Thank you for choosing Iridia Medical for your Basic Life Support for Healthcare Providers (BLS-HCP) training. Since 1998, Iridia Medical has taken the lead in BLS programs in British Columbia, delivering BLS courses across the province to thousands of health professionals.

The Heart and Stroke Foundation of Canada (HSFC) BLS-HCP Renewal course is designed to train participants to save lives of victims in cardiac arrest through high-quality cardiopulmonary resuscitation (CPR). The purpose of this course is to prepare healthcare professionals to perform CPR in both in-and-out-of-hospital settings.

This course trains students to promptly recognize cardiac arrest, give high-quality chest compressions, deliver appropriate ventilations, and provide early use of an Automated External Defibrillator (AED), as part of a team and individually. This course also teaches adult, child and infant rescue techniques and how to relieve choking.

Please wear loose, comfortable clothing. You will be practicing skills that require working on your hands and knees, bending, standing, and lifting. If you have physical conditions that might prevent you from participating in the course, please advise the instructor when you arrive. The instructor will work to accommodate your needs within the stated course completion requirements.

If you are unable to attend the course on your registered date, please view Our Withdrawal & Transfer Policies section, and contact us as soon as possible.

Our office is open Monday to Friday, 8:00-5:00. Feel free to contact us with any questions.

Thank you for choosing Iridia Medical. We hope you enjoy the course!
Contents

About Us

Our Story  p2
Our Services  p3
Our Withdrawal & Transfer Policies  p4
Parking, restaurants & accommodation  p5

Course Information and Tools

BLS-HCP Renewal Precourse Preparation  p6 - 7
BLS-HCP Renewal Agenda  p8

Reading

BLS-HCP Renewal Reading  p9 - 16
Notes  p17 - 22
In 1998, a British Columbia company suffered the tragic loss of two employees on its worksite due to Sudden Cardiac Arrest (SCA). Post incident, the company learned that the only treatment for SCA was the timely delivery of a shock from a defibrillator. Although local ambulances carried Automated External Defibrillators (AEDs) as standard issue, the worksite’s distance from the nearby town meant they would arrive too late to be effective. The only option was to position an AED onsite. Sadly, efforts to secure such a device were thwarted by regulations that didn’t permit the use of AEDs by non-medical personnel.

That same year, an emergency room physician heard about the company’s plight and was moved to act. He saw the life-saving potential of having AEDs broadly available in workplaces, airports, community facilities, etc. In response, he founded a company and became a distributor for AEDs outside of the medical community. That doctor was Dr. Allan Holmes, and the company was Global Medical Services.

In 2013, Global Medical Services became Iridia Medical, and identifying emerging needs and responding to them has defined Iridia’s way of doing business. Embracing this philosophy, Iridia Medical has grown to offer a broad cross-section of products and services to clients around the world. Iridia is:

- the second largest non-hospital AED distributor in Canada
- the leading provider of cardiac care education in British Columbia
- the biggest supplier of paramedics to oil and gas operators in BC, and
- a recognized name in both health and emergency preparedness consulting.

Our values reflect our desire to remain on the cutting edge of finding needs and meeting them in innovative ways, providing exceptional, client-focused service, and being a responsible employer and business. We fully anticipate that as our company grows, we’ll continue to see needs and fill them to fulfill our vision.

On this journey, Iridia has gone from having one employee (Dr. Holmes himself) to more than 20 office staff, a dozen consultants, and over 100 paramedics. In the process, the company has been identified as one of the Fastest Growing Companies in British Columbia and has been awarded the Profit 500 in 2013.

To learn more about Iridia Medical and our rebrand journey visit, www.iridiamedical.com/iridia-is-born.htm
Iridia Medical specializes in providing innovative, practical solutions to enhance the delivery and quality of healthcare for populations across Canada. Our services are separated into four primary areas:

**Medical Education & Training**
We have overseen the training and certification of over four thousand lay rescuers in the use of AEDs, and over three thousand medical professionals via our advanced training programs, such as Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support (PALS).

**Medical Consulting**
Iridia Medical has influenced healthcare delivery and provided emergency preparedness guidance for public and private sector organizations across North America. Our clients include health authorities, public healthcare facilities, EMS providers, private surgery and diagnostic imaging facilities, and police and fire departments.

