Aquatic Emergency Response

Lifeguard Training Manual
10th Edition
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10th Edition
2013
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<tr>
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<td>Lloyd Plueschow</td>
</tr>
<tr>
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<td>Sharon Blanchard</td>
</tr>
<tr>
<td>Original textbook proof-reading, editing and layout</td>
<td>Lori Bonneville</td>
</tr>
<tr>
<td>Medical content review - Fire Paramedic Services</td>
<td>Kent Brown, Jim McKendry, Lori Bruce-Smith</td>
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<thead>
<tr>
<th>Grant Badger</th>
<th>Norma Mowat</th>
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<tr>
<td>Wayne Bergen (Safety)</td>
<td>Scott Pearce</td>
</tr>
<tr>
<td>Alex Henry (Safety)</td>
<td>Kathy Plett</td>
</tr>
<tr>
<td>Dennis Kasdorf</td>
<td>Karen Ross</td>
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<tr>
<td>Mikey (Karla) Guzej</td>
<td>Pam Schlamp</td>
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<tr>
<td>Debra Folkers</td>
<td>Stacie Schneider</td>
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<tr>
<td>Michael Hadder</td>
<td>Doug Sexton</td>
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<td>Dean Jansen</td>
<td>Teri Slobodzian</td>
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<tr>
<td>Kevin Johnson</td>
<td>Robert Taraschuk</td>
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<td>Lisa-Marie Jones</td>
<td>Betty Thiessen</td>
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<tr>
<td>Rayna Kosowan</td>
<td>Randy Trager</td>
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<tr>
<td>Steve Kowalchuk</td>
<td>JoeAnne Wiebe</td>
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<tr>
<td>American Red Cross</td>
<td>Larry Patterson - Lifesaving Society Alberta</td>
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<td>Gaetan Lauze - Zoll Inc</td>
<td>Lifesaving Society Manitoba</td>
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A special thanks to all the staff that contributed so many great ideas. Often these ideas were simply comments in passing. I encourage you to continue to share your ideas, as they are a rich source to draw from.
Foreword

I was honoured in the summer of 1999, when Kerry Wilson, Superintendent of Aquatics, offered me the opportunity to perform a lead role in the development and implementation of the Aquatic Emergency Response (AER) program.

The objective was to create and maintain a standardized, citywide professional lifeguard training strategy for aquatic employees.

These are exciting times for Aquatics within the City of Winnipeg. The quality of the service provided in each of the pools has consistently increased over the past number of years. The expectation of increased skill proficiency and professionalism of the staff has also increased dramatically.

This is the 10th Edition of the AER Training Manual; this project has certainly progressed from its initial beginnings and includes more diagrams and photos for clarity. It is supported by audio visual learning including Frank Pia’s classic video On Drowning. In-house training videos are provided, and PC based learning is now available at: http://www.winnipeg.ca/cms/aertraining/.

No matter which edition you have studied, the program is intended to provide the modern City of Winnipeg Lifeguard with the necessary tools to carry out their duties with confidence.

Lloyd Plueschow
Purpose

The purpose is to create a standardized consistent, city-wide training program for aquatic employees. It will focus on the development of lifeguarding techniques, responses, and aquatic emergency procedures for all lifeguards and clerical staff. Staff city-wide will utilize the same techniques and respond similarly to all aspects of lifeguarding. This includes using the same equipment, in the same process, such as spineboards, trauma bags, oxygen equipment, AED, etc, and following the same procedures, protocols, and guidelines. A consistent centralized approach simplifies the training process, and increases the level of service provided city-wide.

AER is employer provided in-house training based on the principles of the National Lifeguard Services (NLS) award. Because this is a nationally recognized professional lifeguard training program and the principles are widely accepted, it makes sense to use the NLS as a spring board for training.

AER was never intended to replace the formal certification training provided by the respective agencies such as The Lifesaving Society. It was not intended to be an all-answer source to every situation a lifeguard may encounter. The Lifeguard has to accept that no level of training can provide them with a response to every contingency and must see themselves problem solvers. Judgment, problem solving, personal accountability, due diligence, continuous education, fitness, and practice will always be the responsibility of the individual Lifeguard. Specific protocols such as oxygen, spinals, and EpiPens are generally addressed; where no specific technique or direction is provided, or if an area of a protocol or response lacks clarity, the lifeguard would revert to the agency, society, policy manual, reference, or staff member that deals with that area of expertise.

The list of agencies and societies, for further resources, would include but are not limited to the following:

- Training and coaching personnel
- Lifesaving Society
- The Canadian Red Cross
- St. John Ambulance
- Criti Care
- Manitoba Heart and Stroke Foundation
- Various City of Winnipeg departments, agencies, and branches
- Other government agencies
- CUPE Manitoba
PROFESSIONALISM CREED FOR THE AQUATICS PRACTITIONER

Any person who is committed to providing excellence in the aquatic environment can say "I am an aquatic professional".

I maintain a safe aquatic environment by demonstrating work habits that promote efficient facility operation, including:
  o Maintaining optimal levels of physical and mental competence.
  o Taking a proactive role in recognizing unsafe situations.
  o Preventing injuries and handling emergencies competently.
  o Work within my own level of training and certification.
  o Enforcing the highest standard of safety as defined by municipal codes and professional association recommendations, including:
    o Enforcing rules.
    o Maintaining water quality.
    o Establishing risk management and emergency action plans.
    o Providing facility accommodation for persons with disabilities.
  o I educate facility users, management, other staff and the general public by:
    ▪ Emphasizing safety awareness in my communications with others
    ▪ Encouraging aquatic participation for persons for whom aquatics is a nontraditional sport.
    ▪ Demonstrating effective leadership for safe aquatic practices and programs.
    ▪ Mentoring others in their aquatic leadership development.
    ▪ Disseminating to others what I have learned through my own research, networking and experimentation.
    ▪ Promoting developmentally appropriate and effective methods of skills instruction.

I continue to develop my own aquatic education by:
  o Maintaining my skills and certifications.
  o Keeping current with advances in the field by reading journals, books and research reports.
  o Upgrading my own knowledge by attending in-service training sessions, conferences, workshops, conventions, competitions, and/or seminars on related topics.
  o Locating and using available resources; asking for assistance when needed.

By making these professional commitments, I help to develop and uphold the standards of the profession and in my own arena initiate positive change and contribute to the field of aquatics.

Adapted from the Aquatic Council, AAALF/AAHPERD, 1900 Association Drive, Reston, VA 20191
PREFACE

Winnipeg
Embrace the Spirit • Vivez l’esprit
Community Services Department
Community Development & Recreation Services
Aquatics

Aquatic Emergency Response
Learning Objective:
Personal Accountability and Consequences of Conduct

At the end of this section the learner will:

- Define personal accountability.
- Explain the consequences of unprofessional conduct while lifeguarding.
- State at least 4 Lifeguarding factors that may lead to tragedy at a supervised swim area.
- Explain how leadership is a factor in accident prevention.
Drowning Case Studies

Personal Accountability: The requirement or expectation to justify actions or decisions\(^1\)
Lifeguards are accountable.

The following pages contain actual case studies of drowning incidents. In every case the
lifeguards were a major factor in the outcome of each incidence. Read all the stories. Discuss the
stories and answer the following questions for the two stories assigned to your group:

What went wrong here? What action or inaction of the lifeguards contributed to the tragedy?
How did leadership affect each situation? What other factors played into the outcome?

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\(^1\) Concise Oxford Dictionary 10\(^{th}\) Edition
Drowning Case Studies

1

Man Drowns in Apartment Complex Swimming Pool

A 48-year-old man drowned in the deep end of his apartment complex pool. Two Lifeguards were on duty at the time. Neither Lifeguard was in the elevated Lifeguard stands, but rather, were sitting at the table at the shallow end of the pool talking to one another and listening to the radio. At 4 PM, the man was seen walking to the deep end of the pool and then dove into the water. No one recalls seeing the man after that time until he was observed by another patron at 6:30 PM.

2

Child Drowns at Community Swimming Lake

A 6-year-old child drowned at a community swimming lake run by the city Parks and Recreation Department with 8 Lifeguards on duty. Two unattended Asian-speaking 6-year-old children had been left at the lake by their father. Both children were playing at the lake and hanging onto the lifeline when one of the children slipped off the line and submerged below the surface of the water. While one child began screaming for help, none of the 4 Lifeguards situated in elevated Lifeguard stands or on the floating pier recognized the incident or heard the child screaming. A 16-year-old patron went to the aid of the screaming child and brought her to one of the Lifeguards. When the teenager told the Lifeguard she thought the child's companion was in trouble in the water, the Lifeguard refused to assist and stated the child must be in the locker room. The teenager then went to another Lifeguard and voiced the same concerns. The second Lifeguard then got off her stand, without alerting the other Lifeguards, and began an informal search for the child. When the 4 Lifeguards who were on break in the guard room came down to the beach to relieve the guards providing supervision, they saw the Lifeguard searching around the water for the child. The Lifeguard Supervisor immediately evacuated everyone from the water and organized the Lifeguards to conduct a formal search. The child was located within 40 seconds of the search. Unfortunately, the formal search was not initiated until approximately 10 minutes after the child slipped below the surface. CPR was immediately administered and continued to the hospital by Fire and Rescue personnel where the child was pronounced dead on arrival.
3

**Child Drowns in Community Swimming Pool**

A 7-year-old child drowned in a community swimming pool operated by the Parks and Recreation Department with two Lifeguards on duty. The child was last seen diving off the diving board when he began to choke and struggle in the water. The two Lifeguards had been standing side-by-side talking to one another next to the elevated Lifeguard stand and failed to observe the child's distress. Another child saw the victim and ran to the Lifeguards in order to get their attention. The Lifeguards removed the child from the water and began CPR which was continued until EMS personnel arrived on the scene. The child was transported to the hospital where he died several days later from complications resulting from the near-drowning.

4

**Military Man Drowns in Community Swimming Pool**

A 33-year-old military man drowned in a community swimming pool during a family retreat sponsored by the Navy. While his wife and children were preparing lunch, the man was seen swimming laps underwater in the pool while the two Lifeguards sat at a picnic table talking to one another. Several minutes later, one of the Lifeguards noticed the man lying motionless on the bottom of the 5' section of the pool with bubbles coming to the surface. The Lifeguard assumed he was breathing and decided to time him. After several additional minutes, another patron alerted the Lifeguards to the fact that the man wasn't moving and was in trouble. One of the Lifeguards then walked around the perimeter of the pool, looked down at the victim, then removed her shorts and dove into the pool. The man was removed from the water and CPR was administered. The man was pronounced dead on arrival at the hospital.
Woman breaks neck diving into resort swimming pool

A 23-year-old Canadian woman broke her neck when she dove into the shallow section of the swimming pool at a resort in Jamaica. When she hit the bottom and floated to the surface, she was able to turn herself over onto her back and float until help arrived. The Lifeguard, with the assistance of a bus boy, removed her from the water, placed her into a wheelchair, and then wheeled her into the nurse's station. No immobilization was provided of the victim's neck or spine. She was transported by ambulance to the hospital. The woman is now a quadriplegic because of this injury.

6-year-old child drowns at community swimming pool

A 6-year-old child drowned at a community swimming pool with 4 Lifeguards on duty. The child had been left unattended for several minutes in the shallow end of the pool while her guardian was in the locker room with another child. The child somehow progressed into the deeper section of the pool and her distress went unrecognized for approximately 4 - 6 minutes. Prior to the incident, there were approximately 20 children participating in swim team practice in two lanes of the pool under the supervision of the swim coach. Two Lifeguards were positioned in the elevated Lifeguard stands, with two other Lifeguards on duty in the office or on the deck, supervising 6 people in the shallow end of the pool and 2 children using the diving boards in the diving section.

The 6-year-old non-swimmer became unconscious and floated motionless towards the deep section of the pool. When an adult patron finally observed the child, she alerted one of the Lifeguards who then implemented the facility's Emergency Response Plans. The child was immediately removed from the pool and CPR was initiated and maintained until Fire Department EMS Personnel arrived on the scene. The child was pronounced dead on arrival at the hospital. During the trial, when the deep-end Lifeguard was asked why she hadn't noticed the child, she replied "I was looking in the deep end of the pool". When asked how long she was watching the deep end only, she replied, "It couldn't have been more than a couple of minutes". 
Conclusion

City of Winnipeg Aquatic Instructor/Guards are in fact accountable for their actions and decisions; this includes the supervisors as well. The Collective Agreement between the Canadian Union of Public Employees (CUPE) - Local 500, and The City of Winnipeg protects employees in regards to civil and criminal liability in those cases “while in the performance of their duties and provided such actions do not constitute a gross disregard or neglect of their duties as an employee...” See Articles 40 and 41.
SECTION 1

Surveillance, Recognition & Prevention
Learning Objective:
Scanning, Surveillance, and Recognition

At the end of this section the learner will:

- Define zones
- Explain the concept of sightlines
- Explain basic sweep scanning techniques
- Explain basic scanning strategies
- Explain pool balance
- Define alert, vigilant, and attentive
- Explain the RID factor
- List at least 4 factors in positioning Lifeguards on a pool deck
- Define major, minor, and public relation situations
- Define the length of time a Lifeguard should recognize a problem under normal circumstances
- Explain shift-to-cover
- Explain the 5-Minute Scanning Strategy
- Compare elevated stations with ground level patrol
- Describe the factors that may have a negative effect on vigilance
- List the two types of water victim emergencies
  - Compare these two types
  - Identify the time a drowning may occur in
- List at least 10 critical signals a lifeguard may respond to
- List at least 10 considerations when analyzing a pool
- Define the minimum amount of Lifeguards required on the deck for various bather loads, as per the Provincial Government Regulations
PART 1 - SURVEILLANCE
Scanning – Looking for Problems

**Zones:** That area of the pool that a Lifeguard is directly responsible for i.e. shallow end, diving area, etc.

- **Intensive** – each guard is responsible for a specific zone or area.

- **Extensive or global** – all areas combined. Example: Lifeguards share the entire area equally, scanning globally.

- **Combined** – combination of both intensive and extensive. This is an accepted technique.
Sightlines:

- A $90^0$ angle is best when the Lifeguard is at the corner of the pool.

- Adaptations will work in various circumstances, but the principle is the same; basic sightlines are based on $90^0$ blocks. Ex. Long pools with or without bulkheads.

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Section 1 - Surveillance– 10th Edition 2013
Multiple Lifeguard Situations and Pool Balance

Multiple Lifeguards employ the $90^\circ$ site lines with each Lifeguard's zone overlapping into one another.

![Diagram of pool with life guards and overlapping site lines]

Having Lifeguards on both and/or multiple sides of the pool (see above) increases and balances the surveillance. Lifeguards are better able to watch each other’s backs.

Field Of Vision and Scanning

The eye can accept light from about a $200^\circ$ angle. However, only a very narrow $10^\circ - 15^\circ$ block is in focus at one time. We also need to stop and look for a moment to register what is in our focused field of vision.

![Diagram of focused field of vision]

Lifeguards use all their senses when scanning: vision, hearing, smell and touch.
Scanning Techniques & Patterns

Sweep Scanning:

**Side-to-side:** starting from the left far side of your zone, focus on that first 15° block for a moment, then move 15° to the right, moving your head, and stop and focus in that block for a moment. Include front to back. Continue this until you reach the right extreme of your zone; scan quickly to the far left of your zone and start again. This technique works well in small pools or light crowds.

**Front-to-side:** start front and centre. Begin 15° block scans toward the right as you did with the *side-to-side* method until you reach the right extreme of your zone, then scan quickly to the centre of your zone and repeat this scanning technique again toward the left. Remember to move your head and include front to back. This technique works well in large pools or heavy crowds.

With both scanning techniques, the movements are the same:

One “sweep” or “panning” of your entire zone (left to right), will take approximately 10 – 30 seconds, depending on conditions.

Lifeguards scanning zones in excess of 180° would add on the necessary 15° sub-blocks, within reason, to complete the scan. Use the degree figures listed above as guidelines.

**Lifeguards are expected to be alert, vigilant, and attentive**

**Definition**
- **Alert:** Quick to notice and respond to potential danger or problems
- **Vigilant:** Keeping careful watch for possible danger or difficulties
- **Attentive:** Paying close attention

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Top–Down, Bottom–Up Scanning

Lifeguards scan the entire water area in their zone. This includes the water surface, below the surface, and the entire bottom. The bottom of the pool would take priority.

Scanning Strategies

- Head counting – how many? (approximately) Where?
- Grouping – who?
- Mental filing – what, where, how, and why are they doing it?
- Profile matching – match activity to patron. Does it make sense?
- Tracking – where are they now, where did they go, when did they go there, why did they go there? High risk patrons are tracked.

10-20-30

- 10 – 30 second (approximately) zone sweeps
- 20 seconds (approximately) away from any where in your zone; rescue within 20 seconds
- Every 30 – 60 seconds (approximately), do a global scan
The RID Factor – Why Drowning Occurs in Supervised Areas

Recognition failure – Lifeguards need to identify a swimmer in trouble (behaviour).

- Lifeguards can fail to recognize a swimmer in distress for any number of reasons.
  - (See: *Factors That May Work Against Effective Scanning and Vigilance* – page 16)
  - Videos, such as Frank Pia’s *On Drowning* and Ellis & Associates *In Too Deep*, cover the recognition of distressed swimmers and drowning swimmers very well, and are recommended viewing.
  - Learning how various medical conditions, such as shock, stroke, heart attack, diabetes, anaphylactic shock, etc, present is also useful.

Intrusion of non-lifeguarding duties (diversions).

- Keep to one task and one task only - Lifeguarding.
- Combining maintenance tasks, reading, writing, etc, while Lifeguarding, diverts your attention, and should not be done.

Distraction – stay focused.

- Distractions can be categorized as:
  - Legitimate – Examples would include: Lifeguards responding to critical-signals such as rule infractions or very minor situations. Lifeguards still need to maintain vigilance during these tasks and/or have someone cover their area (shift-to-cover).
  - Non-legitimate – Examples would include: Lifeguards responding to non-critical-signals such as socializing with co-workers or friends, diversions, or conducting personal business while guarding.
Positioning

Where Lifeguards position themselves on the pool deck depends on a number of factors:

- The number of staff available
- The number and location of the patrons
- The demography of the patrons
- The patrons' behaviour
- Sightlines
- Response time to problems
- The size and layout of the area
- The locations of hot spots or trouble areas
- Blind spots
- Visibility and environmental factors:

  - Refraction\(^\text{vi}\) bends the light entering the water causing visual distortion
    
    \textit{The dark rectangle represents the actual position of a pencil sitting in a bowl of water. The light rectangle represents the apparent position of the pencil. Notice that the end (X) looks like it is at (Y), a position that is considerably shallower than (X).}
    
  - Glare from the sun or artificial lights can render the pool bottom invisible.
  - Wind, splashing, and wave action creates ripples which distort the water surface making it difficult to see below the surface and the bottom\(^\text{vii}\).
  - A cloudy pool further creates visibility problems
Situations\textsuperscript{viii}

- **Minor Situation**: Generally, requires the attention of one Lifeguard. Communication and coverage of the responding Lifeguard’s area, by other Lifeguards is critical (shift to cover).

- **Major Situation**: Requires the attention of two or more Lifeguards.
  - Many major water situations require immediate backup \textit{in the water} by a second Lifeguard. Some examples include spinals, seizures, multiple drownings, panicked or difficult victims, etc.

- **Public Relations**: Any situation involving public and/or staff.

---

**Situations within your visual zone, should be recognized within 30 seconds**

**What does this mean?**

If a situation is happening where you can readily detect it, you should be able to recognize and react to the situation within 30 seconds
Shift to Cover

Sometimes Lifeguards must shift their position to cover areas left by another occupied Lifeguard. This is essential to effective backup.

Level 1 shift:

In this first example, G2 (Lifeguard 2) notices G1 talking to a patron and simply monitors the situation. If the conversation takes more than 10 seconds, G2 would proceed to a Level 2 shift.

Level 2 shift:

In the next part of this example, the discussion with the patron has become heated – G1 is no longer fully attentive. G2 shifts in closer (within ear-shot if needed), covers G1’s area along with their own area, and is ready to assist if necessary. If this situation escalates, G1 and G2 would proceed to a Level 3 shift and/or call up an available Lifeguard. If there is no available Lifeguard, a decision has to be made whether the situation is a major, and if the pool should be cleared.

Level 3 shift:

In the final part of this example, the patron has entered the water and promptly requires assistance; G1 must initiate a minor pull out. G2 shifts over to the “removal point”, covers G1’s area, along with their own area, and is ready to backup and assist. G2 could briefly assist with the removal if necessary. Pool coverage must be maintained at all times. If this situation progressed to a Major, backup is close by. An available Lifeguard should be called up, or the situation may be handled as a Major.
The 5-Minute Scanning Strategy®

Tom Griffiths’ video, *The 5-Minute Scanning Strategy*, offers an intuitive approach to Lifeguarding. The method suggests changing your scanning style every five minutes to maintain high levels of vigilance. In all cases, sight-lines are always maintained.

**Every Five Minutes:**

- **Posture change**
  - Sit five minutes
  - Stand five minutes
  - Stroll five minutes in your immediate guarding zone; maintain sight-lines at all times.

- **Position change:**
  - On the station
  - Different position on the station
  - Beside the station (if appropriate)
  - Standing on the station
  - Alternate location near the station

- **Pattern change:**
  - Change your scanning pattern
    (Side-to-Side, Front-to-Side, scan bottom, scan top)

- **Conduct a patron count and give an accounting statement**
  - Head counts are approximate
  - Accounting statements are verbal or mental reports of all activity in your zone
  - An excellent time to give an accounting statement is when being relieved
Station and Ground Level Patrol

Stations

Elevated stations, such as guard chairs, platforms, or towers give Lifeguards a broader perspective (“bird’s eye” view) than supervision from ground level. Scanning from an elevated station also reduces the effects of refraction, and minimizes the way in which light or glare from the sun interferes with the ability to see beneath the surface of the water. Patrons can identify the Lifeguards on an elevated station more readily than ground-level Lifeguards.

Not all elevated stations are convenient to get in and out of, and Lifeguards may lose visual coverage while climbing in and out of the chair. Mobility is also a concern and jumping or diving from the station has inherent risks. Hence, the inclination may exist for the Lifeguard to avoid getting out of the chair to deal with a situation, and rely instead on excessive use of whistling, yelling, or ignoring the problem. Elevated stations may also create a psychological and social barrier between the Lifeguard and the public. Elevated stations often have a blind spot directly below and underneath.

Notwithstanding the limitations elevated stations present, they offer a key advantage to effective scanning and cannot be discounted for a seeming lack of convenience.

Ground-level Patrols

Walking patrol or standing on the deck, provides effective public relations and education. It lends itself to efficient enforcement of safety rules. Blind spots are covered more effectively, than elevated stations, because the Lifeguard can keep moving to monitor those areas. Ground-level patrols can be stationed and/or free roving, depending on the crowd and conditions.

However, ground-level Lifeguards have a limited view of the swimming area and many patrons tend to be shielded from view by other patrons and possibly various pool amenities. Because of the close proximity to the patrons, ground-level Lifeguards are more prone to distractions.

It can be useful to combine lifeguarding from elevated stations and ground-level patrols.
The Rotation – Station Method
The 5 Step Program…
Coverage is always maintained during rotations

1. Guarding

2. Relieving Lifeguard Covers

3. BRIEF Accounting
   (Minimal Eye Contact)

4. Coverage during switch-over

5. Guarding – rotation complete
The Rotation – Ground Level Patrol Method
A 3 Step Program…
Coverage is always maintained during rotations

1. Relief Lifeguard begins surveillance as they approach ground level Lifeguard

2. BRIEF Accounting Statement
   Minimal eye contact

3. Rotation complete
Factors That May Work Against Effective Scanning and Vigilance

Bather Load
Two extremes create problems for the Lifeguard:

- Minimal swimmers combined with long uneventful periods (few critical-signals) create monotony leading to boredom in some; this leads to a lack of vigilance. Lifeguards are lulled into a comfort zone. A serious problem associated with this, is the impression by some Lifeguards, that “nothing goes wrong when it’s not busy”, such as during lap swim. This is of course not true. A study, on regulated pools from 1987 - 2004, released from New York City, publicized that:
  - 64% of drownings occurred with less than 30 swimmers present
  - 26% of the drownings occurred when there were less than 5 swimmers present.

- High number of public swimmers combined with constant critical-signals can lead to panic or overload (“zoning out”) on the Lifeguards’ part. After 30 minutes in this environment, the typical Lifeguard shows marked reduction in their ability to maintain effective vigilance. In some cases the reduction in vigilance can occur in as little as 15 minutes. Constantly guarding these conditions may lead to “burn-out”.

Studies seem to indicate that optimal vigilance cannot be maintained for more than 30 minutes. Moderate amounts of alertness, short rotations, activity changes, and regular breaks, tend to produce the best level of vigilance. Vigilance actually increases with the number of critical-signals detected as opposed to the detection of non-critical-signals. Having something to respond to and focusing on what is important is fundamental to vigilance. Other studies found the more non-critical signals that Lifeguards must examine (filter) over a long period of time, the less likely they are to detect the critical signs. Scanning should remain simple – look for problems!
To deal with maintaining optimal performance, ideal work schedules may go as follows:

- 30 minutes guarding / 30 minutes alternate work activity / 30 minutes guarding / 30 minutes alternate work activity / break /. This pattern would repeat until the shift is over.
  - Alternate activities may include skill practice, policy review, fitness, cleaning, administration, and any other duties as assigned.
- The above example is not always practical due to bather loads and staffing. Another option is to alternate the intensity of the guarding. The Lifeguard would alternately rotate from a high intensity zone (being in one zone for a maximum of 30 minutes) to a lower intensity zone. A total rotation could last between 1, 2, or 4 hours depending on the overall level of intensity and available staff.
  - Rotations in each zone can be 10, 15, 20, or 30 minutes in length depending on bather loads and staffing.
- A blend of both systems could also be considered.

- Focus on simple problem recognition and ignore “noise” or non-critical events.
- The time a Lifeguard spends on deck is directly related to the overall intensity level and other factors on the pool deck.
- It should be stressed that Lifeguards require breaks like any other worker. Labour codes and Collective Agreements should be observed.
  - The Lifesaving Society recommends a maximum of 2 hours of guarding before a break is needed.
  - During busy times, Lifeguards need to be patient.
Multitasking

Can the human brain actually perform more than one task at a time? Most workers today feel they are required to juggle multiple tasks and respond constructively to constant interruptions. Surprisingly, multitasking actually wastes time. A growing number of studies show that trying to juggle jobs or functions rather than completing them sequentially can take longer overall and leave multitaskers with a reduced ability to perform each task. In addition, the stress associated with multitasking may contribute to short-term memory difficulties. The combination results in inefficiency, sloppy thinking and mistakes – not to mention the possible dangers of divided attention for drivers, air traffic controllers, Lifeguards, machinery operators, and others that require concentration on one task at a time.

The Stroop Effect

In 1935 American psychologist, John Ridley Stroop, recognised that processing information for one task can cause “interference” with another. Stroop observed that when study participants were asked to name the colour of a word, such as “green,” printed in an incompatible color – such as, red – they experienced difficulty saying the colour. This is now known as the Stroop Effect.
3-Second Windows

Psychologist and brain researcher Ernst Pöppel of the Institute for Medical Psychology at the Ludwig Maximilian University in Munich believes that it is impossible to carry out two or three different tasks simultaneously with the same degree of concentration. He says seemingly simultaneous awareness and processing of information actually takes place in “three second windows.” People only concentrate on a conversation for 3 seconds, then to a crying child for 3 seconds, and then to a computer screen for 3 seconds. In effect they are rotating from task to task. They are only focusing on one task at a time while the other tasks remain in the background.

Research teams at the Center for Cognitive Brain Imaging at Carnegie Mellon University confirmed similar results. The scientists use a magnetic resonance imaging machine (MRI) to measure brain activity as subjects performed two unrelated tasks: listening to sentences being read to them and mentally rotating two three-dimensional figures. The tasks had to have “minimal similarity”. When the subjects tried to do both tasks simultaneously, they struggled. They could manage to do both, but not as quickly and not as well as doing either by itself.

Brain activity actually drops while the participants tried to perform the two tasks; less mental focus was being devoted overall, leading to slower progress and more mistakes. The brain cannot double or triple its efforts when there are multiple problems to solve at the same time; it actually cuts the resources.

An experiment by psychologist David E. Meyer of the University of Michigan at Ann Arbor and his colleagues, quantified just how much time we can lose when we shuttle among tasks. Participants were asked to write a report and check their email at the same time. Those that jumped back and forth between tasks took about one and a half times as long to finish as those who completed one job at a time.

Another trial had the subject switch between solving math problems and classifying geometric figures. The more difficult the problems and the more complex the rules used in sorting, the more time the subjects lost in switching. Each switchover from one task to the next meant rethinking and thus involved additional neuronal (brain) resources and time.

Pöppel does not recommend mental channel surfing. During such disjointed thinking, connections are lost, and as a result no lasting neuronal representation (memory) is created from the information so processed.

Up to a point, people can improve their multitasking skills with practise – at least those that can become routine. The tasks also need to be similar in nature. However, doing one task at a time is overall more efficient.
By its nature, multitasking is stressful, and the area in the brain most involved with multitasking is also most affected by the resulting stress. Located right behind the forehead, the prefrontal cortex, which neuroscientists call the “executive” part of the brain, helps us assess tasks, prioritize them and assign mental resources. It also "marks" the spot at which a task has been interrupted, so we can return to it later. This area is affected by prolonged stress. Such stress can also affect brain cells in another region, the hippocampus, which is important for forming new memories and accessing existing ones. That damage makes it difficult for a person to acquire new skills and facts.

Dr. Brian Kowalchuk (City of Winnipeg – Employee Assistance) comments: “The main point is that if you are going to multitask successfully, you can handle a little novelty on one primary task well, but you can only handle the other tasks if they are routine—i.e. have no novel demands. This is the notion that if a task can become 'automatic' it is no longer effortful— but it had better stay routine because as soon as a complication develops the ability to multitask on it fails. Most of the time, as the article points out, we are not simultasking, we are moving back and forth from one task to the other—and if we do it quickly it seems like we're doing more than one thing at a time.”

Relate this to Lifeguarding

- Lifeguards need to understand that effective scanning is a single task. Unnecessary distractions lower the effectiveness of vigilance.

- Zone sweeps may take longer to complete, and be less effective, if the Guard is distracted.

- Lifeguards are more apt to miss something when distracted.

