LESSON 11

OBJECTIVE

Each participant will identify circulatory emergencies and manage critical interventions. The procedures will follow the guidelines in the Occupational First Aid Reference and Training Manual.

LESSON OUTLINE

- cardiac emergencies
- cardiac emergency management

Reference

Part 5	Chapter 12	traumatic cardiac emergencies
Part 5	Chapter 13	non-traumatic cardiac
Part 5	Chapter 14	cardiopulmonary resuscitation

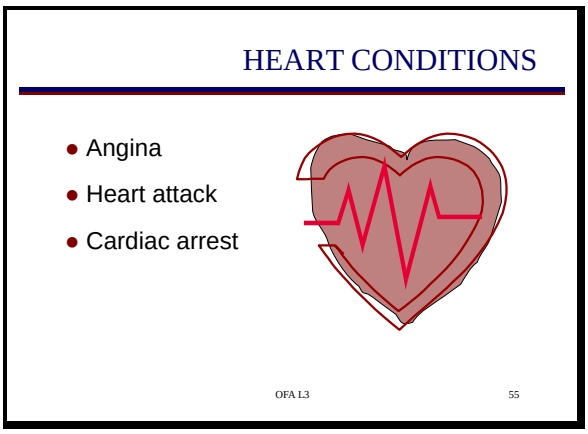
INSTRUCTOR ACTIVITY - Lecture

AS THE WORK FORCE AGES, THE INCIDENTS OF CARDIAC EMERGENCIES WILL BECOME MORE COMMON - RECOGNITION AND PROPER MANAGEMENT MAY SAVE A CO-WORKERS LIFE

Cardiac Emergencies

heart conditions can result from traumatic or non-traumatic incidents

heart conditions include:



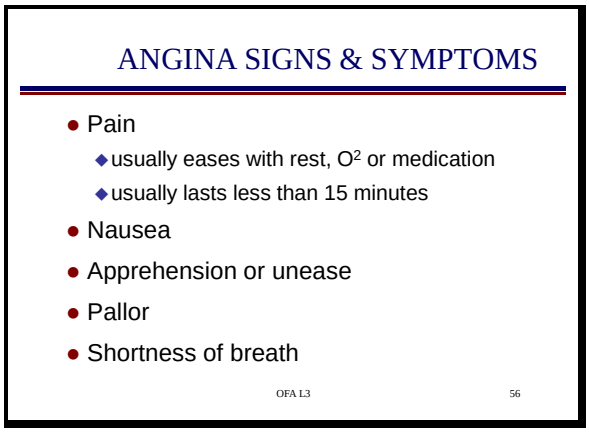
- angina - the reduction of oxygen to the heart muscle due to a narrowing of the heart's arteries (coronary arteries)
    - ♦ lack of oxygen may cause pain which is referred to as angina pectoris
- heart attack - the lack of oxygen to the heart muscle due to a complete blockage of a coronary artery (myocardial infarction)
- cardiac arrest - the heart has stopped beating or beats too irregularly or too weakly to circulate blood effectively
    - ♦ causes include:
        - cardiovascular disease - most common cause
        - blunt trauma/violence to the chest
        - severe blood loss
        - drowning

- suffocation
- certain drugs
- electric shock
- stroke or other types of brain damage

Angina

signs and symptoms may vary from person to person but, for each individual, the pain is of consistent intensity, duration and location

signs and symptoms of angina include:

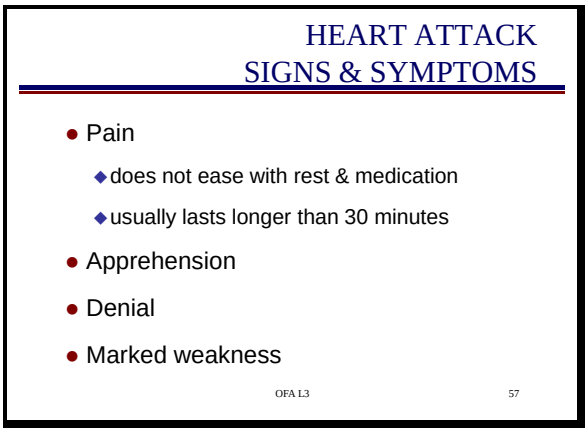


- pain
  - may occur suddenly or gradually
  - usually located beneath the sternum
  - may radiate in left or right arm, neck, jaw or back
  - often assumed to be indigestion (gas, belching)
  - described as mild to moderate heavy pressure, squeezing or vice-like tightness
  - not influenced by deep respiration, coughing or movement
  - usually brought on by stress or exertion
  - often eased by rest, oxygen or medication
  - usually lasts less than 15 minutes
- nausea
- apprehension or uneasiness

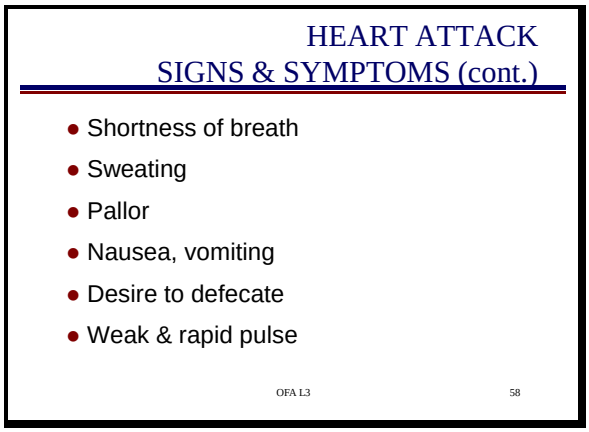
- pallor
- shortness of breath

Heart Attack

the signs and symptoms associated with a heart attack are:



- pain is the classic symptom
  - ♦ may occur suddenly or come on when the patient is at rest
  - ♦ usually substernal and often radiates across the chest
  - ♦ epigastric discomfort usually associated with belching, gas and indigestion (desire to defecate)
  - ♦ may radiate to one or both arms, up to neck, jaw or through to the back
  - ♦ described as choking, squeezing, vice-like, burning or intense, a feeling of pressure
  - ♦ not affected by cough, movement or deep respiration
  - ♦ usually lasts longer than 30 minutes and is constant; rest and medication do not help
- apprehension
- denial
- marked weakness, especially in the arms



