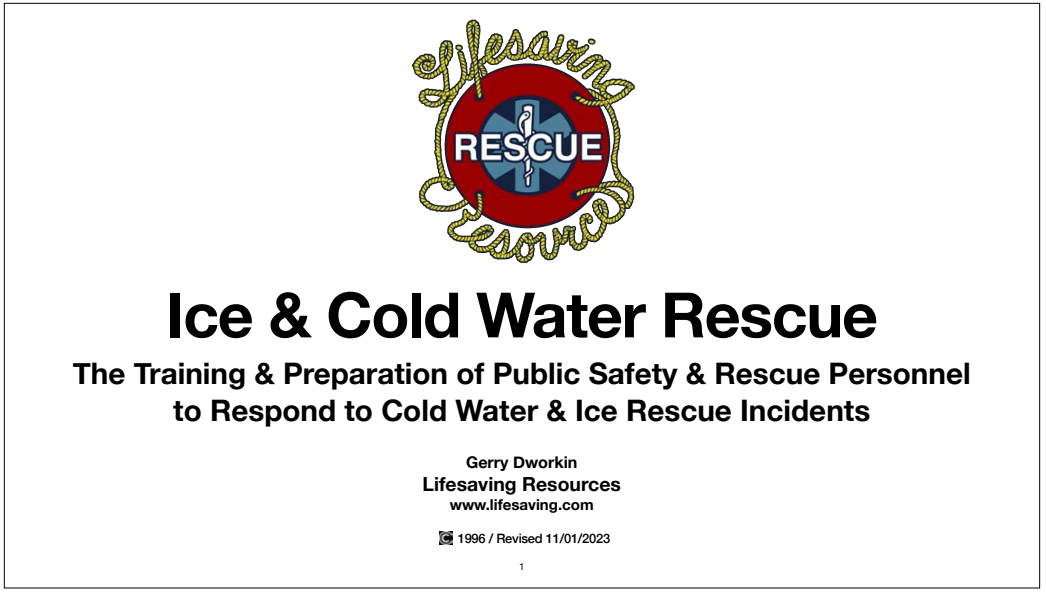
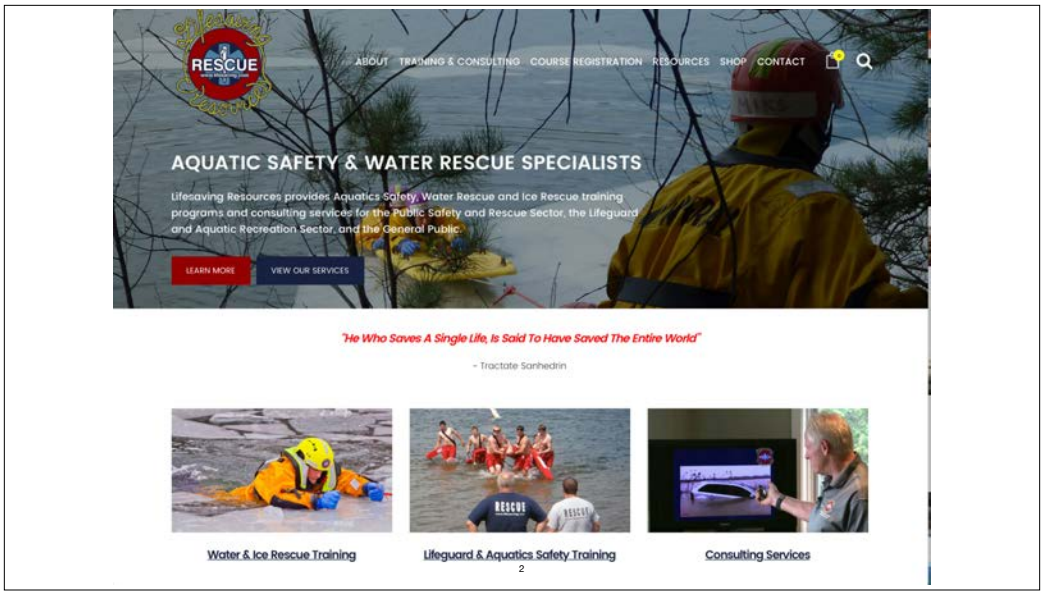


Welcome to this Lifesaving Resources ICE RESCUE training program. This curriculum was designed specifically to provide Public Safety & Rescue personnel with the foundational knowledge required to respond to an ice or cold water rescue or recovery incident.



This course was developed by and is administered through LIFESAVING RESOURCES - a company dedicated to drowning and aquatic injury prevention and emergency management. The Lifesaving Resources' WEBSITE includes information on future training opportunities, articles, case studies, etc. Should you wish to be included in their E-BLASTS, you can subscribe your e-mail address at the bottom of the Lifesaving Resources' homepage @ www.lifesaving.com.

Lifesaving Resources LLC

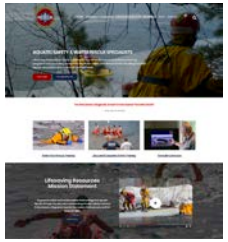
Aquatics Safety & Water Rescue Specialists

Consulting Services

- Forensic Expert Witness Services
- Product & Educational Materials Review & Development

Training Programs (for the Public Safety & Rescue and Lifeguard & Aquatic Recreation Sectors)

- Ice Rescue Training (Awareness, Operations, Technician, Train-the-Trainer)
- Water, Surf & Swiftwater Rescue Training (Awareness, Operations, Technician, Train-the-Trainer)
- Lifeguard Pre- & In-Service Training
- Lifeguard Operations & Management
- The Scared Straight of Aquatics



3

Lifesaving Resources provides training programs for the PUBLIC SAFETY & RESCUE sector, as well as the LIFEGUARD & AQUATIC RECREATION sector. The company also provides EXPERT WITNESS services in DROWNING & AQUATIC INJURY litigation.

Mission Statement

To prevent or reduce drowning and aquatic injury incidents through the education of the public and the conduct of specialized training for the Public Safety & Rescue as well as the Lifeguard & Aquatic Recreation sectors.

4

The MISSION of Lifesaving Resources is to PREVENT or reduce DROWNING and AQUATIC INJURY INCIDENTS. They accomplish this through their training programs, their website, and their public relations & education campaigns, including their Social Media platforms, such as Facebook and LinkedIn.

This curriculum has been developed specifically for the conduct of Lifesaving Resources Ice Rescue training courses. This presentation represents the Ice Rescue Awareness curriculum, which is the pre-requisite for anyone participating in the Ice Rescue Operations or Technician courses.

The Lifesaving Resources' Ice Rescue Awareness, Operations and Technician curriculums meet/exceed NFPA 1670 & NFPA 1006 Standards for Technical Rescue.

5

This presentation represents the Lifesaving Resources ICE RESCUE AWARENESS curriculum which is the pre-requisite for the ICE RESCUE OPERATIONS and TECHNICIAN courses. This curriculum meets and exceeds NFPA 1670 & NFPA 1006 Standards for Technical Rescue.

Certification

Awareness, Operations & Technician Levels

By course completion, the candidate must meet all educational objectives and successfully participate in and/or complete the following:

Awareness Level

- Required classroom instruction

Operations & Technician Levels

- Successfully complete the Awareness Level classroom instruction
- Participate in all required practical skill evolutions

Certification is valid for 5-years from the course completion date. The graduate will receive the following:

- Course completion certificate
- Insignia (optional)

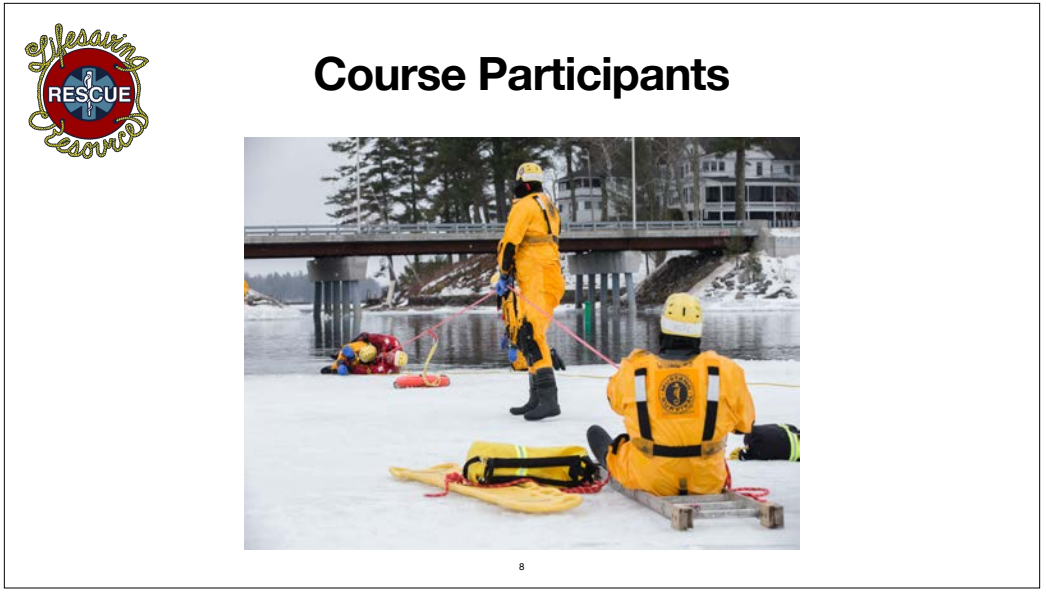
6

Certification at the AWARENESS level, requires participation in the entire classroom portion of the course and pass the written exam with a minimum score of at least 70%. Certification at the OPERATIONS or TECHNICIAN levels, requires completion of the Awareness level and full participation in all required practical skill evolutions. A COURSE COMPLETION CERTIFICATE, valid for 5 years from the course completion date, is awarded at the completion of this training. Optional insignia is available through the instructor or through Lifesaving Resources.

Instructors & Staff

7

Introduce INSTRUCTORS and STAFF who will be conducting and/or assisting in this course.



If they don't already know each other, this is an opportunity for each PARTICIPANT to introduce themselves. *(If the practical training is going to be conducted immediately after the classroom session, have participants bring their ICE RESCUE SUITS into the classroom in order to warm them up, for them to don their suits, and for you to inspect their suits.)*

The Rule of Numbers

Frequency : Probability

The more citizens (*frequency*) who use your lakes, rivers, streams, ponds, or ocean venues increases the *probability* of a significant incident.

Each day that passes without a significant incident brings you one day closer to when that incident will occur.

There is a correlation between FREQUENCY and PROBABILITY in that the more people who use our water venues, increases the probability of a significant incident. Each day that goes by without that significant incident brings us one day closer to when a significant incident will occur. Therefore, it is critical that we prepare for the worst and hope for the best.

Murphy's Law

Anything that can happen…will happen!

10

Lifesaving Resources endorses the theory of MURPHY'S LAW in that if anything can go wrong - it will go wrong. Which is why we need to prepare for the worst, but hope for the best.

11

Here is one example of Murphy’s 1ST LAW: IF ANYTHING CAN GO WRONG - IT WILL GO WRONG.

Murphy's Law

When it occurs, it does so at the least opportune time!

12

Murphy's 2ND LAW is: WHEN IT DOES GO WRONG, IT DOES SO AT THE LEAST OPPORTUNE TIME.

Murphy's Law

Mother Nature is a bitch!

Murphy's 3RD LAW is: MOTHER NATURE IS A BITCH!

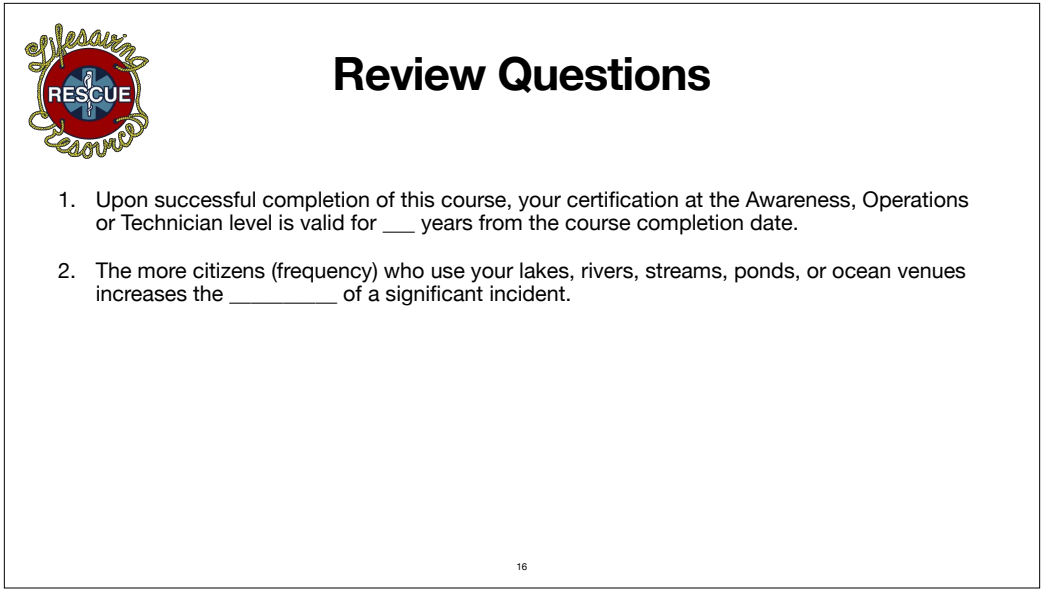
14

Here is a classic example of Mother Nature at its best….

Mother Nature + Stupidity = Job Security

15

And, in combination with Mother Nature, people do STUPID! The combination of MOTHER NATURE + STUPID represents JOB SECURITY for First Responders.



1. Upon successful completion of this course, your certification at the Awareness, Operations or Technician level is valid for 5 years from the course completion date.

2. The more citizens (frequency) who use your lakes, rivers, streams, ponds, or ocean venues increases the probability of a significant incident.

He Who Saves a Single Life,
Is Said To Have Saved The Entire World!

