice.
  - Look out for ice patches and uneven surfaces under the snow or on the ground that can cause you to slip and fall (black ice).
  - Take smaller steps in icy conditions.
  - Wear boots that have slip-resistant soles. Anti-slipping cleats or footwear could be used by those who are prone to falling.

Helpful Hints

- Ask for help.
  - Ask someone to help you if shoveling snow is a huge job.
- Listen to your body.
  - If you feel tightness or pain in your chest, stop right away and call your doctor.
  - If you become sore after shoveling, take a hot bath, get a massage, or take a pain reliever. If you still do not feel well, see your doctor.

Helpful Hints

- See what you are shoveling.
  - Do not let a hat or scarf block your vision.
  - Make sure your glasses are not foggy.
- Think ahead of time.
  - Try to throw snow far, early in the winter.
  - Avoid pushing all of your snow to the end of the driveway. Make a path down the middle of the driveway and push all of the snow to the sides.
  - Keep the snow banks the same height all the way down the driveway.

Helpful Hints

- Snow Plow
  - Try and shovel the snow as soon as you see the snowplow pass by.
  - The sooner you shovel the slush, snow and ice from the snowplow, the easier it is.
  - If you wait, the pile of snow will turn to hard packed ice and will be harder to move.
  - This snow is heavy, so lift half-filled shovels and walk to where you want to place it.

Using a Snow Blower

- Use caution when using them to avoid muscular strains
- Keep the snow blower close to the body (i.e. stay between the handles)
- When there is a large amount of snow, do not take full passes of snow – take half
- Let the snow blower drive itself
  - That is why we have them – to help us – let it do the work
- Vibration – avoid long periods of snow blowing – share the job (job rotation)
- Gripping
  - depends on the controls, but some models have a drive train that only run when the lever is pressed – this can be hard on the wrists - take breaks or share the job

Using a Snow Blower

- Do not lift the snow blower by yourself
- Watch for changes in elevation, or features that stick out
- Earplugs are recommended
- Important Note: *A study in Detroit identified 43 heart attacks after a series of snowstorms. These heart attacks were all attributed to physical exertion, and 36 occurred while removing snow. Several of these heart attacks occurred while using a snow blower...*

  This helps to illustrate that while snow shoveling can lead to a heart attack, using a snow blower does not eliminate the possibility of suffering a similar fate while removing snow.

Take Home Message

- Make sure that you, warm up first, take your time (especially after the first big snowfall), have the proper tools, dress properly, take frequent breaks, stay hydrated, and know when to stop. By planning ahead of time and being prepared for all possible conditions snow removal can be great exercise.

Save the Date

Date	Information
February 4th, 2021	RSI Day+ Month Part 1 10:00 am - 12:00 pm EST
February 11th, 2021	RSI Day+ Month Part 2 10:00 am - 12:00 pm EST
February 18th, 2021	RSI Day+ Month Part 3 10:00 am - 12:00 pm EST
February 25th, 2021	RSI Day+ Month Part 4 10:00 am - 12:00 pm EST

For More Information Contact your Local OHCOW Clinic

1-877-817-0336

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