- shortness of breath or difficulty breathing
- sweating, sometimes profuse
- pallor
- nausea or vomiting
- desire to defecate
- weak and rapid pulse - in some cases the pulse rate decreases

Cardiac Arrest

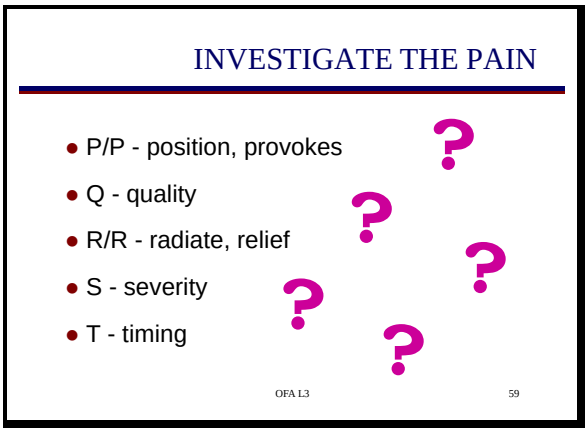
signs and symptoms of cardiac arrest:

- no breathing
- no pulse

Cardiac Assessment

the nature of the heart condition must be investigated by the first aid attendant as soon as possible

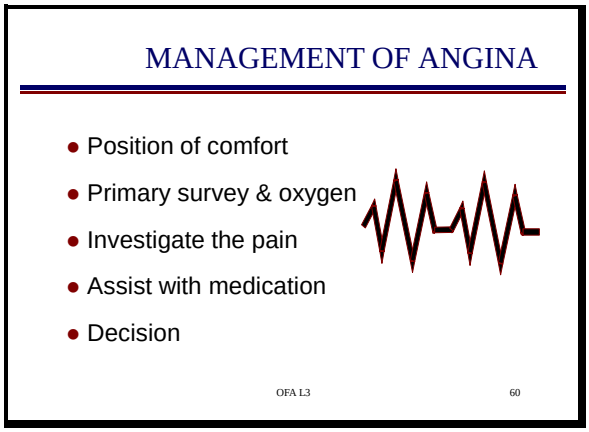
in order to identify that the condition is heart related, ask the following questions:



- P – position
  - ♦ where is the pain?
  - ♦ can the patient point to the pain?
- P – provokes
  - ♦ what makes it worse (movement, coughing)?
- Q – quality (describe the pain)
  - ♦ what does it feel like (sharp, squeezing, etc.)?
  - ♦ does this pain differ from the normal pattern of pain?
- R – radiate
  - ♦ is the pain localized to one region?
  - ♦ does it radiate (spread) to another area?
- R – relief
  - ♦ does anything relieve the pain in any way?
  - ♦ does anything make it feel better?
- S – severity
  - ♦ how severe is the pain?
  - ♦ on a scale of 1-10 how would the patient rate the pain?

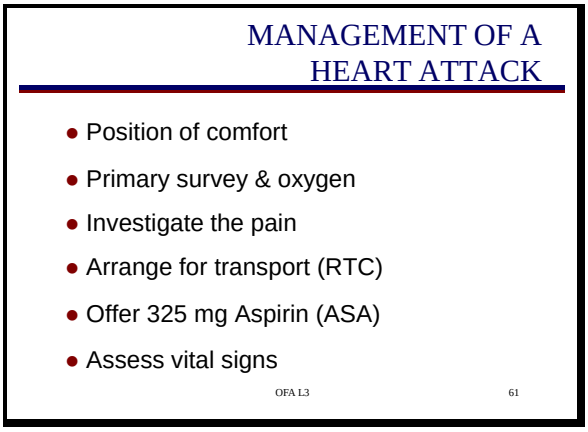
- T – timing
    - ♦ when did the pain start?
    - ♦ how long has it lasted?
    - ♦ what was the patient doing at the onset of the pain?
    - ♦ has the patient had this type of pain before?

Management of Angina:



- place the patient in a comfortable position
- perform a primary survey and apply oxygen at 10 lpm
- investigate the pain because there is no history of trauma - question the patient using the PPQRRST mnemonic
- assist the patient in taking nitroglycerin medication, if required
- patients with chest pain, not relieved by nitroglycerin, rest and oxygen, are in the RTC
- known angina conditions, where pain is relieved by taking medication and rest, may be able to return to work depending on the type of tasks involved - this may require discussion with the supervisor

Management of Heart Attack:



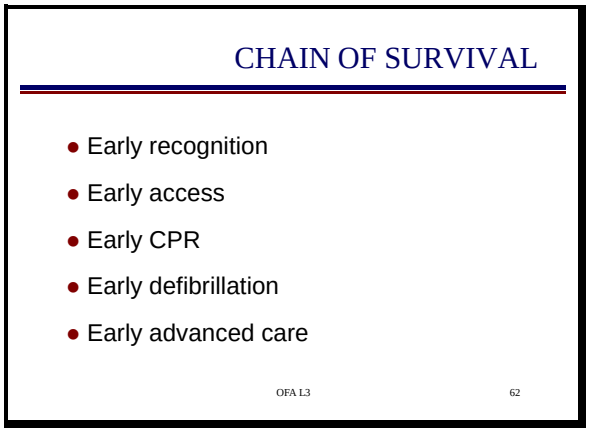
- position the patient for comfort
  - ♦ do not allow the patient to move unassisted
  - ♦ keep the patient as quiet and calm as possible
- conduct a primary survey
  - ♦ and administer oxygen at 10 lpm
  - ♦ keep the patient comfortably warm
- investigate the pain
  - ♦ question the patient using the PPQRRST mnemonic
- all patients with suspected heart attacks are in the RTC
- offer the patient two 80 mg of chewable ASA or one regular adult strength 325 mg ASA tablet to chew if available (it must be ASA, not Ibuprofen or Acetaminophen)
- assess and monitor vital signs (en route or while waiting for transport)

