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Participant Handbook

Customised Crash Course Programme for COVID Warriors

Sector
Healthcare

Sub-Sector
Allied Health & Paramedics

Occupation
COVID Frontline Worker
(Emergency Care Support)

Reference ID - **HSS/Q2303, Version 1.0**
NSQF Level 4

COVID Frontline Worker
(Emergency Care Support)

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This Participant Handbook is designed to skill individuals for emergency care of patient during COVID pandemic by selecting required competencies, appropriately from Participant Handbook of Emergency Medical Technician- Basic, HSS/Q2301, version1.0.

> Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

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Certificate

COMPLIANCE TO

QUALIFICATION PACK - NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

HEALTHCARE SECTOR SKILL COUNCIL

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/ Qualification Pack: **"COVID Frontline Worker (Emergency Care Support)"** QP No. **"HSS/Q2303, NSQF Level 4"**

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HSSC dedicates this book to youth of the country who desire to come forward to fight COVID 19 and learn specialized skills, an invaluable asset for providing the care while making a career in the Healthcare Sector and wish to be part of the most Noble profession of saving lives.

About this Book

This Participant Handbook is designed to enable training for the specific Qualification Pack(QP). Each National Occupational (NOS) is covered across Unit/s.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS.

- Discuss the difference between disease outbreak, epidemic and pandemic
- Identify correct behavioural practices to be followed to prevent self-infection and spread of the disease to a certain extent
- Explain social distancing, self-quarantine and self-isolation
- Identify potential fomites and personal protective equipment (PPE) to be used at workplace
- Describe common practices and guidelines pertaining to management of waste, measures for dealing with stress and anxiety, and procedure of reporting symptoms
- Respond to emergency calls
- Size up the scene at the site
- Follow evidence based protocol while managing patients
- Assess patient at the site
- Patient triage based on the defined clinical criteria of severity of illness
- Manage cardiovascular emergency
- Manage cerebrovascular emergency
- Manage respiratory emergency
- Manage mass casualty incident
- Select the proper provider institute for transfer
- Transport patient to the provider institute
- Manage patient handover to the provider institute
- Collate and communicate health information
- Monitor and assure quality

Symbols Used


Key Learning


Tips


Steps


Exercise


Unit Objectives


Practical

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1. Health & Hygiene

Unit 1.1 – General Practices for an Outbreak/Pandemic

Unit 1.2 – Safety and Sanitisation Guidelines

Unit 1.3 – Other Common Practices & Guidelines

HSS/N9622

Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss the difference between disease outbreak, epidemic and pandemic
2. Identify correct behavioural practices to be followed to prevent self-infection and spread of the disease to a certain extent
3. Explain social distancing, self-quarantine and self-isolation
4. Identify potential fomites and personal protective equipment (PPE) to be used at workplace
5. Describe common practices and guidelines pertaining to management of waste, measures for dealing with stress and anxiety, and procedure of reporting symptoms

UNIT 1.1: General Practices for an Outbreak/Pandemic

Unit Objectives

After having studied this module, the learner will be able to:

1. Differentiate between disease outbreak, epidemic and pandemic
2. Explain the rules and guidelines for epidemic/pandemic
3. Distinguish between self-quarantine and self-isolation
4. Discuss norms for maintaining social distance during a pandemic

1.1.1 Disease Outbreaks, Epidemics and Pandemics

What is a Disease Outbreak?

The term 'outbreak' means 'sudden breaking out' or 'occurrence' of a disease, or anything unpleasant. Disease outbreak specifically refers to a sudden occurrence and exponential rise of a disease beyond anyone's expectation and across any community, geogra phical area, or a country.

Disease outbreak is often caused by an infection which is transmitted to a person from another person, animal, environment or any other source. It may also be caused due to exposure to chemicals or radioactive materials. However, there are times when the cause of outbreak remains unknown. In fact, there is no certainty about the duration of a disease outbreak, for it may last a few days, weeks, months, or even years.

As per the World Health Organisation (WHO) data, disease outbre ak happens every year in the form of influenza or the like in different parts of the world. At times, even a single case of an infectious disease is enough for it to be categorized as an outbreak. This is more so in case of a rare disease or that which has serious public health implications, for example, foodborne botulism.

DDT or mercury related diseases are examples of chemical related outbreaks, for example, Zika outbreak in 2015. Aedes mosquito spread the Zika virus in Brazil, America and South East Asia. It caused brain anomalies in the new borns when pregnant women were infected. Most of these infections were asymptomatic.

What is an Epidemic?

Epidemic refers to an infectious disease that spreads actively and substantially across a specific location affecting large number of people within a short span. In fact, epidemics of 21st century are observed to be spreading more rapidly to far off regions than others.

For example, no one had heard of Severe Acute Respiratory Syndrome (SARS) before 2003, but it affected over 8,000 people and killed one out of ten of them. Similarly, epidemic of Middle East Respiratory Syndrome (MERS) across Middle East in 2012 -2013, and the Ebola epidemic in West Africa in 2014 caused fear and panic as well as inflicted massive damage to the economy. Ebola epidemic of 2014 was a viral haemorrhagic fever caused by the Ebola virus. It spreads from infected bats and fluids of infected humans. It was located in the Sub-Saharan Africa mainly.

What is a Pandemic?

When an epidemic spreads across various countries, it becomes pandemic. It affects larger number of people across the globe, causing greater number of deaths as compared to an epidemic. In addition to adversely affecting people, it has a drastic impact on the economy at large. Since pandemics pose far greater challenge than disease outbreaks and epidemics, the measures undertaken to deal with them are quite stringent, such as partial or complete lockdown imposed during covid 19 in 2020.

Influenza pandemic have been the most widely reported. There have been five of them in the past 140 years-the most severe was in 1918 (Spanish flu) and the most recent being the swine flu (2009). It happens when a new strain of the influenza virus is transmitted from any animal species to humans.

The following figure shows some key highlights of a pandemic:

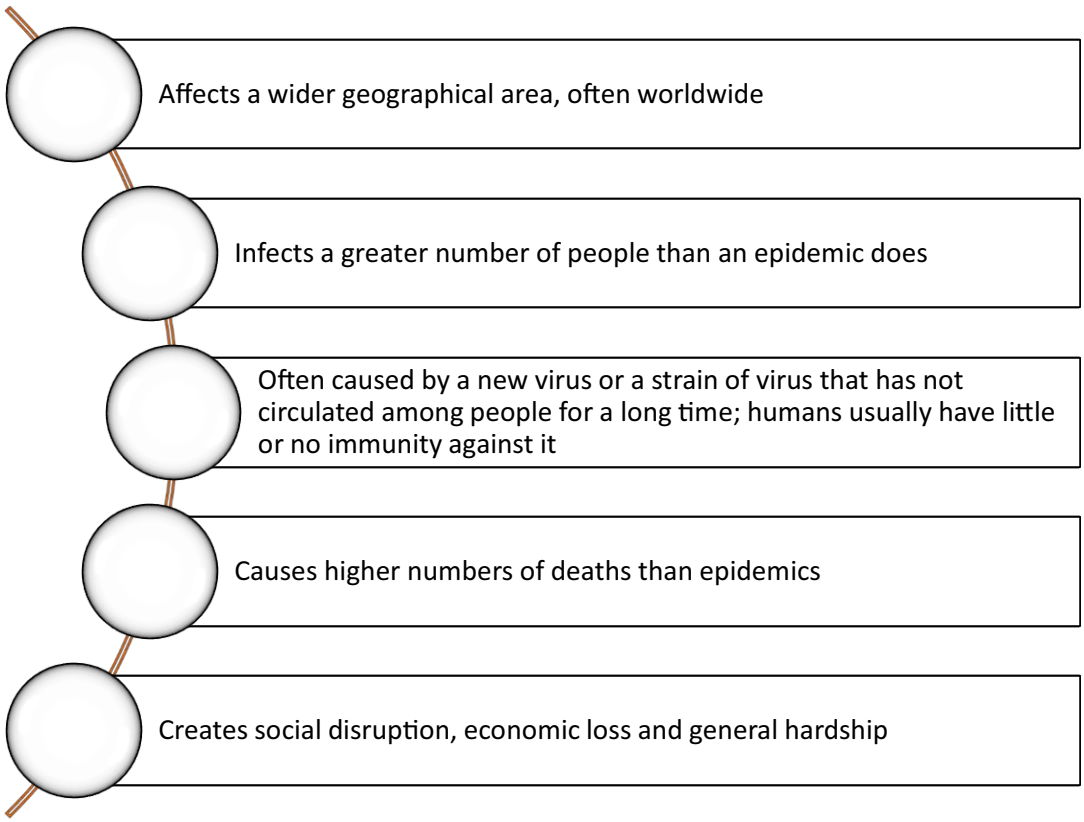

Fig. 1.1.1: Key highlights of a pandemic

1.1.2 Rules and Guidelines during Epidemic/Pandemic

As explained earlier, epidemics and pandemics have a tremendous impact on a large population—across a specific location or various countries respectively. The most significant defence against the outspread of disease is rules and guidelines. It is imperative to adhere to these guidelines for prevention and control of disease. However, first one needs to understand how the viruses/pathogens spread in humans though different means.

The spread of viruses/pathogens in humans is shown in the following figure:

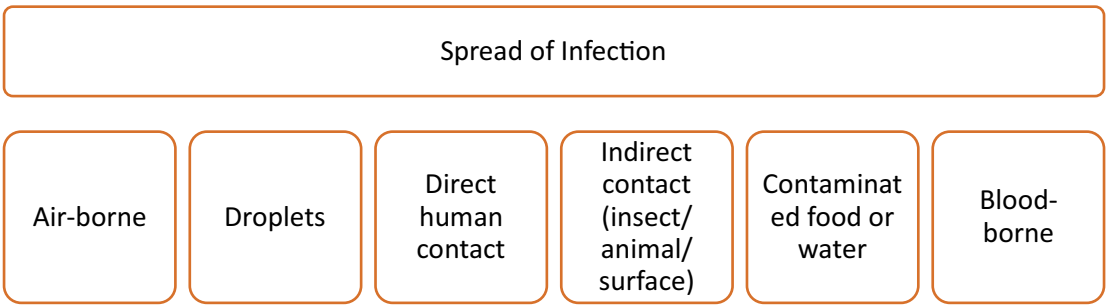

Fig. 1.1.2: Spread of infection

There are four main guidelines to be followed during an epidemic/a pandemic, as shown in the following figure:

Fig. 1.1.3: Guidelines to be followed during epidemic/pandemic

Personal Hygiene

Personal hygiene is significant for prevention of infectious diseases and promotion of overall well-being. It refers to self-care practices for maintaining cleanliness at personal level and preserving health. These practices include bathing every day, washing hands with soap, wearing clean clothes, brushing teeth, grooming and so on. Personal hygiene entails maintaining not only cleanliness but also healthy habits as preventive measures for safeguarding oneself from catching any infection. It becomes all the more important to follow these practices during epidemics and pandemics as the nature of the disease is infectious, i.e., it spreads by coming in contact with infected people or things. Therefore, maintaining personal hygiene is not an option but a compulsion to secure oneself from becoming vulnerable to any infection.

Some points for maintaining personal hygiene are shown in the following image:

Fig. 1.1.4: Maintaining personal hygiene

Hand Hygiene at Workplace

At work, our hands are exposed to all types of surfaces during the day, as everything we do involves hands in one way or the other—be it when shaking hands with people, eating meals, working on laptop, using mobile phone or common landline phone and so on. This makes them prone to various germs and viruses that can lead to sickness. It is for this reason that proper hand washing is on the top of personal hygiene routine. In fact, it is also one of the simplest and most effective ways to protect oneself and family members from falling prey to illnesses such as cold, cough, flu and gastroenteritis (these can all be contracted or passed on through poor hand hygiene). It is imperative to follow proper hand washing techniques at home and workplace to prevent the spread of diseases.

Some key highlights of maintaining hand hygiene at workplace are shown in the following figure:

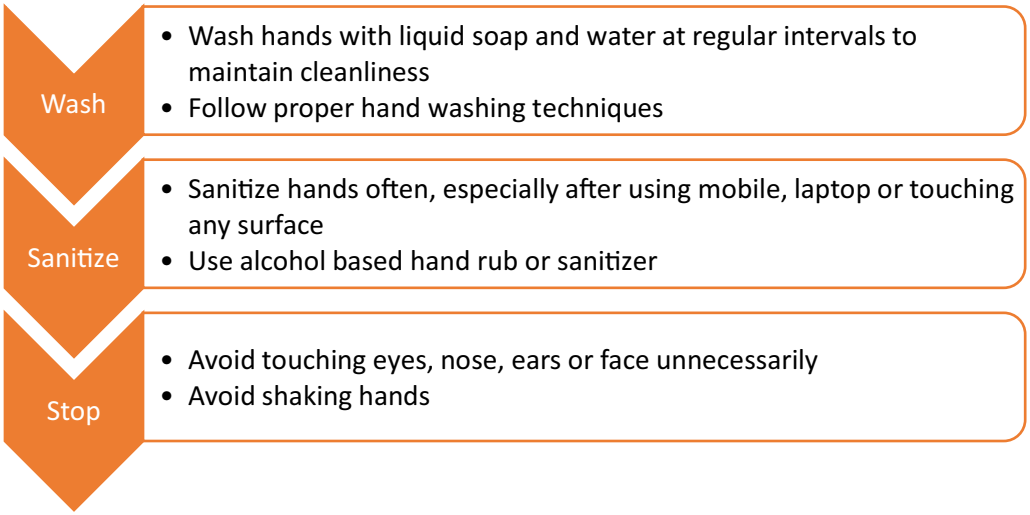

Fig. 1.1.5: Maintaining hand hygiene at workplace

Steps

The detailed process for maintaining hand hygiene using different commodities is shown in the following set of images:

Fig. 1.1.6(a): Maintaining hand hygiene with soap and water

Fig. 1.1.6(b): Maintaining hand hygiene with alcohol-based sanitizers

Respiratory Hygiene

As the name suggests, respiratory hygiene is all about undertaking preventive measures to prevent the transmission of infection via the respiratory tract. It helps reduce the spread of viruses and pathogens, especially during epidemic or pandemic of an infectious disease.

The effective practices to maintain respiratory hygiene at workplace are shown in the following figure:

Cough/Sneeze Etiquette	Face Masks
• Cough or sneeze in the elbow • Use tissues to clean after coughing/sneezing	• Wear appropriate face mask at work place • Avoid touching face and mask unnecessarily • Dispose it off properly in closed bins after use

Fig. 1.1.7: Maintaining respiratory hygiene at workplace

The cough/sneeze etiquette is shown in the following image:

Fig. 1.1.8: Cough and sneeze etiquette

Guidelines for using face masks are given in the following figure:

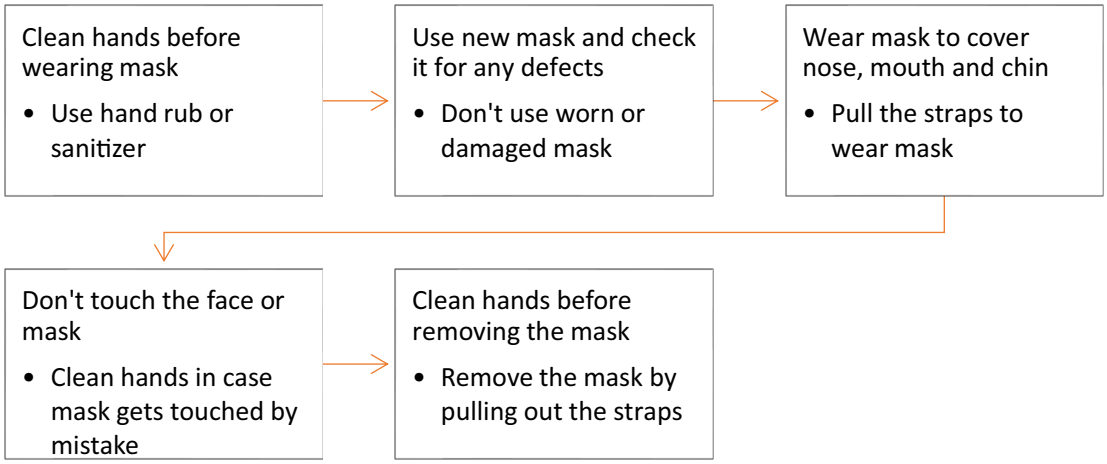

Fig. 1.1.9: Guidelines for using face masks

Steps

The following image shows steps to wear and dispose a surgical mask:

Fig. 1.1.10 (a): Wearing a surgical mask

Steps

The following image shows steps to wear a non-surgical mask:

Fig. 1.1.10 (b): Wearing a non-surgical mask

Types of Face Masks

Face masks play a significant role in protecting the wearer from catching any kind of infection. There are mainly two types of masks, namely, medical masks and non-medical masks (fabric masks) but there are different styles as shown in the following image

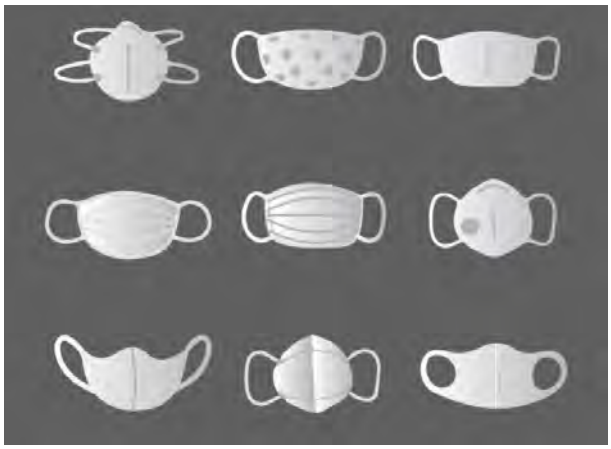

Fig. 1.1.11: Types of face masks

Face masks are worn to protect the wearer and the people surrounding him/her from infection that is carried in the droplets sprayed from coughing, sneezing and talking. They are typically worn to cover the nose and the mouth. There are many types of face masks available and they can be broadly divided into those worn by the healthcare staff and those worn outside a hospital.

Masks worn by non-healthcare givers are largely to protect themselves from dust and microbes. The protection offered depends on the material used and the number of layers. Some common types of masks used by people when they step out of the house are shown in the following images:

Cloth Masks

Surgical Masks

N95 Masks

Fig. 1.1.12: Common type of face masks worn in public place or workplace

Cloth Masks – A simple bandana made of cotton may be fashionably apt but offers virtually no protection from disease bearing droplets. Neck gaiters and balaclavas are effective only if made of cotton. Masks made of synthetic material may lead to more harm than good. There are anecdotal reports of masks made from old T shirts, but these are also equally non effective. For a cloth mask to be effective it shoul d be made of tightly woven 100% cotton and sewn in three layers. Adding a polypropylene filter (which carries an electrostatic charge to trap small particles) can increase the filtration efficiency of a cloth mask to up to 70%. These are reusable masks and should be washed daily after use.

Surgical Masks – These are flat thin paper like masks which filter out 60% of inhaled particles. It provides barrier protection against large droplets but does not have an airtight seal. They are of single use type and should be discarded after each use. When a middle layer of melt blown yarn and a nose clip is added, they are effective in filtration of approximately 95 % of particles.

N95 Masks – These are personal protective devices and are made of melt blown yarn. They are able to filter out 97% of air borne particles. They are tight-fitting masks and have to be worn carefully lest some leakage occurs. People suffering from respiratory distress should not use an N 95 mask. They can be reused a number of times provided proper sanitizing methods are used to disinfect the masks. Masks that have a valve protect the user from the air borne particles that are outside but do not protect the people surrounding the user if he/she is infected.

Social Distancing

We come in contact with people at work place who could be asymptomatic carriers of infection, which makes us all vulnerable unknowingly. An asymptomatic person is someone who shows no symptoms is spite of being infected. In certain cases, even the infected person does not know that he or she is infected without symptoms and is a potential carrier of infection.

Something as simple as talking, coughing or sneezing is enough to spread the infection from an infected person to others. It so happens that tiny droplets that are sprayed while talking, coughing or sneezing may contain virus that is transmitted to the person close by.

That is why social distancing becomes all the more important. Social distancing simply means maintaining physical distance of at least 1 meter (3 feet) from others. It is an effective preventive measure to protect oneself from catching any infectious disease from an infected person. This helps to slow down the spread of disease and safeguard those who are not infected.

The following image shows the sitting arrangement ideal for maintaining social distancing:

Fig. 1.1.13: Social distancing at workplace

Workplace Hygiene

Workplace hygiene is as important as personal hygiene. It has various verticals spanning the work area, meeting etiquette and so on, and has a significant role in prevention of a disease outbreak. It not only helps in keeping oneself safe but also protects others and the environment.

Some key points for maintaining workplace hygiene are given in the following figure:

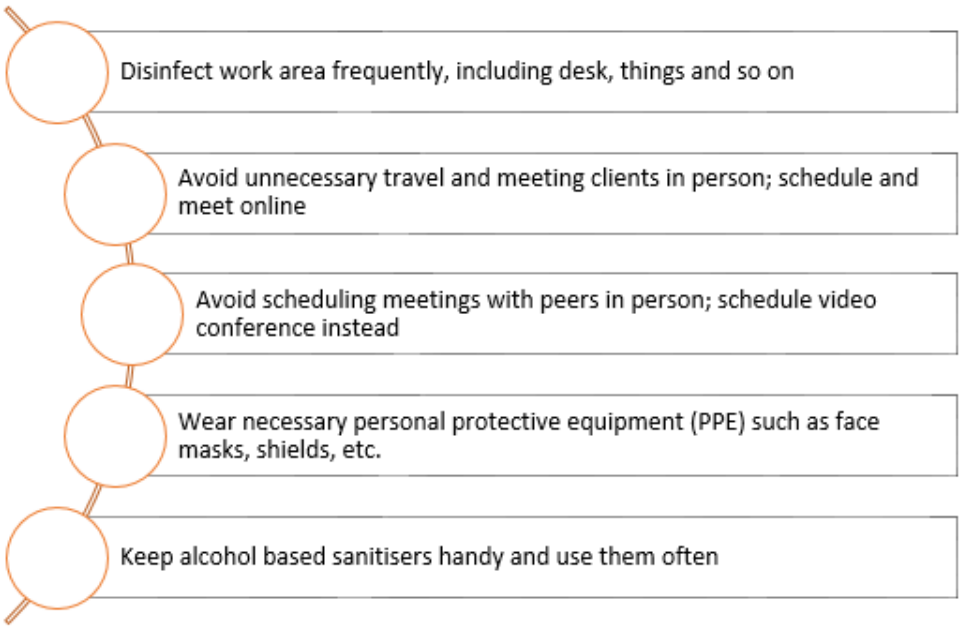

Fig. 1.1.14: Maintaining workplace hygiene

The following figure summarises the do's and don'ts to be practiced at workplace:

Do's

- Use non-contact greeting methods
- Clean hands at the door and keep washing hands regularly
- Disinfect surfaces such as doorknobs, tables and desks regularly
- Stay home if you are feeling sick
- Stay at home if anyone in your family is sick
- Use video conferencing instead of physical meetings
- Ensure you meet people in well-ventilated rooms and spaces

Don'ts

- Shake hands when meeting someone
- Touch your face and leave your mouth uncovered while coughing and sneezing
- Travel unnecessarily
- Get too much stressed if work is not going as planned
- Feel lonely and depressed; instead ensure you talk to people who will uplift your mood

Fig. 1.1.15: Good practices while moving out of home

1.1.3 Self-quarantine vs. Self-isolation

Several preventive measures are undertaken during an epidemic or a pandemic to contain the spread of the disease. Self-quarantine and self-isolation are two such effective ways to prevent the transmission of infection from an infected person to non-infected persons. Both of them are based on social distancing on a broader level, for in both the instances an individual needs to separate oneself from others for a certain period. However, although they are similar, there is a difference between the two.

What is Self-quarantine?

Self-quarantine entails isolating oneself at home or any other place for a period of minimum fourteen days or so. It is meant for people who have been exposed to someone infected with the virus, have travelled during an epidemic/a pandemic, have attended any public gathering, or have been amidst a crowd. If a person has been in any of the above or similar situation then it is not an option but mandatory as per the guidelines that he or she should self-quarantine to prevent any infection or disease from spreading further. If any of the symptoms of infection begin to develop, then the person should contact a medical provider on a priority basis and follow the advice.

What is Self-isolation?

Self-isolation also entails isolating oneself at home or any other place for a period of seventeen days or so. However, it is meant for people who have already tested positive for the virus/infection that has led to the epidemic/pandemic. This is the key difference between self-isolation and self-quarantine. In this case, the person has already caught the infection and needs to isolate to contain the spread of the virus and recover from the disease.

Every disease outbreak, epidemic or pandemic has certain signs and symptoms. For example, in case of Covid 19, symptoms entail fever, cold, cough, shortness of breath and so on. It is recommended to go for the test in case of development of any of these symptoms and follow the advice of the medical provider. As long as the symptoms are manageable, it is often advised to self-isolate at home, but in case of severe complications, the individual is admitted to the hospital.

Both, self-quarantine and self-isolation, involve maintaining personal hygiene and adhering to the guidelines as given in the following figure:

Stay in a well-ventilated room
Restrict movement
No direct contact or face to face interaction with anyone
Wear face masks to prevent the spread of virus
Keep your utensils and belongings separate
Stock up your essentials or go for contactless delivery
Stay active by doing some exercise or yoga

Fig. 1.1.16 (a): Guidelines for self-quarantine and self-isolation

Guidelines for environmental sanitation during self-quarantine and self-isolation are mentioned in the following figure:

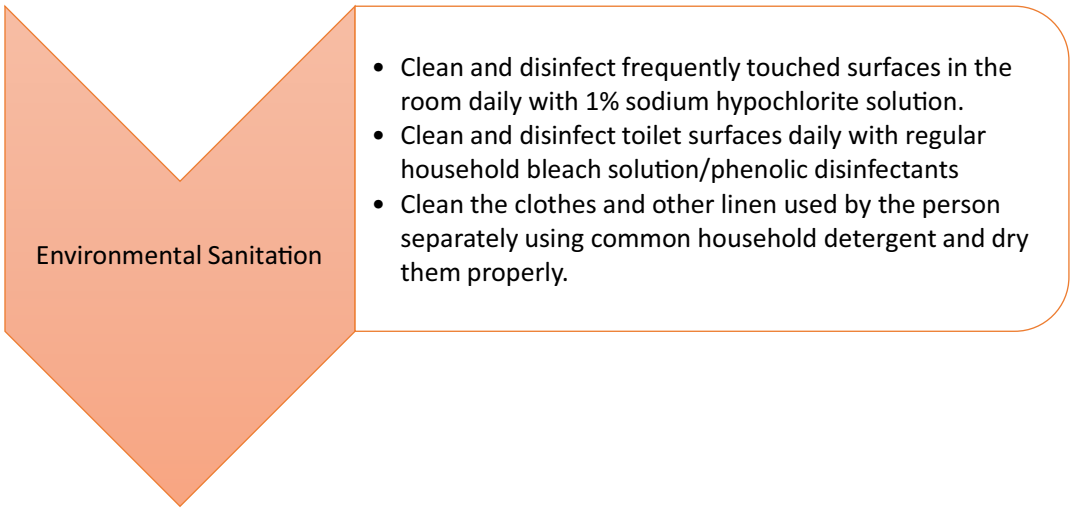

Fig. 1.1.16 (b): Environmental sanitation guidelines for self-quarantine and self-isolation

1.1.4 Social Distancing

As explained earlier, social distancing refers to maintaining physical distance of at least 1 meter (3 ft.) between oneself and others. It also entails not going out in crowded areas or public gatherings during a disease outbreak, an epidemic, or a pandemic. Social distancing combined with strict adherence to personal hygiene routine, respiratory hygiene and workplace hygiene is highly effective in containing the spread of infections/diseases.

Why Practice Social Distancing?

Social distancing protects those who are not infected, as it limits the opportunities of coming in contact with contaminated surfaces or infected people, especially outside home. It is all the more effective in case the epidemic is caused due to a communicable disease, for in such cases the virus can spread from the infected person to other people through droplets of cough or sneeze. The best defence is to wear appropriate face mask and maintain social distance during all interactions, even at home.

Some tips for social distancing are shown in the following figure:

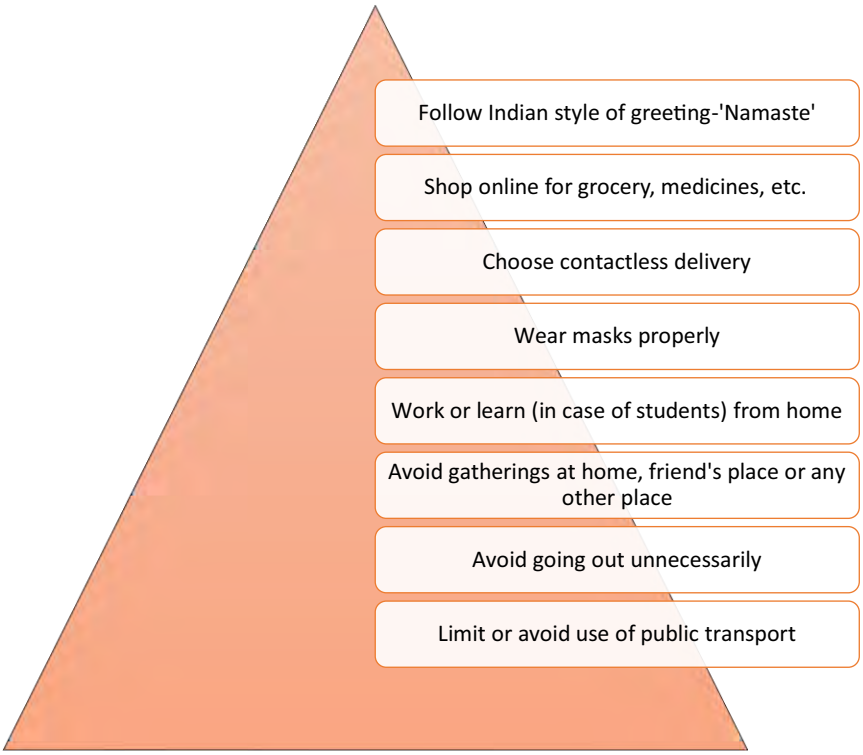

Fig. 1.1.17: Social distancing tips

Some practices while meeting people out of home are shown in the following image:

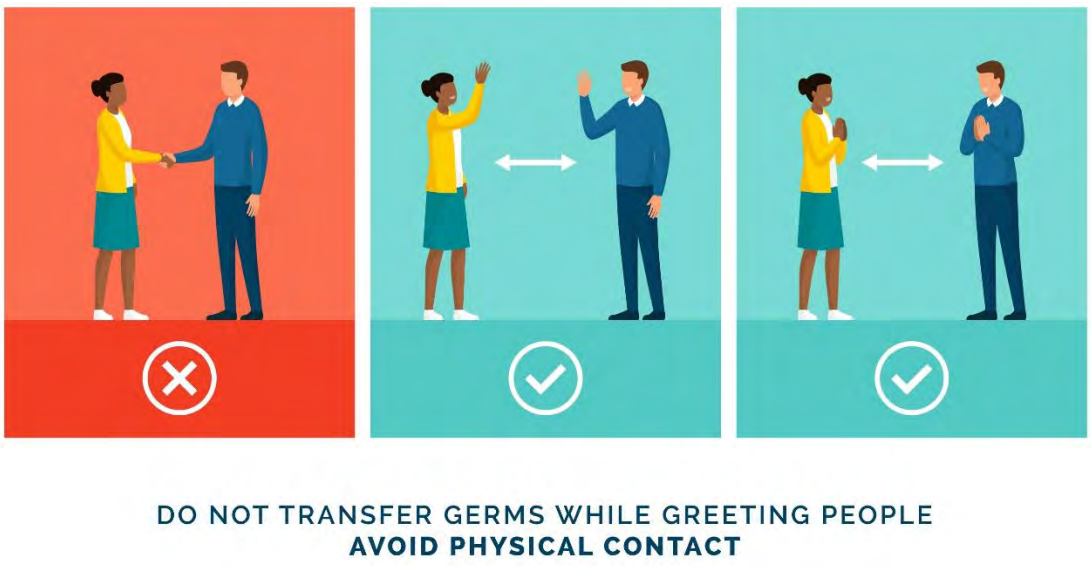

Fig. 1.1.18: Greeting while avoiding physical distance

Tips

Key distinction between a disease outbreak, an epidemic and a pandemic is in terms of geographical area it spreads across ranging from a community to a country or countries.

Self-quarantine and self-isolation are two effective ways to prevent the transmission of infection from an infected person to non-infected persons.

Social distancing combined with strict adherence to personal hygiene routine, respiratory hygiene and workplace hygiene is highly effective in containing the spread of infections/diseases.

Activity

1. Identify which of the following statements are true or false.
   a. Disease outbreak, epidemic and pandemic are all same types of infection outbreaks.
   b. Non-surgical mask is a substitute of surgical mask.
2. If soap and water are not available, one can clean hands with which of the following?
   a. Tissues
   b. Cloth
   c. Sanitizer
   d. Surf
3. Personal hygiene includes which of the following?
   a. Hand hygiene
   b. Workplace hygiene
   c. Social distancing
   d. Work from home

Role Play

1. Inspect adherence to social distancing at workplace

Team Activity

1. Demonstrate ways to maintain social distancing at work place

Practical

1. Demonstrate how to wear mask properly
2. Demonstrate hand washing technique

UNIT 1.2: Safety and Sanitisation Guidelines

Unit Objectives

After having studied this module, the learner will be able to:

1. Discuss personal and workplace hygiene practices
2. Explain potential fomites at workplace
3. Describe appropriate use and disposal of Personal Protective Equipment (PPE)

1.2.1 Personal & Workplace Hygiene Practices

Good personal hygiene is an effective means to protect oneself and others from illnesses in general and catching infection during a disease outbreak, an epidemic or a pandemic. Personal hygiene entails adopting healthy practices to upkeep personal cleanlin ess and appearance. It is often mistaken to be akin to cleanliness but it is much broader than that as it includes habits required to maintain health and wellbeing. These practices include washing hands, sanitising hands, bathing, oral care, self-care and so on. In case of people who do not adhere to personal hygiene routine on a regular basis, their body becomes a breeding ground for all types of germs and viruses.

Hand hygiene is an essential part of maintaining personal hygiene. Our hands are the potent ial carriers of viruses as they are exposed to all types of surfaces and used for carrying out all the tasks during the day. In fact, it is no exaggeration to mention that personal hygiene routine begins with hand hygiene. Keeping them clean and healthy is of prime importance as this would safeguard oneself and others from infections and illnesses.

Washing hands is the quickest and simplest way to get rid of viruses, protect oneself and others, and prevent diseases from spreading. Hand hygiene routine has already been explained in detail in the previous unit. Here we shall learn about when and how to wash hands to stay healthy.

The following images show hand washing techniques:

Fig. 1.2.1: Hand Washing Technique

Fig. 1.2.2: Washing hands with soap and water

Steps

The following figure shows the steps to wash hands properly:

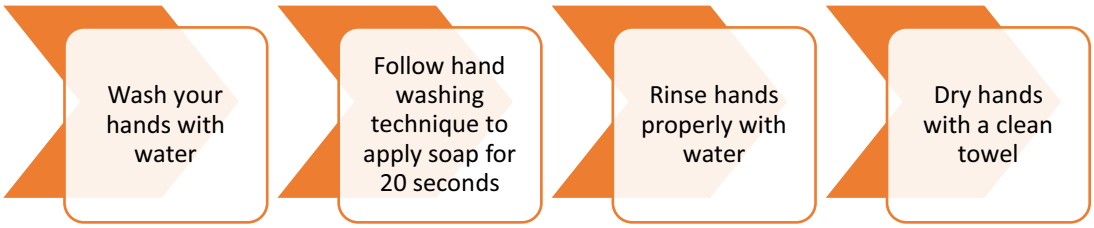

Fig. 1.2.3: Steps to wash hands properly

The Centers for Disease Control and Prevention (CDC) recommend washing hands at certain times, as shown in the following figure:

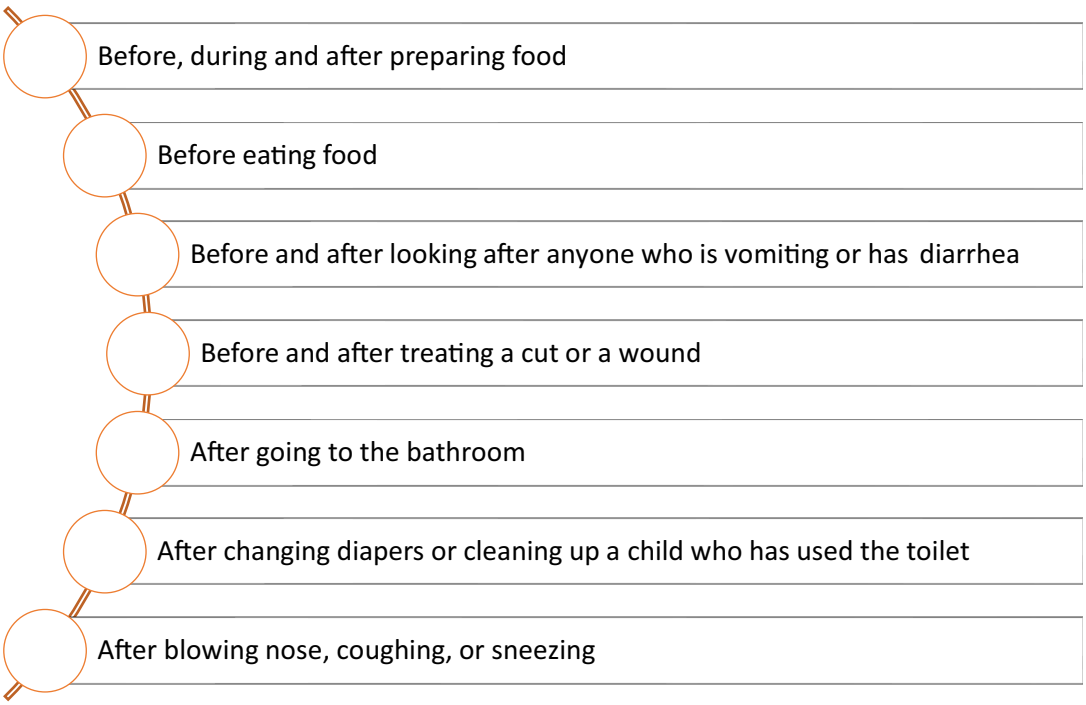

Fig. 1.2.4: Key times to wash hands as recommended by CDC

If soap and water are not available, one must use alcohol-based sanitiser (containing at least 60% alcohol). Although cleaning hands with sanitisers is not a substitute for cleaning them with soap and water, but in case they are not available or one needs to clean hands when not dirty, sanitisers are a good alternative. They help in reducing germs and viruses but don't eliminate them completely, and thus they are less effective in case of dirty or greasy hands.

The following image shows how to use a hand sanitiser:

Fig. 1.2.5: Use of hand sanitiser

Steps

The following figure shows the steps to use sanitiser for cleaning hands:

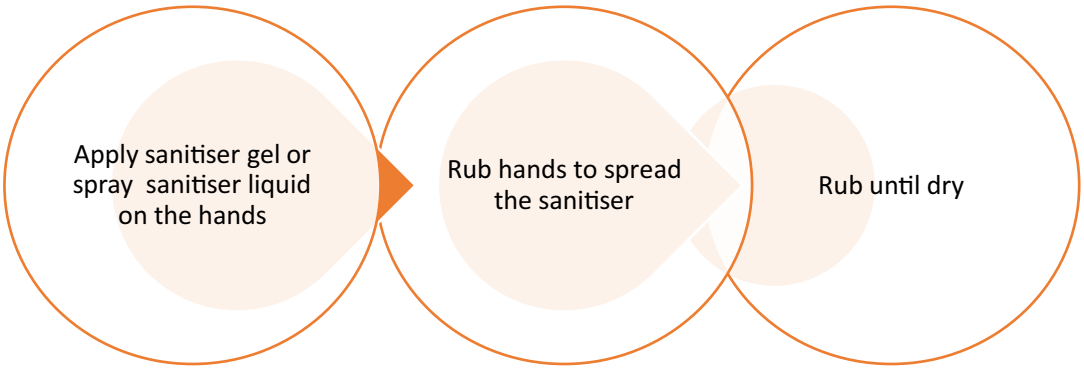

Fig. 1.2.6: Steps to sanitise hands properly

Personal hygiene should extend to workplace, which is all about keeping the work area clean, tidy and disinfected. This would be required more frequently and regularly during an epidemic or a pandemic. It so happens that often personal hygiene gets priority over workplace place hygiene, whereas both should get equal importance. If required one must modify the setting of the work area to facilitate social distancing and wear necessary PPE as per the profile of the job. In case the work entails meeting the public, then in addition to facemask one must use face shield and sanitiser after any kind of exchange with a person.