**Paramedic Services**
Iridia Medical is one of western Canada’s top paramedic service providers. Our comprehensive programs have created a new industry standard for care in remote and/or high-risk work sites and encompass everything from the paramedic teams and equipment, a whole medical unit to telemedicine-supported medical direction.

**Automated External Defibrillator Programs**
As the founder of BC’s first public access automated external defibrillator (AED) program, Iridia Medical is passionate about promoting easy access to life-saving tools. We distribute top-of-the-line AEDs and provide training, support, and medical direction services to ensure that every client receives full value from their unit.
Our Course Policies

Participant requests for transfers, withdrawals, or refunds must be made in writing to Iridia Medical prior to the start of the course.

Notification must be sent via e-mail to registration@iridiamedical.com.

Withdrawals:

- If notice of withdrawal is given more than 14 days prior to the start of the class, the participant will receive a full refund minus a 25% administration fee.
- If notice of withdrawal is given less than 14 days prior to the start of the class, the entire tuition or class fee will be non-refundable.

Transfers:

- If notice of transfer is given more than 30 days prior to the start of the class transfer fees will not be charged.
- If notice of transfer is given less than 30 days prior to the start of the class a transfer fee of 15% of the total fees will be applicable.
- We will not accept any transfer requests less than 14 days prior to the start of the class.
- Transfer fees are applicable for each transfer.

Cancellations:

- Iridia Medical reserves the right to cancel a class and refund registration fees due to insufficient registration or other circumstances beyond our control.
- Participants are given two weeks’ notice of cancellation.

Books:

- All book sales are final.
Is your course held at Iridia's Learning Studio? We have mapped out for you our office location, and recommended parking, restaurants and accommodation around the Iridia Medical office.

Parking:
- **P1**: Iridia Medical, 1644 W 3rd Avenue
  Metered street parking is available with 2 hour time limit
- **P2**: The DPS, 1530 Mariners Walk (North side of W 2nd Ave, between Fir St and the main entrance to Granville Island. Covered & secure.)
  Cost: $18 / 6 hours
- **P2**: Mark’s Work Warehouse, 1885 W 4th Ave and Cypress St (In after 6am out by 6pm. Uncovered.)
  Cost: $10 / daytime

Restaurants:
- **1**: Subway & Starbucks
- **2**: Chronic Taco
- **3**: Blondie’s Café
- **4**: Beaucoup Café
- **5**: Café Bica
- **6**: Creek Slice Pizza
  ...and many more along W 4th Ave and on Granville Island!

Accommodation:
Best Western Plus Downtown
718 Drake Street Vancouver
Phone: 604-669-9888
[www.bestwesterndowntown.com](http://www.bestwesterndowntown.com)

*To receive a discount on your room, advise the Best Western Plus Downtown front desk you are a student with Iridia Medical.
BLS-HCP Renewal Precourse Preparation

Your success in this course depends on adequate precourse preparation. To best prepare and achieve the objectives of the course, please allow at least eight (8) hours to review the following BLS resources - available at [www.iridiamedical.com](http://www.iridiamedical.com).

Mandatory:
- [The 2010 Basic Life for Healthcare Providers Support Student Manual](http://www.iridiamedical.com)
  
  The BLS for Healthcare Providers Student Manual is designed for use by a single user and as a student reference tool pre- and post-course. A summary of the manual is provided in the Reading section of this course package.

The BLS core cases will be reviewed during the course, which will assist you in gaining the knowledge and develop the ability to:

1. Initiate the Chain of Survival:
   a. Promptly recognize cardiac arrest within 10 seconds
   b. Overcome barriers to initiating CPR

2. Perform prompt, high-quality CPR with C-A-B sequence (adult/child/infant)
   a. Provide chest compressions of adequate rate (at least 100/min)
   b. Provide chest compressions of adequate depth
      i. A depth of at least 5cm for adults
      ii. A depth of at least 1/3 of the anterior-posterior diameter of the chest or approximately 4cm in infants and 5cm in children
   c. Allow complete chest recoil after each compression
   d. Minimize interruptions in compressions
   e. Avoid excessive ventilation

3. Initiate early use of an AED (adult/child/infant)
   a. Turn on AED
   b. Place AED pads appropriately
   c. Follow all AED prompts.