Management of Cardiac Arrest

sudden cardiac arrest (SCA) is an abrupt, unexpected loss of heart pump function

The Chain of Survival

the Chain of Survival is a series of steps aimed at decreasing death and disability due to sudden cardiac arrest



- early recognition of warning signs
- early access
- early CPR
- early defibrillation
- early advanced care

Electrical Activity in the Heart

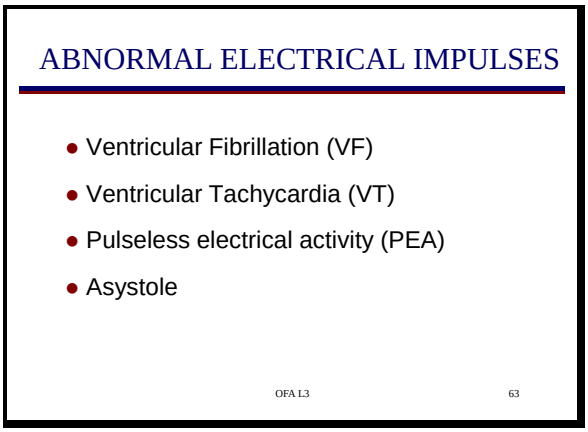
the heart contains an electrical system that sends out impulses that tell the heart when to contract to pump blood

the leader of this electrical system is the sino-atrial (SA) node

the SA node:

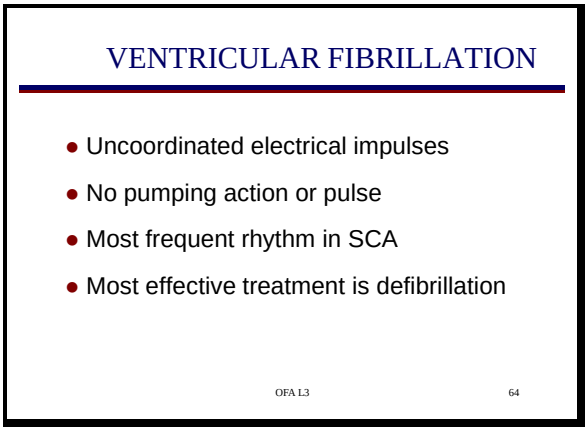
- is the body's pacemaker
- sends out 60 to 100 impulses per minute in a resting adult

types of rhythms that have no palpable pulse and are life-threatening include:



- ventricular fibrillation (VF)
- ventricular tachycardia (VT)
- pulseless electrical activity (PEA)
- asystole

Ventricular fibrillation (VF)



- uncoordinated electrical impulses can occur at a rate of up to 300 times a minute
- no pumping action so no pulse

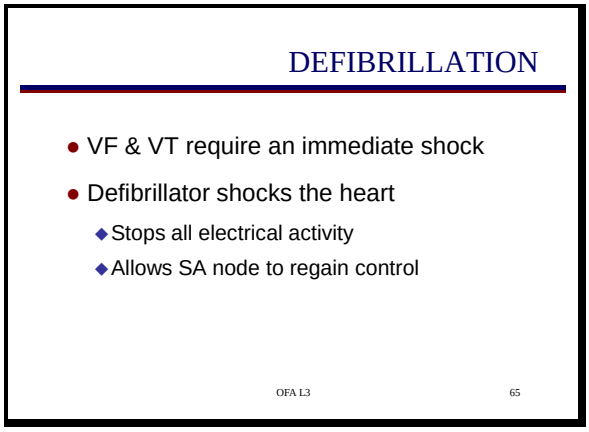
- most frequent rhythm in sudden cardiac arrest
- most effective treatment is defibrillation

ventricular tachycardia (VT) is a heart rhythm that can be so fast that the heart does not have time to fill with blood between contractions leading to a loss of cardiac output and loss of pulse

with pulseless electrical activity (PEA) the SA node sends a signal to contract but the heart does not respond or there is no blood in the system to pump

asystole (flat line) occurs when there is no electrical activity in the heart

Defibrillation



VF and pulseless VT are abnormal heart rhythms that need to be shocked immediately

the defibrillator sends a shock through the heart that:

- stops all electrical activity
- allows the SA node to regain its role in providing effective electrical impulses

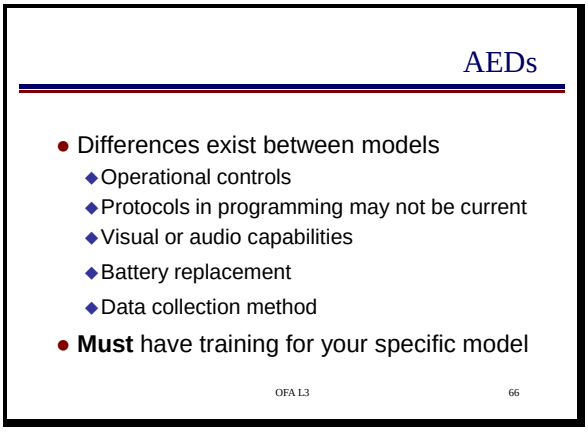
the longer the time period between the onset of VF or VT to defibrillation the smaller the chances of patient survival

the chance for survival decreases approximately 10% for each minute delay in defibrillation

PEA and asystole do not respond to defibrillation and so are called non-shockable rhythms

Automated External Defibrillators

there are many models of AEDs available on the market



the operation of each is basically the same but there are some differences:

- operational controls
- protocols in programming may not be current
- visual and audio capabilities
- battery replacement
- data collection method

data collection is the electronic recording of patient information while protocols are performed when the AED is attached to the patient