- Dealing with rule infractions, other PR, and sharing vital information with other Guards should be done quickly while surveillance is maintained – about 10 seconds. Other Guards would shift to cover at some level.
  - Guards involved in more intense distractions or interruptions should have their zone covered by calling a backup Guard.
  - Ideally, supervisors should deal with major complaints and problems so the Lifeguards can focus on surveillance.

- Lifeguards engaged in multitasking are actually working harder and are less effective; they may also be subjecting themselves to unnecessary stress and exhaustion.
Heat

Working in warm environments, exceeding 29°C, has a noticeable negative effect on vigilance. **Heat can reduce vigilance by 45%**. This concern is twofold for Lifeguards; as the outside temperature climbs higher, attendance at pools usually increases. Lifeguards must take steps to keep cool. Therefore, dipping into the water while rotating to a new position, or using a water-misting bottle when stationary, may help to keep Lifeguards cool and more attentive. Shade and drinking water may also help Lifeguards remain alert when the deck temperature or weather is warm. Proper hydration is essential. Regular small sips have proven to be more effective than consuming large amounts of water at one time.

Noise

High noise levels hinder the ability to share one’s attention and also tend to focus one’s attention on the signals present in the central vision (directly in front of the Lifeguard), to the detriment of those signals present in the peripheral vision.

Fatigue

Hot busy days are exhausting for everyone. Fatigue leads to a loss of vigilance. Lifeguards need to understand the importance of proper rest, regular exercise, diet and nutrition. They also need to understand that alcohol and drug abuse may adversely affect their performance.

- **WHEN APPROPRIATE**, Short 20-minute “power naps”, are proven to be more effective than coffee or mild exercise.

Personal Problems

A staff member, who has personal difficulties, may display performance issues at work. The City of Winnipeg offers Employee Assistance (EA) for all staff and their immediate family. It is a discrete service without charge.
Surface Recognition-Time versus Submerged Recognition-Time

Surface struggle time for the average drowning non-swimmer (DNS) is generally around **one minute**. However, this can occur in as little as **10 seconds**. Lifeguards are trained to recognize problems in less than 30 seconds, and generally do well reacting to victims in trouble at the water surface, averaging between 10 – 30 seconds. Difficulty recognizing submerged victims quickly is a concern.

A study, by Ellis & Associates in 2001 showed:
- It took an average of one minute and 14 seconds for Lifeguards to spot a submerged manikin on the pool bottom.
  - Random multiple tests were done in both deep and shallow water.
- Lifeguards noted the presence of the manikin on only 46 occasions, or in 9% of the tests within 10 seconds.
- It took 30 seconds or less in 43% of the tests.
- In 41% of the tests it took over one minute.
- It took more than 3 minutes in 14% of the tests.

<table>
<thead>
<tr>
<th>Time Elapsed Before Manikin Spotted – Study conducted by Jeff Ellis &amp; Associates, 2001</th>
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<tbody>
<tr>
<td>Over 3 min.</td>
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<tr>
<td>121 sec – 3 min</td>
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<tr>
<td>61 sec – 2 min</td>
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<tr>
<td>31-60 sec</td>
</tr>
<tr>
<td>11 – 30 sec</td>
</tr>
<tr>
<td>0 – 10 sec</td>
</tr>
</tbody>
</table>

These numbers, generated from the Ellis & Associates study, may reflect the type of training the Lifeguards received and/or environmental factors. Lifeguards need to scan the whole pool, which includes the water surface, below the water surface, and the pool bottom.

**Environmental Factors**

Surface glare caused by sunlight, or artificial light, can render the pool bottom invisible. Generally, Lifeguards must position themselves to avoid this situation. It is particularly an issue when a pool is balanced (Lifeguards positioned on opposite or multiple sides of the pool) with some of the Lifeguards on the “glare-side”. Unfortunately, with a balanced pool, this situation cannot always be avoided; Lifeguards on the non-glare side need to compensate to accommodate those lifeguards with impaired visibility. Placing more guards on the non-glare side may be a viable strategy.

Wind, splashing, and wave action creates ripples which distort the water surface making it difficult to see below the surface and the bottom.
Pool design

Pool design can play a big factor in the Lifeguards’ surveillance ability. Designs that include the following, all aid in the Lifeguards’ job:

- Good basic security to prevent unauthorized entry.
- Change rooms exiting to the shallow end.
- Ergonomic guarding stations.
- Clear sightlines with a wide field of vision and no blind spots or glare.
- Adequate ventilation and temperature control.
- Acoustic considerations.

Work Culture\textsuperscript{xv xvi}

A strong and healthy work culture is a powerful force in presenting and maintaining a safe swimming environment. What is the work culture (the shared values and attitudes of the majority of the workers) in your work place? Is it one of safety-first, mutual respect, and professionalism? Or is it one of lax standards, bullying, a poisoned atmosphere, and poor work ethic?

Work culture characteristics manifest themselves during an emergency. During an emergency, Lifeguards perform as a team in the pure sense of the term. Advanced communication skills are essential. A functional team will phrase and frame criticisms in the form of a request or direction (positive language) – Example: “The chest strap is next, do the chest strap!” A less functional team, or team member, may handle the same situation in a more critical and negative manner – Example: “That’s the wrong strap; you’re supposed to do the chest next!!”

A poor work culture can lead staff to second-guess themselves. This may cause indecision and an erosion of self-confidence. Effective team-building and maintenance is critical.

\begin{center}
\begin{tikzpicture}
  \node [shape=ellipse,draw] {Lifeguard};
  \node [shape=rectangle,draw, below=of Lifeguard] {Amount of Critical Signals};
  \node [shape=rectangle,draw, left=of Lifeguard] {Training};
  \node [shape=rectangle,draw, right=of Lifeguard] {Heat};
  \node [shape=rectangle,draw, above=of Lifeguard] {Recognition Time};
  \node [shape=rectangle,draw, below=of Lifeguard] {Bather Load};
  \node [shape=rectangle,draw, below left=of Lifeguard] {Distractions};
  \node [shape=rectangle,draw, below right=of Lifeguard] {Diversions & Multitasking};
  \node [shape=rectangle,draw, below=of Lifeguard] {Fatigue};
  \node [shape=rectangle,draw, right=of Lifeguard] {Environment};
  \node [shape=rectangle,draw, left=of Lifeguard] {Personal Problems};
  \node [shape=rectangle,draw, below left=of Lifeguard] {Noise};
  \node [shape=rectangle,draw, below right=of Lifeguard] {Work Culture};
\end{tikzpicture}
\end{center}

\textbf{Scanning and Vigilance – What affects it?}

What is not known, at this time, is if these factors are cumulative or exponential.
In 52% of the drownings, Lifeguards (Supervision) played a major role. Factors included:

- Distraction
- Failure to recognize
- Poor positioning
- Improper procedure
- Too few Lifeguards
- “Buddy system” for public not in place
- Lack of parental supervision
- Absence of any supervision

“Drownings occurred at facilities not because lifeguards weren’t trained, but because managers (Supervisors & In Charge Lifeguards) didn’t require that they (Lifeguards) follow their training”.[sic] Frank Pia
PART 2 – RECOGNITION – BEHAVIOURAL BASED TRAINING

Victim Types:xix

- **Distress victim** – This victim is in some type of distress such as:
  - Fatigue
  - Poor skills
  - Injury
  - Medical condition
  - Swimming conditions, etc.
  - They often call for help and commonly respond to rescue aids. If not assisted quickly they progress to a drowning victim.

- **Drowning victim** – Drowning victims are unable to support themselves in deep water because of nonexistent swimming skills or other factors. It is uncommon for them to call for help as their prime concern is getting air; they generally respond poorly to rescue aids often pushing them away. They may be at the surface or submerged. A quick, direct contact rescue, with an aid if practical, is most effective.
  - No call for help.
  - Upright body position.
  - Ineffective leg movement.
  - Vigorous arm movement at sides or front.
  - Head tilted back, face turned toward help.
  - Face and eyes show panic.

- Situations take place in the pool and on the deck area. The pool, deck area and the surrounding area should be included in basic surveillance. Remember to include the water surface, below the water surface, and the pool bottom.
- Most drowning occurs in less than 1.5 metres (5 feet) of water. xx
- Good recognition skills will catch situations early, before they materialize.
- Drowning can take place in as little as 10 seconds!
CRITICAL SIGNALS
Any behaviour, activity, action or situation that requires the attention of the Lifeguard is a critical signal.

You need to be prepared for all types of situations. This is not an all inclusive list as there is a plethora of situations which may arise while you are guarding. The following is a sampling to provide a base level of preparedness. Be vigilant and be ready.

General

- Caregiver ratio, height restriction, age not met
- Over age in opposite change room
- Suspicious behaviour in pool or on deck
- Escalating competitiveness in a game (ultimately may lead to aggressive behaviour)
- Tag games (eventually someone will leave the water and an on-deck race will erupt)
  Sometimes these tag games become very aggressive
- Terror on any patrons face
- Argumentative or aggressive behaviour of any patron
- People running into the change room in the middle of a class
- Adults (usually male) that are hanging around striking up “friendships” with unattended children
- Children who are covered with unexplained bruises or markings
- Swinging or climbing on the ladder railings
- Climbing up the lifeguard chairs
- Hanging around or playing on the ropes in case of entanglement
- Patrons attempting to gain access to a restricted area or are trying to gain access to the facility without paying admission fees
- Patron cannot complete laps for deep end
- Running
**PR Minor:**

- Complaint - General
- Complaint - Schedule/space
- Complaint - Staff
- Complaint - Other patrons
- Complaint - Cleanliness
- Complaint - Cold/too hot - sauna/hot tub
- Complaint - Cold/hot deck temp
- Complaint - Cold/too warm pool water
- Complaint - Cold showers
- Complaint - Too hot/scalding showers
- Complaint - Sore eyes
- Lost goggles
- Spitting
- Nose blower
- Splashers
- Lap swim tracking and communication
- Stray animal
- Program questions
- Distraction - General
- Distraction - Look at me!!!
- Distraction - Free lesson
- Distraction – Flirting
- Frightened person using amenity
- Lost contact lens
- Lost valuable on pool bottom
- Weird swim instructor
- Pool/change room screamer
- Change room screamer
- See thru swim wear
- Public sitting in guard station
- Use of safety equipment
- Guard asked to hold valuables
- Inappropriate language
- Hanging around or playing on the lane markers
- Climbing up the Lifeguard chairs
- Rowdy
- Loud music/noise
- Loitering
- Love birds
- Pushing/pulling
- Swimming in front of any open amenity
- Unattended toddler
- Unattended at risk
- Too many patrons on equipment

**PR Minor continued:**

- Towel flicker
- Glass container on deck/in change room
- Food/beverage on deck
- Gum chewer
- Fake drowner
- Tag
- Shaver in sauna/hot tub
- Smoking

**PR Major:**

- Missing Child
- Missing Child VSA
- Pervert
- Stalker
- Media
- Breath holder
- Abuse of staff
- Camera in change room

**Fouling:**

- Deck/flooring
- Pool

**Evacuation:**

- Fire
- Chlorine leak
- Gas leak
- Chemical leak
- Bomb threat
- Suspicious package
- Power failure
- No water services
- No heat
- Labour dispute/strike
- Terrorist threat
- Dangerous person
- Dangerous animal
Crime:
Pervert
Sexual assault
Vandalism
Arson
Assault
Minor theft
Major theft - patron property
Major theft - facility property
Weapons

Special Needs:
Physical
Mental
At risk
Geriatric
Language barrier
Disabled - requires assistance into pool
Hearing impaired
Sight impaired

Staff Situations:
Impaired Lifeguard
Injured Lifeguard
Lifeguard requires rescue
Ill guard
Buddy guarding (Distracted)
Safety violation
Poor performance: guarding/rescue/treatment
Site/Amenity Specific Rules
If your site has extra and unique amenities, familiarize yourself with the safety rules pertinent to each item. Examples include but are not limited to:

- Slides
- Hot tub
- Large inflatable toys
- Lap swim area
- Sauna
- Track and weight room
- Unique toys
- Etc.

Shallow Water
- Shallow diving
- Climbing on other swimmers
- Sitting on shoulders or engaging in “chicken fighting”
- Jumping too close to wall
- Inappropriate use of floatation equipment i.e. lifejackets that don’t fit
- Hitting of anything with the pool noodles
- Aggressive ball play that is dangerous to other swimmers
- Patrons swimming through the middle of classes
- Playing on the pool stairs particularly hanging on the staircase railing
- Playing under the tot dock
- Using shallow end slide without appropriate adult supervision
- Unattended children who do not meet the height requirement
- Non-swimmer slowly and inadvertently approaching deep water while chasing a ball or a friend

Deep Water
- Gutter grabbers or other non-swimmers attempting to sneak to deep end.
- Knowing who has actually done their laps and can safely enter the deep end is essential.
- Evaluate, track and communicate the lap swim requirement to get into the deep end carefully.
- Monitor swimmers who “passed” the distance requirement but are tiring and becoming at risk.
- Swimmers hanging around the drain covers on the bottom.
- Back dives or back flips, “stunting” off the side.
- Cross diving, Cross diving from end to side or side to end.

Lap swim area
- Aggressive/abusive swimmer
- Lane hog and/or thief
- Swimmer not sticking to lane
  - (wandering – collision hazard)
- Backstroke swimmer not paying attention to other swimmers (wandering – collision hazard)
- Children playing in lap area
- Lap swimmer swimming in “play area”

Dive Tank
- Pleasure swimming in the diving area.
- Swimming under the boards or playing on the deck under the boards.
- Multiple bouncing then entering the water off the board is dangerous.
- More than one person on the board at a time.
- Hanging from diving board or platform
- Make sure area is clear before leaving board or platform.
- Not swimming out when appropriate
- Never let divers go in rapid succession (cherry-bombing); ensure they wait until it is safe.
- Follow the guidelines established for your pool carefully before a swimmer goes to the diving area.
The follow matrix summarizes possible pool situations. Again, this is not an all inclusive list as new possibilities arise all the time.

**Minor Water Rescue**
- Minor Pull out Deep
- Minor Pull out Shallow
- Weak swimmer
- DNS
- Gutter grabber
- Cramp - needs assistance

**Major Water Rescue**
- Multiple drowners
- Broken leg - shallow
- Cardiac Arrest
- Lumbar spinal
- Secondary drowning symptoms

**Scuba:**
- Squeeze
- Embolism
- Decompression sickness
- Subcutaneous emphysema
- General Injury
- Requires backup
- Submerged

**Entrapment**
- Bulkhead
- Tot-dock
- Mats
- Under swimmer

**Minor Medical**
- Minor allergic Reaction
- Assist with asthma puffer
- Assistance with glucose - hypoglycaemia
- Assist with asthma puffer
- Assist with nitro – prophylactic

**Major Medical Emergency**
- Severe asthma attack
- Hyperglycaemia
- Hypoglycaemia
- Dizzy
- Fainting
- Unconscious
- TIA
- Convulsions - shallow
- Convulsions - deep
- Angina
- MI (Heart Attack)
- Respiratory distress
- Hyperventilation

**Blocked airway:**
- Conscious
- Unconscious
- Cardiac arrest
- TIA
- Stroke
- Shock
- Anaphylaxis - with meds
- Anaphylaxis - without meds
- Open Pneumothorax (Sucking Chest Wound)
- Imbedded object
- Puncture wound
- Amputation
- Avulsion
- Chest injury
- Abdominal injury

**Poisoning**
- Ingest
- Absorption
- Injection
- Inhale
Spinal Injuries
Shallow
Deep
Standing shallow spinal
Walking
Found on stair case
Found on land
Non-breathing
Non-breathing facedown
Vomiting

Bone and Joint
Bump/bruise
Cramp
Strain/tear
Sprain
Closed fracture
Open fracture
Fracture no distal circulation
Dislocation
Dislocation no distal circulation
Rib fracture
Flail chest

Environmental
Heat cramps
Heat exhaustion
Heat stroke
Hypothermia
Frost nip
Frost bite

Convulsions
Land
Water

Facial injuries
Ear
Eye
Nose
Mouth

Burns
Superficial
Partial
Full thickness
Electrical
Chemical – Wet/dry
Molten metal
Stream/hot gas
Facial
Inhalation
Radiation

Bleed (Major/Minor)
External
Internal
Nose
Menstrual
Animal bite
Human bite
Prevention of Accidents - Public Education

Prevention includes, but is not limited to the following:

1. Facility risk analysis
   a. Determine risks
   b. Eliminate risks
   c. Control and manage risks
2. Rule and Policy creation, review, and enforcement
3. Public education
4. Effective hiring practices
5. Supervision and scanning
6. Performance and equipment audits of the Lifeguards and facilities
7. Post Incident Analysis (PIA) of critical events
8. Personal accountability
9. Lifeguard training and education
10. Maintaining standards through regular testing of the staff’s skills and fitness
11. Effective leadership to reinforce and enforce the training and job expectations of the Lifeguards

Not all rules/preventative actions can or will be written down. It is the Lifeguards responsibility to ensure a safe fun-filled water experience for every patron. Categorized by pool area these are just some of the many activities, which you must monitor during your Lifeguard shifts. Be mindful that these are un-posted rules/preventative measures and that public education is a component of your job. Do not just “roar” the infractions, take some time (when logical to do so) and explain the rules. Look at these lists and see what you can add. Every facility and every swimmer is different.

Always keep in mind that an educated swimmer is a safe swimmer. A bit of knowledge imparted today may prevent an accident tomorrow…

City-wide Posted General Rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk On the Pool Deck – DO NOT RUN</td>
<td>Inflatable toys, buoyant objects of skin diving equipment are not allowed in the pool unless specific authority is given by the Lifeguard in charge</td>
</tr>
<tr>
<td>Spitting, spouting of water, pushing and horseplay are prohibited</td>
<td>When the emergency alarm sounds, clear the pool immediately</td>
</tr>
<tr>
<td>Proper swim attire is required</td>
<td>Street shoes are not permitted on the pool deck</td>
</tr>
<tr>
<td>Infants must wear leak proof swim pants</td>
<td>Have fun, respect others</td>
</tr>
<tr>
<td>Do not use loud or abusive language in or around the pool</td>
<td></td>
</tr>
<tr>
<td>Height, age requirement, and caregiver ratios must be met</td>
<td></td>
</tr>
</tbody>
</table>

Lifeguards Have Complete Authority
Facility Analysis

One of the components of AER is to create a facility analysis of all city pools. The essential objective is to outline Lifeguard positioning and responsibilities. The final product manifests itself as a series of wall mounted posters, outlining guard positions, sight-lines, rotations, responsibilities, hazards, hot-spots, etc.

Legend symbols, on each analysis poster, will be the same throughout the pools. Symbols are exaggerated in size for simplicity. i.e. Emergency alarms, chairs, rules, spine boards etc.

Facility Analysis Example 1
Facility Analysis Example 2
## Instructor Lead Exercise
### Bather load to Lifeguard Ratios

<table>
<thead>
<tr>
<th>Bather Numbers</th>
<th>Minimum Lifeguards Required on Deck</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td></td>
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</table>
### Pool Analysis Exercise

The following page is a diagram of an outdoor pool. With your group, analyze the facility. This is a 2-part exercise; do part 1 first, and then proceed to part 2. Make notes directly on the overhead diagram provided (with water soluble markers) and the following note sheet (page 37).

#### Basic conditions:

<table>
<thead>
<tr>
<th>Physical Layout</th>
<th>Bather Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>The pool area is fenced in; there is one access gate other than the main entrance.</td>
<td>This is a tourist area; many languages and cultures are encountered.</td>
</tr>
<tr>
<td>The deep end of the pool is becoming cloudy.</td>
<td>10 senior-citizens in sauna.</td>
</tr>
<tr>
<td>38°C air temperature.</td>
<td>60 people in the shallow end - mixed ages; 50% are 6-years old and under.</td>
</tr>
<tr>
<td>29°C water temperature.</td>
<td>6, 40-yr old plus, lap swimmers.</td>
</tr>
<tr>
<td>The sky is clear with no wind.</td>
<td>20 children (8 – 12 yrs in age) lined up for waterwalker, west side of pool.</td>
</tr>
<tr>
<td>The pool hours are 9:00 a.m. - 11:30 p.m.</td>
<td>60 young teens in dive area.</td>
</tr>
<tr>
<td>It is 6:00 p.m. in this diagram.</td>
<td>15 people in hot tub - mixed ages.</td>
</tr>
<tr>
<td></td>
<td>40 people on deck evenly spread out - mixed ages.</td>
</tr>
<tr>
<td></td>
<td>3 School buses have just pulled up loaded with Grade 1 age children. (another 180 swimmers)</td>
</tr>
</tbody>
</table>

Include but do not limit yourselves to the following:

#### Part 1 - Pool Layout

1. Place location of elevated stations, Lifeguard equipment, and First Aid Station(s):
   - Spine board(s).
   - Reaching equipment.
   - Throwing equipment.
   - Emergency alarms.
   - Other equipment.
2. Considerations: hot spots, problem areas, and solutions.
4. Focal points (agreed location(s) where Lifeguards set up for emergencies). Consider EMS access.
5. Dive or deep area analyses – what is the traffic flow, and how is it controlled?
6. Signage locations and content (rules etc.).
7. Wheel chair accessibility.
8. Family change room location.
9. Lighting.

#### Part 2 – Bather Load - Dealing With The Variables

1. How will the bather load affect the Lifeguarding?
2. Number of Lifeguards required, by Manitoba Public Health Act, on deck (Include assistant Lifeguards as Lifeguards.) Include any additional Lifeguards.
   - Total number of Lifeguards scheduled.
   - Positioning of Lifeguards.
     - Ground level patrols.
     - Stationed Lifeguards (in Lifeguard chairs).
     - Rotation - start position to finish position.
3. Lifeguard zones, sightlines, and overlap. (The area each Lifeguard is covering and the 90° blocks contained within.)
4. What process would be required to deal with the 3 school buses?
5. What type of problems would you expect to handle? What are the solutions?

It is important for Lifeguards to position themselves for the best possible surveillance

A Moment of Inattention --- A Lifetime of Regrets
Section 1 - Surveillance – 10th Edition 2013

1. Alert - Lifeguarding in Action – Lifesaving Society Canada
2. Video – Making the difference - R.J. Ross Productions
3. Crupi v. Royal Ottawa Hospital and others – Chapter 8 - LSS Alert
5. Frank Pia - Study on drownings from 1919-1980
6. Wikipedia, the free encyclopedia
7. Tom Griffiths Why Dummies Disappear
8. Alert - Lifeguarding in Action – Lifesaving Society Canada
9. Video - Tom Griffiths - The 5-Minute Scanning Strategy
x. Tom Griffiths The Vigilant Lifeguard – Aquatic International
xi. Email survey 2009
xii. Scientific America Mind Publications January 2005, Klaus Manhart
xiii. Tom Griffiths The Vigilant Lifeguard – Aquatic International
xvi. Human Relations for career and personal success Andrew J. DuBrin, Terri Geerinck – Prentice Hall
xvii. Aquazine – American Red Cross 2005
xviii. Frank Pia - Aquazine – American Red Cross 2005
xix. Alert - Lifeguarding in Action – Lifesaving Society Canada
xx. Aquazine – American Red Cross 2005
xxi. Alert – Lifeguarding in Action, Chapter 2 – Lifesaving Society Canada
SECTION 2

Communication
Learning Objective:
Communication Skills

At the end of this section the learner will:

- Define hand signals and accurately demonstrate signalling the following:
  - Signal
  - Backup required.
  - Evacuate the pool.
  - First aid.
  - Cover my area.
  - Spinal.
  - Missing person.
  - Unattended toddler.
  - Everything is okay.

- State at least one benefit of hand signals
- Demonstrate and explain the 4 whistle codes.
- Define “walk and talk”.
- Explain “radio” protocol.
- Describe what advantages using emergency alarms provides the Lifeguard and what should happen when the emergency alarms are activated.
  - Explain the policy on emergency alarms
- Explain how EMS is contacted
- Explain the level of authority a lifeguard has in regards to the safety of the operation
- Explain how risk is an inherent part of the aquatic environment
- Explain how a Lifeguard deals with risk
- Describe how enforcing rules with diverse age groups differs
- Describe positive and negative rule enforcement styles
Hand Signals

Hand signals are useful for communicating over distance and loud pool decks. They are one reliable method of communication when technology, such as radio, fails. Passing on important information, or requesting supplies, can be communicated over a distance, saving time and effort. Hand signals are like a “language” and tend to be contextual; they also need to be executed cleanly to prevent confusion. Tip: Keep signals simple and few; simply pointing at the problem or situation is often enough.

General Signals

SIGNAL: One arm straight up, other arm points at situation

BACKUP / HELP REQUIRED: One arm remains straight up; guard calls out “BACKUP!”

MAJOR EMERGENCY: Both arms extended straight up overhead (Like “touchdown” in football)
ACKNOWLEDGE OTHER
LIFEGUARD: Eye contact and one arm pointing at guard

EVACUATE POOL: Large circular motion above head

PHONE CALL (receiving or making): one hand at ear holding an imaginary phone
Medical / First Aid

FIRST AID: Forearms form a cross in front of chest, below shoulders, one horizontal, and the other vertical (+)

HEART ATTACK: Fist on chest

CERVICAL SPINAL: One hand chops at the neck

LUMBAR SPINAL: One hand chops at the lumbar area of back
Situations

COVER MY AREA / LOOK OVER THERE: Two fingers pointing at eyes with one hand; the other hand pointing at area to be covered / looked at

POTENTIAL DANGER: Move one open hand, palm down, horizontally over the top of the head

PUBLIC RELATIONS: One hand, fingers move up and down, simulating a mouth talking (Use discretion)

UNSTABLE PATRON: Hand flutters - drunken, behavioural, medical condition, mental problems, etc. (Use discretion)
PROBLEM BEHIND: One hand (thumb) points behind

RUNNING ON DECK: Both arms form running motion

MISSING PERSON: Both arms crossed overhead in an “X”

“I’M LOOKING FOR...”: One hand horizontally above the eyes, as if shielding from the sun
UNATTENDED CHILD: Two hands horizontally in line, pointing forward with index fingers, moving inward and outward – “BUDDY UP!”

BROKEN GLASS OR OTHER FLOOR HAZARD: One arm extended horizontally in front with hand in “STOP” motion; the other hand pointing to ground or specific area in a sweeping motion

Facility Areas

DIVING BOARD AREA: One arm bent at elbow 90°, to simulate a diving board (horizontal); other hand indicates incident on, below, behind or beside the diving board

CHANGE ROOMS: Male - One arm extended horizontally at side Female - Both arms extended horizontally at side
People

PEOPLE:
Male - One arm extended horizontally in front
Female - both arms extended horizontally in front

SIZE: Indicate with hand, approximate height of patron / object

Other

I DON’T UNDERSTAND / I DON’T KNOW: Both arms positioned at side, with palms up

EVERYTHING IS OKAY / I UNDERSTAND: One or both hands covering top of head
ON A GUARD-BREAK: Hands twist, as though breaking a stick

LIFEGUARD ROTATION: Large horizontal circular motion **below shoulder height**. Like stirring a large pot or cauldron
Whistle Signals

Don’t over use – WALK AND TALK whenever possible

| ONE SHORT CHIRP: Public Attention | ONE LONG BLAST: Minor Situation |
| TWO SHORT CHIRPS: Guard Attention | TWO LONG BLASTS: Major Situation |

Always carry your whistle with you on a water rescue; you may need it again if backup fails to respond or if the situation escalates. Wrist straps or clips that release easily are the best choice since some neck lanyards may catch on something or be grabbed during a rescue or situation.

Whistles have 3 functions:
1. The first function of the whistle is as a first line emergency alarm; **it does not replace the use of emergency alarms if available**
2. The second function is for basic communication between lifeguards
3. The third function is to gain the attention of the public and is especially useful in preventing injury due to dangerous behaviour and activity

**Overuse of the whistle is annoying; “Walk and talk” whenever possible**

**How to Use the Whistle Properly**

If you are having difficulty getting the whistle to be heard, check how you are blowing it. First get the basic technique down:

1. Stick out your tongue.
2. Blow to inflate your cheeks, but let the tongue act as a plug - no air comes out.
3. Sharply slip your tongue into your mouth and let the air escape. (It’s almost like spitting.)
4. Now place the Fox-40 whistle in your mouth and plug the end of the whistle with your tongue.
5. Blow to inflate your cheeks, but let the whistle and tongue act as a plug - no air comes out.
6. Sharply back your tongue off of the whistle and let the air escape.
7. The more pressure you have, the louder the whistle.
Use of Two-Way Radios:

Two-way radios are very useful communication tools, especially in large facilities. Become familiar with the equipment supplied. Most radios work in a similar manner:
- Ensure radio is turned on and set to correct channel
- Push send button firmly
- Identify receiver first, then your name
  - Example: “Front desk – This is Joe Anne at the dive tank”. Guard in dive tank is calling front desk
- Release send button
- Await acknowledgement
- State message speaking slowly, (50-60 words a minute) and distinctly
- Use “plain language”
- Await acknowledgement before signing off with your name

If you are calling in an emergency, state that first and repeat:
Example: “Front desk – It’s Joe Anne at the Dive tank. We have an emergency! Front desk – It’s Joe Anne at the Dive tank. We have an emergency!”
Whenever possible, call in the emergency on your radio before you use the emergency alarms, so you can be heard.

Ten Code

Radio “Ten Codes” are being phased out in favour of “plain language”. Here are a few that are still in use:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Breaker, breaker!” or “Break, break!”</td>
<td>All clear radio and let &quot;breaker&quot; talk</td>
</tr>
<tr>
<td>10-4</td>
<td>OK – affirmative</td>
</tr>
<tr>
<td>10-100</td>
<td>Nature call</td>
</tr>
<tr>
<td>“Over”</td>
<td>Stated at the end of each one-way communication</td>
</tr>
<tr>
<td>“Over and out”</td>
<td>Stated at completion of communication and indicates to the receiver that the sender has finished the conversation</td>
</tr>
</tbody>
</table>

Remember:
- Radios are for emergencies and important business, not for socializing.
- Use proper manners when “on the air”; other co-workers and especially the public can overhear everything being said.
- Use discretion with sensitive subjects such as a patient’s condition or details of a situation. Radios can be scanned by the media. Consider the use of telephones, or face to face conversation, whenever practical.
- Radios generally do not perform well when submerged in water. Even though, a rescue is of the greatest importance, running out of radios creates other problems affecting future rescues.
  - IF YOUR RADIO DOES GET WET, REMOVE THE BATTERY IMMEDIATELY! GIVE THE RADIO AND BATTERY TO YOUR SUPERVISOR.
Voice Communication

Talking works best when public or staff is reasonably close together. Over distance, the pool clamour drowns out the voice, hence people tend to only hear the vowels and make no sense of what is being said. Yelling at the public generally accomplishes nothing. Therefore when dealing with the public, it is best to “walk and talk” whenever possible.