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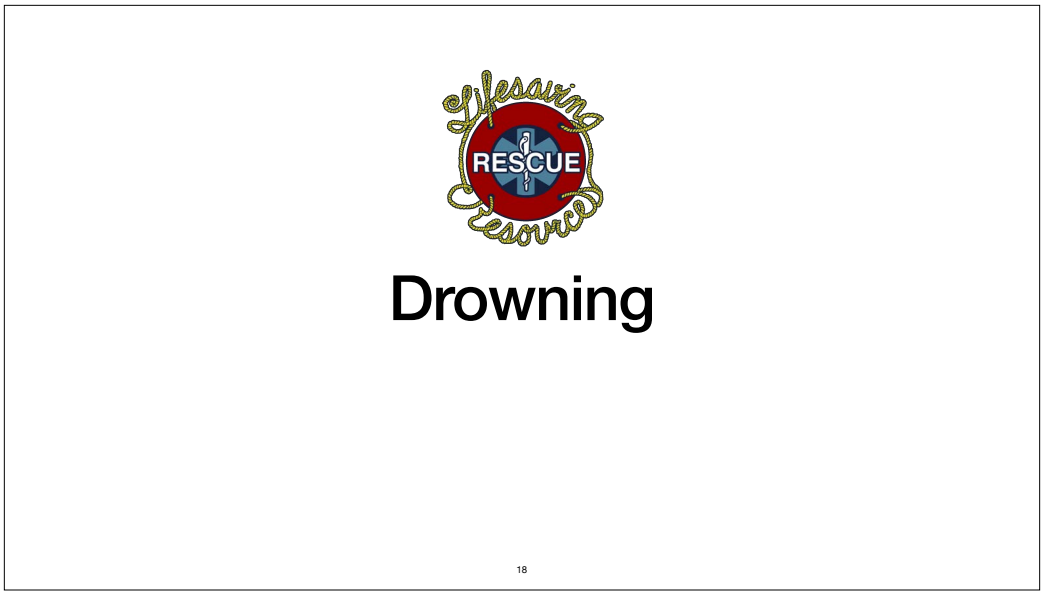
Summary….
Questions?…..



DROWNING is a significant health concern within this country, as well as throughout the world. This section will discuss the incidence of drowning, as well as the Mechanisms and Physiology of Drowning and EMERGENCY RESUSCITATION PROTOCOLS.

Definitions

Drowning: The process of experiencing respiratory impairment from submersion or immersion in liquid. Drowning outcomes are classified as death, morbidity or no morbidity.

Immersion: Airway remains above the surface.

Submersion: Airway goes below the surface.

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DROWNING is defined as the process of experiencing respiratory impairment from either submersion or immersion in liquid and the outcomes are classified as death, morbidity (neurological impairment), or no morbidity.

IMMERSION means the airway remains above the surface, while SUBMERSION refers to when the airway goes below the surface.

Drowning Statistics

- 7th leading cause of unintentional injury deaths for people of all ages.
- 2nd leading cause of unintentional injury deaths for children 1 - 14 years of age.
- 3rd leading cause of death for children 0 - 4 years of age.
- 6 - 10 times more people suffer brain damage than death from non-fatal submersion incidents.
- Males drown at a rate 4x greater than females.
- Minority populations drown at a rate 2x greater than caucasians.
- 6,000 - 7,000 drownings annually.
- 50% - 67% of adult drownings are alcohol or drug-related.

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This slide shows the incidents of drowning by age group. Notice the first 2 bullets refer to unintentional injury deaths, while the 3rd bullet shows that drowning is the leading cause of death, from all causes, within the 0 - 4 age group. Males drown at a greater rate than females because they are the risk takers. Minorities drown at a higher rate than others due to the lack of socio-economic opportunity to learn to swim. And, a large percentage of teen and adult drownings are alcohol or drug-related.

The Drowning Process

- Struggle
- Aspirate water into airway
- Ingest water into stomach
- Laryngospasm
- Hypoxia
- (Aspirate water into lungs)
- Unconsciousness
- Respiratory arrest
- Cardiac arrest

21

When victims enter the water, if they are unable to swim, float or support themselves in the water they will typically struggle at the surface of the water for 20 - 60 seconds before they submerge or lose consciousness. During the STRUGGLE, they will aspirate water into their airway and ingest water into their stomach which reduces their buoyancy. Their airway will become compromised when they experience a LARYNGOSPASM. And, as a result of inadequate oxygenation, the victim becomes HYPOXIC. Unless the victim's airway is out of the water, they will be in RESPIRATORY ARREST and then deteriorate into CARDIAC ARREST. At some point, the laryngospasm will relax and the victim will involuntarily aspirate water into his lungs.

Survival Factors/Drowning Outcomes

Factors that contribute to drowning and/or determine outcomes

- Aspirated fluid into the lungs
- Dry lungs
- Reflux of undigested food
- Mammalian Diving Reflex
- Hyperventilation induced Hypoxia
- Medical Emergency (i.e. heart attack, stroke, arrythmia)
- Torso Reflex

22

These are some of the factors that will contribute to DROWNING and/or determine OUTCOMES for the patient. ASPIRATED FLUID into the lungs will make resuscitation that much more difficult, especially if the fluid is polluted, chlorinated, etc. DRY LUNGS are those which haven't yet been compromised by fluid. UNDIGESTED FOOD regurgitated into the upper airway may cause a laryngospasm and may obstruct the airway. The MAMMALIAN DIVING REFLEX puts the victim in a suspended animated state and metabolism is reduced, so the need for oxygen is diminished allowing for a greater chance of survival. People may become HYPOXIC from HYPERVENTILATION. A MEDICAL EMERGENCY may debilitate the victim in the water. And, a person whose airway isn't protected when they enter the water may experience a laryngospasm from TORSO REFLEX.

Saltwater *vs.* Freshwater Drowning

90% of drowning cases occur in freshwaters such as lakes, rivers and pools.

When salt water enters the lungs, blood and water from the bloodstream enters the lungs causing the victim to drown in his own fluids.

When freshwater enters the lungs, the water is absorbed into the bloodstream causing damage to the blood leading to cardiac arrest.

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There is no significant difference in the victim's outcome after being submerged in SALTWATER versus FRESHWATER. When the victim aspirates fresh water into the lungs and stomach, the water is absorbed into the bloodstream causing damage to the blood and cardiac arrest. When saltwater enters the lungs, blood and water from the bloodstream enters the lungs causing the victim to drown in his own fluids. Regardless of the type of water, the resuscitation efforts are the same for freshwater or saltwater.

Emergency Resuscitation Protocols

A - Airway
B - Breathing
C - Circulation
D - Defibrillation

24

911 Dispatchers will often provide instruction to the public to administer COMPRESSION-ONLY CPR prior to arrival of First Responders. However, drowning is a HYPOXIC event in that the onset of cardiac arrest resulted from suffocation (hypoxia). Therefore, OXYGENATION (positive-pressure-ventilation) of the patient, in combination with CHEST COMPRESSIONS, is critical for a good outcome. Therefore, BASIC LIFE SUPPORT (BLS) CPR includes Airway, Breathing, Circulation and Defibrillation. And, the higher the OXYGEN concentration administered during the resuscitation effort, the better the chance for a better outcome for the patient. Therefore, POSITIVE-PRESSURE-VENTILATION should be administered via the use of a BVM with supplemental oxygen whenever possible.

Mitigate Drowning

Standard of Care

A. Prevention Strategies

B. Early Recognition

C. Effective Management

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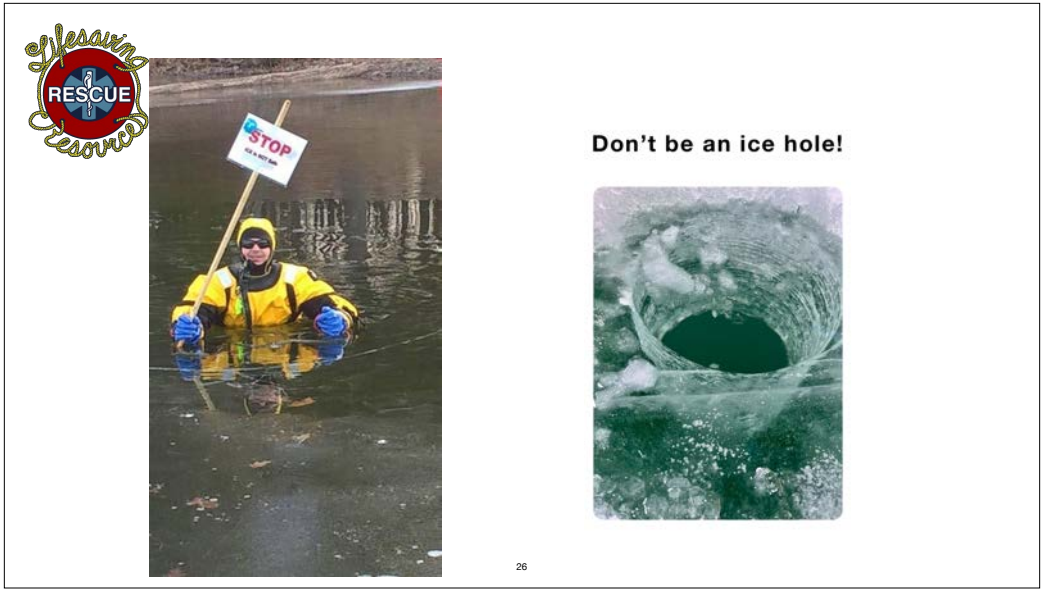
In order to MITIGATE (eliminate) DROWNING in any community, the STANDARD OF CARE includes (A) strategies to PREVENT drowning through education and posting warnings; (B) the ability to RECOGNIZE the incident at its onset, as well as its potential; and (C) the rapid and effective MANAGEMENT of the incident, as well as its potential.



Humor: Don't be an Ice Hole. Lifesaving Resources advocates: NO ICE SHOULD EVER BE CONSIDERED AS SAFE ICE! Be sure the ice is strong enough to support you and others before venturing out.

Review Questions

1. The Standard of Care to mitigate drowning includes 3 elements:
2. Airway above the surface:
3. Airway below the surface:
4. When the airway closes in a reflex spasm:
5. When a victim is submerged in cold water, the body's metabolism is reduced, and the need for oxygen is diminished:
6. When the body is suddenly immersed in cold water:
7. In order to prevent this, individuals should do what when entering the water:
8. Emergency resuscitation protocols for a drowning victim includes:

1. The Standard of Care to mitigate drowning includes 3 elements: Prevention, Recognition, Management
2. Airway above the surface: Immersion
3. Airway below the surface: Submersion
4. When the airway closes in a reflex spasm: Laryngospasm
5. When a victim is submerged in cold water, the body's metabolism is reduced, and the need for oxygen is diminished: Mammalian Diving Reflex
6. When the body is suddenly immersed in cold water: Torso Reflex
7. In order to prevent this, individuals should do what when entering the water: Cover your mouth & nose
8. Emergency resuscitation protocols for a drowning victim includes: A B C D

Train like your life depends on it - because, it does!

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Summary….
Questions?…..

Cold Water & Hypothermia

This section will deal with COLD WATER SURVIVAL as well HYPOTHERMIA prevention, recognition and management.

Cold Water Kills

Cold water = water temperature less than 70 degrees F. (21.1 degrees Celsius)

- Body cools 25 - 30 times faster in cold water than in air
- Within 10 - 15 minutes, core body temperature drops as blood is shunted to the core from the extremities and the person loses strength, coordination & dexterity in and use of extremities.
- As body continues to cool, person becomes confused, and eventually loses consciousness & drowns

30

COLD WATER is considered anything less than 70 degrees F. (21.1 degrees Celsius). While immersed in cold water, the body will cool 25 - 30 times faster than in air. While immersed in cold water, the body's internal protective mechanisms shunts blood from the extremities to the core which results in a loss of strength and coordination in the use of extremities. The patient will also be confused, will lose consciousness and will drown if unable to support himself on the ice shelf or if not wearing a lifejacket designed to turn the victim over and protect his airway.

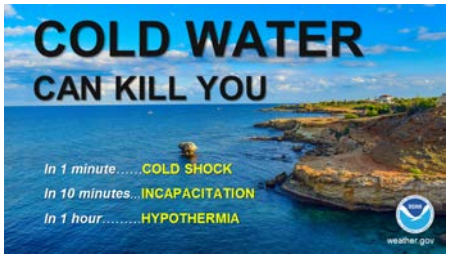
1:10:1 Rule

Cold Water Shock

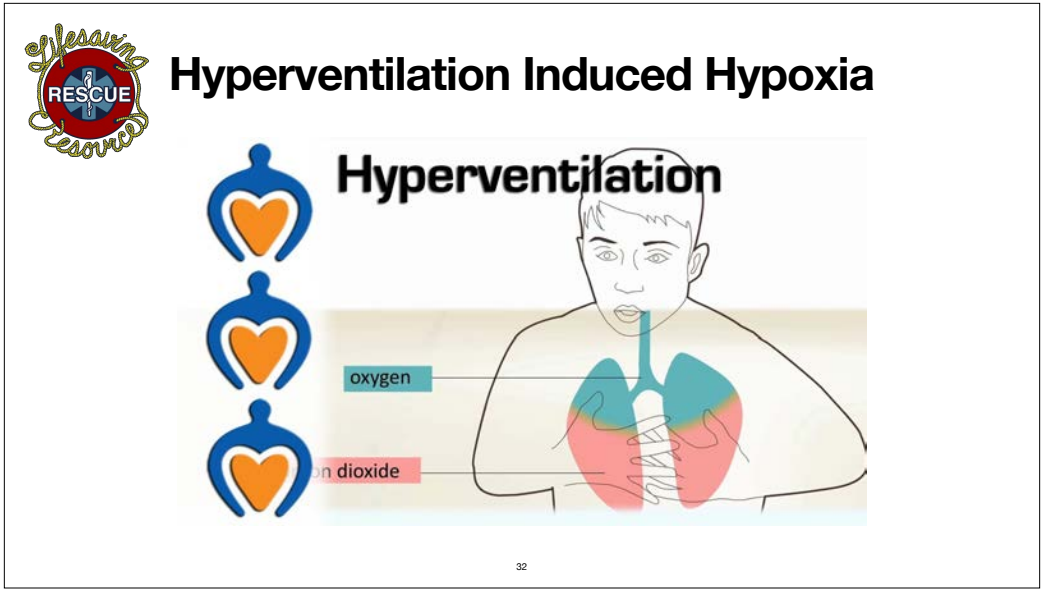
1 minute to get your breathing under control

10 minutes of *purposeful movement* before you are unable to perform *self-rescue* or assist in your own rescue

1 hour before you succumb to hypothermia



The 1:10:1 RULE means that when suddenly immersed in cold water, you have 1-minute to get your breathing under control. You have 10-minutes to perform a self-rescue before you lose strength and coordination in your extremities. And, you have approximately 1-hour before you succumb to hypothermia.



The cold water immersed victim may hyperventilate which can result in HYPERVENTILATION INDUCED HYPOXIA. As a result of blowing off CO2, the instinct to breathe is compromised and the victim can be rendered unconscious resulting in his drowning. First arriving units should encourage the victim to control and slow down his breathing.