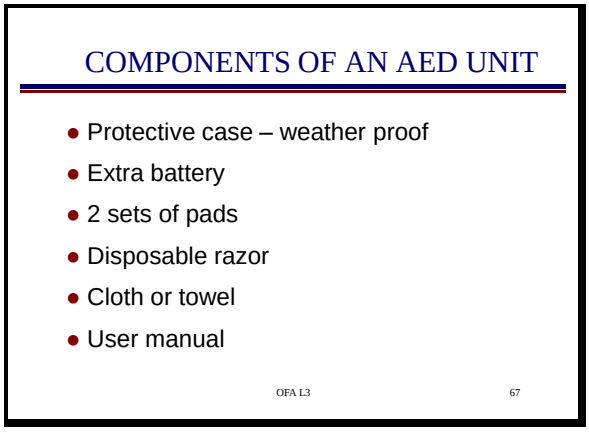
if an AED is supplied at your workplace the employer MUST ensure you receive training in the operation of that specific model

where a defibrillation program exists in the workplace, medical oversight is recommended but is not specifically required by the Occupational Health & Safety Regulation

AEDs are not on the list of equipment required to be supplied by the employer for BC workplaces

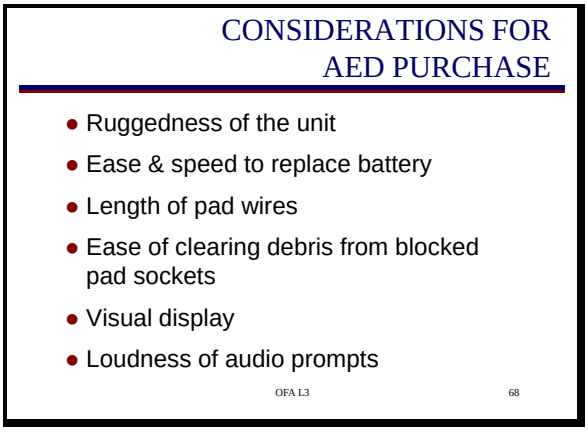
Components of an AED unit

in addition to the AED, an AED unit should consist of:

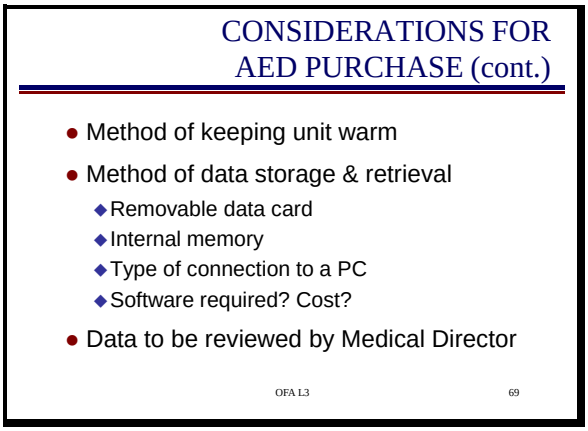


- protective case
  - ♦ weather proof if AED to be exposed to an outside environment
  - ♦ if to be used in a cold environment (approaching freezing) a heated case may be a way of keeping the AED warm
- extra unexpired, unused battery
- 2 sets of AED pad electrodes
- disposable razor
- a cloth or towel
- user or instruction manual

Considerations when purchasing an AED



- the ruggedness of the unit in consideration to the area in which it will be stored and used
- the ease and speed of the battery replacement
- the length of the wires on the AED pad electrodes
- the likelihood of the pad sockets, where the pad electrodes plug into the AED unit, becoming plugged with dirt or mud and the ease of clearing them
- if the unit has a visual display, necessary if it is to be used in a noisy environment
- the loudness of the audio prompts if it is to be used in a noisy environment



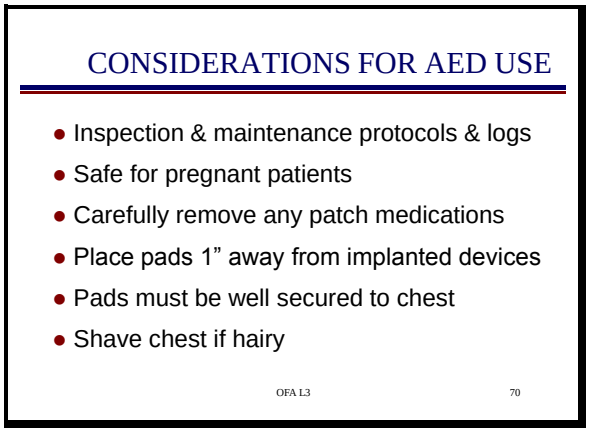
- the method of keeping the unit warm in a cold environment

- the method of incident data storage and retrieval

  - removable data card
  - internal memory
  - type of connection to a PC
  - software required/cost

- this data should be reviewed by the medical director for the AED program at the workplace

Special Considerations and Circumstances for AED use



- establish inspection and maintenance protocols and logs as required by manufacturer’s directions

- AED use is safe for pregnant patients

- carefully remove any patch medications and wipe any excess medication from the chest with a clean cloth or gauze pad

- place AED pad electrodes one inch away from implanted pacemakers or implanted defibrillators

- ensure AED pad electrodes are well applied to the chest

- shave pad area if chest is very hairy

CONSIDERATIONS FOR AED USE (cont.)

- Wipe chest dry if wet
- Move patient if in standing water
- Place O^2 cylinder & tubing away from AED
- Stop vehicle if used during transport
- Read user manual for troubleshooting

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- wipe the chest with towel or cloth before applying AED pad electrodes if the chest is wet
- if attendant or patient in standing water move to dry area
- place oxygen cylinder and tubing away from the chest and AED unit
- stop vehicle if AED is used during transport
- read user manual for troubleshooting

Cardiopulmonary Resuscitation or CPR.

the patient's best chance for survival is the delivery of good quality CPR until an AED is available

CPR

- cardiac arrest caused by drowning
  – 2 ventilations before compressions
- AED is used as soon as available
- If signs of life appear check pulse
  - breathing resumes
  - patient moves
  - patient regains consciousness
- May stop if efforts ongoing for 30 minutes when patient is **not** hypothermic

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- if the cardiac arrest is caused by drowning, give 2 ventilations before starting compressions

- the AED is used as soon as it is available

- if the patient shows any signs of life stop resuscitation efforts and assess the pulse

- signs of life include:

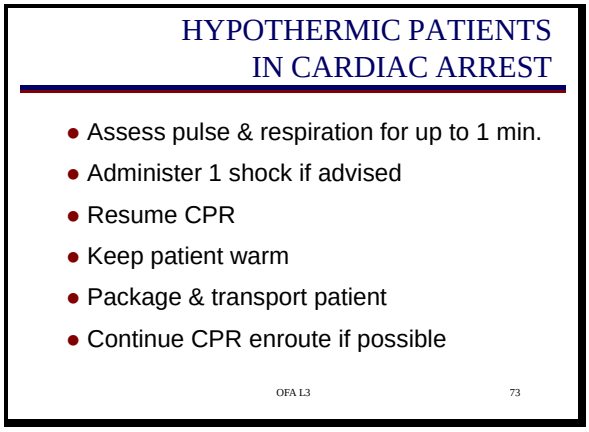
  - breathing resumes
  - patient moves
  - patient regains consciousness

- for patients with normal temperatures **(not hypothermic)**, where there has not been even a temporary return of a pulse, resuscitation efforts may be stopped when:

  - cycles of "No Shock Advised" followed by 2 minutes of CPR, have been ongoing for 30 minutes
  - CPR has been ongoing for 30 minutes

- when an AED is not available, CPR is continued and the AED is used as soon as it is brought to the scene

Hypothermic Patients in Cardiac Arrest



- assess the pulse and respiration for up to 1 minute

- if an AED is available and a “Shock Advised” prompt is given, administer 1 shock
- resume CPR
- keep the patient warm
- package and transport
- continue CPR enroute if possible

PARTICIPANT PRACTICE 11-01

Manage chest pain (walks to the first aid room)

manage a patient with chest pain – walks to the first aid room	
1. scene assessment – modified	*on approach the patient is pale and complains of chest pain*
• what happened?	*"A large delivery arrived and my assistant is off today."* *"My angina pain flared up."* *"I sat down and took my nitro."* *"The boss sent me to see you."*
• did you fall or hurt your head or neck?	*no*
2. explain that a resting position will be more comfortable and then position the patient at rest in the position of most comfort with support (preferably supine)	
3. conduct the primary survey	*-breathing is 24 shallow and effective* *-skin is cool, pale and dry* *-radial pulse is present* *-no pain anywhere else*
4. apply oxygen and keep the patient calm and at rest	
5. because there is no history of trauma the attendant must investigate the pain using the PPQRRST mnemonic	*the patient has a known history of angina*
• Position • Provokes • Quality • Radiates • Relieves • Severity • Timing	*-the pain is behind the breastbone* *-feels squeezing* *-5 out of 10 and* *-has lasted 4 minutes* *-there is nothing different about this pattern of angina attack*

6. assess the patient's medication: • read instructions of use	*patient produces nitroglycerin spray and there are instructions on the container:* *1 dose every 5 minutes to a total of 3 doses*
7. decision – no need to transport patient to medical aid at this time, continue assessment	*since there is a known history wait to see if medication will work*
8. assess vital signs and continue to monitor patient	*the patient is starting to feel better* *- pain subsided in about 5 minutes after taking 1st dose of medication* *-vital signs are now normal*
9. patient can return to work – inform supervisor to ensure no more moving of cartons or other strenuous work today	
10. complete the first aid record and follow up on the patient's condition throughout the day	

PARTICIPANT PRACTICE 11-02

Manage chest pain (conscious, walks to the first aid room)

manage a patient with chest pain who walks to the first aid room	
1. scene assessment – modified	*patient is pale, sweaty and very anxious*
• what happened?	*"I was shoveling snow all morning and started feeling pain in my chest."*
• did you fall or hurt your head or neck?	*no*
2. explain that a resting position will be more comfortable and then position the patient at rest in the position of most comfort with support (preferably supine)	
3. conduct the primary survey	*-breathing 24 shallow and effective* *-skin is cool, pale and clammy* *-radial pulse present* *-no pain anywhere else*
4. apply oxygen – keep the patient calm and at complete rest	
5. determine if the patient is on medication	*patient is on medications for high blood pressure*
6. because there is no history of trauma the attendant must investigate the pain using the PPQRRST mnemonic	*no previous history of chest pain* *-the pain is behind the breastbone* *-feels vice-like* *-radiates down the left arm* *-severity is 7 out of 10* *-has lasted 40 minutes* ***this patient is in the RTC***

7. activate the worksite emergency response procedures • if calling for the ambulance instruct the person to say there is a responsive adult with chest pain lasting longer than 30 minutes and to report back	*chest pain lasting longer than 30 minutes* *skin is cool, pale and clammy*
8. offer the patient two 80 mg of chewable ASA or one regular adult strength 325 mg ASA tablet to chew	*it must be ASA not Acetaminophen or Ibuprofen* *ensure the patient does not have an allergy to ASA*
9. package the patient on the spine board	
10. reassess the ABC's every 5 minutes	
11. continue with the secondary survey en route or while waiting for transport	

PARTICIPANT PRACTICE 11-03

Safety Alert

Students are required to perform CPR compressions during this course. Performing CPR compressions on a classmate for real could result in discomfort or injury.

Students must only simulate compressions if practicing on a classmate.