P.A. Systems

Use the P.A. system to:

- Instruct public as to what they should do in an emergency. If available, relay other information that might be helpful. This may include how long they have to wait before going back in after an incident.
- Call up needed staff for first aid, maintenance, or locker-room problems.
- Assist with missing children.
- Let customers know there is a problem with their vehicle such as lights left on, etc.

Remember to speak slowly and extra clearly. P.A. systems typically echo significantly in an indoor pool area; slowing down the announcement and adding pauses, helps to counteract this effect.
Pool Clearing

Emergency Alarms

Emergency alarms usually sound throughout the facility attracting the attention of all public and staff. Alarms are useful in initiating a rapid pool clearing. All emergency alarms must be treated as a real emergency until confirmed otherwise by a supervisor. The pool is always evacuated, when the alarm is activated, even if a false alarm is witnessed. Over time, patrons become “trained” to respond appropriately in an emergency; this is only possible if a clear policy, on pool clearing, is consistently followed.

In a Major emergency, two critical functions occur:

Critical Function # 1
The pool or activity area is evacuated of all participants.

- Where the public are evacuated to, depends on the nature of the emergency.
- You may have to clear all, or only certain areas, or just parts of an area, in the facility:

<table>
<thead>
<tr>
<th>Pool area</th>
<th>Various amenities</th>
<th>Classroom areas</th>
<th>Public washrooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sauna</td>
<td>Weight rooms</td>
<td>Staff areas</td>
<td>Etc.</td>
</tr>
<tr>
<td>Hot tubs</td>
<td>Change rooms</td>
<td>Hallways, balcony or observation areas</td>
<td></td>
</tr>
</tbody>
</table>

The lifeguard may clear the pool of all swimmers for a variety of reasons and this is accomplished in a number of ways depending on the situation and facility. This would include but is not limited to:

1. The use of whistles and voice
2. The use of the PA system
3. The use of emergency alarms, if so equipped

Critical Function # 2
Back up staff is alerted to the situation. All staff responds to a situation.

Once the pool is clear and all back up staff have materialized, the alarms (if used) are silenced as per the supervisor’s direction.

Visibility

Lifeguards need to be readily identifiable to the public and to fellow staff. Wearing clearly identifiable uniforms is essential.

Lifeguards must remain visible during a rescue. Therefore, lifeguards wear their full uniform while performing a rescue. This aids the backup team in locating the rescue.
Activating EMS for Emergencies

Delegation Method:

When delegating the activation of EMS to a clerk (preferred) or other staff member, the following steps and information must be provided:

• Tell a specific person that they are to contact EMS.
• Give the patient’s condition and any treatment being provided. Basic life threatening or urgent information must be provided. Examples:
  o “We have an unconscious child.”
  o “We have an adult with a severe bleed, they have major blood loss.”
  o “We have an unconscious, non-breathing, pulseless adult, CPR is being performed.”
  o “We have a child with a suspected spinal injury. The patient is conscious. They are being removed from the pool on a spineboard by the lifeguards.”
  o “There is a male Caucasian adult on the premises with a knife. He is threatening people.”
• If the accident is serious or involves a minor, tell the caller they are to contact the police as well
• Confirm that the caller understands everything
• Tell that person to report back to you when they have completed the call

Making the Call:

If you are contacting EMS on a City of Winnipeg telephone, you must dial 9 first before dialling 911 – (9-911). Try to make the call in a discrete location or out of public earshot. EMS is question driven; they will ask you questions in a specific order. You need to give, request, or get the following information:

• Who you are
• The service required (Fire, police, ambulance, poison control)
• If the accident or situation is serious, request the police as well
  o Examples include
    ▪ Any life threatening situation involving a minor
    ▪ Obvious death
    ▪ Crime in progress

• Who the patient is
• The patient’s condition and any treatment being provided
  (see above examples)
• Your location (address)
• How the accident happened
• When EMS will arrive
• Any other information
• Stay on the line until EMS terminates the call first. Report back to the rescue team as soon as possible.
Rule Enforcement and Risk Management

There are three types of rules or policies to enforce:
- Safety rules designed to protect the patrons from injury and/or illness
- Rules or policies to ensure the enjoyment and fair treatment of all patrons
- Rules designed to protect the facility and property

Lifeguards need to ensure a flexible balance when enforcing rules and policies. The direct face-to-face educational approach with the public (people need to know why), works best in most situations. Over-enforcement with rules can lead to confrontations or passive non-compliance (the lifeguard gets ignored). Lifeguards are constantly reminded that patrons wish to have an enjoyable experience, and are also held responsible for the safety of those same patrons – an apparent paradox.

In effect lifeguards are risk managers or assessors in their own right, constantly balancing fun with risk. This balance does not mean an acceptance of a “body count” or number of injuries, but simply dealing with a reasonable level of risk. The aquatic environment is risky simply by nature; those working in this field must accept a certain level of that risk. Acknowledge as well, that each lifeguard has their own perception and comfort level in dealing with risk. To complicate matters further, risk is not necessarily absolute; it runs somewhere from a “very unlikely” possibility to a “highly likely” possibility. A good example of this would be shallow diving. A patron constantly diving into one metre of water has a high likelihood of causing grave bodily harm, and yet the possibility of no injury also exists, but to a very unlikely extent. That very same person diving into four metres of water at the pool edge would very unlikely sustain a head and spinal injury, and yet deep end spinals occur. Many factors play a role in accidents.

None the less, safety is paramount, and lifeguards have complete authority in maintaining the safety of the facility. Therefore, lifeguards are authorized to take any reasonable steps to ensure the environment is maintained in a safe manner. In all cases, certain levels of discretion are exercised. This includes but is not limited to:
- Clearing the pool or sections of the pool (activity area) to restore control and order
- Restricting and/or controlling patrons’ activity or access to areas in the facility
- Restricting and/or controlling access to certain equipment or amenities
- Ejecting and/or barring patrons from the facility

Probability of Risk Scale
Degrees and Styles of Rule Enforcement

Essentially, six observable degrees of enforcement exist. Any of these six degrees can be appropriate or inappropriate depending on the situation. The lifeguard may choose to ignore someone eating food on the deck if the bather load is high, but would always enforce the shallow diving rule. Sometimes a lifeguard may monitor a situation to gather more information or assess risk. Informing an adult that they are proceeding to deep water makes sense as does enforcing the minimal lap rule with minors; that same adult may be required to prove their swimming ability if they appear unsure of themselves. Flexibility is where the lifeguard tends to spend most of their time; this could include closing the diving boards to accommodate lap swimmers, or closing one diving board to accommodate “penny divers”. Perhaps the lifeguard may allow a parent to take their young child off of the one metre board on a slow day and enforce the minimal lap and/or lifejacket rule on a busy day. Lifeguards may control equipment or where and when certain activities take place; this would include certain games or amenities such as water-basketball, the use of inflatables, “jungle ropes” and flutter boards.

The top part of the Degrees of Rule Enforcement chart reflects the style of benefits, educating patrons, and the use of positive language. The use of positive language is powerful; it makes clear what you expect of the patron.

Examples:

- “Walk slowly please” as opposed to “No running!”
- “Please eat your food in the lobby area” as opposed to “No food in the change rooms.”
- “One at a time on the boards, please.”
- “One bounce on the boards please”, as opposed to “no double bouncing!”

The bottom part of this chart reflects the style of consequences, discipline and negative language. Discipline could include “timeouts”, swimming laps, or ejection. Generally discipline is progressive except in extreme situations. Negative language is useful for identifying and targeting a specific behaviour.

Examples:

- “No spitting.”
- “No pushing.”

Note that Advising is the counterpart of Warning, and interestingly enough, Lecturing is the counterpart of Dictating.
Enforcing Rules with Mature Adults

Young or inexperienced Lifeguards may find enforcement with older adults intimidating. Often these staff comment that it feels like they are enforcing rules with their parents. With time and practice this task will become easier. Nonetheless, a few tips will help:

- Always address the adult formally unless informality has been mutually established. At all times remain polite and approachable.
- You are in a legitimate position of authority; be friendly and firm. It is not uncommon to “negotiate” with this age group; but know where the appropriate boundaries are.
- Know what you are talking about.
- Keep the process natural. Be yourself.
- Address the behaviour and the consequences of that behaviour, not the person and your personal judgment of them. Behaviour can be described as “dangerous”, but keep away from describing it as being “stupid”.
- Your appearance is crucial – you must look professional and act confident.

Enforcing Rules with Young Adults and Teenagers

For the experienced lifeguard, this task tends to become easier, but it still has challenging moments.

- Confidence plays a major role here.
- Generally, this age group can be approached more informally; however consistency in approach is important - they need to know what to expect and where they stand.

  - Let them know you are in charge. Be prepared to stand your ground when necessary. Once you have made a decision with this age group, stick to it.
  - Avoid being their “buddy”; this can create problems later when you need to enforce rules.
  - You are less likely to negotiate with this group.
  - Many of the methods in dealing with adults apply with teenagers. Such as:
    - Address the behaviour, not your personal judgment of them.
    - Be friendly, firm, confident, and act natural.
    - Again, appearance is important; you must look and act professional.

Fatal Error: Framing a directive as a question and ending with a rising pitch in your voice. i.e. “We’re going to walk slowly today, okay???”

- Older adults may interpret this as condescension.
- Teenagers may interpret this as a lack of confidence.
- Young children may interpret this as requesting compliance.

It’s all about your attitude; keeping fit helps too.

ALWAYS back your co-workers when they are enforcing rules - ALWAYS
i Lifesaving Society – *Alert Lifeguarding in Action*
ii United States Lifesaving Saving Society – Surf Training Manual
iii Tom Griffiths, Ed. D. Penn State University
SECTION 3
Rescue Skills
Learning Objective:

Rescue Skills

At the end of this section the learner will:

- Explain Emergency Timelines
- Explain when EMS is contacted for a near-drowning emergency
  - List at least 4 other instances that require EMS
  - Explain how a EMS call is delegated out to a clerk or other staff member
  - List and explain the steps in making an EMS call
- Compare a simple Rescue with the 6 grades of drowning
  - Identify which grade of drowning requires EMS
- Describe the technique for rescuing a submerged victim
- Describe how the media is handled in an emergency.
- Describe how the public is handled in an emergency.
  - Identify who is ultimately responsible for handling the emergency.
- List the basic responsibilities, of the Lifeguards and clerk, in a 3-guard major and minor emergency.
- List the basic responsibilities, of the Lifeguards and clerk, in a 2-guard major and minor emergency.
- Explain role trading or shifting.
  - Define 2 examples when this may occur.
- List the steps in a 3-guard side-knife spinal injury with a conscious, breathing, and cooperative patient.
- List the steps in a 2-guard slant-board spinal injury with a conscious, breathing, and cooperative patient.
- Explain the different response to a non-breathing water spinal injury.
- List the steps in a land based head and spinal injury standing takedown.
- List the steps a vomit roll on a spineboard mounted patient.
- Describe other head and spinal rescue techniques.
- Explain when the beavertail may and may not work.
- Explain when a land spinal injury may be moved.
- Define who boards land spinal injuries under normal circumstances. Explain why.
- Diagram and list all the parts on a typical spineboard.
- Define the following terms:
  - Board pitch
  - Board roll
  - Angle of the board
  - Spacing
• Locate in the trauma bag the following items:
  o The front of the trauma bag
  o SealEasy assemblies and spare parts
  o Blankets
  o Gloves
  o Reports
  o Oxygen bottle with attached regulator
  o Nonrebreather mask for adult and pediatric
  o Various dressings and bandages
  o Splints
  o Glucose
  o Scissors
  o Tweezers
• Explain the Personal Safety Pouch Policy
• Explain the Fox-40 Whistle Policy
• Explain the importance of the early morning equipment check
  o Define who is accountable for this task
• Explain why fitness is an important part of Lifeguarding
Emergency Timeline

Basic Life Support  →  Advanced Life Support

- EMS Entry Point
- Lifeguards’ Solo Intervention Period
- Cross Over Time
- Lifeguards’ Intervention Exit Point
- Transport To Hospital
Role Guidelines
Notes on Emergency Procedures Guidelines

Generally the first Lifeguard on the scene is considered in charge of the rescue and/or the patient’s care. They stay with the patient and delegate needed activities and supplies. In some cases aspects of this role may fall to the person who is at the head of the patient since their first function is to monitor vitals.

Leadership and teamwork, communication skills, and prioritization are crucial during an emergency. Team members need to speak freely with one another; they need to comfortably direct and if necessary correct one another no matter what the rank.

Any member of the team may downgrade (decide it’s more serious) a patient’s assessment but no member of the team has the medical authority to upgrade or rule out a worst case scenario. Deal with “over reactive” staff separately. In all cases, the exchange of information should remain professional.

In some situations, Lifeguards may role trade or shift. This may be through circumstance or necessity. It is important that Lifeguards are aware of a role trade or shift, and that the role trade or shift is logical and appropriate. Avoid role confusion or worse, role abandonment. In any case, the first Lifeguard on the scene generally remains in charge of the rescue and stays with the patient.

Supervisors should fit into their role on the team. They still have the added responsibility of ensuring that all roles and functions are being carried out properly. It is their responsibility to ensure all appropriate agencies have been contacted, all reports are completed and all appropriate management staff are contacted. Supervisors “taking over” a rescue should only do this in special circumstances. Example: inexperienced staff who are unsure of themselves or who are performing poorly.

Dealing with the Media

Media must be dealt with effectively. They must be kept out of sensitive areas and are not allowed to take pictures without proper authorization and permission. It is the responsibility of the media relations officer to deal with the media and conduct any press conferences. The best thing to tell any media personnel when queried about an accident is that you can’t say anything right now. The media relations officer will be contacted and all questions regarding this matter should be directed to their office. Ask for the reporters’ phone numbers so they can be contacted. Avoid saying “no comment.” Sometimes management may request the presence of one or more members of the rescue team, at a press conference.

At no time should any one from the public or media see any of our reports. At no time should a situation be discussed with the public even if they are a friend or relative.

MEDIA GOLDEN RULE: NOTHING IS “OFF THE RECORD”
Crowd Control

During emergencies it is important to control and protect patrons. They must be kept away from the emergency situation. Lifeguards must be cautious when utilizing the assistance of the public.

**Lifeguards always remain in charge of all emergencies and avoid giving critical functions to non-staff or non-EMS personnel – basically any non-identified people.**

When working alone, use good judgment and common sense; if you need help, you need help.

**A Review: Situations**

- **Minor Situation:** Requires the attention of one Lifeguard. Communication and coverage of unwatched areas by other Lifeguards is critical (shift to cover).
  - Just because a situation is deemed minor, does not mean that a Lifeguard cannot request assistance. This only becomes a problem if a facility has 3 Lifeguards scheduled, a 2-Lifeguard crowd in the pool, and a minor situation occurs. Since pool coverage is paramount, as well as good public relations, in this situation the minor would only be handled by the one available Lifeguard. If more Lifeguards were scheduled in this example, it would not be an issue; the extra Lifeguards available could assist if necessary.

- **Major Situation:** Requires the attention of two or more Lifeguards.
  - Many major water situations require immediate backup in the water by a second Lifeguard. Some examples include spinals, seizures, multiple drownings, panicked or difficult victims, etc. Sometimes more than two Lifeguards are required in the water.
  - Because major situations tend to create coverage problems, clearing the pool is often the Lifeguard’s first choice and generally a wise one. Sometimes a major situation, not occurring in the pool, can be handled by Lifeguards without clearing the pool because “containing” the public unknowingly and handling the situation “transparently” brings about certain advantages. However, to accomplish this, an adequate number of staff must be available. The downside to this approach is if the major situation gets out of control, the staff now have two problems: a full pool that requires clearing, a need for staff to accomplish that task, and an out of control situation that requires staff that are tied up clearing the pool. Use good judgment and common sense.

- **Public Relations:** Any situation involving public and/or staff.
  - Often public opinion is based solely on perception. Basically, what they see is what they believe.
Always be mindful of public-to-Lifeguard ratios. If necessary, bring another guard on deck.
### Role Guidelines - 3 Member Lifeguard Team - Major Situations

<table>
<thead>
<tr>
<th></th>
<th>Guard 1 (G1)</th>
<th>Guard 2 (G2)</th>
<th>Guard 3 (G3)*</th>
<th>Clerk**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* Leads the rescue *</td>
<td>Backs up and assists G1</td>
<td><strong>Secures/Controls the scene</strong></td>
<td>Controls reception area</td>
</tr>
<tr>
<td><strong>May initiate Primary Assessment.</strong></td>
<td>May initiate Primary Assessment. Exchanges info between G1 &amp; G3.</td>
<td>Completes pool clear unless G1 &amp; G2 require immediate assistance. Crowd control</td>
<td>Crowd control as required.</td>
<td></td>
</tr>
<tr>
<td><strong>Generally stays with patient.</strong></td>
<td>Generally stays with patient.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the rescue team has secured the patient, each rescuer’s role will be defined by where they are relative to the patient.

<table>
<thead>
<tr>
<th>Vitals (patient’s head)</th>
<th>Backup (patient’s side)</th>
<th>Scene Control*</th>
<th>Clerk**</th>
</tr>
</thead>
</table>

**All Lifeguards**

Assist with reports and interviews. Assist with transfer of patient to the care of the EMS team. Once scene is released (see section 7 – Reporting and Scene Management), assist with returning the facility to normal use. Evaluate the Lifeguard team's response to the situation.

In situations where there are more than 3 Lifeguards working, the tasks of Guard 3, and Scene Control are simply divided up among the available Lifeguard staff.

** In situations where there is no clerk working, those tasks are the responsibility of the Lifeguards.
### Role Guidelines - 2 Member Lifeguard Team - Major Situations

<table>
<thead>
<tr>
<th>Guard 1 (G1)</th>
<th>Guard 2 (G2)</th>
<th>Clerk**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognizes.</strong> Recognizes.</td>
<td><strong>Recognizes.</strong> Responds to communication / Signals.</td>
<td><strong>Immediately finishes phone calls and hangs up phone.</strong> Responds to communication / alarms.</td>
</tr>
<tr>
<td><strong>Communicates / Signals.</strong></td>
<td><strong>Communicates / Signals.</strong></td>
<td><strong>Responds to communication / alarms.</strong></td>
</tr>
<tr>
<td><strong>Initiates pool clear (Alarms).</strong></td>
<td><strong>Initiates pool clear (Alarms).</strong></td>
<td><strong>Stops all admissions.</strong></td>
</tr>
<tr>
<td><em>Initiates the rescue</em></td>
<td><em>Initiates the rescue</em></td>
<td><strong>Locks cash register.</strong></td>
</tr>
<tr>
<td><em>Leads the rescue</em></td>
<td><em>Leads the rescue</em></td>
<td><strong>Locks safe.</strong></td>
</tr>
<tr>
<td>Relays info to G2.</td>
<td>Relays info to G2.</td>
<td><strong>Receives / obtains info.</strong></td>
</tr>
<tr>
<td>Generally stays with patient.</td>
<td>Generally stays with patient.</td>
<td><strong>Controls reception area</strong></td>
</tr>
</tbody>
</table>

Emergency Alarms are deactivated when the pool is cleared, backup has arrived, and when instructed to do so by the supervisor.

<table>
<thead>
<tr>
<th>Vitals (patient’s head)</th>
<th>Backup/Control (patient’s side)</th>
<th>Clerk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiates Primary Assessment.</td>
<td>Controls scene</td>
<td>Contacts EMS if so directed and confirms this action. Records time of call and EMS arrival. Meets EMS or delegates this function.</td>
</tr>
<tr>
<td>Monitors vitals.</td>
<td>Assists with Primary Assessment.</td>
<td>May assist with crowd control and reporting.</td>
</tr>
<tr>
<td>Initiates Secondary Assessment.</td>
<td>Sets up and operates AED</td>
<td></td>
</tr>
<tr>
<td>Conducts SAMPLE interview.</td>
<td>Sets up oxygen.</td>
<td></td>
</tr>
<tr>
<td>Takes vitals.</td>
<td>External and Internal bleeds and injuries.</td>
<td></td>
</tr>
<tr>
<td>Positions patient.</td>
<td>Finds Emergency Medical Alert Tags.</td>
<td></td>
</tr>
</tbody>
</table>

**Backs up G1 & secures the scene**
Crowd control. Exchanges info with G1. Activates EMS via clerk. Note: If necessary, G2 may have to assist G1 before activation of EMS. If pool in control, (cleared) assists G1. May initiate Primary Assessment.

When the rescue team has secured the patient, each rescuer’s role will be defined by where they are relative to the patient; backup guard will assume scene control as well.

### Vitals (patient’s head)
- Initiates Primary Assessment.
- Monitors vitals.
- Initiates Secondary Assessment.
- Conducts SAMPLE interview.
- Takes vitals.
- Positions patient.

### Backup/Control (patient’s side)
- Controls scene
- Assists with Primary Assessment.
- Sets up and operates AED
- Sets up oxygen.
- External and Internal bleeds and injuries.
- Finds Emergency Medical Alert Tags.
- Assists with patient positioning.
- Assists with Secondary Assessment: Head-to-toe check.
- Initiates report and interviews with public.

### Clerk
- Contacts EMS if so directed and confirms this action. Records time of call and EMS arrival. Meets EMS or delegates this function.
- May assist with crowd control and reporting.

### All Lifeguards
Assist with reports and interviews. Assist with transfer of patient to the care of the EMS team. Once scene is released (see section 7 – Reporting and Scene Management), assist with returning the facility to normal use. Evaluate the Lifeguard team's response to the situation.

**In situations where there is no clerk working, those tasks are the responsibility of the Lifeguards.**
### Role Guidelines

#### 1 Lifeguard & 1 Clerk - Major / Minor Situations

<table>
<thead>
<tr>
<th>Guard 1 (G1)</th>
<th>Clerk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guard 1 (G1)</strong></td>
<td><strong>Clerk</strong></td>
</tr>
<tr>
<td><strong>Emergency Alarms are deactivated when the pool is cleared, backup has arrived, and when instructed to do so by the supervisor</strong></td>
<td><strong>Responds to communication / alarms:</strong></td>
</tr>
<tr>
<td>Recognizes.</td>
<td>Completes phone calls and hangs up phone immediately.</td>
</tr>
<tr>
<td>Communicates / Signals.</td>
<td>Locks cash register.</td>
</tr>
<tr>
<td>Initiates pool clear (Alarms) if appropriate.</td>
<td>Locks safe.</td>
</tr>
<tr>
<td>Crowd control.</td>
<td>Stops all admissions.</td>
</tr>
<tr>
<td>Initiates Low-risk Rescue</td>
<td>Receives / obtains info.</td>
</tr>
<tr>
<td>** * Leads the rescue * **</td>
<td>Contacts EMS if so directed and confirms this action.</td>
</tr>
<tr>
<td>Relays info to clerk.</td>
<td>Records time of call and EMS arrival.</td>
</tr>
<tr>
<td>Initiates Primary Assessment.</td>
<td>Meets EMS or delegates this function.</td>
</tr>
<tr>
<td>Sets up and operates AED</td>
<td>Brings equipment:</td>
</tr>
<tr>
<td>Sets up oxygen.</td>
<td>Trauma bag</td>
</tr>
<tr>
<td>Generally stays with patient but may delegate minor first aid to cashier.</td>
<td>AED</td>
</tr>
<tr>
<td>Initiates Secondary Assessment if appropriate.</td>
<td>Other equipment</td>
</tr>
<tr>
<td>Assists with and completes all reports and interviews.</td>
<td>Assists G1. May perform some first aid.</td>
</tr>
<tr>
<td></td>
<td><strong>Controls reception area</strong></td>
</tr>
<tr>
<td></td>
<td>Assists with crowd control.</td>
</tr>
<tr>
<td></td>
<td>Assists with reporting and interviews.</td>
</tr>
</tbody>
</table>
### Role Guidelines - 3 Member Lifeguard Team - Minor Situations

<table>
<thead>
<tr>
<th>Guard 1 (G1)</th>
<th>Guard 2 (G2)</th>
<th>Guard 3 (G3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relays info to G2 &amp; G3.</td>
<td>Exchanges info.</td>
<td>Brings any needed equipment.</td>
</tr>
<tr>
<td>Initiates response: rescue, treatment, report, or refers to G3.</td>
<td><strong>Shifts to cover</strong> area of G1 along with own area. Remains close enough to monitor situation and offer assistance until available Lifeguard appears.</td>
<td>Exchanges info.</td>
</tr>
<tr>
<td>* Leads the rescue. *</td>
<td>May call up Lifeguard on break to cover unwatched areas or assist.</td>
<td><strong>Takes over unwatched area(s).</strong> Remains close enough to monitor situation. May also take over response completely (if on a break), and allow G1 to return to lifeguarding.</td>
</tr>
</tbody>
</table>

Clerks may become involved by paging needed staff, phoning appropriate contacts, initiating basic first aid, etc. They should stop what they are doing to assist with the situation if need be.

Once situation is completed, normal rotations are resumed.

---

### Role Guidelines - 2 Member Lifeguard Team – Minor Situations

<table>
<thead>
<tr>
<th>Guard 1</th>
<th>Guard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognizes.</td>
<td>Recognizes.</td>
</tr>
<tr>
<td>Relays info to G2.</td>
<td>Exchanges info with G1.</td>
</tr>
<tr>
<td>Initiates response: rescue, treatment, report, or refers to G2.</td>
<td><strong>Shifts to cover area of G1 along with own area.</strong> Remains close enough to monitor situation and offer assistance. May also take over response completely (if on a break), and allow G1 to return to lifeguarding.</td>
</tr>
<tr>
<td>May choose to clear pool if staff numbers warrant.</td>
<td></td>
</tr>
<tr>
<td>* Leads the rescue *</td>
<td></td>
</tr>
</tbody>
</table>

Clerks may become involved by paging needed staff, phoning appropriate contacts, initiating basic first aid, etc. They should stop what they are doing to assist with the situation if need be.

Once situation is completed, normal rotations are resumed.
# Role Guidelines - 2 Member Lifeguard Team – Fitness Area Response

<table>
<thead>
<tr>
<th>Rec-Tech</th>
<th>Guard 1 (G1)</th>
<th>Guard 2 (G2)*</th>
<th>Clerk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Alarms are deactivated when the pool is cleared, backup has arrived, and when instructed to do so by the supervisor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiates alarms.</td>
<td>Alarms, if not already sounding.</td>
<td>Initiates Pool Clear</td>
<td>Stops all admissions.</td>
</tr>
<tr>
<td>Delegates EMS call to Clerk</td>
<td>Initiates Pool Clear</td>
<td>Gets trauma-bag and AED and responds to Fitness Area</td>
<td>Locks cash register.</td>
</tr>
<tr>
<td><strong>May Initiate treatment</strong></td>
<td>Exchanges info with Rec-Tech; ensures EMS contacted if appropriate</td>
<td>Exchanges info with Rec-Tech, Maintenance.</td>
<td>Locks safe.</td>
</tr>
<tr>
<td>May initiate Primary Assessment.</td>
<td>Assumes leadership role of rescue</td>
<td>Exchanges info with rescue team.</td>
<td>Receives / obtains info.</td>
</tr>
<tr>
<td>May continue to assist Lifeguards if necessary</td>
<td>Communicates with Guards/Clerks via radio.</td>
<td>Sets up AED, O2, etc.</td>
<td>Contacts EMS if so directed and confirms this action. Records time of call and EMS arrival.</td>
</tr>
<tr>
<td>May have to take over pool deck control</td>
<td>Works with Rec-Tech until G2 arrives</td>
<td>Works into rescue as necessary.</td>
<td>Controls reception area</td>
</tr>
<tr>
<td>May need to receive and direct EMS if necessary.</td>
<td></td>
<td></td>
<td>Crowd control as required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May have to take over pool deck control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May need to receive and direct EMS if necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reporting as required</td>
</tr>
</tbody>
</table>

* If there are more than 2 guards working or available, the tasks of guard 2 would be simply divided up among the available Lifeguard staff. Use General Guidelines for a 3 Guard Emergency.
Rescue Skills
Spinal Cord Injury – Background
Source: Kent Brown - City of Winnipeg, Fire Paramedic Services

- 20 – 40 cases, per million per year
- US data: 10,000 cases per year
- Of these 10,000 cases
  - 40% are “complete” - No sensory or motor function below the injured site
- 4,000 cases per year of quadriplegia/paraplegia
- Most common in males – 85%
- Ages usually between 15 – 35 years

Mechanisms of Injury in Canada

- Motor vehicle accident 36%
- Domestic/Work 44%
- Sport (including water sport) 14%
- Assault 6%

Possible Mechanisms of Injury in Pools

- Shallow water diving
- Contact with pool bottom/side
- Hitting their head on diving board
- Landing on a swimmer in the water
- Falls
- Assault
- Other

Cost of Spinal Cord Injury

- Lifetime direct medical costs range between $325,000 – $1,350,000
- Varies according to age at injury as well as severity of injury
- High quadriplegics account for over 80% of expenditures
- $7.7 Billion per year in USA
There are only two situations which require moving a suspected spinal injured or seriously injured victim:

- Face-down non-breathing land spinals would normally be moved to facilitate resuscitation.
- The only other reason to move a seriously injured person is to remove them from imminent danger.
- Under normal circumstances, Lifeguards are required to board water spinal injuries only; land spinal boarding is generally handled by EMS personnel.
- To properly board a patient on land requires at least 4 trained and practiced personnel
- Lifeguards would normally wait until EMS arrives and have the First Responders board the patient
- The Lifeguard’s job is to immobilize and stabilize the head and neck, and deal with ABCs

Immobilizing the head and neck may cause other concerns:

- Pain and discomfort
- Respiratory compromise
- Increase intracranial pressure
- Actual worsening of the symptoms

Regardless, the Lifeguard must consider:

- Spinal cord injury is primarily the result of the initial impact
- Secondary damage may be caused by swelling, ischemia etc, but NOT necessarily by unrestricted movement post injury
- Immobilization and stabilization is still the expected response for spinal cord injury

Walking spinals pose a special circumstance to the Lifeguard:

- Immobilizing the head and neck of a standing patient is risky. There is potential for the patient to lose consciousness and collapse.
- Using a chair is somewhat better, but may pose similar problems
- Laying the patient down without any rescue-gear is difficult and requires at least 3 guards to do properly
- If the patient stops breathing, they need to be positioned supine regardless
- The standing take-down is the technique of choice for walking spinal injuries (see page 24)
Head and Spinal Injuries – Water Rescue Techniques
Principles of Head and Spinal Injury Rescue

The principles presented here are based on the Alert - Lifeguarding in Action Manual and The Canadian Lifesaving Manual. For review, refer to these sources. Only face-down non-breathing land spinals may be moved to facilitate resuscitation if necessary. Under normal circumstances, Lifeguards are expected to board water spinal injuries only; land spinal boarding is generally handled by EMS personal. This is due to the level of training generally provided to the average Lifeguard, and to skill retention concerns.