4. Provide appropriate breaths.
   a. Deliver appropriate breaths with minimal interruptions in compressions
      i. 30:2 for an adult, child, or infant without an advanced airway
      ii. 15:2 for 2-rescuer CPR for a child or infant without an advanced airway
      iii. One breath every 6-8 seconds (8 to 10 breaths per minute) for a victim with an advanced airway (without pauses in chest compressions)
   b. Provide visible chest rise with each breath
   c. Avoid excessive ventilation

5. Practice the minor basic life support (BLS) differences for children and infants.

6. Practice team CPR (adult/infant)
   a. Practice team resuscitation to optimize coordinated CPR to achieve objectives 1 through 4
   b. Change rescuers every 2 minutes to avoid compressor fatigue
   c. Provide constructive feedback to other team members
To successfully complete the course, you must:

- pass a written exam and skills test in order to qualify for a HSF BLS course completion card.

In the incident you are unsuccessful in demonstrating BLS practical knowledge and skills during a testable case scenario or do not achieve 84% on the written exam, you will be offered a second attempt at the end of the course.

If either the second attempts are unsuccessful, arrangements can be made with Iridia Medical to participate in further training courses and to repeat the evaluation process.
The Basic Life Support for Healthcare Providers Renewal Course is approximately 2 hours 20 mins in total.

- **Course Starts** - 8:30am (15 mins)
  Course Overview & Guideline Update

- **Adult CPR/AED** - 8:45am (30 mins)
  1 & 2 Rescuer Practice

- **Child and Infant CPR/AED** - 9:15am (20mins)
  1 & 2 Rescuer Practice

- **Choking** - 9:35am (10 mins)
  Adult & Child

- **Skills Test** - 9:45am (40 mins)
  1 & 2 Rescuer Adult & Infant CPR/AED

- **Written Exam** - 10:25am (20 mins)

- **Q&A, Evaluations** - 10:45am (5 mins)
  **Course Ends** - 10:50am
The Human Heart

How It Works
The human cardiovascular system is made up of two important components: an electrical system (the sino-atrial node) and a pumping system (the ventricles).

Right Side of the Heart
Blood enters the heart through the superior vena cava, emptying oxygen depleted blood into the right atrium; from here, the blood flows through the right ventricle into the pulmonary artery into the lungs.

Left Side of the Heart
In the lungs, the blood exchanges oxygen for carbon dioxide and then flows back to the left atrium by way of the pulmonary vein. The blood then travels through the left atrium to the left ventricle where it is pumped into the aorta and then out to the rest of the body.

Fig. 1 - a normal sinus rhythm

ECG of Normal Sinus Rhythm

P wave
Q wave
R wave
S wave
T wave
Sudden Cardiac Arrest (SCA)

What Is It?
Sudden Cardiac Arrest is a condition in which the heart suddenly and unexpectedly stops beating. It affects over 40,000 Canadians each year – the survival rate for a Sudden Cardiac Arrest is low.

When Sudden Cardiac Arrest occurs, there is an interruption to the flow of blood through the heart and the ventricles no longer pump effectively. If the heart does not pump blood to the body, then no oxygen is supplied to the vital organs, and death quickly results.

Sudden Cardiac Arrest can occur due to several reasons, each of which has a unique ECG output. Some Sudden Cardiac Arrest rhythms can be treated with defibrillation (shockable rhythms) and some cannot (non-shockable rhythms).

The American Heart Association (AHA)

Why It Matters
The American Heart Association is a non-profit organization that fosters appropriate cardiac care to reduce disability and death caused by cardiovascular disease and stroke. Although headquartered in Dallas, Texas, health policy developed by the AHA impacts health policy and protocol developed in Canada by the Heart and Stroke Foundation.

2010 CPR Guideline Changes
In October of 2010, the AHA announced guideline changes with respect to the practice of CPR. The new guidelines emphasized the need for high quality CPR, defined as including:

- A compression rate of at least 100/min
- A compression depth of at least 2 inches (5cm) in adults
- Complete chest recoil during compressions
- Minimized interruptions to chest compressions
- Minimized excessive ventilations

These changes were made because research suggested that delaying chest compressions at the outset of a cardiac arrest reduces an individual’s chance of survival. The airway, breath, compression (A-B-C) sequence delays chest compressions and has been abandoned in favour of the C-A-B method where chest compressions begin immediately. Research suggests that many cardiac arrest victims do not receive any bystander CPR because most first responders find opening the airway and delivering rescue breaths difficult; by starting CPR compressions immediately, more rescuers will initiate CPR.