In addition to wearing necessary PPE such as masks, gloves and shields, cleaning and disinfecting the work area is also important. It should be carried out with a solution containing 1% sodium hypochlorite disinfectant and a disposable cleaning cloth. Ensure to disinfect the frequently used devices such as laptop, mobile, mouse and so on.

Steps

The following figure shows the steps to perform cleaning and disinfection of work area:

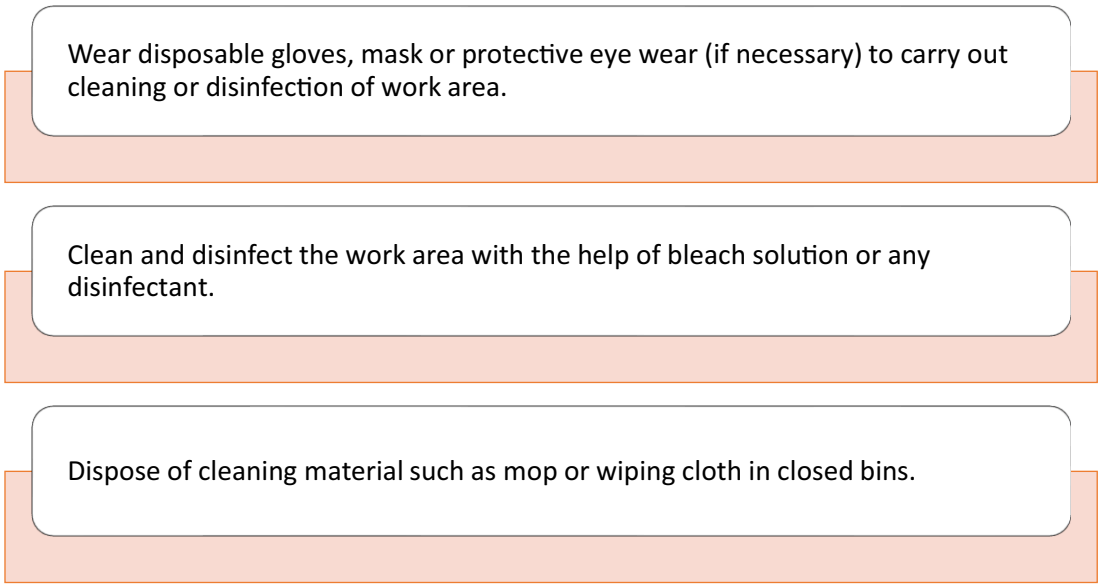

Fig. 1.2.7: Steps to perform cleaning and disinfection of work area

1.2.2 Potential Fomites at Workplace

Fomites refer to all those objects or surfaces that can become contaminated with viruses when touched by an infected person and can further transmit the infection to those who touch the surfaces next. It is all the more important to clean and disinfect fomites as viruses and germs survive for hours or even months on these surfaces, if not cleaned. Example of fomites include doorknobs, light switches, remote controls, elevator buttons and so on.

Fomites are not just pertinent with respect to disease outbreak, epidemic or pandemic but even in normal circumstances these fomites lead to rapid indirect transmission of viruses, leading to spread of communicable diseases. Thus, cleaning and disinfection of these fomites with a disinfectant solution must be carried out on frequent basis for a healthy workplace environment. Any lapse can be a threat to the health of one and all. Moreover, on a personal level, one can ensure not to touch these surfaces directly but to use any disinfectant tissue or wipe and dispose of it immediately in a closed bin.

A list of potential fomites at workplace is shown in the following figure:

Potential fomites at workplace	Common areas such as pantry, printing stations, etc.
	Vending machines, coffee mug handles, etc.
	Conference or meeting rooms
	Door handles or doorknobs
	Electronic devices such as laptops
	Telephone receivers
	Elevator buttons
	Desks or countertops

Fig. 1.2.8: Potential fomites at workplace

The following image shows cleaning and disinfection of workstation:

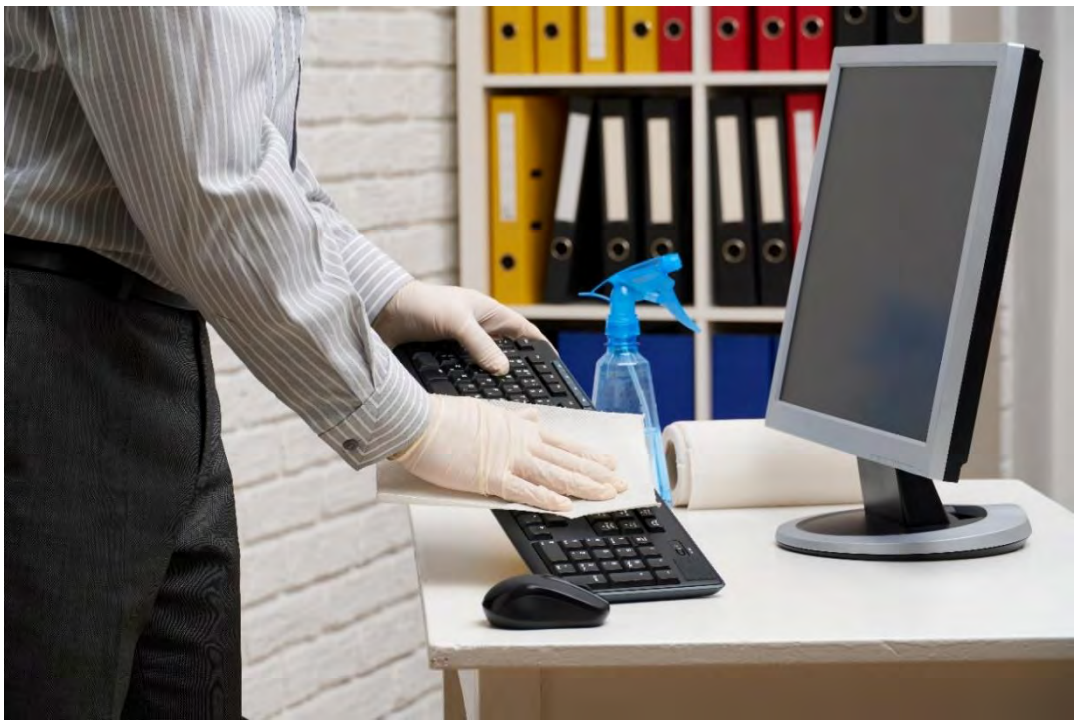

Fig. 1.2.9: Disinfecting workstation

Following image shows cleaning and disinfection of mobile:

Fig. 1.2.10: Disinfecting mobile

1.2.3 PPE to be used at Workplace

PPE refers to protective facemasks, gloves, clothing, helmets, face shields, eye protective wear or other equipment designed to protect the wearer from the spread of infection or illness. PPE should be used in combination with other recommended preventive measures such as maintaining personal hygiene, respiratory hygiene and social distancing, for lack of doing so makes the person vulnerable to viruses and infections.

Let us take an example of Covid 19 pandemic to understand the use of PPE. Covid 19 virus gets transmitted from one person to another through close contact and droplets. Thus, wearing appropriate type of PPE is imperative depending upon the work setting and risk of exposure. The type of PPE used in order to protect oneself is different from the type used when caring for an infected person, as health care workers need extra protection in terms of respirators and fluid resistant gowns. Although PPE is one of the effective means to prevent the spread of virus, it gives benefit only when followed with other preventive measures explained earlier.

Steps

The steps to put on PPE for precaution are given in the following figure:

Fig. 1.2.11: Steps to put on PPE

The guidelines for use of PPE are given in the following figure:

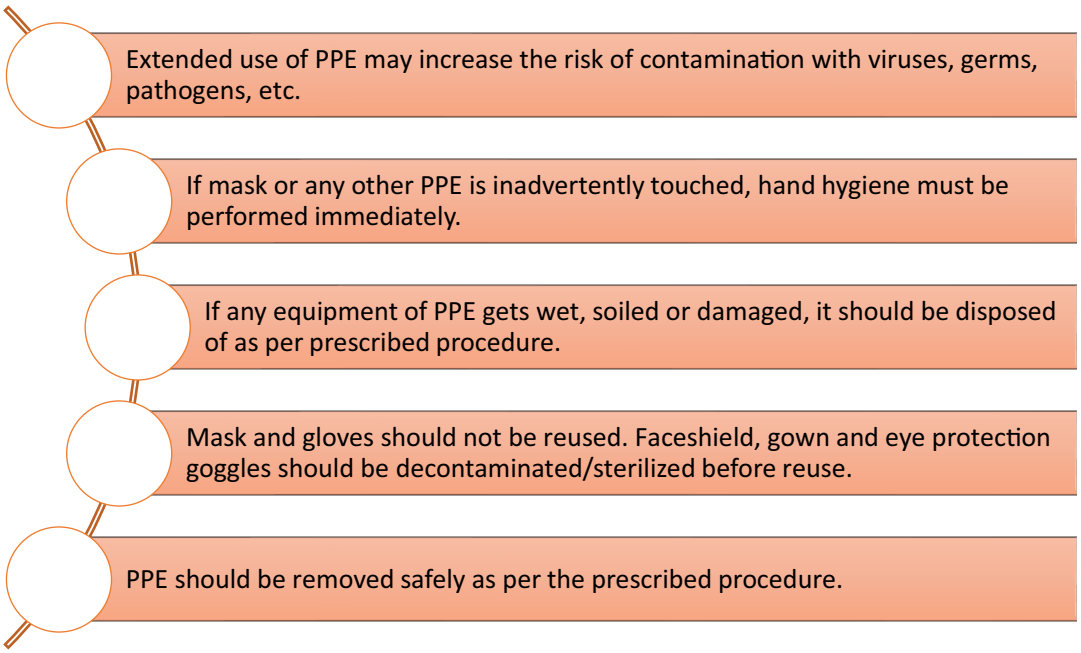

Fig. 1.2.12: Guidelines for use of PPE

Steps

The steps to take off PPE after use are given in the following figure:

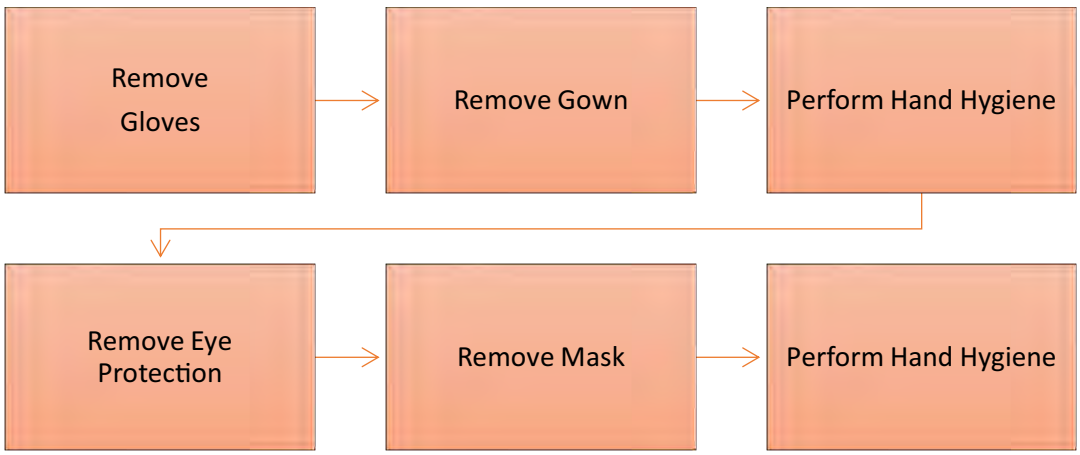

Fig. 1.2.13: Steps to take off PPE

The different PPE required by different professionals is shown in the following set of images:

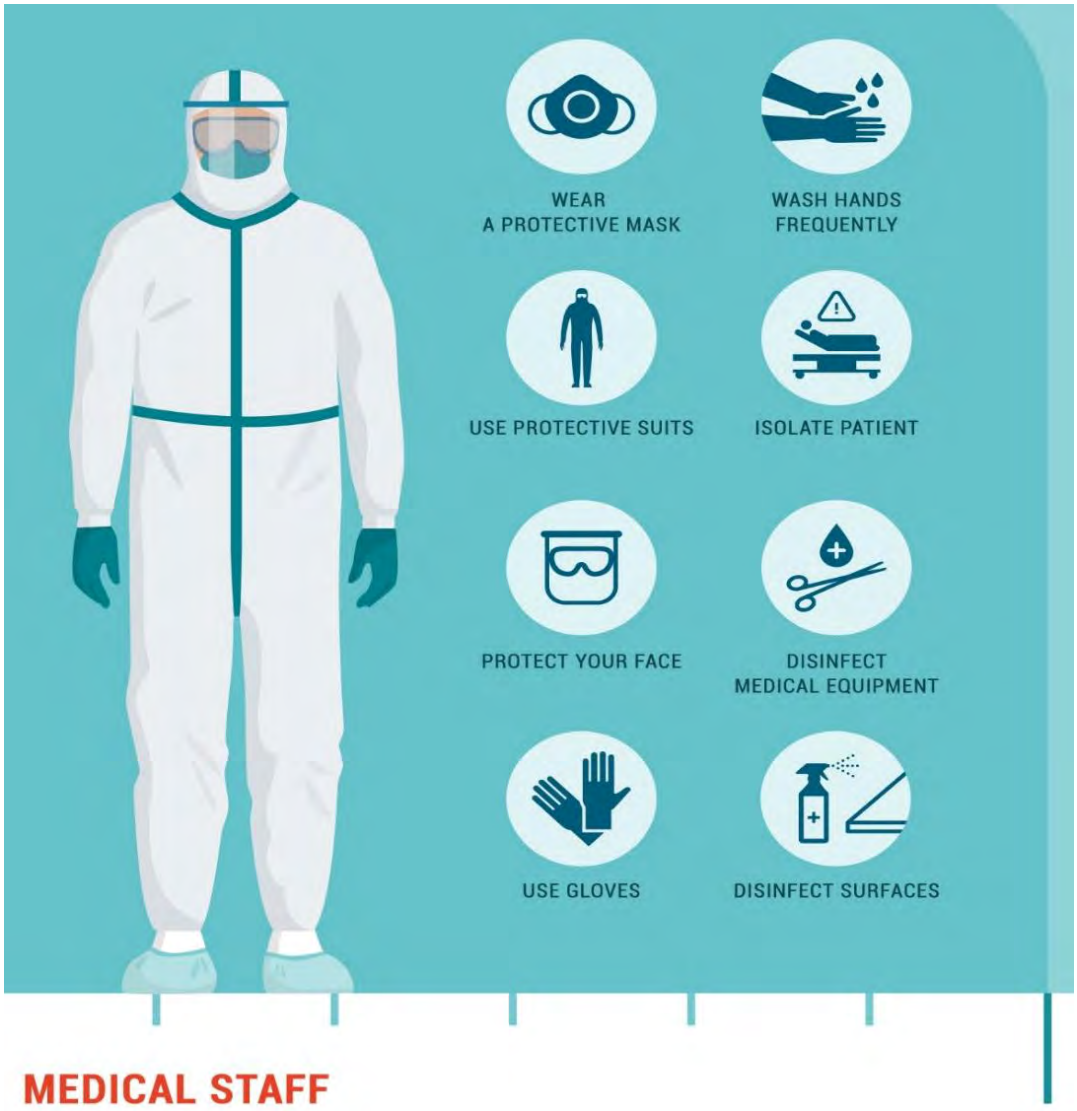

Fig. 1.2.14 (a): PPE for healthcare professionals

Fig. 1.2.14 (b): PPE for grocery, poultry, or other professionals who work with wet products

Fig. 1.2.14 (c): PPE for other professionals, typically working in offices

Let us now learn about the correct methods of taking off PPE as shown in the following set of images:

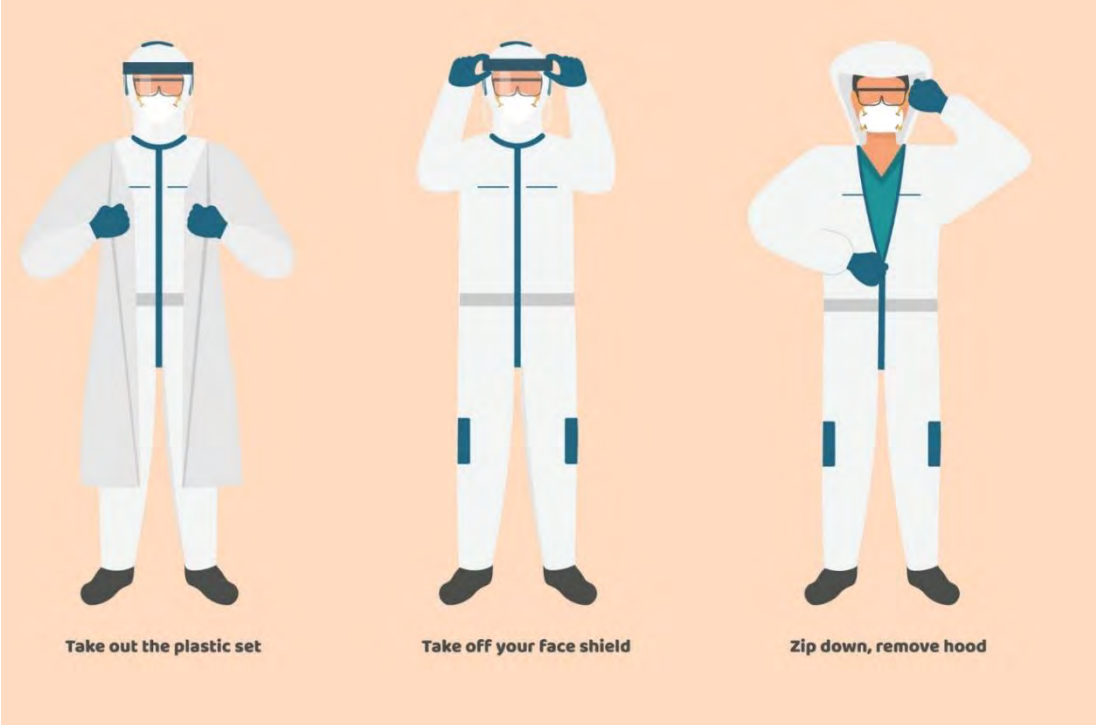

Fig. 1.2.15 (a): Procedure to remove PPE for healthcare professionals

Fig. 1.2.15 (b): Procedure to remove PPE set, boots, leg cover and gloves

Fig. 1.2.15 (c): Procedure to remove goggles and masks

Tips

Washing hands is the quickest and simplest way to get rid of viruses.

Workplace hygiene entails wearing necessary PPE as well as disinfecting the work area.

Surface touched frequently become potential fomites capable of spreading the infection.

PPE should be worn in the following sequence: gown, mask, eye protection and gloves.

PPE should be removed in the following sequence: gloves, gown, eye protection and mask.

Activity

1. Identify which of the following statements are true or false.
   a. Self-quarantine is done at home and self-isolation is done in a hospital.
   b. Hands should be washed after every meal.
2. Which of the following items is not part of PPE?
   a. Hand sanitiser
   b. Mask
   c. Protective eye wear
   d. Gown
3. List two potential fomites at workplace.

   _____

   _____

   _____

   _____

Team Activity

1. Demonstrate cleaning and disinfection of work area

Practical

1. Demonstrate steps to put on and take off PPE
2. Identify potential fomites at workplace

Role Play

1. Supervise cleaning and disinfection of potential fomites

UNIT 1.3: Other Common Practices & Guidelines

Unit Objectives

After having studied this module, the learner will be able to:

1. Discuss the importance and process of identifying and reporting symptoms to the concerned authorities
2. Explain the importance and mechanism of proper collection, transportation and safe disposal of waste
3. Select different types of waste and various types of colour coded bins/containers used for disposal of waste
4. Discuss the ways of dealing with stress and anxiety and providing support during an epidemic or a pandemic

1.3.1 Identifying and Reporting Symptoms

Identifying and reporting the symptoms of a disease can help a great deal in seeking timely care and taking immediate actions to prevent further spread of the disease. This is one of the best early control measures in case of a disease outbreak, an epidemic or a pandemic. For example, in case of Covid 19, researches across the world have identified the sequence of symptoms, such as fever, cough, sore throat, shortness of breath, fatigue, aches and pains, headaches, runny nose and so on, which help differentiate Covid 19 from common cold and flu.

It is mandatory for the workplace to have a formal documentation procedure pertaining to identification and reporting of symptoms as per the organisational policy. The employee must immediately inform the concerned officer in-charge and complete the required documentation accordingly in this context.

In addition to this, one needs to inform the local authorities appointed for the purpose and follow the prescribed procedure as given in the following figure:

Be aware of symptoms	Stay informed about the symptoms of the infection
Report to officer in-charge/local authorities	As soon you identify symptoms, inform the person concerned at workplace and local authorities as per your location
Follow reporting procedure	Fulfill documentation with complete details required as per workplace reporting procedure and local reporting procedure
Seek immediate consultation and undergo testing	Consult the appointed medical specialist and undergo the required test to determine the result at the earliest
Decide on self-isolation or hospitalization	Follow the advice of medical specialist, as per the intensity of symptoms, to either go for isolation at home or admission to the recommended hospital
Inform your contacts	Let those who have come in contact with you recently know about your test status and advise them to take necessary measures as per the recommendations of medical specialist

Fig. 1.3.1: Steps to be followed for identification and reporting of symptoms

1.3.2 Handling Waste

Waste management has a significant role to play in controlling the spread of infection. It entails following prescribed procedures for proper collection, segregation, transportation and disposal of waste. During a disease outbreak, an epidemic or a pandemic, waste from households and organisations can transmit infectious germs and viruses and thus pose risk to the health of people. That is why it is imperative to follow health and safety guidelines for waste management at home as well as workplace.

Steps

The guidelines to dispose of waste outside home during a pandemic, for example Covid 19, are given in the following image:

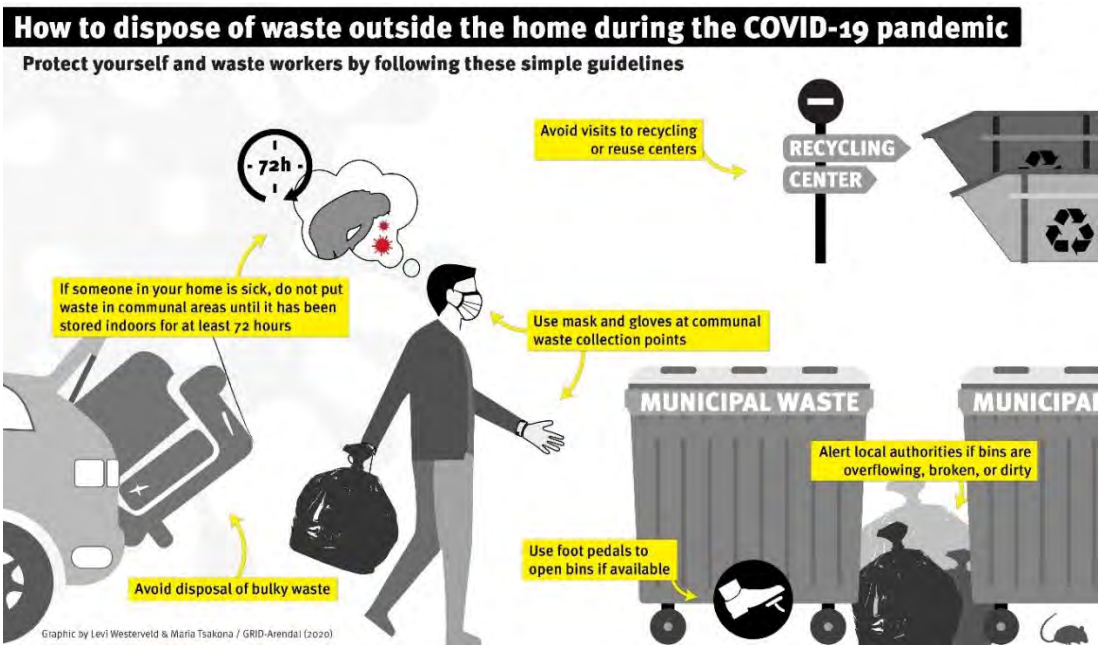

Fig. 1.3.2: Disposing waste during pandemic

Image Credit: Creator— Maria Tsakona and Levi Westerveld, Grida.no. 2020. Quick Tips For Safe Handling Of Waste During The COVID-19 Pandemic | GRID-Arendal. [online] Available at: <https://www.grida.no/resources/13574>

Procedure for safe disposal of non-healthcare waste:

1. Waste should be collected in a plastic rubbish bag and tied properly.
2. The plastic bag should then be placed in a second bin bag and tied properly.
3. Waste should be stored safely in a suitable and secure place until the individual's test results are known. This is applicable in case any individual at home or workplace is suspected to have caught the infection.
4. Waste should be kept away from children.
5. Waste should not be thrown in communal waste areas until negative test r esults are known, or the waste has been stored for at least 72 hours.
6. If storage for at least 72 hours is not appropriate, arrange for collection by the local waste collection authority.

Waste management entails the processes as shown in the following image:

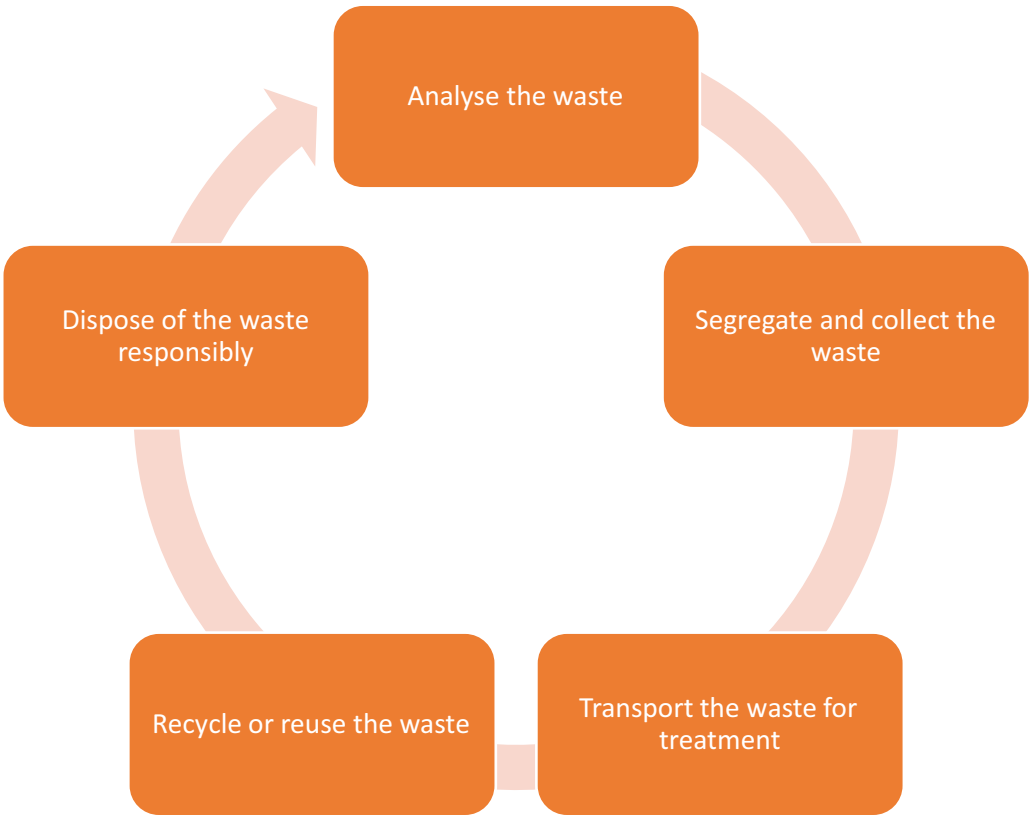

Fig. 1.3.3: Steps of waste management

Procedure for safe disposal of greywater or water from washing PPE, surfaces and floors:

1. WHO recommends that after each time utility gloves or heavy-duty, reusable plastic aprons are used, they should be cleaned with soap and water, and then decontaminated with 0.5% sodium hypochlorite solution.
2. Single-use gloves made of nitrile or latex, and gowns should be discarded after each use and not reused as they could have come in touch with infectious waste.
3. Hand hygiene should be performed after PPE is removed.
4. If greywater includes disinfectant used in prior cleaning, it does not need to be chlorinated or treated again.

Procedure for Safe Disposal of Healthcare Waste

The procedure for disposal of healthcare waste may vary according to the state guidelines on disposal of waste. The following figure shows general information for safe disposal of healthcare waste:

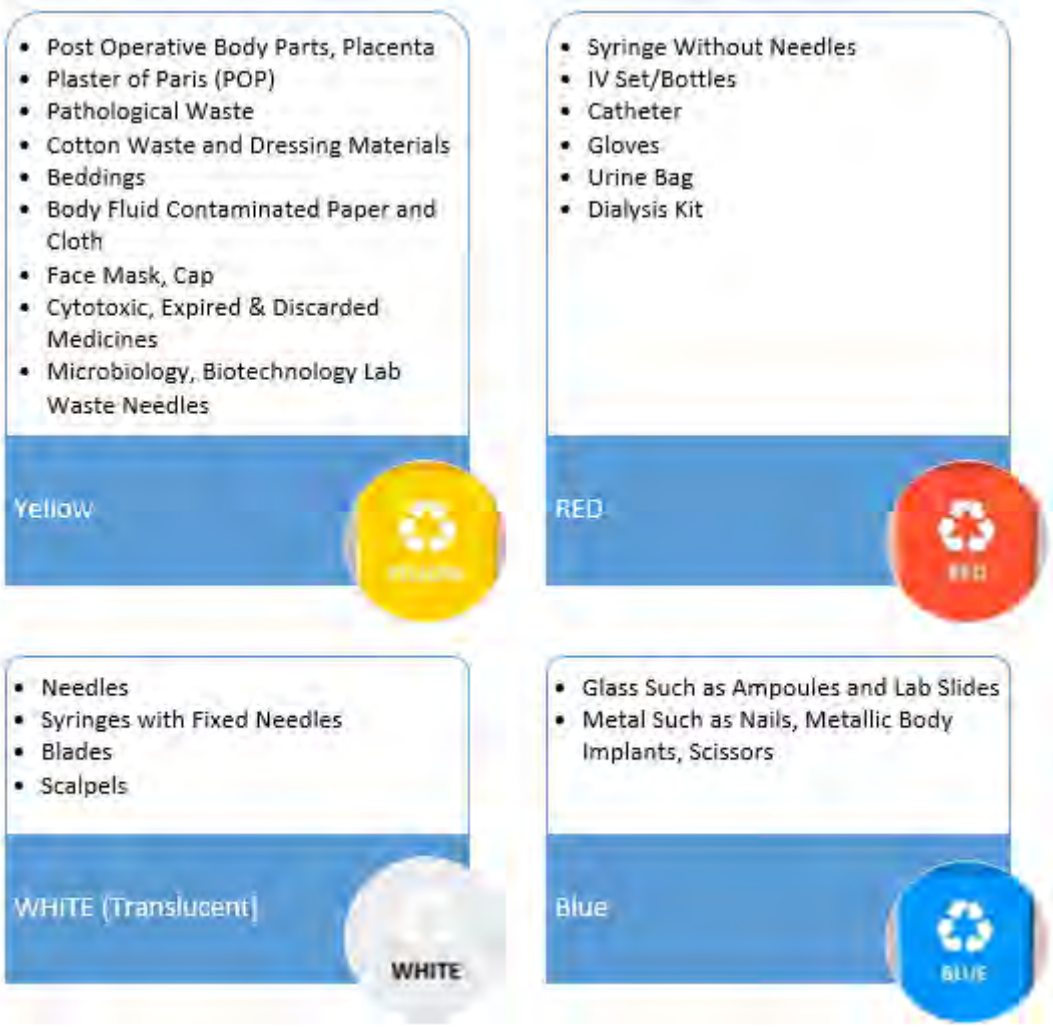

Fig. 1.3.4: Safe disposal of healthcare waste

During a disease outbreak, an epidemic or a pandemic, health of waste- collection workers is very much at risk, given the nature of their job wherein they are exposed to all types of waste. The following image shows how waste-collection workers can minimise risks during a pandemic, for example during Covid-19:

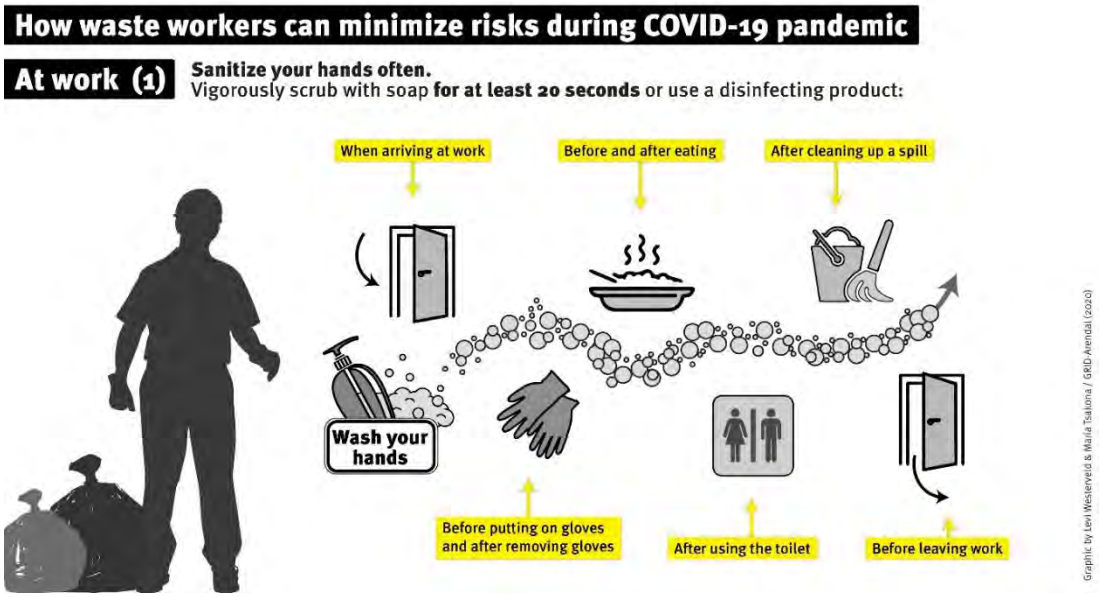

Fig. 1.3.5(a): Guidelines for waste- collection worker

Fig. 1.3.5 (b): Guidelines for waste- collection worker

The following image shows how waste-collection workers can minimise risks during a pandemic, for example during Covid-19:

Fig. 1.3.6: Guidelines for waste- collection worker

Image Credit: Creator— Maria Tsakona and Levi Westerveld, Grida.no. 2020. Quick Tips For Safe Handling Of Waste During The COVID-19 Pandemic | GRID-Arendal. [online] Available at: https://www.grida.no/resources/13574

1.3.3 Dealing with Stress and Anxiety during a Disease Outbreak

A disease outbreak, an epidemic or a pandemic brings about numerous challenges worldwide. On one hand, we need to deal with the virus and the illness, and on the other hand, we need to deal with the inherent fear, which is the springboard of stress and anxiety. In a way, we need to strengthen both our body and mind to be able to deal with such a challenging situation.

We need to understand the impact of stress and anxiety on our physical and mental health. It poses unnecessary pressure on our body and mind, which lowers our immunity and makes us more vulnerable to viruses and illnesses. To make matters worse, we do not even realise when it begins to build up and overpowers our thinking.

You need to ask yourself certain questions to identify stress and anxiety, such as – Are you fearful and worried about your own health and health of your loved ones? Do you have difficulty sleeping or concentrating? Is your physical and mental health getting worse? Do you constantly fear catching the infection?

If the answer to any of these questions is yes, then you need to change your mindset and take the following practical measures for your safety and security:

People diagnosed with a disease and their family/neighbours often feel sad, stressed, confused, scared or angry. Such people should:	• Talk to people you know will provide help and listen. • Share your feelings with close friends and family.
People in self-quarantine or self-isolation should:	• Maintain a healthy lifestyle. • Take proper diet. • Ensure a healthy routine, proper sleep, exercise and social contact with loved ones at home and by email and phone with other family and friends. • Do not smoke or consume alcohol/ other drugs to deal with your emotions. • Ask for professional counselling if extremely stressed.
People living in contamination zones/areas most affected should:	• Gather information to analyse the risk and necessary precautions. • Find a credible source you can trust such as Arogya Setu app, WHO website or a local health authority. • Restrict watching too much news or media coverage of the pandemic/epidemic to avoid worry and agitation. • Focus on personal and inter-personal skills that have helped you to recover from a tragic/difficult experience in the past.

Fig. 1.3.7: Guidelines for dealing with stress and anxiety

Tips

Identifying and reporting symptoms is an effective control measure to contain the spread of infection and safeguard oneself as well as others.

Safe disposal of waste from households and organisations is imperative to minimise the risks of an outbreak, an epidemic or a pandemic.

Strengthen body and mind to be able to deal with stress and anxiety effectively

Activity

1. Identify which of the following statements are true or false.
   a. After undergoing the test, one must not continue with regular activities at home and workplace until the test results are known.
   b. Healthcare waste and non-healthcare waste are to be disposed of in the same manner.

2. Which of the following is not one of the processes of waste management discussed in this unit?
   a. Collection
   b. Transportation
   c. Treatment
   d. Disposal

3. List two effective ways of dealing with stress and anxiety.

   _____

   _____

   _____

   _____

Practical

1. Demonstrate the procedure to identify and report symptoms

Role Play

1. Supervise safe disposal of waste in different set-ups

Summary

Disease outbreak refers to a sudden occurrence and exponential rise of a disease beyond anyone's expectation and across any community, geographical area, or a country.

Epidemic refers to an infectious disease that spreads actively and substantially across a specific location affecting large number of people within a short span.

When an epidemic spreads across various countries, it becomes pandemic. It affects larger number of people across the globe, causing greater number of deaths as compared to an epidemic.

Key guidelines to be followed during an epidemic or a pandemic entail personal hygiene, respiratory hygiene, social distancing and workplace hygiene.

Personal hygiene entails maintaining not only cleanliness but also healthy habits as preventive measures for safeguarding oneself from catching any infection.

Respiratory hygiene mainly involves following cough/sneeze etiquette and wearing face masks to reduce the spread of viruses and pathogens, especially during epidemic or pandemic of an infectious disease

Hands should either be washed with soap and water or sanitised properly before wearing mask and after removing the same.

Social distancing means maintaining physical distance of at least 1 meter (3 feet).

Workplace hygiene is as important as personal hygiene. It has various verticals spanning the work area, meeting etiquette and so on, and has a significant role in prevention of a disease outbreak.

Self-quarantine entails isolating oneself at home or any other place for a period of minimum fourteen days or so. It is meant for people who have been exposed to someone infected with the virus.

Self-isolation also entails isolating oneself at home or any other place for a period of seventeen days or so. It is meant for people who have already tested positive for the virus/infection that has led to the epidemic/pandemic.

Fomites refer to all those objects or surfaces that can become contaminated with viruses when touched by an infected person.

Cleaning and disinfection of potential fomites with recommended disinfectant solution is indispensable to ensure prevention of disease spread.

PPE should be used in combination with other recommended preventive measures such as maintaining personal hygiene, respiratory hygiene and social distancing, for lack of doing so makes the person vulnerable to viruses and infections.

Identifying and reporting the symptoms of a disease can help a great deal in seeking timely care and taking immediate actions to prevent further spread of the disease.

Waste management has a significant role to play in controlling the spread of infection. It entails following prescribed procedures for proper collection, segregation, transportation and disposal of waste.

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Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

Healthcare
Sector
Skill Council

2. Introduction to Emergency Medical Care

Unit 2.1 - Introduction to Emergency Medical Care

Unit 2.2 - Tools and Equipment

Bridge Module

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Learn about the Emergency Medical Care
2. Identify Emergency Medical Service System
3. Analyse the components of EMS System
4. Elaborate roles and responsibilities of the CFW-ECS
5. Analyse the Well-Being of CFW-ECS
6. Identify the workplace issues
7. Elaborate the scene safety and personal protection
8. Identify the workplace issues
9. Explore the risk reduction and prevention techniques
10. Identify the behavioural emergencies
11. Analyse the medical and ethical Issues
12. Identify the right to refuse treatment
13. Analyse good Samaritan Laws and Immunity
14. Elaborate the special reporting requirements
15. Analyse the physical signs of death

UNIT 2.1: Introduction to Emergency Medical Care

Unit Objectives

At the end of this unit, you will be able to:

1. Learn about the Emergency Medical Care
2. Identify Emergency Medical Service System
3. Analyse the components of EMS System
4. Elaborate roles and responsibilities of the CFW-ECS

2.1.1 Introduction to Emergency Medical Care

Emergency medical service (EMS) is a team which contains health care professionals who are responsible for handling medical situations. They provide health treatment to the people who have suffered due to incidents like accidents, natural disaster and explosion.