- Recognize
- Immobilize
- Maintain airway
- Stabilize

Two techniques are acceptable:
1. Side-knife (also known as the “flat-board procedure”)
2. Slant-board procedure (also known as the “beavertail technique” if the board is so equipped)
   - AER utilizes the Side-knife technique & the Slant-board technique with beavertail
   - All training is done with V-Block™ spineboards
   - V-Block™ spineboards have the chest strap fixed in place, underside the board, with a screw. Therefore, the patient is lined up, at the top of their armpits, to this strap.
   - The “Must Sees” for water spinal injury rescue are outlined in the Skills Evaluation Document.

City of Winnipeg Instructor/Guards should be well versed in both Side-knife and Slant-board techniques; both techniques offer advantages and disadvantages. Spinal rescue techniques require a significant amount of practice to learn, and regular review to maintain the needed skills; a certain amount of fitness is also required. This involves developing personal skills and team skills.

Remember that ABCs always take priority; it is possible to begin artificial resuscitation while the patient is still in the water. **For deep water spinal rescue, eggbeater is the only kick of choice.**
V-Block™ Spine Board – Terms and Definitions

- Head immobilizer
- Head strap transport-strap assembly

- Tapered nose skids
- Rail blunts

Bumper

Rail/skid assembly
**Pitch:** The angle created by the height of the head of the board in relation to the foot of the board.

**Roll:** The longitudinal angle created when the board is tilted or “rolled” horizontally on one side or the other. This creates a “banking” or “rocking” effect.

**Board Angle:** The angle created when the board swings on its vertical axis in relation to the wall of the pool. The board is said to be “T”ed up when properly positioned (90°).

**Spacing:** The distance between the board bumper and the pool edge or rescuer. Generally, the board is kept in very tight. Any undesirable deviation in the pitch, roll, board angle, or spacing is considered “board drift”.

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[Diagram showing Pitch, Roll, Head strap/transport-strap assembly, Head immobilizer, Rails, Bumper, and Spacing]
Use of Beavertail with Slant-board Technique

Many City of Winnipeg pools have spineboards equipped with an appendage (beavertail) at the head of the board that allows the rescuer to maintain better control of the board during a rescue. The rescuer sits on the beavertail, which greatly increases the stability of the board, making the rescue easier. A two-rescuer situation is simplified dramatically. When the beavertail is used, the “slant-board” technique is employed.

The slant-board technique is not suited to all pool environments and the rescuer must know beforehand which technique will work best in each situation. The spineboard must be positioned with the head of the board (bumper) just under the water to ensure the patient isn’t too low on the board. The board starts flush against the pool wall with the Lifeguard sitting on the beavertail. It is then pitched to approximately $45^\circ$ from the wall (half way up). In cases where the shallow pool depth does not allow vertical positioning of the board, the foot of the board is moved away from the wall until the bumper is submerged. Another alternative is for the rescuer to push the board under, from the surface, with their heels. With practise and in deep water, the Lifeguard can also pre-pitch the spineboard at approximately $20^\circ$ from the wall; by the time the Lifeguard sits on the beavertail, the spineboard will be in place. This pre-pitch technique requires practise. All of these techniques will generally work at minimum depths of 1 metre and deeper. Slanted or rounded pool walls will also create a pitch. High pool ledges make the slant-board technique unstable and unsuitable; in this case, the side-knife technique becomes the choice, but there are exceptions. Wherever possible and practical, tow deep-end spinals to shallow water first.

Whether choosing the slant-board technique or the side-knife technique, teamwork, skill, fitness, speed without rushing, and control are essential in a successful rescue. Paramount to all of this: ABCs TAKE PRIORITY.
Spinal Rescues and the Tri-pod Technique

The tri-pod technique creates 3 points of stability, thru 3 points of contact, during a spinal-injury rescue: the spineboard, the wall, and the patient. This stabilizing technique allows for patient support at a near horizontal position, and is best represented during the stage of the rescue when the headblocks are being applied to the patient. The technique is used throughout the entire rescue and has variations.

Picture A shows rescuer 1 (R1) in the tripod. Her right leg is at the wall, she is holding the wall with the right hand, her left arm is doing a one-armed vice-grip, and her left knee is supporting the spineboard from underneath.
Rescuer 2 (R2) is about to let go of the patient and apply the headblocks.

Picture B shows the same technique from the other side; Rescuer 1’s left supporting leg is clearly visible at a right angle to the wall. At this stage, the headblocks have been applied and the rescuers are preparing to finish the straps.

The tripod technique can be modified to adapt to various conditions such as patient size, the number of rescuers, and the size, strength and body type of the rescue team members.

Picture C shows Rescuer 1 with their left supporting leg under the spineboard, but in this case the knee is closer to the patient’s head with the same leg making contact with the wall. Note as well, that Rescuer 1 is positioned facing more forward.
The final example, in Picture D, shows another possible variation, in this case a 3-rescuer spinal injury removal. Rescuer 2 is performing the tri-pod similar to Picture C, but is leaning back and is low in the water, which helps some rescuers get their supporting knee under the spineboard with less effort. The opposing leg is making contact with the wall. Rescuer 2’s right arm is supporting the spineboard, from underneath, almost like a drink tray; she is also using her right shoulder to spread the load. This is in fact a variation of the tripod, as Rescuer 2 is not actually making direct contact with the patient at this stage of the rescue; nonetheless, the term tri-pod still applies.

**General common guidelines to tri-pod:**
- One foot and one hand at the wall
- One knee under the spineboard
- Spineboard and patient stabilized with opposing arm
Lifeguards are expected to employ the ILCOR 2010 CPR Guidelines & the National Lifeguard Standards (NLS) in their CPR response.

For suspected non-breathing spinal injuries, Lifeguards are expected to first attempt the modified jaw thrust for CPR

- If the first attempt is successful, continue with the jaw thrust
- If the jaw thrust is unsuccessful, you must return to the head-tilt-chin-lift

The following points should aid the Lifeguard in regards to non-breathing spinal injury rescues:

1. In water, for non-breathing spinal injury rescues, only the chest strap and short strap on the head blocks is utilized to speed removal.
   a. The transport strap would be utilized if the patient starts breathing normally.

2. When attempting the jaw thrust, leave all the straps in place when opening the airway. If the jaw thrust is successful, continue with the jaw thrust.
   a. If the patient vomits, roll the board as usual and return the board flat after the vomiting has been dealt with. Continue CPR with the jaw thrust.
   b. Leaving the short strap in place with the head-tilt-chin-lift, may make it difficult to properly open the airway and may cause the head to “snap” back in a ballistic movement.
   b. If the patient vomits, quickly place the short strap back in place and roll the board as usual and return the board flat after the vomiting has been dealt with. Remove one side of the short strap if it’s necessary to continue CPR.

3. If the jaw thrust is unsuccessful, remove one (1) side of the short strap. The guard at the head uses the head-tilt-chin-lift to open the airway; continue with the CPR sequence.
   a. Leaving the short strap in place with the head-tilt-chin-lift, may make it difficult to properly open the airway and may cause the head to “snap” back in a ballistic movement.
   b. If the patient vomits, quickly place the short strap back in place and roll the board as usual and return the board flat after the vomiting has been dealt with. Remove one side of the short strap if it’s necessary to continue CPR.

4. If the patient is breathing normally at this point continue assessment and follow-up.
Walking Spinal Injuries
The spineboard standing take-down

The principles are:
1. Talk to the patient
2. EMS
3. Hold and secure the head
   a. In-line
   b. Neutral position
   c. Prevent movement
4. Prepare the spine-board
5. Lay the patient down
6. Assess and treat the patient

Talk to patient - Hold the head – Prepare the Spine-board
Prepare the Spine-board
Ready for the Take-down

Take-down!

Take-down Follow-up
- Position Patient
- Finish straps
- Blanket between legs
- Cover with blanket
- Oxygen
- Assessment & treatment
- Reporting
- Etc.
Whenever possible, place a dry bulky blanket between the patient’s legs and strap in place. This adds to the patient’s comfort, immobilization, secures the legs better, and makes rolling them for vomiting much more stable.
Turning the Board Away From Backup Guard

On Vitals guard's cue, the board is smoothly turned away from the Backup guard. Both guards assist with the turn. Backup guard’s stabilization hand, minimizes patient movement and board slide. Watch for the bump on the rail and board edge. Don’t let the patient’s lower hand get pinched under the board. Move the arm down and out of the way in advance. The board is returned flat after the airway is cleared on Vitals guard’s cue.
Turning the Board Toward Backup Guard

On *Vitals* guard's cue, the board is smoothly turned toward *Backup* guard. Both guards assist with the turn. *Backup* guard’s stabilization hand, minimizes patient movement and board slide. Watch for the bump on the rail and board edge. **Don’t let the patient’s lower hand get pinched under the board. Move the arm down and out of the way in advance.** The board is returned flat after the airway is cleared on *Vitals* guard’s cue.
Submerged Victim Rescue
What you need to know

Rescuing an actual submerged victim is very different from practicing this skill on a fellow Lifeguard. Drowning victims submerge for a host of reasons including body type, the amount of air and water in the lungs, the amount of water in the stomach, the amount and type of clothing worn at the time, and medical conditions such as seizures. Body type and the body fat index (body composition), play a very large role in the weight of the submerged victim. People with a higher body fat composition will displace more water than lean people. The Submerged Body Weight (mass) Guideline Chart below will give you a rule of thumb. Mass of course does not change; submersion only affects the buoyancy.

Archimedes’ Principle

- A body immersed in a fluid is buoyed up by a force equal to the weight of the displaced fluid. The principle applies to both floating and submerged bodies and to all fluids.
- The buoyant force is equal to the weight of the displaced fluid.
- The weight of the displaced fluid is directly proportional to the volume of the displaced fluid (specifically if the surrounding fluid is of uniform density). Thus, among objects with equal masses, the one with greater volume has greater buoyancy.
- The loss of weight, of the body underwater, is equal to the weight (volume) of the water displaced.
- Body air weight, minus the weight of the displaced water, equals the body’s weight underwater. Example:
  - 150 lb male displaces 140 lbs of water.
  - Difference is 10 lbs.
  - Submerged buoyed weight is 10 lbs

<table>
<thead>
<tr>
<th>Submerged Body Weight (mass) Guideline Chart</th>
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<tbody>
<tr>
<td><strong>Body</strong></td>
</tr>
<tr>
<td>Males</td>
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<tr>
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<tr>
<td>Females</td>
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<tr>
<td></td>
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<tr>
<td>Children</td>
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<td></td>
</tr>
</tbody>
</table>

Source: Encyclopedia of Underwater Investigations
Clp. Robert G. Teather C.V. RCMP
Best Publishing Company 1994
Techniques for Submerged Victim Recovery

The Method:

- Get behind the victim
- Use a modified body hug
- Protect the victim’s airway
- Get a solid push off the pool bottom
- Use your strongest kick
- Get the victim as horizontal as possible at the surface
- Get help as soon as possible

Don’t:

- Work from the side of the victim
- Forget to use a strong push-off
- Use a weak kick
- Keep the victim vertical or low in the water at the surface
Rescue Preparedness

Trauma Bag – North Centennial Pool
Early Morning / Opening Lifeguard Safety Equipment Check

The opening Lifeguard(s) will perform a **mandatory** Safety Equipment Check **daily**, by following the supplied checklist. This is meant to be an inspection of the safety equipment, and the general pool and first aid room condition. Ensuring completion of a thorough opening inspection is the responsibility of the in-charge Lifeguard. Additional inspected items are done on a separate check list.

**Initial each box as you complete the check**

<table>
<thead>
<tr>
<th>Date</th>
<th>SUN</th>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
<th>SAT</th>
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<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
<th>SAT</th>
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<tr>
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</tbody>
</table>

**AED**

- Unit 1: Include AED checklist
- Unit 2: Include AED checklist

**Trauma Bag**

- First Aid Supplies
- O₂ PSI Pressure
- O₂ Supplies

**Other**

- Aux FA Supplies
- Aux O₂ Supplies
- General FA Room Condition
- Phones
- 2-way Radios
- PA System
- Emergency Flashlights
- Emergency Alarms
- Spine Board(s)
- Lifeguard Chairs
- Reaching & Throwing Aids
- General Facility Condition
Personal Safety Pouch Policy

The City of Winnipeg Aquatics Branch issues safety pouches to all Instructor/guard staff. This is to ensure minimum safety guidelines for Lifeguards; it protects them from body substance contact (BSI – Body Substance Isolation) when carrying out their normal duties. The wearing of these pouches with all listed contents, and a Fox 40 whistle, while lifeguarding, is mandatory. Failure to wear this issue pouch, while on lifeguarding duty, is a safety violation and may result in disciplinary measures.

The personal safety pouch and contents, with the exception of the Fox 40 whistle, are supplied and maintained at the employer’s expense. The pouches are intended for use while on duty only.

Staff replenish supplies as needed from stock at their respective pool(s) of employment. Stock the pouches with only City issue supplies.

Staff losing their personal safety pouch, or damaging it through abuse, will be required to replace it at their expense, from the employer, before their next working shift.

Personal Safety Gear Minimum FA Supplies:
Staff are limited to stocking their Safety Pouch with only approved supplies, personal articles are not allowed.
- Fox 40 whistle – accessible whenever working. (Employee supplied)
- 1 hip pouch containing (in Zip lock): (Employer supplied)
  - 2 pair medical grade examination gloves.
  - 1 disposable CPR mask.
  - 2 - 10 cm x 10-cm bandage compress.
  - 2 - 10 cm x 10-cm sterile pads.
  - 10 - sterile adhesive dressings, 2.5 cm wide.
  - First Aid reference card.

Uniforms and Fox - 40 Whistle Policy

Lifeguards should only be wearing City of Winnipeg issue guarding uniforms; they can not alter them in any way. While employed and working as a Lifeguard, staff must also provide their own Fox-40 whistle. The Fox-40 must be easily accessible to the Lifeguard while on duty at all times.
Trauma Bag

All City of Winnipeg Aquatics Branch Swimming Pools are equipped with Trauma Bags. These large orange first aid bags contain all necessary first aid and oxygen supplies. The trauma bags do not necessarily replace existing supply stations but function as the main-source-portable-unit. The trauma bags are checked and maintained daily. Any supplies used are replaced. The trauma bags are loaded in a prescribed manner; every item has a place and every item is in its place. This maintains consistency at all pools.

Trauma Kit Minimum Equipment List

1) First Aid Supplies.
   a) 8 sterile bandage compresses, 10 cm x 10 cm.
   b) 8 roller bandages, 10 cm x 4.5 m, individually packaged in plastic.
   c) 2 Mylar rescue blankets.
   d) 2 rolls waterproof tape, self-contained 2.5 cm x 6 m.
   e) 2 chemical ice packs.
   f) 2 splinter tweezers, stainless steel, and blunt nose.
   g) 2 pair stainless steel safety scissors, approx. 10 cm long.
   h) 2 large “Zip lock” plastic bags.
   i) Contents list and First Aid Manual (left outside pocket).
   j) 100 sterile adhesive dressings, 2.5 cm wide.
   k) 12 safety pins.
   l) 5 envelopes Steri-strips 3 mm X 75 mm.
   m) 10 medium skin closure bandages ("Butterfly bandages").
   n) 2 tubes oral glucose.
   o) 9 triangular bandages.
   p) 4 non-stick dressings 20 cm X 7.5 cm.
   q) Antiseptic.
   r) Saline 250 ml.
   s) 4 sterile gauze compresses, 1 m x 1 m.
   t) 30 sterile pads, 10 cm x 10 cm.

   u) 3 wooden splints (right outside pocket).
      i) 2 – Large
      ii) 1 medium.
   v) 10 pair medical grade examination powder free Nitrile gloves.
   w) 2 non-static cloth blankets.
   x) 1 pen style disposable flashlight.
   y) 2 Report Clipboards.
      i) 10 blank reports.
      ii) 2 pencils.

2) Oxygen Equipment Section.
   a) Front Pouch: SealEasys.
      i) 1 full adult assembly, (mask with bite-block, one-way valve & oxygen adapter).
      ii) 1 full pediatric assembly, (mask, one-way valve & oxygen adapter).
      iii) 1 non-kink tubing with assemblies.
   b) Centre bag:
      i) 1 “D” Oxygen bottle with regulator attached.
      ii) 2 main valve wrenches.
      iii) 1 spare seal washer.
      iv) 2 spare non-kink tubing.
      v) 1 Spare adult SealEasy assembly.
      vi) 1 Spare pediatric SealEasy assembly.
      vii) Non re-breath masks:
         (1) 2 adult.
         (2) 2 pediatric.
Fitness

Maintaining a reasonable level of fitness is critical for Lifeguards. The benefits of regular exercise include:

- Improve emergency response
- Improved energy levels
- Improved cognitive abilities
- Protection against illness
- Increase in strength and reaction skills
- Cardiovascular improvement
- Stress reduction
- Mood improvement
- Bone mass increase and maintenance
- The reduction of bad cholesterol and increases in good cholesterol

---

\(^i\) Alert - Lifeguarding in Action – Lifesaving Society Canada
\(^iii\) Wikipedia, the free encyclopedia
SECTION 4

Medical Information
• Learning Objective:
  Medical Information

At the end of this section the learner will:
• List the 6 elements in all First Aid
• List in point form, the steps in a thorough patient assessment
• Demonstrate the steps in a thorough patient assessment
• List at least 5 important factors to consider when conducting a patient assessment
  o Compare shock in children to shock in adults
• List at least 5 important factors to consider when dealing with a possible heart attack
• Explain why distal circulation is checked prior and after treatment for musculoskeletal and bleeding injuries.
• Explain the conditions required to administer an EpiPen in the field
  o Explain the possible consequences of not following the EpiPen protocol
  o Demonstrate the steps in administrating the EpiPen
• Explain the 7 rights of medication
• Diagram a 3-guard patient care model.
First Aid Model
This model shows how everything flows from one section to the next.

TREAT AS YOU FIND – MOST SERIOUS FIRST
MONITOR VITALS CONTINUOUSLY

The level of treatment and care is directly related to the severity of the patient’s condition and timelines. Treatment must be based on patient assessment and is appropriately recorded.

**ABCs are always the Priority**
- Recognize, take charge
- Signal / communicate - get backup
- Safety – make area safe – use of gloves & mask
- History – what happened, number of casualties?
- Mechanism of injury – the force applied to the body that caused the injury
- Identify yourself as a first aid provider and offer to help
- Level of responsiveness/consciousness (LOC)
- EMS – (if/when applicable) - Trauma Bag/AED

### Airway
- Breathing
- Circulation
- Defibrillation
- External/Internal Bleeds/Injuries
- Find Emergency medical tags
- Recovery/Shock position
- Blankets
- Monitor Vitals

### Interview:
- Signs & Symptoms
- Allergies
- Medications
- Past and present medical history
- Last Oral (food, fluid, etc.) intake
- Events leading up to situation

### Vitals (Record time(s))

<table>
<thead>
<tr>
<th>LOC</th>
<th>Breathing</th>
<th>Pulse</th>
<th>Skin Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Eye contact</td>
<td>- Breaths per minute</td>
<td>- Pulse per minute</td>
<td>- Temp</td>
</tr>
<tr>
<td>- Verbal ability</td>
<td>- Sound and character</td>
<td>- Character</td>
<td>- Colour</td>
</tr>
<tr>
<td>- Motor skills</td>
<td>- Rhythm, depth, and regularity</td>
<td>- Rhythm, strength, and regularity</td>
<td>- Condition</td>
</tr>
<tr>
<td>- Person</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Alert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Semi-alert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Unresponsive</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMEMBER TO DO BOTH**

- Any additional treatment
- Ongoing care
- Follow up

### If medical conditions, do vitals first

<table>
<thead>
<tr>
<th>Normal Respirations Per Minute</th>
<th>Normal Pulse Per Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Child</td>
<td>20 - 30</td>
</tr>
<tr>
<td>Infant</td>
<td>30 - 50</td>
</tr>
</tbody>
</table>

### If injury, do head-to-toe first

- Head
- Neck
- Collarbones
- Shoulders arms & hands
- Chest & under
- Abdomen & under
- Pelvis & buttocks
- Legs, ankles & feet

**Diagnostics**
- Eyes reaction to light
- Movement
- Pain

### Shock
- Monitor Vitals
- Check Treatment
- Record
- Report

Section 4 - Medical Information – 10th Edition 2013
Patient Care Model (Guideline)

Communication Lines

**Vitals Guard**
(At patient’s head)

Primary care giver. Conducts interview. Records if working alone.

**Backup Guard**

Backs up *Vitals Guard*. Records if possible.

**Scene Control**

Secures and controls scene. Records.
First Aid & the Lifeguard - A System

First Aid & the Lifeguard

- Lifeguards follow a system, like any other medical professional
  - Following a system offers the Lifeguard a path to follow
- Lifeguards need to prioritize treatment, treating the most serious conditions first
- ABCs are always the priority
- Treatment is based on assessment and appropriately recorded
- The order of events, in this system, may or may not be critical depending on the situation

The System:
Consists of 4 Sections:

1. Scene Assessment
2. Primary Assessment
3. Secondary Assessment:
   a. Interview
   b. Vitals
   c. Head-to-toe Examination
4. Ongoing Care / Follow-up

- The four sections are sequential
- You may do some or all of components/elements/steps/parts depending on the situation
- The system is applied to illness, injury, and water-rescue
- Use the system as a framework

Follow the Path
There are 6 elements:

1. Scene Assessment
2. Primary Assessment
3. SAMPLE Interview
4. Vitals
5. Head-to-toe Examination
6. Ongoing Care

Secondary Assessment
Scene Assessment
There are 8 steps:

1. Recognize, take charge
2. Signal, get backup
3. Safety (for both rescuer and patient) – Gloves and mask
4. History – What happened?
5. Mechanism of injury – the force applied to the body
6. Identify yourself and obtain consent to help
7. Level of responsiveness
8. EMS – if and when applicable – delegate out when possible
   • Trauma Bag & AED

Primary Assessment
There are 9 steps:

1. Airway
2. Breathing
3. Circulation
4. Defibrillation
5. External and Internal Bleeds/Injuries (Rapid assessment)
6. Find Emergency Medical Alerts Tags
7. Shock position / blankets
8. Oxygen implementation (when needed)
9. Monitor vitals (continuous)

Secondary Assessment
Done when:

• EMS is delayed: there is time
• The condition is serious
• You suspect there may be more injuries
• You have elected to transport the patient to hospital yourself
  o THIS IS THE EXCEPTION!
  o City staff should not normally transport public to hospital
    • If a special circumstance arises, contact your supervisor first
    • Never transport someone alone

A local examination is done:

• When it is obvious that the injury is isolated to one area or body part, and no other conditions exist
• Before bandaging or splinting
There are 3 Components to a Secondary Assessment:

1. SAMPLE Interview
2. Vitals Assessment
3. A head-to-toe Examination

SAMPLE Interview

Signs/Symptoms (S/S)

Allergies

Medications

Past and present medical history

Last Oral (food, fluid, etc.) intake

Events leading up to situation

Symptoms

- What are you feeling right now?
- Where does it hurt?
- What kind of pain is it?
  - Dull
  - Sharp
  - Burning
  - Radiating
- What else are you feeling right now?

Allergies

- Do you have any allergies?
  - Food
  - Pets
  - Medications
  - Inhalants
  - Contact
- Have you recently (last four hours) come into contact with any of these allergens?

Medications

- Are you taking any medications?
- What medications are you taking?
- Did you take them today? When? How much?
- Do you have them with you?
- Do you need to take any medications now?
7 Rights of medication:

- Right patient
  - Ensure you are assisting the patient with *their* prescribed medication and not someone else’s medication

- Rights of the patient
  - The adult patient can refuse treatment and medication

- Right medication
  - The correct medication for the medical condition indicated

- Right time
  - Medication taken when the patient needs the medication
  - Medication timed out as prescribed

- Right method (route)
  - Correct technique
    - Oral
    - Inhaled
    - Injected
    - Topical
    - etc

- Right amount
  - Correct dose
    - Pills, tablets
    - Volume
    - Times taken

- Right documentation
  - Record on field report and report to EMS personnel

Use common sense when applying the Seven Rights of Medication. The point is to ensure that the right patient receives the right medication in the right manner. Do not knowingly give a patient someone else’s medication. If the patient is in possession of the medication, a simple question “is this your medication?” is sensible. A caregiver may carry the medication for a patient in some cases such as a spouse, parent or special needs worker. Medication does not always have the patient’s name on the actual drug but the package it came in, which they probably do not possess anymore. Taking the medication away from the patient may make them feel threatened.

Past and present medical history

- Have you ever had this condition before?
  - How would you compare the previous episode with this one?

- What other medical conditions do you have that I should be aware of?

- Do you have………?
  - Heart condition?
  - Diabetes?
  - Asthma?
  - Allergies?
  - Etc.?
**Last Oral (food, fluid, etc.) intake**
- When is the last time you ate or consumed anything today?
- What and how much did you have?

**Events leading up to situation**
- When did these symptoms begin?
- How did you feel before/during the incident?
- How did you feel this morning?
- How was your sleep?
- How did you feel last night?

- How did this all start?
- What happened?

**Vitals**
- Taken at least every 5 minutes
- More often if the condition is serious
- **RECORD THE TIME OF DAY FOR EVERY SET OF VITALS TAKEN**
  - This is critical in order to monitor the patient’s condition over time

**There are 4 parts for every set of vitals**

1. Level of Consciousness (LOC)
2. Breathing
3. Pulse
4. Skin Condition

**LOC**
- Person: Do they know who they are?
- Place: Do they know where they are?
- Time: Do they know the date, day, time?

- Do they **look** at you when you talk to them?
- Do they respond (verbally) **coherently** to your questions?
- Are their **movements** (motor skills) normal?

Would you describe them as?
- Alert
- Semi-alert
- Unresponsive
<table>
<thead>
<tr>
<th>Breathing</th>
<th>Pulse</th>
<th>Skin Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
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<td>Temperature</td>
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<td>Rhythm</td>
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<tr>
<td>Depth</td>
<td>Strength</td>
<td>Condition</td>
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<td>Quality</td>
<td>Regularity</td>
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</tr>
<tr>
<td>Regularity</td>
<td>Describe the character of the breathing</td>
<td></td>
</tr>
</tbody>
</table>

**Physical Head-to-toe Examination**

- This is a thorough head-to-toe assessment and can be “hands off – eyes on” or “hands on”
- Guideline (situation dependant):
  - Conscious patient: hands off
  - Unconscious patient: hands on
  - A combination approach may be practical
- Use the “DOTS” acronym
  - Deformities
  - Open wounds
  - Tenderness
  - Swelling

**Be systematic:**

- Head
- Neck
- Collarbones
- Shoulders, Arms* & Hands*
- Chest
- Abs
- Back
- Pelvis
- Buttocks
- Legs, knees, & feet
- Distal Circulation
- Note: Pupils—Movement—Strength—Response to pain (diagnostics)
- *Some agencies teach to inspect the arms and hands last. Even though this is not incorrect, it may lead to forgetting the limbs altogether. Remember to be systematic.*

**Ongoing Care**

- Monitor vitals
- Record vitals every 5 minutes, and repeat physical assessment if appropriate
- Continue treatment for shock
- Any additional treatment
- Check and monitor any treatment
- Record all relevant information
- Document and complete a report
- Gather patient’s personal effects
Review the Path

1. Scene Assessment
2. Primary Assessment
3. SAMPLE Interview
4. Vitals
5. Head-to-toe Examination
6. Ongoing Care

Memorize This!
Important Things to Pay Attention to When Conducting Patient Assessments:

1. When getting information, make the patient comfortable; put them at ease
   a. Interview should be 10% talk and 90% listen
   b. Any treatment should be based on information received and conditions discovered during assessment
2. Use Oxygen as soon as possible; it benefits the patient in most first aid situations
   a. Any breathing problems
   b. Shock
   c. Bleeding
   d. Spinal injuries
   e. Head injuries
3. A patron who is under the influence of drugs and/or alcohol is difficult to assess
4. Women with abdominal pain must go to the hospital for evaluation
   a. May be pregnant
   b. May be symptoms of a more serious problem such as a heart attack
5. Dizzy and fainting spells are serious. Assess the patient thoroughly
   - Could be:
     i. Arrhythmias (heart rate too fast or slow)
     ii. Gastrointestinal (GI) (internal) bleed
     iii. Neurological emergency (stroke)
     iv. Diabetic emergency
6. Internal bleeding can cause total blood loss. Treat this as a very serious situation
7. Battle’s sign (bruising behind the ears) and “raccoon eyes” take up to 12 – 24 hours to develop in head/spinal injury. You will probably not see this during your assessment. Determining history and mechanism of injury is critical here.
8. Treat for shock in all cases
   a. Treat the injury or illness
   b. Position the patient
   c. Maintain patient’s normal body temperature
9. Children are not adults; they react differently to illness and injury
   a. Often do not display signs and symptoms (S/S) of shock until much later
   b. Often crash suddenly
   c. Crying, screaming children are usually stable
   d. Lethargy and minimal response is an important critical sign
10. Keep up on your assessment and treatment skills; they should be routine
11. Review your multiple casualty skills
12. Stay up to date; this includes in-house protocols. There are always changes. Ensure that your information is coming from reliable sources
13. Do not be afraid to get experience and build on your experiences. Share.
14. Stay out of trouble

Important Things to Note about Heart Attacks (MI)

1. Discomfort is usually unrelenting and not cycled
2. Most common time of day of occurrence is between 5 a.m. and noon
3. Discomfort and shortness of breath (SOB) are often together
4. Sweating is usually severe (diaphoresis)
5. Angina and MI should be treated the same – Heart attack
6. Palpitations (a sensation of throbbing or fluttering of the heart), fainting (syncope), fatigue are common
7. Patients with diabetes, women, and the elderly often display different signs and symptoms (S/S) when having a heart attack (MI).
   a. Often the symptoms are more vague; the Lifeguard has to focus on a broader range of information and be detailed on the interview and vitals, particularly with history, mechanism of injury, and the medication the patient is taking. Exercise suspicion with this type of patient; investigate thoroughly and error on the side of caution.
   b. Elderly:
      i. May not show signs of shock
      ii. May not have an unusual heart rate
      iii. May have ongoing problems along with present condition
      iv. Often have a diminished sense of pain (diabetes & elderly)
      v. Often have reduced circulation in their extremities
   c. Women:
      vi. S/S more vague
      vii. May have abdominal discomfort
8. Do not forget the “Denial Factor”; this can be very subtle and can be generated by a patient’s friend, spouse or family member
9. MI is treatable. EMS should be contacted ASAP for best patient outcome
10. When assisting a patron with their nitro-glycerine:
    a. Ensure patient is counselled on contra-indicators such as erectile dysfunctional (ED) medication – this is very important. Mixing ED medication with nitro-glycerine (even one nitro dose) may create a fatal drop in blood pressure for the patient.
    b. Check code date
    c. Sprays are more common
    d. Tablets when “Fresh” should burn (fizzle) under the tongue; these are not as common anymore
    e. Do not make direct skin contact with the patient’s medication – wear gloves
11. ASA may be helpful for the heart but may be hard on the GI tract and may be an allergen.
   a. **Follow local protocol** *(See page 17 of this section)*
When to call EMS - The Obvious and the Not So Obvious Examples
Life-threatening conditions include but are not limited to:

1. Altered mental state (change in the patient’s level of consciousness)
2. Airway obstruction that must be cleared with abdominal thrusts or chest compressions
3. Severe respiratory distress such as asthma
4. Water rescue with severe coughing
5. Water rescue with severe coughing and/or foam from mouth
6. Signs/symptoms of heart attack or angina
7. Signs/symptoms of stroke or TIA
8. Signs/symptoms of shock (all shock)
9. Severe allergic reaction
10. Sudden severe abdominal pain
11. Severe bleeding, particularly if it cannot be controlled immediately
12. Severe chest injury
13. Head injury with one dilated pupil
14. Head injury patient who is rapidly getting worse
15. Suspected spinal injuries
16. Leg fracture
17. Loss of circulation (pulse) to limb
18. Diabetic emergency not treatable with glucose
19. Mother giving birth
20. Unknown medical condition that deteriorates with time
EVALUATING NEAR-DROWNING AND DROWNING VICTIMS

Taken and adapted from an article by: David Szpilman MD - Fire Department of Rio de Janeiro - Medical Doctor of the Near-Drowning Recuperation Center (NDRC) of Barra da Tijuca (CBMERJ-GMAR). Miguel Couto Municipal Hospital - Medical Doctor of Intensive Care Unit. (See section 9 of this manual)

<table>
<thead>
<tr>
<th>GRADE</th>
<th>SIGNS AND SYMPTOMS</th>
<th>FIRST AID (Includes local protocol)</th>
</tr>
</thead>
</table>
| Rescue| No coughing, foam, difficulty with breathing, or cardiac arrest | Evaluate and release from the accident site without further medical care as appropriate. EMS may not be needed.  
Contact/council guardian for minors or those at risk. |
| 1     | Cough, without foam in mouth/nose | Rest, warm and calm the victim; advanced medical attention or oxygen administration should not normally be required.  
Must be seen by doctor immediately.  
If coughing is severe, transport to hospital via EMS and treat as Grade 2. |
| 2     | Small amount of foam in mouth/nose | Oxygen – high flow by NRB mask or tubing (infant); rest, warm and calm the victim.  
Transport to hospital via EMS  
Requires observation from 6 to 24 hours. |
| 3     | Large amount of foam in mouth /nose with palpable radial pulse | High flow oxygen by NRB mask or tubing (infant); basic life support (BLS); hospitalization required.  
Transport to hospital via EMS. |
| 4     | Large amount of foam in mouth/nose, without palpable radial pulse | High flow oxygen by NRB mask or tubing (infant); monitor breathing; basic life support (BLS), hospitalization (ICU) required.  
Transport to hospital via EMS. |
| 5/6   | Respiratory (cardiac) arrest | Apply CPR (AED) immediately at the scene; hospitalization (ICU) required.  
Transport to hospital via EMS. |

Table 1: CLASSIFICATION AND DEATH RATE*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1189</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>338</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>3</td>
<td>58</td>
<td>3 (5.2%)</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>7 (19.4%)</td>
</tr>
<tr>
<td>5 (Respiratory arrest)</td>
<td>25</td>
<td>11 (44%)</td>
</tr>
<tr>
<td>6 (Cardiac arrest)</td>
<td>185</td>
<td>172 (93%)</td>
</tr>
</tbody>
</table>

*Overall death rate was 10.6%.
Medical Protocols

Leg Fractures
- Suspected leg fractures are best managed by EMS
- Stabilize and restrict movement of the leg(s) in the position found
- Use blankets to fill hollows if appropriate
- Treat ABCs, any open wounds (bleeding), and for shock.
- Administer oxygen, make the patient comfortable, and wait for EMS
- Remember to assess circulation prior and after stabilization
- If the casualty is in the pool, using the spineboard for removal is sensible

Ankles Injuries
- Circulation is assessed prior to and after splinting
- Twisted or sprained ankles (always suspect fracture) can be immobilized with a blanket splint
- Ice is beneficial for swelling and pain reduction; maximum time for ice is 15-20 minutes
- Use the guidelines for “Clavicle, Shoulder, Upper Arm, Lower Arm, Wrists and Hands” below.
- If deformity is severe, use protocol for fractured legs
- Do not attempt to straighten or realign any injured limbs or joints
- Do not allow the patient to bear weight on the injured limb
- Consider EMS if complications arise

Clavicle, Shoulder, Upper Arm, Lower Arm, Wrists and Hand Injuries
Splint / immobilize if:
- Circulation is assessed prior to and after splinting
- If circulation is impaired to the injured side, stabilize and restrict movement only; leave assessable for EMS personnel
  - This is an urgent EMS situation
- Complete a thorough local secondary assessment on the injured area prior to splinting/immobilizing
- The patient may be transported to hospital by private means
- Ensure that the patient is not in any life-threatening situation that requires priority attention, such as shock, and circulation is not impaired to the injured side
- Consider EMS if the patient is alone or complications arise
Oral Glucose Administration

- Symptoms should indicate hypoglycemia or diabetic emergency
- Check expiry date on tube
- Counsel only – the patient self administers
- Nothing by mouth if unconscious or mental state is altered
  - Lifeguards have no mechanical suction device to use if the patient gags on the glucose
- If the patient begins to lose consciousness or has an altered mental state, call EMS
- Ensure stock is replaced after administration and a regular report is completed

ASA (aspirin - acetylsalicylic acid) Administration for Heart Attack (MI)

- ASA is not provided
- Assist patient with their own prescription medications (including their own ASA) they are counselled to take by their physician
- Nothing by mouth if unconscious or mental state is altered
EpiPen Protocol
For
Lifeguards
What Is Anaphylactic Shock? (Anaphylaxis)

- Anaphylaxis is a sudden, severe, potentially fatal, systemic allergic reaction that can involve various areas of the body such as the skin, respiratory tract, gastrointestinal tract, and cardiovascular system
- The body’s immune system essentially “over reacts” to a perceived threat
  - People with severe allergies usually wear Medical Alert bracelets
- People with allergies come into contact with an allergy substance (allergen) through ingestion (eating), skin contact, inhalation, sometimes exercise, and insect bites
- Some people react to a single allergen, others to a combination of 2 or more allergens
- Common allergens include:
  - Food such as nuts, fruit, and shell fish
  - Medication such as antibiotics (penicillin)
  - Insect stings/bites (bees, wasps, etc)
  - Latex, various chemicals
  - Second hand smoke
- Symptoms occur within minutes to two hours after contact with the allergy-causing substance, but in rare instances may occur up to four hours later.

SIGNS OF ANAPHYLACTIC SHOCK:

- Warm, tingling feeling of the mouth, tongue, face, chest, feet, and hands
- Itching, hives, and flushing
- Swelling of the throat, tongue, face, lips, hands, feet, and joints
- Difficulty swallowing, or speaking
- Breathing difficulties, coughing, wheezing, and gasping for air
- Itchy watery eyes, headache, runny nose, sense of doom
- Abdominal discomfort
- Cyanosis, paleness
- Increased heart rate
- Loss of consciousness
- RAPID DEVELOPMENT OF ANY OF THE ABOVE (VERY SERIOUS)
What is an EpiPen?

- An Epi-Pen is a device that has been prescribed to an individual who has severe allergic reactions. It is a pen-like device that will inject a measured dosage of medicine (epinephrine) to counteract the allergic reaction.
- Epinephrine (adrenaline) raises the lowered blood pressure of a anaphylaxis patient
- The Epi-Pen will last only about 15 – 20 minutes, after which time the symptoms may reappear
TO: ALL COMMUNITY SERVICES AQUATICS STAFF
FROM: Phil Hay
DATE: Revised March 15, 2007
SUBJECT: ADMINISTRATION OF EPIPENS

An EpiPen is a device that has been prescribed to an individual who has severe allergic reactions. It is a pen-like device that will inject a measured dosage of medicine (epinephrine) to counteract the allergic reaction.

The Lifeguard may administer EpiPens (auto-injector), to all anaphylaxed patients, adult or minor, who are unable to self-administer the drug, and/or do not have a guardian or EMS personnel to administer the drug, and only in those situations where the following conditions exist:

• EMS is called in all instances
• The Lifeguard has received recognised training.
• If any patient is unable to administrate the Auto-Injector/EpiPen:
  o Follow the package instructions
  o The Auto-Injector/EpiPen must be the patient’s medication; never use another’s medication
  o This applies only to Auto-Injector/EpiPen; other medications must be administered by the patient themselves i.e. inhalers, nitro-glycerine, etc
• Oxygen is administered
• Waivers, for minor patients, are still encouraged but not required
The onus is on the child’s parents/guardians to inform the staff of the need for an EpiPen. Staff cannot be expected to administer the EpiPen, if they have not been provided with the notification and/or training. It is imperative that staff follow the Epi Pen protocol, their training, and the direction received from the EMS dispatcher.

Please note: The Authorization and Release form is applicable only to the **EpiPen** and cannot be used for other purposes. Additionally this form cannot be revised in any fashion from that which is attached.

**Process:**
- If any Staff are informed that a participant has an EpiPen, inform the Supervisor-In-Charge at that time.
- The supervisor will inform the parents/guardians that the staff will be able to administer the EpiPen, and that the optional Authorization and Release form allows for quicker intervention as the patient’s condition would probably be assessed sooner.
- **The parents/guardians will also be informed that on occasion there may be staff working at the site who are not trained and will therefore not be able to administer the EpiPen.**
- The parents/guardians will also be informed that EMS is contacted in all cases where an Auto-injector is administrated.
- The supervisor will record in a memo to their supervisor that the parents have been notified of these matters and the date it occurred.
- Parents will be provided with the optional Authorization and Release form to complete.
- The form will be forwarded to the Branch office with a copy to be kept on site.
- Contact will be made with the supervisor who is responsible for the program to inform them of the situation.
- The appropriate supervisor will then arrange for any required training for the staff at that site if necessary.

Records are kept as to the date that the training took place and who delivered it.
AUTHORIZATION AND RELEASE FORM

WHEREAS ________________________ hereinafter called the “parent(s)” are the parent(s) of __________________________________ hereinafter called “the child”; (Name of parent(s) (Name of child)

AND WHEREAS the child is taking part in programs offered by the City of Winnipeg (hereinafter called “the City”);

AND WHEREAS the parent(s) have informed the City that the child periodically suffers severe and sudden allergic reactions, which require the immediate injection of medication by EpiPen;

1. (a) The term “Authorized Personnel” used herein means all of the employees of the City having control or supervision of the child in the course of their employment and shall include the City’s agents and servants.

(b) The terms “Drugs” used herein means Adrenalin or such other drugs as are provided to the City by the parent(s) for the purposes set out herein.

(c) The term “Treatment” used herein means the administering of Drugs to the child or such other treatment as the authorized Personnel, in their sole discretion, deem appropriate.

In the event that the authorized Personnel believe the child to be suffering an allergic reaction, the undersigned does hereby authorize the authorized Personnel to administer the Treatment.

2. The undersigned does hereby:

(a) Appoint the City and Authorized Personnel as their agents, and

(b) Confere upon the City and authorized Personnel all rights, powers and privileges of a guardian of the child’s person;

when the Authorized Personnel are administering the Treatment.
3. In consideration of the City’s undertaking to inform some of the Authorized Personnel of the child’s medical condition and the treatment available, the undersigned does hereby release the City and Authorized Personnel and their respective heirs, executors, personal representatives, successors and assigns, as the case may be, from any claims, actions, causes of action, suits, demands or damages which they may in future have, whether in their own capacity or in a representative capacity, by virtue of any matter or thing of whatsoever nature in respect of, or arising out of, any act, whether of commission or omission, and whether negligent or otherwise, performed by any Authorized Personnel hereunder, including, without limiting the generality of the foregoing:

(a) The decision as to whether or not to administer the Treatment;
(b) Delay in administering the Treatment;
(c) The amount of Drugs administered;
(d) The manner in which the Treatment is administered

4. Nothing herein creates any duty, obligation or responsibility on the part of the City or Authorized personnel and the decision as to whether or not to administer Treatment shall always remain in the sole discretion of the City or Authorized Personnel.

5. All provisions herein are intended to be severable, one from the other. If any term or provision hereof, or part thereof, is found to be illegal or invalid for any reasons whatsoever, such illegality or invalidity shall not affect the validity of the remainder of the provisions hereof.

6. The provision herein contained shall ensure to the benefit of and be binding upon the undersigned and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF this Authorization and Release has been signed and delivered by the undersigned in the City of Winnipeg in Manitoba, this ______ day of _____________, 20___.

SIGNED AND DELIVERED
In the presence of:

_____________________________
Signature of Parent

______________________________    _____________________________
Witness        Signature of Parent
REMEMBER!

- EMS is called in all instances
- The Lifeguard has received recognised training
- If any patient is unable to administrate the Auto-Injector/EpiPen:
  - Follow the package instructions
  - The Auto-Injector/EpiPen must be the patient’s medication; never use another’s medication
  - This applies only to Auto-Injector/EpiPen; other medications must be administered by the patient themselves i.e. inhalers, nitro-glycerine, etc
- Oxygen is administered
- Waivers, for minor patients, are still encouraged but not required

HOW TO ADMINISTER THE EPIPEN

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take control of the situation.</td>
</tr>
<tr>
<td>2</td>
<td>Send someone to call EMS and request an ambulance.</td>
</tr>
<tr>
<td>3</td>
<td>Talk to (prepare) the patient.</td>
</tr>
<tr>
<td>4</td>
<td>Grasp the EpiPen firmly around the middle only with the black/orange tip facing downward. <strong>DO NOT PLACE YOUR THUMB, FINGERS, OR HAND OVER BLACK/ORANGE TIP OR OVER EITHER END OF THE PEN!</strong></td>
</tr>
<tr>
<td>5</td>
<td>Remove the grey/blue cap. <strong>THE CAP CANNOT BE REINSERTED.</strong></td>
</tr>
<tr>
<td>6</td>
<td>Grasp the patient’s leg.</td>
</tr>
<tr>
<td>7</td>
<td>Swing and jab firmly into outer thigh. The unit is perpendicular (at a 90° angle) to the thigh. (The Auto-injector is designed to work through clothing.)</td>
</tr>
<tr>
<td>8</td>
<td>Listen for the click.</td>
</tr>
<tr>
<td>9</td>
<td><strong>Hold firmly in place</strong> for the slow count of 10 seconds.</td>
</tr>
<tr>
<td>10</td>
<td>Gently massage the area for 10 seconds to help absorb the medication. <strong>NO ICE</strong></td>
</tr>
</tbody>
</table>

The used EpiPen is reinserted and locked into its carrying tube without bending the needle. Give this to the paramedics or dispose of it into a sharps container.
HOW TO ADMINISTER THE EPIPEN™

1. Take control

2. EMS

3. Talk to the patient

4. Grasp the EpiPen firmly

5. Remove the grey/blue cap

6. Grasp the patient’s leg

7. Jab firmly the black/orange tip into the outer thigh.

8. Listen for the click

9. Hold firmly in place for a slow count of 10

10. Gently massage the area for 10 seconds to help absorb the medication – NO ICE.

Lifeguard

Patient

Patient

Lifeguard

Lifeguard

Patient

Patient
How to use the EpiPen® Auto-Injector...

Three simple steps:

1. Pull off grey safety cap.

2. Jab black tip into outer thigh until unit activates.

3. Hold EpiPen® in place several seconds. Then discard unit.

Comment utiliser l'auto-injecteur d'adrénaline EpiPen®

en trois étapes simples.

1. Enlever le couvercle gris de sécurité.

2. D'un coup sec, placer le bout noir sur la cuisse jusqu'au déclenchement du mécanisme d'auto-injection.

3. Laisser en place pour plusieurs secondes. L'unité EpiPen® doit ensuite être enlevée et jetée.
How to use EpiPen® and EpiPen® Jr Auto-injectors.

Remove EpiPen® Auto-injector from carrier tube

1. Hold firmly with orange tip pointing downward
2. Swing and push orange tip firmly into mid-outer thigh until you hear a ‘click’

Hold on thigh for several seconds

Built-in needle protection
- When the EpiPen® Auto-injector is removed, the orange needle cover automatically extends to cover the injection needle

After administration, patients should seek medical attention immediately or go to the emergency room. For the next 48 hours, patients must stay within close proximity to a healthcare facility or where they can call 911.

For more information go to www.EpiPen.ca

Important Safety Information

EpiPen® and EpiPen® Jr Auto-injectors are indicated for the emergency treatment of anaphylactic reactions in patients who are determined to be at increased risk for anaphylaxis, including individuals with a history of anaphylactic reactions. They are intended for immediate self-administration for the emergency treatment of severe allergic reactions (Type I), including anaphylaxis, associated with food, insects and inhalants, medications, latex, other allergens, and the idiopathic and exercise-induced anaphylaxis. Selection of the appropriate dosage strength is determined according to patient body weight.

There are no absolute contraindications to the use of epinephrine in a life-threatening allergic situation. Epinephrine use should be avoided in patients with cardiac arrhythmias, asthma, myocardial infarction, and/or cardiac arrhythmias. Epinephrine use should be avoided in patients with organic brain damage and in patients with narrow-angle glaucoma. Administration with caution to elderly or hypertrophic individuals, pregnant women, and individuals with cardiac or respiratory disorders.

Adverse reactions are uncommon. Epinephrine use may cause a transient, moderate anxiety. Feelings of over stimulation, apprehension, nervousness, tremor, weakness, shakiness, flushing, sweating, tachycardia, palpitations, paresthesia, and trembling. Headache, nausea, and respiratory difficulties.

EpiPen® and EpiPen® Jr Auto-injectors are designed as emergency supportive therapy only. They are not a replacement or substitute for subsequent medical or hospital care, nor are they intended to supplant insect venom hyposensitization.

EpiPen.ca
Simple to use when it counts.
It seems to erupt from nowhere: a young man, finishing his shift as a taxi driver, sits down to have a snack. Within seconds, he complains that he has a lump in his throat. Moments later he is gasping for air, and as the ambulance arrives, he loses consciousness. On arrival in the emergency room, the man suffers a respiratory arrest, and his heart stops briefly. As physicians treat him, they wonder what evil can strike such a powerful blow: Drugs? Asthma? Clots in the lungs? Several hours later, in an intensive-care unit, he wakes up on a ventilator and gives us an answer: cashews.

He has mild allergies to many foods, he reveals, and just before falling ill he had eaten two nuts, precipitating the kingpin of allergic reactions — anaphylaxis, a violent systemic response to something (usually) eaten or injected. Although relatively rare, it is common enough that two new cases of anaphylaxis a week are referred to Dr. Gillian Shepherd, an allergy specialist at New York Hospital. Large skin-test studies with insect venom suggest that 15 percent of the population may be predisposed.

Antibiotics, nuts, seafood and insect stings are the most common culprits, but even substances as seemingly innocuous as celery are implicated. Against the backdrop of the usual hospital disasters, full-blown anaphylaxis is an incomparable cataclysm, a Krakatoa boxed inside a body.

Timely treatment works. But it must be administered soon, sometimes within minutes, to be effective. Several hundred otherwise healthy people die each year in the United States after reactions to penicillin alone. The incidence of nonfatal reactions is much higher. Interest in how to prevent and treat attacks has recently intensified in the South by the march of the imported fire ant; up to 2 percent of fire ant bites may bring on anaphylaxis.

In every case of anaphylaxis, the patient has encountered the offending substance, sometimes harmlessly, in the past, though perhaps without being aware of it. People, for example, may be exposed to penicillin in trace amounts as a contaminant in milk.

At the time of first contact, the immune system manufactures specific molecules designed to protect the body, antibodies of a type called IgE. The antibodies, in effect, take a biochemical “mug shot” of the invader and remember it indefinitely. At the time of the next exposure, the foreign invader, or allergen, is “caught” by this vigilant immunologic patrol squad. Then, for reasons that are not fully understood, the patrol squad gets mightily carried away, setting into motion the release of chemical weapons - notably histamine and leukotrienes - that attack the lungs, blood vessels, intestine and skin. Anaphylaxis in Greek translates as “backward protection.” Indeed, in anaphylaxis, the misguided immune system attempts to keep out a foreigner by burning down the house.

The first manifestations of anaphylaxis begin seconds to two hours after exposure to the allergen. The reaction commonly starts with itching and flushing, hives, or a lump in the throat. Oddly, even in these early stages, victims may sense that something terrible is afoot, their fear wildly out of proportion to their symptoms. Heart-attack victims may also experience such premonitions. The reaction bursts forth in one of several directions. Most patients will develop swelling of the airways, leading to audible wheezing and, in severe cases, respiratory obstruction. In others, molecules attack primarily the walls of the blood vessels, leading to profound drops in blood pressure, and unconsciousness. Patients with food allergies are particularly prone to intestinal
anaphylaxis - nausea, vomiting, diarrhea; the reaction may be so violent that patients need intensive care simply to treat severe dehydration. Serious anaphylaxis often combines several of these ingredients.

It is virtually impossible to predict a first attack. Intuitively, one would expect people who suffer from lesser allergies, such as hay fever, to be predisposed. But studies of patients who have anaphylaxed to penicillin and wasp stings show no greater incidence of allergy than in the general population. Patients are more likely to react to substances injected into the blood - intravenous antibiotics or stings - than to swallowed allergens. But even oral antibiotics should never be taken lightly. Several years ago, a colleague took Bactrim, which she had taken before, for a minor infection. Fifteen minutes later, in the shower, she developed a diffuse rash and collapsed from anaphylaxis.

Serious allergic reactions to foods often occur after consuming foods that people eat most often, because each repeat exposure further sensitizes, or agitates, the immune system. In Asia, rice is a major cause of allergic reaction, whereas in this country this food is a staple for patients with multiple allergies.

Two factors - alcohol and exercise - seem to enhance otherwise mild or silent allergies, perhaps by increasing uptake from the stomach. I recall one young man with no history of anaphylaxis who arrived in the emergency room itching and wheezing on the evening of his bachelor party. He had eaten a big lobster dinner, imbibed a fifth of scotch, then run some drunken sprints - which in combination apparently precipitated a reaction. The dose of the allergen is also important. “The best time for an anaphylactic reaction” says Dr. Shepherd, “is at the end of a wedding. People drink too much. They dance. And they are exposed to all sorts of food that they usually eat in small quantities.”

Any allergic reaction that begins within one minute of eating food, receiving a sting, or taking a drug is cause for concern. Stories abound of patients who ignore hives or pop antihistamines (which cannot reverse a serious reaction) and end up two hours later in shock. One woman ignored hives after a jellyfish sting, and passed out at sea.

The mainstay of therapy for anaphylaxis is repeated injections of epinephrine, or adrenalin. The drug works within seconds, but is short lived in the blood, and symptoms often recur with their own savage rhythm until the allergen is sufficiently dispersed in the body or is removed. In the case of food allergies, patients may be given noxious syrup to induce vomiting and medicine to stimulate diarrhea. If the reaction subsides readily - some are self-limited and many clear with one shot - the patient is discharged after several hours. But severe anaphylaxis may necessitate cardiopulmonary resuscitation and intensive care.

The allergist’s first challenge after anaphylaxis is to identify the offending substance, which is not always obvious. The patient’s history often isolates a suspect. The allergist may analyze the patient’s blood for the offending IgE antibody or conduct skin tests with tiny amounts of allergen, to measure the local reaction. But anaphylactic reactions represent a complex interplay between patient and environment and sometimes demand clever detective work. A certain group of patients, for example, has anaphylaxis only when they eat celery and exercise; either stimulus alone does nothing. One patient has anaphylactic reactions to shrimp only during the week before her menses. Another reacts for unclear reasons to canned ham eaten in New Jersey, but not to the same brand consumed in Florida.
Each anaphylactic episode may be more serious than the last, so prevention is crucial. Patients with allergies to insect stings are now being “desensitized” with progressively concentrated solutions of venom; these injections are designed to cause the body to manufacture a “protective” antibody of the IgG class, which snags insect venom before it is seen by the hysterical IgB patrol squad.

The best protection against drug and food induced anaphylaxis is avoidance. Whenever you are about to receive a new drug, remind your physician about allergies, even minor reactions. Physicians forget. Labels frequently carry brand names that you may not recognize - Dynapen, Wymox and Augmentin - to name a few, are all penicillin derivatives and may cause trouble for allergic individuals. The Annals of Allergy last February printed three tragic accounts of individuals with known antibiotic allergies who died after receiving medications from physicians. One was wearing a Medic Alert bracelet at the time of her death.

Avoidance is more difficult for people with serious food allergies, who may be sensitive to even microgram quantities of antigen, and for whom dining out is like traversing a mine field. One man with a seafood allergy anaphylaxed after eating french fries that may have been cooked in oil previously used to fry fish. In a much-publicized case several years ago, a Brown University student with a nut allergy died after eating chili thickened with peanut butter.

One life saving innovation for such individuals is EpiPen, a device available by prescription. It resembles a retractable ball-point; it automatically injects a dose of epinephrine. Dr. John Yunginger, professor of pediatrics at the Mayo Medical School advises all his patients who have had systemic allergic reactions to carry one. It may calm symptoms en route to the emergency room and “it dramatically reduces mental wear and tear,” says Dr. Yunginger. “Anyone who’s had an anaphylactic reaction lives with fear. They hear a buzzing in the kitchen and it’s probably a fly. But, my god, what if it’s a bee or a wasp?”

Although I have no allergies, I usually bring along an EpiPen when I travel to the countryside, a practice I have always attributed to paranoia. I have since discovered that many colleagues do the same. One, whose wife has a celery allergy, carries the device whenever they go out; another keeps one in his pocket at all times, “just in case.” I suppose we all have dreams and nightmares about that potential moment when one injection, at a cost of a few dollars, could literally make the difference between life and death.

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i 13th Annual Emergency InterAct Update Conference – Winnipeg Manitoba, 2000
iii 13th Annual Emergency InterAct Update Conference – Winnipeg Manitoba, 2000
iv CLSM – Lifesaving Society Canada
SECTION 5
Oxygen Therapy Guide For Lifeguards
AQUATIC TASK FORCE

PHASE 2
OXYGEN THERAPY

Recommendation:

That “Oxygen Therapy” be available on a consistent basis and standardized in all City of Winnipeg Aquatic Facilities as it relates to training, application, procedure and equipment.

The above referenced document and its recommendation was accepted by the managers and is the basis of the training that is being presented. When an employee is evaluated successfully, it becomes their responsibility to use the oxygen equipment supplied in the manner and appropriateness which is consistent with the knowledge, skills and protocols identified in the training received.

1st Edition
Philip M. Hay
Trish Carter
Kevin Johnson

2nd - 10th Editions (Revisions) 2001 - 2013
Lloyd Plueschow
Learning Objective:
The Instructor/Guard will be able to explain and demonstrate the use of the oxygen delivery equipment and the various masks supplied under various scenarios.

Performance and Learning Objectives:
The Instructor Guard will be able to:
1. Identify various anatomy and physiology terms
2. List conditions that may require oxygen therapy
3. Explain the contraindications for the use of oxygen therapy
4. Describe the following components of an oxygen delivery system:
   - Oxygen bottle, cylinder, or tank
     a. Valve stem
     b. Oxygen inlets and outlets
     c. O2 wrench
   - Oxygen regulator
     a. Screw clamp
     b. Regulator yoke
     c. Pressure gauge
     d. Flow meter and flow dial
     e. Oxygen inlets and outlets
     f. Pin index
     g. Seal washer
   - Non-kink tubing
   - Pocket mask (in safety pouch)
   - SealEasy™ mask
     a. Adult and pediatric
       i. Cuff inflator
     b. One-way valve
     c. O2 adapter
   - Nonrebreather mask
     a. Adult and pediatric
   - Trauma bag
5. Estimate the approximate flow time of an O2 bottle at 15 litres per minute
6. List the safety measures for the administration of oxygen therapy
7. Demonstrate use of the equipment for the following patients (Infant, Child, Adult):
   a. Breathing
   b. Non-breathing
   c. Cardiac arrest
   d. Laryngectomy patient
The Respiratory System

Function

The respiratory system carries air in and out of the body. Specifically, this process is responsible for supplying oxygen to the body and eliminating carbon dioxide from the body. The red blood cells in the lungs pick up oxygen and carry it to the body cells and in return pick up the carbon dioxide and returns it to the lungs for elimination. The breathing process is initiated by the build up of carbon dioxide in the blood stream.

Structure

This system is comprised of the mouth/nose, pharynx, trachea, larynx, epiglottis, bronchi, lungs, alveoli, and capillaries. It is through these tubes and passageways that the exchange of oxygen and elimination of carbon dioxide is processed.

The Upper Respiratory System
The Lower Respiratory Tract

Alveoli
The alveoli are the tiny sacs at the ends (or "leaves") on the bronchial tree. Each small bronchiole divides into half a dozen or so alveolar ducts, which are the narrow inlets into alveolar sacs. Each alveolar duct subdivides, leading into three or more alveolar sacs. Each large alveolar sac is like a grape cluster, which contains ten or more alveoli. Because the membrane separating the alveolus and the capillary network which carries blood over them is very thin and semi-impermeable, oxygen can transfer from the air into the blood cells within the capillaries. Likewise, carbon dioxide and other waste gases can transfer out of the blood and into the air to be exhaled from the lungs.
Mechanics of Respiration

Breathing or respiration is a two step process involving inspiration (inhalation) and expiration (exhalation).

**Inspiration**

During inspiration, the thoracic diaphragm contracts and pulls the lungs downward. The external intercostal muscles (located between the ribs) contract and expand the rib cage. This process creates a negative pressure in the lungs forcing air in.

**Expiration**

During expiration the thoracic diaphragm and external intercostals relax. The internal intercostal muscles assist as well. The diaphragm moves up, pushing on the lungs. The rib cage contracts. This creates a positive pressure in the lungs; air is forced out.
Respiratory Distress (Hypoxia)

The time to stop the process of respiratory distress, is as soon as a problem has been recognised. The choice of equipment, or method, to correct respiratory distress, will depend upon the type of problem encountered. ABCs are always the priority; also important, is patient positioning, shock care, administration of oxygen and assurance of adequate ventilation by an appropriate method.