Manage cardiac arrest with one rescuer (AED **not** immediately on scene)

manage a supine patient in cardiac arrest	
1. scene assessment	*no danger* *one worker* *patient was found slumped over in a chair and was carefully positioned on floor by co-workers*
2. approach the patient from the front, identify yourself and attempt to communicate with the patient	*the patient does not respond to verbal stimuli* ***this patient is in the RTC***
3. activate the worksite emergency response procedures • if calling for the ambulance instruct the person to say there is an unresponsive adult and to report back	
4. open the airway with a head-tilt chin-lift and check for breathing	*there is no breathing* *(the need for C-spine control and jaw thrust will depend on the mechanism)*

5. move one hand up to the neck, while maintaining the head-tilt, and assess for a carotid pulse	*there is no pulse*
Note: the assessment of the breathing and pulse should not take longer than 10 seconds	
6. request any other OFA attendants or workers trained in CPR to assist	
• instruct bystanders to go get the AED if one is available at the worksite and update the ambulance that the worker is in cardiac arrest	*a worker goes to get the AED* ***Note:*** *the AED is used as soon as it is available*
7. ensure the patient is on a hard surface	***Note:*** *if the cardiac arrest was caused by drowning, 2 ventilations would be given before starting compressions*
NOTE: all patients who are in cardiac arrest must receive CPR unless there is clear evidence that death has occurred, for example, if there is decapitation, transection, decomposition, an adult patient who has been submerged in water for over 60 minutes or in certain triage situations	
8. start CPR	*compress the chest at least 5.0 cm (2 inches) at a rate of at least 100 per minute*
• expose the chest as necessary	
• instruct a helper to watch what you are doing as they will be doing the compressions after the next cycle	***push hard, push fast*** - *allow the chest to recoil after each compression*
• place hands in the centre of the chest, between the nipples, interlock fingers, lock elbows and perform 30 chest compressions	
9. using a pocket mask, ventilate the patient with 2 breaths	*air goes in* *1 second per breath, just enough to see the chest rise*
10. instruct the helper to watch what you are doing regarding compression depth and timing, and give 30 chest compressions	
11. ventilate the patient with 2 breaths	*air goes in*

12. instruct the helper to kneel close to the side of the patient and place their hands in the centre of the chest, interlock their fingers, lock their elbows so their arms are straight and start compressing

    - ensure a depth of at least 5 cm, a rate of at least 100 per minute and a full recoil of the chest between compressions

Note: *if a helper is not available or cannot compress adequately, cycles of 30 compressions and 2 ventilations are performed by the Attendant*

13. ventilate the patient once every 6 to 8 seconds timed with the recoil phase of the compression

    - between ventilations insert an oral airway and apply oxygen
    - switch to the bag-valve mask for the ventilations with the oxygen at 15 lpm
    - have the helper, giving the compressions, switch with another helper every 2 minutes

1 second per breath, just enough to see the chest rise

14. continue with the sequence of continuous compressions (performed by the helper) and 1 ventilation every 6 to 8 seconds (given by the Attendant) until:

    - the AED arrives
    - a physician assumes responsibility
    - patient is transferred to ambulance personnel
    - the attendant is physically exhausted and unable to continue
    - spontaneous breathing and circulation are restored
    - CPR has been ongoing for 30 minutes without even the temporary return of a pulse in patients with normal temperatures

the AED arrives after 1½ minutes of compressions

15. instruct the helper to continue with compressions while the AED is prepared and the pads are attached

16. prepare the AED:

    - position the AED on the operator side of the patient so the unit and the entire patient can be seen
    - open and turn on the AED
    - **follow voice prompts** - wait while the AED completes a self evaluation
    - plug the cables into the AED
    - ensure the AED pads are not expired or torn and are connected to the cables

Note: *the AED model at the workplace may operate differently*

Note: *the employer must ensure that the Attendant is trained on the specific model used at the workplace*

17. attach the AED:

    - prepare the patient's chest for the AED pads, work around the helper doing the compressions
    - remove the backing from the pads and place one pad below the patient's right clavicle and the other pad on the left side of the chest, just inferior to nipple level

patient's chest is dry
there is no chest hair
there are no medication patches or any implanted medical devices

18. analyze the heart rhythm:

    - instruct the helper: "stop compressions and don't touch the patient"
    - ensure no one is touching the patient and everyone is standing clear
    - follow voice prompts or press the analyze button

the AED gives a "Shock Advised" prompt

19. deliver a shock:

    - **state** "I'm clear, everyone is clear, do not touch the patient"
    - press the shock button if the AED advises

20. administer 2 minutes of CPR:

    - instruct a helper to resume compressions
    - ventilate the patient once every 6 to 8 seconds

21. repeat cycles of analyze/shock or no shock and 2 minutes of CPR until:

    - a physician assumes responsibility
    - patient is transferred to ambulance personnel
    - the attendant is physically exhausted and unable to continue
    - cycles of "No Shock Advised" followed by 2 minutes of CPR have been ongoing for 30 minutes without even the temporary return of a pulse in patients with normal temperatures **(not hypothermic)**

      after 30 minutes resuscitation efforts may be stopped:
      - ♦ *follow the procedure outlined in the Reference and Training Manual on page 368 – Appendix B – Fatalities*
    - spontaneous circulation and breathing are restored

Note: *if a "No Shock" prompt was given then 2 minutes of CPR is administered before the heart rhythm is re-analyzed*

compress the chest 3.8 – 5.0 cm (1½ to 2 inches) at a rate of 100 per minute

1 second per breath, just enough to see the chest rise

Note*: in the case of a hypothermic patient in cardiac arrest:*

- *assess pulse and respiration for 1 minute*
- *attach the AED*
- *administer 1 shock if advised*
- *keep the patient warm*
- *prepare the spine board*
- *move the patient onto the spine board*
- *secure the patient with 2 straps*
- *place a sandbag on either side of the head*
- *load and secure the spine board into a basket stretcher*
- *initiate transport*
- *continue CPR enroute if possible*
  turn up the heat in the transport vehicle to help warm the patient

PARTICIPANT PRACTICE 11-04

Manage cardiac arrest with one rescuer (AED immediately on scene)

manage a supine patient in cardiac arrest	
1. scene assessment	*no danger* *one worker* *patient was found slumped over in a chair and was carefully positioned on floor by co-workers*
2. approach the patient from the front, identify yourself and attempt to communicate with the patient	*the patient does not respond to verbal stimuli* ***this patient is in the RTC***
3. activate the worksite emergency response procedures • if calling for the ambulance instruct the person to say there is an unresponsive adult and to report back	
4. open the airway with a head-tilt chin-lift and check for breathing **Note:** the assessment of the breathing and pulse should not take longer than 10 seconds	*there is no breathing* *(the need for C-spine control and jaw thrust will depend on the mechanism)*
5. move one hand up to the neck, while maintaining the head-tilt, and assess for a carotid pulse	*there is no pulse*
6. request any other OFA attendants or workers trained in CPR to assist and instruct a helper to update the ambulance that the worker is in cardiac arrest	