The EMS provides pre-hospital treatment and first-aid procedure for the people who need medical help. These services are regulated by government organizations.

CFW-ECS Training: Focus and Requirements

CFW-ECS raining is classified into three main sections.
The first section deals with treatment of life-endangering or potentially life-endangering situations.

To deal with these situations, you will learn to:

Size up the scene and situation
Ensure that the scene is safe
Perform an initial assessment of the patient
Obtain a history of the episode and a pertinent past medical history
Identify life-threatening injuries or conditions
Establish and maintain an open airway
Provide adequate ventilation
Manage conditions that prevent proper ventilation
Provide high-flow supplement oxygen
Perform cardiopulmonary resuscitation (CPR)
Perform automated or semi-automated external defibrillation (AED)
Control external bleeding
Recognize and treat shock
Care for patients in an acute life-threatening medical emergency
Assist patients in taking certain medications that they carry and those that their physician has prescribed for an acute episode
Identify and rapidly prepare or “package”, patients (by positioning, covering and securing them) for rapid initiation of transport, when necessary
Perform heavy and frequent lifting

Fig.2.1.1: CFW-ECS training

The second section of training deals with conditions that may not be life-threatening, but may be an emergency which can put the person's life into danger. Conditions such as severe trauma and organ deterioration come under this category. You will learn to:

Identify patients for whom spinal precautions should be taken and immobilize them properly
Dress and bandage wounds
Splint injured extremities
Care for burns
Care for cases of poisoning
Deliver a baby
Assess and care for a newborn
Manage patients with behavioral or psychological problems
Cope with the psychological stresses on patients, families, your fellow CFW-ECS and yourself

Fig.2.1.2: CFW-ECS training

The third section covers important issues that are related to your ability to provide emergency care. You will develop the following skills:

- Understanding the role and responsibilities of an CFW-ECS
- Understanding your service's protocols and orders from medical direction
- Understanding ethical and medico legal problems
- Doing defensive driving of the Emergency vehicle
- Using equipment carried on the ambulance
- Checking and stocking the ambulance
- Communicating with patients and others at the scene
- Using the radio or cell phone and communicating with the dispatcher or medical control
- Giving a precise patient radio report and obtaining direct medical direction
- Giving a full verbal report when transferring the patient's care at the hospital
- Preparing proper documentation and completing the patient care report
- Working with other responders at a crash scene

Fig.2.1.3: CFW-ECS training

2.1.2 Overview of the Emergency Medical Services System

An CFW-ECS team is led by a medical director who gives orders and fixes the protocols to work. All the CFW-ECS act under him to give medical care and treatment at the work site.
An EMS system has a standard procedure and protocols for all kinds of injuries, illnesses and medical emergencies. They are derived and written by medical professionals.

These instructions are documented in a handbook which guides an CFW-ECS in the treatment process.

The medical director serves as a link between the medical health centre and the hospitals. He/she is the one who decides on the protocols that needs to be followed by every CFW-ECS. There are variety of protocols and procedures available in the industry. The medical director is solely responsible for deciding the protocols and procedures that need to be followed in an emergency situation. The approved protocols are documented in a hand book.

The medical director is also involved in approving CFW-ECS training and service for any person. He/she also approves an CFW-ECS for additional training.

The medical director is responsible for quality control. He/she can take feedback from a patient or a person who has been cared for by an CFW-ECS to check the quality of service. He/she can also evaluate the protocols that have been approved for use, and can change them if they are not effective.

CFW-ECS should have knowledge about all emergency equipment which they are taught to use during training. They are also taught the first aid procedure and other safety procedures. They should be aware of the functions and usage of the equipment that are placed in the ambulance.

The EMS are spread across the country to serve people who are affected by different medical emergencies.

The Ambulance

As an CFW-ECS you can be ordered to drive an ambulance in case of an emergency. Hence, it is very important for an CFW-ECS to know driving and have a valid driver's license.
While driving an ambulance, an CFW-ECS also needs to have knowledge about routes and road maps to reach the destination at a short period of time.

The ambulance should be checked for the presence of equipment that can be used at the incident that an CFW-ECS is going to handle. Also, the CFW-ECS should check for the ambulance's working condition and maintenance.
Before taking the patient in an ambulance to the hospital, an CFW-ECS should do initial assessment, check the chief complaint, take medical history and provide first-aid.
While taking a patient from the place of incident to a hospital in the ambulance there should be a person who needs to monitor the vital signs of the patient.

Working with Hospital Staff

Team work is very important as an CFW-ECS Once you have taken a patient from the incident place to the hospital after doing initial assessment, you must provide the required information to the hospital staff.

So, it is very important to be aware of medical terms and the protocols that you have used on the patient. It is also important to inform about the patient's condition at the hospital, like if the patient is very serious and needs immediate medical help.

Hospital staff can teach you about the assessment that can be done on a patient during emergency situations. So, you should learn them carefully and use them. Experience can enable an CFW-ECS to develop patient management skills.
Hospital staff is usually willing to help in improving your skills throughout your career.

2.1.3 Roles and Responsibilities of the CFW-ECS

The patient outcomes are determined by the care that you provide in the field and your identification of patients who need prompt transport. The roles and responsibilities require you to perform the following activities:

Fig.2.1.4: Roles and responsibilities of CFW-ECS

Professional Attributes

- An CFW-ECS can be paid or volunteer.
- So, in any case, make sure that you give high quality patient service. Make sure to safe guard yourself while working with patients by using safety equipment like gloves and masks.
- Make sure to maintain professional appearance and manners all the times. An CFW-ECS should be calm and friendly towards everyone. It is really important to have professional relationship with the patients and medical professionals.
- There should not be any appearance which can cause inconvenience to any patient or medical professionals; for example, a tattoo, improper uniform and other styles. Make sure to keep yourself hygienic and well-groomed all the time.
- As an CFW-ECS, always give respect to patients and other persons around you. Do not use any kind of drug or alcohol during work time.
- If you are a new CFW-ECS try to seek guidance from experienced colleagues. These inputs will help you to shine in your work. In some cases, some colleagues can misguide you; such as asking you not to show respect to patients and to their relatives. You must ignore such advice.
- Being a health care professional, it is very important to be confident in the work that you're doing. Always maintain privacy. Do not disclose any information about a patient to any unauthorized patient.
- Revealing confidential information can put your job at risk.

Exercise

1. Which is one of the most significant trait that an CFW-ECS must have?

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2. You are at a site with a cardiac patient and seeking advice from an ER physician on the telephone. He asks you to give the patient a nitro-glycerine pill. What kind of order or medical direction is this?

_____

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3. What is a list of steps, such as an assessment and an intervention, to be performed by an CFW-ECS in different situations that he/she is called?

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4. What is the physician responsible for the patient care section of an EMS system called?

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_____

5. How can an CFW-ECS participate in quality improvement?

_____

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UNIT 2.2: Tools and Equipment

Unit Objectives

At the end of this unit, you will be able to:

1. Identify and recognize the use of different types of medical instruments and equipment.

2.1.1 Tools and Equipment

Weighing machines: Weighing machines have an important role to play in patient care. If there are inconsistencies in recording the body weight of patients or if wrong weighing equipment are used, it could cause errors in the diagnosis, medication and treatment. Hence appropriate weighing machines should be used.

Fig.2.1.1: Weighing machines

Blood Pressure Gadgets: It is an equipment which is used to measure blood pressure. It is made up of an inflatable bag which is wrapped around the arm. It is collapsed slowly to release the artery under the bag.

Fig.2.1.2: Blood Pressure Gadgets

Gauge: It is a bandage utilized to give support to a dressing, a splint or a similar device. It can also be used to give support or curb the movement of a body part.

Fig.2.1.3: Gauge

Tourniquet: A tourniquet is a restricting or a compressing equipment. It is utilized usually as a bandage to limit blood flow in the arteries and veins for some time.

Fig.2.1.4: Tourniquet

Wheel chair: Wheelchairs are equipment utilized for people who are unable to walk because of some disability, sickness or injury.

Fig.2.1.5: Wheel chair

PPE: Personal protective equipment (PPE) are specially designed equipment to protect workers from germs by creating a barrier.

Fig.2.1.6: Personal protective equipment

First Aid kit: It consists of various medicines, equipment and other supplies that are needed in case of minor injuries or treatments. It can be easily purchased by an individual or an organization.

Fig.2.1.7: First Aid kit

Betadine: These microbicides have been used worldwide as a crucial initial line of defence in both homes and hospitals.

Fig.2.1.8: Betadine

Cotton Bandage: These medical bandages are like rolled gauze bandages and are utilized for various kinds of wounds, cuts and injuries.

Fig.2.1.9: Cotton Bandage

Sanitizers: You can use germicidal cleaners to maintain cleanliness as per standards.

Fig.2.1.10: Sanitizers

Disinfectants: These are antimicrobial agents which are used on objects to eradicate microorganisms which might be present on them.

Fig.2.1.11: Disinfectants

Insulin pen: Insulin pen is used by diabetic patients. It gives them confidence and the advantage of precision and convenience.

Fig.2.1.12: Insulin pen

Ambu Mask (Adult): These are face masks which are designed to be used with manual and automatic resuscitators and ventilators.

Fig.2.1.13: Ambu Mask

AED Kit: An automated external defibrillator (AED) is a portable device light in weight that gives an electric shock to the heart through the chest. The shock enables an irregular heart rhythm to stop and the normal rhythm to start again if there was a case of cardiac arrest.

Fig.2.1.14: AED Kit

Pocket Mask: A pocket mask is an equipment utilized to safely provide rescue breaths at the time of a cardiac arrest or respiratory arrest.

Fig.2.1.15: Pocket Mask

Walker: It gives support to patients who are facing difficulty while walking due to a surgery or a fracture.

Fig.2.1.16: Walker

Crutch: It is a long-padded stick that fits under a person's arm that can be used for help or support while walking.

Fig.2.1.17: Crutch

Cane: It is used for help or support while walking.

Fig. 2.1.18: Cane

Bed pan: It is used to provide toilet facilities to a bedridden patient in a Healthcare facility; generally a metal or plastic container.

Fig.2.1.19: Bed pan

Urinal (Male & Female): A urinal is a bottle for urination. It is most frequently used in Healthcare for patients who find it impossible or difficult to get out of bed.

Fig.2.1.20: Urinal (Male & Female)

Artery Forceps: It is a surgical tool used in many surgical procedures to control bleeding.

Fig.2.1.21: Artery Forceps

Dissecting Forceps: Dissecting forceps are used to handle tissues and other materials and also to manipulate needles and other instruments while operating.

Fig.2.1.22: Dissecting Forceps

Splint: A splint is a medical device which is used to limit the movement of an injured limb and to prevent any more damage to it. It is generally utilized to give temporary stability to a broken bone while the injured person is being transported to a hospital for proper treatment.

Fig.2.1.23: Splint

Cervical Collar: A cervical collar is formed from thick foam rubber which is covered with cotton for softness. It is utilized to support the neck and to control pain and discomfort after an injury (e.g., whiplash).

Fig.2.1.24: Soft Cervical Collar

Kidney Tray: It is a bean shaped shallow basin utilized as a receptacle to collect soiled dressings and medical waste in the hospital wards.

Fig.2.1.25: Kidney Tray

IV Stand: It is used for administering intravenous drugs such as drips.

Fig.2.1.26: IV Stand

Measuring Glass: This is a measuring glass for measuring liquid ingredients.

Fig.2.1.27: Measuring Glass

Uro bag: This is a urine collection device

Fig.2.1.28: Uro bag

Sample Collection Bottle: This is used for collecting blood, urine, sputum sample.

Fig.2.1.29: Sample Collection Bottle

Normal Saline Bottle: It contains saline which is a sterile solution of sodium chloride (NaCl), generally called table salt, in water. It can be considered sterile only when it is to be placed parenterally; otherwise, this solution is a salt water solution.

Fig.2.1.30: Normal Saline Bottle

Micropore: This is a surgical tape utilized for general taping purposes. It is a hypoallergenic adhesive which is gentle on sensitive and delicate skin.

Fig.2.1.31: Micropore

Hydrogen Peroxide: This is considered world's safest natural sanitizer because of its unique combination of hydrogen and oxygen

Fig.2.1.32: Hydrogen Peroxide

Syringe destroyer: It is a compact equipment with a steel alloy cutter used for secure and fast removal of needles and syringes.

Fig.2.1.33: Syringe destroyer

Syringe Sterilizer: This is used for sterilising syringe.

Fig.2.1.34: Syringe Sterilizer

Thermometer: This is a device that measures temperature.

Fig.2.1.35: Thermometer

Hot Water Bottle: This is a container with a stopper used to provide warmth to the body of a patient, usually when in bed or to give heat to a particular part of the body. It is filled with hot water and sealed with the stopper.

Fig.2.1.36: Hot Water Bottle

Transfer forceps: This is an instrument similar to a pair of pincers or tongs, made for grasping, handling, or extracting tissues. It is especially used by surgeons.

Fig.2.1.37: Transfer forceps

Foley's catheter: This is a thin tube which is sterilized and inserted inside the bladder to drain urine. It is also called an in-dwelling catheter as it can be left in the bladder for a period of time.

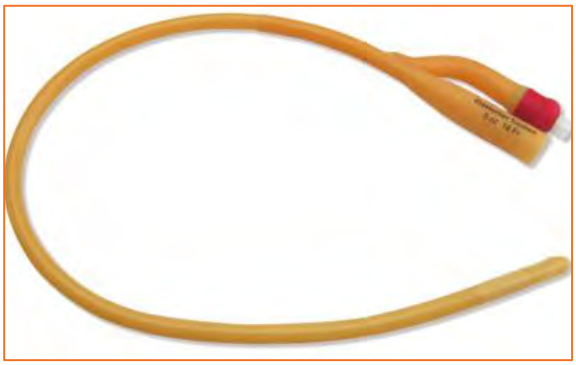

Fig.2.1.38: Foley's catheter

Suction Catheter: These are flexible, elongated tubes utilized to eliminate respiratory secretions from the airway by suction to keep the airway clear.

Fig.2.1.39: Suction Catheter

Ryle's Tube: This is a tube that is passed through the nose and down through the nasopharynx and oesophagus into the stomach.

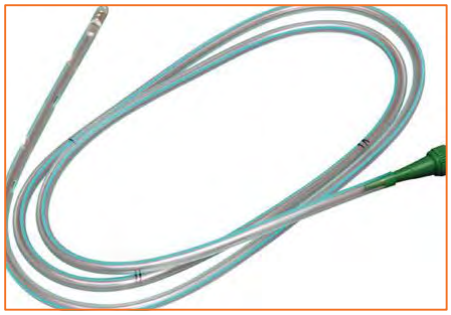

Fig.2.1.40: Ryle's tube

Vacutainer: This is a blood collection tube which is a sterile tube made of plastic or glass. It has a closure that is evacuated to create a vacuum in the tube. This facilitates the dra w of a predefined volume of liquid.

Fig.2.1.41: Vacutainer

Draw Sheet: This is a sheet that is placed in such a way that it can be taken from under a patient or invalid without disturbing the bedclothes.

Fig.2.1.42: Draw Sheet

2.1.2 Common Medical Equipment

The common medical equipments used in the hospital include:

- Diagnostic equipment's such as stethoscope, blood pressure apparatus, thermometer.
- Imaging equipment's such as x-ray, ultrasound, CT scan, MRI.
- Specialized equipment such as ECG, ventilator, oxygen, pulsometer, dialysis machine.
- Other equipment's used for patient management such as hospital beds, wheelchairs and stretchers.

You need to identify and understand the form and function of some hospital equipment in order to assist the doctor or the nurse efficiently. Let us now look at the common medical equipment used in the hospitals in following image:

Patient monitor	ECG (Electro Cardio Gram) Machine	Medical Ventilator
		
It is a large device that records and interprets the vital signs of a patient during medical care or treatment. The heart rate, breathing rate and the ECG of the patient are displayed on the LCD monitor. The patient monitor will be attached by the nurses. The recordings of the patient monitor are noted and reported to the doctor from time to time.	An ECG machine detects any abnormalities in heart functions. It is found in the heart disease section in the hospital.	A medical ventilator is a machine designed to mechanically move air into and out of the lungs.

Fig.2.1.43 (a): Common medical equipment

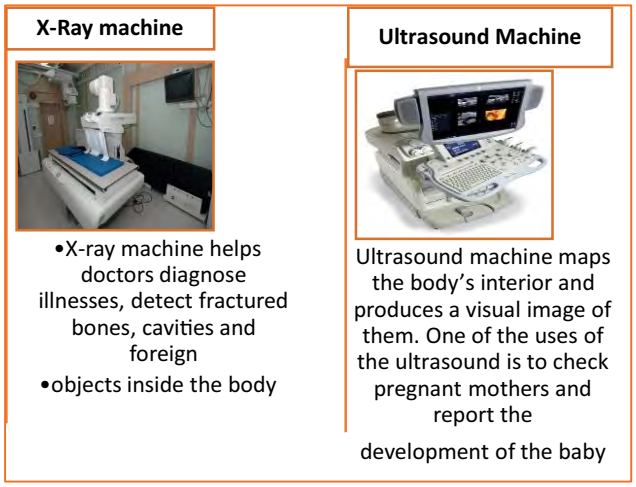

Fig.2.1.43 (b): Common medical equipment

Dialysis:

Role of a dialysis machine is to remove harmful/toxic substances and purify the blood stream in absence of kidney not functioning properly. It is used for removing waste and excess water from the blood. It is used as an artificial replacement for a kidney that has failed. In addition to the medical equipment, there are specialized equipment such as saline bottles, catheters and equipment used in the feeding and medication of the patient.

Skills Practical: General Medical Tools

Divide the class into groups of five

1. Name each group as team A, B, C, D and E.
2. Once the teams are formed, open your participant handbooks
3. Each team has to make questions on any of the medical tools that have been discussed in the chapter
4. Each team will get 15 minutes to read and prepare questions.

Tips

- Common medical instruments used at home.
- Helping the healthcare professional in the use of the common medical equipment.

Exercise

1. What may you be guilty of if you leave the scene before more highly trained personnel arrive?
   a. Abandonment
   b. Negligence
   c. Assault
   d. Battery
2. Who is allowed to consent to or refuse care for a child?
   a. Child
   b. Medical director
   c. Bystander
   d. Parent
3. Which quality deals with questions like "Did you do the right thing, at the right time and for the right reasons?
   a. Standard of care
   b. Ethical responsibility
   c. Limit of liability
   d. Scope of practice
4. What is behaviour determined by?
   a. Religion
   b. Beliefs
   c. Media
   d. Instruction
5. In which case would breach of duty be easily proven?
   a. Care was given according to the level of training
   b. Injuries were outside of the realm of training
   c. Emergency Medical Responder could not save the patient
   d. Care outside of the scope of practice was given
6. List few common medical equipment and their usage.

   _____

   _____

   _____

7. List few common surgical instruments and their usage.

   _____

   _____

   _____

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Corporation
Transforming the skill landscape

3. Introduction to Human Body - Structure & Function

Healthcare
Sector
Skill Council

Unit 3.1 - Structure and Function of Human Body

Bridge Module

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Explain the different parts of the body.
2. Describe different systems of the body.
3. Explain different positions of the body.

UNIT 3.1: Structure and Function of Human Body

Unit Objectives

At the end of this unit, you will be able to:

1. Differentiate different parts of body.
2. Explain organization of body cells, tissues, Systems, membranes and glands.
3. Describe Muscular Skeletal System.
4. Describe Digestive System.
5. Describe Respiratory System.
6. Describe Cardio Vascular System.
7. Describe Excretory System.
8. Describe Nervous System.
9. Describe Endocrine System, Sense Organ and Reproductive System.

3.1.1 Understanding the Human Body

The major three division of human body are:

- Head and Neck
- Thorax and Abdomen
- Upper limbs and lower Limbs

Head and neck region of our body is the top most part of our body. It consists of organs like brain, eyes, ears, mouth with the food pipe (or the oesophagus) and nose with trachea (or the wind pipe).

The middle part is the thorax region that contains of the lungs and heart. The abdomen area is the area consisting of liver, stomach, pancreas, intestines, kidneys and reproductive organs. The arms form the upper limbs while the legs form the lower limbs respectively.

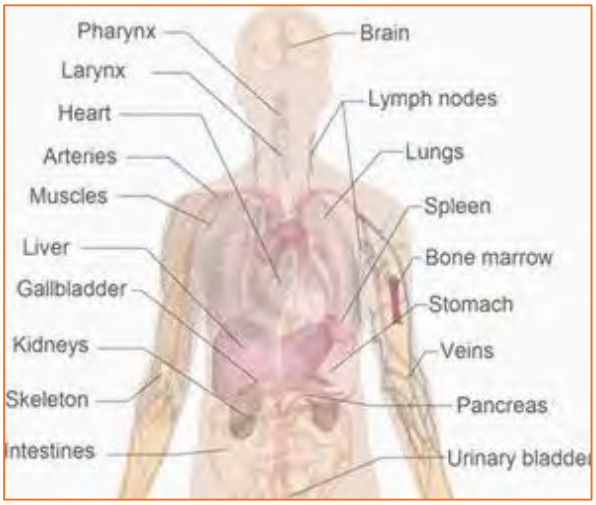

Fig.3.1.1: Human Anatomy

The shape and structure of the body is supported by a framework of specialized tissues called the bones and muscles. The bones and muscles hold the organs in place. The internal organs of the human body are very delicate. They are covered with a bony structure to protect them from external shocks and injuries. For example, the human heart and lungs are covered with the rib cage for protection from external injuries.

Head and Neck

The brain, eyes, ear, nose and mouth are part of the head. Each of these organs has specific functions of its own.

The head has a hard-outer covering. This is a bone called cranium or skull. All the organs in the head region are held by muscles which are attached to the skull. The skull protects the brain from external injuries and shocks.

The functioning of our body is controlled by the human brain for example breathing, digestion, heartbeat, blood circulation. The other functions are broadly classified as sensory, motor and special senses.

Fig.3.1.2: Head and Neck

Fig.3.1.3: Ear and its Structure

The sensory functions include touch and pain sensations. The motor functions include movement of organs such as limbs or muscles and special senses include sight, sound, taste and smell. The brain extends as the spinal cord at the back of the body. The brain connects to the various organs by nerves which transmit signals to the organs.

The face contains the organs – eyes, ears, nose and mouth. The eyes allow us to see. The eyes, which are connected to the brain, control the sensation of vision, and eye-ball movements through nerves. The ears, which allow us to hear, comprise of the external, middle and internal ear which are made of the hearing apparatus. The hearing apparatus are set of bones and membranes which allow us to hear.

The nose supports in the sensory function of smell. Two nostrils on the external side serve in the function of breathing, while internally, it opens into the wind pipe which is connected to the lungs. The mouth is located below the nose and is the opening of the digestive system. It opens into the food pipe or the oesophagus extending into the neck and thorax.

The mouth comprises of teeth that help in chewing the food. The neck portion of our body contains the food pipe and the trachea. The neck also comprises the larynx or the voice box. It is prominent in the male body.

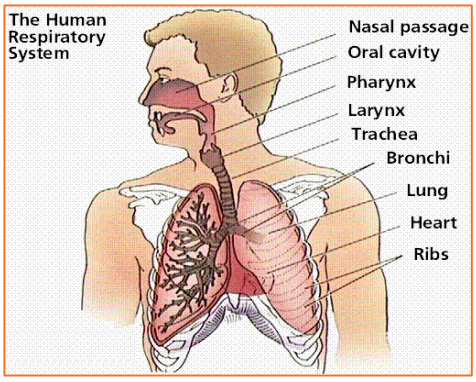

Fig.3.1.4: Respiratory System

Thorax

The neck region extends into the thorax region which is made up of shoulders and the chest. The chest is made up of a bone framework called the ribs. The rib encloses a pair of lungs which help in breathing. The heart is present at the centre of the two lungs towards the left. The heart supplies blood throughout the body using a network of arteries, while veins collect blood from different areas of the body.

Arteries and veins are vessels or pipes which form the arterial and venous system respectively. These vessels are connected to all the organs. Blood from the heart is carried by arteries to the various organs and after purification the blood from the various organs is carried to the heart by veins.

Fig.3.1.5: Thorax (Male)

The thorax also has a large muscle called the diaphragm that aids in breathing and supports the lungs. The thorax in the female body also comprises of the mammary glands also known as breasts. The breasts function is to provide nutrition to the new-born child.

Abdomen

The thorax extends into the abdomen. The abdomen comprises of the stomach which helps to digest the food that we eat. The stomach is supported by other vital organs such as the liver, which releases substances called enzymes that help in digestion of the food. The stomach extends into long tube-like structures called intestines. Intestines help in the digestion and absorption of nutrients from food. At last, the undigested food is excreted (thrown out) through an opening called the anus. A pair of kidneys is present in the lower back-side of the abdomen is said to be a vital organ that helps in excreting the waste materials produced in the body.

The lower region of the abdomen is made up of a bony framework called the pelvis or the hip. This region also comprises of the reproductive organs or the genitalia which are different in men and women.

The upper abdomen part comprising of stomach, liver, etc. is not covered by any bone structure to protect it from external shocks and injuries. Therefore, as a Diabetes Educator, you must take special care while handling the patient to avoid injuries to the upper abdomen.

Upper and Lower Limbs

The upper limbs and lower limbs enable humans to move from one place to another. They also help in eating and carrying out important functions. The arms are connected to the thorax in the shoulder region. The arms are jointed organs comprising of the upper arm and the lower arm and the palm. The lower limbs are jointed organs that are connected to the abdomen at the pelvis region. The upper leg region is made of thighs and the lower leg region comprises of heels and toes that aid in movement.

Back of Human Body

The back region of the human body is made up of the vertebral column that extends from the back of the head to the back of the hip. The spinal cord is the extension of the brain. It is located in the vertebral column. It performs the function of movement.

3.1.2 Human Physiological Systems

The human body performs various activities like breathing, eating, running. Each part of the body has specific functions which help the body perform these various activities.

The basic physiological systems in the human body are:

- **The nervous system -** It includes the brain, spinal cord and nerves.
- **The muscular and skeletal system -** It includes of the bones, muscles and the connective tissues.
- **The circulatory system -** It includes heart, the network of arteries and veins.
- **The respiratory system -** Is upper and the lower tracts – the nose and the sinuses, and the trachea, bronchi and the alveoli.
- **The digestive system -** It consists of the mouth, the oesophagus (food tube), the stomach, the liver and the gall bladder, the pancreas, the large and the small intestine extending into the rectum and the anal canal.
- **The urinary system -** It consists of the kidneys, ureters and the bladder.
- **The reproductive system -** It consists of the sex organs.

The basic physiological systems are supported by the endocrine system that secrete the hormones and the immune system that helps in protecting the body from infections.

Nervous System

The nervous system is the main path through which information is sent and received by the brain to keep a track about happenings on the exterior and interior parts of the body. The central nervous system is brain and spinal cord. The brain is the leader of body; it controls the working of various body parts. It is responsible for all sensory processing done by the body. Sensory functions such as sight, hearing, taste and smell are termed as special senses. And the organs which help us to see, hear, taste, smell are eyes, ears, mouth and nose respectively. These organs are called sensory organs as they connect us to the outer world. These senses are controlled by the brain.

There is another sensory organ which helps us to connect with the outside environment, i.e. the skin that helps us feel. The nerves, spinal cord and brain together control all the parts of the human body.

Any feeling that a person experiences is a result of the signals that are carried to the spinal cord by nerves and eventually to the brain. The nerves are the units of the nervous system that connect the various organs to the spinal cord and brain. The brain then responds with a reaction which is carried back to the organ. The organ then acts as per the instructions received from the brain.

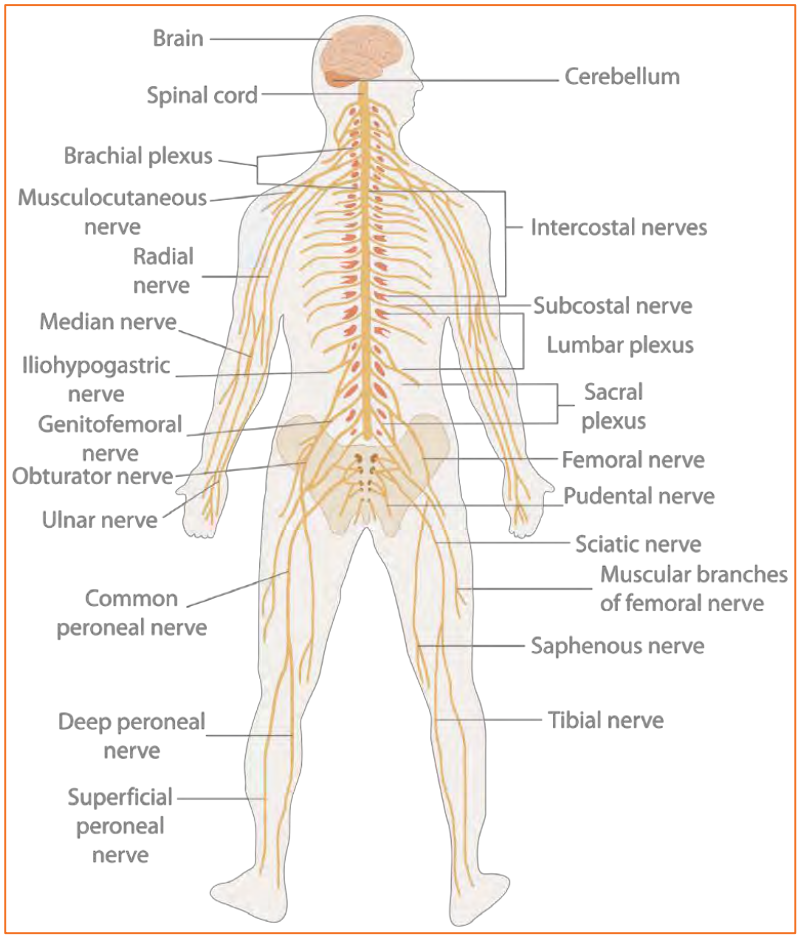

Fig.3.1.6 Nervous System

Muscular and Skeletal System

The muscular and skeletal structure of our body comprise of the skeleton, and the attached muscles that are over 600. The human skeleton gives the body a basic shape and structure and is comprised of bones. The bones are the hard structures of the body and form the framework of the body. The bones support the entire body weight and at the same time gives it a proper shape. The skull provides protection to the brain and gives shape to our face. The backbone protects the spinal cord which is a passage for the transmission of messages between the different parts of the body and the brain. The ribcage covers and protects different organs of the body such as the heart, the lungs and the liver. The pelvis protects the bladder, the intestines and in females, the reproductive organs.

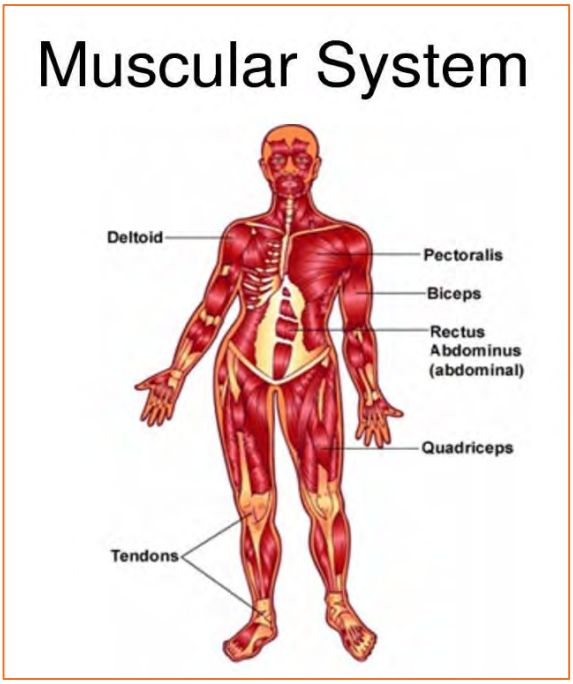

Fig.3.1.7 (a): Muscular System

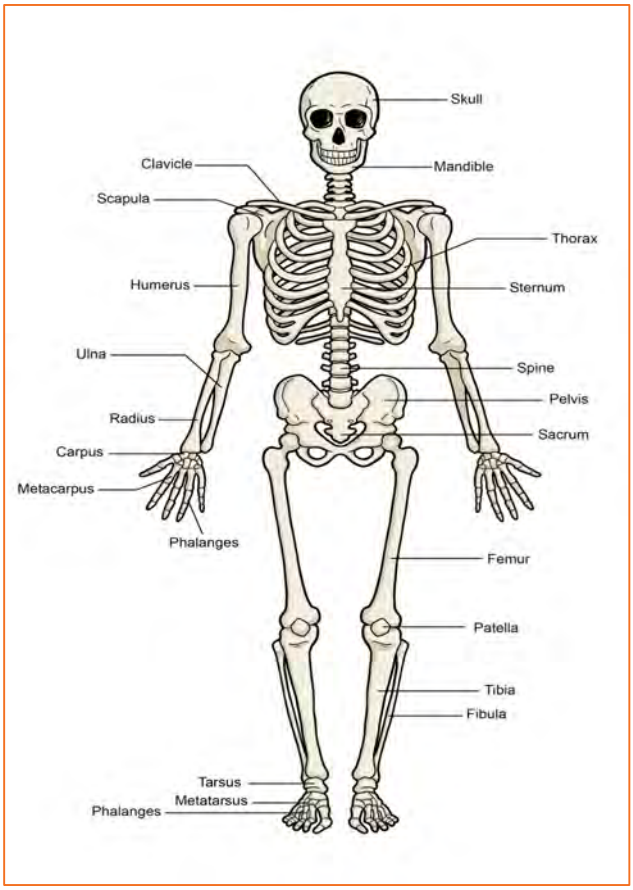

Fig: 3.1.7 (b): Skeletal System

Bones are rigid and inflexible. So, with just the bones, a person will be unable to walk or move hands or legs. You need muscles for flexibility and they also support the bones in activities like walking and running. The muscles form the bulk of the body organs. The bones and muscles together are responsible for the body to move. Muscles are also connecting structures that hold the various organs in place. The bones are attached to the muscles by tissues called Tendons. The muscular and skeletal systems hold the body in place.

Circulatory System

The circulatory system, also called as cardiovascular system, involved in circulating blood to the tissues of the body. With each heartbeat, blood is pumped throughout our body. It carries nutrients along with oxygen to all the cells. The heart and the blood vessels, which include arteries, veins and capillaries, form the circulatory system. The blood, pumped by the heart, acts as a transportation system. It carries oxygen and nutrients to the various organs. It does this through blood vessels known as arteries and capillaries. Once the oxygen and nutrients are absorbed by the body, waste products are released.

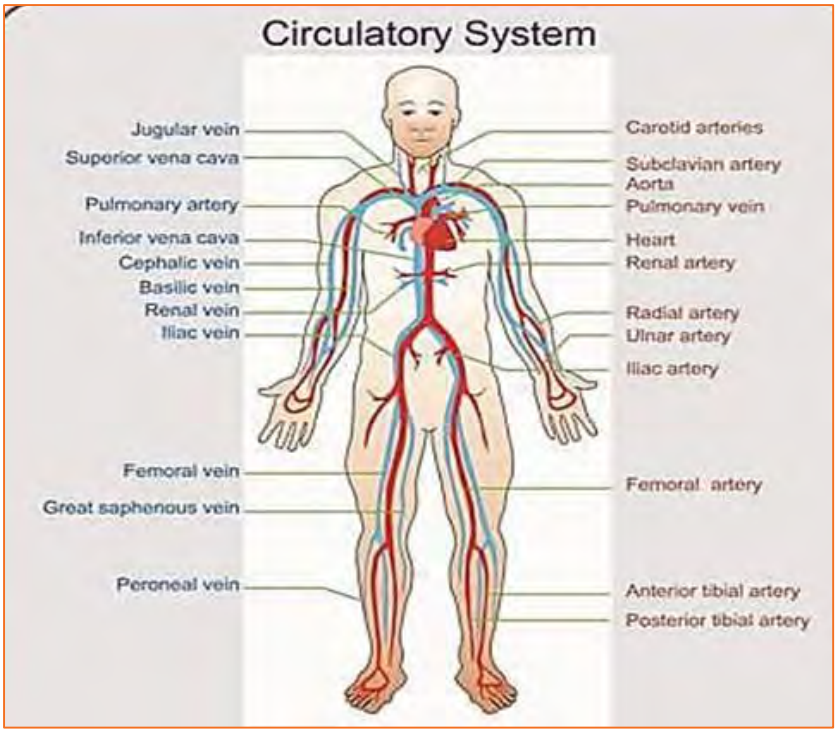

Fig.3.1.8: Circulatory System

The circulatory system functions in collaboration with respiratory system in transporting oxygen to various parts of the body and removing carbon dioxide. It does this through a different set of blood vessels known as veins. The circulatory system is, therefore vital in the maintenance of the regular body functions.

Respiratory System

The respiratory system helps in carrying oxygen to our body and eliminating carbon dioxide. This system has trachea and lungs as the central units. While breathing, the air is inhaled by the body mostly through the nose and enters the wind pipe, known as trachea. From the trachea, the air passes through the lungs and the oxygen is then absorbed in the lungs. The oxygen present in blood is then transported from the lungs to other organs of the body. Each body organs use the oxygen to release energy. This energy released is utilized for performing essential body functions.

While performing various activities, the body organs produce carbon dioxide.

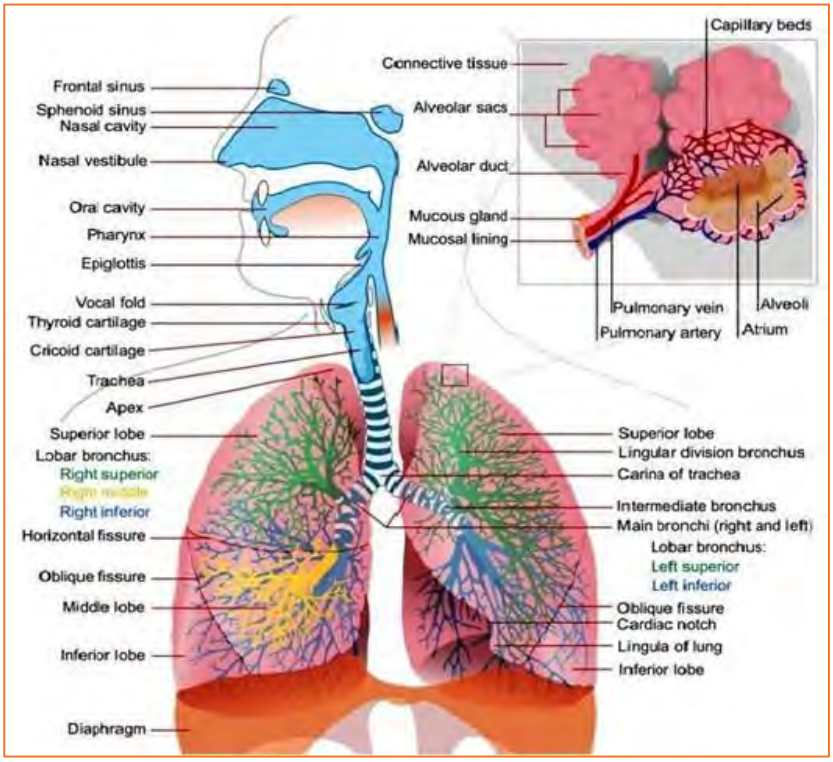

Fig.3.1.9: Respiratory System

The carbon dioxide is transported to the lungs by the blood and from the lungs the air carrying carbon dioxide is breathed out. This process of breathing in — using oxygen for releasing energy— and breathing out of air is collectively called respiration. The organs that are involved in respiration are grouped together as the respiratory system. Thus, the respiratory system an important role as it provides oxygen that is critical for body functioning.

Digestive System

- It consists of the mouth, food pipe also known as oesophagus, stomach, intestines and other organs like the liver, the pancreas, the gall bladder and the salivary glands. The food that we eat needs to be converted into smaller units for absorption by the body.
- The digestive system breaks the food down and absorbs the nutrients in the food. This whole process is known as digestion.
- The tongue pushes the food from the mouth and is chewed and swallowed. It passes through the oesophagus. From the oesophagus the food enters the stomach and then the intestines.