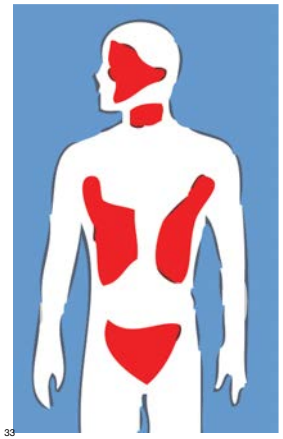
High Heat-Loss Areas of the Body

Head

Neck

Sides of chest

Groin

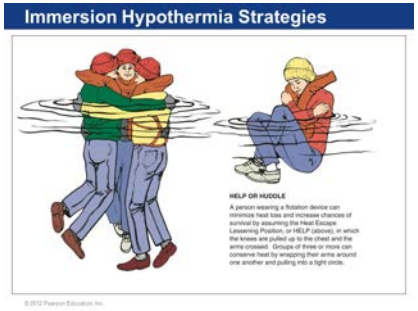


33

The HIGH HEAT-LOSS AREAS of the body are the head, neck, sides of the chest and the groin area. Anything that can be done to insulate these areas will reduce heat loss. At the same time, during the treatment of a hypothermic patient, serious consideration and effort should be made to prevent heat loss from those areas of the body.

Cold Water Survival Factors

- Water temperature
- Protective clothing
- Body size
- Percentage of body fat
- Children & elderly cool faster than younger adults
- Movement in/of the water
- Struggling increases heat loss by 30%



34

SURVIVAL in COLD WATER is dependent upon a number of factors including water temperature, body size, percentage of body fat, the protective clothing the person is wearing, and the person's behavior in the water. Children and the elderly cool faster than younger adults. Movement in the water, such as swimming or struggling, will increase heat loss by as much as 30%. And, immersion in moving water, such as a river, will increase heat loss as well. The best way to conserve heat while immersed in cold water is to assume the HELP (Heat Escape Lessing Position) or HUDDLE position with minimal movement.

Prevention of Torso Reflex

35

When entering cold water, whether on purpose or by falling in, protect your airway to prevent TORSO (GASP) REFLEX by covering your mouth and nose with your hand. If your airway is unprotected, when you inadvertently gasp, you will aspirate cold water into your airway.

Wind Chill

Wind increases loss of body temperature as it blows across the person

The presence of wind increases the transfer of heat away from the person's body

If the person is wet, heat loss may be accelerated by as much as 25 times

WIND CHILL is a term used to describe what the air temperature feels like to the human skin due to the combination of temperature and wind blowing on exposed skin. In simple terms, the colder the air temperature and the higher the wind speeds the colder it will feel on your skin while outdoors.

Hypothermia

Normal body temperature is 98.6 degrees F. (37 degrees Celsius).

Hypothermia is a medical emergency that occurs when body loses heat faster than it can produce heat, causing a dangerously low body temperature.

When body temperature drops, the heart, nervous system & other organs cannot work normally.

37

Normal body temperature is 98.6 degrees F. (37 degrees Celsius). HYPOTHERMIA is a medical emergency that occurs when the body loses heat faster than it can produce heat, causing dangerously low body temperature. When the body temperature drops, it affects your heart, nervous system and other organs.

Causes of Hypothermia

Being outside without enough protective clothing in cold weather

Cold water immersion

Wearing wet clothing in windy or cold conditions

Heavy exertion while in a cold environment

Malnutrition and/or dehydration

There are numerous causes of HYPOTHERMIA. Heavy exertion in a cold environment, as well as malnutrition and/or dehydration will contribute to the onset of hypothermia as well. It is critical to recognize the early signs of hypothermia and take immediate action to mitigate the problem. Extricate the victim from the water, insulate the victim from the cold, and get the patient to shelter and warmed up as soon as possible.

Mild Hypothermia

95 degrees F (35 C.) to 89.5 degrees F (31.9 C.)

Uncontrolled shivering

Loss of fine motor function

Cold diuresis (blood vessels constrict to reduce blood flow to the skin and shunts warm blood around internal organs)

Normal to elevated vital signs

39

Signs of MILD HYPOTHERMIA include uncontrolled shivering, loss of fine motor function, constriction of the blood vessels in the extremities as blood is shunted to the core, and normal to elevated vital signs. Recognition of these signs is critical and immediate action must be taken to prevent additional heat loss and to get the patient into shelter and re-warmed as soon as possible.

Moderate Hypothermia

89.5 degrees F. (31.9 C.) to 82.5 degrees F. (28 C.)

Shivering decreases and eventually stops

Altered level of consciousness, confusion & lethargy

Slurred speech

Bradycardia & respiratory depression

Cardiac dysrhythmias

Loss of consciousness

40

During MODERATE HYPOTHERMIA, the body can no longer generate heat as shivering decreases and eventually stops. The patient will show signs of an altered level of consciousness, confusion and lethargy, along with slurred speech. The heart rate will slow (bradycardia) and the respiratory system becomes depressed. The patient may have cardiac dysrhythmias (changes in the rate or rhythm of the heartbeat). And, patient will eventually lose consciousness.

Severe Hypothermia

82.5 degrees F (28 C.) and below

- Muscle rigidity
- Vital signs reduced or absent
- Patient appears to be deceased
- Build-up of acids in muscles
- Cardiac arrest

Prolonged resuscitation is warranted.
Nobody is dead until warm and dead

41

In SEVERE HYPOTHERMIA, the victim appears to be dead with signs of muscle rigidity, absent vital signs, and cardiac arrest. Prolonged resuscitation is warranted and the patient should never be pronounced dead until he has been warmed and still shows no signs of life.

Management of Hypothermia

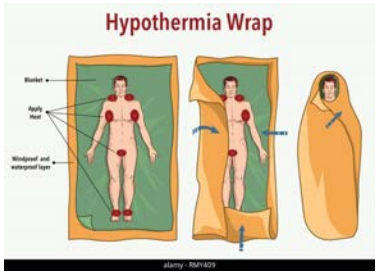
Provide *shelter* in warm environment & remove wet clothing

Insulate from cold, including high heat-loss areas of the body

Apply *warm compresses* to neck, chest wall & groin

If patient is alert & can swallow, give warm, sweetened, non-alcoholic fluids

Medical attention



42

Get the victim out of the cold and into shelter as soon as possible and remove wet clothing. Insulate the victim from the cold including the high-heat-loss areas of the body (head, neck, sides of chest and groin). If possible, apply warm compresses to these areas. If the patient is alert and can swallow, give him warm, sweetened, non-alcoholic fluids. And, get the patient medical attention. The HYPOTHERMIA WRAP is an excellent tool used to insulate and warm the patient.

Management of Severe Hypothermia

Monitor patient's respiratory & cardiac rates

Minimize rough handling to prevent arrythmias

Keep patient supine to avoid hypotension

Prolonged resuscitation is warranted. Nobody is dead until warm and dead

43

The patient's respiratory and cardiac rates should be monitored. During rescue and transport, minimize rough handling in order to prevent ARRYTHMIAS (a problem with the rate or rhythm of the heart). During rescue and transport, keep the patient supine to avoid HYPOTENSION (low blood pressure). Remember, prolonged resuscitation is warranted and the patient should never be pronounced dead until he has been warmed and still shows no signs of life.

Review Questions

1. Cold water is considered as less than____ degrees F or ____ degrees C.
2. The body cools ___ - ___ times faster in cold water than in air.
3. The 1:10:1 rule means you have 1 minute to get your under control; 10 minutes of _____ _____ for self-rescue; and 1 hour before you succumb to _____.
4. The high heat-loss areas of the body include:
5. In order to prevent Torso Reflex, you should _____ your mouth and nose while entering the water.

1. Cold water is considered as less 70 degrees F or 21.1 degrees C.
2. The body cools 25 - 30 times faster in cold water than in air.
3. The 1:10:1 rule means you have 1 minute to get your breathing under control; 10 minutes of purposeful movement for self-rescue; and 1 hour before you succumb to hypothermia.
4. The high heat-loss areas of the body include: head, neck, sides of chest and groin.
5. In order to prevent Torso Reflex, you should cover your mouth and nose while entering the water.

Don't just train until you get it right...
Train until you can't get it wrong!

45

Summary….
Questions?…..

Ice Formation & Safety

This section addresses ICE FORMATION and SAFETY PROTOCOLS.

Ice Formation

Ice forms from below and the ice shelf relies on the water below it for support

Ice forms along the shoreline & shallow water first

Deeper water takes longer because the entire depth needs to become isothermal

47

ICE FORMATION is dependent upon the water below it for support. Ice first forms along the shoreline & shallow water. Ice formation in deep water takes longer because the entire depth needs to become isothermal. However, as ice begins to deteriorate, the ice along the shoreline becomes compromised before the ice in deeper water.

Safe Ice?

NO ICE should ever be considered as SAFE ICE!

48

Lifesaving Resources advocates that NO ICE should ever be considered as SAFE ICE! Just because the ice is clear and strong in one area, doesn't mean it is not compromised in another section, especially if there are rocks or tree stumps, moving water, congregation of fish or birds, etc.

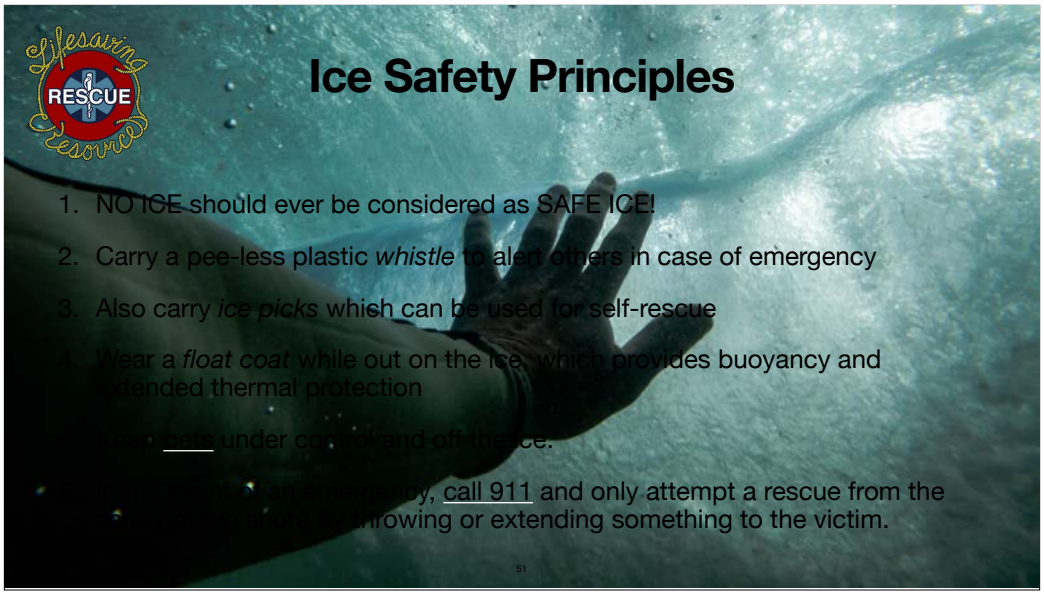
Minimum Ice Thickness

for new, clear, hard ice

49

These are recommendations for new, clear, hard ice. If the ice is in the process of forming and becomes snow covered, the snow acts to insulate the ice from further forming. And, ice that has been thawed, then re-frozen, although it may be 12” or more thick, probably only has the integrity of 4” of ice.

Should you fall through the ice, immediately cover your mouth and nose with your gloved or bare hand in order to prevent torso (gasp) reflex. Then, turn in the direction you just came from as you know the ice was strong enough to support you. Then get into a horizontal position and get as much of your body up onto the ice shelf as you can, while letting the water drain from your clothing. If you are carrying ice picks, now would be a good time to use them. While doing so, kick your feet as if you were swimming while pulling yourself up and onto the ice. And, once on the ice, do not stand up. Stay flat and roll away from the hole. And, when on solid ice, keep your weight distributed as you crawl back off the ice.



Lifesaving Resources advocates these ICE SAFETY PRINCIPLES.

Lifesaving Resources

Ice Safety Public Service Announcement

The following Public Service Announcement (PSA) video demonstrates each of these principles.

Review Questions

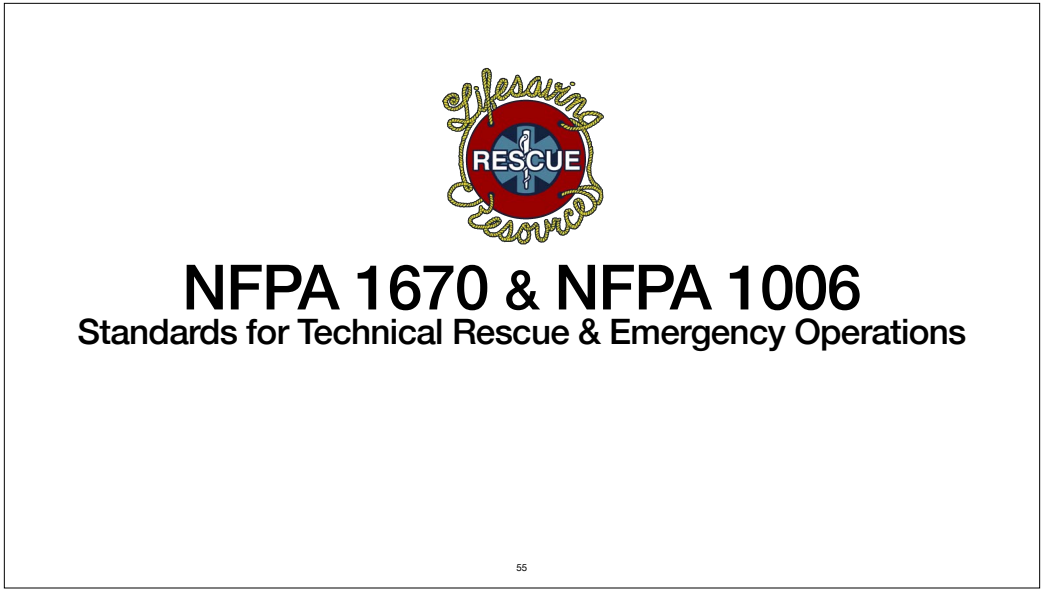
1. Ice forms along the shoreline and deep or shallow water first?
2. Minimum ice thickness of new, clear, hard ice for 1 person is:
3. No ice should ever be considered as _____ ice.

1. Ice forms along the shoreline and deep or shallow water first? Shallow
2. Minimum ice thickness of new, clear, hard ice for 1 person is: 4"
3. No ice should ever be considered as safe ice.

These things we do,
so others may live

54

Summary….
Questions?…..



Even if your department/agency is not NFPA compliant, the Standard of Care by which departments are measured is evaluated based on NFPA standards. This section looks at NFPA STANDARDS FOR TECHNICAL RESCUE.

Threat Assessment

Hazard + Risk = Danger

Identify *Target Hazards*

Recognize activities that place persons at heightened *risk*

The goal is to reduce or eliminate the danger:

- Pre-plan the *Target Hazard*
- Remove or warn of the *hazard*/*danger*
- Safeguard or prohibit the *risk*

The AUTHORITY HAVING JURISDICTION (AHJ) should conduct a THREAT ASSESSMENT within his jurisdiction in order to identify the HAZARDS and RISKS that exist in and around water venues. And, strategies should be developed to mitigate the hazards by removing them or warning the public of them. And, when possible, risk needs to be either safeguarded or prohibited. The combination of HAZARD + RISK = DANGER!