7. ensure the patient is on a hard surface

NOTE: all patients who are in cardiac arrest must receive CPR unless there is clear evidence that death has occurred, for example, if there is decapitation, transection, decomposition, an adult patient who has been submerged in water for over 60 minutes or in certain triage situations

8. prepare the AED:

    - position the AED on the operator side of the patient so the unit and the entire patient can be seen
    - open and turn on the AED
    - **follow voice prompts** - wait while the AED completes a self evaluation
    - plug the cables into the AED
    - ensure the AED pads are not expired or torn and are connected to the cables

Note: *the AED model at the workplace may operate differently*

Note: *the employer must ensure that the Attendant is trained on the specific model used at the workplace*

9. attach the AED:

    - expose the patient's chest and prepare the chest for the AED pads
    - remove the backing from the pads and place one pad below the patient's right clavicle and the other pad on the left side of the chest, just inferior to nipple level

patient's chest is dry
there is no chest hair
there are no medication patches or any implanted medical devices

10. analyze the heart rhythm:

    - ensure no one is touching the patient and everyone is standing clear
    - follow voice prompts or press the analyze button

the AED gives a "Shock Advised" prompt

11. deliver a shock: • **state** "I'm clear, everyone is clear, do not touch the patient" • press the shock button if the AED advises	***Note:*** *if a "No Shock" prompt was given then 2 minutes of CPR is administered before the heart rhythm is re-analyzed*
12. administer 2 minutes of CPR: • instruct a helper to watch what you are doing as they will be doing the compressions after the next cycle • place hands in the centre of the chest, between the nipples, interlock fingers, lock elbows and perform 30 chest compressions	*compress the chest at least 5.0 cm (2 inches) at a rate of at least 100 per minute* ***push hard, push fast*** - *allow the chest to recoil after each compression*
13. using a pocket mask, ventilate the patient with 2 breaths	*air goes in* *1 second per breath, just enough to see the chest rise*
14. instruct the helper to watch what you are doing regarding compression depth and timing, and give 30 chest compressions	
15. ventilate the patient with 2 breaths	*air goes in*
16. instruct the helper to kneel close to the side of the patient and place their hands in the centre of the chest, interlock their fingers, lock their elbows so their arms are straight and start compressing • ensure a depth of at least 5 cm, a rate of at least 100 per minute and a full recoil of the chest between compressions	***Note:*** *if a helper is not available or cannot compress adequately, cycles of 30 compressions and 2 ventilations are performed by the Attendant*

17. ventilate the patient once every 6 to 8 seconds timed with the recoil phase of the compression

    - between ventilations insert an oral airway and apply oxygen
    - switch to the bag-valve mask for the ventilations with the oxygen at 15 lpm
    - have the helper, giving the compressions, switch with another helper every 2 minutes

1 second per breath, just enough to see the chest rise

18. after 2 minutes of CPR follow voice prompts to allow the AED to re-analyze the heart rhythm

19. repeat cycles of analyze/shock or no shock and 2 minutes of CPR until:

    - a physician assumes responsibility
    - patient is transferred to ambulance personnel
    - the attendant is physically exhausted and unable to continue
    - cycles of "No Shock Advised" followed by 2 minutes of CPR have been ongoing for 30 minutes without even the temporary return of a pulse in patients with normal temperatures **(not hypothermic)**

      after 30 minutes resuscitation efforts may be stopped:
      - ♦ *follow the procedure outlined in the Reference and Training Manual on page 368 – Appendix B – Fatalities*
    - spontaneous circulation and breathing are restored

***Note**: in the case of a hypothermic patient in cardiac arrest:*
- *assess pulse and respiration for 1 minute*
- *attach the AED*
- *administer 1 shock if advised*
- *keep the patient warm*
- *prepare the spine board*
- *move the patient onto the spine board*
- *secure the patient with 2 straps*
- *place a sandbag on either side of the head*
- *load and secure the spine board into a basket stretcher*
- *initiate transport*
- *continue CPR enroute if possible*
  turn up the heat in the transport vehicle to help warm the patient

PARTICIPANT PRACTICE 11-05

Manage cardiac arrest with two rescuers (AED immediately on scene)

manage a supine patient in cardiac arrest	
1. scene assessment	*no danger* *one worker* *patient was found slumped over in a chair and was carefully positioned on floor by co-workers*
2. 1st Attendant – approach the patient from the front, identify yourself and attempt to communicate with the patient	*the patient does not respond to verbal stimuli* ***this patient is in the RTC***
3. 2nd Attendant – activate the worksite emergency response procedures • if calling for the ambulance instruct the person to say there is an unresponsive adult and to report back	***Note****: it is important for the team of Attendants to communicate with each other regarding findings and actions*
4. 1st Attendant – open the airway with a head-tilt chin-lift and check for breathing	*there is no breathing* *(the need for C-spine control and jaw thrust will depend on the mechanism)*
5. 1st Attendant – move one hand up to the neck, while maintaining the head-tilt, and assess for a carotid pulse	*there is no pulse*
6. 2nd Attendant – instruct a helper to update the ambulance that the worker is in cardiac arrest	
7. 1st Attendant – start CPR • expose the chest as necessary • place hands in the centre of the chest, between the nipples, interlock fingers, lock elbows and start chest compressions	***Note:*** *if the cardiac arrest was caused by drowning, 2 ventilations would be given before starting compressions*