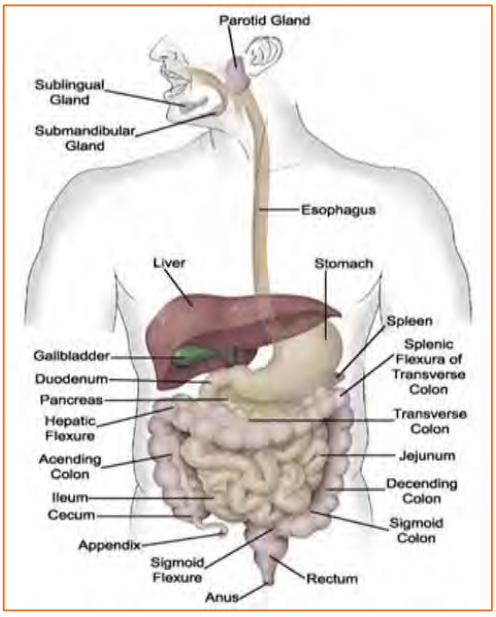

Fig.3.1.10: Digestive System

- Here the food is broken into small units with help of substances called enzymes. The enzymes that are needed for the digestion of the food are produced by the salivary glands, liver, pancreas and gall bladder. The blood absorbs the nutrients from the food and transports them to the various organs for producing energy.

Urinary System

- The urinary system has a pair of kidneys, the urethra, the ureters and the urinary bladder. When the body organs utilize the nutrients and oxygen for the production of energy, they produce waste products such as ammonia and urea. These waste products are carried by the blood to the kidney. In the kidneys, the waste products are filtered from the blood and excreted out of the body as urine.

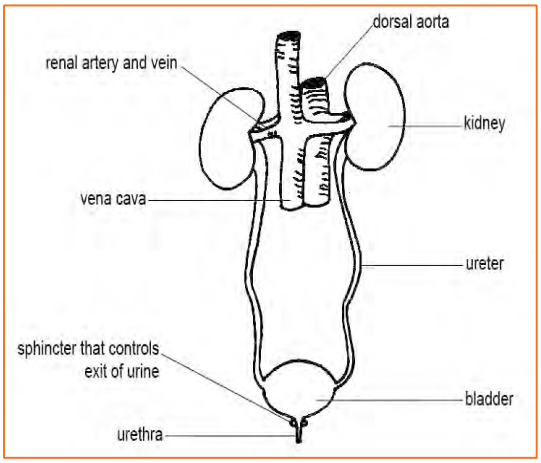

Fig.3.1.11: Urinary System

- Urine, a liquid with excess water passes through the ureters and fills the urinary bladder. The urinary bladder when full of urine, releases the urine out of our body. If the kidneys are unable to function normally, the waste products present in the blood can cause harm to the body organs. So, it is very necessary to throw out the waste materials.
- The excretory system is hence critical to good health as the harmful wastes are thrown out from the body by this system.

Reproductive System

- The reproductive system is of two kinds - the male and female reproductive system. It comprises of the sex organs.
- Male reproductive system comprises of testicles and sex organ, the penis. The testicles produce seminal fluid which contains fertilization units called sperms. The semen is passed through the penis.

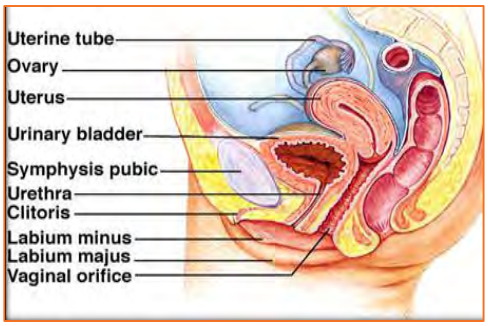

Fig.3.1.12: Reproductive System (Female)

- The female reproductive system is made up of ovaries, uterus and sex organ, the vagina. When the sperms enter the female body, in the ovum, fertilization takes place that leads to the development of a foetus, and then into a baby.
- The reproductive system functions to develop a new human body in the within the woman's body

Female Reproductive System

This reproductive system comprises of parts which take part in reproduction.

- The female body has from birth multitude of eggs that could grow into a baby.
- The female body has a fallopian tube where the eggs get fertilized by sperms resulting in a whole human being.

Male Reproductive System

- The penis includes:
  - o the lowest part connected to the lower abdominal organs as well as the pelvic bones,
  - o the shaft
  - o a cone shaped end called glans penis
  - o an opening of the urethra at the head of penis which carries semen
    And urine

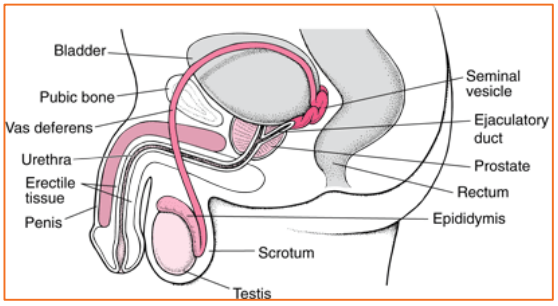

Fig.3.1.13: Male Reproductive System

- The scrotum is a thick-skinned sac that encircles and shields the testes.
- Usually the left testis hangs a little bit lower than the right testis. The testes have the following main functions:
  - o Produce sperm (carrier of the man's genes)
  - o Produce testosterone (the male sex hormone)

Supporting Physiological Systems

The basic physiological systems are supported by other physiologic systems such as the endocrine system and the immune system.

The endocrine system has called endocrines glands. Some examples of endocrine glands are the thyroid, pituitary, thymus.

The immune system comprises the lymph nodes and the lymphocytes.

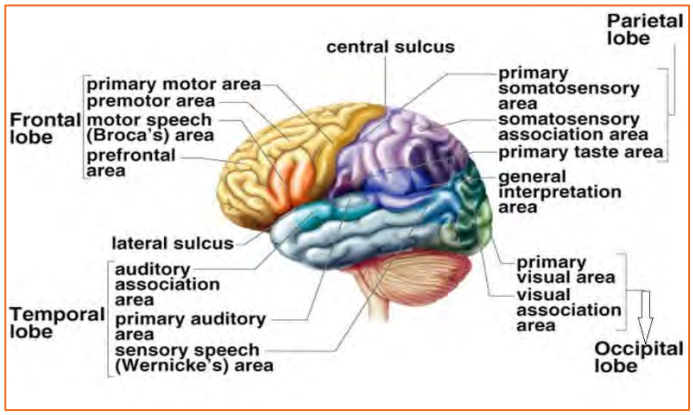

Fig.3.1.14 (a): Physiological Systems

It protects the body from harmful germs and keeps the body healthy. The immune system is critical in preventing the infections and protects the body from diseases.

3.1.3 Immune System (Lymphatic System)

The immune system or the lymphatic system plays an essential role in the body as it keeps us free from infection. Long term issues can crop up along with type I and type II diabetes in case the immune system does not function properly. The major role of the immune system is protection of body from bacteria, viruses and tumours.

The immune system of the body can get affected by various factors like bacteria, virus, tumours and killing parasites.

Major components of the immune system:

- Bone marrow
- Thymus
- Spleen
- Lymph nodes

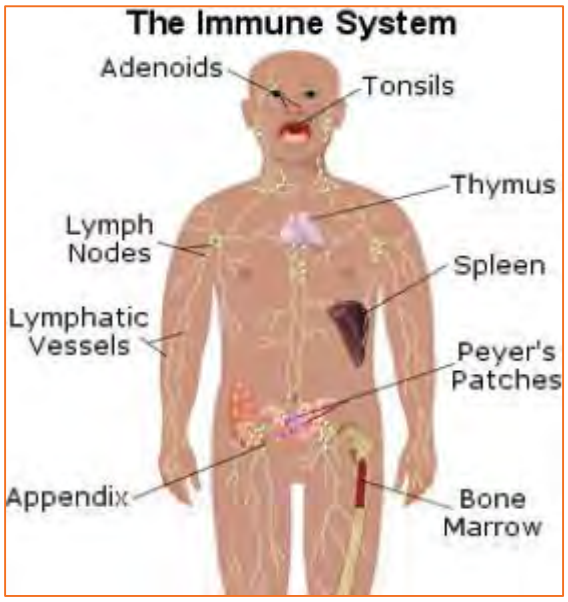

Fig.3.1.14 (b): Immune system

Exercise

1. Describe the basic human body shape and structures.

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2. Describe the working of the nervous system.

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3. List the different organs that form the circulatory system

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4. How does the digestive system work? Explain with the help of a diagram.

_____

_____

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_____

Skill India
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4. Respond to Emergency Calls

Unit 4.1 - Emergency Medical Response

Unit 4.2 – First-Aid

HSS/N2301

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe chain of survival
2. Demonstrate Cardio Pulmonary Resuscitation (CPR)
3. Apply first aid on an injured person

UNIT 4.1: Emergency Medical Response

Unit Objectives

At the end of this unit, you will be able to:

1. Describe Chain of Survival
2. Demonstrate CPR

4.1.1 Basic Life Support

An emergency medical condition can be defined as a condition where acute symptoms of immense severity manifest themselves and absence of prompt medical service may cause permanent impairing or may endanger the life of the individual.

Learning basic responses to emergencies can help you deal with an emergency. You may help by trying to keep a person breathing and alleviate their pain or reduce the effects of an injury or unexpected illness until an ambulance comes.

First aid includes simple steps of ABC – airway, cardiopulmonary resuscitation (CPR) and breathing. In any situation, the DRSABCD Action Plan should be implemented.

DRSABCD stands for:

- **Danger:** Always be careful about any danger to you, to the bystanders, if any, and then to the wounded or ill person.
- **Response:** Try to find out if the person is conscious.

Fig.4.1.1: Basic life support chart

- **Send for Help:** Call an ambulance.
- **Airway:** Check if the injured or the ill person's airway is clear and if the person is breathing. If the person is responsive and conscious and the airway is unobstructed, try to find out ways to help with the injury or illness.

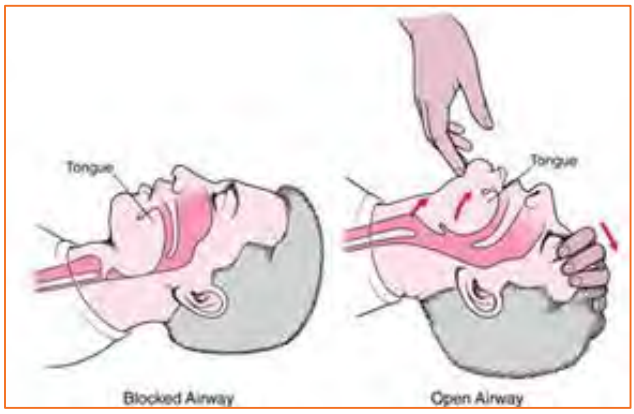

Fig. 4.1.2: Airway

- **Breathing:** Check the breathing of the wounded or ill person by observing the chest movements of the person. Check for signs of breathing.
- **CPR:** This procedure is applied if an adult is unconscious and does not show any signs of breathing.
- **Defibrillator:** If the afflicted person responds to this treatment, turn him or her to one side and tilt the head to keep the airway clear.

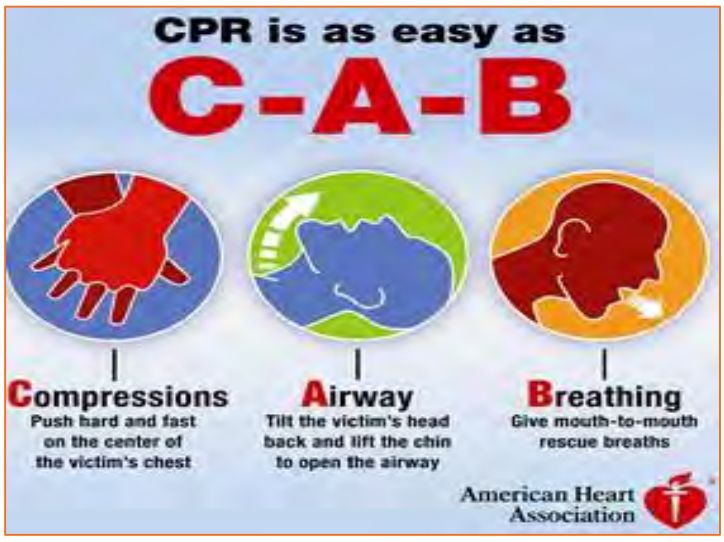

Fig. 4.1.3: CAB

Once the patient's level of consciousness has been checked, inspect the airway. If the patient is conversing and is alert, the airway can be considered to be open. If the patient is not responding, he or she should be placed lying facing up to inspect the airway properly. If the patient is lying facing down, then roll the patient on the back carefully. If the patient is not responding and the airway is not clear, clear the airway. Tilt the head, and lift the chin.

Head-tilt/chin-lift Method

Cardiopulmonary resuscitation is provided to a patient when the heart and breathing of the patient has stopped due to a cardiac arrest. It circulates blood which contains oxygen to the essential organs of the body. Chest compressions, a ventilator and an AED are used for this purpose.

- **Compressions:** Chest compressions are an important element of a CPR. To ensure good results and proper CPR, high quality chest compressions must be provided. Ensure that:
  - Patient has been laid down on a firm, flat surface allowing adequate room for compression.
  - The chest is uncovered to facilitate proper hand placement and notice the chest uncurl.
  - Place the hands so that the heel of one hand is on the centre of the chest and the other on top of the first hand.
  - Arms are kept straight, while the shoulders are position ed over the hands to facilitate proper compressions.
  - The chest must be given time to totally recoil before the next compression to enable the blood to flow back into the heart after the compression.

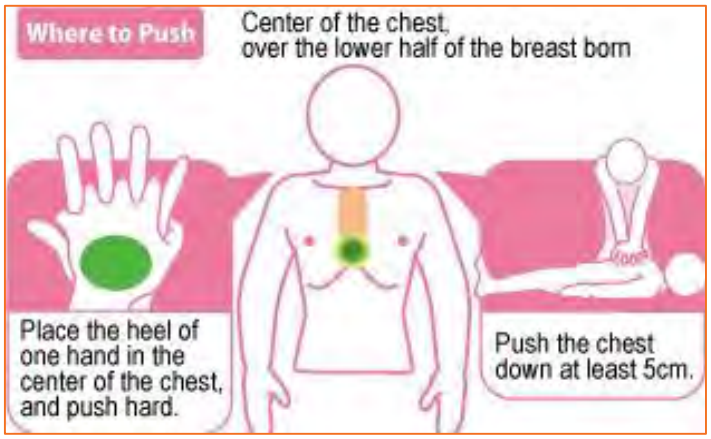

Fig. 4.1.4: Compressions

- **Ventilations:** Provide oxygen to a person who does not seem to be breathing. They may be given through various methods such as:
  - Mouth-to-Mouth
  - Pocket mask

4.1.3 Performing CPR for an Adult

Steps for performing CPR on an adult:

- **STEP 1:** Check the scene for any immediate danger.
- **STEP 2:** Assess the victim's consciousness.
- **STEP 3:** Perform thirty chest compressions.
- **STEP 4:** Minimize gaps between chest compressions.
- **STEP 5:** Ensure that airway is clear.
- **STEP 6:** If necessary, provide two rescue breaths.
- **STEP 7:** Repeat the cycle of thirty chest compressions.

4.1.4 CPR Using AED

Steps for performing CPR using AED:

- **STEP 1:** Use an automated external defibrillator or AED.
- **STEP 2:** Expose the person's chest totally.
- **STEP 3:** Place the sticky pads with electrodes to the person's chest.
- **STEP 4:** Press and analyse on the AED machine.
- **STEP 5:** Do not remove the pads from the person and repeat CPR for another five cycles before using the AED again.

4.1.5 Choking Treatment

Steps for treating choking:

- **STEP 1:** If the person is conscious but not able to breathe or speak, give five blows between the shoulder blades with your hand.

Fig.4.1.12: Back blow

- **STEP 2:** If person Is still choking, do thrusts:

Fig.4.1.13: Thrust

  - In case the person is not pregnant or too overweight, do abdominal thrusts.
  - Stand at the back of the person and encircle the waist with your arms.
  - Position your closed fist just atop person's navel, clasp your hand over the closed fist.
  - Pull inward and upward at a quick pace as if attempting to lift the person up.
  - Do a total of 5 abdominal thrusts.
  - If the blockage still persists, carry on with five back blows and five abdominal thrusts until the object is thrown out or the person begins to breathe or cough.
  - Pick the object out of the patient's mouth but refrain from searching with your fingers.

- **STEP 3:** In case the person is obese or pregnant, perform high abdominal thrusts:
  - Stand at the back of the person and encircle the person with your arms positioning your hands just below the breast bone.
  - Pull inward and upward at a quick pace.
  - Continue until the object is forced out.

Fig.4.1.14: High abdominal thrusts

- **STEP 4:** Give CPR, if necessary:
  - o If the obstruction is forced out, but the person is not able to breath or gain consciousness:
  - o For a child, start CPR for children.
  - o For an adult, start CPR for adults.
- **STEP 5:** Follow Up:
  - o The emergency medical personnel will take over and might give CPR or take the person to the hospital, if needed.

Fig.4.1.15: Obstruction comes out

4.1.6 Conversion Disorder

Conversion disorder (CD) was a diagnostic term used earlier for some psychiatric conditions. It is also at times used for patients who show neurological symptoms. These symptoms include numbness, blindness, paralysis, or fits. All these symptoms cannot be related to a well-established organic cause, and can cause considerable distress.

Conversion disorder is shown by symptoms such as:

- Poor coordination or balance
- Unusual movements
- Paralysis or extreme weakness
- Difficulty in talking or swallowing
- Withholding urine
- Losing sense of touch
- Blindness or other visual disability
- Deafness
- Seizures, convulsions or fits

- Psychological symptoms such as stress or conflict.

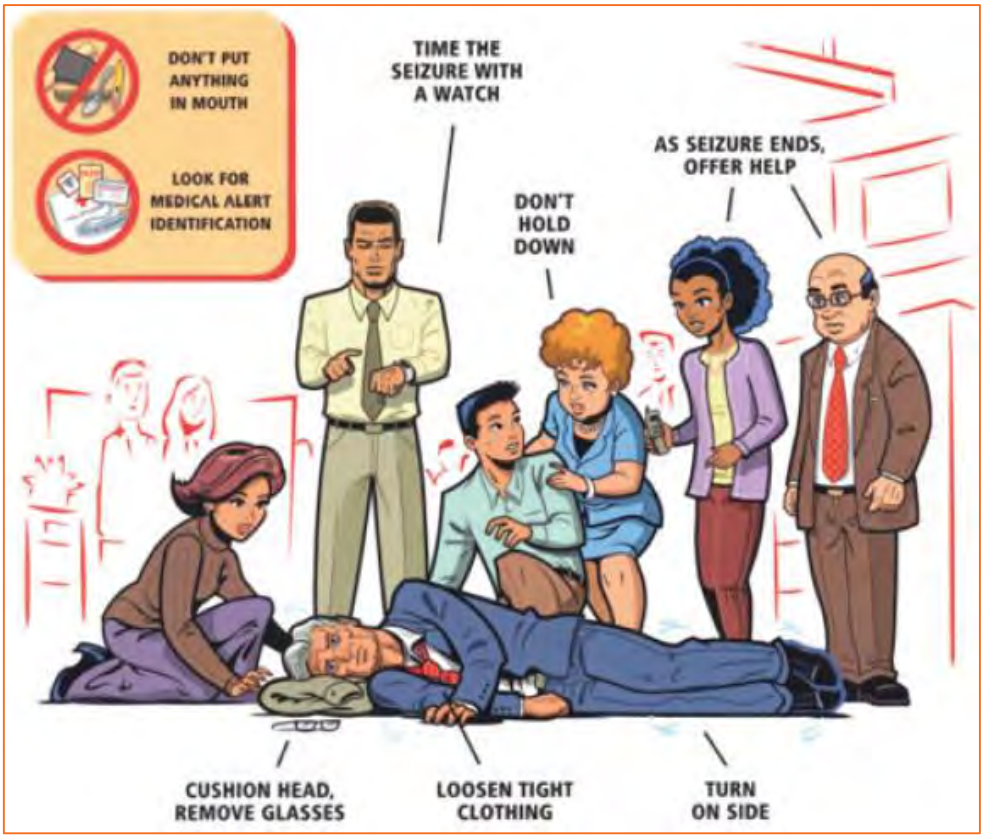

Fig.4.1.16: Emergency measures for a convulsive seizure

Emergency measure in case of a convulsive seizure:

- Stay calm.
- Move objects like furniture.
- Note the time at which the seizure begins.
- Stay at their side. If they do not faint but appear blank or dazed, gently take them away from any danger. Talk to them slowly and calmly.
- Use cushion under their head, if they have collapsed to the ground.
- Don't hold them down.
- Avoid putting anything in their mouth.
- Check the time again. Call for help if a convulsive shaking doesn't stop after five minutes
- Check if normal breathing has returned after the seizure has stopped. Ensure that things like food or dentures are not blocking their airway. Call for medical assistance if their breathing after the seizure sounds difficult.
- Stay with them until they have fully recovered.

Call for emergency help if:

- The person is pregnant or diabetic
- The seizure happened in water
- The seizure lasts longer than five minutes
- The person does not regain consciousness after the seizure
- The person stops breathing after the seizure
- The person has a high fever
- Another seizure begins before the person is conscious
- The injury occurs during the seizure
- This is the first seizure the person has ever had
- If the medical ID shows a history of epilepsy.

Fig.4.1.17: Emergency situations

4.1.7 Needle Stick Injuries

These are wounds caused by needles which may puncture the skin accidentally. Medics who work with syringes and other needle equipment are always at risk of receiving needle stick injuries. These injuries happen while using, disassembling, or disposing needles.

"Sharps" include needles, scissors, metal wire, retractors, scalpels, lancets, razor blade, clamps, pins, staples, cutters, and glass items. An object that can cut the skin is considered a sharp. Sharps can allow entry of blood or fluids into the body through the skin.

Accidently puncturing the skin with used needles can give entry to the hazardous fluids into the body of the person receiving injuries. In case of needle stick injuries, contact with infectious fluids, especially blood, is the most dangerous. Severity of needle skin injuries varies as per the blood borne pathogen.

Emergency Measures in Case of Needle Stick Injury

Steps for providing emergency treatment for a needle stick injury:

- **STEP 1:** Encourage the wound to bleed, ideally by holding it under running water
- **STEP 2:** Wash the wound with plenty of water and soap
- **STEP 3:** Refrain from scrubbing the wound while washing it

- **STEP 4:** Dry the wound and cover it with a waterproof plaster or dressing.
- **STEP 5:** Seek medical attention immediately. The blood may need to be tested to find out if further treatment is required.
- **STEP 6:** Find out if there is a possibility of HIV exposure. Precautions should be promptly taken to prevent zero-conversion.
- **STEP 7:** Find out if there is a possibility of other exposures. The risk for transfer of hepatitis is much more than that of HIV (about 30% for Hepatitis B and about 10% for Hepatitis C)

6.1.8 Chain of Survival

Chain of Survival is a consecutive treatment process given for the victims of SCA (Sudden Cardiac Arrest) outside of a hospital setting. It includes:

- Emergency response system is activated when cardiac arrest is identified in a person.
- Initially, early CPR is started with chest compressions
- Rapid defibrillation is done
- Advanced life support is activated
- Post-cardiac arrest care is facilitated
- Execution of each step is crucial as chances of survival decrease with each passing minute by 7-10%.

Tips

- Cardiopulmonary Resuscitation (CPR) is a method to save lives that includes chest compressions and mouth-to-mouth resuscitation
- While giving CPR:
  - Ensure safety.
  - Check for response.
  - Seek nearby help so that the resuscitation team can activate the resuscitation.
  - Be extra cautious while performing CPR on babies/infants.
  - Check for breathing and pulse.
  - Immediately begin CPR, and use the AED/defibrillator when available.
  - If the baby is not breathing, perform gentle compressions using maximum three fingers.
  - Always wear gloves to avoid direct contact with the patient's potentially infected body fluids.

Exercise

1. Describe DRSABCD action plan?

_____

_____

_____

_____

2. Describe CPR in detail?

_____

_____

_____

_____

UNIT 4.2: First Aid

Unit Objectives

At the end of this unit, you will be able to:

1. Apply first aid on an injured person.

4.2.1 First Aid

First aid is the assistance given to a person experiencing an unexpected illness or injury to save life, prevent the condition from worsening, or to promote recovery.

There are numerous circumstances which may require first aid, and various nations have legislation, regulation, or guidance which specifies a basic level of first aid provision in specific conditions.

This can include specific training or equipment that is procurable within the work zone, (for example, an Automated External Defibrillator).

Fig.4.2.1: First aid pyramid

The scope can also include specialist first aid cover at a public function, or important first aid coaching among learning institutes.

First aid, in any case, doesn't basically require any specific equipment or past data, and may include improvisation with materials offered at the time, typically by undisciplined people.

Vital Signs	Good	Poor
Heart Rate	60-100 beats per minute	Less than 60 or greater than 100 beats per minute
Respiration	14-16 breaths per minute	Less than 14 breaths per minute
Skin	Warm, Pink and Dry	Cool, pale and moist
Consciousness	Alert and Orientated	Drowsy and unconscious

Fig.4.2.2: Vital Signs

Awareness	Assessment	Action	Aftercare
• Observe • Stop to help	• Assess what is required to be done • Ask yourself, 'Can I do it?'	• Do what you can • Call for expert medical help • Take care of your and the bystander's safety	• Once you have assisted the victim, stay with him/her till expert care arrives

Fig.4.2.3: Four A's of first aid

While delivering first aid always remember:

- Prevent deterioration.
- Act swiftly, deliberately and confidently.
- Golden Hour – First 60 minutes following an accident.
- Platinum Period – First 15 minutes following an accident.
- Prevent shock and choking.
- Stop bleeding.
- Loosen victim's clothes.
- Regulate respiratory system.
- Avoid crowding/over-crowding.
- Arrange to take victim to safe place/hospital.
- Attend to emergencies first, with ease and without fear.

- Do not over do. Remember that the person giving first aid is not a doctor. First aid for different types of injuries are as follows:

Injury	Symptom	Do's	Don'ts
Fracture	• Pain • Swelling • Visible bone	• Immobilise the affected part • Stabilise the affected part • Use a cloth as a sling • Use board as a sling • Carefully transfer the victim on a stretcher	• Do not move the affected part • Do not wash or probe the injured area
Burns (see degrees of burn table)	• Redness of skin • Blistered skin • Injury marks • Headache/seizures	• In case of electrical burn, cut-off the power supply • In case of fire, put out fire with blanket/coat • Use water to douse the flames • Remove any jewellery from the affected area • Wash the burn with water	• Do not pull off any clothing stuck to the burnt skin • Do not place ice on the burnt area • Do not use cotton to cover the burn
Bleeding	• Bruises • Visible blood loss from body • Coughing blood • Wound/Injury marks • Unconsciousness due to blood loss • Dizziness • Pale skin	• Check victim's breathing • Lift up the wound above heart level • Give direct pressure to the wound with a clean cloth or hands • Remove any visible objects from the wounds • Apply bandage once the bleeding stops	• Do not clean the wound from out to in direction • Do not apply too much pressure (not more than 15 minutes) • Do not give water to the victim
Heatstroke/Sun Stoke	• High body temperature • Headache • Hot and dry skin • Nausea/Vomiting • Unconsciousness	• Move the victim to a cool, shady place • Wet the victim's skin with a sponge • If possible apply ice packs to victim's neck, back and armpits • Remove any jewellery from the affected area • Wash the burn with water	• Do not let people crowd around the victim • Do not give any hot drinks to the victim

Injury	Symptom	Do's	Don'ts
Unconsciousness	• No movement of limbs • No verbal response or gestures • Pale skin	• Loosen clothing around neck, waist and chest • Check for breathing • Place the victim's legs above the level of heart • If victim is not breathing, perform CPR	• Do not throw water or slap the victim • Do not force feed anything • Do not raise the head high as it may block the airway

Fig.6.2.4: First aid for different types of injuries

1st Degree Burn	2nd Degree Burn	3rd Degree Burn	4th Degree Burn
Will recover itself in a few days. **Action Required:** Place under running water.	Serious but recovers in a few weeks. **Action Required:** Place clean wet cloth over the burnt area.	Very serious and will require skin grafting. **Action Required:** Place a clean dry cloth over the burnt area.	Extremely serious and requires many years with repeated plastic surgery and skin grafting, is life threatening. **Action Required:** Leave open and prevent infection.

Fig.4.2.5: Degree of burns

4.2.2 Splints and Aids of Torso

A bandage immobilizing a broken bone is known as a splint. It may be done with the help of sticks or boards. For some injuries, the only option is tying up the broken limb to the body.

Splints

While applying a splint, do not try to fix or straighten the break. This may exclusively cause an additional injury or pain. Rather, just apply the splint to the break the way it is.

When Using Rigid Material

- Always use sufficiently long things to reach the joints behind the break. For example, while splinting a forearm, fabric should be sufficiently long to touch both the wrist joint and the elbow. This helps in keeping the fabric in place and keeps an unnecessary amount of pressure from being connected to the injury.

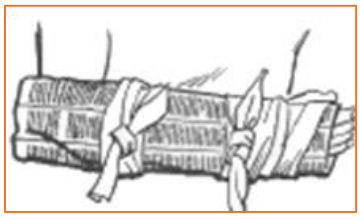

Fig.4.2.6: Splint the forearm

- Always put cushioning in between the body and rigid material to make the victim comfortable. Knots must be tied between the rigid material and the body (in mid-air) once feasible. This will make them simpler to loosen. In the event that this can be inconceivable, tie knots over the rigid material.
- To support the forearm, envelope the split with rigid material and adequately bandage to the arm with wide fabric strips. A daily paper or magazine, twisted into a "U" shape, works adequately. Splint the wrist joint with similar approach. The entire forearm needs to be immobilized.

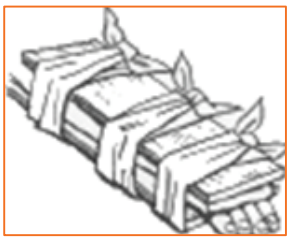

Fig.4.2.7: Splint the wrist

- In order to splint the elbow, utilize enough rigid material to make a trip from the armpit to the hand. The whole arm should be immobilized. Try not to plan to fix the elbow; support it in position. In order to splint the upper leg, utilize long things of rigid material which will reach from the lower leg (ankle) joint to the armpit. Use long straps to tie it around the torso to maintain immobility.
- Use a length of a rigid material that reaches from the ankle to the armpit to splint the upper leg. Use long straps to tie the rigid material with torso to keep the top splint in place.

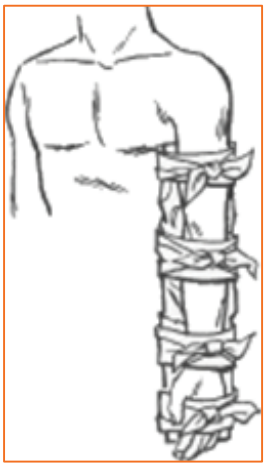

Fig.4.2.8: Splint the elbow

Fig.4.2.9: Splint the upper leg

- To put a splint on the lower leg, use a stiff material long enough to travel from the knee to the foot. The foot ought to be immobilized and unable to turn. Make sure to use a lot of cushioning, particularly round the ankle.

Fig.4.2.10: Splint the lower leg

4.2.3 Bleeding

- Excessive bleeding is a condition when the body loses large quantity of blood.
- Most of the time it occurs externally via natural openings, such as mouth.
- Skin injury or any damage to the skin can lead to bleeding.
- Internal bleeding occurs when blood vessel gets damaged or injured.

Causes

- Accidents/falls
- Head injury
- Tooth extraction
- Certain medications
- Illnesses like
  - Haemophilia
  - Scurvy
  - Cancer
  - Thrombocytopenia
  - A plastic Anaemia
  - Leukaemia
  - Haemorrhage
  - Peptic Ulcer
  - Platelet Disorder
  - Liver Disease
  - Septicaemia

Symptoms

- Discharge of blood from a wound
- Bruising
- Blood in stool/urine

- Blood coming from other areas, like mouth/ear

Fig.4.2.11: Bleeding

Treatment

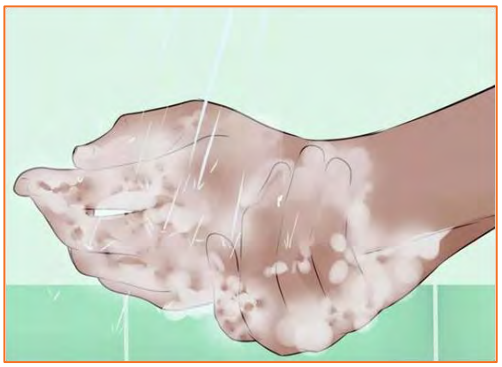

Fig.4.2.12: Washing hands

- Wash hands before attending the patient.
- Wear synthetic gloves.
- Lay the victim on the bed.
- Lift the legs slightly.
- Remove any obvious debris/particle.
- Apply direct pressure using clean cloth for about 20 minutes.
- Use hand if cloth is not available.
- Don't try to remove the cloth to check the bleeding.
- Try to keep the bandage in place using a tape.
- Do not take out the bandage if blood seeps through it.
- Add additional bandage on top of the first one.
- If necessary, apply direct pressure on the pressure points, i.e., below arm-pit/above elbow, for leg-behind knee/near groin.
- Apply pressure with flat fingers.
- Do not move the victim's affected part immediately after the bleeding stops.

If Bleeding Does not Stop

If bleeding occurs through nose, ears etc. it may be due to:

- Coughing up blood
- Vomiting
- Bruising/deep wounds
- Abdominal tenderness
- Fracture or Shock

Steps to Treat:

- **STEP 1:** Do not replace a displaced organ.
- **STEP 2:** Cover the wound with a clean cloth.
- **STEP 3:** Do not try to remove an embedded object.

Fig.4.2.13: Wash your hands

Fig.4.2.14: Clean the wound

Fig.4.2.15: Immobilize the effected part

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5. Patient Assessment

Unit 5.1 - Patient Assessment (Scene Size up)

Unit 5.2 - Patient Assessment (Initial Assessment)

Unit 5.3 - Patient Assessment History & Physical Exam

Unit 5.4 - Patient Assessment (Detailed Physical Exam)

Unit 5.5 - Patient Assessment (On – Going Assessment)

Unit 5.6 - Patient Assessment (Communication)

HSS/N2301, HSS/N2302, HSS/N2304

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe kinetics of trauma
2. Identify bleeding and shock trauma
3. Define soft tissue injuries and burn
4. Define musculoskeletal care
5. Identify the injuries to the head and spine
6. Identify face and throat injuries
7. Identify chest injuries
8. Identify abdominal and genital injuries

UNIT 5.1: Patient Assessment (Scene Size up)

Unit Objectives

At the end of this unit, you will be able to:

1. Identify scene size up
2. Consider mechanism of injury / nature of illness
3. Determine the number of patients
4. Define additional resources
5. Identify C-spine immobilization

5.1.1 Scene Size-up

When you receive an emergency call, some information about the condition where your assistance is required, will be provided by your dispatcher. Your scene size-up begins here. It explains the individual preparation against a specific situation. From the moment you are called into action until you finally reach your patient, you must consider a variety of things that will have an impact on how you attend your patient. The scene size-up includes conveyance of information in combination with inspection of the scene to help you identify scene hazards, safety concerns, mechanisms of injury, the natures of illness, and the number of patients you have to attend, as well as additional resources you might need to safely and effectively care for the patient.

5.1.1.1 Body Substance Isolation (BSI)

On every emergency call, you will need to wear PPE because this equipment will reduce your personal risk for injury or illness. The type of protective equipment you wear will depend on your specific job responsibilities as an CFW-ECS As a medical responder, responsible primarily for patient care, you will need to use precautions for BSI. This is the most potent way to minimize the risk of exposure to potentially infections substances. The concept of BSI assumes that all body fluids pose a potential risk for infection whether a known infection exists or not.

The use of BSI precautions, including eye protection as well as masks, gloves and gowns, may be dictated by your local protocol. If a situation requires additional PPE, you must be properly trained about how to use those in specific situations.

5.1.1.2 Scene Safety

Every scene can potentially cause injury to you, your team, your patients, and bystanders. You will need to evaluate for potential or actual hazards when you proceed towards the scene. Information provided by dispatch may help in determining potential hazards.

For example, a call to an industrial site may have chemicals involved or a private residence may have animals that pose a threat. You should be open to many possible risks, ranging from complex hazardous materials spills to slippery grass.

If you become injured at the scene, you will be unable to provide the required help to your patient. In fact, you may use the important resources required by the original patients.

Personal Protection

Ensuring your personal protection begins by looking for possible dangers when you proceed towards the scene and before you step out of the vehicle.

- Oncoming traffic
- Unstable surface (e.g., wet or icy patches, loose gravel, slopes)
- Leaking fluids and fumes (e.g., gasoline, diesel fuel, battery acid, transmission fluids)
- Broken electric poles and electrical wires on ground
- Unfriendly spectators with a potential for violence
- Smoke or fire
- Possible hazardous or toxic materials (e.g., propane, hydrogen chloride)
- Crash or rescue locations with unstable elements such as unsecured vehicles (paying particular attention to placards)
- Violence and crime sites

Making an Unsafe Scene Safe

If the hazard presents a real risk to health and safety, you should request the appropriate assistance. Do not enter into the site, until a professional rescuer (i.e., fire fighters, utility workers, or hazardous material crew) has made the scene safe. On other occasions, you might enter a scene that appears safe but later becomes unsafe. If you have the appropriate and PPE to make the scene safe, you should make it safe. If not, extricate yourself and your patient as quickly as possible, protecting him or her from injury as best you can. These situations are sometimes very difficult to manage when you want to provide medical care as quickly as possible. Remember your safety and the safety of your team come first. Other scenes may have a potential for risk that, as a medical responder, you will be able to manage with your training. Remember that hazards do not need to be dramatic situations but could be as simple as a hole in the ground or spilled transmission fluid. Carefully evaluate the scene and request specific help to manage the scene threats (e.g., law enforcement, fire personnel, and hazardous materials crews).

5.1.2 Consider Mechanism of Injury/ Nature of Illness

The final complaint will lead you to analyse the issue with the patient. The issue can be anything related to a mechanism of injury (MOI) or a medical problem based on the nature of illness (NOI).

Mechanism of Injury

As an CFW-ECS, if you work on the motor vehicle crashes or some other crash, patient might have sustained life-endangering injuries. To treat such patients properly, you have to understand how these injuries take place, or the mechanism of injury (MOI).

In case of a traumatic injury, the body must have faced some force or energy that caused the temporary wound, the permanent injury, or even death.

As you might expect, certain parts of the body are more easily injured than others. The brain and the spinal cord are very fragile and easy to injure. Fortunately, they are protected by the skull, the vertebrae, and several layers of soft tissues. The eyes are also easily injured. Even small forces on the eye may result in serious injury. The bones and certain organs are stronger and can absorb small forces without resulting in an injury. Mechanism of injury (MOI) can be used to predict the potential for serious injury by assessing following factors: quan tity of force applied on body, time duration of force and location of the body.

Blunt trauma and penetrating trauma are the common names in case of injury. Blunt trauma is the injury that happens due to the force over a wide area, and the skin is generally not broken. It damages the tissues and organs that lies below the region of impact. In penetrating trauma, the injury is caused due to object penetration and mostly over a small area. It is more prone to infection. The level of injury depends on the force of object, energy and part where injury happened.

Nature of Illness

As an CFW-ECS you will care for many medication patients as well as trauma patients. First examine MOI as a part of scene size-up. For patients with some disease, check for nature of illness (NOI). These give information on how the incident has initiated. You must be able to determine the type of illness and effective treatment from the patient chief complaint.

To analyse the patient quickly, you need to talk to their relative, friend and family to know more on the problem. If you find patient unconscious you can ask the person who accompanied him to the hospital regarding his complications/injury. It is also important to examine the patient for any visible clues by physical examination.

At the place of incident, we can view some hazard substances which caused the complications. And any smell, room condition can give a clue on the incident that has caused patient ill. There can be also a sound which caused illness. So observe carefully f possible sounds, smell and other things. It is very important to use senses to analyse possible reasons that caused patient to suffer.

The Importance of MOI and NOI

MOI and NOI helps to prepare our self against patient care. For example, when you begin to gather equipment from the unit to treat your patient, what would you take for an older patient complaining of chest pain? How would that equipment differ from the equipment used for a pedestrian struck by a vehicle? The appearance of the scene may also guide you in your preparation. Other mechanism of injury may include motor vehicle crashes, assaults, and stabling or gunshot wounds. Examples of nature of illness include seizures, heart attack, diabetic problems, and poisonings. Family members, bystanders, or even law enforcement personnel may also provide important trauma or medical information to help you prepare as you approach the patient.

During your prehospital assessment you might want to classify your patient right away as a trauma patient or a medical patient. Remember, the basics of a proper patient assessment are identical in spite of the unique characteristics of trauma and medical care. If you find an unresponsive patient, near or below the ladder then you need to assess accordingly based on the visible injury and signs on the body. In initial stage it is very hard to find the problem and to check whether it is an injury or medical issue. In such cases MOI or NOI can help to identify and give clue in further assessment.