NFPA 1670

Standards for Technical Rescue

AHJ Responsibilities

- AHJ to *conduct Threat Assessment*
- Determine *level* of *operational capability* required
- *Develop operational protocols* (ERPs, SOPs/ SOGs)
- *Plan* for the incident
- *Train* for the incident
- Acquire the *resources* required to safely & effectively *respond* to & *manage* the incident

57

Regardless of whether or not your department is NFPA compliant, the NFPA standards are considered to be the STANDARD OF CARE. In the event there is a significant ice rescue or recovery incident within your jurisdiction, the public and the courts will evaluate your response against the NFPA standards. NFPA 1670 advocates that the Authority Having Jurisdiction (AHJ) conduct a Threat Assessment to determine the Target Hazards within that jurisdiction. The AHJ must then determine the level of OPERATIONAL CAPABILITY required of and obtain training for his personnel. The AHJ must develop OPERATIONAL PROTOCOLS, including SOPs or SOGs, and Emergency Response Plans. And, the AHJ must then PLAN for, TRAIN for, and acquire the RESOURCES required to respond to and manage the incident.

NFPA 1006

Standard for Technical Rescue Personnel Qualifications

Qualifications and requirements for individual responders

More guidance on specific skills

Skills and knowledge required to operate as a team member

58

NFPA 1006 is directed at the qualifications and requirements for personnel. Regardless, once personnel have been trained at a certain level, plans must be put in place to regularly review and assess their skills and knowledge.

Incident Pre-Plans

Identify Target Hazards

Develop Pre-Plans

- SOPs/SOGs
- Emergency Response Plans

Eliminate/Reduce the Danger

- Mitigate *hazards*
- Safeguard/prohibit *risks*

59

Incident PRE-PLANS, including SOPs or SOGs, should be developed for each identified TARGET HAZARD. Besides developing pre-plans or EMERGENCY RESPONSE PLANS (ERPs), prevention strategies should be developed in an effort to prevent the incidents from occurring.

Personnel

Develop pre-incident management and Emergency Response Plans (ERPs)

Develop Standard Operating Procedures/Guidelines (SOPs/SOGs)

Train & equip personnel with appropriate PPE & specialized rescue equipment

60

PERSONNEL need to be appropriately trained and equipped to rapidly, safely and effectively respond to and manage incidents. They should be knowledgeable of the pre-plans (Emergency Response Plans) for each aquatic venue, and they should be provided with and understand the department SOPs or SOGs specific to water and ice rescue incidents. Appropriate PPE and specialized rescue equipment should be obtained based on the Threat Assessment.

Multiple-Casualty Incident

This is a video of an incident that occurred in California. What started out as a single person through the ice escalated to multiple victims by the time First Responders arrived on scene.

Ice Rescue Awareness Level

- Assessment of the incident
- Size-up of existing/potential conditions
- Identification of resources required/available
- Implementation of Emergency Response Plans (ERPs)
- Establish Incident Command - site control & scene management
- Recognition of general hazards
- Determine Rescue vs. Recovery

62

All personnel should be trained at the AWARENESS Level. By the conclusion of this training, they should be able to establish INCIDENT COMMAND at the scene of an ice or cold water incident; determine whether this is a RESCUE vs. RECOVERY mission; and initiate the RESPONSE to and MANAGEMENT of the incident.

Ice Rescue Operations Level

- Awareness level responsibilities
- Shore-based rescue operations
  - Extension (reach) rescues
  - Throwing rescues
- Support & assist Technician level (Rescue Swimmers) personnel
  - Preparing & staging equipment
  - Donning ice rescue suits
  - Rigging lines
  - Manning shore-based tether lines
  - Boat operations

63

Personnel trained at the OPERATIONS Level should also be able to perform shore-based rescue operations, man tether lines, and assist Rescue Swimmers in the event a GO Rescue is required.

Ice Rescue Technician Level

- Awareness & Operations level responsibilities
- Self-rescue
- Go Rescues (Rescue Swimmer)
- Use of specialized equipment

64

Personnel trained at the TECHNICIAN level must be able to perform self-rescue; be comfortable in and approved Ice Rescue Suit; be able to propel themselves through the water; and, be capable of performing GO Rescues, including the use of specialized equipment.

65

And, here is another example of Murphy's Laws at its best. 1: If it can go wrong, it will. 2: When it occurs, it occurs at its least opportune time. And, 3: Mother Nature is a bitch! It also demonstrates how an incident can quickly escalate into a multiple casualty incident (MCI).

Review Questions

1. AHJ stands for?
2. The purpose of a _____ _____ is to identify physical hazards and to determine those activities that may place the public at heightened risk.
3. The AHJ must then determine the level of _____ _____ required of its personnel.
4. And, the AHJ must then develop _____ _____ for his/her personnel.

1. AHJ stands for? Authority Having Jurisdiction
2. The purpose of a Threat Assessment is to identify physical hazards and to determine those activities that may place the public at heightened risk.
3. The AHJ must then determine the level of Operational Capability required of its personnel.
4. And, the AHJ must then develop Operational Protocols for his/her personnel.

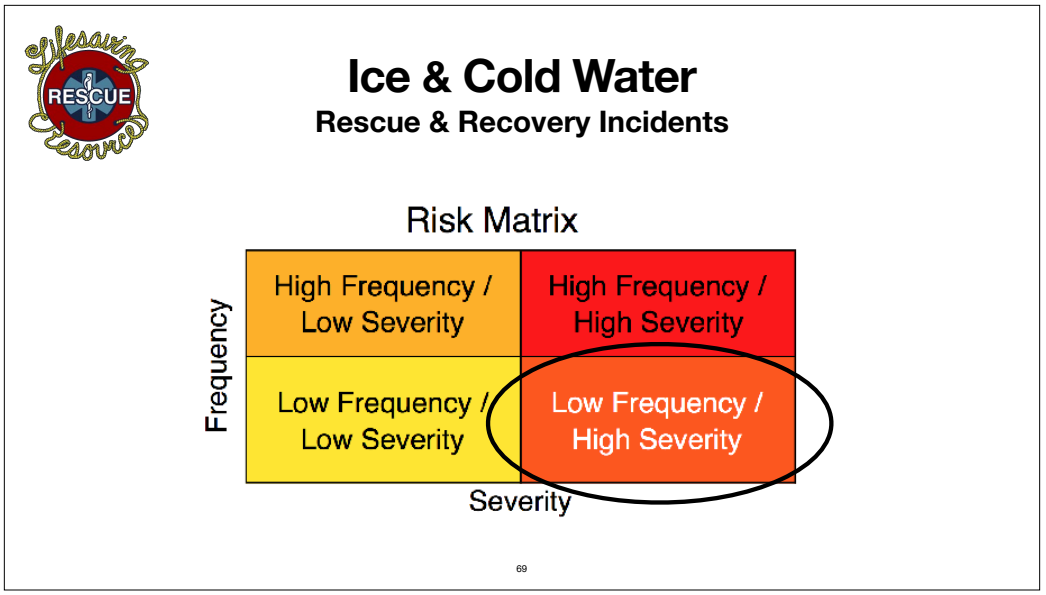
Service is the price you pay
for the space you occupy on earth!

67

Summary….
Questions?…..

Operations & Incident Management

This section will focus on OPERATIONS and INCIDENT MANAGEMENT principles and protocols.



Ice and Cold Water Rescue or Recovery Incidents are low frequency, but high severity incidents. They don't happen frequently, but when they do, they place rescue personnel at heightened risk. And, these incidents can escalate rapidly into multiple casualty incidents.

Rescue Priorities

1. The safety of the Rescue Swimmer
2. The safety of all other rescue personnel
3. The safety of witnesses, family members & friends of the victim
4. The victim

70

Like anything else we do in Rescue, our first priority is our own personal safety. Our 2nd priority is the safety of all other rescue personnel. We also need to be concerned about the safety of witnesses, family members and friends (3rd priority) on scene and we need to prohibit them from putting themselves at risk. Our final priority (4th priority) is that of the victim. However, we need to have all the SOPs/SOGs, PPE, ERPs (Emergency Response Plans), EAPs (Emergency Action Plans) and rescue equipment in place and readily available in order to rapidly intervene and perform the rescue or recovery.

Pre-plans

- Standard Operating Procedures (SOPs) or Guidelines (SOGs)
- Emergency Response Plans (ERPs)
- Personal Protective Equipment (PPE)
- Rescue Equipment

PRE-PLANS for TARGET HAZARDS must be developed based on the THREAT ASSESSMENT. These pre-plans would include appropriate SOPs/SOGs, Emergency Response Plans (ERPs), PPE, and specialized Rescue Equipment needed.

Incident Command

Operational plans (SOPs & ERPs)

On-scene assessment

- Situation
- Victim's physical & emotional condition
- Personnel & equipment resources available and/or required

Rescue

72

We need to pre-plan for incidents around our water venues and personnel need to be familiar with those plans, including the SOPs/SOGS and ERPs. Upon arrival, the first arriving unit needs to immediately establish INCIDENT COMMAND, perform an immediate ON-SCENE ASSESSMENT, evaluate the victim's physical & emotional condition, and determine the personnel & equipment resources that will be required to effect the rescue or recovery. Then, the RESCUE sequence should be initiated.

Hazards/Risks

Critical heat loss & hypothermia

- Victim
- Rescue Swimmers
- Line tenders & support personnel

Torso Reflex

Tethering rescuer from shore

73

The INCIDENT COMMANDER (IC) must consider the safety of his/her personnel to include the Rescue Swimmers, as well as line tenders and other support personnel. Exposure to cold water and weather can result in CRITICAL HEAT LOSS and HYPOTHERMIA for rescue personnel, and especially the victim. Rescue personnel must be knowledgeable about identification of hypothermia and prevention of TORSO REFLEX while entering the water. And, all personnel need to be appropriately TETHERED to shore, but should not be tethered to any motorized equipment.

The Rescue Process

Scene Size-up

- *Recognize* the danger of the situation to the victim, as well as rescue personnel
- *Assess* all rescue options based on resources available

Ensure adequate personnel, equipment & resources

Act to effect the rescue/recovery

- Implement primary & back-up plans

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After establishing INCIDENT COMMAND, the RESCUE PROCESS starts with the scene size-up by the first arriving unit. That size-up should include the recognition of the hazards and risks to the victim, as well as rescue personnel, and all rescue options should be assessed based on the resources available. Once adequate personnel, equipment and other resources are ready, we need to ACT to effect the rescue or recovery.

Scene (Assessment) Size-Up

Assess the victim's physical & emotional condition

- Can you communicate with the victim?
- Can the victim self-rescue or assist in his own rescue?

Gain as much intel as possible from the victim & scene

Provide shore-based rescue/assist prior to deploying rescue swimmers

If victim submerges, identify the last seen point (LSP) & initiate underwater search & rescue

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Immediately ASSESS the victim's physical and emotional condition to determine whether or not you can instruct them to SELF-RESCUE or whether or not they can assist in their own rescue. You also need to gain as much INTEL as you can to determine whether or not there are additional victims or additional hazards. Prior to deploying Rescue Swimmers, determine whether a shore-based rescue can be performed. And, if the victim submerges, identify the POINT LAST SEEN & initiate underwater search & rescue. (Note: if the water depth is 10', the victim should be within 20' of their point of submersion).

WATER

W = Weather & water/ice conditions

A = Access/egress; amount of victims

T = Time of day

E = Equipment & resources required

R = Rescue & back-up plans

76

The following mnemonic identifies the elements of a proper SCENE SIZE-UP and includes (W) the WEATHER/WATER and ice conditions; (A) ACCESS/egress and amount of victims; (T) TIME of day; (E) EQUIPMENT & resources required; and (R) RESCUE and back-up plans.

Recognition

Danger of the situation to victim, bystanders & rescue personnel

Influencing factors of the situation

- Victim's physical & emotional condition
- Environmental conditions
  - Ice condition
  - Water temperature, flow, pollutants, etc.
  - Weather
  - Light remaining
  - Temperature

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The INCIDENT COMMANDER needs to RECOGNIZE the dangers that exist for the victim, bystanders, and rescue personnel and needs to consider the victim's physical & emotional condition, as well as environmental conditions. These include the ice condition, water temperature and flow, the weather, light remaining and whether auxiliary lighting might be required, air temperature, etc.

Act (Perform the Rescue)

Perform lowest risk method of rescue possible

Direct/control bystanders as may be needed

Prepare for EMS intervention

1 Victim
+ 1 Rescuer

2 Patients

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Then ACT to perform the lowest risk method of rescue possible. Use bystanders to assist, if necessary, but be sure they only act under your direction. And, prepare for EMS intervention for the victim(s) as well as rescue personnel who were exposed to cold water and weather.

The Rescue Ladder

Low Risk - High Risk

Talk the victim through self-rescue

Shore-based rescues

- Reach
- Throw

Go Rescues (Rescue Swimmer)

- Walk/crawl
- Wade
- Boat-based
- Swim

79

Always attempt the lowest risk method of rescue possible and consider the RESCUE LADDER. (1) Can the victim be talked through self-rescue or can he assist in his own rescue? (2) Can a shore-based rescue be performed by extending something or throwing something to the victim? Or (3) must we deploy RESCUE SWIMMERS, and if so, can they walk/crawl out to the victim, wade in shallow water, perform a boat-based rescue, or must they swim to the victim? A GO Rescue, should only be performed, if the victim cannot be rescued by any other means.

Victim Self-Rescue

Establish verbal & eye contact with victim

Command the victim to stop struggling & control his breathing

Command victim to reach as far onto the ice as he can (get horizontal) while allowing his feet to float

Command the victim to gently kick his feet & use his elbows to push up & onto the ice

80

In order to assess the victim's physical & emotional condition and to determine whether or not the victim can perform a self-rescue or assist in his own rescue, establish verbal & eye contact with the victim. Get the victim to control his breathing in order to prevent him from hyperventilating. Instruct the victim to attempt to swim/climb out of the hole and onto the ice shelf by getting horizontal, kicking his feet, and using his elbows to crawl back onto the ice shelf.

Shore-Based Rescue

Extend or throw something to the victim to assist the victim in remaining afloat or in contact with the ice shelf.

If throwing a line to the victim, instruct the victim to wrap the line around his wrist.

If using an Arm-Loc device, instruct the victim to insert his wrist through the device up to his forearm and then pull the deployment tab.

81

Before deploying rescue swimmers, attempt a SHORE-BASED RESCUE if the victim is within a reasonable distance. Extend or throw something to the victim. If throwing, instruct the victim to wrap the line around his wrist as he will, most likely, be unable to hold onto the line when it is pulled. (If using an Arm-Loc device, instruct the victim to insert his wrist into the device up to his forearm and then pull the deployment tab.)