Regardless of the cause, the effects of respiratory distress will be the same; unless corrected early enough, the patient will suffer certain consequences that may produce shock, respiratory arrest, cardiac arrest, and eventually biological death.

Some causes include:

- An obstruction in the respiratory tract (i.e. choking, laryngospasm, aspiration)
- Inadequate ventilation of the alveoli due to an insufficient rate and/or depth of respiration
- An inability for oxygen to cross the alveolar wall due to disease, trauma, poisoning, drowning, etc
- An inability for blood to carry the oxygen; causes may include shock or poisoning
- An inability for the blood to circulate properly possibly due to shock or other causes

Adequate breathing is characterised by three factors:¹

- Adequate rise and fall of the chest
- Ease of breathing
- Adequate respiratory rate

<table>
<thead>
<tr>
<th>Normal Respirations Per Minute</th>
<th>Normal Pulse Per Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult 10 - 20</td>
<td>50 - 100</td>
</tr>
<tr>
<td>Child 20 - 30</td>
<td>80 - 100</td>
</tr>
<tr>
<td>Infant 30 - 50</td>
<td>100 - 140</td>
</tr>
</tbody>
</table>

Signs and symptoms of respiratory distress (inadequate breathing):

The effects of respiratory distress will depend upon the type and degree, how rapidly it develops, how long it lasts and how well the cells are able to function. The brain, heart, and retina are particularly sensitive to oxygen deficiency.

Inadequate breathing is characterized by:²

- Mental status changes (LOC)
- Inadequate rise and fall of the chest
- Gasping or grunting
- Increased effort or difficulty breathing (dyspnea)
- Cyanosis, a bluish/greyish colour to the skin
- Slow heart rate accompanied by slow breathing rate

Breathing rates per minute:

- Less than 8 – above 30 in adults.
- Less than 10 – above 40 in children.
- Less than 20 – above 60 in infants
Chronic Obstructive Pulmonary Disease (COPD)

Obstructive airway disease is characterised by ongoing obstruction to airflow within the lungs. The 3 most common conditions include:

- Asthma.
- Chronic Bronchitis.
- Emphysema.

Bronchial Asthma

Asthma is characterized by an increased sensitivity of the respiratory tract to various stimuli. It involves episodes of airway obstruction due to bronchospasm, swelling of mucus membranes in the bronchial walls, and/or plugging of the bronchi by thick mucus. All asthma attacks should be of concern and monitored closely. Typically, the person with asthma is symptom free between attacks.

May be triggered by:

- It can be exercise induced
- Pollutants in the atmosphere
  - These could possibly include gaseous by-products generated at all pools
- Stress
- Pollens in the air
- Certain foods can trigger asthma

Signs and symptoms include:

- Tripod position (sitting upright, leaning forward, fighting to breathe).
- Over inflated chest with air trapped in the lungs.
- Fatigue, confusion, agitation, lethargy.
- High pitched wheezing during exhalation, which may also occur during inhalation.
- Spasmodic, apparently unproductive cough.
- Rapid, shallow respirations.
- Very little movement of air during inhalation.
- Inability to speak in full sentences without catching the breath.
- Rapid pulse often exceeding 120 per minute.

**Status asthmaticus** is a severe, life-threatening, prolonged asthma attack. It is a dire medical emergency. The patient may begin shallow breathing or stop breathing altogether.
**Chronic Bronchitis**

Chronic bronchitis is characterised by inflammation, edema (extra fluids build up in the tissues around the spaces of the lungs), and excessive mucus in the bronchial tree. It features a productive cough that has persisted for at least three months per year over two consecutive years.

**Emphysema**

In emphysema the alveoli lose elasticity, become distended with trapped air and stop working. As the total number of alveoli decreases, breathing becomes more and more difficult.

**Hyperventilation**

Hyperventilation is a condition characterised by breathing too fast. Many people, occasionally such as when surprised, hyperventilate. It is normal as long as the rate of breathing quickly returns to normal.

Hyperventilation syndrome is an abnormal state in which rapid breathing persists. It is a common disorder usually associated with anxiety. As the patient becomes more anxious, they breath more rapidly, which in turn makes them more anxious and so on, creating a vicious cycle.

The syndrome is characterized by rapid, deep, or abnormal breathing. The lungs over-inflate, and the patient blows off too much carbon dioxide. In prolonged cases, the patient may pass out. It typically occurs in the young, anxious patient, most whom are not aware they are breathing too fast.

Signs and symptoms include:

- Sensation of choking.
- Air hunger or gulping air.
- Deep, sighing, rapid breathing with rapid pulse.
- Dizziness, light-headedness, fainting.
- Drawing up the hands at the wrist and knuckles with the fingers flexed.
- Marked anxiety escalating to panic and a feeling of impending doom.
- Dryness or bitterness of the mouth.
- Tightness or a lump in the throat.
- Numbness or tingling of the hands and feet or around the mouth.
- Pounding of the heart with stabbing pains in the chest.
Not every patient who is breathing rapidly or deeply is hyperventilating. Several serious conditions may be the cause, for example diabetes (rare), asthma, trauma, etc. It may also have a medical origin, such as aspirin overdose. If you are certain that no life-threatening condition exists, then try calming the patient. Convence the patient into breathing slowly; getting them to “mirror” your breathing can be very effective. If the patient does not respond immediately to your efforts, then administer oxygen. It will not make hyperventilation worse.

**Putting a paper bag over a patient’s mouth is dangerous, especially if an underlying medical reason exists. Calming is a powerful benefit to the hyperventilating patient.**

**Appropriate Uses Of Oxygen**

Any problem that causes acute hypoxia should be treated with the administration of oxygen. Essentially, the Lifeguards’ contact with patients requiring oxygen is short term. Oxygen administration must be monitored carefully. The general rule is to administer oxygen to all patients who need it. Any patient requiring oxygen should be seen by a doctor immediately; EMS should be contacted. All use of oxygen is documented. Oxygen should be administered for:

- Water rescue and near-drowning
- Any breathing problems
- Cardiovascular and/or neurological emergencies
- Shock
- Severe bleeding
- Spinal / bone fractures
- Head injuries
- Altered mental state
- Unresponsiveness
- Seizures
- Any serious condition or trauma

**Inappropriate Uses Of Oxygen**

For our purposes, oxygen is not intended to “cure” specific diseases or conditions, nor is it intended for personal non-medical use (theft). For the Lifeguard, its primary use is for **FIRST AID**. Patients with specific medical conditions, regularly requesting or requiring oxygen, should also be advised to see their doctor and follow what ever directive given. Again, oxygen is administered to those who need it.

**Cautions with AED & Oxygen**

Studies have shown that there is a slight risk that, during defibrillation, the energy that is created in the chest area plus high levels of oxygen could result in a fire. Removal of medical oxygen from the patient’s face or chest area prior to starting the defibrillation sequence is the recommended way to avoid this from occurring.
**Oxygen - Properties**

- It is a colourless, odourless gas
- Oxygen is normally present in the atmosphere in a concentration of approximately 21%, the rest of the air makeup is 78% Nitrogen, 1% Carbon Dioxide and traces of other gases.
- Pure \( O_2 \) is produced commercially by fractional distillation, the air is liquefied and the other gases are boiled off.
- Liquid \( O_2 \) is converted under high pressure to a gaseous state.

**Equipment**

The Oxygen delivery system that is presently used is comprised of the following components:

- D size oxygen cylinder(s)
- Regulators
- SealEasy™ masks.
- Nonrebreather masks.
- Non-kink tubing.
Oxygen Cylinders

- The gas is stored in steel or aluminium cylinders of various sizes:
  - The most common portable size is the “D” tank; it holds approximately 350 litres of oxygen compressed to 2000 PSI
  - Another less common size is the “E” tank; it holds approximately 625 litres of oxygen compressed to 2000 PSI

- All gas cylinders are colour coded according to contents:
  - Common O₂ cylinders:
    - Are all white
    - Are all green
    - Have green sides with white tops
    - Or just have white tops with bare metal sides

- Oxygen cannot be used directly from the cylinder due to the high pressure that it is under.

Regulators

- A regulator is used to reduce the pressure in the tank from 2000 PSI to a useable pressure of 50 PSI
- There are various types of regulators available. They most commonly have a gauge that indicates the amount of contents in the cylinder and a second gauge or indicating dial that represents the litre flow, in litres per minute (lpm).
- Regulators have a pin index system. This prevents the use of a regulator that is not appropriate for that particular gas.
  - O₂ has 2 pins.
  - Nitrous Oxide has 1 pin.

Oxygen Cylinder Valve Stem

The oxygen cylinders used, are equipped with a valve stem to which the oxygen regulator is attached. This valve stem is compatible only with oxygen regulators. This is ensured by the type of pin index present on the valve stem.

Only the main valve should turn when opening or closing a bottle; the valve stem attached to the bottle should remain fixed – if it does move, close the valve, if possible, and stop using the bottle immediately. Tag the bottle out and contact a supervisor.
**Oxygen Regulator**

The pressure regulator is used to reduce the tank pressure to a usable level. The type of regulator that is being used is an *adjustable flow regulator*, which reduces the pressure to approximately 50 psi. Prior to connecting this regulator, the cylinder must be “cracked” slightly for a second. This ensures that any foreign objects that might be present in the outlet are expelled. With the regulator in place, the pressure can now be regulated into a usable state by using the flow meter portion of the regulator.

**Flow meter**

This Flow meter is adjustable from 0 to 15 and sometimes as high as 25 lpm. A flow rate of 15 litres per minute is not exceeded in any case. The actual flow is controlled by an internal plate with precision created holes corresponding with a flow rate. The litre flow dial will usually “click” at each corresponding flow number; it is important *not* to set the flow meter “between the numbers”, as this stops the flow of oxygen. The oxygen is delivered to the mask being used via the non-kink tubing.

The amount of time that a cylinder lasts, is directly related to the flow rate at which the regulator is set. It is critical to check the pressure gauge on the regulator to ensure that a sufficient amount of oxygen is present in the cylinder at all times.

**Precision Medical™ Regulator**

![Precision Medical™ Regulator Diagram](image-url)
Precision Medical Regulator - oxygen inlet - cut away view

Puritan Bennett™ Regulator

The PRECISION MEDICAL oxygen regulator will or has replaced all Puritan-Bennett oxygen regulators.
Oxygen Masks

SealEasy™

The SealEasy™ masks are intended for non-breathing patients. They are of high quality and when used properly, form a good seal even in difficult situations. By removing the bite-block on the adult mask, a patient can be resuscitated via the nose, or in the case of a laryngectomy patient, via their stoma. Presently, there are two sizes in use, Adult and Pediatric. Choose the mask that fits the patient properly; the mask should seal easily around the patient’s mouth and cover the nose, or in the case of resuscitating via the nose (bite block removed) seal around the patient’s nose and cover the mouth. The bite block on the pediatric mask is non-removable and can only be used when resuscitating via the mouth. The pediatric SealEasy is intended for infants or very small children.

The SealEasy™ mask allows Lifeguards to build on their previous training of “direct method” artificial respiration (AR). The head-chin-lift and jaw thrust techniques are easily performed. Another advantage is the ability to easily combine the head-chin-lift technique with the jaw-thrust at the patient’s head (cephalic technique). (See photos page 24)

The mask assembly consists of the actual mask (removable bite-block included in the adult), a one-way valve and an oxygen adapter. The mask is assembled with the oxygen adapter at the top, the one-way valve in the middle and then the mask itself. The non-kink tubing is attached to the regulator and the oxygen adapter on the mask.
Both the adult and pediatric mask are not completely filled with air; this partial inflation is necessary to obtain an optimal seal. To verify proper inflation on the pediatric mask, press one thumb on the mask as shown in the figure 1, with one thumb pressing against the mask base, the remaining part (approximately 3/4 of the mask) will be fully inflated with air. To verify proper inflation on the adult mask, press both thumbs on the cushion as shown in Figure 2, with thumbs pressing against the mask base, the remaining part of the cushion will be completely filled with air.

**Figure 1**

**Figure 2**

**Non-Kink Tubing**

This tubing is used to attach the oxygen regulator to various masks. The tubing is approximately 2 metres in length and is maintained in a sterile package.
Nonrebreather Mask (NRB)

The nonrebreather mask is for breathing patients. There is a one-way valve located above the O2 reservoir bag to prevent the patient from “re-breathing” their exhaled air. Another one-way valve is located on the mask; it opens when the patient exhales. There are two sizes at present, Adult and Pediatric; choose the mask that fits the patient properly. The mask is attached to the regulator via the non-kink tubing. Generally, nonrebreather masks come pre-assembled with the non-kink tubing, but sometimes the tubing must be attached to the mask prior to use. The flow rate is adjusted to ensure that the O2 reservoir bag remains inflated while in use by the patient.

Nonrebreather (NRB) Masks for Adult, Child, and Infant patients

All NRB masks should fit the patient properly; The bottom of the mask should tuck neatly under the chin, and the top of the mask should cover the bridge of the nose at the cheek bones without allowing oxygen to flow into the patient’s eyes. For small infants, the NRB will probably be too large; simply holding the end of the tubing (no mask), near the infants mouth, and away from the patients eyes, will suffice. (See photos page 27 - 28)
**Pocket Mask**

All City of Winnipeg Aquatic Instructor/Guards are issued a CPR compact face shields, with a one-way valve, as a first line barrier device when faced with a resuscitation emergency. Although brands may vary, they all essentially work the same way.

**Shield - face up**

Performing mouth-to-mouth resuscitation, with the CPR shield, is identical to doing the technique without the shield:
- Open the patient’s mouth, place the shield on the patient’s face while inserting the bite block into the patient’s mouth, head-tilt-chin-lift or jawthrust, seal around the outside of the patient’s mouth with your mouth, pinch the patient’s nose (with the shield), and blow in slowly.

Ensure the mask is facing up; commonly there is text on the top side. The bite block on the underside is either oval or round.

Pocket masks, SealEasy masks, nonrebreather masks, and non-kink tubing are all intended for one time rescue use and discarded appropriately.
Preparing Oxygen Cylinder for Use

- **NEVER HAVE ANY PART OF YOUR BODY OVER THE TANK WHEN WORKING ON IT.** Always work from the side of the equipment.

1. Check tank for damage.
2. Remove protective wrap.
3. Remove dust cap assembly (may be one or two parts) and discard.
4. Face main valve opening and tank top away from yourself and any other persons.

5. “Crack” the tank for one second utilizing the oxygen wrench, turning the main valve counter clockwise. This clears debris from the opening.
   a. "Righty tighty"
   b. "Lefty loosey"

6. Inspect the regulator valve to ensure it is the right type. Be sure the seal washer is intact, and properly seated.

7. Attach regulator yoke to main valve, aligning the pins to ensure that the regulator makes contact with delivery port. Hand-tighten securely. Ensure litre flow dial is in the OFF position.

8. Turn the pressure gauge away. Open tank valve completely, turning counter clockwise and then close (turn back) one-half turn. Read pressure.
   a. Generally, a tank is rescue-ready with at least 900 psi and must be changed, during use, with a new tank if it is less than 200 psi (red refill zone).

9. Tank is ready for use.
   a. All tanks in use should be lain down with the pressure gauge showing up.

10. Once finished with the tank, and it is no longer required, the main valve should be shut off by turning it clockwise with the wrench. The pressure must be released by turning on litre flow; once the pressure has been released, return the regulator to the OFF position. The pressure gauge should read “0” psi.

11. Secure tank in a safe manner:
   a. In a trauma bag or oxygen bag.
   b. Stored upright in a proper storage container.
Set Up Procedures for Oxygen Equipment (Field Emergency)

Note: The following is pre-assembled by staff, and stored in trauma or oxygen bags:
- One oxygen bottle and regulator.
- One complete adult SealEasy assembly (one spare).
- One complete pediatric SealEasy assembly (one spare).

The main valve on the bottle is turned off when the bottle is not in use. If bottle and regulator are not pre-assembled refer to “Preparing Oxygen Cylinder for Use” (page 20).

Basic Set Up
1. Remove the O₂ assembly from the trauma bag.
2. Quickly inspect to ensure proper assembly and litre flow dial is in OFF position.
3. Open main valve turning counter-clock-wise full open and a half turn back.
4. Check the tank pressure.

SealEasy Masks:
1. Ensure you have the appropriate SealEasy mask assembly (adult, pediatric - non breathing); choose the one that fits best.
2. Attach the non-kink tubing to the regulator ensuring a solid connection to the regulator.
3. Attach the non-kink tubing to the O₂ adaptor on the mask.
4. Set litre flow dial to appropriate flow rate.
5. Lay bottle down with gauge face up.
6. Open the patient’s mouth and insert bite-block portion over the tongue (do not push the tongue to the back of the throat).
7. Ensure the inflated cuff is completely in contact with patients face and properly lined up.
   a. Choose the mask that fits the patient properly; the mask should easily seal the around the patient’s mouth and cover the nose, or in the case of resuscitating via the nose (bite block removed), seal the around the patient’s nose and cover the mouth. The bite block on the pediatric mask is non-removable.
   b. The bite-block can be removed on the adult SealEasy in the case of lockjaw or ventilating the patient via the nose or stoma.
8. Ventilate in the appropriate manner.
   a. Ensure airway is opened with appropriate method.
      i. Head tilt chin lift – working from patient’s side.
      ii. Jaw thrust or cephalic technique
9. Monitor the patient ensuring:
   a. Appropriate ventilation is taking place.
   b. There is sufficient oxygen flow.
Nonrebreather Masks:

1. Ensure you have the appropriate nonrebreather mask (adult, child or infant - breathing); choose the one that fits best. It should form a good seal on the patient’s face with no oxygen flow into the eyes. NRBs are not suitable for young infants; use just the tubing at a low flow rate of 6 – 8 lpm (see page 27, 28).
2. Attach the non-kink tube to the regulator ensuring a solid connection to the regulator.
3. Adjust the oxygen flow to the appropriate setting.
4. Place your thumb over the one-way valve above the O₂ reservoir bag and carefully inflate the O₂ reservoir bag; be careful not to burst the reservoir bag.
5. Place the mask on the patient and adjust the elastic strap to hold the mask in place ensuring a good seal at the edges. Ensure no oxygen is flowing into the patient’s eyes.
6. If necessary, adjust the flow rate to ensure that the reservoir remains full (max 15 lpm).
7. Monitor the patient ensuring:
   a. Appropriate ventilation is taking place.
   b. There is sufficient oxygen flow.

Changing a Low/Empty Oxygen Cylinder (Field change)

1. Replace a cylinder in use when the content is 200 psi or less (red refill zone).
2. Leave the litre flow valve on.
3. Leave Seal-Easy masks and non-kink-tubing assembled and in place.
4. You will have to remove the nonrebreather mask from a patient’s face during a bottle change. The reservoir bag will deflate without a supply of oxygen and the patient may suffocate.
   Carefully monitor the patient during any oxygen bottle change.
5. Turn off main valve.
6. Wait until all the pressure has been released; the pressure gauge will read 0 psi.
7. Loosen screw clamp on the regulator yoke and remove regulator from the empty or low oxygen bottle.
8. Quickly check new bottle for damage.
9. Quickly remove protective wrap.
10. Quickly remove dust cap assembly (may be one or two parts) and discard.
11. Quickly “crack” the new bottle for one second by using the wrench and turning the main valve counter clockwise. This clears debris from the opening. Point away from everyone.
12. Quickly check that the seal washer on the regulator is intact, and properly seated.
13. Replace the regulator on the valve stem properly. Tighten the screw clamp on the regulator yoke.
14. Face the pressure gauge away from everyone. Open tank valve completely, turning counter clockwise and then close (turn back) one-half turn. Quickly read pressure.
15. Tank is ready for use.
   a. A bottle in use should be laid down with the pressure gauge showing up.
SealEasy Assembly

Nonrebreather Assembly
USING THE MASKS
Using the SealEasy™ CPR mask


The Cephalic technique can be used if the rescuer is space confined, or for spinal injuries when the jaw thrust or Head-tilt-chin-lift method is impractical. The Cephalic technique must be performed properly to ensure the patient’s airway is opened. It is in fact a jaw thrust with a head tilt performed at the patient’s head; the jaw is lifted or squeezed behind the angle of the jaw, and then the head is tilted back. Use the head-tilt-chin-lift method if this does not work.

Cephalic technique at patient’s head.  Cephalic technique at patient’s head. Note patient’s head and rescuer’s hands position.
The *jawthrust* is used on non-breathing head and spinal injured patients. It can be used to open the patient’s airway and to perform CPR. The jaw is lifted or squeezed behind the angle of the jaw. Use the Cephalic technique or head-tilt-chin-lift method if this does not work.
Head-tilt-chin-lift infant

Infant CPR compressions

Ventilating via the nose

Ventilating for a Laryngectomy patient. (Bite-block removed) Note: mouth and nose plugged; head tilt is not necessary.
Nonrebreather Mask / Infant Tubing

Conscious adult/Child

Unconscious breathing adult/child in the recovery position.

Conscious infant with oxygen (tubing)
Infant recovery with oxygen (tubing)

### Flow Rates for Oxygen Therapy - Litres per Minute (lpm)

<table>
<thead>
<tr>
<th>Oxygen Flow Guidelines</th>
<th>Adults O₂ flow</th>
<th>Pediatric O₂ flow</th>
<th>% O₂ delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-breathing patient with Seal-Easy (SE) mask – no O₂</td>
<td></td>
<td></td>
<td>16%</td>
</tr>
<tr>
<td>Non-breathing patient with Seal-Easy mask &amp; O₂</td>
<td>15 lpm</td>
<td>Infant 6-8 lpm (Ped SE) Child 10-15 lpm (Ped/Adult SE)</td>
<td>40% - 60%</td>
</tr>
<tr>
<td>Unresponsive patient with vitals – nonrebreather mask with O₂</td>
<td>15 lpm</td>
<td>Small Infant 6-8 lpm (tube) Infant/Child 10-15 lpm (Ped NRB)</td>
<td>Up to 90%</td>
</tr>
<tr>
<td>Responsive patient requiring oxygen – nonrebreather mask with O₂</td>
<td>15 lpm</td>
<td>Small Infant 6-8 lpm (tube) Infant/Child 10-15 lpm (Ped NRB)</td>
<td>Up to 90%</td>
</tr>
</tbody>
</table>

**Careful monitoring is required when ventilating all patients; over & under inflation may be possible, particularly with infants and children**

<table>
<thead>
<tr>
<th>Approximate flow time of full O₂ bottle at 15 lt/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>D size - 350 litre bottle</td>
</tr>
</tbody>
</table>
Safety Precautions

When Working With Oxygen Equipment:

- **When working with an oxygen cylinder, always work from the side of the equipment. Never place any body parts over the cylinder.**

- Remove medical oxygen from the patient’s face or chest area prior to starting the AED defibrillation sequence to avoid a fire.

- Combustible material, such as oil or grease, should be kept from contacting any parts of the cylinder, regulator fittings, valves or tubing. This includes lotions and ointments, and is one reason why all rescuers wear medical grade gloves.

- An oxygen cylinder must always have a safe and properly fitting regulator valve. Never use oxygen equipment that is damaged or malfunctioning. Report any problems immediately.

- Valves should always be closed when the oxygen cylinder is not in use, even when empty.

- Smoking is not permitted in any area where oxygen tanks are in use or stored.

- Always secure cylinders in a way that will prevent them from falling. During use, keep them out of people’s way.

- Cylinders not stored in a trauma or oxygen bag are stored upright in a proper storage container.
### Respiratory System - Anatomy & Physiology - Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alveoli</td>
<td>Within the lungs at the terminal ends of the bronchioles are the alveoli. The alveoli resemble very small bunches of hollow grapes. These air pockets have very thin walls and are surrounded by a network of very small blood vessels known as capillaries; the exchange of O₂ and CO₂ occurs here.</td>
</tr>
<tr>
<td>Anoxia</td>
<td>An absence or lack of oxygen in the body tissues. The lack of oxygen in the body due to no respiration process.</td>
</tr>
<tr>
<td>Asphyxia</td>
<td>A condition due to lack of oxygen resulting in cessation of life.</td>
</tr>
<tr>
<td>Breathing</td>
<td>Breathing is usually automatic. It is controlled by the respiratory centre in the brain.</td>
</tr>
<tr>
<td>Bronchi</td>
<td>The trachea divides into two branches. One going to each lung. Within the lungs these bronchi branch out into smaller and smaller passageways known as bronchioles.</td>
</tr>
<tr>
<td>C.O.P.D.</td>
<td>This is a common phrase, which identifies a number of various health problems, which affects the performance of the respiratory system. It stands for <strong>Chronic Obstructed Pulmonary Disease</strong>.</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>Bluish or greyish colour of the skin due to the lack of oxygen in the blood system.</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Difficult breathing.</td>
</tr>
<tr>
<td>Enriched Oxygen</td>
<td>Air, which has had pure oxygen added to raise its oxygen concentration.</td>
</tr>
<tr>
<td>Epiglottis</td>
<td>To protect the windpipe from foreign bodies there is a flap called the epiglottis. It acts as a trap door and closes during swallowing.</td>
</tr>
<tr>
<td>Esophagus</td>
<td>The esophagus is the pathway to the stomach.</td>
</tr>
<tr>
<td>Exhalation</td>
<td>During exhalation, muscles relax causing the ribs to move inward and downward and the diaphragm returns to its resting position. This causes a positive pressure in the lungs forcing air out through the nose and/or mouth. The brain continually monitors the level of oxygen and carbon dioxide in the body and thus regulates the rate and depth of ventilation.</td>
</tr>
<tr>
<td>Expired Air</td>
<td>Air, which is exhaled out of an individual by their normal respiration process.</td>
</tr>
<tr>
<td>Free Flow</td>
<td>A type of Oxygen Delivery system, which allows an adjustable continuous flow of oxygen to be administered.</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Insufficient supply of oxygen to the lungs. A low level of oxygen in the body due to insufficient respiration.</td>
</tr>
<tr>
<td><strong>Hypoxic</strong></td>
<td>Insufficient supply of oxygen in the lungs.</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>During inhalation, muscles between the ribs contract causing the chest wall to move outward and upward. At the same time the diaphragm contracts in a downward motion. This causes a negative pressure in the chest cavity causing the lungs to expand.</td>
</tr>
<tr>
<td><strong>Inspired Air</strong></td>
<td>Air, which is drawn into an individual by their normal respiration process.</td>
</tr>
<tr>
<td><strong>Laryngectomy</strong></td>
<td>In some individuals the normal point of entry of air into the body has been moved from the nose/mouth area to a hole at the base of the neck (stoma).</td>
</tr>
<tr>
<td><strong>Larynx</strong></td>
<td>The larynx is located at the upper end of the trachea. It contains the vocal cords or voice box. It is also referred to as the Adam's Apple.</td>
</tr>
<tr>
<td><strong>Lungs</strong></td>
<td>The lungs are cone-shaped bodies that are soft and spongy. They are divided into lobes.</td>
</tr>
<tr>
<td><strong>Non-kink Oxygen Tubing:</strong></td>
<td>The tubing which is used to connect the oxygen mask to the regulator.</td>
</tr>
<tr>
<td><strong>Nose &amp; Mouth</strong></td>
<td>Air enters the respiratory system via the nose and mouth. The air is warmed and moistened through the nose and the hairs and mucous membrane filter out much of the dust.</td>
</tr>
<tr>
<td><strong>Oxygen Regulator</strong></td>
<td>The control unit, which reduces the tank pressure to a usable level.</td>
</tr>
<tr>
<td><strong>Oxygen Therapy</strong></td>
<td>The use of pure oxygen to assist the respiratory performance of an injured or ill patient.</td>
</tr>
<tr>
<td><strong>Pharynx</strong></td>
<td>The pharynx that is also known as the throat is a continuation of the nose and mouth. At the lower end of the pharynx, it is divided into two openings, the trachea at the front of the neck and the esophagus.</td>
</tr>
<tr>
<td><strong>Pin Index</strong></td>
<td>All compressed gas cylinders have their own special pin configuration which allows only regulators designed for that type of gas to be placed on the cylinder.</td>
</tr>
<tr>
<td><strong>Short Term</strong></td>
<td>The handling of an injured individual for the FIRST AID time period of first contact to when the ambulance arrives. Generally, this will be five (5) to ten (10) minutes.</td>
</tr>
<tr>
<td><strong>Trachea</strong></td>
<td>The trachea or windpipe leads to the lungs.</td>
</tr>
<tr>
<td><strong>Tumbling</strong></td>
<td>The process used to clean the inside of the oxygen cylinder.</td>
</tr>
<tr>
<td><strong>Visual Inspection</strong></td>
<td>This process is done to see if any oxidation or other contaminants are present in the oxygen tank.</td>
</tr>
</tbody>
</table>

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ii First Responder – Prentice Hall  
iii First Responder – Prentice Hall
Learning and Performance Objective:

Automated External Defibrillation

At the end of this section the learner will:

- Describe the principles and rationale for AED use
- Identify the parts of the AED
- Explain how to use an AED
- Demonstrate the use of an AED with the incorporation of oxygen administration
- Explain “Shock Advised” vs. “No Shock Advised”
- Identify special considerations when using an AED
- Identify cautionary environments when using an AED
- Identify AED problems that may arise when using the AED
- Explain where to find information regarding AED maintenance
What is Defibrillation?1

Defibrillation is an electrical current applied to the chest. The electrical current passes through the heart with the goal of stopping the abnormal heart rhythm. This ceasing of the irregular rhythm gives the heart an opportunity for it’s normal electrical system to take control and start to pump blood effectively again.

An AED can defibrillate a heart.

Pondering Facts2

- In Canada 35,000 – 45,000 people die of sudden cardiac arrest each year.
- Heart disease and stroke represent the leading cause of death in Manitoba – nearly 3700 deaths.
- AEDs are safe and easy to use.
- AEDs will only allow you to shock a heart that has a “shockable” rhythm.
- Immediate CPR combined with defibrillation within 3 minutes can save 30 – 74% of people in cardiac arrest.
- For every 1 minute delay in defibrillation, the survival rate of a cardiac arrest victim decreases by 7-10%.

Rationale for Use3

Arrhythmias (abnormal heart rhythms), such as ventricular fibrillation or ventricular tachycardia, cause most sudden cardiac arrests. Early defibrillation is the intervention that is most likely to improve survival rates. The time between the onset of cardiac arrest and the use of an AED is the major determinant for success of the resuscitation attempt. While CPR helps to maintain circulation and ventilation in a victim of cardiac arrest for a short period of time, it is unlikely to convert ventricular fibrillation to a normal heart rhythm. Restoring a normal heart rhythm requires defibrillation to be provided within a few minutes of the arrest.