5.1.3 Determine the Number of Patients

It is very important to identify the problem in all the patient during scene size-up. This process is very difficult, and you may need extra resource for evaluation. You may require fire department, specialized rescue group, or a HazMat team.

When there are more than one victim or patient you can call for additional units, and begin triage. Triage is a process of classifying patients based on their disease/injury severity and seriousness.

Once patients are triaged you can transport them and give treatments based on their needs. Experienced CFW-ECS are advised to perform the triage process. Triage is very important function which determines the treatment, first-aid and additional care to be given as per the need. It is always important to plan properly when operating in large group of patients. It is must to know the needs of patients and have sources to fulfil them all. It is also important to know the local procedure and protocols and incident management system when handling large groups of people.

5.1.4 Consider Additional Resources

Some trauma or medical situations may simply require more ambulances, while others may have need for specific additional help. Basic life support (BLS) units may be all that are needed for some patients; however, advanced life support (ALS) should be requested for patients with severe injuries or complex, medical problems depending on available resources and local protocols. ALS may be provided by CFW-ECS-Is or CFW-ECS-Ps, depending on how your EMS system is set up. Air medical support is another good resource for ALS. Follow your local protocols in requesting ALS resources.

Many resources in addition to fire suppression are often available through the fire department, including high-angle rescue, hazardous material management, and complex extrication from motor vehicle crashes, water rescue, or other specific types of rescue, such as swift water rescue. Search and rescue teams can be helpful in finding, packaging, and transporting patients over a long distance or through unusual terrain. Law enforcement also may be needed to control traffic or intervene in domestic violence situations.

Knowing how your EMS system is organized will help you determine what additional resources may be required. The sooner these resources are identified, the sooner they can be requested.

5.1.5 Consider C-Spine Immobilization

If an injury is suspected, consider early spinal immobilization. This is a vital step, as shifting such kind of a patient without providing proper spinal immobilization can cause permanent damage such as lifelong paralysis. If spinal injury is only suspected but not confirmed, immobilize the patient anyways as a precautionary measure.

Exercise

1. If you do not know the injuries that a patient has sustained, this will at least help to determine general injury patterns:
   a. USDOT EMS handbook
   b. Patient
   c. Receiving medical facility
   d. Mechanism of injury

2. Because of multiple impacts, the type of collision which is potentially the most serious is the:
   a. Head-on
   b. Side-impact
   c. Roll-over
   d. Rear-end

3. Finding out what is or may be wrong with a medical patient is similar to identifying the mechanism of injury with a trauma patient. It is called:
   a. Mechanism of illness
   b. Nature of illness
   c. The cause of disease
   d. Nature of sickness

4. An important aspect of the scene size-up in deciding whether or not you have enough to effectively respond to the incident is:
   a. Courage
   b. Experience
   c. Resources
   d. Time

5. The "up and over pattern" is an injury type common in:
   a. Rear-end collisions
   b. Head-on collisions
   c. Side-impact collisions
   d. Rotational-impact collisions

UNIT 5.2: Patient Assessment (Initial Assessment)

Unit Objectives

At the end of this unit, you will be able to:

1. Define initial assessment
2. Identify general impression
3. Assess mental status
4. Assess circulation
5. Assess breathing
6. Identify priority patients and make transport decisions

5.2.1 Initial Assessment

During the scene size-up, you used dispatch information and your own evaluation of the scene to begin to determine what happened. You also evaluated potential or actual scene threats, how to protect yourself and your team, and whether you need additional resources. These steps are critical in the initiation of patient care. However, your actual patient assessment begins when you greet your patient. The only and an extremely important goal of initial assessment is to identify and begin treatment of imminent or potential life threats. Inputs related to life-endangering conditions can be gathered from the appearance of the patient, the connection between the patient's complaint and the current MOI or NOI, and urgent issues with the patient's airway, breathing, and circulation (ABCs). In most of the accidents and injuries, ABCs will give an idea about the treatment and it is a must to give high consideration to analysing the ABCs in all the scenes.

5.2.2 General Impression

When you visit a patient at time of scene observe him completely. This observation can help you to check on the problems which can be dangerous. Most of the life-threatening issues are visible at the first impression. Common impressions are person's age, gender, race, level of distress, and overall appearance. It is very easy to decide or guess on the problem of patient based on the age, gender, or race.

Note the patient's position and whether the patient is moving or still. Make note of odours that suggest chemical hazards or smoke. The general impression continues during your introduction and questioning of their complaints. For instance, a wound on the hand, difficulty in breathing and airway problem can be identified easily and it needs immediate treatment.

Introduce Yourself and Ask Permission to Treat

Start a conversation with patient by introducing yourself. And explain the procedure that you will be doing on them. Ask for their personal details like their address and name to inform their relatives. Get their permission to contact their relatives before informing. sing the patient's name frequently will help reduce his or her anxiety about being ill or injured.

Obtain Consent to Care for the Patient

Conscious patient may allow you to care for them without you needing to ask specifically if you can help them. Other times, you may want to formally ask them. In unconscious patient treatment is based on the initial assessment and guess on the symptoms that their body is showing. At the same time, you must explain all the treatment and other process to patient once he gets his conscious.

Determine the Chief Complaint

You can ask the patient for complaints with his consent. You need to be polite and gentle while asking the chief complaints. It can be like, "What is the issue?" or "is there anything that I can help you with?" Chief complaint is very important, and it is told in patient's own words or language. As an CFW-ECS you must observe the vital and baseline signs. If a patient is unconscious, then he/she is "unresponsive." Always remember that chief complaint is very important and it can help in the treatment and for further assessment. For example, a patient with chest pain and dizziness can indicate problem related to heart or lungs. So, as an CFW-ECS you should decide which is important and you can start assessing patient as per the priority.

As an CFW-ECS you will be called on to treat an almost infinite number of different problems. The chief complaint will help you narrow down the MOI or NOI information gathered in the scene size-up. You can try to determine if the patient fell from the ladder or passed out by asking the patient. Evaluating how a person was injured may help predict the types of injuries the person may have. If you suspect a potential for a spinal injury, manually stabilize the patient's head. You will learn that it is not easy to find out whether a patient is a medical or a trauma patient until you have completed an in-depth assessment. This should not prevent you from providing stabilization to a patient with a suspected spinal injury. In many situations, medical emergencies and trauma go hand in hand.

For this reason, the initial assessment does not encourage you to differentiate immediately between medical and trauma patients. In fact, the assessment process starts by presuming that all patients might be both, medical and trauma patients. This approach is both simpler and safer than an approach that starts with an unsupported assumption that the patient is either ill or injured. One way to evaluate "the big picture" is to obtain a general impression of the patient before focusing on specific concerns.

5.2.3 Assess Mental Status

Evaluating a person's mental status is a good way to evaluate brain function. Many conditions, medical or trauma, may alter brain function and therefore the patient's level of consciousness. You will learn more about these conditions as you progress through the CFW-ECS course. Mental status and level of consciousness can be evaluated in just a few seconds by using two separate tests: responsiveness and orientation.

One test for the degree of responsiveness makes use of the AVPU scale to analyse how well a patient responds to external stimuli. This includes verbal stimuli that is sound, and painful stimuli, which could involve pinching the patient's earlobe. The AVPU scale is based on the following criteria:

- **Alert:** The patient's eyes open spontaneously as you reach to them, and the patient appears conscious of you and responsive to the environment. The patient appears to follow commands, and the eyes visually track people and objects.

A. Gently but firmly pinch the patient's earlobe.

B. Press down on the bone above the eye.

C. Pinch the muscles of the neck.

Fig.5.2.1: Assess mental status

- **Responsive to Verbal Stimulus:** The patient does not open his or her eyes spontaneously. However, when verbal stimuli are provided, the patient's eyes do open, and the patient is able to respond to a certain extent when spoken to.
- **Responsive to Pain:** When patient remain unresponsive by words to you but shows some signs like moving or crying out in response to a painful stimulus. So be alert that some methods do not indicate if spinal cord injury is present.
- **Unresponsive:** The patient does not show a spontaneous response to any verbal or painful stimulus. These patients generally do not exhibit cough or gag reflex and are unable to protect their airway. If you suspect that a patient is really unresponsive, assume the worst and treat accordingly.

In case of a patient who is alert and showing response to verbal stimuli, you should assess the person's orientation. Orientation tests the mental condition by inspecting a patient's memory and thinking capability. The most common test evaluates a patient's ability to remember four things:

- **Person:** Name.
- **Place:** Current location.
- **Time:** The current year, month, and approximate date.
- **Event:** What happened (the MOI and NOI)?

These questions were not selected at random. They evaluate long-term memory (person and place if the patient is at home), intermediate memory (place and time when asking year or month), and short-term memory (time when asking approximate date and event). If the patient knows these facts, the patient is said to be "alert and fully oriented" or "alert and oriented to person, place, time, and event." If a patient does not know these facts, he or she is considered less than fully oriented.

An altered mental status, anything other than alert, may be caused by a variety of conditions, including head trauma, hypoxemia, hypoglycemia, stroke, cardiac problems, or drug use. If the patient has an altered mental status, you should rapidly complete the initial assessment, provide high-flow supplemental oxygen, think for spinal immobilization if injury is suspected, and immediately take them to hospital. Support the ABCs as required and continually reassess for changes in the patient's.

5.2.4 Assess the Airway

As you proceed with the steps of the initial assessment, repeat checking for respiration changes or for airway obstruction. Irrespective of the reason, a partial or complete obstruction of the airway will cause insufficient or total lack of air flow into the lungs and out of it.

Proper open airway and adequate respiration is needed to avoid serious/fatal damage to the brain, heart, and lungs. A blocked airway can even lead to death.

Responsive Patients

Patients are considered to have an open airway if they can talk and cry. In patients with respiration problem, given clues based on the way they speak to find the airway and breathing status. For example, harsh sounds give clue of a partially obstructed airway due to swelling. Crowing sounds made at a high pitch suggest a foreign object obstruction in airway. If a patient in a conscious state is not be able to speak or cry properly, it means there is an airway obstruction.

If you find any signs of airway obstruction, stop the assessment and give treatment to relieve the airway. The treatment may be simple, like properly positioning the patient in a way where air moves in and out properly. In some case it may involve removing the foreign material from the airway. The signs and symptoms are same for both airway and bre athing problems. If a patient is unable to breathe or shows some signs of respiratory symptoms immediately give him or her the required treatment which can solve the problem.

Unresponsive Patients

If a patient does not respond and you find his airway is not clear you can open it by head tilt-chin lift or jaw-thrust manoeuvre. It normally happens due to relaxation of the tongue muscles. The tongue drops towards the back of the throat. Also any blood clot, food material, vomitus and foreign material can also cause obstruction. In unconscious patients, the following signs indicate airway obstruction:

- Acute trauma,
- Bleeding, or other injury
- Sound while breathing, like snoring or other unnatural sounds
- Shallow or absent breathing (Airway obstruction may hamper breathing)

If airway is not cleared, the patient will not have sufficient oxygen for survival. So it is very important to clear the airway for breathing and to provide enough oxygen for patient to survive. Airway positioning, depends on the age and size of your patient.

Spinal Consideration

Spinal injury can have possible effect on the conscious or unconscious level of patient. So when handling patient be cautious while doing scene size-up and analysing MOI of NOI and also while finding chief complaint. When managing the airway status of a patient, you must decide if you need to protect the spine.

Unconscious or minimally responsive medical patients may not be able to protect their airway. If you have evaluated the scene and have reliable information from witnesses who indicate that a patient does not have a spinal injury, you may consider placing the patient in a recovery position or side-lying position as soon as possible. In this position, secretions will drain out of the patient's mouth rather than into the airway, where they could be dangerous. Follow your local protocol in determining who has potential for spinal injury and who may be considered "clear."

5.2.5 Assess Breathing

A patient's breathing status is directly related to the adequacy of his or her airway. Check and confirm that the airway is open, the patient is getting adequate respiration and is able to breathe. Oxygen should be administered to patients who are having difficulty in breathing and also to patients who are breathing adequately, while positive pressure ventilation should be done on patients who are apneic or whose breathing is very slow or extremely shallow.

While assessing a patient's breath, check and try to hear and feel the patient's breathing and then examine adequacy of breathing. In adult's, the respiratory rate is around 12 to 20 breaths/min, whereas breathing in children is very fast. However, taking the time to actually count respiration may distract you from assessing more life-threatening problems. With practice, you should be able to estimate the rate and note whether it is too fast or too slow. At times, it may be important to actually count the number of respirations in your initial assessment. The objective of your initial assessment is to identify airway, breathing and circulatory issues and treat them as quickly as possible. Measuring vital signs more precisely is accomplished in another part of the assessment, once time and life threats are less of an issue.

Always check on effort of patient while breathing. In normal patients the respirations are not slow or deep. Slow respirations are caused due to reduced movement of chest wall and deep respirations are because of increased chest rise and fall.

Inadequate breathing is said to occur when retractions are present or accessory muscles are used for respiration. In paediatric patients, nasal flaring and see-saw breathing shows inadequate breathing. Dyspnea is a condition in which patient is able to talk only 2 or 3 words without stopping to take a breath. It is a very serious breathing condition.

As you analyse the breathing of the patient, you should consider the following questions:

- Are there any choking signs?
- Is the respiratory rate normal?
- Are the respirations shallow or deep?
- Is the patient cyanotic or appears blue?
- Are there abnormal sounds coming from the lungs?
- Are both the sides of the lungs functioning?

Place the stethoscope on the upper anterior chest along the midclavicular line and carefully listen to a few breaths. Repeat on the opposite side. Reduced or absent breath sounds or less rise and fall movement even on one side of the chest indicates inadequate breathing.

If a patient appears to develop difficulty in breathing after you have done initial assessment, you should quickly re-evaluate the airway. If the airway is open and breathing is present and adequate, you should consider placing the patient on supplemental oxygen. If breathing is present and inadequate because respiration is too rapid (usually more than 20 breaths/ min) or decreased or too slow (normally less than 12 breaths/ min), give supplement oxygen and provide positive pressure ventilations to the patient. You always need to focus on the difficulty in air exchange not on the number of breaths.

Any patient with a low level of consciousness, respiratory problems, or unnatural skin colour should also receive high-flow oxygen. The patient should be positioned in a comfortable position to support breathing in case no risk of spinal injury is found. The most preferred position is sitting up with the legs dangling or even a high Fowler's position (sitting up at almost a 90 degree angle). If a patient seems to have a spinal injury, you should first immobilize the cervical spine, ensuring all the while that respirations are maintained.

5.2.6 Identify Priority Patients and Make Transport Decisions

As you complete your initial assessment, you have to make some decisions about patient care. You should have already identified and begun treatment of life-threatening injuries and illnesses. Now, you should identify the priority status of your patient. Would you consider your patient a high priority or a medium or low priority for transport? Priority designation is used to determine if your patient needs immediate transport or will tolerate a few more minutes on the scene.

Patients showing any of the following symptoms are to be considered at a high-priority basis and should be quickly transported:

- Difficulty in breathing
- Poor general appearance
- Unresponsive and lacking gag or cough reflexes
- Acute chest pain, during <100mm Hg systolic blood pressure
- Pale and skin abnormality and poor perfusion
- Complication in childbirth
- Uncontrolled bleeding
- Responsive but unconscious and not able to respond for commands
- Extreme pain felt on any part of the body
- Immobilization or incapable of moving any part of the body

A high-priority patient should be transported as quickly as possible. The decision to transport should be made at this point in the assessment, and preparations for packaging and transport initiated. However, physically loading the patient on the stretcher and leaving the scene may occur shortly after the decision. It is very important to identify the patient who is at high-priority level of emergency. Even though initial treatment is important but high-priority patient needs to get transported to emergency unit as soon as possible to improve the survival rate.

From here, you proceed to history and focused physical exam based on your assessment of whether the cause of the patient's problems is a result of trauma or medical emergency, or both.

UNIT 5.3: Patient Assessment History & Physical Exam

Unit Objectives

At the end of this unit, you will be able to:

1. Identify history and perform physical exam
2. Analyse trauma patient with a significant MOI
3. Analyse trauma patient with no significant MOI
4. Identify medical patient who are responsive
5. Identify medical patients who are unresponsive

5.3.1 History and Physical Exam

You now have information from the scene size-up and initial assessment. These have provided you with valuable information about the scene, allowing you to prepare to care for your patient. You have stabilized any life-threatening conditions, perhaps provided spinal immobilization, and initiated transport. How do you proceed now? Your patient may have, almost literally, one or more of a million different problems. How do you identify, prioritize, and treat this variety of potential problems?

The history and physical exam will help you identify specific problems. It is based on the patient's chief complaint (what happened to this patient) and has the following goals:

- Recognize the correct situations surrounding the chief complaint, understanding the key factors associated with the event and analysing whether the MOI of patient poses a high risk for severe injuries.
- Obtain objective measurements related to the patient's condition. Do the examination and confirm on the severity of patient condition. Find how effective patient is dealing with the injury or illness?
- Do additional or required physical examination. These clues should help to identify the problems associated with patient.

The history and physical exam includes:

- Evaluation of the patient's medical history
- Obtaining baseline vital sign
- Performing a physical exam as per the patient's complaint, or, in the case of a critical patient, the MOI or NOI.

For many CFW-ECS taking the patient's history seems to be a bewildering series of questions that seem to bear little or no relationship to the patient's need for help. This becomes worse with patients who have had many medical problems; taking their history is time consuming and may yield little or no information that is useful to you. However, this does not need to be the case. The patient's history can help to tie together your findings from the physical exam and the vital signs.

As we explore more of how the focused history and physical exam applies to medical and trauma patients, you will understand how to question patients and obtain a 'SAMPLE history' (general medical history using the mnemonic SAMPLE) and a history of specific problems using the QPQRST mnemonic. SAMPLE history and QPQRST are discussed in detail in Chapter 5.

The baseline vital signs provide useful information about the overall functions of the patient's internal organs. They will be an important part of your assessment if your patient appears to have problems related to blood loss, circulation, or breathing. In other patients, you may simply document the vital signs as baseline information. If patient is found to be in normal condition, it is very important to check on the vital signs every 15 minutes to ensure the stable and safety condition of the patient. If you find the patient in an unstable condition check him every 5 minutes or more often for his condition and analyse for treatment of shock.

Do not be falsely reassured by apparently normal vital signs. The body has amazing abilities to compensate for severe injury or illness, especially in children and young adults. Sometimes a patient with severe or worst medical trauma shows normal vital signs. But at the same time body loses the energy and ability to keep up the normal vital signs in a patient's body. This can damage the body severely and it is normally found in children. In these conditions patient's vital signs can change at any point of time, so it is very important to recheck or assess the vital signs frequently at standard interval time. Treating a patient for shock before obvious signs of shock appear would help to reduce the overall effect of de-compensatory shock and therefore potentially increase your patient's survival rate.

There are two types of physical exams performed in this part of the assessment: a rapid physical exam and a focused physical exam. Either one is performed on a medical or a trauma patient depending on the circumstances surrounding the illness or injury.

5.3.1.1 Rapid Physical Exam

A rapid physical exam is a quick head-to-toe exam to identify any deformities, contusion, abrasions, punctures/ penetrations. burns, tenderness, lacerations, and swelling, among other signs, that may indicate a problem. This can be remembered with the mnemonic DCAP-BTLS. This exam is performed in as quickly as 60 to 90 seconds. The goal of a rapid physical exam is to quickly identify the potential for hidden injuries or identifiable causes that may not have been easily found in the initial assessment. It is typically performed on a trauma patient with a prominent MOI or on an unresponsive patient.

STEP 1: Assess the hand. Have your partner maintain in line stabilization.

STEP 2: Assess the neck

STEP 3: Apply a cervical spinal immobilization device on trauma patients.

STEP 4: Assess the chest. Listen to breath sounds on both sides of the chest.

STEP 5: Assess the abdomen.

STEP 6: Assess the pelvis. If there is no pain, gently compress the pelvis downward and inward to took look for tenderness or instability

STEP 7: Assess all four extremities. Assess pulse, motor and sensory function.

STEP 8: Assess the back. In trauma patients, roll the patient in one motion.

5.3.1.2 Focused Physical Exam

A focused physical exam utilizes particular assessment techniques to check patient's chief complaints. It usually checks on the location of body system and some complaints related to body system. For instance, if a patient is complaining of pain on the head or a headache you should assess the head and neck portion for possible injury and also spine and neurologic system. A person with a laceration on the arm may need only that arm evaluated. The objective of a focused assessment is to concentrate on the immediate problem. It is typically carried out on a trauma patient showing no prominent mechanism of injury or a responsive patient. The following points summarize the steps of a focused physical exam (only the relevant steps for the particular patient will be done):

- **Head, Neck, and Cervical Spine:** Check the head, neck, and cervical spine abnormalities. Gently touch the head and back of the neck for any pain, deformity, tenderness, crepitus, and bleeding (Step 1). Also get patient concern for any kind of pain or tenderness. Examine the neck for trauma, swelling, or bleeding sings. Gently touch the neck for subcutaneous emphysema. Also, inspect for abnormal lumps or masses (Step 2). In patients who do not seem to have spinal injury, you should look for swollen jugular veins. Ensure that the patient is sitting at a 45˚angle.

- **Chest and Breath Sounds:** Inspect the chest area for injury or trauma symptoms, including bruising, tenderness, or swelling and then palpate the area. (Step 3). Both sides of the chest should rise and fall at the same time and the breathing should be normal. Look out for abnormal signs of breathing, including retraction, or paradoxical motion. Feel for crepitus. Palpate the chest for subcutaneous emphysema. Auscultate breath sounds.
- **Abdomen:** Check the abdomen for any distinct injuries, bruising signs, and bleeding (Step 4). Palpate both the front and the back of the abdominal region, checking for tenderness and bleeding.
- **Pelvis:** Check for any distinct injuries, bleeding, or deformity (Step 5). If the patient does not complain of pain, softly apply a downward and inward pressure on the pelvic bones.
- **Extremities:** Check for major cuts, deep bruises, swelling, distinct injuries, and bleeding (Step 6). Inspect the extremities by palpating them for deformities. Check the pulse and the motor and sensory function.
    - **Pulse:** Inspect the distal pulses on the foot region and the wrist. Also check the circulation. Evaluate the skin colour in the hands or feet.
    - **Motor Function:** Request patient to make movements using fingers or toes like waving.
    - **Sensory Function:** Sensory function can be evaluated by asking a patient to close and open the eyes. You can also pinch a part of the patient's body to check on the feeling sensation of the patient.
- **Posterior Body:** Inspect the back of the patient to see if there is any tenderness, deformity or an open wound (Step 7). Touch the spine portion from neck region to the pelvis area for any tenderness or deformity, and check under the clothing for distinct injuries, such as bruising and bleeding.

Assessment of some common chief complaints are discussed below. History and vital signs of each of these will also be assessed:

- **Chest Pain:** Check for any visible wound or trauma on chest and hear for breath sounds. Also check on the pulse, blood pressure, and respiratory rate and evaluating the skin are

- good ways to focus on how well the cardiovascular and respiratory systems are functioning.
- **Shortness of Breath:** Look for signs of airway obstruction, as well as injury to the neck or chest. Listen carefully to breath sounds, noting abnormalities. Measure respiratory rate, chest rise and fall (for tidal volume), and effort. Because the location of this complaint is the chest, carefully evaluate pulse, blood pressure, and skin condition.
- **Abdominal Pain:** Look for injury to the abdomen or distension. Touch the abdomen to check for tenderness and rigidity.
- **Any Pain Associated with the Bones or the Joints**: Uncover the site and check the pulse and the motor and the sensory function near and under the affected area. Assess the range of motion. This should be done by asking the patient how much he or she can move the extremity or joint. Never force a painful joint to move.
- **Dizziness:** Assess the level of consciousness and the orientation to find out the patient's thinking ability. Evaluate speech for clarity. Inspect the head for trauma. Pulse, blood pressure, and skin changes may indicate hypoperfusion of the brain.

STEP 1: Gently palpate the head for any pain, deformity, tenderness, crepitus, and bleeding. Ask a responsive patient if he or she feels any pain

STEP 2: Gently palpate the back of the neck. Ask a responsive patient if he or she feels any pain or tenderness

STEP 3: Inspect visualize, and palpate over the chest area for injury or signs of trauma. Auscultate breath sounds.

STEP 4: Palpate the abdomen, evaluating for tenderness and bleeding.

STEP 5: Inspect the pelvis for any obvious signs of injury, bleeding, or deformity.

If the patient reports no pain, gently press downward and inward on the pelvic bones.

STEP 6: Inspect the extremities for cuts, bruises, swelling, obvious injuries, and bleeding.

Palpate along each extremity for deformities. Check for pulses and motor

STEP 7: Feel the back for tenderness, deformity, and open wounds. Carefully palpate the spine from the neck to the pelvis for tenderness or deformity. Look under clothing for obvious injuries, including bruising and bleeding

5.3.1.3 Physical Exam Techniques

The type of physical exam you perform is based on the needs of your patient but many of the following assessment techniques may be used:

- **Inspection:** Inspection is simply looking at your patient for abnormalities. This is done by looking for anything that may pinpoint a problem. For example, swelling in the lower extremity region may hint at a severe injury or a serious illness.
- **Palpation.** Palpation is the process of checking for abnormalities by touching or feeling the patient.
- **Auscultation.** Auscultation is the process of listening to the sounds that the body makes by using a stethoscope. For example, when measuring a patient's blood pressure, you can listen to the sound of the flow of blood against the brachial artery with the stethoscope. This is auscultation of the blood pressure.

DCAP-BTLS will guide you about what to look for while inspecting and palpating various body regions.

An integral part of your physical exam is to compare findings on one side of the body to the other side when possible. For example, if one ankle appears swollen, look at the other. If one shoulder feels "out of joint" feel the other one to compare. When listening to breath sounds, listen on both sides of the chest. On some occasion it may be helpful to use your nose in your physical exam. Odours can indicate anything from infections, to certain medical conditions, to scene safety threats.

The following are guidelines on how and what to assess during a physical exam. There may be times when you assess all of these areas quickly (rapid medical or trauma exam). There may be other times when you assess only one or two areas, but in great details (focused medical or trauma exam).

Head, Neck, and Cervical Spine

Look for possible injury or any abnormalities in the head, the neck, and the cervical spine region. Gently touch and examine the head region and the back of the neck for any pain, tenderness, crepitus, disfigurement and bleeding. Crepitus is the grating or grinding that is often felt or heard when two ends of a broken bone rub together. Ask for patient response on pain and feeling on tenderness. Next, check the neck region for any possibility of trauma, bleeding or a lump. Touch and examine the neck region for symptoms of trauma, such as abnormalities, bumps, lumps, bruising, or bleeding. Also, check for a crackling sound produced if there is an air bubble under the skin, also called as subcutaneous emphysema. It is particularly important to assess the neck before covering it with a cervical collar. Also, in case of patients who do not appear to have a spinal injury, check for swollen jugular veins. The patient should be sitting at a 45° angle. This is a normal finding in a person who is lying down; however, jugular venous distention in a patient who is sitting up suggests that there is a problem in the flow of the blood back to the heart. Report and record your findings carefully. Do not move on to the next step until you are sure that the airway is secure and you have initiated or continued spinal immobilization.

Chest and Breath Sounds

Examine the chest area for possible injury or trauma symptoms, like bruising, tenderness, or swelling and then palpate the area. Chest should rise and fall at the same time at both the sides of the lung and the breathing should be normal. Look out for abnormal signs of breathing, including retractions. It can be detected when skin pulls in around ribs during paradoxical motion, where one side of the chest rises and another side falls.

Retraction indicates the patient has some condition, usually medical, that is hampering the air flow in and out of the lungs. Paradoxical motion is linked to a fracture of many ribs (flail), resulting into a part of the chest area to move separately from the rest of the chest area. Feel for grating of the bones as the patient breathes. Crepitus is often related to a rib fracture. Palpate the chest area checking for subcutaneous emphysema, especially if severe blunt chest trauma is observed.

If the patient reports difficulty in breathing or has evidence of trauma to the chest, auscultate breath sounds. This helps you to evaluate air movement in and out of the lungs. To auscultate, you need a stethoscope. Make sure you place the ear pieces facing forward in your ears. The position of the patient will determine the way you proceed to check for breathing. Here's how and where to listen.

- First, always remember that the patient's breathing sound can be heard adequately from the patient's back. So if the patient's back is accessible, listen there. Listen from front if you have immobilized the patient or if the patient is in a supine position.
- Auscultate over the upper lungs (apices), the lower lungs (bases), and over the major airways (midclavicular and midaxillary lines).
- Place stethoscope by removing the clothing or place it under the clothing. When you listen over clothing, you will primarily hear the sound of the stethoscope sliding over the fabric because breath sounds are muted by clothing.
- Place the diaphragm of the stethoscope firmly against the skin to hear the breath sounds.

What are you listening for? The goal is to listen and document the presence or absence of breath sounds in the three regions described. It is important to compare one side to the other. If you believe the breathing is abnormal, reassess breathing, and then ensure that the patient is receiving oxygen and, if appropriate, assisted with ventilations.

Abdomen

Inspect the abdomen for injuries, bruises, and bleeding. Gently touch both the front and back of the abdominal region, checking for soreness and bleeding. As you palpate the abdomen, use the terms "firm,"" soft," "tender," or "distended" (swollen) to report your findings. If the patient is conscious, ask about pain as you perform the exam. Do not touch and examine any possible or obvious soft-tissue injuries, and be careful not to palpate too firmly.

Pelvis

Examine for injury, bleeding, or disfigurement signs. If the patient does not complain of pain, apply gentle downward and inward pressure on the pelvic bones. If you observe any movement or crepitus, or the patient complains of pain or tenderness, serious injury may have occurred.

During, pelvis injuries and wounds, the surrounding abdomen region can bleed highly. Hence, keep check on the skin colour and the vital signs of the patient, and provide supplemental oxygen to reduce the shock effects.

Extremities

Check for major cuts, bruises, lumps, injuries, and bleeding. Then, gently touch each extremity, checking for deformities. Ask the patient about any tenderness or pain. As you evaluate the extremities, check for pulses and motor and sensory function:

- **Pulse:** check the distal pulses on the foot (dorsalis pedis or posteriot tibial) and wrist (radial). Also check circulation. Evaluate the skin colour in the hands or feet. It is normal? How does it compare with the skin colour of the other extremities? Pale or cyanotic skin may indicate poor circulation in that extremity.
- **Motor Function:** Ask the patient to move his or her fingers or toes. If the patient is not able to move a specific extremity, it could be due to a bone, muscle, or nerve injury. If the patient is unable to move many extremities, it may indicate a brain impairment or a spinal cord injury. Verify that spinal precautions have been taken.
- **Sensory Function:** Check sensory function in an extremity by telling the patient to shut his or her eyes. Softly press or pinch a finger or a toe, and then ask the patient to relate your action. If the patient is unable to feel sensation in the extremity, it indicates a local nerve injury. If the patient is not able to feel sensation in many extremities, it indicates a spinal cord injury. Ensure that you have begun and/ or are maintaining spi nal immobilization.

Posterior Body

Feel the back for tenderness, deformity, and open wounds. If you are placing the patient on a backboard, it is particularly important that you check the back before you log roll the patient, and before you place him or her into a backboard.

5.3.2 History and Physical Exam

At this point in the assessment, the history and physical exam guides you to take actions that will stabilize or relieve the patient's problems. It will always have three components; baseline vital signs, SAMPLE history, and a rapid or focused physical exam. The physical exam will tell you what is happening outside the body, the vital signs will tell you what is happening inside the body, and the history will help make sense out of the two by guiding your assessment and treatment. The sequence in which you should perform these three components depends on the type of the patient; whether your patient is a trauma or a medical patient. The order also depends on the type of trauma or the type of medical patient you encounter.

The next four sections describe how to perform the focused history and physical exam on four types of patients; trauma with significant MOI; trauma without significant MOI; responsive medical patients; and unresponsive medical patients.

5.3.3 Rapid Trauma Assessment

In a patient trauma with a known MOI, begin with a rapid trauma assessment. Check for the hidden and obvious injuries in 60 to 90 seconds. This process can help in 2 ways. You can get idea on the hidden life threats and their treatment which are not seen at the initial assessment. Second, you will know better how to prepare your patient for packaging and rapid transport. Remember, the rapid physical exam tells you what is happening outside the body.

Baseline Vital Signs

After the rapid trauma exam is complete, obtain your baseline vital signs. A good baseline set of vital signs will be useful as you continue to monitor changes in the patient's condition. These may be obtained in the ambulance if rapid transport is necessary.

SAMPLE History

In the trauma patient with a significant MOI, the patient's history is not as critical as performing a rapid physical exam or obtaining vital signs; however, it should not be ignored. Many of these patients are conscious and able to provide some history. A SAMPLE history should be obtained in case the patient becomes unresponsive and is unable to provide the emergency department with this important information. If your patient is unresponsive, continue to gather history from a witness, bystanders, or from the environment. This information may provide important clues for the emergency department physician.

Revaluate Transport Decision

If the ambulance is not reaching on time, then you can take the patient to the hospital.

5.3.4 Trauma Patients with No Significant MOI

Focused Trauma Assessment Based on Chief Complaint

Once you're done with the MOI of trauma in patient, check if he/she had only minor trauma – like twisted ankle or arm fracture. In this case, a focused physical exam guiding you to the specific injury would be appropriate. If your patient has multiple complaints - for example, neck pain, a twisted ankle, and a laceration on the arm - you may want to perform a focused exam on each of these areas. Also suspect other injuries.

Baseline Vital Signs

After evaluating each of the patient's complaints, obtain the patient's pulse, respiration, and blood pressure and assess the patient's pupil and skin, including capillary refill time. These vital signs will serve as a baseline to evaluate changes during transport.

SAMPLE history

A SAMPLE history should be collected to conclude whether a medical problem could be the reason for the trauma. The mnemonic OPQRST is used to evaluate conditions such as chest pain and headaches; however, it may also be used to evaluate ankle or shoulder pain, or pain related to trauma.

Revaluate Transport Decision

If transport is not yet under way, consider transporting the patient at this time.

5.3.5 Medical Patient Who Are Responsive

History of illness

The patient's response to your question about the chief complaint drives your assessment of the history of the present illness (focused history) and physical exam in the medical patient. If possible, take time to sit down and help the patient get comfortable. Listen to get more understanding about the patient's condition. Avoid reaching quick conclusions related to the chief complaint just based on simple observations or hearsay. Most of the time, chief complaint may not be obvious; it can vary from what the dispatcher reported. When this occurs, stay flexible. Assess and treat the patient's problem rather than simply responding to the dispatch report. Nevertheless, the chief complaint will help you focus your history and physical exam. If the patient cannot tell you what is wrong, perhaps because of a language barrier, altered mental status, or severe respiratory distress, you may ask for the patient's history from a family member or bystanders or from your observations of the scene and patient actions. However, remember that information from the patient is far more valuable. You should try, whenever possible, to speak directly to the patient.

SAMPLE History

Evaluate as many signs and symptoms as possible in your SAMPLE history. For example, a 50-year-old man with chest pain and dizziness may be having a heart attack. The same person with chest pain and a cough rather than dizziness may be having an asthma attack. The more signs and symptoms you are able to obtain, the better. As you listen to the patient, you might want to make some brief notes to aid your memory and assist with documentation after the call. Try to record chief complaints using few of the patient's own words. Also, make a note or highlight the information that comes from the person other than the patient.

5.3.6 Focused Medical Assessment

Based on Chief Complaint

The key to this exam is to emphasize the priorities you have learned during the history taking process. Be logical and investigate problems that you identified during the initial assessment and while obtaining history.

As discussed earlier, you can focus on the region of the problem or the physiological system involved. For example, if the patient's history suggests a heart attack, you may also want to check the patient's chest for indication of trauma and listen to lung sounds.

Baseline Vital Signs

Although vital signs are obtained last in the focused history and physical exam of a responsive medical patient, they are important to establish a baseline for how your patient is compensating with regard to his chief complaint. In problems related to the cardiovascular system and respiratory system, the vital signs will also be a part of your focused physical exam.

Revaluate Transport Decision

If ambulance is not reaching on time, then you can consider transporting the patient.

5.3.7 Medical Patients Who are Unresponsive

Rapid Medical Assessment

Once you have done the initial assessment in an unconscious patient, then start initial treatment for any life-threatening problems. Because an unconscious patient remains unresponsive and cannot give any information, you must do a rapid medical exam. In 60 to 90 seconds assess the patient from head to toe looking for problems and possible life threats that may be hidden.

Baseline Vital Signs

After performing a rapid physical exam, you should evaluate the patient's vital signs to determine if the person is tolerating the unresponsive state well and establish a baseline for your continuing assessment.

SAMPLE History

While packaging the patient for transport, gather what history you can from family, witness, and bystanders. Remember, the environment may provide important clues related to the patient's condition. For example, drug paraphernalia such as syringes may indicate an occurrence of overdose. A medical identification device (e.g., Medic Alert Tag, Global Med Net Card, Vial of Life Container) may also provide important medical history. Patient medication labels may also be used to help determine the patient's medical condition.

Revaluate Transport Decision

If transport is not yet under way, consider transporting the patient at this time.

Exercise

1. To determine the response to _____, The CFW-ECS may_____.
   a. Pain, administer a sternal rub
   b. Voice, examine the larynx and trachea
   c. Pain, gently pull on the patient's earlobe
   d. Voice, whisper quietly just inside the audible _____.

2. The C in DCAP-BTLS stands for:
   a. Concern
   b. Contusion
   c. Chief Complaint
   d. Cardiovascular

3. Asking the question "Does anything make the pain better or worse?", is which part of OPQRST:
   a. Radiates
   b. Provocation
   c. Onset
   d. Severity

4. When assessing airway in a conscious patient, what are the main things the CFW-ECS looks for ?
   a. Rapid breathing over 40 per minute and inadequate perfusion
   b. Cyanosis, elevated BP, irregular breathing
   c. Rate, quality and rhythm
   d. Stridor, wheezing, cheyne stokes

5. The A in SAMPLE stands for:
   a. Arythmia
   b. Allergies
   c. Airway
   d. Asystole

UNIT 5.4: Patient Assessment (Detailed Physical Exam)

Unit Objectives

At the end of this unit, you will be able to:

1. Define detailed physical exam.

5.4.1 Detailed Physical Exam

Recall that the assessment process began with anticipation and hazard preparation when you received the dispatch information and performed the scene size-up. Then you performed the initial assessment, in which you identified and treated life-threatening conditions. If trauma was a factor, you also initiated spinal immobilization. You also provided transport if your patient had an obvious life-threatening condition. When indicated, you followed up on the initial assessment by gathering history, taking at least one set of vital signs, and performing either a rapid or focused physical exam based on the patient's chief complaint.

At this point, in most cases you are already en-route to the hospital. If you are still on the scene, it is because your patient does not have a life-threatening condition and you have not found the cause for the patient's complaints. In the case of a trauma patient with a significant mechanism of injury, you are en route but may still have unanswered questions. In either case, this is the time to perform the detailed physical exam. The goal of this exam is to further define physical exam. It also defines problems that were identified in the focused history and physical exam and enables you to possibly identify the cause of complaints that were not identified during the focused history and physical exam. In most cases, it is the trauma patient with a significant mechanism of injury who receives the detailed exam, because getting the patient to a hospital took priority over performing a detailed exam on scene. The detailed exam can help provide a better understanding of your medical patients as well but should never delay transport, and is also most often performed en route to the hospital.

It will provide you with more information about the nature of the patient's problem. Depending on what is learned, you should be prepared to do the following:

- Return to the initial assessment if a potentially life-threatening condition is identified. (This is unlikely this late in the exam, but it is always possible. Remember, stay focused on the ABCs.)
- Perform spinal immobilization if neck or back pain or abnormality in sensation or movement is identified. (Again, this is unlikely this late in the exam.)
- Modify any treatment that is under way on the basis of any new information.
- Provide treatment that is under way on the basis of any new information.
- Provide transport to an appropriate facility, or call for ALS backup.

The detailed physical exam is a more in-depth examination that supplements the history and physical exam portion of your assessment. The patient and the particular problem will determine the need for this exam. Many of your patients will not receive a detailed physical exam, either because it will be irrelevant or unnecessary or because it is not possible given the time constraints.

Most patients have isolated problems that can be adequately evaluated earlier in the assessment process. You will identify the problem and treat it, making a more detailed physical exam of the entire body unnecessary. If you do perform a detailed physical exam in these patients, it will be to further explore what you learned during the history and physical exam portion of your assessment.

A few patients will have life-threatening conditions that were identified during the initial assessment. You may spend all of your time with these patients, stabilizing ABCs, which means you will never have a chance to obtain history and to perform physical exam, let alone a detailed assessment.

You will perform a detailed exam only on stable patients with problems that cannot be identified earlier in the patient assessment process. In some cases, this portion identifies only minor, obscure, or isolated problems, which is why you did not identify them earlier. Regardless of the exact situation, the detailed physical exam is usually performed en route to the hospital in order to save time.