8. 2nd Attendant – prepare and attach the AED:	
• prepare the patient's chest for the AED pads, work around the Attendant doing the compressions	*patient's chest is dry* *there is no chest hair* *there are no medication patches or any implanted medical devices*
9. 2nd Attendant – analyze the heart rhythm:	
• instruct the 1st Attendant: "stop compressions and don't touch the patient"	
• ensure no one is touching the patient and everyone is standing clear	
• follow voice prompts or press the analyze button	*the AED gives a "Shock Advised" prompt*
10. 2nd Attendant – deliver a shock:	***Note:*** *if a "No Shock" prompt was given then 2 minutes of CPR is administered before the heart rhythm is re-analyzed*
• **state** "I'm clear, everyone is clear, do not touch the patient"	
• press the shock button if the AED advises	
11. 2nd Attendant – begin compressions	
12. 1st Attendant – using a pocket mask, ventilate the patient once every 6 to 8 seconds timed with the recoil phase of the compressions	*air goes in* *1 second per breath, just enough to see the chest rise*
• between ventilations insert an oral airway and apply oxygen	
• switch to the bag-valve mask for the ventilations with the oxygen at 15 lpm	
13. after 2 minutes of CPR follow voice prompts to allow the AED to re-analyze the heart rhythm	

14. switch positions after each cycle and repeat cycles of analyze/shock or no shock and 2 minutes of CPR until:

    - a physician assumes responsibility
    - patient is transferred to ambulance personnel
    - the attendant is physically exhausted and unable to continue
    - cycles of "No Shock Advised" followed by 2 minutes of CPR have been ongoing for 30 minutes without even the temporary return of a pulse in patients with normal temperatures **(not hypothermic)**

      after 30 minutes resuscitation efforts may be stopped:
      - ♦ *follow the procedure outlined in the Reference and Training Manual on page 368 – Appendix B – Fatalities*
    - spontaneous circulation and breathing are restored

***Note**: in the case of a hypothermic patient in cardiac arrest:*
- *assess pulse and respiration for 1 minute*
- *attach the AED*
- *administer 1 shock if advised*
- *keep the patient warm*
- *prepare the spine board*
- *move the patient onto the spine board*
- *secure the patient with 2 straps*
- *place a sandbag on either side of the head*
- *load and secure the spine board into a basket stretcher*
- *initiate transport*
- *continue CPR enroute if possible*
  turn up the heat in the transport vehicle to help warm the patient

SUMMARY

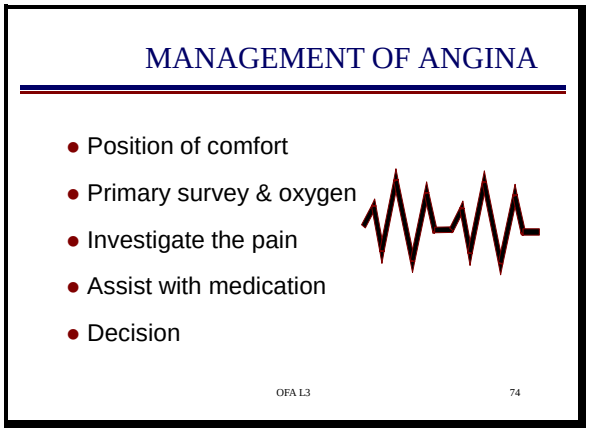
the attendant must be able to recognize and manage cardiac emergencies

questioning should be thorough enough to gather all the relevant information about the patient's symptoms

chest pain can be a symptom of angina or heart attack

- with angina the pain:
  - ♦ is relieved by rest and oxygen
  - ♦ usually lasts less than 15 minutes.
- with a heart attack the pain:
  - ♦ is not relieved by rest, oxygen or nitroglycerin
  - ♦ lasts longer than 30 minutes.

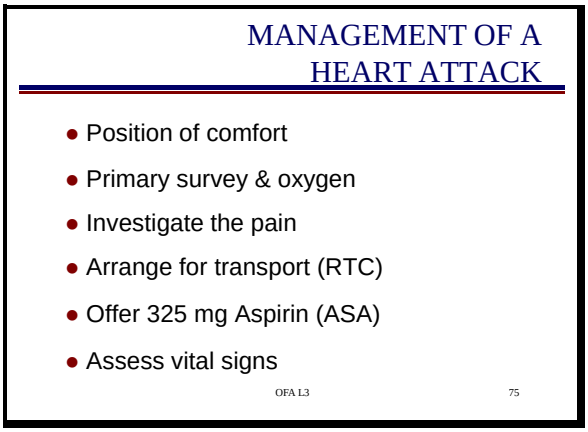
the management for angina follows the priority action approach and includes:



- place the patient in a comfortable position
- perform a primary survey and apply oxygen at 10 lpm
- investigate the pain because there is no history of trauma - question the patient using the PPQRRST mnemonic
- assist the patient in taking nitroglycerin medication, if required
- patients with chest pain, not relieved by nitroglycerin, rest and oxygen, are in the RTC

- known angina conditions, where pain is relieved by taking medication and rest, may be able to return to work depending on the type of tasks involved - this may require discussion with the supervisor

the management for heart attack follows the priority action approach and includes:



- position the patient for comfort
    - ♦ do not allow the patient to move unassisted
    - ♦ keep the patient as quiet and calm as possible
- conduct a primary survey
    - ♦ and administer oxygen at 10 lpm
    - ♦ keep the patient comfortably warm
- investigate the pain
    - ♦ question the patient using the PPQRRST mnemonic
- all patients with suspected heart attacks are in the RTC
- offer the patient two 80 mg of chewable ASA or one regular adult strength 325 mg ASA tablet to chew if available (not Ibuprophen or Acetaminophen)
- assess and monitor vital signs (en route or while waiting for transport)

The management for cardiac arrest is the delivery of good quality CPR until an Automated External Defibrillator is available

REVIEW READING FROM LESSONS 1 – 11 FOR LESSON 12

Name: _____

Assignment Answer Sheet

	A	B	C	D
1.	[ ]	[ ]	[ ]	[ ]
2.	[ ]	[ ]	[ ]	[ ]
3.	[ ]	[ ]	[ ]	[ ]
4.	[ ]	[ ]	[ ]	[ ]
5.	[ ]	[ ]	[ ]	[ ]
6.	[ ]	[ ]	[ ]	[ ]
7.	[ ]	[ ]	[ ]	[ ]
8.	[ ]	[ ]	[ ]	[ ]
9.	[ ]	[ ]	[ ]	[ ]
10.	[ ]	[ ]	[ ]	[ ]