Recognizing the warning signals of cardiac arrest, reacting by rapid notification of the EMS system by calling (9) 9-1-1, getting the AED to the victim quickly, and reducing delay to defibrillation are all key in a potentially successful outcome.

Cardiac Arrest may occur due to the following causes and all are candidates for defibrillation:

- Heart Attack
- Stroke
- Diabetic Emergency
- Drug Overdose
- Medical Emergencies
- Suffocation / Asphyxiation
- Drowning
- Enviromental Conditions
- Etc.
Components of the AED

Most of the AED machines available to the public for use are very similar in their components.

The main components found on the Zoll™ AED Plus are:
- Internal batteries
- Audible alarms and prompts
- Visible alarms and prompts
- Data collection tool
- Pad connector
- Shock button
- LCD
- Status indicator
- On/Off
- Special Drying Towels & extra mask/gloves
- Scissors, razor, towel in a bag. (Attached to adult pads)
AED Sequence

1. Ensure that the scene is safe to enter – put on personal protective equipment i.e. Gloves and prepare barrier shield

2. Check for responsiveness – tap and shout

3. Communicate to other Lifeguard/staff to activate EMS (9-911) and to bring Trauma Bag and AED

4. Position patient on back on flat, level and dry surface

5. Initiate Primary Assessment

6. If not breathing, begin CPR until AED arrives

7. When AED arrives, position it so that the Lifeguards can see both the unit and the entire patient – usually the AED is placed at the head of the patient

8. The appropriate Lifeguard would turn the machine ON* (single click) and open the cover; the unit will respond with voice commands.
   a. In a 3 guard rescue, the guard performing compressions would normally set up the AED.
   b. In a 2 guard rescue, the guard bringing the equipment would normally set up the AED
   c. If AED guard is wet, they should first dry their hands (and possibly arms) before turning on the unit. This is very important! Avoid dripping on the machine.

9. Plug in the AED cables if they are not already attached to the AED. (The AED is stored with the adult pads attached)

10. CPR continues until pads are attached to body and AED is ready to analyze

11. Expose the chest – cut away or lift up clothing (ensure this does not restrict the airway or ventilation)

12. Prepare the chest for the application of the AED pads – use razor to shave off excess hair and/or dry off excessive moisture with a towel or cloth. Ensure that jewellery does not come into contact with the electrodes. Remove any medical patches that may interfere with the pads.

* Holding the power button for an extended period will put the AED unit into diagnostic mode. A single click is all that is required to activate the AED unit for the CPR application.
13. Attach the pads to the chest. Place pads on chest according to diagram 4 & 5.

   a. The CPR sensor pad gets placed between the nipples and on the middle of the patient’s breast bone, using the sensor’s cross hairs to guide you.

   b. Press the CPR sensor with your right hand and pull the number 2 tab to peel the protective backing from the electrode. Press the electrode from the center out to make sure it adheres properly to the patient’s skin.

   c. Press the CPR sensor with your left hand and pull the number 3 tab to peel the protective backing from the electrode. Press the electrode from the center out to make sure it adheres properly to the patient’s skin.

   d. One pad will get placed to upper right (anterior) just under the collarbone (clavicle) and the other pad will be placed to the front of the chest just below the left nipple (lateral).

14. Analyze:

   a. Tell all Lifeguards and bystanders: (While looking at everyone)
      “I’M CLEAR!”
      “YOU’RE CLEAR!”
      “WE’RE ALL CLEAR!”

   b. Ensure that no one is touching the patient

   c. The AED will analyze the patient automatically. The AED will now interpreting the patient’s heart rhythm. Remind all Lifeguards and personnel in the rescue area to remain still while the AED is analyzing. The AED will pick up the motion of others and this may interfere with the analyzing phase.

   d. At the end of the analysis the AED will prompt the Lifeguard that there is a “Shock Advised” or “No Shock Advised”
It is extremely important that during the “ANALYZE”, “SHOCK ADVISED”, or “NO SHOCK ADVISED” that NO ONE is touching the patient including the Lifeguard that was performing CPR.
If Shock Advised

Prior to shocking, remove Oxygen from patient's face.

- Before pressing the “SHOCK” button, the Lifeguard communicates to everyone in the area: “I’M CLEAR!”
  “YOU’RE CLEAR!”
  “WE’RE ALL CLEAR!”
  - Be sure to keep the AED and patient in full view to ensure that no one is touching the patient and that you hear and see the AED prompts.
  - Press the “SHOCK” button. The patient receiving the shock may jerk when the shock is delivered, however this does not always happen.
  - If needed, continue with CPR

If No Shock Advised

- If the AED prompts “NO SHOCK ADVISED” – continue with 2 minutes of CPR if needed – 30 chest compressions followed by 2 breaths.
  - The AED will analyze the patient after approximately 2 minutes of CPR and will prompt with either a “Shock Advised” or “No Shock Advised” once again.
  - If at anytime you receive a “Shock Advised” prompt – begin again from the top of the “Shock Advised” sequence.

The function of the AED is to analyze electrical activity of the heart and to advise whether a shock is needed or not. The AED can not determine if the patient has an actual pulse, so the Lifeguard would have to assess for visible signs of circulation. Never attach the AED to a patient with visible signs of circulation.
AED SEQUENCE

CHECK FOR SAFETY  PUT ON GLOVES

CHECK FOR RESPONSIVENESS – TAP AND SHOUT

ACTIVATE EMS 9-911 BRING BACK AED AND TRAUMA BAG

POSITION PERSON ON BACK IN DRY, FLAT AREA

BEGIN PRIMARY ASSESSMENT

IF NOT BREATHING – BEGIN CPR

WHEN AED ARRIVES:
LIFEGUARD TURNS MACHINE ON, OPENS COVER, AND ATTACHES PADS; CPR CONTINUES UNTIL MACHINE READY TO ANALYZE

SHOCK ADVISED

“STAND CLEAR”

PRESS “SHOCK” BUTTON

CONTINUE 2 MINUTES OF CPR

AED WILL RE-ANALYZE FOLLOW PROMPTS

NO SHOCK ADVISED

CONTINUE 2 MINUTES OF CPR

AED WILL RE-ANALYZE FOLLOW PROMPTS
Special Considerations of AED Use

Age and Weight Restrictions

If the patient requiring defibrillation is between the ages of 0 and 8 years of age or weighs less than 55lbs (25 kg), the Lifeguard should use the AED with the pediatric pads/cables. The sequence to use the pediatric pads with the AED does not change. Follow the AED sequence as outlined.

To prepare the pediatric patient:

1. Remove all clothing covering the patient’s chest.
2. Ensure the patient’s chest is dry.

To apply the electrodes:

1. Tear open the electrode package and unfold the inner package to expose the electrodes. Place the electrodes on the patient according to the graphics on the package (see Figure).
2. Remove the round electrode from its backing material and place it on the patient’s chest (as shown in Figure).
3. Place your hand on the electrode edge and, using the other hand, gently roll the electrode onto the patient’s chest, pushing any air out from beneath the electrode as you go.
4. Roll the patient onto his/her chest, remove the square electrode from its backing and place it on the patient’s back (as shown in Figure).
5. Place your hand on the electrode’s edge and, using your other hand, roll the electrode onto the patient’s skin, pushing any air out from beneath the electrode as you go.
6. Roll the patient onto his/her back and follow the ZOLL AED Plus prompts.
Zoll AED Pedi Padz II (Child) Application

1. Turn the AED unit on.  
2. Unzip AED carrying bag

3. Open AED cover  
4. Unplug adult AED pads

Put adult AED pads aside  
6. Remove pedi-padz II from the AED carrying bag storage
7. Plug *pedi-padz* II into the AED

8. Peel the *pedi-padz* II envelope open, using the two red arrows, and remove the pad holder

9. Remove the pediatric AED chest pad from the plastic holder (always remove pads one at a time!)

10. Place and smooth the pad ensuring it makes good contact with the patient’s dry chest. (Note the left of centre positioning.)

11. Remove the pediatric AED back pad from the plastic holder

12. Place and smooth the pad ensuring it makes good contact with the patient’s dry back (note centre between the shoulders positioning)
13. When the AED prompts, all clear

14. Shock if shock advised. Follow prompts

15. If needed, continue CPR
Implanted Pacemakers

An implanted pacemaker sends an electrical impulse to stimulate the heart muscle to contract if it falls below a set heart rate. Pacemakers are surgically inserted under the skin in various locations. The Lifeguard will usually find them below left collarbone or in some circumstances may be on the right; there will be a slightly raised bump about the size of a pill box. If a patient requiring the AED treatment has an implanted pacemaker, the Lifeguard may have to alter the placement of the pads slightly. If the pacemaker is located near the right collarbone, turn the 1-piece-pad, 1 inch (2.5 cm) away from the pacemaker. AED pads should never be positioned directly on top of the implanted pacemaker as this will reduce the effectiveness of the defibrillation attempt and may cause a malfunction of the pacemaker.

Automatic Implantable Cardio Defibrillators

Patients at high risk for abnormal heart rhythms may have had an automatic implantable cardio defibrillator (AICD) surgically placed in their body. These are usually found in the mid to lower section of the body. If the unresponsive patient has this implanted device after exposing the chest, and is in need of the AED based on the evaluation criteria (no breathing and no visible signs of circulation), follow the AED sequence as trained. Attach the AED pads; however, be sure not to place the pads directly over the AICD. The pads should be at least 1 inch (2.5 cm) to the left or right of the AICD. The Lifeguard may note that after exposing the chest the AICD may already be in shock sequence. The Lifeguard should continue to follow the AED prompts; however, the AED may pick up the impulses from the AICD and provide a “No Shock Advised”. In this case continue CPR until the AED reanalyzes the patient.

*It is important to note that the Lifeguard is in no danger of being “shocked” during CPR if the implanted defibrillator attempts to shock the patient internally.*
Hypothermia

Hypothermia is a condition where a patient’s core body temperature falls to 35°C or cooler. If the patient suffering from severe hypothermia also meets the criteria for defibrillation, the maximum number of shocks delivered is restricted to one (1). CPR is then continued by the Lifeguards and the machine is shut off. Hypothermic victims are extremely delicate and caution should be taken if moving them to a safer area or exposing them in the environment.

Physical Trauma

Trauma is defined as severe and life-threatening injuries sustained to multiple body systems. When a victim suffers a cardiac arrest they may collapse and minor injuries may occur. If this is the situation, defibrillation is applied. When a victim has suffered severe trauma and the breathing and circulation stop as a result, defibrillation may not function as expected. It may be difficult to determine why exactly the breathing and circulation have stopped based on the initial scenario, if this is the case follow a simple guideline: **When in doubt, use the AED as trained.**

Wet Surfaces

Water is a good electrical conductor and may pose a risk to AED the provider and bystanders. Use the *splash test* to evaluate the rescue area. Place the victim in the driest possible area. The Lifeguard should dry their hands as best as possible, with the *special drying towels* provided in the storage compartment of the AED carrying bag; this must be done prior to turning the unit on and attaching the pads to the patient’s chest. Wipe the chest off with the towels provided in the rescue kit. Ensure that the pads are not immersed in water and the Lifeguard is not kneeling in water next to the patient. Once all of these considerations have been met, continue with the AED sequence as normal.

Medical Patches or Paste

It is fairly common to see medical patches placed on the upper arm or chest when the chest is exposed. These patches may be Nitro-glycerine, nicotine or birth control patches to mention a few. These often have a medicinal paste on the part attached to the body. These patches must be removed if they are located directly where the pads need to be placed. This should be done prior to delivering a shock because it may interfere with the delivery of energy from the pads to the heart during the shock. The paste must be wiped off to avoid burns to the skin. Use the cloth in the rescue kit to wipe off the paste to avoid getting the medication on the Lifeguard’s skin. Discard the cloth and patch so that no other Lifeguard or person comes into contact with the substance. The use of gloves by the Lifeguard will ensure that the medicinal ingredient will not be transferred unnecessarily.

*If you can generate a splash with your foot; move the rescue.*
Oxygen

Studies have shown that there is a slight risk that, during defibrillation, the energy that is created in the chest area plus high levels of oxygen could result in a fire. Removal of medical oxygen by the AED operator, from the patient’s face or chest area, prior to administrating a shock is the recommended way to avoid this from occurring.

Conductive Surfaces

As safety is one of our primary concerns when treating patients, it is recommended that the Lifeguard always be aware of his/her surroundings. When treating a patient with an AED it is important to remove any conductive material that is on or around the patient. The treatment surface should be non-conductive, dry and non-metallic. As mentioned above try to move the patient to a dry location and move jewellery from the patient’s neck so it doesn’t touch the pads.

Electrocution Injuries

If the patient requiring attention has been electrocuted, ensure your own safety first. Follow proper guidelines and turn off the power source prior to treatment.

THE DEFIBRILLATOR PUBLIC ACCESS ACT

The City of Winnipeg is subject to follow the Act as it pertains to public facilities.

Mechanical Problems and Maintenance

See manual for detailed information

In-house Care

- Include AED check in early morning check list
- Batteries can be replaced as needed
- Record time and date batteries were replaced
  - Reactivate Unit – See Administrator Guide
- If AED is requiring service, call for backup unit
- Call toll free number
  - AED will be picked up or sent to Zoll, and another AED will be delivered
References:

1  What is Defibrillation? http://www.rescue-one.com

2  Pondering Facts www.heartandstroke.ca

3  Rational for Use www.heartandstroke.ca

4  Adult placement of AED pads illustration www.aedhg.com

5  Zoll AED Plus Administrator’s Guide

6  Zoll AED Plus Administrator’s Guide

7  Implanted Pacemaker illustration www.electron.gr
SECTION 7
Reporting
&
Scene Management
Learning Objective:
Reporting and Scene Preservation

At the end of this section the learner will:

- Explain who fills out a report for a minor and major emergency.
- Explain when the reports must be completed.
- Explain why full names are required.
- Define who (positions) gets contacted in a major emergency.
- Explain what happens to the accident scene in the case of a serious accident or death.
- Demonstrate filling out a complete field report.
- Explain the importance of diagrams.
Reporting, Documentation, and Scene Preservation

All field reports must be completed before going home

- All staff involved must make a report
- Always write the report from your perspective
- For major situations, all staff complete individual reports
- For minor situations, staff may compile one collective report if practical
- Ensure that the public or media do not have access to any reports

Include all details in your report:

- What date, time, site, and address did the incident occur?
- Exactly who was involved?
- List full names of all parties involved
  - Family members may have different last names
- Include full names of staff members
- What time was EMS called?
- What time did EMS arrive?
- Police are required for any serious injury or situation, particularly anything involving a minor
- Remember to obtain an incident number from the police
- Was the AED used?
  - How many shocks were administered?
  - Who operated the AED?
- Which hospital did they go to?
- Which supervisor was the first to be notified?
- List the in-charge lifeguard
- Exactly what happened? Give the complete story.
  - State the source of all information (who?)
  - Include information that may indicate the victim's own negligence (important!)
- Were there witnesses? – Get their names, phone numbers and addresses
- If first aid was performed, who performed the first aid and exactly what did they do?
  - Treatment is based on patient assessment; both assessment and treatment are appropriately recorded
- Use diagrams (see example on page 5)
- Detail the exact location of the incident, where everyone was at the start of the incident and where they ended up
SCENE PRESERVATION

IN THE CASE OF A SERIOUS INCIDENT OR DEATH\(^1\)

In the case of a serious incident or death, the scene must be preserved, as it was at the time the incident occurred, until released by the POLICE and an APPROPRIATE CDRS SUPERVISOR.

- NO equipment should be put away
- NO clean up of the incident scene should be carried out until such time as the scene has been examined and released
- NO members of the public or the media should be admitted to the incident scene

Contact: An emergency call out list is posted at all sites

You must leave messages and continue to call until you speak to a live person

- Pool Supervisor or designate
- Appropriate manager(s)
- Safety Officer if needed
- Media Relations personnel if needed
- Critical Incident Personnel if needed

\(^1\) Justice Susan Devine – Recommendations from the Inquest in the Joshua Harder Drowning
Example Report Diagram

G3 clears and secures pool

G3

G1 initiates rescue

G2 backs up G1 and helps with removal

Deep End

6’ Lap Area

Shallow End

 Victim

October 17, 2003
18:35
SECTION 8
Drills & Skills
Learning Objective:
Drill Training

At the end of this section the learner will:
• Define drill training.
• Explain when drills work best.
• Explain benefits to drill training.
• Explain cautions to drill training.
• Demonstrate Drill # 1 by memory.
• Demonstrate Drill # 2 with the use of the test book or quick reference card.
• Demonstrate Drill # 3 and explain the significance of this particular drill.
• Demonstrate Drill # 4 on the pool deck with full gear with some coaching.
Drill Training

Lifeguard Drill Training: A sequence of steps performed in a certain order, used to improve emergency rescue response skills.

- Works best:
  - When the drills are followed as written
  - When the drills are based on actual rescue skills
  - When the drills are relatively simple and straightforward
  - When the drills are easily memorized

- Benefits to drill training include:
  - Allows the rescue response to be broken down into smaller steps or components
  - Builds a framework of “exactly what to do”
  - Improves overall response
  - Increases confidence
  - Improves individual skill
  - Improves teamwork
  - Can be used to improve fitness

- Cautions with drill training include:
  - May be perceived as “the only way to do things” in an emergency; this may lead to a lack of common sense and critical decision making
  - May be perceived as boring and repetitious
Drill # 1 – Found Unconscious
No spinal, breathing with pulse
Do the steps exactly as written

1. Signal!
2. Safety – gloves and mask
3. History
4. Mechanism of injury
5. L.O.C. (Level of consciousness)
6. EMS (Trauma Bag & AED)
7. Airway
8. Breathing
9. Circulation
10. Defibrillation
11. External and internal bleeds & injuries
12. Find medical tags
13. Recovery/Shock position
14. Blanket
15. Monitor vitals

STOP SEQUENCE & REPEAT UNTIL MEMORIZED
Drill # 2 – Conscious Patient - Full Assessment
Patient has a serious medical condition; full assessment is being done while waiting for EMS

Time yourself

Scene Assessment
1) Signal
2) Safety - gloves and mask
3) History
4) Mechanism of injury
5) LOC
6) EMS – Trauma Bag/AED

Primary Assessment
7) Airway
8) Breathing
9) Circulation
10) Defibrillation
11) External/Internal Bleeds/Injuries
12) Find Emergency medical tags
13) Recovery/Shock position
14) Blankets
15) Monitor Vitals
16) SAMPLE Interview
   - Signs/Symptoms
   - Allergies
   - Medications
   - Past and present medical history
   - Last meal and fluid intake
   - Events leading to the incident

17) Vitals: Record vitals start time:

   a) LOC
      - Eye contact
      - Verbal
      - Motor skills
      - Person
      - Place
      - Time
      - Alert
      - Semi-alert
      - Unresponsive

   b) Breathing
      - Breaths per minute
      - Sound and character
      - Rhythm and regularity

   c) Pulse
      - Pulse per minute
      - Character
      - Rhythm and regularity

   d) Skin Condition
      - Temperature
      - Colour
      - Condition

18) Complete head-to-toe examination

   - Head
     - Include eyes reaction to light
   - Neck
   - Collarbones
   - Shoulders, arms & hands
   - Chest
   - Abdomen
   - Back
   - Pelvis
   - Buttocks
   - Legs, knees, ankles & feet
   - Distal circulation
   - Movement and strength
   - Reactions to pain

How long did it take you?
### Drill #3 – Witnessed Collapsed, Found Conscious

No Spinal. EMS contacted. Trauma Bag & AED unavailable. Deteriorating Situation with Complications.

<table>
<thead>
<tr>
<th>Step</th>
<th>Rescuer</th>
<th>Coach</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Checks the patient</td>
<td>&quot;Patient collapsed.&quot;</td>
</tr>
<tr>
<td>Mechanism of injury</td>
<td>Spinal suspected?</td>
<td>&quot;No spinal suspected.&quot;</td>
</tr>
<tr>
<td>LOC</td>
<td>Asks patient, &quot;what happened&quot;</td>
<td>&quot;Conscious.&quot;</td>
</tr>
<tr>
<td></td>
<td>Keeps talking to patient</td>
<td>&quot;Patient loses consciousness.&quot;</td>
</tr>
<tr>
<td>Patient becomes unconscious</td>
<td>Delegates EMS/AED/Trauma bag call</td>
<td>“Acknowledged.”</td>
</tr>
<tr>
<td>Airway</td>
<td>Patient on back, head tilt / chin lift</td>
<td></td>
</tr>
<tr>
<td>Breathing</td>
<td>5-10 second check</td>
<td>&quot;Normal breathing present.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>10 second check</td>
<td>&quot;Pulse present, showing signs of shock.&quot;</td>
</tr>
<tr>
<td>Defibrillation</td>
<td>“Do I have AED &amp; O2?”</td>
<td>“Unavailable at this time; EMS is on the way”</td>
</tr>
<tr>
<td>External/Internal bleeds &amp; injuries</td>
<td>Rapid body assessment (30 sec)</td>
<td>&quot;No bleeds or injuries to be found.&quot;</td>
</tr>
<tr>
<td>Find Emergency Medical Tags</td>
<td></td>
<td>“Bracelet found on right wrist, states 'diabetic'.”</td>
</tr>
<tr>
<td>Shock position</td>
<td>Updates EMS / Positions patient semi-prone, quickly inspects back, and covers with blanket</td>
<td></td>
</tr>
<tr>
<td>Monitor vitals</td>
<td>Checks vitals</td>
<td>&quot;No breathing detected.&quot;</td>
</tr>
<tr>
<td>Airway / Breathing</td>
<td>Puts patient on back, head tilt / chin lift 5-10 second check</td>
<td>&quot;No breathing detected.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>Starts CPR</td>
<td>&quot;Patient vomits&quot;</td>
</tr>
<tr>
<td>Patient vomits</td>
<td>Turns patient on side, clears mouth</td>
<td>&quot;Patient finished vomiting.&quot;</td>
</tr>
<tr>
<td>Airway / Breathing</td>
<td>Patient on back, head tilt / chin lift 5-10 second check</td>
<td>&quot;No breathing.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>Starts CPR – 30 compressions / 2 breaths</td>
<td>&quot;Air goes in.&quot; &quot;Patient vomits.&quot;</td>
</tr>
<tr>
<td>Patient vomits</td>
<td>Turns patient on side, clears mouth</td>
<td>&quot;Patient finished vomiting.&quot;</td>
</tr>
<tr>
<td>Airway / Breathing</td>
<td>Patient on back, head tilt / chin lift 5-10 second check</td>
<td>&quot;No breathing.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>Starts CPR – 30 compressions / 2 breaths</td>
<td>&quot;Air does not go in.&quot;</td>
</tr>
<tr>
<td></td>
<td>Repositions head – attempts 2 breaths</td>
<td>&quot;Air does not go in.&quot;</td>
</tr>
<tr>
<td></td>
<td>Gives 30 chest compressions. Checks mouth, removes object, 2 breaths</td>
<td>&quot;Air goes in.&quot;</td>
</tr>
<tr>
<td></td>
<td>Patient on back, head tilt / chin lift 5-10 second check</td>
<td>&quot;No breathing.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>Starts CPR – 30 compressions / 2 breaths</td>
<td>&quot;Air goes in.&quot; &quot;Patient vomits.&quot;</td>
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<td>Airway / Breathing</td>
<td>Patient on back, head tilt / chin lift 5-10 second check</td>
<td>&quot;Normal breathing.&quot;</td>
</tr>
<tr>
<td>Circulation</td>
<td>Starts CPR – 30 compressions / 2 breaths</td>
<td>&quot;Air goes in.&quot;</td>
</tr>
<tr>
<td>Defibrillation</td>
<td>10 second check</td>
<td>&quot;Pulse present, showing signs of shock.&quot;</td>
</tr>
<tr>
<td>External/Internal bleeds &amp; injuries</td>
<td></td>
<td>&quot;On the way&quot;</td>
</tr>
<tr>
<td>Find Emergency Medical Tags</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock position</td>
<td>Re-positions patient semi-prone and covers with blanket</td>
<td></td>
</tr>
<tr>
<td>Monitor vitals</td>
<td>Checks vitals</td>
<td>&quot;Vitals present. EMS takes over&quot;</td>
</tr>
</tbody>
</table>

**Stop Sequence**

* Use CPR Guidelines 2010 as per ILCOR
## Drill # 4 – Rescue Response

Unresponsive, at surface or submerged, vitals signs absent, spinal not suspected*

<table>
<thead>
<tr>
<th>Events</th>
<th>Guard-1</th>
<th>Guard-2</th>
<th>Guard-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recognizes Signals Alarms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Initiates rescue</td>
<td>Backs up in water or from deck</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Secures patient at wall - patient’s back to wall Prepares for 2-person lift from water</td>
<td>If in water, climbs out and prepares for 2-person lift from deck If on deck, prepares for 2-person lift from deck</td>
<td>Initiates EMS</td>
</tr>
<tr>
<td>4</td>
<td>2-person lift</td>
<td>2-person lift</td>
<td>Brings gear Trauma bag/O2 AED</td>
</tr>
<tr>
<td>5</td>
<td>Sets up AED Pays attention to AED prompts Remains in charge of AED throughout rescue Ensures all clear when AED is analysing or in Shock Advised prompt Removes O2 from patient’s face before shocking</td>
<td>Gloves/mask Initiates visual patient assessment Primary assessment Initiates CPR Pays attention to AED prompts</td>
<td>Passes AED to Backup Lifeguard Prepares SealEasy mask and valve assembly for Guards 1 &amp; 2 Prepares blanket(s) Gloves up Sets up and monitors oxygen Pays attention to AED prompts Records</td>
</tr>
<tr>
<td>6</td>
<td>Gloves/mask Initiates 2 rescuer CPR when prompted or available</td>
<td>Continues CPR</td>
<td>Changes “low” O2 bottle</td>
</tr>
<tr>
<td>7</td>
<td>Switch positions after 5 cycles or 2 minutes of 2 rescuer CPR Pays attention to AED prompts</td>
<td></td>
<td>Pays attention to AED prompts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Events</th>
<th>Vitals Guard</th>
<th>Backup Guard</th>
<th>Scene Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Vital Signs return</td>
<td>Vitals check Requests nonrebreather mask Monitors vitals</td>
<td>External/Internal bleeds &amp; injuries Finds Medical Tags</td>
<td>Hooks up nonrebreather mask and passes to Vitals Guard</td>
</tr>
<tr>
<td>9</td>
<td>Shock position Ensures patient properly covered with blanket</td>
<td>Assists with patient positioning</td>
<td>Initiates report</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>Hand off to EMS</td>
</tr>
</tbody>
</table>

**End of Sequence**

* Use CPR Guidelines 2010 as per ILCOR
Drill # 5 – Reaction Drill
Respond appropriately to the coloured flutter boards.

<table>
<thead>
<tr>
<th></th>
<th>Guard 1</th>
<th>Guard 2</th>
</tr>
</thead>
</table>
| Red - Major | Whistles - Signals  
Alarm  
Enter water, tags flutter board | Whistles – Signals  
Alarm (if not done)  
Enters water, tags flutter board |
| Yellow - Minor | Whistles - Signals  
Enter water, tags flutter board  
Query for help, from G2, will be a response “No, cover my zone!” | Whistles - Signals  
Shifts to Cover  
“Do you need help?” |

Guards switching positions in the water will assume the number of that spot.
SECTION 9
Additional Resources
### CONTENTS

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<td>Lifeguard Skin Cancer Protection</td>
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<tr>
<td>International Life Saving Federation Medical Commission</td>
<td></td>
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<tr>
<td>Statement on the Use of Abdominal Thrusts in Near Drowning</td>
<td>19</td>
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EDITOR’S NOTE

One of the most difficult medical decisions a lifeguard must make is how to treat a victim who is believed to have aspirated (inhaled) water. Should an ambulance be summoned? Should the victim simply be kept under observation? Can the victim be released without further care?

Dr. David Szpilman, a medical doctor who works with professional lifeguards in Rio de Janeiro and serves as President of the Brazilian Lifesaving Society (SOBRASA), has developed a classification system to assist lifeguards, ambulance personnel, and doctors in cases such as these. The system was recently detailed in an article published in the medical journal Chest (September 1997). It is reprinted here in an abbreviated form.

INTRODUCTION

The coastline of Brazil is 4,445 miles long, the longest in South America. Its warm climate encourages a beach-going culture year round. In 1995, 7,020 people are known to have died due to drowning in Brazil.

The Brazilian city of Rio de Janeiro has a rescue service responsible for safety along 60 miles of beaches, with 2 lifeguards every 550 yards and specialized medical teams in 2 different care centers. These care centers, called Near-Drowning Recuperation Centers (NDRC), are located immediately adjacent to the beaches.

The duty of medical personnel at the NDRCs is to render specialized medical assistance to near-drowning and drowning (ND/D) patients. Patients stay at an NDRC until their condition is stabilized. At that point, the patient may be referred to a hospital, kept for further observation at the NDRC, or released.

The uniquely focused responsibilities of medical personnel at the NDRCs has resulted in an unusual degree of expertise in handling drowning and near-drowning victims. Their experience in this area of medicine goes well beyond that of most emergency room physicians, who may treat ND/D only occasionally.

Doctors at the NDRCs sought a method for determining the chances of survival of these patients based on symptoms presented, as well as a method to determine the best treatment protocols based on patient status. In 1972, two Brazilian doctors, Menezes and Costa, developed a classification system to separate cases of ND/D into 4 grades of severity. The study reported here was conducted to evaluate this system and update it.
MATERIAL and METHODS
We reviewed 41,279 cases of predominantly seawater rescues, utilizing rescue reports recorded by beach lifeguards, from January 1972 to December 1991. Of these cases, 2,304 (5.5%) were referred to the NDRC during the study period because they had been diagnosed as ND/D requiring medical attention. The remaining 38,975 cases did not require further medical care and were released directly from the site of the aquatic accident after lifeguards had completed a rescue report.

The medical aid report completed at the NDRC describes what happened prior to the physician's arrival based on a detailed report compiled by the lifeguard responsible for first aid, as well as the subsequent medical treatment. Further data was compiled until the patient was discharged from the NDRC or died. In addition, the records of patients referred to a hospital were reviewed.

At a minimum, we define a near-drowning case as a case in which the victim is coughing, indicating that water has been aspirated. More serious findings, such as foam about the nose and mouth, difficulty or absence of breathing, or cardiac arrest resulting from an aquatic accident, also indicate ND/D. A case was considered a ND/D case if any of those findings were present when the patient was first evaluated by a lifeguard. A case was classified as a simple rescue (without near-drowning) if none of those findings were present.