This video shows a tethered ring buoy that was thrown to the victim from shore while the rescue swimmers were suiting up and preparing to deploy.

The Rescue Swimmer (GO) Team

To provide a safe & effective operation, the team should consist of:

- Rescue Swimmer
- Secondary Rescuer
- Line Tenders

83

The RESCUE SWIMMER (GO) Team should include, at a minimum, 1 Rescue Swimmer, 1 Secondary (back-up) Swimmer, and several Line Tenders. Line tenders should operate from shore whenever possible. But, if they need to operate while on the ice shelf, appropriate PPE and training is absolutely required.

Secondary Rescuer

Provides directional guidance to the Rescuer Swimmer

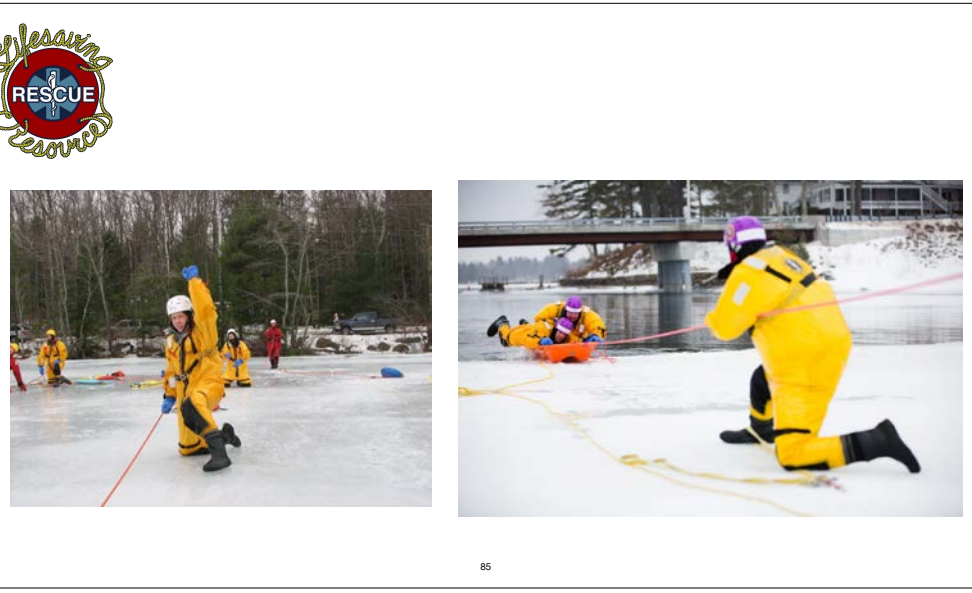
Supervises the rescue process

Backs up & assists the Rescuer Swimmer

Directs the line tenders

84

The SECONDARY RESCUER provides directional guidance to the Rescue Swimmer, supervises the rescue process, and directs the line tenders. The Secondary Rescue should be, if possible, about half-way between the line tenders and the Rescue Swimmer. And, if the Rescue Swimmer needs additional in-water assistance, the Secondary Rescue should tie or clip into the line and enter the water to assist in the rescue.



Should the Rescue Swimmer need more line or need tension on the line, it is the responsibility of the SECONDARY RESCUER to pay out the line or take tension on the line. And, the Secondary Rescuer must be prepared to put the brakes on the line at any time should the Rescue Swimmer experience a problem during the rescue.

Submersion Incident

Avoid breaking the ice around the hole

Mark the point last seen

Activate the dive team & probe the area prior to their arrival

Note: unless there is a swift current, the victim will usually be located within a radius of twice that of the water depth.

86

In the event of a reported SUBMERSION, maintain the integrity of the ice shelf and/or hole in order to identify the point last seen (PLS). Be sure the dive team has been activated; but, while waiting for their arrival, if the ice shelf allows, or if there is a boat available, personnel can probe using pike poles or other specialized equipment. Rescue Swimmers can also float/tread at the surface of the water while probing beneath the surface. Unless there is a swift current, the victim will usually be located within a radius of where they submerged twice that of the water depth. (If the water is 10' deep, the victim should be located within 20' of where they were before submersion).

Rescue Swimmers can also use a mask and snorkel to search for a submerged victim as this video shows them searching and probing the water.

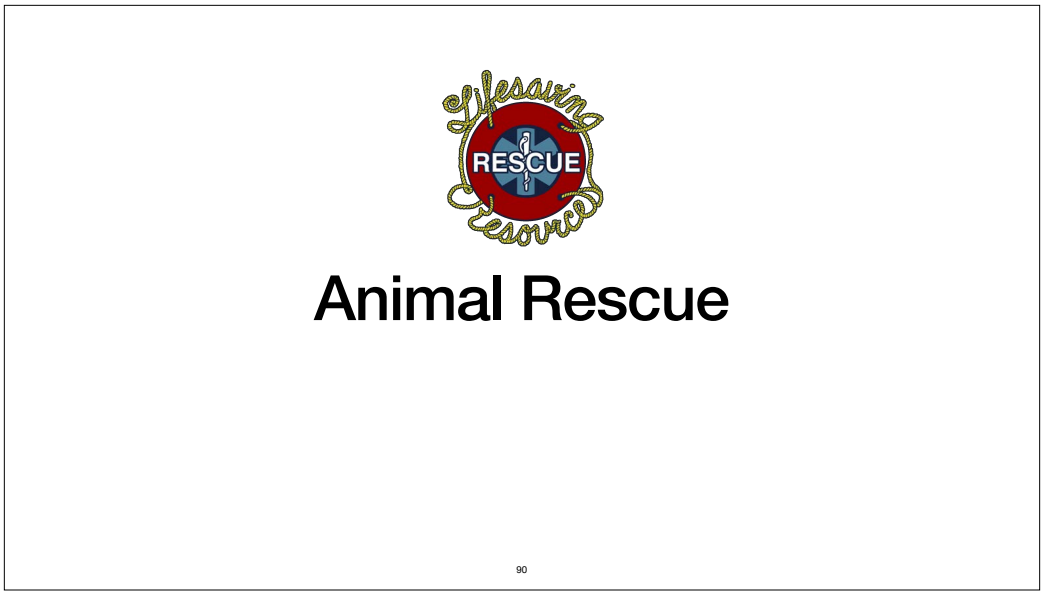
Review Questions

1. Ice Rescue incidents are _____ frequency, but _____ severity.
2. When responding to any incident, your first priority should be:
3. The 2nd priority should be:
4. The 3rd priority should be:
5. And, the 4th priority should be:
6. When responding to an incident, we should attempt to perform the _____ risk method of rescue possible.
7. The Rescue Swimmer (GO) Team includes the Rescue Swimmer, in addition to:
8. When a victim submerges, unless there is significant current, the victim will usually be located within a radius of _____ that of the water depth.

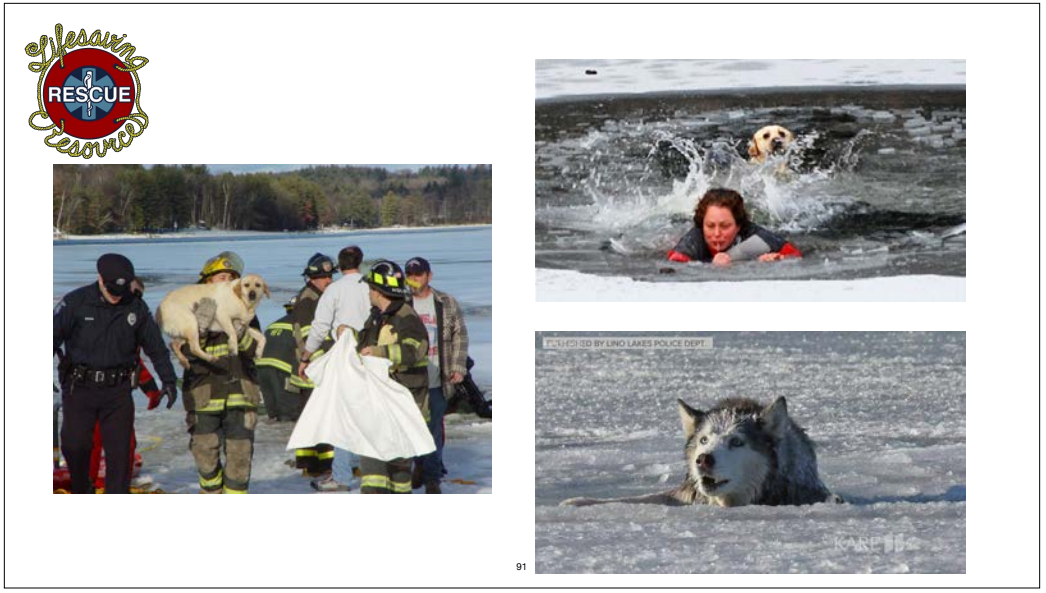
1. Ice Rescue incidents are low frequency, but high severity.
2. When responding to any incident, your first priority should be: your own personal safety
3. The 2nd priority should be: the safety of all other rescue personnel
4. The 3rd priority should be: witnesses, family members & loved ones
5. And, the 4th priority should be: the victim
6. When responding to an incident, we should attempt to perform the lowest risk method of rescue possible.
7. The Rescue Swimmer (GO) Team includes the Rescue Swimmer, in addition to: Secondary Rescuer & Line Tenders
8. When a victim submerges, unless there is significant current, the victim will usually be located within a radius of twice that of the water depth.

Train for the worst...
Hope for the best!

Summary….
Questions?…..



This section deals with small and large animal rescue. Pet owners should be encouraged to keep their pets under leash or voice control and keep them off the ice as many ice emergencies are initiated by an animal in distress while on or through the ice.



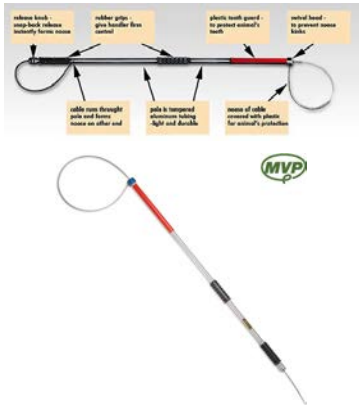
A large percentage of ice or cold water emergencies are initiated because a pet went through the ice and the owners or other good samaritans then got into trouble trying to save them. The animals have claws for self-rescue - humans do not. As a result, in many of these cases, the animals survived, but the humans did not.

92

This video shows the rescue of a Golden Retriever. Remember, we have no idea what is going on in the mind of the animal. We need to protect ourselves in order to prevent the animal from biting or injuring rescue personnel.

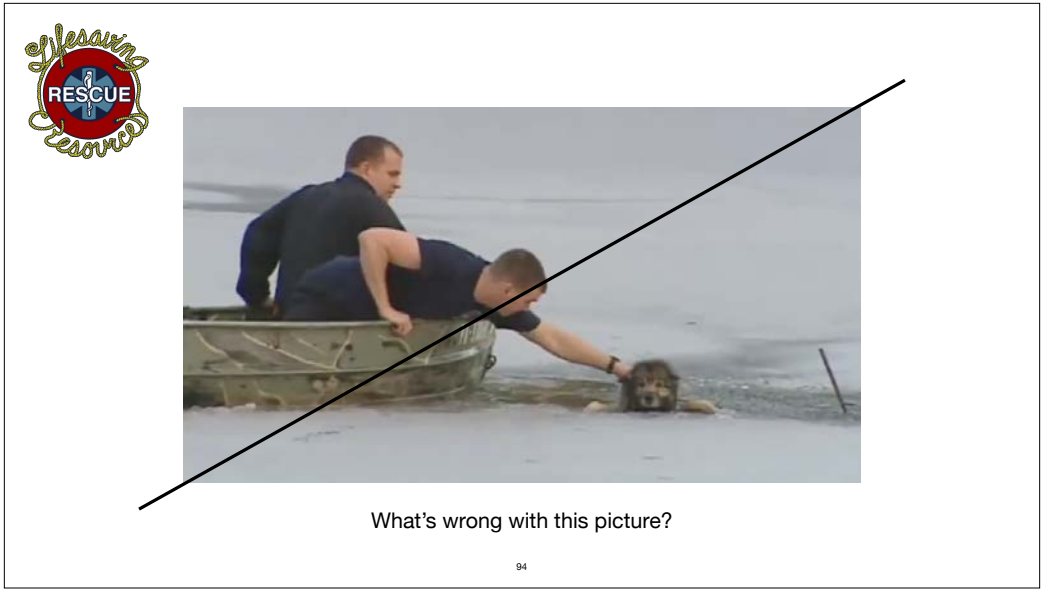
Animal Control Device

Ketch-All



93

ANIMAL CONTROL DEVICES (such as the Ketch-All) are commercially available, or you can improvise and make your own. This device allows the rescuer to maintain control of the animal and away from the rescuer and his equipment. You may want to purchase such a device or speak with your local Animal Welfare agency to request a donation of such a device.



Although we applaud these First Responders for making this rescue, there are a number of things that could have gone wrong. First and foremost, the personnel are not wearing LIFEJACKETS. Should they fall out of the boat or the boat capsizes, the personnel would be thrown into very cold water. Although there may be lifejackets in the boat, a lifejacket is very difficult to don while immersed in cold water. Secondly, they are making direct hand contact with the dog. Should the dog feel threatened or become aggressive, it could bite the First Responder.

What's wrong with this picture?

95

Rescue personnel should keep distance between themselves and the animal using an animal control device/stick. Again, should this dog feel threatened or become aggressive, it could severely injure the First Responder.

We always advocate to spin feet-first at least one body length away from the victim and enter from the side, rather than straight on. Should the ice shelf give way, this rescuer, because he is approaching the animal head first, is putting himself at great risk of getting severely injured.

This is just another example of a domestic animal rescue, although it is a little chaotic.

What's wrong with this video?