5.4.2 Perform the Detailed Physical Exam

Here, organized by body region, are some additional assessments that you might want to perform during the detailed exam. As you evaluate each region inspect and palpate to find evidence of injury, again using the mnemonic "DCAP-BTLS".

STEP 1: Look at the face for obvious laceration, bruises, or deformities.

STEP 2: Inspect the area around the eyes and eyelids.

STEP 3: Check the eyes for signs of redness. Also, check for contact lenses. Examine the pupils with a penlight.

STEP 4: Inspect behind the ear of the patient to see if there is bruising (battle's sign).

STEP 5: Look for seepage of spinal fluid or blood in the ears with the penlight.

STEP 6: Check for bruising and gashes about the head. Palpate the region for soreness, depression in the skull, and disfigurement.

STEP 7: Palpate the zygomas for soreness or instability.

STEP 8: Palpate the maxillae.

STEP 9: Palpate the mandible.

STEP 10: Inspect the mouth and the nose for cyanosis, foreign objects such as loosened teeth or dentures, bleeding, gashes, or deformities.

STEP 11: Check the patient's breath for foul smell.

STEP 12: Inspect the neck area for gashes, bruises, and disfigurements.

STEP 13: Palpate the front and the back area of the neck for soreness and deformity.

STEP 14: Look for swollen jugular veins. Note that swollen neck veins do not necessarily indicate an impairment in a patient's who is lying down.

STEP 15: Examine the chest for clear signs of injury before initiating palpation. Be sure to check the movement of the chest for respiration.

STEP 16: Softly palpate the rib region to find out soreness. Avoid applying pressure pressing over bruises or fractures.

STEP 17: Listen for sounds of breath along the midaxillary and midclavicular lines.

STEP 18: Listen for sounds of breath at the base and apices of the lungs.

STEP 19: Examine the abdomen and the pelvis region for gashes, bruises, and disfigurement.

STEP 20: Softly palpate the abdomen region for soreness. If the abdomen appears tense, it should be reported as rigid.

STEP 21: Apply gentle pressure on the pelvis from the sides to check for tenderness.

STEP 22: Softly press the iliac crest to detect instability, soreness, or crepitus

Step 23: Examine all the four extremities for gashes, bruises, lumps, disfigurements, and medic alert anklets or bracelets. Also check the extremities for distal pulses and motor and sensory function.

STEP 24: Check the back for soreness or deformities. If you think there is a spinal cord injury, use spinal precaution while log rolling the patient

Head, Neck, and Cervical Spine

A more detailed exam of these areas could include a careful examination of the head, face, scalp, ears, eyes, nose, and mouth for abrasion, laceration, and contusions.

Chest

Throughout the patient assessment process, you should monitor the patient's breathing. If you have not already done so, you should carefully palpate the patient's chest. Feel for crepitus, as this occurs with a ruptured airway, pneumothorax, or rib fractures. Also, evaluate the movement of the chest wall during breathing. Paradoxical motion of the chest wall means that your patient has a fail chest and might need supplement oxygen and/or assisted ventilation. You might also wish to perform a more detailed evaluation of the patient's breath sounds. Listening to the lungs at the apices, at the midclavicular lines bilaterally, at the bases, and at the midaxillary line bilaterally; check for the specific sounds of breathing.

You may be able to identify one of the following:

- Normal breath sounds do not make any sounds and are clear
- If wheezing breath sounds occur, it indicates an obstruction in the lower airways. Wheezing is high during expiration.
- Wet breath sounds suggest cardiac failure. A moist crackling, while breathing, is called rales, or crackles.
- Congested breath sounds may indicate that there is mucus in the lungs. A low-pitched, noisy sound that is most conspicuous on expiration can sometimes be heard. This sound may be referred to as rhonchi. The patient usually reports a productive cough related to this sound.
- A crowing sound can typically be heard without a stethoscope and may suggest that the patient is suffering from an airway obstruction in the neck region or upper section of the chest. Expect to hear a brassy, crowing sound that is most prominent on expiration. This sound may be referred to as stridor.

Abdomen

During the detailed physical exam, you may perform a more complete examination of the abdomen. As you palpate the abdomen, use the term firm, soft, tender, or distended (swollen) to report your findings. Some patients may actively contract their abdominal muscles when you palpate them. This is known as guarding.

Pelvis

If you have not previously identified any pelvic injury, recheck the pelvis to identify problems. If the patient is not complaining of pain in the pelvis, gently press in and down on the pelvis to assess for pain, tenderness, instability, and crepitus; all may indicate a fractured pelvis and the potential for shock.

Extremities

If you not already done so, you should carefully evaluate the extremities for any signs of trauma, again using the DCAP-BTLS method. You should also evaluate the distal circulation, sensation, and movement. If you have already identified an injury, regular evaluation of the

circulation, sensation, and movement below the injury will allow you to be sure that the injury has not compromised neurovascular status.

Back

During the rapid assessment, if performed, you should have visualized and palpated the patient's back for signs of trauma, especially near the spine. You must use spinal precautions when rolling a patient for assessment of back injuries. The presence of spinal deformity or pain suggests that—if you have not already done so—the patient requires spinal immobilization. Look for and document any other conditions that you find on the back.

UNIT 5.5: Patient Assessment (On – Going Assessment)

Unit Objectives

At the end of this unit, you will be able to:

1. Elaborate ongoing assessment

5.5.1 Ongoing Assessment

The ongoing assessment is done on all patients while transporting them. Its purpose is to ask and answer the following question;

- Is the treatment improving the patient's condition?
- Has the identified problem become better? Worse?
- What is the nature of any newly identified problem?

The ongoing assessments help you to keep a check on the changes in the patient's condition. If the changes are improvement, simply continue whatever treatment you are providing. However, in some instances, the patient's condition will deteriorate. When this happens, you should be prepared to modify treatment as appropriate and then begin new treatment on the basis of the problem identified.

The procedure for the ongoing assessment is simply to repeat the initial assessment and the focused assessment and to check the intervention steps that pertain to the problems you are treating. These steps should be repeated and recorded every 15 minutes for a stable patient and every 5 minutes for an unstable patient. Remember to use your judgment when timing the ongoing assessments. Some patients may require more frequent assessments.

The steps of the ongoing assessment are as follows:

1. Repeat the initial assessment
    - o Reassess the mental status.
    - o Maintain an open airway.
    - o Monitor the patient's breathing.
    - o Reassess the pulse rate and its quality.
    - o Monitor the skin colour and the temperature.
    - o Re-establish the patient priorities.
    - o Reassess and record the vital signs
2. Repeat your focused assessment regarding patient complaint or injuries, including question about the patient's history
3. Check interventions.
    - o Ensure adequacy of oxygen delivery/artificial ventilation.
    - o Ensure management of bleeding.
    - o Ensure adequacy of other interventions.

5.5.2 Repeat the Initial Assessment

- The first step is to repeat the initial assessment. If you have been treating the ABCs, you need to continue monitoring these essential functions. It is particularly important to reassess mental status; changes can be initially subtle and then rapidly decline.
- Re-evaluate any problems that you have been treating. Reassess the patient's skin colour, wound, or anything for which you have begun treatment. There is no urgency if the patient's condition remains stable. But, you may discover a need to change a dressing, tighten a strap, or turn up the oxygen. Do it now.

5.5.3 Repeat the Initial Assessment

Be sure that the patient's vital signs have not changed. Record these so that your documentation is accurate and complete. If the vital signs have changed, evaluate what may have happened and apply the appropriate interventions.

5.5.4 Repeat the Focused Assessment

As you transport your patient, remember to ask the patient about the chief complaint. Is the chest pain getting better or worse? Is leg pain improving with treatment or staying about the same? If you previously asked the patient to rate symptoms on a 1 to 10 scale, ask the patient for an updated rating for comparison.

5.5.5 Check Interventions

Re-evaluate any intervention you started. Take a movement to make certain that the airway is still open, the bleeding has been controlled, the oxygen is still flowing, and the backboard straps are still tight. Things often change in the uncontrolled pre-hospital environment. So, this is a good time to be sure that your treatments are still "working" the way you intended.

UNIT 5.6: Patient Assessment (Communication)

Unit Objectives

At the end of this unit, you will be able to:

1. Define communication system and components
2. Elaborate the procedure for radio communication

5.6.1 Verbal Communication

- After arrival at the hospital, give a verbal report to the staff
- Introduce the patient to them by name, if it is known to you
- Summarize the information given over the radio:
  - Chief complaint
  - History not provided earlier
  - Further treatment given en route
  - Other vital signs taken en route
  - Additional information that was gathered but not conveyed

5.6.2 Interpersonal Communication

- General principles
- Create a general impression
- Guess the situation
- Make a communication goal and plan
- Understand the surroundings
- Have an eye contact with the patient
- Be practical and position yourself at a level lower than the patient
- Be honest with the patient
- Speak in a language which patient can understand
- Always check on own body language
- Have a clear, slow, and distinct speech
- Pronounce patient name clearly and ask him/her which name he/she wishes to be called by; first or last
- Tips for effective communication:
  - Exhibit your support
  - Listen to patient and allow them to talk
  - Give gentle touch
  - Show respect
  - Separate personal bias
  - Maintain silence when required

Special populations

- If a patient has hearing problems, speak clearly with lips visible
- Give time to patient to talk
- Behave and speak in a calm, confident manner
- Communicate with hearing-impaired patients, with non–English-speaking populations, use interpreters, etc.
- Have potential for visual deficit
- Have potential for auditory deficit

Exercise 

1. When caring for a patient who does not speak the same language as you, remember to:
   a. Speak louder. The patient will understand some words if you say them louder
   b. Use an interpreter, such as a family member or friend
   c. Try and make up some words that sound like their language
   d. Write your words on paper. The patient may understand them when written instead of spoken

2. While talking to a patient you must address the person:
   a. By the first name
   b. By the last name
   c. By any suitable name
   d. By the first or last name, as per the patient's wish

3. The practice which must not be followed while communicating with a patient is:
   a. Exhibiting your support
   b. Listening to patient and allowing them to talk
   c. Showing respect
   d. Keep personal bias

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6. Patient Triage

Unit 6.1 – Mass Casualty Incident

HSS/N2305

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Identify incident command system
2. Define Triage
3. Define disaster management
4. Elaborate hazardous material

UNIT 6.1: Mass Casualty Incident

Unit Objectives

At the end of this unit, you will be able to:

1. Identify incident command system
2. Define Triage
3. Define disaster management
4. Elaborate hazardous material

6.1.1 Incident Command Systems

There are different organizations and service procedures that have come up since 20th century. These organizations have been created to give solutions for emergency situations. For example, ambulance service, fire service, emergency care unit etc.

Medical emergency care unit is the one which involves in caring for a victim who has got some medical situation. This unit gives first-aid and immediately transports the victim to the hospital.

These kinds of service providing units are called incident command systems. These systems are controlled by specific organizations and they work 24/7. They operate on daily basis with no holiday.

These systems has unique mobile number in which people can contact anytime for any emergency help. Most of the time these telephone services are free of cost.

6.1.1.1 Components and Structure of an Incident Command System

During fire accidents we can expect incident command systems like, fire service, rescue team, police, emergency care unit and medical team.

There is a team which decides on the need of service that is needed by victims. One call is enough to activate these systems for emergency help.

This system has a structure with one single authority who is responsible for the emergency incident. This single person authority has under him various branches which deal with different emergency systems. Once the authority receives a call, he/she connects to the different branches to send them for help.

The person who receives the information on the emergency is called as incident commander. He appoints a safety officer who circulates among the responding personnel.

So, this safety officer has all the authority on handling the incident and as an COVID Frontline Worker (Emergency Care Support) it is very essential to know about this.

A safety officer is appointed to check for the possible hazards and the potential threats at the incident area. To coordinate with all EMS activity, a medical group supervisor or a rescue group supervisor is appointed. He/she takes care of the people who are affected with the situation. Most of the time these emergency situation action has no timeline. It can go for a week also. The supervisor should have proper planning, executing and managing skills.

In major incidents, the incident officer gives unified command. In this situation, the officer commands all the units that are involved in the situation to act appropriately to the incident. This unified command helps different units to act as group against the incident and is time effective.

Most of the time these systems work on the nature of incident. For example, in case of fire accident at the hospital, fire commander, rescue team and law enforcement commander are involved.

Once the incident is reported to the system, there will be an officer who is appointed to take care of the emergency situation. This officer is responsible for taking care of all the functions and actions that will be done in the incident area.

Incident command systems are not constant. The names given to them varies from one place to another. But they do the same function with different names. So, it is very important to know about the terms while working in a particular area.

As an example of how responsibilities may be assigned at a major EMS incident, consider the following typical assignments:

Assignment	Description
Command centre	This is typically a vehicle or building at the scene where the EMS commander establishes an "office". From here, the commander oversees and coordinates the activities of the various groups and leaders
Staging area	This is a holding area for arriving ambulances and crews until they can be assigned a particular task
Extrication area	in this area, patients are disentangled and removed from a hazardous environment, allowing them to be moved to the triage area
Triage area	The triage area is a sorting point, run by a triage officer, where all patients are assessed and tagged, using color-coded tags or tape, according to their injuries. These triaged patients are then directed to specific locations in the treatment area (s), according to their assigned priority
Decontamination area	Any incident involving a hazardous material or use of a nuclear or radiologic, chemical, or biologic agent will require a special area for removing the agent from any patients or responders. If established, this area will be situated after the extrication area and before the triage area

Treatment area	A more thorough assessment is made in this area, and on- scene treatment is begun while transport is being arranged. The treatment area is organized and managed under the authority of the treatment officer. Patients are given care under the standards of the EMS system in the treatment area before being transported. This means that all fractures should be splinted, and all care normally given in a focused assessment should be accomplished before the patient is released for transportation
Supply area	This is an area in which to assemble extra equipment and supplies, such as blankets, oxygen cylinders, bandages, and backboards, for dispersal to other areas as needed
Transportation area	In this area, ambulances and crews are organized to transport patients for, the treatment sector to area hospitals. The transportation area is managed by the transportation officer, who will assign patients to waiting ambulances
Rehabilitation area	This area gives treatment and provides a resting place to the people working as emergency responders at the scene. As workers enter and leave the scene, they are medically monitored and provided any needed care (such as rehydration with fluids or nourished with small snacks). This helps to ensure the safety and health of emergency workers who could become injured or ill while on the job

Fig.6.1.1: Types of assignments

Key components at a mass-casualty incident:

- Incident commander, command post, and incident comm and system
- On-site communications system
- Adequate supply of medical equipment
- Extrication area and retrieval tea,
- Triage officer and designated triage area
- Staffed patient collection area
- Staffed patient treatment area
- Supply location adjacent to the treatment area
- Transportation officer and transport area
- Staging area to hold resources until they are needed
- Fire and law enforcement personnel
- A secure perimeter

6.1.1.2 Mass-Casualty Incidents

If the incident involves more than three patients it is called mass-casualty incident. These incidents require high amount of equipment, devices and persons.

Example: Train crash, earthquakes.

Since it involves many victims it needs more than one team that will be acting on the situation. It requires a team to transport them immediately to the hospital, where it requires more doctors and medical professionals to help all the patients. The source required for these incidents are very vast.

These incidents require proper plans, team work and efficient work.

6.1.2 Triage

It is a process of classifying the victims based on their emergency situations. It is a very important process during mass casualty incidents.

Patients are ranked based on the emergency priority and they are given medical facilities. Also, while ranking the patient the team check for the available source and if there is an additional source requirement, they inform the system to provide them.

Fig.6.1.3 : Triage

Triage operations that is done during mass-casualty incident involves following steps:

Life saving care rapidly administered to those in need
Color coding to indicate priority for treatment and transportation at the scene. Red -tagged patients are the first priority, yellow -tagged patients are the second priority, and those tagged green or black are the lowest priority.
Rapid removal of red-tagged patients for field treatment and transportation as per availibility of ambulances.
Use of a separate treatment area to care for red -tagged patients if transport is not immediately available. Yellow-tagged patients can also be monitored and cared for in the treatment area while waiting for transportation.
When there are more patients waiting for transport than there are ambulances, the transportation sector officer decides which patient is the next to be loaded.
Specialized transportation resources (such as air ambulances, paramedic ambulances) require separate decisions when these resources are available but limited.

Fig.6.1.4: Mass casualty incident operation

6.1.2.1 Triage Priorities

- During triage process patients are labelled with colour coding to identify their emergency.
- These tags indicate the patient's situation and how soon they need to be assessed.
- So, when going to mass casualty incident make sure your team is provided with enough tags which can be used to tag the patients.
- Also, the person who is involved in the triage process should be experienced in tagging the patient. You should be sure on the tags and their usage function.
- Tag structure: It is usually in specific colour like yellow, red and green to indicate the ranking. They have special numbers and electronic bar code on them which can be used for assessment. These bar codes can help to identify the patients' information like their location, belongings and name.

Most of the tags come as water proof material and are made up of strong material which cannot be erased easily.

Fig.6.1.5: Triage priorities

Triage category	Typical injuries
Red Tag: First Priority (Immediate) Patients who need immediate care and transport. Treat these patients on first priority basis, and transport promptly	• Airway and breathing impediments • Uncontrolled or excessive bleeding • Reduced level of consciousness • Serious medical problems • Indications of shock (hypoperfusion) • Major burns
Yellow Tag: Second Priority (Delayed) Patients whose treatment and transportation can be temporarily delayed.	• Burns, but no airway problems • Multiple bone or joint injuries • Back injuries with or without damage to the spinal cord
Green Tag: Third Priority (Walking Wounded) Patients who do not require any treatment or whose treatment and transportation can be delayed until last.	• Minor fractures • Minor soft-tissue injuries
Patients who are already dead or have little chance for survival. If resources are limited, treat salvageable patients before treating these patients.	• Obvious death • Obvious, not survivable injury, such as major open brain trauma • Respiratory arrest (if limited resources) • Cardiac arrest

Fig.6.1.6 : Triage priorities

In multi casualty incidents triage continues till all the patients are assessed and treated. After all the patients are treated the person who are involved in the situation should be checked for need of counselling and any medical needs.

The success of these incident teams is mainly depending on the team work, knowledge of the professionals and the lives that are saved.

6.1.3 Disaster Management

A disaster is a large-scale incident which affects large number of people, property and resources.

For example: Droughts in a specific area can destroy the crop and water, where people are affected at large scale. In this incident there is no physical injury caused.

Disaster can cause physical injury and some time it does not directly cause physical injury. But it can affect people in a negative way. Disasters that cause physical injury are flood, fire, hurricanes and earthquakes.

It is very important to report the incident command system immediately in case of any natural disaster. Also try to use the available nearby safety devices to save people. Once the team arrives to the situation triage and assessment can be performed.

6.1.4 Introduction to Hazardous Materials

In any situation or incident always check for possible hazardous materials and you must first step back and assess the situation.

Hazardous materials can be encountered in the following situations:

A truck or train crash in which a substance is leaking from a tank truck or railroad tank car
A leak, fire, or other emergency at an industrial plant, refinery, or other complex where chemicals or explosives are produces, used, or stored
A leak or rupture of an underground natural gas pipe
Deterioration of underground fuel tanks and seepage of oil or gasoline into the surrounding ground
Buildup of methane or other byproducts of waste decomposition in sewers or sewage-processing plants
A motor vehicle crash in which a gas tank has ruptured
Often, the presence of hazardous materials is easily recognized from warning signs, placards, or labels found in the following locations: On buildings or areas where hazardous materials are produced, used, or stored.

In the event of a leak or spill a hazardous materials incident is often indicated by the presence of:	A visible cloud or strange-looking smoke resulting from the escaping substance
	A leak or spill from a tank, container, truck, or railroad car with or without hazardous material placards or labels
	An unusual, strong, noxious, acrid odor in the area

Fig.6.1.7: Assessing hazardous material

Most of the times, the ambulance reaches the scene first; if you reach the scene check for any hazardous materials and keep yourself away from the place. Also, alert others on the same. You can intimate HazMat team for removing the hazards.

If you recognize the danger nearby, immediately leave the place and ask for HazMat team's help.
Give information regarding location, the size and shape of the containers of the hazardous material, and other details on hazards.

Leave the area once the HazMat team has cleared the place and also do not re-enter the scene till they clear the danger. Also , do not allow other people to enter the scene.

6.1.4.1 HazMat Scene Operations

Once you have identified the hazard at the incident, immediately leave and notify the HazMat team. And protect the place and notify others also on the danger of the place. You can use ambulance's public-address system to alert other civilians who are nearby.

You can mark the zone by using special tapes to indicate danger. Also, this restricts the other person who may enter accidently. In large incidents there are always chance s that not everyone will be alerted about the danger. So, these labels and ropes that indicate danger can help in restricting people's entry.

If possible, give detailed information of hazard material that you have observed at the place to HazMat team. This information can be related to size, location, amount or quantity of the hazard material. This information eases the work of team and also helps to remove the hazard material from the incident soon.

In some cases, patient may carry the hazard materials in their cloth or skin or in their belongings. In such cases isolate them and inform the HazMat team immediately. So, once they are cleared with hazard material they can be sent to the decontaminated area. Decontamination is a word which refers to removal of contamination.

6.1.4.2 Classification of Hazardous Materials

Classification of hazardous materials based on the health hazard or toxicity levels are fire hazard, chemical reactive hazard, and special hazards (such as radiation or acids) for fixed facilities that store hazardous materials. Toxicity protection levels are also classified according to the level of personal protection required.

6.1.4.3 Toxicity level

There are main 5 levels of toxicity, which is explained below:

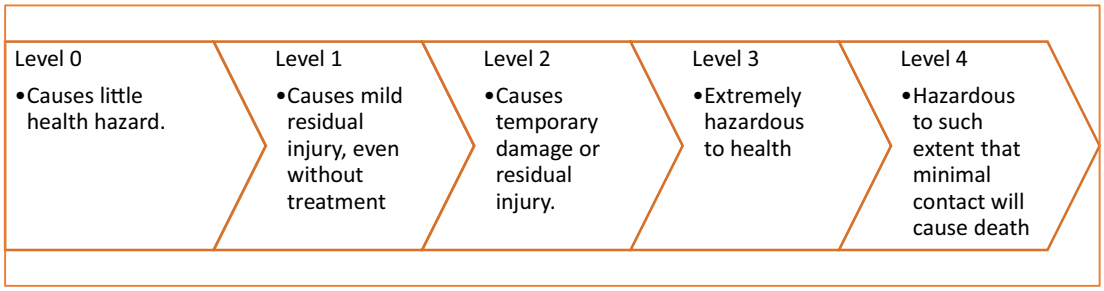

Fig.6.1.9: Levels of toxicity

You must mote that all health hazard levels, with the exception of 0, require respiratory and chemical protective gear that is not a standard on most ambulances and in specialized training. The following table further describes the four hazard classes:

Level	Health Hazard	Protection Needed
0	Little or no hazard	None
1	Slightly hazardous	SCBA (level C suit) only
2	Slightly hazardous	SCBA (level C suit) only
3	Extremely hazardous	Full protection, with no exposed skin (level A or B suit)
4	Minimal exposure causes death	Special HazMat gear (level A suit)

Fig.6.1.10: Toxicity Levels of hazardous materials

6.1.4.4 Caring for Patients at a Hazardous Materials Incident

In some incidents, patient may carry the hazard materials with them. So in such cases HazMat team personnel who are qualified to perform prehospital emergency care will begin the emergency care.

Your responsibility at a HazMat incident involves:

- Look and assess on the trauma that has occurred from the other related incident, such as a vehicle crash, fire, or an explosion
- Providing care for the injury that has occurred from being exposed to the poisonous hazardous material

Mostly airway problems play a major role during any kind of injury or death. So always make sure to give proper airway methods to the patients. Please refer module 8 for the details of the airway problem, assessment and treatment.

In case of injury, treat the patient normally as you do for the injury. In case of specific hazard materials affecting a patient, first decontaminate them and provide supportive care and treatment. Different people react differently for the same problem or for same hazard material. So, your support should focus on the patient exposure to the hazard material. Provide immediate transport in all the cases of injury.

In case of any special care there will be a team who are allocated to treat them. Patient may require special treatment, medicine and advanced care.

6.1.4.5 Special Care

Sometimes, there will some victims who are contaminated with hazards and require immediate transport and medical treatment to survive. In such cases you cannot ask HazMat to decontaminate them and do medical care. So, in such cases, the patient with some contamination needs medical support. So, you must wear all the possible safety equipment and give them treatment.

Some patients may have decontaminated partially, and some may not. So, it is all in your hands to treat them and also protect yourself from hazard materials which is on them.

For making ambulance safer from such victims you can tape the cabinet door shut and keep away all the monitoring devices from patient compartment. Also, isolate the patient from another patient while treating. Do not reuse the materials that have been used on them. For Monitoring device should be sterilized and reused, such as stethoscope.

Also, inform the hospital once you are travelling with the patient in the ambulance to arrange for isolated treatment area for the contaminated victim.

6.1.4.6 Personal protective equipment Level

Personal protective equipment (PPE) levels indicate the amount and type of protective gear that you need to prevent injury from a particular substance. The four recognized protection levels, A, B, C, and D, are as follows:

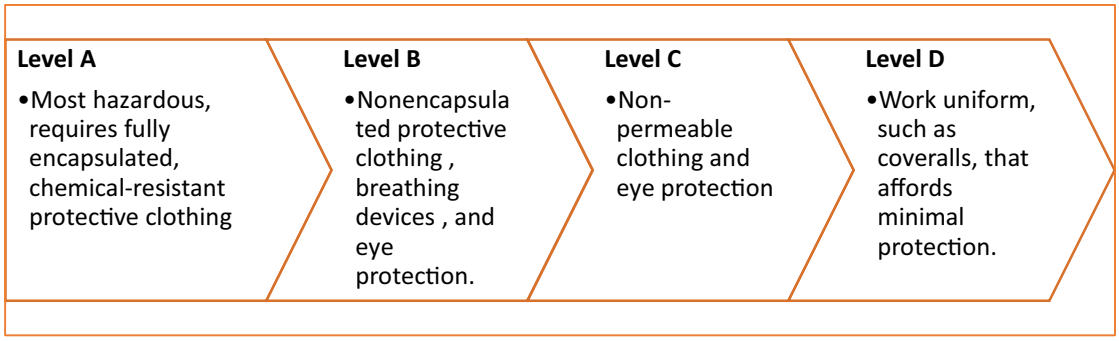

Fig.6.1.11: Personal protective equipment level

All levels of protection require the use of gloves. Two pairs of rubber gloves are needed for protection in case one pair has to be removed because of heavy contamination.

Fig.6.1.12: Personal protective gear

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7. Manage Cardiovascular Emergency

Unit 7.1 - Medical (Cardiovascular Emergencies)

Unit 7.2 - Medical (Cerebrovascular Emergencies)

Unit 7.3 - Medical (Respiratory Emergency)

HSS/N2306, HSS/N2307, HSS/N2318

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe Medical Respiratory Emergencies
2. Describe Medical Cardiovascular Emergencies
3. Describe Medical Cerebrovascular Emergencies

UNIT 7.1: Medical (Cardiovascular Emergencies)

Unit Objectives

At the end of this unit, you will be able to:

1. Define cardiovascular emergencies
2. Analyse circulation
3. Identify the cardiac compromise

7.1.1 Cardiovascular Emergencies

It is essential to understand how the heart functions, to recognize and treat the various cardiovascular emergencies such as acute myocardial infarction and comprehend the complications of sudden death, cardiogenic shock, and congestive heart failure.

7.1.2 Circulation

The myocardium, or the heart muscle requires a regular supply of oxygen and nutrients to carry out its function of pumping blood.

Its requirement for oxygen rises at times of stress and physical exercise; so the heart needs to raise its output of blood flow.

In a normal heart, the coronary arteries, which are the blood vessels that supply blood to the heart muscles, dilate to enhance the blood flow.

Blood pressure is the term which describes the pressure that is applied to the arterial walls due to circulating blood.

There are two types of blood pressure:

1. **Systolic blood pressure** - The maximum pressure given by the left ventricle
2. **Diastolic blood pressure -** Pressure that is given against the arterial walls

7.1.3. Atherosclerosis

Atherosclerosis is a disease which is caused when cholesterol, fat and other molecules settle on the blood vessels. This controls or leads to slow blood flow. Some time it can cause full blockage of blood vessel and it can occur at any stage of life.

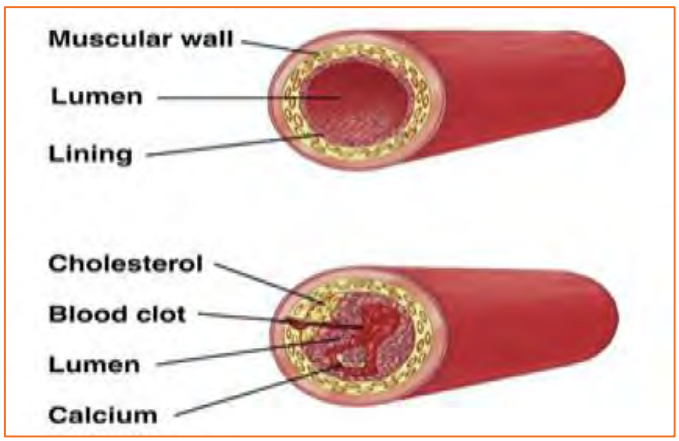

Fig.7.1.1: Cross -section of blood vessel in atherosclerosis

Blood clot is referred to as an object which blocks the blood vessel. Clot can be made up of fats, cholesterols and other compounds. These can block the blood vessel, which disrupts the passing of blood. So, this can lead to heart failure or heart attack.

Blood vessel crack can be developed due to brittle plaque which can lead to blood clot. This clot blocks the supply of oxygen in the tissues that are connected to muscles. This can also cause acute myocardial infarction (AMI).

Cardiac arrest happens when the heart muscle is dead due to lack of oxygen.

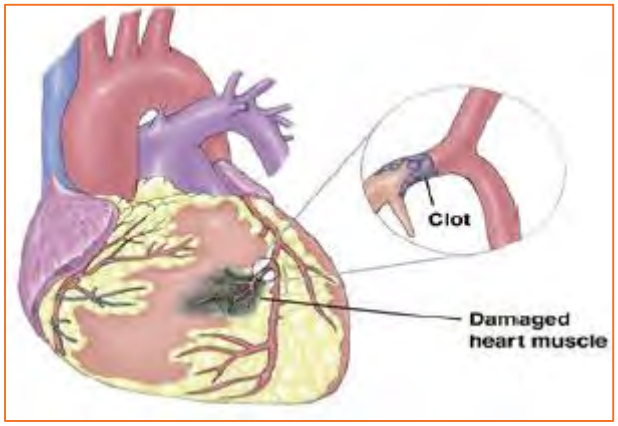

Fig.7.1.2: Myocardial infarct

MI risk can be caused due to smoking, high blood pressure, raised cholesterol levels, raised blood glucose levels (diabetes), stress and sedentary life style. These risks are related to age and family history.

7.1.3.1 Angina Pectoris

Angina pectoris is a condition in which heart muscle lacks oxygen; it can cause chest pain.

It is a common symptom of atherosclerotic coronary artery disease. Stress, large appetite and sudden scare may also cause an attack. When the need for additional oxygen goes away, such as when the individual stops exercising, the pain generally goes away.

This disease is experienced in chest region, and can spread to left arm, jaw and epigastrium. It can last for 10-15 minutes. Symptoms are breathlessness, nausea, or sweating.
Patient needs to rest and get supplemental oxygen, or nitro-glycerine.

7.1.3.2 Heart Attack

Heart attack is caused when the blood vessel is blocked by clot and there is lack of oxygen supply to heart muscles. This lack of oxygen causes death of heart tissue.

Heart attack needs immediate treatment, because it can cause death. The only treatment is to remove the blockage in heart or perform surgery.

There are medicines which can act on clot to burst: those medications need to be given to patient within an hour of the feeling of symptoms. And transport the patient to emergency department immediately.
An AMI occurs mostly in the larger, thick-walled left ventricle, which requires more blood and oxygen, than the right ventricle.

Signs and Symptoms of Heart Attack

Sudden onset of weakness, nausea, and sweating without an obvious cause
Chest pain/discomfort/pressure that is often crushing or squeezing and that does not change with each breath
Pain/discomfort/pressure in the lower jaw, arms, back, abdomen, or neck
Sudden arrhythmia with syncope (fainting)
Shortness of breath or dyspnea
Pulmonary edema
Sudden death

Fig.7.1.3: Signs and symptoms of heart attack

Physical Findings of AMI and Cardiac Compromise

Pulse	•Generally, the pulse rate increase as a normal response to pain, stress, fear, or actual injury to the myocardium. Because arrhythmias are common in AMI, you may feel an irregularity of the pulse.
Blood pressure	•. Blood pressure may fall as a result of diminished cardiac output and diminished capacity of the left ventricle to pump.
Respiration	•Respirations are usually normal unless the patient has congestive heart failure. In that case, respiration may become rapid and labored.
General appearance	•The patient often appears frightened. There may be nausea, vomiting, and a cold sweat. The skin is often ashen gray because of poor cardiac output and the loss of perfusion, or blood flow through the tissue.
Mental Status	•Patient with AMI sometimes experiences an almost overwhelming feeling of impending doom. If a patient tells you, "I think I am going to die," pay attention

Fig.7.1.4: Physical findings

Consequences of Heart Attack

Heart attack can have three major consequences;

- Sudden death
- Cardiogenic shock
- Congestive heart failure

Fig.7.1.5: Consequences of heart attack

1. **Sudden Death**

During first hour of AMI or heart attack heart lacks the oxygen, where it beats/pumps fast to get oxygen. This situation can lead to following conditions:

2. **Tachycardia -** Fast heart beating, 100 beats/min or more.

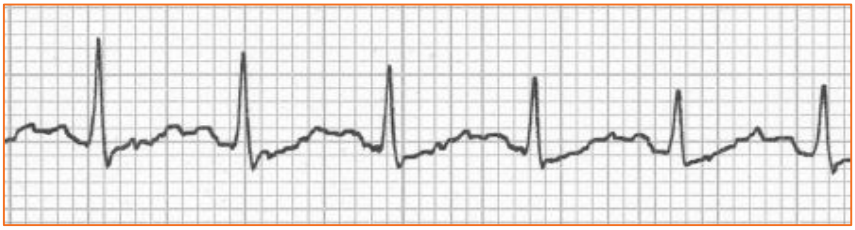

Fig.7.1.6: Tachycardia

3. **Bradycardia.** Excessively slow beating of the heart, 60beats/min or less

Fig.7.1.7: Bradycardia

4. **Ventricular tachycardia (VT).** It is an extreme heart beat which causes 150 to 200 beats/min. In this case patient becomes weak and unconscious. Acute chest pain is also caused because of VT.

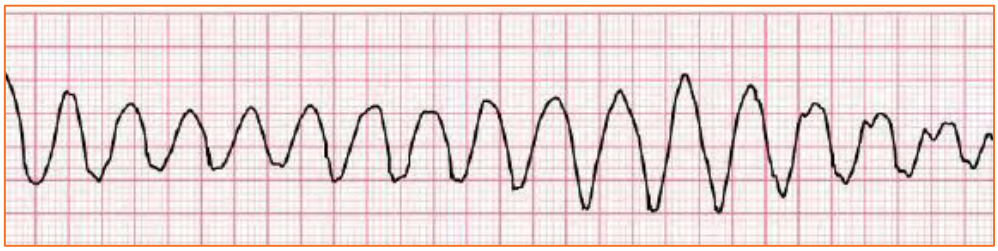

Fig.7.1.8: Ventricular tachycardia

5. **Ventricular fibrillation.** When the blood vessel is blocked then oxygen is not supplied to body, which causes unconsciousness. Electric shock can be given to recover the heart beat and CPR is given immediately. There is only 10% of survival chance.

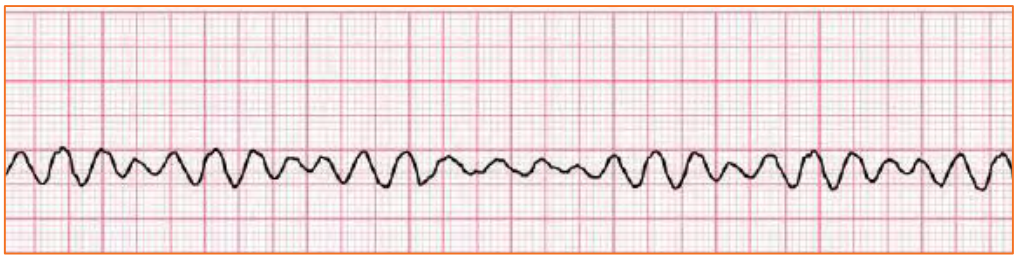

Fig.7.1.9: Ventricular fibrillation

6. Cardiogenic Shock

When body tissues do not get enough oxygen, it leads to cardiogenic shock.

It occurs due to heart attack, where our body does not get enough oxygen and it happens after 24 hours of AMI.

It can be treated if identified.

7. Congestive Heart Failure(CHF)

When ventricular heart muscles are damaged it can cause congestive heart failure. It occurs after MI, heart valve impairment, or prolonged high blood pressure. It occurs in few hours or few days after heart attack.

7.1.3.3 Assessment of the Patient with Chest Pain

While going towards a scene involving a patient with chest pain take all the required BSI precautions. It could range from simple gloves for a chest pain patient to full BSI precautions for a patient in cardiac arrest.

1. Scene Size-up

- Once you reach the incident check for the patient condition and analyse on the possible cause of heart pain.
- If possible given some medication which can help patient to feel better.
- Check the patient and look for spinal stabilization.

2. Initial Assessment

General Impression

- If you find unconscious patient check for his/her pulse, breathing and assess the ABCs.
- If patient is conscious check for the chief complaint. If there is chest pain and breathing difficulty, then transport immediately. Most of the patients are scared and you need to make them comfortable and calm.

Airway and Breathing

- During cardiac problems dizziness and fainting may occur, so always check for the spinal injuries.
- If patient is conscious he/she can manage on the airway and if he/she is unconscious, you need to check on the airway and remove any possible obstructions.
- Check on the patient for oxygen need and provide him supplemental oxygen. If you find that patient is not breathing, provide 10 to 15 L/min oxygen supply.

Circulation

- Check the pulse and heart beat rate.
- In case of any irregularities in pulse, check for the possible heart issue.
- Examine skin colour, and temperature of patient's body.
- Start shock treatment if your find any irregularities.
- Place the patient in appropriate position to avoid internal bleeding and oxygen.

Transport Decision

- Always transport immediately in case of any kind of heart issue.
- First aid does not help all the time. Transport need to be provided if you find patient with cardiac problems in initial assessment.
- Do not let the patient strain to walk or sit; place them in comfortable position and transport.

History and Physical Exam

SAMPLE History

Check and assess for patient history. If possible, ask patient to provide information or the persons who have accompanied him can also give the required inputs.

Ask them below questions;

1. Did he/she have heart problem previously?
2. Does he/she have any heart problem?
3. Does he/she smoke or have other complications related to heart disease?

Try to get all possible signs and symptoms of the problems. Check on any medication which they might have been using before for any heart problems.

This information can give an idea on the treatment which you can give to the patient.

Focused Physical Exam

- Check the cardiovascular system and respiratory system.
- Examine the pulse rate, skin colour, temperature and condition.
- Also check the lung sounds and swollen veins.

Baseline Vital Signs

- Pulse, blood pressure and respiration rate are the possible vital signs for cardiac patient.
- Check both the systolic and diastolic blood pressure frequently.
- Record and document the vital signs which were taken from the patient.

Communication

- Once you get the patient in the ambulance, give information to the hospital about the expected arrival.
- On arrival, give them all the information that was taken in the initial assessment, like vital signs, medicine given and patient's history.
- Give the correct state of patient while transporting.

Interventions

You can give aspirin or nitro-glycerine after consulting a doctor. Wear gloves before administrating nitro-glycerine to the patient. There are different forms of nitro-glycerine available like:

In small tablet form; spray form; skin patches which can be applied on chest.

Role of nitroglycerin:

1. Blood vessel wall relaxation
2. Coronary arteries dilation
3. Increase blood flow
4. Increase oxygen supply

Sometime nitro-glycerine can lower blood pressure or cause headache. So, check on BP at every 5-min interval. If systolic blood pressure falls below 100mm Hg, stop the medication.

Another contraindication is:

1. The presence of head injury,
2. The use of erectile dysfunction drugs earlier within 24 to 48 hours,
3. The maximum prescribed dose already administered (generally three doses).