All ND/D cases received immediate care on the beach by lifeguards and referral to a physician from NDRC. The physician was contacted by the lifeguard via radio immediately after the water rescue had taken place and near-drowning was diagnosed.

RESULTS
Of 2,304 cases of ND/D referred to the NDRC because they required medical assistance, 92.6% were rescued from the water by lifeguards and 7.4% by bathers present at the accident site (these include fresh water cases brought from other areas). Of those seawater ND/D patients 90% were transported to NDRC by ambulance and the rest (10%) arrived in private cars or by helicopter. Although lifeguards were not present at all rescues, they were always present during subsequent first aid, except in cases of ND/D in fresh water.

Of the 2,304 cases, the reports on 1,831 of the cases were adequately thorough to be used in the study. All 1,831 cases were at least initially treated at the NDRC, but 187 patients required transfer to a hospital. Of the entire study group treated at an NDRC, 89.4% survived and 10.6% died.

CONCLUSION
The study concluded that instead of 4 grades of severity for ND/D victims, there are actually 6 grades which can be defined based on initial signs and symptoms of the victims and the decision as to whether they will need advanced medical treatment. These 6 grades constitute the basis of a new classification system, which can easily be applied by lifeguards.

Of the 38,975 cases studied, it was found that if the victims showed none of the signs and symptoms discussed in Grade 1 – 6, there were no later medical complications. Therefore, cases without any of these symptoms can be classified as simple rescues and the victims released at the scene.
NOTE: Once the classification of a particular case has been determined upon the initial evaluation of the victim by a lifeguard, it should not be changed during the recovery period or hospitalization.

Grade 1 - patients who aspirate a small amount of water, sufficient to provoke irritation of the upper airways causing *cough without foam in mouth/nose*. Treatments include rest, warming and calming the victim (this can be done on the beach or hospital). This grade does not normally require transport to a hospital.

Grade 2 - patients who aspirate a moderate amount of water causing *a small amount of foam in mouth/nose*. Treatment requires up to 5 liters of oxygen per minute (by nasal cannula) to restore normal arterial oxygenation, as well as the procedures for Grade 1. These patients require observation in a hospital from 6 to 24 hours.

Grades 3 and 4 patients who have aspirated a great amount of water with *a large amount of foam in mouth/nose* generally need high flow (15 liters) oxygen by facial mask and advanced cardiac life support (ACLS). In both cases, hospitalization is required. Grades 3 and 4 are differentiated from each other by:

- **Grade 3** - great amount of foam in mouth/nose with radial pulse present (without low blood pressure).
- **Grade 4** - great amount of foam in mouth/nose without radial pulse (low blood pressure). Oxygen administration may ameliorate low blood pressure, but usually this grade needs intravenous (I.V.) infusion of fluids to restore adequate blood pressure (ACLS).

Grade 5 - *respiratory arrest* (no breathing) *without cardiac arrest*. Cardiac arrest will occur quickly, varying from seconds to 2 or 3 minutes, if mouth-to-mouth is not applied immediately at the scene (even during rescue in water). High flow (15 liters) oxygen after resuscitation should be used. Hospitalization is always required.

Grade 6 - *cardiopulmonary arrest* (CPA). Treatment is immediate application of CPR with supplemental oxygen. Hospitalization is always required.

Tables 1 and 2 show the outcome for each of the victims considered as part of the study. Based on this study, a chart of recommended procedures for dealing with ND/D victims has been developed. It can be easily applied by lifeguards on the beach to determine the best method for treating ND/D patients and can be found in Figure 1.

It is important to remember that treatment must be provided in a manner that is appropriate to the lifeguard’s level of medical training and in accordance with local medical protocols. While this study was extremely thorough and has been published in a major medical journal (Chest), the procedures outlined have not been universally accepted at present. Lifeguards should consult with their local medical authorities and provide them with a full copy of the Chest article for evaluation.

The author wishes to acknowledge the assistance of Chief B. Chris Brewster in editing this article for lifeguards.
Table 1: CLASSIFICATION AND DEATH RATE* (n = 1831)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number(n)</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1189</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>338</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>3</td>
<td>58</td>
<td>3 (5.2%)</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>7 (19.4%)</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>11 (44%)</td>
</tr>
<tr>
<td>6</td>
<td>185</td>
<td>172 (93%)</td>
</tr>
</tbody>
</table>

**P < 0.0001**

*Overall death rate was 10.6%.

Table 2: NEED FOR HOSPITALIZATION AND MORTALITY (n=187)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Taken to Hospital</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35 – 2.9%</td>
<td>0 – 0.0%</td>
</tr>
<tr>
<td>2</td>
<td>50 – 14.8%</td>
<td>2 – 4.0%</td>
</tr>
<tr>
<td>3</td>
<td>26 – 44.8%</td>
<td>3 – 11.5%</td>
</tr>
<tr>
<td>4</td>
<td>32 – 88.9%</td>
<td>7 – 19.4%</td>
</tr>
<tr>
<td>5</td>
<td>21 – 84%*</td>
<td>7 – 33.3%</td>
</tr>
<tr>
<td>6</td>
<td>23 – 12.4%*</td>
<td>10 – 43.5%</td>
</tr>
<tr>
<td>Total</td>
<td>187 – 10.2%</td>
<td>29 – 15.5%</td>
</tr>
</tbody>
</table>

**Note:** Mortality in the hospital was 15.5%; *Four patients grade 5 and 162 grade 6, out of this table, were pronounced dead and thus taken directly to the morgue.
<table>
<thead>
<tr>
<th>GRADE</th>
<th>SIGNS AND SYMPTOMS</th>
<th>FIRST AID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rescue</td>
<td>No coughing, foam, difficulty breathing, or cardiac arrest</td>
<td>Evaluate and release from the accident site without further medical care as appropriate.</td>
</tr>
<tr>
<td>1</td>
<td>cough, without foam in mouth/nose</td>
<td>Rest, warm and calm the victim; advanced medical attention or oxygen administration should not normally be required.</td>
</tr>
<tr>
<td>2</td>
<td>small amount of foam in mouth/nose</td>
<td>Oxygen - 5 litres/min (by nasal cannula), rest warm and calm the victim; hospital observation from 6 to 24 hours.</td>
</tr>
<tr>
<td>3</td>
<td>large amount of foam in mouth/nose with palpable radial pulse</td>
<td>15 litres/min of oxygen by facial mask; advanced cardiac life support (ACLS); hospitalization required.</td>
</tr>
<tr>
<td>4</td>
<td>large amount of foam in mouth/nose, without palpable radial pulse</td>
<td>15 litres/min of oxygen by facial mask; monitor breathing; advanced cardiac life support (ACLS) immediately for mechanical ventilation and I.V. fluid infusion; hospitalization (ICU) required.</td>
</tr>
<tr>
<td>5</td>
<td>respiratory arrest, without cardiac arrest.</td>
<td>Mouth-to-mouth immediately at the scene; hospitalization (ICU) required.</td>
</tr>
<tr>
<td>6</td>
<td>cardiopulmonary arrest</td>
<td>Apply CPR immediately; hospitalization (ICU) required.</td>
</tr>
</tbody>
</table>

**Notes:** 1. Once the ND/D classification has been determined, it should not be changed during the recovery period; 2. On sloping beaches all ND/D victims should be positioned face-up, with their body parallel to the waterline, with the lifeguard’s back to the water (so as to facilitate CPR manoeuvres without falling over the victim); 3. Don’t use techniques to try to drain the water from lungs as this can increase the occurrence of vomiting; 4. In general, CPR is carried out in all cardiac arrest cases when the exact duration of the submersion is not known, or when such time is certainly less than 1 hour.

**Author’s Reprint Request:** For a full copy of the original article (which is significantly more detailed), you may write or fax the author Dr. David Szpilman at: Av. das Américas 3555, bloco II, sala 302 - Barra da Tijuca - Rio de Janeiro - RJ - Brazil - CEP: 22631-004 - Telephone: 055 (021) 4900192, Phonefax: 4307168, e.mail <szpilman@ccard.com.br>

The original article, along with many others, was republished in the proceedings of the International Life Saving Federation Medical Rescue Conference, which can be purchased by sending a check for $20, made out to ILS to: B. Chris Brewster, 2581 Quivira Court, San Diego, CA 92109.
Communicable Disease Avoidance for Lifeguards

James G. Dobbins, Ph.D.
National Center for Infectious Diseases
Centers for Disease Control and Prevention
Atlanta, Georgia, USA

International Life Saving Federation Medical/Rescue Conference Proceedings
September 1997

Summary
Lifeguards may be exposed to infectious agents while in the water, on the beach, or in contact with the victim's skin, saliva, or blood. Water-borne infections from polluted water are possible even when fecal coliform counts are low. In general, the risk of infection for lifeguards is high for water-borne infections, moderate to low for infections caused by microbes found in sand, and extremely low for potentially severe, blood borne infections. Simple preventive steps include avoiding swallowing water while swimming, wearing sandals or shoes while walking on the beach, using pocket masks for resuscitation, avoiding contact with victims' blood, and vaccination for hepatitis B for those guards who do come into contact with blood.

Introduction
In the normal function of their duties, lifeguards are frequently at increased risk of contact with infectious agents. While in the water, they are repeatedly exposed to water-borne infectious agents. Walking on the beach, they are exposed to other infectious agents as well as to the threat of contact with medical wastes. Finally and most importantly, while in contact with a victim, they are often exposed to infectious agents. These agents may be present on the victim's skin or in their saliva, or they may be present in the blood of the victim. Perhaps the most common type of exposure occurs in the water, while exposure to blood is certainly the most serious infectious disease threat to the guard's health. Fortunately, much can be done to reduce the risk from each type of exposure.
Contact with Water

A wide range of infectious organisms can be found in swimming pools, rivers, lakes, and near oceans beaches, especially those beaches adjacent to rivers or sewers. Some examples of these agents are hepatitis A virus, enteroviruses, salmonella, Cryptosporidium, Vibrio vulnificus, and leptospira. Most of these pathogens enter the water in inadequately treated human sewage, while others come from domestic and wild animals living near rivers and lakes.

A number of studies of human illness associated with recreational exposure to contaminated water have been done in various countries (for example, Australia, Canada, Costa Rica, Denmark, Egypt, France, Germany, Great Britain, Israel, Poland, and the U.S.A.), but research on this problem is extremely difficult to conduct. In the next presentation at this meeting, you will hear a description of one of these studies and understand better the problems of connecting exposure to swimming water with illnesses that may develop days or weeks after that exposure. Furthermore, even though most of these pathogens are usually associated with diarrheal diseases, exposure in the water can commonly result in lung, eye, and ear infections (Corbett, et al., 1993).

Standards for safe water are traditionally based on the presence or absence of fecal coliform bacteria, but recent published and unpublished studies have repeatedly shown that these standards are inadequate (see, for example, Myint, et al., 1994). While it is true that high fecal coliform levels indicate a high risk to swimmers, low or undetectable levels do not mean that there is no risk of infection from other agents.

Risk to lifeguards. Based on the results of a British study of persons with long-term exposure to ocean water, we can estimate that the virtually all ocean lifeguards will experience some illness from these water-borne pathogens (Myint, et al., 1994). Furthermore, both the British study and an Australian study found that the risk of illness among persons with prolonged exposure to ocean water is approximately 4 times greater than that of persons who do not swim in the ocean.

Prevention. Individual lifeguards can take a number of steps to avoid contact with water-borne pathogens. The most obvious of these is to avoid swallowing water while swimming. A new Hepatitis A vaccine is available for previously unexposed guards working in areas where hepatitis A is prevalent. In addition, because some pathogens enter the human body through the skin, guards with cuts and abrasions should avoid water contact. Lastly, shellfish that have collected at the water line should also be avoided, since a puncture wound can lead to infection with Vibrio vulnificus. Long-term prevention, of course, involves stopping the discharge of inadequately treated sewage into bathing areas. One way of encouraging this change is to maintain records on water quality and to initiate or collaborate in studies on illnesses among lifeguards and visitors to beaches.
Contact with Sand

Some infections, especially those caused by various types of worms, can be contracted by walking on sand beaches. Recent studies of this type of infection have been conducted in England, France, the Netherlands, and Poland. In tropical areas, the most common type of infection, and perhaps the least studied, is helminthal infections from worms deposited in dog and cat feces (larva migrans). In developed areas, a second hazard on the beach is contaminated medical waste. Studies in Great Britain indicate that this problem is continuing to increase in spite of new control measures that may have been taken since the advent of the AIDS epidemic (Phillip, et al., 1993; 1994).

Risk to lifeguards. Evidence of human contact with medical waste on beaches suggest that infection is certainly possible. For example, Phillip and colleagues (1994) report that between 1988 and 1991, 40 needlestick injuries on British beaches were reported to public health authorities. In Palm Beach, Florida, 3 needlestick injuries to lifeguards have been reported in a 10-year period (J. Fletemeyer, personal communication).

Prevention. Contact with both of these hazards can be prevented by wearing sandals or shoes while walking on the beach. Surveying the beach for medical waste each morning, along with the use of containers to collect and dispose of sharp objects, will also help to reduce the chance of infection from needlesticks. Exclusion of pets from popular bathing areas is also helpful, but regulatory and logistic support for such efforts is usually lacking.

Contact with Victims

Direct contact with injured or drowning victims is unavoidable, yet these people can present a rich mixture of pathogens to a lifeguard. I will comment separately on the risk from contact that occurs in administering cardiopulmonary resuscitation (CPR) and the more serious risk from general contact with blood and other blood-contaminated bodily fluids.

Contact with skin or saliva

A number of viruses can be transmitted through direct contact when a guard is attempting to resuscitate a victim. Some viruses, such as herpes simplex virus type 1 (HSV-1), the cause of oral herpes, are present on the mucosal surface, while others, such as cytomegalovirus (CMV) and Epstein-Barr virus (EBV), are present in saliva.

Risk to lifeguards. The risk of infection caused by these agents is probably relatively low. An unpublished study conducted at the US Centers for Disease Control (CDC) and Prevention (J. Stewart, personal communication) found that some of these viruses can persist on the surface of mannequins used for training in CPR. However, these viruses are fairly common, with 50-95% of lifeguards having already been exposed to them, and therefore it is only the previously unexposed guards who are at risk for new infection. Prevention. The use of pocket masks while administering CPR to victims should significantly reduce the risk of this type of infection, and wiping the mouth areas of mannequins with alcohol will prevent transmission of viruses during CPR training.
**Contact with blood**

The two major bloodborne viruses are hepatitis B virus and human immunodeficiency virus (HIV).

*Risk to lifeguards.* The risk of occupationally acquired infection from these viruses in lifeguards is extremely small. In 1990, CDC conducted a collaborative study of the risk for hepatitis B virus infection among lifeguards at an ocean beach in the state of New York. The beach is heavily used in the summer, with many visitors coming from New York City. Serum specimens collected from over 100 guards were tested for antibody to hepatitis B virus and all were negative, indicating that none of the guards had been exposed to hepatitis B virus at any time in the past. (Guards who reported high-risk sexual behavior, injection drug use, and tattoos were excluded from the study so that the results would apply only to occupationally acquired infection).

*Prevention.* All blood and all bodily fluids should be assumed to be contaminated with these viruses, and steps should be taken to avoid contact with these fluids. Protective devices, such as gloves and pocket masks or disposable mouthpieces, should be routinely available for all first aid. Specialized first aid kits should also contain barrier masks and gowns. Special containers should be provided for the disposal of blood-contaminated sharp objects, and special waterproof bags should be available for the disposal of other blood-contaminated waste. A mixture of 10% bleach and water should also be available for cleaning blood-contaminated surfaces.

All lifeguard services should provide hepatitis B vaccination in advance to those guards who are regularly exposed to blood as part of their duties. In addition, detailed plans should be developed to be followed once a guard has actually been exposed to blood. This plan should include vaccination against hepatitis B for guards who have not been previously vaccinated, an evaluation of the risk of HIV infection in the victim and the probability of transmission to the guard, and counseling of the guard concerning procedures that may be followed for treatment for HIV.
**Conclusions**
Lifeguards are, by the nature of their work, routinely exposed to communicable diseases. The major steps to avoid these infections include:

**Contact in the water**
- Avoid swallowing water while swimming, even when coliform counts are low
- Guards with cuts and abrasions should avoid swimming in polluted water
- Avoid puncture wounds from shellfish

**Contact on the sand**
- Clean all types of waste, especially medical waste, from the beach
- Wear sandals or shoes while walking on the beach

**Contact during CPR**
- Use pocket mask or other barrier over victim's mouth
- Wipe practice mannequins' mouth area clean with alcohol

**Contact with blood**
- Avoid all contact with blood
- Assume that all blood is contaminated
- Have gloves, masks, gowns, "sharps" containers, water-proof bags, and disinfectant available for all first aid
- Obtain hepatitis B vaccination if exposed to blood!
- Develop a plan for evaluation, counseling, and treatment following exposure to blood.

Selected References:


Lifeguard Skin Cancer Protection
An Approach to Protecting Health and Promoting Image
B. Chris Brewster, Lifeguard Chief
San Diego Lifeguard Service

International Life Saving Federation Medical/Rescue Conference Proceedings
September 1997

Introduction

The problem of skin cancer is insidious. As a result of high levels of sun exposure, many lifeguards have sustained this disease, even at a young age. Throughout the world however, lifeguards can be seen working under the sun with little protection, wearing a minimum of clothing, even during the most severe hours of the mid-day sun.

Lifesaving is a hazardous profession. Orthopedic injuries abound, trauma injuries can occur due to wave action and other factors, and, occasionally, death can result. For this reason, in Southern California, many professional lifeguards are classified as having high risk jobs and are given enhanced injury and retirement benefits in recognition of that risk. The high risk designation was not conferred with skin cancer in mind, but beginning several years ago, skin cancer emerged as a significant injury source.

In the early 1980’s, the San Diego Lifeguard Service realized that it had a problem. Lifeguards were contracting skin cancer at a seemingly accelerating rate, some forced to retire early. Experienced lifeguards seemed most susceptible. They had been guarding the beaches long before sunblock became commonly available and fully recognized as a valuable protectant; but even younger lifeguards were developing this disease. In fact, from 1984 to 1989, 25 San Diego lifeguards sought treatment or medical evaluation for suspected skin cancer.

In some cases, the cancer was treated and resolved, with doctors determining that the lifeguards could continue to work, using proper precautions. In other cases, the cancer was treated, but doctors determined that the lifeguards could no longer return to their customary and usual assignments. They were disabled and forced to retire – some while only in their 30’s.

In either case, the results were costly, both to the physical well-being of the lifeguards and the financial well-being of their employer. California maintains employment laws that require both treatment of injured workers and certain payments to workers when they are permanently injured on the job. When they are forced to retire early, there is an additional cost borne by the employee retirement system. In the case of retirements, the employer must hire new, less experienced personnel to take the place of those departing, and incur the costs of training. Such was the case for City of San Diego.
LIFEGUARDS AND SUN EXPOSURE

Part of problem of lifeguard skin cancer rates is founded in the very culture of lifeguarding. Persons drawn to lifeguarding are typically highly physically fit and desirous of displaying their physical fitness. Those with light skin coloring typically consider a deep, dark tan to be an essential part of their self-image and personal appearance. Meanwhile, they are sustaining accelerated damage to their skin and apparently greatly enhancing the likelihood of becoming skin cancer victims.

The fact that lifesaving disproportionately attracts the youthful only compounds the problem. Youths rarely worry about problems they might experience later in life. They are known to be higher risk takers than the general populace and they are particularly concerned with personal physical attractiveness.

To address these issues, prudent lifeguard employers need to take strong steps to ensure that their employees are adequately protected. Lifeguard employers commonly distribute sunblock to their personnel and some require its application. Lifeguard station designs should take sun protection into account, not only to reduce skin cancer problems, but also to counter the accelerated fatigue which results from over-exposure to the elements, sapping attentiveness and physical readiness. Unfortunately, the San Diego Lifeguard Service found that these steps were not enough. In consulting experts, we learned that the only true protection came from covering up the body, particularly areas of the body that are frequent skin cancer sites.

THE PROFESSIONAL IMAGE

Skin cancer aside, lifesaving has an image problem. Too often, lifesavers are inadequately recognized for the essential role they play. Although lifeguards probably have a greater impact on the saving of human life than any other public safety providers, they are sometimes seen as having a less important role than, for example, police or firefighters. This, in turn, has a deleterious impact on lifeguard budgets, equipment, and public recognition, all of which are inextricably intertwined.

There are many reasons for this, including the fact that lifesaving is often, literally, a day at the beach, which most people identify with recreation and relaxation. Some are jealous of the person who is able to work daily where most can only vacation occasionally. Thus lifesavers are sometimes seen as having a role that is more of a vacation itself than a serious public safety job. This is far from the truth, but it is a part of the image lifesavers must continually work to shed if they are to attract the funding and support necessary to ensure that they can adequately do their job.
There are many ways to improve image. One of the most obvious is through uniforms. Police and firefighters are almost always attired in official and readily identifiable uniforms which are clean and authoritative. They imply professionalism, whether the individual employees deserve that image or not. To the general public, these are people who, if necessary, have committed to risk their lives for the lives of others and their uniform tells this story.

Contrast this image with that of a lifeguard, perhaps slouching in an elevated chair for all to see, with only a pair of trunks on, relaxed and seemingly “catching rays.” Perhaps then one can understand a primary reason that fire and police agencies are typically better funded, equipped, and paid than lifesaving agencies. For all three, professional image is essential to ensuring public support, but in many places, lifesavers are losing the public relations battle over professional image.

Lifeguards too, wear uniforms, but often the uniform is just a pair of trunks with a small patch, and perhaps a T-shirt occasionally worn. To a degree, dressing light is necessary. Lifeguards must be ready at a moment's notice to enter the water and make a rescue. They also need to keep cool. Improvements are possible however, which do not impede a lifeguard's response.

Perhaps more important than image is the need for the beachgoer and other lifeguards to readily identify the lifeguard in a crowd or at an emergency scene. It is essential that the lost child, the distraught parent, the arriving ambulance crew, the patrolling police officer can quickly and easily find the lifeguard, but this is often a difficult task. Perhaps the lifeguards' swimsuits are of consistent color, but rarely are they of a color or design unavailable to the general public. A small patch on the suit may be the only distinction. How often is the lifeguard at an emergency scene brushed aside by other emergency workers, partly perhaps by negative stereotyping, but partly due to lack of a professional image as compared to other emergency services workers?

Uniforms are also important for proper attribution and visibility when the news media visits a rescue scene or other event. Many years ago, firefighters took to placing their names and that of their agencies on the upper back of their uniforms, probably to help identify each other while assaulting a house fire or similar calamity. Today however, one of the most photographed images in local and national news stories is the backs of firefighters prosecuting a fire or rescue, with their agency's name widely credited. On their chests too, and their helmets, their agency's name is available for all to see. And those who are inspired by the heroism of emergency workers are moved to support them all the more as a result.

In San Diego, we found that too often, news accounts of beach emergencies identified all of the emergency workers except the lifeguards. Less experienced reporters would identify a lifeguard rescue boat as belonging to the police or fire department. They might assume that a cliff rescue could not have been performed by lifeguards, so they reported that firefighters had accomplished the rescue, even if none were there. This led to great frustration on the part of lifeguards whose deeds were not recognized or, seemingly, even appreciated.
PROTECTING HEALTH AND IMAGE

In the early 1980’s, the San Diego Lifeguard Service decided to address both of these issues in an effort to protect it’s personnel and burnish its professional image. In 1984, it adopted a standardized uniform policy including everything from wetsuits to T-shirts and the dress uniforms worn by its personnel on formal occasions. A standard logo for the shirts was chosen, which is also an educational depiction of a person in distress in the water, waving for assistance. The backs of all uniforms state LIFEGUARD in bold letters, and SAN DIEGO. The front of beach uniforms of full time employees includes a silk-screened badge, as well as the employee's name. For seasonal employees, the front of the shirt includes a smaller version of the logo on the back. The colors of the shirts too, are consistent. This logo arrangement is also used on uniform sweatshirts, jackets, wetsuits, and personal floatation devices.

For trunks, tanksuits, and dress uniforms, the San Diego Lifeguard Service retained the traditional patch. It is worn on the lower left thigh of trunks or lower left abdomen of tanksuits. It is also worn on both shoulders of Class A (dress) uniforms, which include a metal badge and nametag. The patch, which is red, white and blue, appears at left.

The policy regarding the wearing of uniforms and sunblock, both for personal protection and professional image, is perhaps the most strict of any lifeguard service. It includes:

Uniform shirts of a consistent color must be worn at all times unless actively involved in a water rescue.
- All upper body uniform items, including wetsuits, personal floatation devices, etc. must be emblazoned back and front with standard, identifying logos.
- Hats must be worn whenever the lifeguard will be exposed to the sun for more than 15 minutes.
- Sunscreen must be applied regularly to all exposed areas.

These requirements ensure that the upper bodies of lifeguards, excluding the necks and lower arms, are protected from the sun at all times, greatly reducing sun exposure of areas of the body heavily susceptible to skin cancer. They also ensure that San Diego lifeguards are immediately identifiable to the public they serve, fellow safety providers, and to persons watching news media accounts.
Initially there was great resistance to the policy. Lifeguards rejected the shirts and strong supervision was required to keep the policy in force. Today, discipline is still occasionally meted out to lifeguards who decide that tanning is more important than personal protection, public identification, and professional image; but this is the exception.

**OUTCOME**

Has San Diego's initiative accomplished its twin goals? In regard to skin cancer, it appears that there has been a significant reduction, both in severity and frequency. Obviously this has also come during a time of heightened awareness of skin cancer and the need for sunblock, and skin cancer can take many years to develop, so the full effect of this policy may take decades to fully evaluate. No one however, would dispute the fact that covering up is the most effective way to protect against the ravages of the sun. The following charts give some specific data on our history of skin cancer problems:
As for the benefits of professional image, San Diego lifeguards have progressed tremendously over the past several years. Since implementation of the uniform policy, San Diego lifeguards have developed a much stronger public image within and outside their community. One reason is that San Diegans watching the local news regularly see the word "lifeguard" in local news accounts of beach area emergencies, be they cliff rescues, water rescues, boat fires, river rescues, etc. Even if the reporter gets the story wrong, the video identifies the rescuers. National news accounts of major disasters in our area, such as flooding, as well as reenactment shows, have also shown San Diego lifeguards involved in rescue work. Each time, we believe that it gives the public a sense that their tax dollars are well spent on lifeguards.

Once a district within a division of the Park and Recreation Department, the San Diego Lifeguard Service was made a full division in 1988, then combined with the Fire Department to form a new organization called Fire and Life Safety Services in 1995. On July 30, 1997, a City Council committee discussed a proposal to make the San Diego Lifeguard Service an independent department.

Since 1985, the annual budget of the San Diego Lifeguard Service has grown significantly, from $2.7 million to $6.5 million. The number of budgeted full time equivalent positions in the Lifeguard Service has increased from 72 to 107 during that same period. Recently, the City Council voted to increase the annual budget of the Lifeguard Service by $300,000, which translates to five additional full time lifeguard positions.

Certainly all of these improvements cannot be singularly attributed to uniforms and the professional image they bring. Professionalism, after all, goes well beyond image, but ensuring that the public we serve knows who made the rescue is very important. There is little doubt that the palpable change in public support for the San Diego Lifeguard Service and the various enhancements in pay, budget, and positions are owed to a large part to the improved image presented by the uniforms worn by its employees. Certainly each of them is better protected and better respected since this policy was implemented.
International Life Saving Federation  
Medical Commission  
STATEMENT ON THE USE OF ABDOMINAL THRUSTS IN NEAR DROWNING  

Approved by the ILS Board of Directors: September 26, 1998  

BACKGROUND  
In January 1996 the Medical Commission of the International Life Saving Federation issued a statement on the use of abdominal thrusts in near drowning.  

At a meeting of the Commission in San Diego in September 1997 the Statement was again discussed in the light of several papers presented at the preceding International Medical/Rescue Conference.  

The Commission decided to endorse the previous statement but with expanded explanation and list of references.  

STATEMENT  
Near drowning victims present unique and challenging problems in airway management because of the nature of the episode. Since drowning is a process of asphyxiation, the victims are usually profoundly hypoxic. They have often swallowed large quantities of water and air; their stomachs frequently contain food and drink consumed just prior to entering the water.  

This combination of hypoxia and a full stomach is the cause of the regurgitation that is very familiar to lifeguards and is an almost inevitable accompaniment of near drowning. This has been well documented in the literature (1, 2).  

Submersion victims may aspirate some fluid into their lungs but there is no evidence that this can or need be removed by any technique.  

The priority for rescuers is to implement resuscitation at the earliest possible opportunity. In doing this, the maintenance of a clear airway and prevention of aspiration are of paramount importance.
The Medical Commission of the International Life Saving Federation has carefully considered the particular problems of upper airway management in near drowning. Techniques which have poor efficacy and purely anecdotal support are strongly discouraged. Abdominal thrusts (Heimlich Maneuver) to relieve airway obstruction have been carefully considered and the following conclusions drawn:

- In near drowning upper abdominal thrusts pose a great risk of precipitating gastro-oesophageal regurgitation and subsequent inhalation of stomach contents into the lungs.
- There is no clear medical rationale for its use and in particular it seems clear that the manoeuvre cannot expel sufficient water from the lower portions of the respiratory tree to aid in resuscitation.
- There are no well controlled blind studies to validate its value in near drowning.
- The use of abdominal thrusts as a first maneuver will merely serve to delay the institution of appropriate cardiopulmonary resuscitation which has been well proven to save life in this condition.

Therefore the Medical Commission of the International Life Saving Federation strongly recommends that in cases of near drowning the use of upper abdominal thrusts is contraindicated unless a solid foreign body (not water) is present in the upper airway and cannot be dislodged by other means. This would be demonstrated by inability to obtain adequate ventilation of the lungs in the course of basic resuscitation measures.
References

PRIMARY AUTHOR
Dr. Ian Mackie (Australia)

APPROVED BY
Hans Astrom, M.D. (Sweden)
Steve Beerman, M.D. (Canada)
Joost Bierens, M.D. (Netherlands)
Peter Fenner, M.D. (Australia)
Glen Hagemann, M.D. (South Africa)
Tony Handley, M.D. (United Kingdom)
Ian Mackie, M.D. (Australia)
David Szpilman, M.D. (Brazil)
Peter Wernicki, M.D. (United States)
International Life Saving Federation
Medical Commission
Peter Wernicki, M.D., Chair (wernicki@irmh.com)
26, Gemeenteplein, Leuven 3010
Belgium
Tel: 32-16-35-35-00
Fax: 32-16-35-01-02,
Email: international_lifesaving@club.innet.be