98

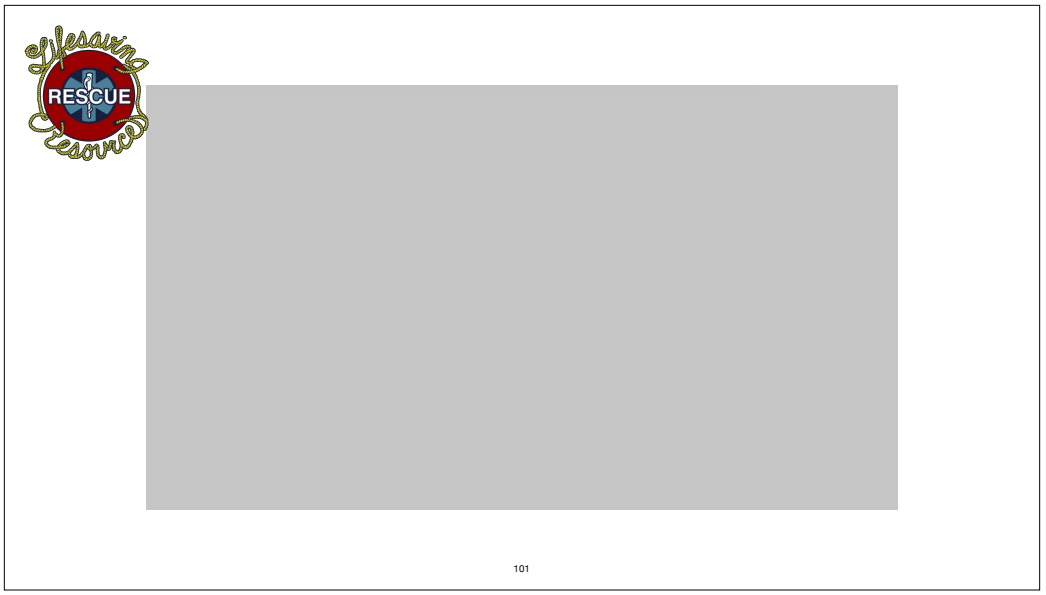
Again, what is wrong with this video? The Rescue Swimmer is making a direct head-on approach.

Large Animal Rescue

Large animals cannot be snared around the neck and pulled from the water as the line will injure the animal. But, rather, cut a path from the animal to shore and allow the animal to walk out on his own.

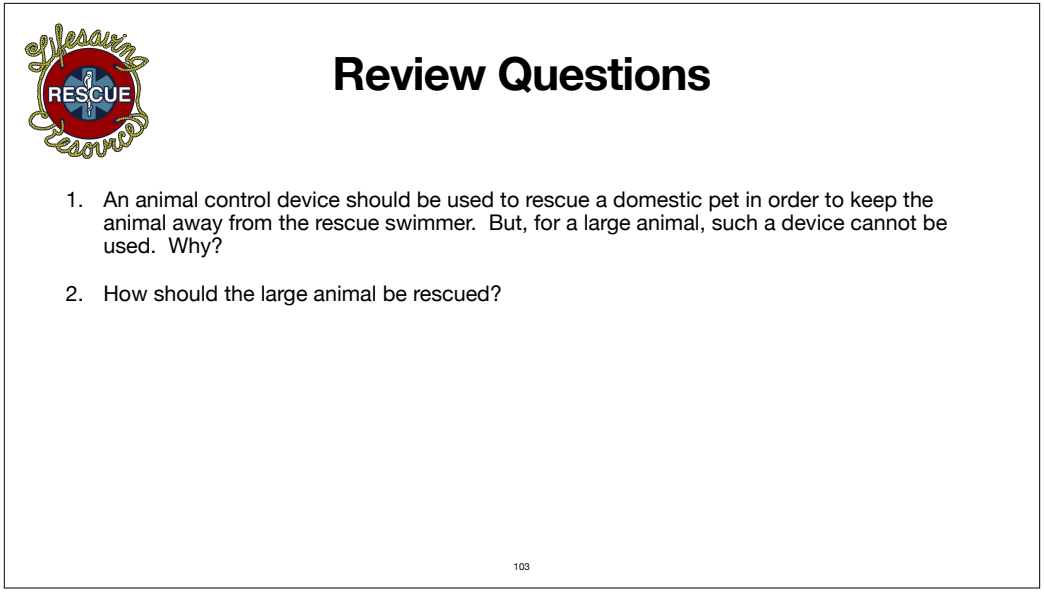
100

Because the animal can’t climb out on his own, using axes and/or chain saws cut a path back to shore for the animal to climb out.



This video shows Firefighters cutting the path for the animal to escape.

Here is an example of a moose rescue.



1. An animal control device should be used to rescue a domestic pet in order to keep the animal away from the rescue swimmer. But, for a large animal, such a device cannot be used. Why? The line around the animal's neck will injure the animal.
2. How should the large animal be rescued? Cut a path for the animal to escape on his own.

There is no greater gratification
than to be part of the saving
of another human being!

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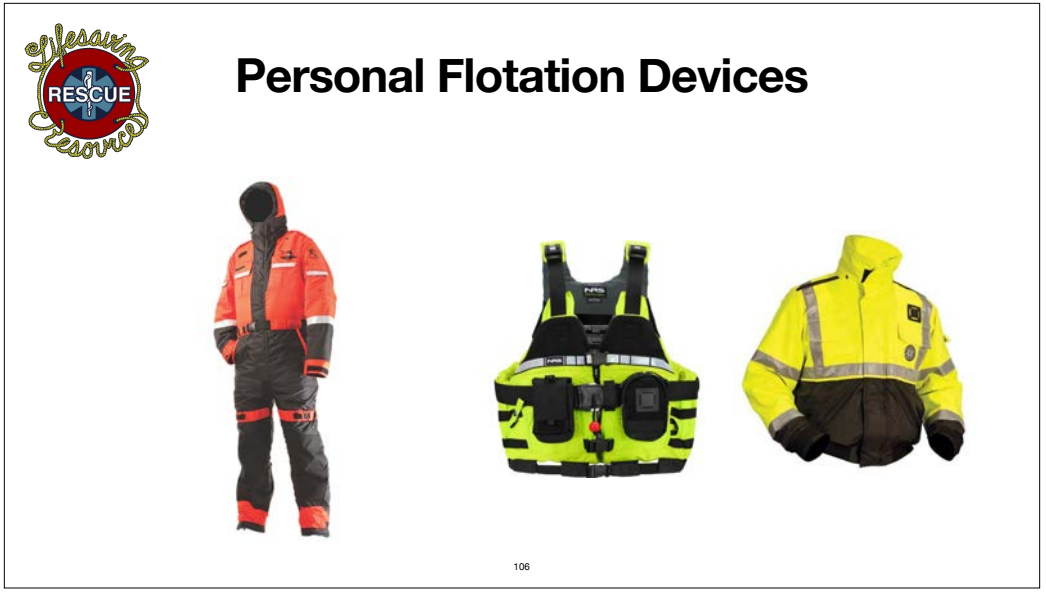
Summary….
Questions?…..

Equipment

This section looks at a variety of equipment for ice and cold water rescue….



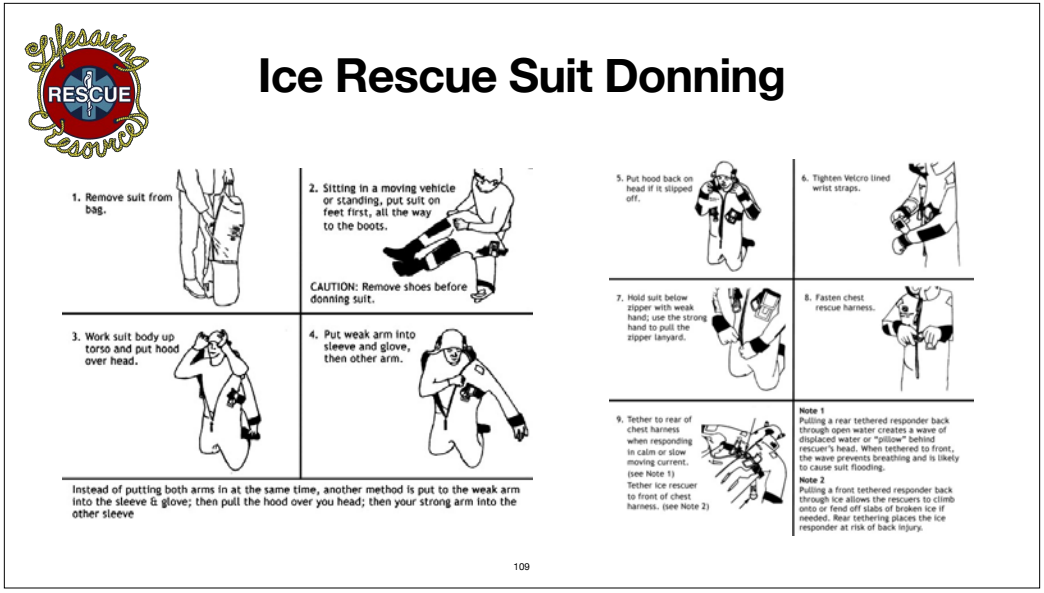
Shore-based and boat-based crews, as well as anyone operating within the Hot or Warm Zones should be wearing a PFD (Personal Flotation Device), if they are not wearing an Ice Rescue Suit. Shown here (left to right) are anti-exposure coveralls, a Type V lifejacket, and a float coat.

Swiftwater Rescue Dry Suit

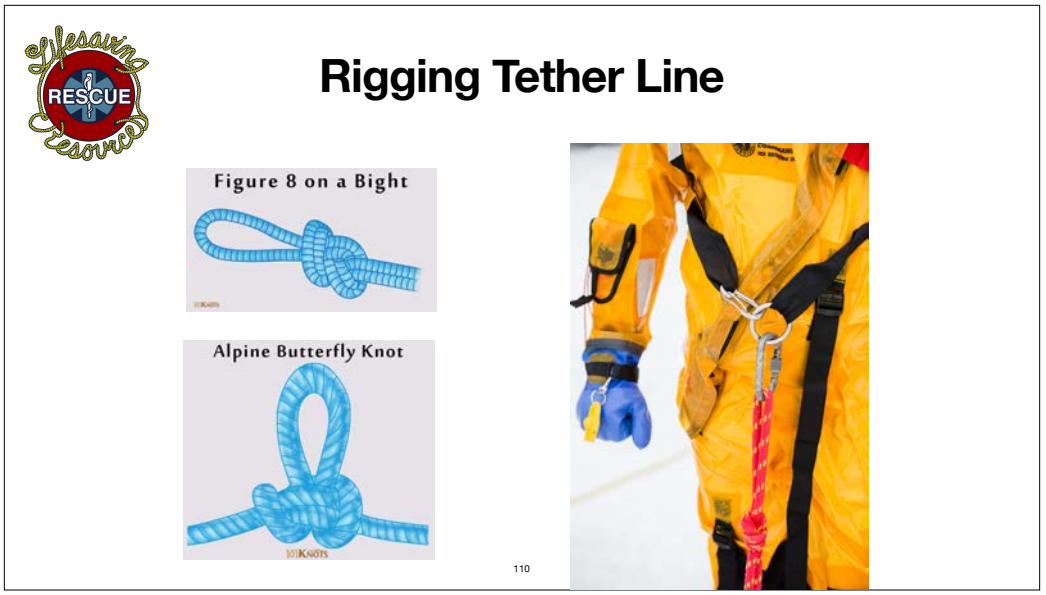
- Dry Suit
- Thermal Insulation
- Gloves
- Boots
- Helmet
- PFD

A SWIFTWATER RESCUE DRY SUIT, with thermal insulation worn underneath, is fine for use during ice and cold water rescue incidents, but not for extended periods as may be required for training purposes. Furthermore, because these suits don't have integral gloves and boots, these need to be added. Boots should have rigid soles. And, because these suits do not have integral buoyancy, a PFD (lifejacket) must also be worn.

There are a number of commercial ICE RESCUE SUITS. The Survitech Imperial Suit is constructed of cordura nylon and has integral internal suspenders. The Stearns neoprene suit is no longer in production, but was an easily-repaired suit because of its design. The First Watch is the latest suit to hit the commercial market. And, the Mustang Survival Suit has two models in use (standard and pro), although the pro model (shown here) is no longer in production. All suits have integral gloves and boots, reinforced knee and elbow pads, an integral hood, and an integral body harness.



This is an excellent opportunity to demonstrate how to don a suit. It is also an opportunity to have every participant don a suit in the classroom which gives the instructor the opportunity to inspect all the suits and to identify any issues before hitting the ice.



Although we attach tether lines to the back of lifejackets for water rescue operations, we only tether to the front of ice rescue suits in order to avoid injury to the rescuer when he is pulled back to shore and/or an ice shelf. Typically, we attach a carabiner to a FIGURE-8 ON A BIGHT, and we use an ALPINE BUTTERFLY for in-line knots. The Rescue Swimmer is always attached to the bitter end of the rescue line, while we attach our equipment to the in-line knot. There are a number of videos available on YouTube that demonstrate how do tie these knots.

Safety Equipment

- Whistle
- Ice Cleats
- Ice Picks
- Helmet

111

Other SAFETY EQUIPMENT that should be required for Rescue Swimmers would be a helmet in order to protect the Rescue Swimmer in the event of a fall, or to protect him from the ice; ice picks (recommend only those with retractable sleeves); and, a pea-less plastic whistle. Ice cleats are a good idea, especially for use by line tenders. However, be very careful while wearing them around inflatable boats and other inflatable equipment.

Rope & Rope Bags

- 7/16” Waterline as Primary Rescue Line
- 3/8” Waterline as Secondary Safety Line
- Ice Screw

112

We recommend rope/line specifically designed for water/ice rescue, such as the Waterline (manufactured by Sterling Rope). We recommend 3/8” line used as a safety/back-up line, while 7/16” is used as the primary rescue line. We also recommend the use of ice anchors to secure equipment and/or ladders to the ice.

In order to perform shore-based rescues, or for probing in the water while waiting for the dive team, pike poles or commercially-developed equipment can be used. Shown in the center photo is the WATER RESCUE JAWS. The pole extends to 18’ long, and when lowering the jaws down into the water, the jaws open, and when pulling the jaws up, they will close around the victim.

Flotation Basket Stretcher

114

Some BASKET STRETCHERS have internal, while some have external ribs. A basket stretcher with external ribs tends to get caught up on the ice shelf during extraction. If the plastic basket is dedicated just for water and/or ice rescue, drain holes can be drilled into the bottom of the basket stretcher for drainage.

There is a variety of SPECIALIZED RESCUE EQUIPMENT commercially available, including a variety of inflatable boats, the Rescue Alive sled, the Dive Rescue International Ice Rescue Board, the Marsars Sled, and the Arm-Loc device. The upper right corner shows a standard plastic basket stretcher with a flotation collar attached to the upper 2/3 of the basket.

Rapid Deployment Boats

116

A variety of rapid deployment boats are available, including the RIT Craft (upper right corner), NRS AR155 Rescue Boat (left photo), the Oceanid RDC, and the Polar 75 (lower right corner).

There are several different types of line launching devices available. The Big Shot is a huge slingshot, while others may use compressed air or a blank 22 caliber shell to launch the projectile and line. Personnel must be knowledgeable about the features, as well as the limitations of this equipment.