Administration of nitro-glycerine:

- Take the patient's blood pressure. Continue with administration of nitroglycerin only if the systolic blood pressure is greater than 100 mm Hg.
- Check that you have the right medication, the right patient, and the right delivery route. Check the expiration date.
- Question the patient about the last dose he or she had and its effects. Make sure that the patient understands the route of administration. Be prepared to have the patient lie down to prevent fainting if the nitroglycerin substantially lowers the patient's blood pressure (the patient gets dizzy or feels faint).
- Request patient to lift tongue. Place the tablet or spray the dose underneath the tongue by wearing gloves, or ask the patient do so. Have the patient keep his or her mouth closed with the tablet under the tongue until it is dissolved and absorbed. Caution the patient against chewing or swallowing the tablets
- Recheck blood pressure within 5 minutes. Record medication and the time of administration. Re-evaluate the chest pain and note the response to the medication. If the chest pain persists and the patient still has a systolic blood pressure greater than 100 mm Hg, repeat the dose every 5 minutes as authorized by medical control. In general, a maximum of three doses of nitroglycerin are given for any one episode of chest pain.
- Re-evaluate your transport decision. Transport the patient. Early, prompt transport to the emergency department is critical so that treatment such as clot busting medications or angioplasty can be initiated. To be most effective, these treatments must be started as soon as possible after the onset of the attack. If the patient does not have prescribed nitroglycerin, move ahead with your focused assessment and prepare to transport. Be sure that this process does not consume too much time. Do not delay transport to assist with administration of nitroglycerin. The drug can be given en route.

Detailed Physical Exam

- Assess and get all the possible information on patient and his medical history
- Also get information on the patient on possible risk factors such as cholesterol level, smoking, activity levels, and family history of heart disease.

Ongoing Assessment

- Repeat the initial assessment to analyse the patient's condition. Check on the effects of given treatment. Check for improvement in the patient,
- Check on vital signs every 5 minutes. Keep checking for any possible symptoms of cardiac arrest. If you find any signs of cardiac arrest, immediately perform CPR.

Communication and Documentation

- Proper documentation is very important to assess the patient further and to do treatment.
- Record all the treatment and assessment that has been done on the patient.
- The documenting should be clear and use appropriate medical terms

UNIT 7.2: Medical (Cerebrovascular Emergencies)

Unit Objectives

At the end of this unit, you will be able to:

1. Define neurological emergencies
2. Analyse the common causes of brain disorder
3. Define Seizures
4. Elaborate altered mental status

7.2.1 Neurological Emergencies

- Common neurological problems are: stroke, seizure and altered or changed mental status.
- You must be skilled to recognize these emergencies to give appropriate treatment.

7.2.2 Common Causes of Brain Disorder

1. Blood clot blockage of brain-blood vessel.
2. Stroke
3. Infection
4. Plaque formation on brain tissue
5. Tumour

7.2.2.1 Stroke

When blood flow to the brain is disrupted it causes stroke. Stroke is known as brain function loss due to lack of blood flow.

In case of atherosclerosis, clot can be formed which can block the blood flow to the brain. In this situation brain cells deteriorate due to lack of oxygen.

There are two kinds of strokes:

1. **Haemorrhagic (**typically due to arterial rupture)
2. **Ischemic** (due to embolism or thrombosis)

Their symptoms are identical, although the events occurring inside the brain differ.

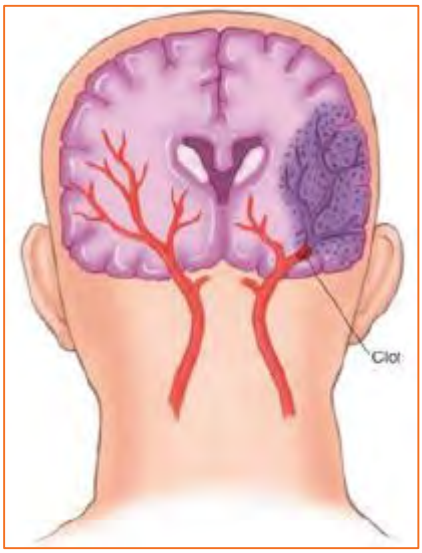

Fig.7.2.1: Brain parts

7.2.2.2 Types of Stroke

1. Haemorrhagic Stroke

- It is due to high blood pressure. Increased blood pressure can damage the blood vessels which can break anytime, and blood can be poured into nearby organs.
- So high blood pressure needs to be properly treated to avoid stroke.
- The main symptom is headache. When a person's blood vessels are leaking blood in the brain it causes sudden headache as the brain cells are irritated by the blood.
- It needs immediate treatment, which can be surgery.

2. Ischemic Stroke

- It is caused due to blood vessel blockage which is a result of a clot. This may be due to thrombosis or an embolism that interrupts the blood flow.
- Atherosclerosis can cause ischemic stroke. Blood vessel can be blocked with plaque ; which consists of calcium and cholesterol. This can obstruct the blood flow and impede the vessel's ability to dilate.
- This plaque can get ruptured and form clot, or some time plaque can fully block the blood flow to the brain and stop the brain cells from functioning.

3. Transient Ischemic Attack

- Transient ischemic attack (TIA) is a mini stroke. Symptoms lasts less than a day.
- This needs to be treated, because it is an indicator of actual stroke.

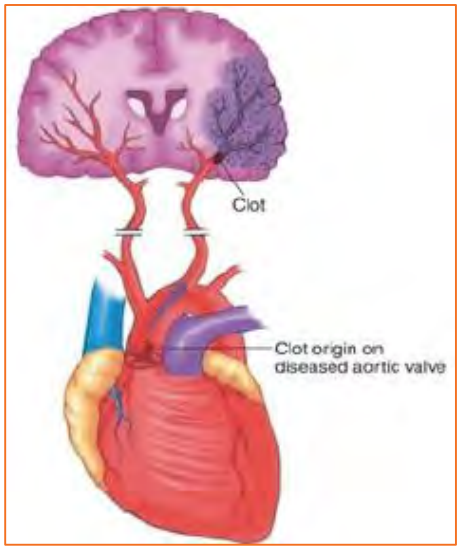

Fig.7.2.2: TIA

7.2.2.3 Signs and Symptoms of stroke

Left Hemisphere Problems	Right Hemisphere Problems	Bleeding in the Brain
•Aphasia - Speaking problem •You can detect this problem by asking the patient a question such as "what day is today?" in response, the patient with alphasia may say, "Green."	•Patients will have trouble moving the muscles on the left side of the body. Usually, they will understand language and be able to speak, but their words may be slurred and hard to understand. This problem is called dysarthria.	•Patients who have bleeding in their brain, otherwise known as a cerebral hemorrhage, may have very high blood pressure or cerebral aneurysms.

Fig.7.2.3: Other conditions

The following three conditions may appear to be a stroke:

1. Hypoglycaemia
2. A postictal state (a period of 5 to 30 minutes after a seizure)
3. Subdural or epidural bleeding.

7.2.2.5 Assessment of the Stroke Patient

The assessment of a patient suspected of having a stroke is similar to that for patients presenting other complaints. Stay organized in your approach and follow a routine familiar to you. This will help prevent you from forgetting steps and help you organize your information.

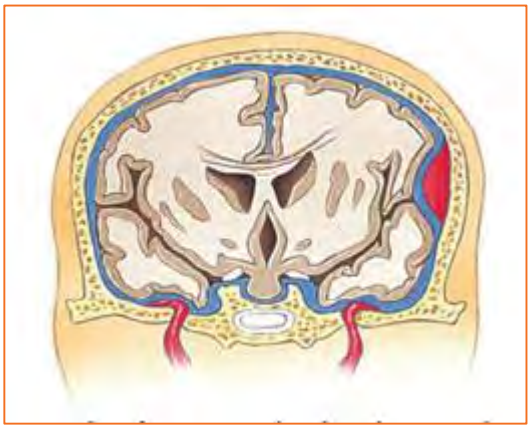

Fig.7.2.4A. Bleeding outside the dura and under the skull is epidural.

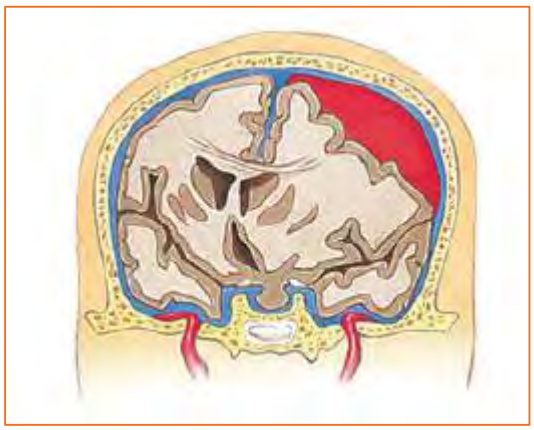

Fig.7.2.4B. Bleeding beneath the dura but outside the brain is subdural.

Scene Size-up

- There are different types of strokes. And the symptoms might be confusing. So look for the BST safety precautions and follow them and help the patient.
- Don't be distracted with family members of patient.
- Check for the symptoms and signs and other complications.

Initial Assessment

General Impression

- Ask patient for chief complaints if he is awake. If he is not responsive like in the state of confusion and slurred speech, then immediately check for his airway.
- Give him oxygen and ventilation and also quickly determine responsiveness by using the AVPU scale.

Airway and Breathing

Strokes affects the body functions in many ways. It can cause:

1. **Difficulty to swallow -** use oropharyngeal or a nasopharyngeal airway based on consciousness level
2. **Airway obstruction -** Position the patient appropriately and remove any obstruction and give oxygen and ventilation.

Check for breath rate and depth and administer supplemental oxygen.

Circulation

- Check the pulse. If no pulse found give CPR immediately.
- Give oxygen and elevate patient arms and legs to administer oxygen to the brain. While doing it be careful about arm or leg shock.
- Check for any external bleeding

Transport Decision

- Once you give oxygen and ventilation, transport patient immediately.
- Inform the hospitals before you reach. Ask hospital to make preparations for patient.
- Stroke is very dangerous and needs immediate treatment. So place the patient on one side, with the paralyzed side down and well protected with padding. This will help prevent aspiration of secretions which can block the airway.

Focused History and Physical Exam

Once you have done initial assessment and addressed all life threats, begin the next step in the patient assessment process—the focused history and physical exam.

SAMPLE History

- Gather patient information from relatives or friends. It can give idea to check patient heath problem.
- Ask them the time that they have felt the symptoms and document everything properly.
- Check for the medication that they are taking for particular cause.
- Try to communicate with a patient who is unable to speak by observing responses such as a glance, motion of the hand, effort to speak, or a head nod.

Focused Physical Exam (Responsive Patients)

- Check for following if you suspect a patient is having a stroke: Speech test, movement of face and arm movement. If you find any of the above are abnormal you can suspect patient for having stroke.
- For speech test you can ask patient to repeat a sentence. If he repeats it properly, it means he is not having a stroke.
- To check face movements, ask patient to move their face or show their teeth. If they are unable to do these movements, it implies that something is wrong.
- To check arm movement, ask the patient to hold both arms in front of his or her body, palms up toward the sky, with eye closed and without moving. Watch for 10 seconds. If you find any side drift towards the ground, he is weak. If both the arms don't move, it means his brain is normal.

- You can repeat the test if the results are not satisf actory or confusing.
- Patient suspected of stroke, should also have a Glasgow Coma Scale (GCS) calculated.

Baseline Vital Signs

- Check for pulse, blood pressure and circulation.
- In case of stroke, following change in vital signs are found:
- High BP; low pulse rate; altered breath; change in pupil size; poor perfusion

Interventions

The cause of many patients' AMS may be unknown, even after arrival at the hospital. This hampers definitive care at the site of incident. Most of your interventions will be as per your assessment findings.

Detailed Physical Exam

- It involves detailed inspection, palpation and auscultation to identify DCAP-BTLS in all areas of the body.
- It is done in unconscious patients who are unable to respond to you. If you don't make detailed exam, abnormalities can go unnoticed which can cause serious problems.

Ongoing Assessment

- Observe patient and check for the airway and respiration which can be affected any time.
- In case of stroke multiple interventions need to be made. So, reassessing the vital signs are necessary.
- If there is any change in vital signs you can look for the alternative treatment.
- You can compare the previous reading and current reading and check on the efficiency of treatment.

Communication and Documentation

- Document everything from chief complaints, to the treatment properly and use medical terms for further reference.
- Carefully note the signs and symptoms that the patient had. Also, note the medication given.
- It is also important to document the result of the Glasgow Coma Scale. Document airway management in which the patient was placed.

7.2.2.6 Definitive Care for the Patient Who Has Had a Stroke

It is very important to check for bleeding in patient with stroke. If there is no bleeding found, then there is a chance of blood clot. In that case you give medicines to dissolve the clot. Once clot is diffused brain cells can survive. Computed tomography (CT) is a way to check bleeding in the brain.

7.2.3 Seizures

- Seizures are sudden illnesses or attacks in the brain. It can disrupt the function of brain and the patient can become unconscious.
- Sometimes, a seizure occurs for a few seconds and the patient recovers with just a short memory loss related to the event. This is called as a petit mal seizure.

7.2.3.1 Signs and Symptoms

The signs and symptoms of seizure are given in below table:

Sudden loss of consciousness	Chaotic muscle movement and tone	Apnea	Extensor muscle tone activity
Tongue biting	Bladder or bowel incontinence	Tachycardia	Hyperventilation
	Intense salivation	Confusion and Fatigue	

Fig.7.2.5: Symptoms of seizure

7.2.3.2 Causes of Seizures

The causes of seizures can be categorized as follows:

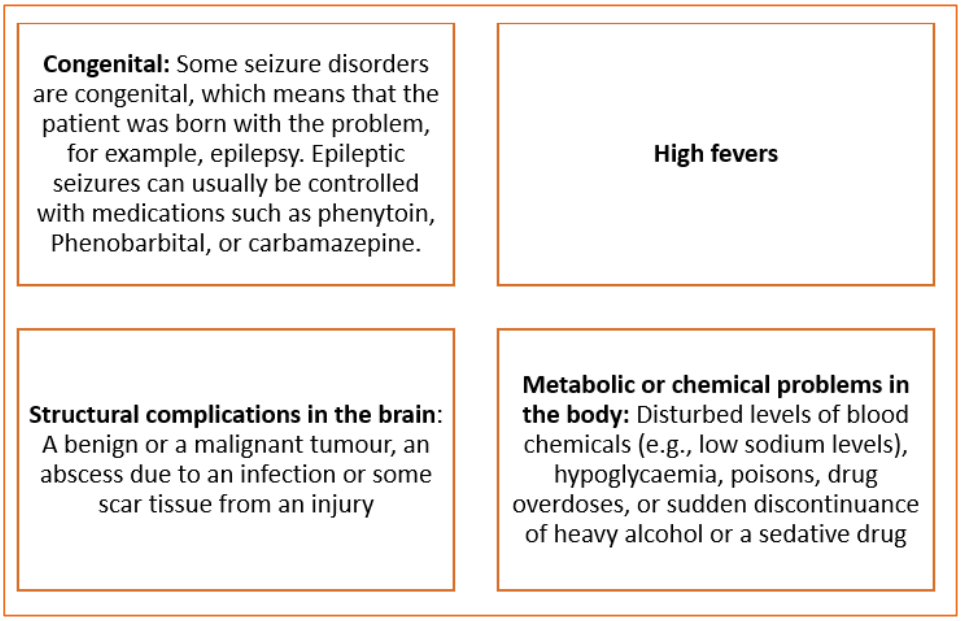

Fig.7.2.6: Causes of seizure

7.2.3.4 Assessing the Seizure Patient

Scene Size-up

- There is a chance of injury which can happen due to seizure.
- Follow safety and wear appropriate BSI protection
- ALS is needed in case of severe situation.

Initial Assessment

General Impression

Check for the consciousness state of patient. If found unresponsive or just beginning to regain awareness, use the AVPU scale to find out the patient's progress.

Airway, Breathing, and Circulation

- Provide ventilation and airway even if you think the patient is breathing normally.
- It is preferred to give high-flow oxygen at 15 L/min via non-breathing mask.

Transport Decision

Seizure occurs for 4 to 5 minutes. So, the transporting to hospital is not required.

You can ask patient to visit physician if he need any emergency help or you can take physician along with you as per patient request.

If a patient in postictal state denies transport, the following points need to considered:

1. Whether patient is conscious and aware of surroundings after a seizure.
2. If after seizure there are signs of trauma or any complications during assessment.
3. If the patient has had a seizure before.
4. Whether the length, activity and recovery of the seizure is usual.
5. Whether the patient is under medication and getting regular evaluation by doctor.
6. You can consider for patient refusal, if the answer is "yes" for above questions. If no , then transport patient immediately to the hospital.

Focused History and Physical Exam

- If your patient is unresponsive you cannot get information from patient.
- So check patient from head to toe and analyse for the issue. You can check for the vital signs and history once he responds.
- If the patient is already responding to question, get SAMPLE history and do a focused physical exam looking for injuries, and next obtain vital signs.
- If you find low glucose level in the patient, then you can give him oral glucose solutions.
- Also check for infection, tumour and bleeding in patient.

Focused Physical Exam (Responsive Medical Patients)

- A Glasgow Coma Scale score can be taken to assess mental state of patient.
- You can also check for their speech, ability and consciousness level.

Baseline Vital Signs

- Check for respiration rate, rhythm and strength of pulse.
- Also check for skin colour, blood pressure and body temperature.
- If the patient is diabetic check for his glucose level.

Interventions

Seizure last for less than 5 minutes. So, if you arrive at the scene at the time the patient is having seizures then protect them from injury, provide suction, clear airway, and provide oxygen.

Ongoing Assessment

- Keep checking on the mental status and vital signs of the patient.
- Also compare the previous report with new and check the efficiency of treatment.

Communication and Documentation

Report and record your findings of the initial assessment and interventions performed. Give a description of the episode and include bystanders' comments, especially if they witnessed the patient seizing. Document the onset and duration of the seizure.

7.2.3.6 Definitive Care for the Patient Who Has Had a Seizure

- A patient who has a seizure needs to get assessment and treatment in the hospital.
- He/she needs to be transported immediately to the hospital and get medications and treatment at the hospital.
- Supplemental oxygen and ventilation should be given. Clear and maintain the airway
- Check on the blood sugar levels of patient. In case of trauma arrange for spinal immobilization.
- In case there is an infant with seizure, reduce the body temperature by removing the clothing and applying tepid water.

7.2.4 Altered Mental Status (AMS)

A patient who is having seizure can possibly get AMS. Most of the time patient remains in confused state or is unconscious.

It can be caused due to hypoglycaemia; hypoxemia; intoxication; drug overdose, unrecognized head injury; brain infection; body temperature abnormalities; and condition such as brain tumours, glandular abnormalities, and overdoses/ poisoning.

Causes of AMS

1. Hypoglycaemia
2. Other causes of AMS

AMS can happen due to hypoglycaemia, a head injury or alcohol intoxication. You should be prepared that the patient might be violent and refuse treatment. Follow local protocols for dealing with these situations.

Psychological problems and complications from medication are also possible causes of AMS. A person who seems to have a psychological problem may also have an underlying medical condition.

Infections can also be a cause of AMS, especially those of the brain or the bloodstream.

AMS can also be due to a drug overdose or poisoning. You should observe the patients closely for associated cardiac and breathing issues.
Thus, AMS ranges widely from simple confused state to coma. It should always be treated as an emergency.

Assessment of the Patient with Altered Mental Status

The patient assessment process for patients with AMS is the same as for patients with potential stroke and seizure with a few differences. The most significant difference between AMS and other emergencies is that your patient cannot tell you reliably what is wrong, and there may be more than one cause. Therefore, being vigilant in your ongoing assessment is essential, both to uncover possible causes of your patient's condition and to monitor your patient's condition for changes and deterioration. Prompt transport is necessary, with close monitoring of vital signs en-route and careful attention to the airway and to the positioning of the patient to avoid aspiration and to maintain comfort.

UNIT 7.3: Medical (Respiratory Emergency)

Unit Objectives

At the end of this unit, you will be able to:

1. Identify the respiratory emergencies
2. Define the assessment of the patient in respiratory distress
3. Define the emergency care of respiratory emergencies
4. Analyse the treatment of specific conditions

7.3.1 Incident Command Systems

An COVID Frontline Worker (Emergency Care Support) requires to identify the medical problems that can impede the normal functioning of the respiratory system and cause dyspnoea. These include acute pulmonary oedema, chronic obstructive pulmonary disease, and asthma.

7.3.1.1 Causes of Dyspnea

Dyspnea is an uncomfortable condition involving shortness of breath or problems in breathing.

This develops in the following medical conditions:

1. Infection of the upper or lower airway
2. Acute pulmonary oedema
3. Chronic obstructive pulmonary disease (COPD)
4. Spontaneous pneumothorax
5. Asthma or allergic reactions
6. Hyperventilation
7. Extended seizures
8. Obstructed airway
9. Pleural effusion
10. Hyperventilation
11. Severe pain, especially chest pain

Infectious diseases resulting in dyspnoea may have an effect on the entire airway. This effect ranges from mild discomfort to obstruction of the airway to the extent that the patients have to get respiratory support.

Pulmonary oedema, can occur immediately after a big heart attack or some other sickness. There is build-up of fluid in the space between the alveoli in the lungs and the pulmonary capillaries.

Inhalation of big quantities of smoke or poisonous chemical fumes can cause pulmonary oedema, as can major injuries in the chest region. In such cases, fluid accumulates in the alveoli and the lung tissue in response to the damage to the lung tissues or the bronchi.

Chronic obstructive pulmonary disease (COPD) is a kind of obstructive lung disease which occurs due to long-term bad airflow. The main symptoms are difficulty in breathing, increased mucus, fatigue occurrence of cough along with sputum production.

Chronic bronchitis is a condition which can be caused by tobacco smoke which is a bronchial irritant. There is a continuous irritation in the trachea and the bronchi.

Emphysema is a kind of COPD where there is depletion of the elastic material around the air spaces. This happens because of incessant stretching of the alveoli when inflamed airways impede the removal of gases. Smoking is also responsible for harming the elasticity of the lung tissue.

Asthma is an intense convulsion of the bronchioles in the lungs due to extensive mucus formation and swelling in the mucus lining of the air passages. Patients produce a wheezing sound as they try to breathe out through partly obstructed air passages. These air passages do not hamper inspiration.

Patients might suffer from serious allergic reactions to certain substances. These substances are called as allergens. They may also cause anaphylaxis which involves airway swelling and expansion of the blood vessels. There may be lowering of blood pressure, extensive itching and other symptoms similar to asthma.

A pleural effusion is an accumulation of fluid, exterior to the lung on one or both the sides of the chest region; dyspnoea is caused when it compresses the lungs. An infection, congestive heart failure, cancer or irritation are some of the causes of pleural effusion.

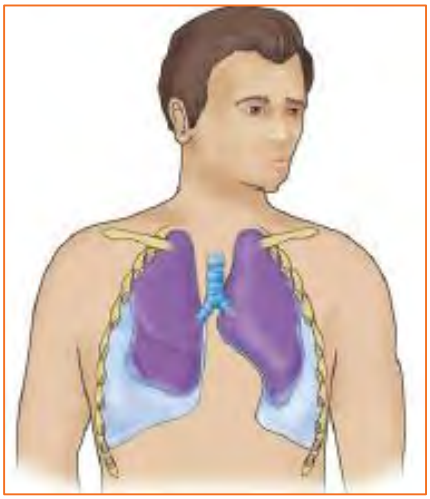

Fig.7.3.1: Pleural effusion

The obstruction in the airway may occur in unconscious patients due to expiration of vomitus or some foreign object. Mechanical obstruction happens due to dropping back of the tongue in the throat if the head is in an incorrect position.

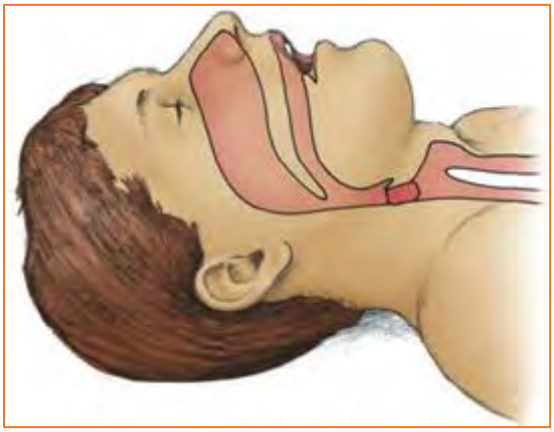

Fig.7.3.2 (a): Foreign body obstruction occurs when an object, such as food is lodged in the airway.

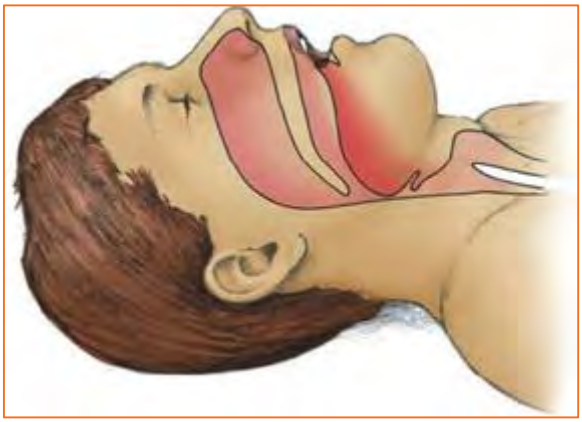

Fig.7.3.2 (b): Mechanical obstruction also occurs when the head is not properly positioned, causing the tongue to fall back into the throat.

An embolus is a clog within the circulatory system that travels from the place where it originates to a different location and fixes itself there, obstructing the blood flow in that region.

A large embolus can result in total obstruction of the output of blood flow from the right side of the heart causing sudden death.

A pulmonary embolus is a venous blood clot that detaches itself, travels through the venous system and the right side of the heart into the pulmonary artery.

It can fix itself here and cause significant obstruction of blood flow.

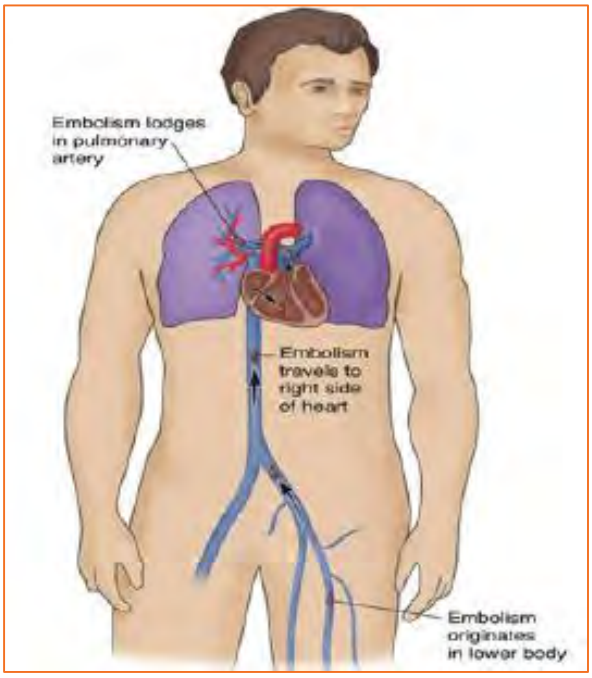

Fig.7.3.3: Pulmonary embolism

Hyperventilation refers to over-breathing to the stage that the arterial carbon dioxide level drops below normal. This might be the sign of a life-threatening illness.

Alkalosis is a condition which causes many symptoms similar to that caused in hyperventilation syndrome, including anxiety, giddiness, numbness, tingling of the extremities, and also a feeling of dyspnoea in spite of the fast breathing.

7.3.2 Assessment of the Patient in Respiratory Distress

The assessment of the patient in respiratory distress should be done in a calm and systematic manner.

7.3.2.1 Scene Size -up

While attending to patients with respiratory distress, you should adhere to the BSI guidelines of precaution. Wearing exam gloves is the minimum requirement and if you think that the patient might have a respiratory disease, then a mask, safety goggles, or a face shield should also be used.

Once you are sure that the scene is safe, you should determine the type of illness or the mechanism of injury, and whether the spinal immobilization precautions are required. Then, you must decide if additional resources are needed.

7.3.2.2 Initial Assessment

General Impression

When you reach the site, and start interacting with the patient, you require to form a general impression of the patient. This first impression will enable you to decide whether the condition of the patient is stable or not. AVPU will assist you to conclude if the patient is alert and responding to verbal stimuli or touch stimuli, or if the patient is unresponsive. If the patient is responding to a verbal stimulus, it implies that the brain is still getting oxygen. If the patient is only responding to touch stimuli or unresponsive, it implies that the brain lacks oxygen and there might be an airway or a breathing problem.

Airway and Breathing

Assess the airway to check if the air is flowing easily in and out of the chest. If snoring sounds are observed in a patient who is unresponsive, the airway should be repositioned and, if required, an oral or a nasal airway should be inserted. If strenuous breathing sounds are heard, reposition the patient to facilitate breathing. If gurgling sounds are audible, suction as necessary.

If adequate or patent airway is observed, check the patient's breathing. If breathing is absent, quickly provide two ventilations. As you ventilate, you require to check if the ventilations are sufficient to meet the oxygen requirements of the patient.

If they are not, reposition the patient and use an oral airway to prevent the tongue from obstructing the airway. Reposition the head of the patient and slow down or increase the ventilation rate.

Circulation

The pulse can give you an idea of the patient's breathing condition. A normal pulse rate indicates there is adequate oxygen to sustain life. If the pulse rate is faster or slower than the normal rate, the patient might not be getting adequate oxygen. Check the following:

1. The oxygen bottle is hooked to the mask
2. The oxygen bottle knob is turned on
3. The flow rate is adequate (10 to 15 L/min)
4. The face mask seal is good enough
5. The chest is rising and falling with every breath
6. The airway is not obstructed with vomit or with the tongue

Control the bleeding, no matter how little, and treat the patient for shock.

Transport Decision

The initial assessment process finally involves the transport decision. If there is no urgency and the patient is stable, you can perform a history and physical exam at the site. If the patient is unstable and life is at risk, provide rapid transport. This implies keeping a brief scene time and giving only lifesaving care there. Carry out a history and physical exam on the way to the hospital.

7.3.2.3 History and Physical Exam

The history and physical exam implies gathering information related to the history of the patient's illness. Use SAMPLE and OPQRST to help you in your queries.

Generally, a patient with COPD depicts a barrel-shaped chest and utilizes the accessory muscles to breathe. The lips are pursed, and the patient sits in the tripod position.

SAMPLE History

Since the patients is in respiratory distress, the family of the patient or the bystanders may answer most of the SAMPLE questions. Search for medications, medical alert bracelets, environmental status, and other hints to deduce what may be the cause of the problem.

Try to get the patient to explain the problem. The queries should relate to OPQRST: when the problem started (onset), what aggravates the breathing problem (provocation), how the breathing process feels (quality), and whether the distress travels (radiation). What is the level of the problem (severity)? Is the problem unceasing or intermittent (time)? In case it is intermittent, how regularly does it take place and its duration?

Find out how the patient has dealt with the breathing problem earlier. Does the patient utilize a prescribed inhaler? If an inhaler is being used, when was it done so last and what was the dose? Was more than one inhaler being used by the patient? Record the name of each of the inhalers and time of last use.

Fig.7.3.4: Old man with COPD

The patient with COPD usually has shortness of breath, rapid and often irregular pulse and rapid or very slow respirations. Sputum, if present, will be thick and green or yellow. The blood pressure will be normal and there will be no chest pain.

Patients with asthma might have various causes of acute attacks such as allergens, cold, stress, infection and lack of medications. It is important to try to find out the trigger to provide appropriate treatment.

Patients with congestive heart failure (CHF) take several medications, most often including diuretics ("water pills") and blood pressure medications. Your SAMPLE and OPQRST history will assist the emergency department physician in giving treatment.

7.3.2.4 Focused Physical Exam

Patients with COPD usually are above 50 years of age and will often have a history of lung problems. If you listen to the chest with a stethoscope, you will hear abnormal breath sounds that may be crackles, rhonchi, or wheezing.

Asthma patients show tripod positioning, fast breathing, use of accessory muscles and wheezing. The patient may appear to relax or go to sleep. These signs might imply an imminent respiratory arrest, and you should act quickly.

The patients with CHF often experience pulmonary oedema, and are wet in their own fluid. In addition to the typical signs of respiratory discomfort, they might have pink, foamy sputum oozing out from their mouths. The lung sounds are rhonchi, crackles and sometimes wheezes. Their lungs and feet may be distended (pedal oedema) due to the build-up of fluid.

Baseline Vital Signs

Along with pulse, respirations, and blood pressure; skin colour, capillary refill, level of consciousness, and pain assessment are important checks for a respiratory patient.

After you provide oxygen, a lowering of the breathing rate towards normal may suggest that your patient is improving. However, it may also mean that the patient is decompensating and may deteriorate.

Patients initially make up for respiratory discomfort by raising their respiratory and heart rates. If adequate oxygenation is maintained, their level of consciousness, skin colour, and capillary refill time will be normal. Blood pressure varies with the patient's baseline status. It is often raised in pulmonary oedema occurring due to congestive heart failure.

The essential vital signs are confusion, coordination loss, abnormal behaviour or even violence, change in the level of consciousness, pale skin, delayed capillary refill in the hands and the feet and cyanosis.

In patients with normal levels of haemoglobin, pulse oximetry can be a useful tool in checking oxygenation. To utilize pulse oximetry properly, it is important for you to be able to assess the quality of the reading and relate it to the patient's condition.

If you get a good reading which correlates with the patient's condition, the pulse oximeter helps you judge the seriousness of the respiratory part of the patient's issues. If the reading travels up or down, it indicates the improvement or decline in the ventilation status. Bright light, dark pigmented skin, and nail polish can hamper the working of the oximeter.

Interventions

Interventions for respiratory problems may include:

1. Providing oxygen via a nonrebreathing mask at the rate of 15 L/min
2. Supplying positive pressure ventilations using a BVM, pocket mask, or a flow restricted oxygen powered ventilation device
3. Using airway management techniques such as inserting an oropharyngeal airway or a nasopharyngeal airway, administering suctioning, or performing airway positioning
4. Positioning the patient in the high Fowler's position or a position of choice to enable easy breathing
5. Respiratory medications such as an MDI or other medications

Remember to document your assessment, including all medications given.

7.3.2.5 Detailed Physical Exam

You should only carry out the detailed physical exam once all life threats have been detected and treated, even if it implies performing the exam at the emergency hospital.

The detailed physical exam helps in providing further clues to identify the problem. For example, a patient in acute respiratory distress with audible wheezing may be in CHF or having an asthma attack. The detailed physical exam may give you clues, such as elevated blood pressure and pedal oedema, which would tell you that the problem is CHF.

Ongoing Assessment

You should continue to monitor patients having shortness of breath. Repeat the initial assessment and try to note down changes in the patient's condition. Obtain vital signs regularly at short intervals for a patient who is unstable or who is using an inhaler. If the patient's condition is stable the vital signs should be taken at least every 15 minutes. Carry out a focused reassessment of the respiratory system. Take input from the patient regarding the treatment and check the chest region to assess whether assessor muscles are still being utilized to breathe. Pay attention to the patient's speech pattern. The patient's condition may deteriorate. Be ready to help in ventilations with a BVM equipment.

After assisting the patient with the inhaler, transport the patient quickly to the emergency care. While en-route, carry on checking the patient's breathing. Try talking calmly and continue to provide supplemental oxygen.

7.3.3 Emergency Care of Respiratory Emergencies

When recording the initial vital signs of a person depicting dyspnoea, you should be extremely attentive to the respirations. Re-assess the respirations and the response to oxygen supplement continuously, at least at an interval of every 5 minutes, until you arrive at the hospital. This is crucial especially in a person having high carbon dioxide level as the supplemental oxygen may increase the arterial oxygen level. The secondary respiratory oxygen drive would then get abolished and result in a respiratory arrest.

7.3.3.1 Supplemental Oxygen

If a patient has a breathing difficulty, you should provide supplemental oxygen during the history and physical exam if not done already during the initial assessment. Apply a nonrebreathing face mask on the patient and provide oxygen at a rate of 10 to 15 L/min in a patient with severe breathing problem.

In patients who have prolonged COPD and possible retention of carbon dioxide, start with supplying low-flow oxygen (2 L/min), and changing to 3 L/min, then 4 L/min, and so on until symptoms have improved.

7.3.3.2 Prescribed Inhalers

Some medications are used when patient feels difficult to breathe. These medicines are called as inhaled beta-agonists. Examples are albuterol, asthalin, ventorlin. Do not use these medicine in the following conditions:

- If the patient feels shortness of breathing due to depression or if he is in confused state.
- Without doctor's prescription.
- When the maximum dose has been administered in the patient.

Administration of a Metered-Dose Inhaler

To assist a patient to self-administer medication from an inhaler, follow the given steps:

Obtain an order from medical control or local protocol.
Check that you have the right medication, the right patient, and the right route.
Make sure that the patient is alert enough to use the inhaler.
Check the expiration date of the inhaler.
Check to see whether the patient has already taken any doses.
Make sure the inhaler is at room tmperature or warmer
Shake the inhaler vigorously several times.
Stop administering supplemental oxygen and remove any mask from the patient's face.
Ask the patient to exhale deeply and, before inhaling, to put his or her lips around the opening of the inhaler .
Have the patient depress the hand held inhaler as he or she begins to inhale deeply.
Instruct the patient to hold his or her breath for as long as is comfortable to help the body absorb the medication .
Continue to administer supplemental oxygen.
Allow the patient to breathe a few times, then repeat second dose as per direction from medical control or local protocol .

Fig.7.3.5: Administration of metered-dose inhaler

7.3.4 Treatment of Specific Conditions

Acute Pulmonary Edema

Dyspnea due to acute pulmonary oedema may be because of a cardiac disease or lung damage. Supply 100% supplemental oxygen, and if required, suction the secretions from within the airway. Provide quick transport for emergency care. A conscious patient should be positioned in a comfortable posture, which is sitting up. An unconscious patient with acute pulmonary oedema might require complete ventilator support, including airway, positive pressure ventilation with oxygen, and suctioning.

Chronic Obstructive Pulmonary Disease

Patients with COPD may be unconscious from hypoxia, or from carbon dioxide retention. They might show respiratory distress or cyanosis. They will have pursed lips and might be utilizing accessory muscles for breathing.

Assist the patient to use the prescribed inhaler, in case there is one. Transport immediately to a hospital for emergency care, keeping the patient in an upright position.

Asthma

In an asthmatic patient, there will be a history of many incidents of abrupt shortness of breath along with difficulty in exhaling. Try to find out if the patient has normal breathing at other times. Remember that some kinds of heart failure, foreign body expiration, inhalation of poisonous smoke, or severe allergic reactions may also cause wheezing.

The patient's vital signs will show the pulse rate as normal or raised, the blood pressure might be slightly more than normal, and the respirations will be elevated. Help the patient with the prescribed inhaler, if there is one. Provide supplemental oxygen, and place the patient in an upright position.

Be ready to suction mucus from the mouth. Give oxygenation between suction attempts. If the patient is unconscious, you may have to perform airway management.

You require to recheck breathing continuously and assist in ventilation in serious cases.

An extended asthma attack may cause status asthmaticus. The patient will be desperately trying to breathe using all the accessory muscles. The patient must be given supplemental oxygen and transported as soon as possible to the emergency department.

Obstruction of the Upper Airway

There might be partial or total upper airway obstruction. If your patient is talking and breathing, provide supplemental oxygen and transport to the hospital. As far as the patient is getting adequate oxygen, refrain from doing anything that might convert a partial airway obstruction into a total airway obstruction.
If there is a complete airway obstruction, the obstruction must be removed at once. Clear the upper airway of the patient following the BLS guidelines. Then administer supplemental oxygen and shift the patient quickly to a hospital for emergency care.

Pulmonary Embolism

In pulmonary embolism, majority of the lung tissue might not be functioning. Supplemental oxygen becomes mandatory. Ensure that the patient is in a comfortable posture, generally sitting, and facilitate breathing as required. Haemoptysis might be there but is generally mild. Any blood that has been coughed up should be removed from the airway. The patient might have an abnormally fast and irregular heartbeat. Transport the patient quickly to the hospital for emergency care as a pulmonary embolus may result in a cardiac arrest.

Exercise

1. Inspiration occurs when:
   a. The intercostal muscles and the diaphragm contract.
   b. The intercostal muscles and the diaphragm relax.
   c. The diaphragm rises and the ribs move upward and outward
   d. The diaphragm rises and the ribs move downward and inward

2. Hyperventilation refers to over-breathing to the stage that the:
   a. Arterial carbon dioxide level falls below normal
   b. Venous carbon dioxide level falls below normal
   c. Arterial oxygen level falls below normal
   d. Venous oxygen level falls below normal

3. All of the following are steps the COVID Frontline Worker (Emergency Care Support) takes when assisting a patient to use his prescribed inhaler, EXCEPT:
   a. Have the patient exhale deeply first.
   b. Have the patient inhale deeply as he presses the inhaler to activate the spray
   c. Hold the inhaler in the patient's mouth and activate the spray for him.
   d. Make sure the patient is alert enough to use the inhaler properly.