Note: The introduction of new CPR guidelines does not mean that the old guidelines are wrong or dangerous. Rescuers should perform CPR as they have been trained and follow the prompts of the AED they are using.
The Heart and Stroke Foundation

Not long after the AHA introduced their new CPR guidelines, the Heart and Stroke Foundation of Canada introduced the ‘Chain of Survival.’ Similar to the AHA’s new CPR guidelines, the Chain of Survival was designed so that first responders to a Sudden Cardiac Arrest could provide optimum care to the patient; thereby increasing their chance of survival. The Chain of Survival is outlined and described below.

The Chain of Survival

The Chain of Survival consists of 5 critical steps that first responders should follow in numerical order; they consist of:

1. Immediate recognition of cardiac arrest and activation of the emergency response system (calling 911)
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation (use of AED)
4. Effective advanced life support
5. Integrated post-cardiac arrest care

The Chain of Survival Applied to SCA

As with any emergency situation, always begin with a scene assessment; remember to use the appropriate personal protective equipment (gloves and mask).

Determine the patient’s level of responsiveness (if responsive) and call 911 – call for an AED (if available).

If there are no signs of life (i.e., the patient is unresponsive and there are no normal respirations) begin CPR with 30 compressions. The compression rate should be at least 100/min with a depth of at least 2 inches for adults. Perform CPR until the AED arrives.

If an additional bystander is able to perform rescue breathing simultaneously, then compressions and breaths should be provided in a ratio of 30 compressions to 2 breaths.

When an AED becomes available, power up the device and follow the voice/visual commands. Continue CPR and rhythm analysis as directed by the AED until medical help takes over.
Simplified Basic Life Support Flowchart

Unresponsive
No breathing or no normal breathing (only gasping)

Activate emergency response

Get defibrillator

Start CPR

Check rhythm/shock if indicated
Repeat every 2 minutes

Push Hard • Push Fast
Shockable Rhythms

As discussed earlier in the Sudden Cardiac Arrest section of this document, shockable rhythms are treatable through defibrillation. There are two different kinds of shockable rhythms; they are outlined and described below.

**Ventricular Fibrillation**
When the sino-atrial node stops firing the ventricles usually begin to quiver in a rapid unorganized rhythm. This makes the heart incapable of pumping any blood out of the heart and to the rest of the body. This is known as *ventricular fibrillation*. This is the most common initial rhythm associated with cardiac arrest.

**Chaotic ventricular deplorization**
Rapid, wide irregular ventricular complexes

**Ventricular Tachycardia**
Another common rhythm associated with Sudden Cardiac Arrest is ventricular tachycardia. When this rhythm occurs, it is because the sino-atrial node has failed and the ventricles are pumping so rapidly that they do not have time to fill with blood and therefore are not pumping any blood out of the heart.

**Impulses originate at ventricular pacemaker**
Wide ventricular complexes. Rate > 120/min

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**Note:** Ventricle fibrillation and ventricular tachycardia are best treated with CPR and defibrillation. Because all cardiac arrests are different, there is no standard amount of time that either of these rhythms will last. For example, they could last 2 minutes or 20 minutes – this is why early defibrillation is important.
Non-Shockable Rhythms

Pulseless Electrical Activity
Pulseless Electrical Activity (PEA) is a rhythm that is seen when the cardiac arrest event has occurred due to a failure of the pump (ventricles) rather than the electrical system (sino-atrial node). The sino-atrial node still fires in an organized pattern; however, the ventricles have ceased contracting and are therefore not pumping any blood out of the heart. PEA looks like a normal sinus rhythm, except no pulses will be felt on the patient. CPR should be continued; PEA is considered a survivable rhythm, but it is treated with cardiac medications rather than defibrillation.

Asystole
A flat-line, or asystole, is another rhythm found in cardiac arrest patients. In an asystolic rhythm there is no evidence of electrical or pump function whatsoever in the heart; therefore, defibrillation is not useful. However, CPR should be continued as it has been shown in some cases to convert asystolic rhythms to ventricular fibrillation.

CPR and Defibrillation

Cardiopulmonary resuscitation (CPR) is the manual compression of the chest combined with artificial respiration in a 30:2 ratio (30 compressions followed by 2 ventilations) at a rate of at least 100 compressions per minute. The chest should be compressed at least 2 inches by pushing on the sternum with the heel of one hand with the other hand on top. Compressions should be paused for ventilations.