Inflatable Fire Hose

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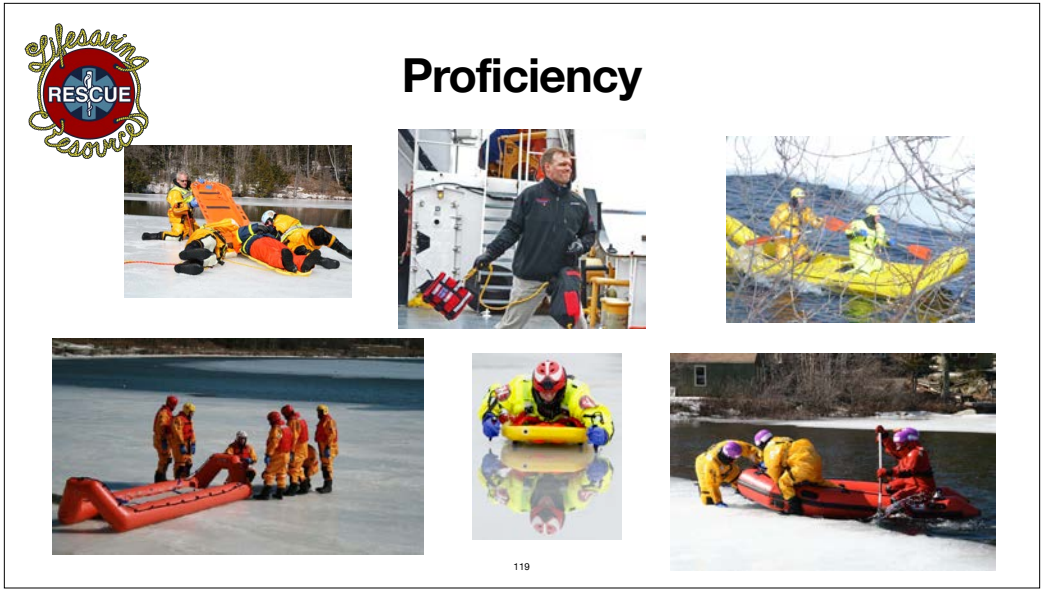
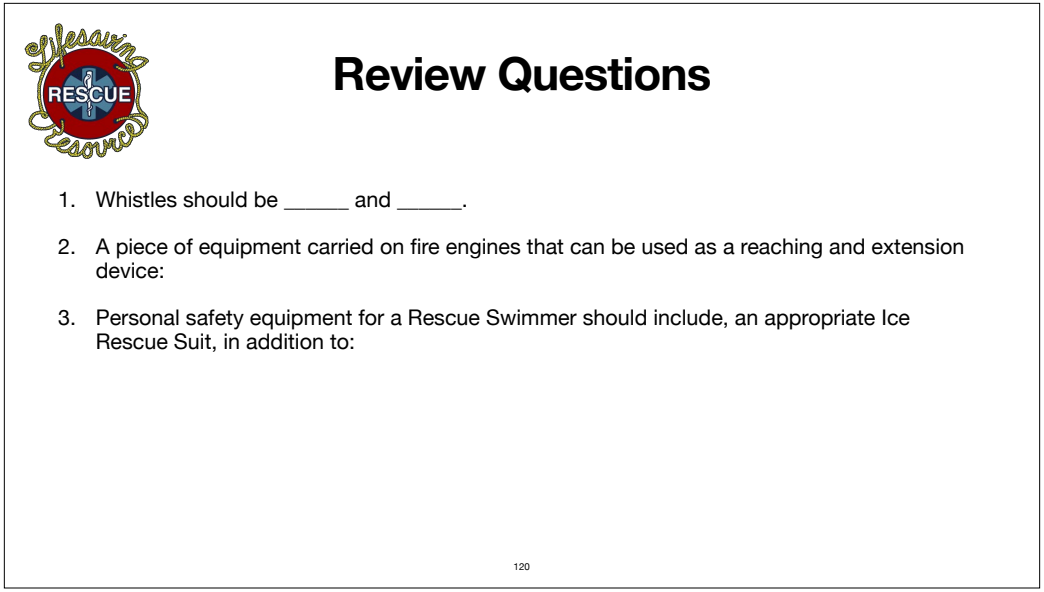
An INFLATABLE FIRE HOSE works well as a shore-based extension device. There are several commercial kits available (i.e. RQ3 Fire Hose Inflation Kit), or you can make your own by attaching a blind cap on both ends and drill an air chuck into one end.



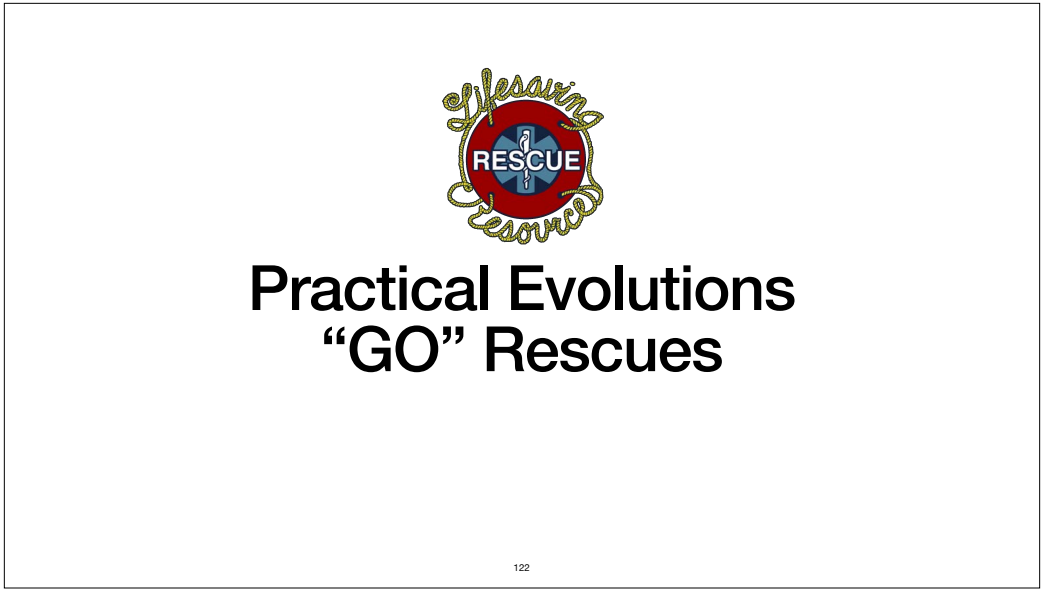
Regardless of what specialized equipment your department is using, it is critical that personnel are proficient in the deployment and use of this equipment, as well as the maintenance of it. And, they must be comfortable with and knowledgeable about the equipment's features as well as its limitations.



1. Whistles should be peeless and plastic.
2. A piece of equipment carried on fire engines that can be used as a reaching and extension device: pike pole
3. Personal safety equipment for a Rescue Swimmer should include, an appropriate Ice Rescue Suit, in addition to: helmet, ice picks, whistle, etc.

Hindsight is a wonderful thing.
But, foresight is better...
especially when it comes to saving life!

Summary….
Questions?…..



This section demonstrates some, not all, of the skills and principles we’ll be practicing during the Ice Rescue Technician practical skills session(s).

Ice Rescue Principles

Rescue line tethers

- Water rescue: rear
- Ice Rescue: front

Hand signals & Whistle signals

- 1 short: STOP!
- 2 short: GO!
- 3 short: BACK / RETRACT!
- Long blast(s): Evacuate the ice!

Manning tether lines

Protection from torso reflex

Hypothermia

123

The Rescue Swimmer's tether line should be attached to the front of the Ice Rescue Suit in order to prevent injury while pulling the Rescue Swimmer back to shore. Tether lines should only be pulled by hand and should never be attached to mechanized equipment. During instruction, we'll be using these whistle signals: 1 short blast to get attention of another instructor. 2 short blasts to get attention of all participants. 1 or several long blasts to clear the ice or alert everyone to an emergency. However, whistle signals can also be used during an operation (i.e. 1 whistle blast = STOP / 2 whistle blasts = GO / 3 whistle blasts = Pull or Retract the line). The major hand signals are a clenched fist to STOP; a tap on the head means OK or PULL; motioning with your hand forward means SLACK, and motioning with your hand back to shore means TAKE TENSION. In order to prevent TORSO REFLEX, we will cover our mouth and nose with our hand during every entry into the water. And, if anyone is shivering, we need to warm you up immediately to prevent HYPOTHERMIA.

Shore-based rescue personnel should be able to deploy a Rescue Throw Bag as well as a Heaving Line. The Throw Bag is typically deployed with an underhand throw, whereas the Heaving Line is best deployed using a side-arm throw as demonstrated here. Rescue Throw Bags should have 65' - 75' of line so shore-based rescue personnel can attempt a rescue from the safety of the shore while Rescue Swimmers are preparing to deploy.

Walking on Ice

125

While walking out on the ice, be sure to carry several coils of your tether line in your hand. If the ice gives way, the coils will prevent the line from going taut on you. As soon as you drop to your knees, you can release the coils.

Approaching the Victim

126

When approaching compromised ice, get down and crawl in order to distribute your weight as much as possible. Always approach the victim from the side, at least 1 body length away - not straight on. When approximately a body-length from the water, spin while keeping your eyes on the victim to allow you to enter the water feet first. While approaching the victim, attempt to gather as much intel from him as you can by asking him questions and directing his actions.

Entering the Water

Stay at least 1 body length away from the victim while entering the water. Be sure you maintain eye contact with the victim while spinning 180 degrees.

Prevent Torso Reflex

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As you enter the water, cover your mouth and nose with one hand in order to prevent Torso Reflex. Once in the water, be sure to burp your suit.

Burping the Suit

In order to get all the excess air out of your suit, burp your suit as soon as you enter the water. Get as low in the water as you can, pull the neck seal away from your body and squeeze all the air out of it by squeezing your arms against your body, and bringing your knees up as well.

Directing the Rescue Swimmer

While the Rescue Swimmer is swimming on his back, the SECONDARY RESCUER straddles the tether line and provides direction to the Rescue Swimmer. The Secondary Rescuer should put both hands together and move them in the direction you want the Rescue Swimmer to go. And, when it is time for the Rescue Swimmer to spin, separate your hands and rotate your arm(s) above your head.

Self-Rescue

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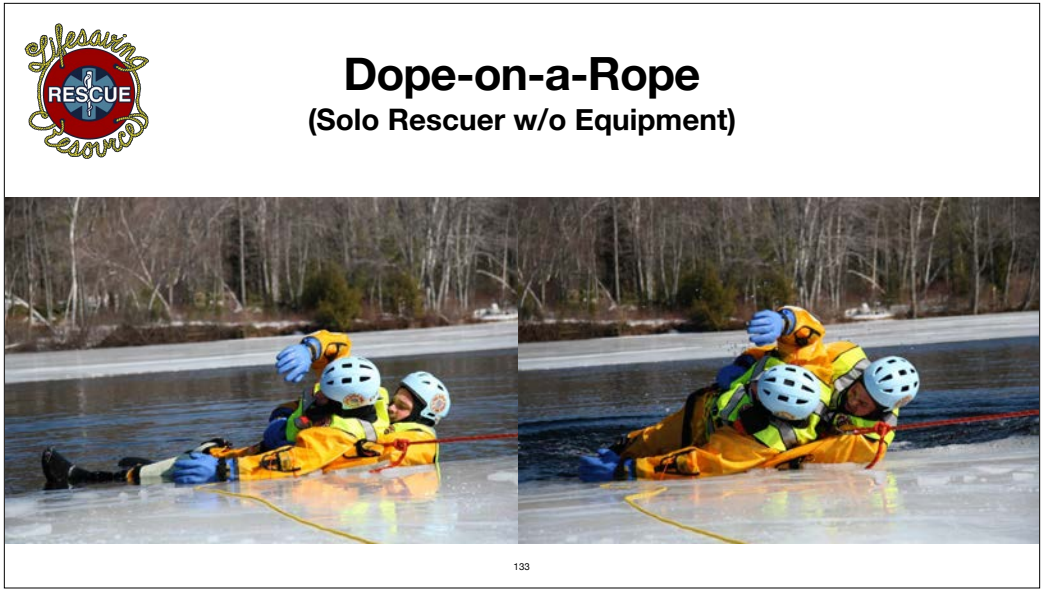
When self-rescuing yourself out of the water and onto the ice shelf, keep your body horizontal and kick your feet while placing your elbows on the ice shelf. Crawl with your elbows while using your ice picks in short choppy strokes.

Roll-Away

132

As soon as you are out onto the shelf, grab your tether line and hold it with one hand over your head as you roll away from the water and onto solid ice. The line is held in this manner so as not to get caught up in it.



This evolution (DOPE-ON-A-ROPE) is a rescue performed without the use of equipment, other than your PPE and a tether line. While using equipment during a rescue, if something goes wrong, we will always fall back to the Dope-on-a-Rope. While performing this skill, you place the victim in a bear hug with your arm under the tether line as you attempt to keep the victim as horizontal as possible by supporting him with your legs/feet. When you give the command to the line tenders to extract, you use your arm that is under the tether line to support and get your body up onto the shelf. While being extracted attempt to keep yourself and your victim on your sides, rather than on your stomach or back.

Quick Sling

The QUICK SLING is a simple piece of equipment attached to the in-line knot of the tether line. Grab the victim's hand nearest you and slip the sling over his hand, arm and body and then capture the other arm as well. Then, hold the sling with one hand to keep it taut against the victim as you are being extracted. The Rescue Swimmer can also approach the victim with the sling diagonally across the Rescuer's body. The Rescue Swimmer and victim should attempt to be on your sides during extraction.

Buoyant Sling

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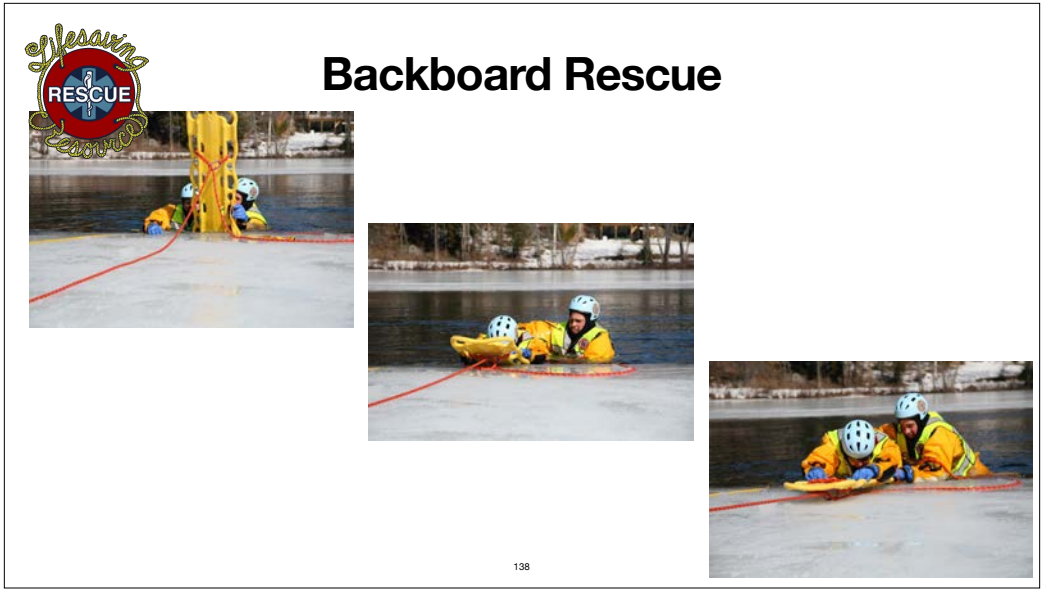
The BUOYANT SLING works the same way. This device is more beneficial in that it provides positive buoyancy for the Rescue Swimmer and the victim. While being extracted from the water, the Rescue Swimmer should remain on his side in order to reduce friction, whereas the victim may come out on his belly.

A buoyant device, such as a RING BUOY, can be used. As the Rescue Swimmer approaches the victim from the side, prior to spinning and entering the water, he pushes the device towards the victim. The Rescue Swimmer then enters the water, burps his suit, and works his way to the victim. The Rescue Swimmer will then place the buoy between the victim and the ice shelf. When giving the command to the line tenders to extract them, the Rescue Swimmer will hold the victim to the device. As the victim is extracted while laying on top of the device, the Rescue Swimmer stays on his side and alongside the victim.

Rigging Backboard or Ladder

The tether line is attached to the BACKBOARD 1’ - 2’ from the top of the board and attached to the in-line knot of the tether line. Webbing can also be attached to the board as an additional handhold and safeguard for the victim and Rescue Swimmer.



The Rescue Swimmer places the BACKBOARD vertical in the water between the victim and the ice shelf. The victim is pushed up against the backboard and the Rescue Swimmer kicks out the foot of the backboard in an attempt to get the board horizontal in the water with the head of the board over the ice shelf. Then, the board is extracted with the victim lying on top of the board with the Rescue Swimmer alongside. Be sure the victim's fingers, as well as the Rescue Swimmer's fingers, are not under the board in order to prevent injury.

Ladder Rescue

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The LADDER is rigged the same way as the backboard and the evolution is similar to that of the backboard. Caution the victim and Rescue Swimmer to be sure not to grab the underside of the rails as the ladder is being extracted.

Advancing Equipment

Victim Approach

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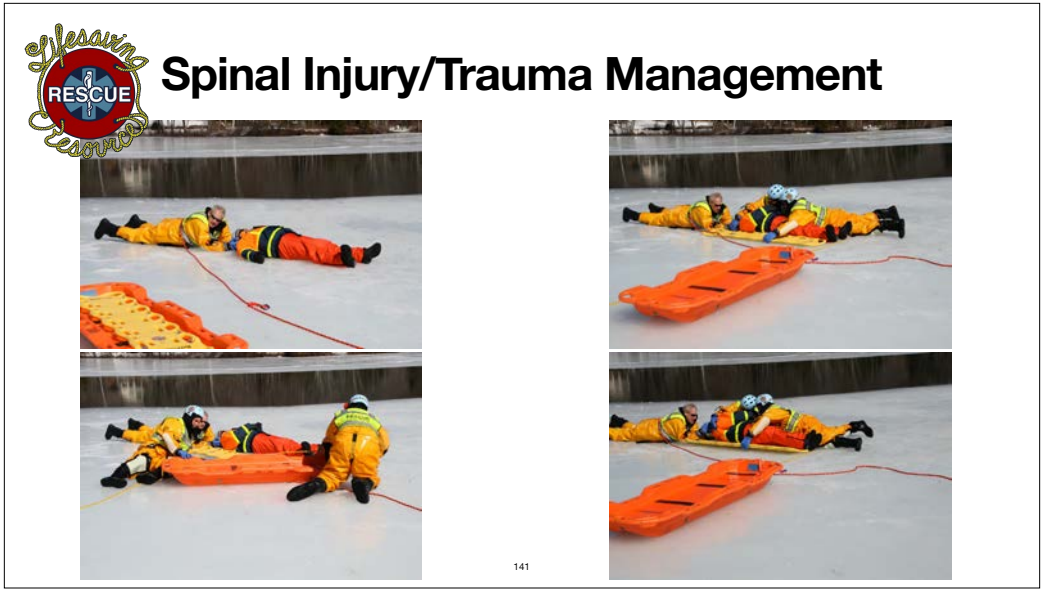
All approaches should be made from the side of the victim, rather than head on. And, the equipment should be slid/pushed to the victim while the rescuer stays low and distributes his weight as much as possible.



This is a complicated evolution requiring numerous steps and all personnel must be tethered. The bottom line is that a Rescue Swimmer approaches the victim, assesses the patient, and takes C-spine control. 2 to 3 additional rescue personnel then proceed out onto the ice while clipped into a secondary line. Line management is critical so that the patient and the equipment doesn't get tangled in either the primary or the secondary line. A backboard is placed alongside the patient who is then log-rolled onto the board. A basket stretcher is then placed at the head of the patient. The patient (while on the backboard) is loaded into the basket using a long-axis drag.

Once the patient is loaded, the secondary rescuers back out but before they do, they will adjust the basket so that it is in line with the primary rescue line while the Rescue Swimmer maintains C-spine control. The Rescue Swimmer (with the help of one of the secondary rescuers) wraps the line around his leg and crosses his other leg over that line. As the line-tenders pull the basket and Rescue Swimmer, C-spine control is maintained. The Rescue Swimmer can also maintain C-spine control from alongside the patient as the patient & basket is being extracted.

Walk for Life

143

This is a team-building exercise in which each squad is tethered together as they maneuver through compromised ice and open water. Each squad works together to rescue one another and continue on the designated path.

Practical Sessions

Incident Command System

- Safety/Accountability of all personnel
- Suit Inspection
- Hypothermia prevention & identification

Tether lines

Whistle Signals

- 1 short blast: Instructor-to-Instructor
- 2 short blasts: Attention
- 3 short blasts: Emergency!
- Long blasts: Evacuate the ice!

Equipment

No smoking

Report injuries/issues

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During the practical sessions, INCIDENT COMMAND must be maintained. The lead instructor, or SAFETY OFFICER, in combination with the SQUAD OFFICERS, will maintain accountability of all personnel, continually check suits, and assess participants for signs of hypothermia. Each squad is responsible for maintaining their assigned equipment and tether lines. There is NO SMOKING during practical sessions or breaks. And, any injuries or issues should be reported.

Incident Command

- Lead Instructor
- Safety Officer
- Faculty/Instructors
- Rescue Squad Officer
- Participants/Students

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The INCIDENT COMMAND STRUCTURE will include the LEAD INSTRUCTOR and ASSISTING INSTRUCTORS, as well as the designated SAFETY OFFICER. Each squad will have a designated RESCUE SQUAD OFFICER.

Rotation System

1. Rescue swimmer
2. Victim
3. Line Tender
4. Line Tender
5. Secondary rescue swimmer

A weighted full-body manikin can be used as the victim

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This is an example of the ROTATION SYSTEM that will be used throughout the practical sessions. The RESCUE SWIMMER rotates to become the next VICTIM (unless you are using manikins as victims). The VICTIM rotates to the end of the line as a LINE TENDER and keep moving up until you finally serve as a SECONDARY RESCUE SWIMMER.

Questions

1. While walking out on the ice, the Rescue Swimmer should _____ coils of line.
2. When approaching the victim and preparing to enter the water, the Rescue Swimmer should spin towards or away from the victim?
3. While entering the water feet first, the Rescue Swimmer should do what to prevent Torso Reflex?
4. As soon as the Rescue Swimmer enters the water, he/she should _____ his/her suit. Why?
5. After picking yourself out of the water onto the ice shelf, the Rescue Swimmer should?
6. While performing a Solo Rescue without equipment (Dope-on-a-Rope) the Rescue Swimmer's arm should be above or below the tether line?

1. While walking out on the ice, the Rescue Swimmer should carry coils of line.
2. When approaching the victim and preparing to enter the water, the Rescue Swimmer should spin towards or away from the victim? Away from the victim
3. While entering the water feet first, the Rescue Swimmer should do what to prevent Torso Reflex? Cover his mouth and nose with 1 hand
4. As soon as the Rescue Swimmer enters the water, he/she should burp his/her suit. Why? To eliminate as much air as possible from the suit
5. After picking yourself out of the water onto the ice shelf, the Rescue Swimmer should? Roll away until on solid ice
6. While performing a Solo Rescue without equipment (Dope-on-a-Rope) the Rescue Swimmer's arm should be above or below the tether line? Below the tether line

So others may live!

148

Summary….
Questions?…..

Escape & Rescue from Submerged Vehicles

This section deals with self-rescue from submerged vehicles and methods to perform a rescue of entrapped occupants.

Unfortunately, these incidents happen all too often, and in many cases they become MULTIPLE CASUALTY INCIDENTS (MCIs).

If you are a driver or an occupant in a vehicle that goes off the road into water, or that crashes through the ice into water, it is critical that self-rescue be performed as soon as possible, before the vehicle begins to sink.

Escape & Rescue Principles

Float time = 30 seconds to several minutes

- Characteristics
- Closed windows
- Submersion
- Structural damage

Water / ice pressure against doors

Escape / Self-Rescue

Stabilize the vehicle

Access the vehicle

152

Once the vehicle enters water, its float time is only 30 seconds to several minutes, depending upon the integrity of the seals around the doors and windows of the vehicles, as well as its undercarriage. The vehicle will typically assume a nose-down orientation due to the motor in the front of the vehicle. Because of the water pressure against the doors, as well as ice, the doors may not be able to be opened. And, the only avenue of escape will be through an open window. When called for a vehicle in the water, request dispatch to send a wrecker, along with the rescue crews so that the vehicle can be stabilized. Rescue personnel need to be in full PPE prior to attempting rescue.

Escape Procedures

- Escape before submersion
- Human chain through door or window
- Protect face & head during submersion
- Escape!
- Fumes & fuel considerations

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The occupants must attempt self-rescue before the vehicles submerges, and you only have 30 seconds to several minutes to make your escape. Once a point of egress is established, occupants should form a HUMAN CHAIN and everyone needs to escape through the same route. However, if the vehicle sinks and you are unable to make your escape, protect your face and head in the event the windows implode. Then, once the vehicle stops moving and the pressure inside is equal to the pressure on the outside of the vehicle, you should be able to open the door for escape, assuming there is no significant structural damage to the vehicle that may prevent you from opening the doors. Whatever the case, attempt to ESCAPE as soon as feasible. And, while in the water, be aware there may be fumes & fuel at the water's surface which you may need to clear with your hands while treading or swimming to safety.

There are a number of spring-loaded tools and hammer-type tools that are commercially on the market. However, many late-model vehicles have laminated glass, rather than tempered glass, in the door windows. These devices will not work on laminated glass. A saw-type tool (upper middle photo) is the best way to penetrate and open up laminated glass.

This video explains the difference between TEMPERED GLASS and LAMINATED GLASS.

Escape Protocol….

1. SEATBELTS (off/cut)
2. WINDOWS (open/break)
3. CHILDREN (removed)
4. GO (get out!)

Don’t panic and don’t waste time calling on your cellphone!

Do not waste time calling anyone. You only have 30 seconds to several minutes to escape. The ESCAPE PROTOCOL that should be performed by occupants is:

1. SEATBELTS removed (unclip or cut)
2. WINDOWS opened
3. CHILDREN removed
4. GET OUT!

157

This is a video of a tragic submerged vehicle incident resulting in the death of two women.

Questions

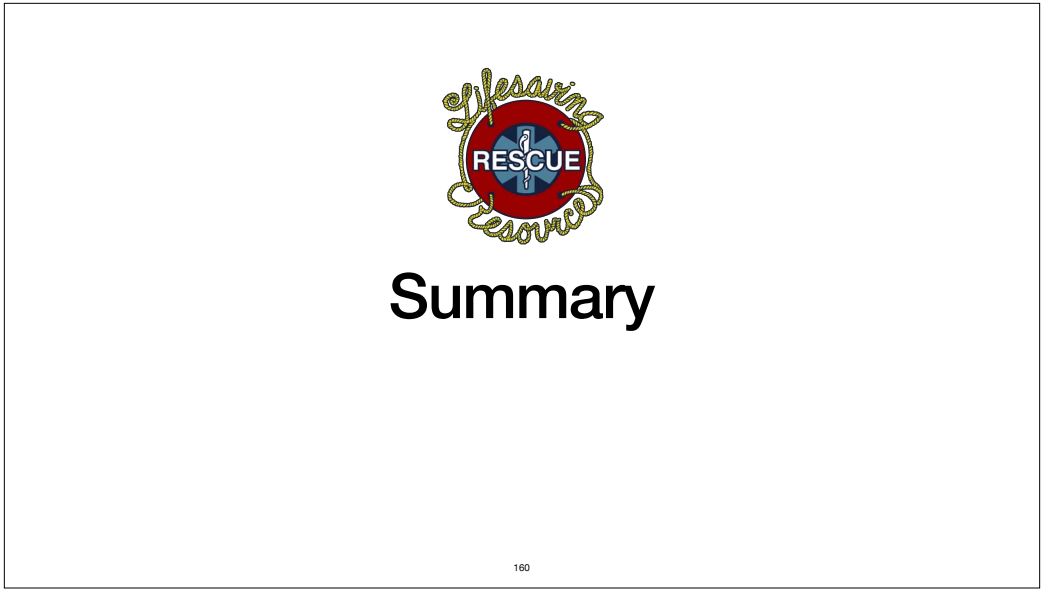
1. Once a vehicle enters the water, its float time may range from ___ seconds to _____ _____.
2. Once the vehicle enters the water, the occupants may be unable to open the door due to what?
3. If the occupants were unable to escape before the vehicle began sinking, what should they do as the vehicle sinks?:
4. Once escape is made from the submerged vehicle, the occupants should consider what as they come to the water's surface?:
5. The Escape Protocols should be:
6. A spring-loaded window punch will work on tempered or laminated glass?

1. Once a vehicle enters the water, its float time may range from 30 seconds to several minutes.
2. Once the vehicle enters the water, the occupants may be unable to open the door due to what? Structural damage or water pressure or ice against the doors
3. If the occupants were unable to escape before the vehicle began sinking, what should they do as the vehicle sinks? Cover their face with their hands
4. Once escape is made from the submerged vehicle, the occupants should consider what as they come to the water's surface? Fumes and fuel at the water's surface
5. The Escape Protocols should be: Seatbelts off/cut, Windows open/break, Children removed, Get Out!
6. A spring-loaded window punch will work on tempered or laminated glass? Only tempered glass

He Who Saves a Single Life,
Is Said To Have Saved The Entire World!

159

Summary….
Questions?…..



This is an opportunity to summarize everything accomplished during this training.


COME HELL OR HIGH WATER
RESCUE
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