3 Key Skills for CPR – The 3 Ps (push hard, push fast, pause little)

- Push hard and fast on the chest (100/min)
- Ensure full chest recoil
- Minimize interruptions in chest compressions
- 1 cycle = 30 compressions and 2 breaths
- Avoid hyperventilation

Defibrillation electrodes should be attached to the cardiac arrest patient’s bare chest at the right anterior aspect just below the clavicle and at the left lateral aspect on the axillary line. The AED measures the impedance of the heart, analyzes the rhythm and will advise a shock if ventricular fibrillation or ventricular tachycardia is detected. **Be sure to verbally and visually clear the area around the patient before you push the shock button. If your unit is fully automatic, be sure no one is touching the patient while the machine is analyzing and stay clear until the device has delivered the shock.**
Fig. 2 - Proper Anterior-Lateral placement of AED Pads

In order to use the AED, the patient must be unresponsive and have no signs of circulation.

Use child pads/child system if available for infants and children. If child pads/system are not available, use adult AED and pads with appropriate pad placement for small children (anterior/posterior). Do not use child pads/child system on an adult patient (over the age of 8).

2010 AHA Guidelines mean that a single shock is followed with 2 minutes of immediate CPR. Only reassess for signs of life if/when there is change in the patient’s circulation (movement, return of colour or breathing). If you have an older AED, shocks may be delivered in a series of no more than three in a row, followed by one minute of CPR. Shocks are usually delivered at 200 joules for the first shock, 300 joules for the second shock, and 360 joules for the third. Once the AED reaches 360 joules it will continue to shock at this level as long as a shockable rhythm is detected. Note that different AED units may have different energy level protocols.

Should signs of circulation return, assess breathing and provide artificial respiration as required at a rate of 1 breath every 5 to 6 seconds. Signs of circulation, including a pulse check, should be monitored frequently and the AED should be left powered on with the electrodes attached. The machine will continue to analyze every 2 minutes and should the patient re-arrest, the AED protocol should be continued until medical aid takes over.

**Transfer of Care**

Once Emergency Health Services (EHS) arrives on scene, continue with CPR and your AED protocol until instructed by EHS to stop. The responders may ask several questions regarding the patient. In your brief report, be sure to include: length of time down (without a pulse) if known, length of time of your resuscitative efforts, number of shocks delivered and whether or not there was a return of a pulse. Any known medical history is also important information to pass along.
Special Considerations

**Hairy Chest**
If the patient is exceptionally hairy the chest may need to be shaved before applying the electrodes, or, apply and rapidly remove electrodes to remove the hair. If the latter is done, use a new set of electrodes for defibrillation.

**Pregnant Women**
The AED can be used on pregnant women in cardiac arrest.

**Metal Surface**
The AED can be used on a metal surface such as a stretcher or bleacher. Care should be taken to ensure the electrodes are not in contact with the metal.

**Wet Surface**
The AED can be used on a wet surface such as the side of a swimming pool or wet pavement. Care should be taken to ensure the patient is not in standing water and the chest may need to be dried off prior to attaching the electrodes.

**Pacemaker**
The AED can be used on patients with an implanted pacemaker or internal defibrillator. Care should be taken to ensure the electrodes are not placed directly on top of the pacemaker. Pacemakers can be seen as a small rectangular bulge (about the size of a cigarette lighter) just under the skin.

**Traumatic Arrest**
The AED can be used on patients who are in cardiac arrest as a result of trauma such as a fall from a height or a motor vehicle incident.

Troubleshooting

As with all machines, there is the possibility of a malfunction. The AED has warning lights, and/or audible warnings, that should indicate, “service required” or “low battery”. A low battery will still initially deliver several shocks. Should the warning lights, and/or audible warnings, come on, continue to follow the commands on the machine as it may still work. Should it fail to work, power it off and power it back on again while continuing to do CPR. If it still does not work, continue with CPR alone.
Do you have the skills to beat the highest score in our SMARTMAN COMPRESSION CHALLENGE?

Visit our office and find out!
1644 West 3rd Avenue, Vancouver
Let’s Connect!

Need to know what’s going on at Iridia? This should be your first stop!
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Stop by and say hi to the Iridia team on our Google+ page.
gplus.to/iridiamedical

For the most up-to-date information, head over to our Twitter feed.
twitter.com/iridiamedical

Have a look under the hood of Iridia Medical!
blog.iridiamedical.com