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Corporation
Transforming the skill landscape

Healthcare
Sector
Skill Council

8. Ambulance Management

Unit 8.1– Operations (Ambulance Operations)

HSS/N2322

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe the ambulance operations
2. Identify gaining access operations

UNIT 8.1: Operations (Ambulance Operations)

Unit Objectives

At the end of this unit, you will be able to:

1. Identify emergency vehicle design
2. Identify the phases of an ambulance call
3. Identify defensive ambulance driving technique
4. Define law and regulations
5. Define air medical operations
6. Analyse helicopter medical evacuation operations

8.1.1 Emergency Vehicle Design

An ambulance is a vehicle in which patients are transported to medical facilities for emergency care. They are also given treatment in the vehicle, en route to the hospital.

As defined by National Academy of Sciences, the modern ambulance is a vehicle for emergency medical care that has the following features:

- A driver's compartment
- A compartment for patients which has the capacity for two CFW-ECS and two supine patients
- Equipment and supplies to administer emergency medical care, safeguard personnel and patients from hazardous conditions, and carry out light extrication procedures
- Two-way radio communication so that the ambulance staff can stay connected with all concerned authorities and seek help or report progress.
- Design and construction that ensures maximum safety and comfort

8.1.2 Phases of an Ambulance Call

There are nine phases in an ambulance call which address the vehicle and its crew, and their roles in a response to a medical emergency. The details of patient care are not included in these nine phases.

These phases are as given below:

1. Preparation for the call
2. Dispatch
3. En route
4. Arrival at scene
5. Transfer of the patient to the ambulance
6. En route to the receiving facility (transport)
7. At the receiving facility (delivery)
8. En route to the station
9. Post-run

8.1.2.1 The Preparation Phase

Making sure that equipment and supplies are in their proper place and prepared for use is an important part of preparing for the call. Items that are missing or that do not work have no relevance to the patient. As a thumb rule, the more complex a piece of equipment is, and the harder it is to learn to use, the more likely it is to malfunction during an emergency. Many EMS items have never been rigorously tested under field conditions and could turn out to be expensive mistakes. For this reason, new equipment should only be placed on an ambulance after consulting with the medical director.

Equipment and supplies should be durable and, to the extent possible, standardized. This makes it easy to quickly exchange equipment with other ambulances or with the emergency department, thus saving time during patient transfer.

Equipment and supplies must be stored in the ambulance as per the urgency and usage. Give priority to items that are needed to care for life-threatening conditions. These include devices for airway management, artificial ventilation, and oxygen delivery. Place these items within easy reach, at the head side of the stretcher. Place articles for providing cardiac care, controlling external bleeding, and measuring blood pressure at one side of the stretcher.

Cabinets and kits should open easily. They should also close securely and not open when the ambulance is moving. Cabinets and drawers should have transparent fronts to enable quick identification of their contents; if they are not so, be sure to label each container.

1. Medical Equipment

As an CFW-ECS you have access to different kinds of medical equipment and supplies, far more than can be described here. Some items should always be available in an ambulance.

2. Basic Supplies

This lists the common supplies carried on ambulances. These include supplies such as airway and ventilation equipment, disposable gloves and sharps, splinting supplies, basic wound care supplies, an automated external defibrillator, childbirth supplies, patient transfer equipment, medications, and other supplies such as a snake bite medical kit or certain regional supplies.

3. Airway and Ventilation Equipment

Airway management equipment that should be maintained on ambulances includes the following:

1. Oropharyngeal airways
2. Nasopharyngeal airways
3. Two sets of devices for advanced airway processes

It is important that two portable artificial ventilation devices that operate independently of an oxygen supply are carried on the ambulance: one for use in the ambulance and one for use outside the ambulance or as a spare. These devices include disposable pocket masks and bag-valve-mask (BVM) devices. In addition, BVM devices capable of oxygen enrichment such that, when attached to oxygen supply, give almost 100% oxygen, should also be carried on the ambulance. Masks for these devices come in a variety of sizes; from infant to adult and are necessary materials to carry on the ambulance. Oxygen-powered devices are also available to provide ventilation to a patient. You should follow local guidelines in identifying the specific ventilation equipment carried on the ambulance.

The ambulance should carry both portable and mounted suctioning units. These units must provide an airflow of about 30 L/min and a vacuum of about 300 m Hg. The suctioning force must be adjustable for use on infants and children. The units should include large-bore, no kinking suction tubing with a semi rigid pharyngeal tip, with additional semi rigid tips available. The installed unit should include a suction yoke, an unbreakable collection bottle, water for rinsing the suction tips and suction tubing, all easily accessible when you are sitting at the head of the stretcher. The tubing must extend up to the patient's airway. All the components of the suctioning unit must be disposable or made of material that is easily cleaned and decontaminated.

The ambulance should carry at least two oxygen supply units: one portable and one installed. The portable unit should be located near a door or in the jump kit, for easy use outside the ambulance. It should have a capacity of at least 300 L of oxygen and have a yoke, a pressure gauge, a flowmeter, an oxygen supply tubing, non-rebreathing masks, and nasal cannula. This unit must be able to deliver oxygen at a variable rate between 2 and 15 to 25 L/min. At least one extra portable 300-L cylinder should be kept in the ambulance. Many services equip the backup cylinder with its own yoke, gauge, regulator, and tubing so that it can be used for a second patient.

The mounted oxygen unit should have a capacity of 3,000 L of oxygen. It should also be equipped with flowmeters that can deliver 2 to 25 L/min and are accessible from the head of the stretcher. Oxygen masks, with and without non-breathing bags, should be transparent, and disposable, in sixes for adults, children, and infants.

Ambulance services that often transport patients on runs lasting longer than 1 hour should consider using a disposable, single-use humidifier for the mounted oxygen system. On runs of less than 1 hour, humidification is not usually necessary. Humidification may enhance a patient's chances of infection if the equipment is not extremely well maintained.

CPR Equipment

A CPR board provides a firm surface under the patient's body to give proper chest compressions. It also establishes an appropriate degree of head tilt. In the absence of a CPR

board, you can place a long or short backboard under the patient on the stretcher. Make a tight roll of a sheet or a towel and use it to lift the patient's shoulders 3" to 4"; this will also maintain maximum backward tilt of the patient's head and allow the shoulders and the chest to remain in a straight position. Caution: do not utilize this roll to overextend the neck if you suspect a spinal injury.

Mechanical devices that operate on compressed gas and deliver chest compressions and ventilations are also available.

Basic Wound Care Supplies

Basic supplies to enable dressing of open wounds should be kept in the ambulance. These include a pair of trauma shears, sterile sheets, sterile burn sheets, adhesive tape, self-adhering, soft roller bandages, sterile dressings, gauze, ABC or laparotomy pads, sterile universal trauma dressings, sterile, occlusive, non-adherent dressings (aluminum foil sterilized in original package), an assortment of Band-Aids, a tourniquet (depending on local protocols) and an adult size pneumatic anti-shock garment (PASG), previously called MAST trousers (depending on local protocols).

Splinting Supplies

Examples of supplies or splinting fractures and dislocations include an adult-size traction splint, a child-size traction splint, different types of arm and leg splints, such as vacuum, inflatable, plastic, cardboard, foam wire-ladder, or padded board, different triangular bandages and roller bandages, a short backboard device, a long backboard and cervical collars in an adjustable size or a variety of sizes.

Childbirth Supplies

You must carry an emergency sterile obstetric (OB) kit consisting of a pair of surgical scissors, haemostats or special cord clamps, umbilical tape or sterilized cord, a small rubber bulb syringe, towels, gauze sponges, pairs of sterile gloves, sanitary napkins, a plastic bag and a baby blanket.

Automated External Defibrillator

Modern-day EMS was ushered in by the first ever prehospital use of the defibrillator by a St. Vincent's Hospital ambulance in New York City under the direction of Dr. William Grace in the early 1970s. Now as a prehospital standard of care, a semi-automated defibrillation equipment, as permitted by regulation and the local medical director, should always be carried on the ambulance.

Patient Transfer Equipment

Each ambulance should have the following articles for transferring patients:

- A primary wheeled ambulance stretcher
- A wheeled stair chair to be used in narrow spaces
- A long backboard
- A short backboard or a short immobilization device

You should be able to tilt the head of the stretcher upward to a minimum of 60° semi sitting position and tilt the complete stretcher into 10° to 15° of Trendelenburg's position for airway care and treatment of shock. Stretchers must be provided with fasteners to secure them firmly to the floor or side of the ambulance during transport. Stretcher restraints should be capable of holding the stretcher in place in case the vehicle rolls over. Make certain th at the wheeled stretcher is locked into position properly, as injuries can occur to the patient and COVID Frontline Worker (Emergency Care Support) if the stretcher becomes loose while the ambulance is in Motion. Ensure there are at least three provisions for restraining the patient, such as stopping straps across the shoulders, to stop the forward movement of the patient in case the ambulance abruptly slows down or stops. Other devices that can be utilized include:

- A scoop stretcher
- A portable/folding stretcher
- A flexible stretcher
- A basket stretcher

Medications

It is important that the ambulance carry appropriate medications. Be certain that you have the telephone number and the radio frequency of the medical control or the regional poison control centre.

The Jump Kit

The ambulance should have a portable, durable, and waterproof jump kit that can be carried to the patient. Think of the jump kit as the "5-minute kit", containing anything you might need in the first 5 minutes with the patient except for the semi-automated external defibrillator, possibly the oxygen cylinder, and portable suctioning unit. The jump kit must be easy to open and secure.

The following is the list of the items that are typically contained in a jump kit:

Items carried in a jump kit
• Latex, vinyl, or other gloves Triangular Bandages Trauma shears • Adhesive tape in various widths Universal trauma dressings • Self-adhering soft roller bandages, 4" x 5 yd and 2" x 5 yd Oropharyngeal airways in adult, child, and infant sizes* BVM device with masks for adults, children, and infants* Blood pressure cuff • Stethoscope Penlight • Sterile gauze dressings, 4" x 4" • Sterile dressings (ABD pads), 6" x 9" or 8" x 10" Adhesive strips • Oral glucose Activated charcoal

Fig.8.1.2: Items carried in a jump kit

4. Safety and Operations Equipment

In addition to medical equipment, a properly stocked ambulance carries several kinds of equipment for responder safety, rescue operations, and locating emergency scenes. To do the job effectively, the COVID Frontline Worker (Emergency Care Support) team will need the following equipment:

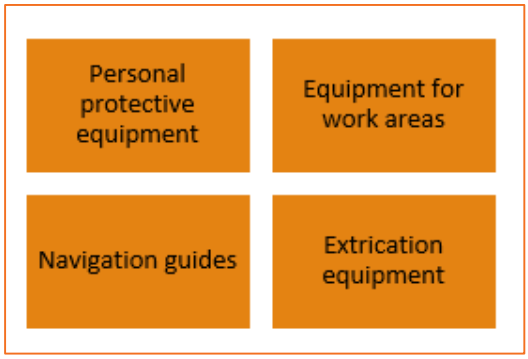

Fig.8.1.3: Safety equipment

Personal Safety Equipment

You should always carry personal protective equipment that allows you to work safety in a limited variety of hazardous or contaminated situations. These situations include the edges of a structural fire or explosion, vehicle extrication, and violent crowds. The equipment should protect you from exposure to blood and other infectious fluids. Note that you will not be equipped to face all HazMat and other exposure situations that you may encounter; this is the job of specially trained HazMat technicians and response teams.

Your equipment might include the following:

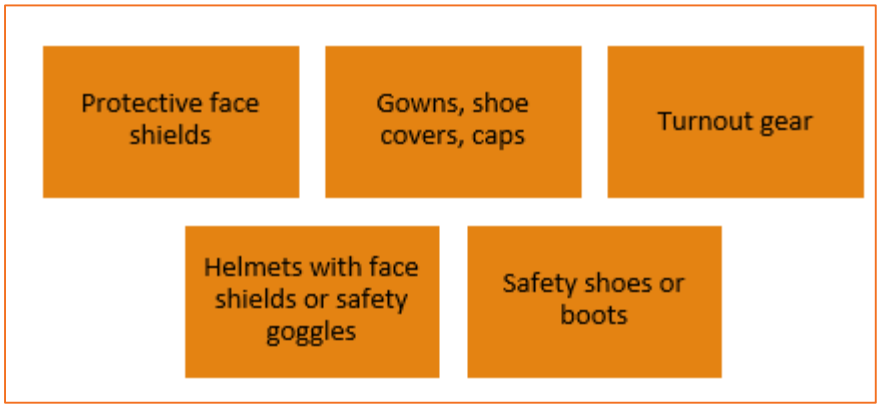

Fig.8.1.4: Personal safety equipment

Equipment for Work Areas

A weatherproof compartment should have devices for the protection of the patients and the CFW-ECS for controlling the traffic and the bystanders, and for providing light to work areas. The following items are recommended:

- Warning devices that flash intermittent light or contain reflectors (road flares are not acceptable because they can pose an additional hazard, such as ignition of flammable liquids or gases)
- Two high-intensity halogens 20,000 candle flashlights of the recharging battery-powered, stand-up type
- Fire extinguisher, type BC, dry power, 5-lb minimum
- Hard hats or helmets along with face shields or safety goggles
- Movable floodlights

Preplanning and Navigation Equipment

Make sure you have detailed street and area maps in the driver's compartment of the ambulance, along with directions to key locations, such as local hospitals. Become familiar with the roads and traffic pattern in your town or city so that you can plan alternative routes to common destinations. Pay particular attention to ways around frequently opened bridges, congested traffic, or blocked railroad crossings. Often, switching to an alternative route will save more time than driving faster. You must be aware of the special facilities and locations within your regional operation area, including medical facilities, airports, arenas and stadiums, and chemical or research facilities that might pose unusual problems (staging areas may be predefined for emergency operations).

Extrication Equipment

A weatherproof compartment located outside the patient's compartment should have devices that are required for simple, light extrication. Prepare a list of the articles that should be stored in the compartment.

If rescue and extrication services are not readily available, additional equipment may be needed.

Extrication Equipment

- 12" wrench, adjustable, open-end 12" screwdriver, standard square bar 8" screwdriver, Philips head # 2 Hacksaw with 12" carbide wire blades, Vise-grip pliers 10"
- 5-lb hammer with 15" handle, Fire ax, butt, 24" handle
- Wrecking bar with 24" handle. This may be a combination tool with a hammer and ax.
- 51" crowbar, pinch point
- Bolt cutter with 1" to 1 %" jaw opening Folding shovel, pointed blade
- Tin snips; double action, 8" minimum
- Gauntlets; reinforced, leather covering past mid forearm; one pair per crew member
- Rescue blanket
- Ropes; 5,400-lb tensile strength in 50" lengths in protective bags, Mastic knife (able to cut seat belt webbing)
- Spring-load center punch pruning saw
- Heavy duty 2" x 4" and 4" x 4" shoring (cribbing) blocks; various lengths

5. Personnel

Every ambulance must have a minimum of one CDW-ECS present in the patient's compartment at the time of transportation of the patient to a hospital.

6. Daily inspections

Being fully prepared implies that the ambulance and the equipment must be checked daily to ensure their proper working condition. The ambulance inspection involves checking the following:

- The fuel levels
- The oil levels

- The transmission fluid levels
- The engine cooling system and the fluid levels
- The batteries
- The brake fluid
- All the engine belts
- Wheels and tires, including the spare ones, if present. Check the inflation pressure and inspect for indications of unusual wear and tear.
- All the interior and the exterior lights
- Windshield wiper and fluid
- Horn
- Siren
- Air conditioners and heaters
- Ventilating system
- Make sure doors open, close, latch, and lock properly.
- Communication systems; vehicle and portable
- All windows and mirrors. Check for cleanliness and position.

Check all the medical equipment and the supplies daily. This check should include inspecting the following articles:

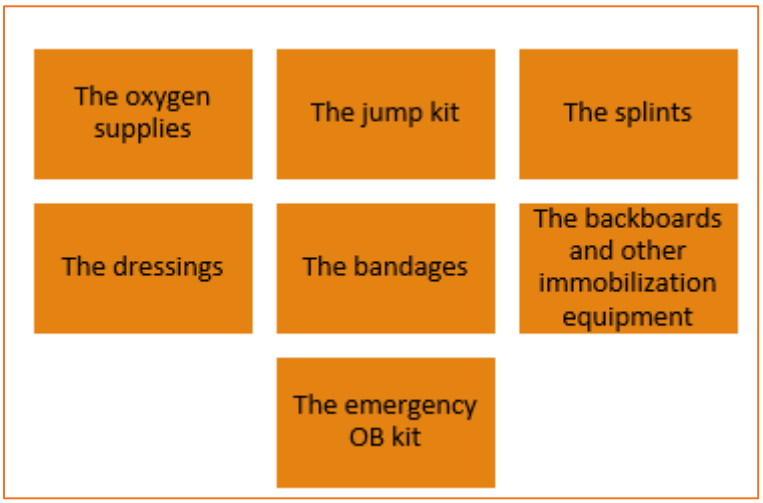

Fig.8.1.6: Objects for daily inspection

The equipment should be checked for functioning, quantity as well as cleanliness.

7. Safety Precautions

A final part of the preparation phase is reviewing safety precautions. These precautions, which include standard traffic safety rules and regulations, should be followed on every call. Check to make sure that safety devices, such as seat belts, are in good working order. Regardless of their location, movable oxygen tanks should always be properly secured with fixed clasps or housings. Never try to secure an oxygen tank to the stretcher or the bench; tanks may act as projectiles if the ambulance meets with an accident.

8.1.2.2 The Dispatch Phase

Dispatch must be easy to access and in service 24 hours a day. It may be operated by the local EMS or by a shared service that also covers law enforcement and the fire department. The dispatch centre might serve only one jurisdiction, such as a single city or town, or it might be an area or regional centre serving several communities or an entire county.

In either case, it should be staffed by trained personnel who are familiar with the agencies they are dispatching should gather and record the following minimum information:

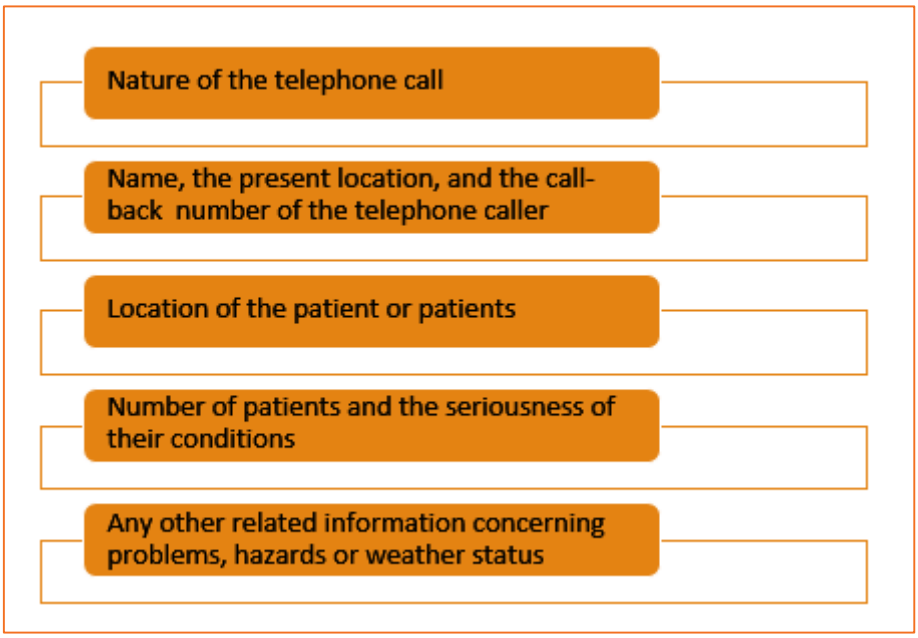

Fig.8.1.7: Information needed to be gathered

Many regions provide emergency medical dispatching, which gives guidance to the caller for patient care prior to the arrival of the ambulance.

8.1.2.3 En-Route to the Scene

Ensure the following while en route to a scene:

- Many collisions occur between automobiles and emergency vehicles when the latter are en route to a scene. You and your associate must fasten your seat belts and shoulder harnesses.
- You should inform the dispatch as soon as you depart towards the scene that your unit is responding and reinstate the type and location of the call.
- You should try to garner additional information about the location.
- The team should prepare for the treatment of the patient by reviewing the dispatch information.
- Discuss and delegate the initial duties and tasks related to the scene
- Select the equipment to be carried initially.

8.1.2.4 Arrival at the Scene

If you arrive first on a scene involving a mass-casualty incident, you should report your arrival as well give a scene description to the dispatch. Also inform about any unexpected situations and ask as per requirement for backup units, a heavy rescue unit, or a HazMat team. Refrain from entering the scene if there is any danger. If hazards are observed at the scene, the patient should be shifted to a safe place before care is begun.

Immediately size up the scene by using the following guidelines:

- Check for safety hazards.
- Assess the requirement for backup units or other help.
- Find out the mechanism of injury in case of trauma patients or the type of illness in medical patients.
- Assess the requirement for spine stabilization.
- Ensure to follow BSI precautions. The type of care that you will provide determines the personal protective equipment you will use.

If you arrive first at a scene involving a mass-casualty incident, quickly estimate the number of patients. Inform dispatch that backup units are needed at the scene. Mass-casualty incidents involve complex organization of personnel under the incident command system. In this system, individual CFW-ECS may be assigned roles; for example, to begin the triage process, assist in treating patients, and load patients for transportation to a hospital.

8.1.2.5 Safe Parking

While inspecting the scene, you must ensure safe parking of the ambulance. Park at a place from where the traffic can be efficiently controlled and there is no blockage in the movement of other emergency vehicles. Park about 100' ahead of the scene on the same side of the road. Park uphill of the scene if smoke or hazardous materials are noticed. If you must park on the backside of a hill or a curve, leave your warning lights switched on. Do the same when parking at night. Always leave space between your vehicle and the operations at the scene.

Stay away from any fires, explosive hazards, downed wires, or structures that might fall down. Apply the parking brake. If your vehicle is blocking any section of the roadway, leave the emergency warning lights on. Leave only the flashing yellow lights on if your vehicle has them. Other drivers tend to drive toward emergency vehicles with flashing red or red and white lights. Within these safety guidelines, you should try to park your ambulance as close to the scene as possible to facilitate emergency medical care. If necessary, you can temporarily block traffic to unload equipment and to load patients quickly and safely. If you must do this, try to do it quickly so that traffic is not blocked any longer than is absolutely necessary. Also, park in a location that will not hamper leaving the scene.

8.1.2.6 Traffic Control

After ensuring that you are safe, your first duty at a crash scene is to care for the patients. Traffic or flow of road takes place only when all the patients are treated and there is no emergency needed. If the police are slow to arrive at the scene, you might then need to take action.

The purpose of traffic control is to ensure an orderly traffic flow and to prevent another crash. Under ordinary circumstances, traffic control is difficult. A crash or disaster scene presents serous additional problems. Passing motorists often sow down paying little attention to the roadway in front of them. Some curiosity seekers may park down the road and return on foot, creating still other hazards.

As soon as possible, place appropriate warning devices, such as reflectors, on both sides of the crash. Remember, the main objectives in directing traffic are to warn other drivers, to prevent additional crashes, and to keep vehicles moving in an orderly fashion so that care of the injured is not interrupted.

8.1.2.7 The Transfer Phase

Many patients have said that one of the most frightening parts of being suddenly ill or injured is the ambulance ride to the hospital. Already anxious, a patient may be made more so by a fast, bumpy ride with a siren blaring. Sometimes, such a ride is truly lifesaving. However, in most cases, excessive speed is unnecessary and dangerous. What is necessary is that the patient be safely transported to an appropriate medical care facility in the shortest time possible. This takes common sense and defensive driving techniques. Speeding should be avoided. In almost every instance, you should give lifesaving treatment right where you find the patient, before shifting the person to the ambulance. You may then begin less critical measures, such as bandaging and splinting. Next, you must prepare the patient for transportation after using an equipment such as a backboard, a scoop stretcher, or a wheeled ambulance stretcher to secure him or her. Then move to the ambulance, and properly lift the patient into the patient compartment.

No matter how careful the driver may be, riding to the hospital while lying down on a stretcher can be uncomfortable and even dangerous. So, you should secure the patient properly using a minimum of three straps across the body.

8.1.2.8 The Transport Phase

You must inform the dispatch team about your departure from the scene. The information should include the number of patients being transported for medical care and the name of the hospital where they are being taken. Even though you have already assessed and treated the patient, you should continue to monitor the patient's condition en route. These ongoing assessments may uncover changes in the patient's vital signs and overall condition. Be sure to recheck the patient's vital signs en route. The frequency of checking vital signs depends on the situation, but checking them at 15 minutes interval for a stable patient and 5 minutes interval for an unstable patient is a practice that many services use.

In addition, it is important that you regularly re-examine the patient's clinical situation, and record and address new problems and the patient's responses to earlier treatment.

At this time, you should also contact the receiving hospital. Inform medical control about your patient(s) and the nature of the problem (s). Depending on the number of CFW-ECS on your team and how much care the patient needs, you might also want to begin working on your written report while en route.

Finally, and most importantly, do not abandon the patient emotionally. Do not become so involved in paperwork and ongoing assessments that you ignore the patient's fears. You are there to help the patient as a person, so use this time to reassure him or her. Some patients, such as very young or older people, may benefit from added attention during transport. Be aware of the differing levels of need of different patients.

8.1.2.9 The Delivery Phase

You should inform dispatch immediately after arriving at the hospital. Provide information about your arrival to the triage nurse or other concerned personnel. Then, transfer the patient from the stretcher to the allocated bed. Give a verbal report to the personnel who are taking over the patient's treatment. Also, give a full detailed report to the concerned hospital staff.

The written report must provide details of the history of the patient's current illness or injury along with related positives and negatives, mechanism of injury, and findings on your arrival. In addition, you should mention the vital signs and give brief information about the pertinent medical or surgical history. Information about medication and allergies should also be written. Also, be sure to report any treatment provided and its effect during the pre-hospital setting.

While at the hospital, you may be able to restock any items that were used during the run, such as oxygen masks or dressings and bandages. Remember, though, that your priority is transfer of the patient and patient information to the hospital staff. Restocking the ambulance comes second.

8.1.2.10 En-Route to the Station

On leaving the hospital for duty purpose, inform the dispatch where you are going. On coming back to the station, you should immediately do the following:

- Follow appropriate cleaning and disinfection procedure related to the ambulance and the used equipment.
- Restock the supplies that you did not receive at the hospital.

8.1.2.11 The Post-run phase

The post-run phase entails completing and filing other written reports, if required, and informing the dispatch of your status, your location, and availability.

You also have the responsibility of maintaining the ambulance. It should always be ready to attend to a call. This can only be ensured by routine inspections. You should have a checklist of the required repairs or replacements. You must also take the following steps after each trip:

- Wipe off blood, vomitus and similar material from the floor, sides, and roof of the ambulance with soap and water.
- Clean and decontaminate the inside of the ambulance, according to state and local regulations. (You can use a 10% solution of bleach in water to clean the ambulance after any contamination.)
- Discard the contaminated waste according to the prescribed procedure of your agency.
- Clean the ambulance from the outside as well.
- Replace or repair the damaged equipment as soon as you can.
- Replace any other equipment or supplies that were used.
- Check the fuel level.
- Inspect the oil level every time the ambulance is refuelled.

It is important that you know the meanings of the terms “cleaning”, “disinfection”, “high-level disinfection”, and “sterilization”, as follows:

- **Cleaning:** This involves removal of visible contaminants such as dirt, dust or blood from a surface
- **Disinfection:** This entails the destruction of pathogenic agents by using a chemical made for that specific purpose on a surface.
- **High-level disinfection:** This involves using potent means of disinfection to destroy pathogenic agents.
- **Sterilization:** This is a process that uses heat to remove microbial contamination.

Dispose any contaminated materials that are not disinfected by placing them in the appropriate containers used for biohazard disposal.

8.1.3 Law and Regulations

While on an emergency call, emergency vehicles typically are exempt from usual vehicle operations. While on an emergency call, when warning lights and siren are being used on the ambulance, you are permitted to do the following:

- Park the vehicle or stand at an otherwise illegal location
- Break the traffic rule and pass through a red traffic light or stop sign
- Exceed the posted speed limit
- Drive against the traffic on a one-way road, or make an illegal turn
- Travel towards the left of the centre of the road to make an otherwise illegal pass

Remember that these exemptions vary by state and local jurisdiction. Therefore, you should check your local statutes for regulation in your area.

Use of warning lights and siren

Three basic principles govern the use of warning lights and siren on an ambulance:

1. The unit must genuinely be attending to an emergency call.
2. Both the sound and light warning equipment should be used in conjunction.
3. The unit must be driven keeping in mind the safety of people present on the roadway.

8.1.4 Air Medical Operations

Air ambulances are utilized to evacuate both the medical and trauma patients. They land near the site, and shift the patients to trauma facilities. There are two main categories of air medical units: fixed-wing and rotary-wing or helicopters. Fixed-wing aircraft are utilized for patient transfers between hospitals and cover distances more than 100 to 150 miles. For shorter distances, ground transport or rotary-wing aircraft are more efficient.

Specially trained medical flight crews accompany all air ambulance flights. Your role in fixed-wing aircraft transfers probably will be limited to providing ground transport for the patient and medical flight crew between the hospital and the airport.

Rotary-wing aircraft have become an important tool in providing emergency medical care. Trauma patient survival is directly related to the time that elapses between injury and definitive treatment. Most helicopters that are used for emergency medical operations fly well in excess of 100 mph in a straight line, without road or traffic hazards. The crew may include CFW-ECS paramedics, flight nurses, or physicians.

You should be acquainted with the protocols and processes required to be done for availing helicopters in your region. Helicopter services provide training for CFW-ECS in ground operations and safety. The following discussion is an introduction to safe operations, and is not intended to be substituted for the more extensive courses available locally.

8.1.5 Helicopter Medical Evacuation Operations

A medical evacuation is typically called as a medivac, and is performed only by helicopters. The CFW-ECS should become familiar with the medivac capabilities, protocols, and procedures of their particular EMS service. The following are some general guidelines that the CFW-ECS should be familiar with when considering whether to initiate a medivac operation.

8.1.5.1 Calling for a Medical

Every agency has specific criteria for the type of patient who may receive medical evacuation, and how and when to call for a medivac. These basic guidelines will help you to understand the process better.

- Need for medivac: The time taken by ground ambulance to transport emergency patients to a hospital is too long. The road, traffic, or the environmental conditions might restrict or totally prohibit the utilization of a ground ambulance.
- Beneficiaries of a medivac: Medivac evacuations are mostly used for suspected spinal cord injury cases. Serious circumstances that may need the use of helicopter medivacs are seen in far off secluded areas and include scuba diving accidents, near-drowning incidents, or skiing and wilderness accidents. Other patients who require medivac evacuation are trauma patients or individuals needing to go to special treatment facilities such as a limb replantation centre, a burn centre, or a venomous bite centre.
- The contact personnel: Generally, your dispatcher must be notified first. In some regions, after the medivac has been initiated, the ground EMS crew may be able to access the flight crew on a specially designated radio frequency for one-on-one communications. The CFW-ECS may be asked to give a brief presentation or update on the patient's condition. In this case, you should gather your thoughts and speak clearly and concisely, avoiding information that is not immediately pertinent. Another important topic of communication between the ground and flight EMS crews will be where to land the helicopter.

8.1.5.2 Establishing a Landing Zone

The most important part of conducting a medivac is choosing the best location. Establishing a landing zone is, more than simply looking for a clear space and is the responsibility of the ground EMS crew. Therefore, the CFW-ECS must be prepared to perform certain measures to make certain that the flight crew is able to land and take off safely. Considerations that must be made when selecting and establishing a landing zone include:

- The landing area should be hard or grassy. It should be a level surface with recommended measurements of 100' x 100' and no less than 60' x 60' (Figure 35-30). If the site is not level, the flight crew must be notified of the steepness and direction of the slope.
- The area must be cleared of any loose debris that could become airborne and strike either the helicopter or the patient and crew. This includes branches, trash bins, flares, accident tape, and medical equipment and supplies.
- The CFW-ECS must survey the immediate area for any overhead or hazards at a height such as power lines or telephone cables, antennas and tall or leaning trees. The presence of these should be immediately informed to the flight crew; an alternate landing place might be needed. The flight crew might want the hazard to be immediately marked or illuminated so that it stands out. Weighted cones could be used for this purpose or an emergency vehicle with its lights switched on could be positioned next to or below the potential hazard.
- Never use accident tape or people to mark the site. The use of flares is also not recommended, because not only can they become airborne, but they have the potential to start a fire or cause an explosion.

- Always move the nonessential persons and vehicles to a safe distance outside of the landing zone.
- If wind is strong, radio the direction of the wind to the flight crew. They may request that you improvise some form of wind directional device to aid their approach. A bed sheet tightly secured to a tree or pole may be used to help the crew determine wind direction and strength. Never use tape.

8.1.5.3 Landing Zone Safety and Patient Transfer

Helicopter safety entails good sense and awareness of safety measures. You should venture near the helicopter only according to the directions of the crewmembers. You have to stay away from the aircraft when the helicopter blades are still spinning. Most of the time, the rotor blades will remain running because the flight crew does not generally expect to remain on ground for a long time. This means that everyone should remain away from the landing zone perimeter unless otherwise directed by the pilot or one of the flight crew. Usually, the flight crew will come to the COVID Frontline Worker (Emergency Care Support) carrying their own equipment and not require any assistance inside the landing zone. If you are instructed to access the landing zone, avoid the tail rotor; its blades seem to be invisible due to fast speed. Always go around the front of the aircraft so that you are visible to the pilot

When you approach the aircraft be careful of the main rotor blade. Bend low when going near them and safeguard the equipment as well. Practice extreme caution and follow the directions of the crew members.

Keep the following guidelines in mind when operating at a landing zone:

- Become acquainted with the helicopter hand signals practices within your jurisdiction.
- Do not go near the helicopter unless otherwise instructed and guided by the flight crew.
- Ensure that the patient care equipment is secured to the stretcher and that the patient is properly fastened as well. The equipment to be secured includes the oxygen tanks, the cervical collars, and the head immobilizers. Any other articles such as the patient's or the crew's hats, coats or bags might need to be taken to the hospital by ground.
- Be mindful that some helicopters may load patients from the side, while other have rear-loading doors. Regardless, of where the patient is being loaded, always approach the aircraft from the front unless otherwise instructed by the flight crew. Always take the same path when exiting away from the helicopter, moving the patient headfirst.
- Smoking, open lights or flames, and flares are prohibited within 50' of the aircraft at all times.

8.1.5.4 Special Considerations for Night Landings

Night time operations are considerably more hazardous than daytime operations because of the darkness. The pilot may fly over the area with the helicopter's lights on to spot obstacles and the shadows of overhead wires, which can be hard to see. Never use spotlights, flashlights, or any lights to guide the pilot: because they can restrict the pilot from what he can see. You can use low intensity headlight lights or any light to form an X at the centre of the landing zone.

Switch off the headlights or lanterns that are facing the aircraft after it has landed. Always ensure that the flight crew is aware of the overhead hazards or obstructions, and illuminate these as much as you can.

8.1.5.5 Landing on Uneven Ground

If the helicopter must land on an uneven surface, extra caution is advised. The primary rotor blade should be closer to the ground towards the uphill side. In this situation, approach the aircraft from the downhill corner only or as instructed by the flight crew. Do not start the shifting process of the patient to the helicopter until the crew indicates that they are prepared to receive you.

8.1.5.6 Medivacs at Hazardous Materials Incidents

The flight crew should be promptly informed about the hazardous materials (HazMat) present at the scene. The aircraft generates tremendous wind and may easily spread any HazMat vapours present. Always take the advice of the flight crew and the incident commander about the best approach and inform the medivac about the distance from the scene. The landing zone should be fixed upwind and uphill from the HazMat scene. Patients who have been exposed to a HazMat must be appropriately decontaminated before being loaded into the aircraft.

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Sector
Skill Council

9. Lifting and Moving Patients

Unit 9.1 - Lifting and Moving Patients

HSS/N2322

Key Learning Outcomes

At the end of this module, you will be able to:

- Define lifting and moving Patients
- Identify the moving and positioning the patients
- Identify the body mechanics
- Analyse the weight and distribution
- Elaborate directions and commands
- Define the principles of safe reaching and pulling
- Identify the general considerations

UNIT 9.1: Lifting and Moving Patients

Unit Objectives

At the end of this unit, you will be able to:

2. Define lifting and moving Patients
3. Identify the moving and positioning the patients
4. Identify the body mechanics
5. Analyse the weight and distribution
6. Elaborate directions and commands
7. Define the principles of safe reaching and pulling
8. Identify the general considerations

9.1.1 Lifting and Moving Patients

In the course of a call, you will have to move a patient several times to provide emergency medical care in the field and transport the patient to the emergency department. While transporting patients, you must exercise extreme care. Remember the patient is unwell. You must keep the comfort of the patient foremost in your mind and adopt the correct procedure while transportation.

Most of the case you need to move the patient often, in which you will be changing the position and location of the patient. These moments are done after assessment to provide care and the team will move the patient into the cot. Patient need to be shifted into the ambulance to take him/her to the hospital. Again on the arrival to the hospital patient is shifted in to the special ward. To be able to move a patient safely and properly in the various situations that you will encounter in the field, you will have to learn how to perform emergency body drags and lifts. You will need to know the special techniques for moving the patients.

9.1.2 Moving and Positioning the Patient

Every time you have to move a patient, you must take special care that neither you nor your team, nor the patient is injured. Patient packaging and handling are technical skills that you will learn and perfect through practice and training.

Practice the various techniques with your team frequently so that when a patient has to be moved, you can do the task promptly, securely, and efficiently. After each patient transfer, you and your team should evaluate the appropriateness of the technique that you used, as well as your technical skill in completing the transfer. You must also be sure to maintain your equipment according to the manufacturer's instructions.

Certain medical conditions, such as a head injury, a shock, a spinal injury, and pregnancy, require specialized lifting and shifting techniques. Patients having chest pain or difficulty in breathing should sit in a comfortable position, taking care they are not hypotensive. Patients with

spinal injuries needs to be placed in a supine position on a long backboard and immobilized. Patients exhibiting shock should be transported in a Trendelenburg position. They are placed in a supine posture with their legs elevated to 6" to 12". Pregnant, hypotensive patients should be placed and transported on their left sides. Place an unresponsive patient showing no spinal injury in the recovery posture. The patient is rolled onto his or her side keeping the body straight. Transport a vomiting or nauseous patient in a position of comfort without hampering the airway.

Fig.9.1.1: Moving a patient using stretcher

9.1.3 Body Mechanics

Patient Care requires the COVID Frontline Worker (Emergency Care Support) to bend their backs, flex their arms and legs and strain their body while handling the patients. COVID Frontline Worker (Emergency Care Support) are, hence, at a risk of straining themselves physically and developing spinal injuries. They can prevent these problems from occurring by practicing body movements known as body mechanics. This is a term used for the efforts made by our body in coordination with the muscl es, bones and nervous system.

Rules

The rules that should be followed when transferring/moving patients:

- The base of your back should always be kept in its normal position.
- Move as near to the patient's bed as possible.
- Do not twist your body.
- Set the feet to provide a comfortable and firm wide support when lifting.
- The abdominal muscles should be contracted.
- Keep your head upright and shoulders straight.
- Push up from the knees.

Importance

Body mechanics are important as they protect the COVID Frontline Worker (Emergency Care Support) from the following:

- Musculoskeletal strain
- Injuries to self
- Injury to patients
- Tiredness

The various principles for body mechanics are:

Steady Centre of Gravity

- Keep a steady centre of gravity to ensure even distribution of weight.
- The centre of gravity should be low.
- Greater balance is met with a low centre of gravity.
- Flex your knees and keep your body straight rather than bending.

Wide Base of Support

- Maintain a broad base of support
- Having a broad base of support provides the body with more stability.
- Spread your feet apart to a reasonable distance.
- Flex your knees so that the center of gravity is near the base.

Proper Body Alignment

- Body alignment is the manner of arrangement of the joints, tendons, ligaments and muscles when a position is being initiated.
- The gravity line passing through the base of your support helps to maintain your balance.
- Balance in upper and lower body parts would reduce risks of having back injury.
- When you're stronger muscle (groups) are involved, greater amount of work can be safely done.
- Keep the back upright.

The power lift position is used to lift patients or cots:

- Be on a squat position facing the subject.
- Hold the subject and tighten your centre of gravity.
- Use your dominant leg muscles when lifting.
- Hold the subject at waist height and close to the centre of gravity.
- Keep your back erect.
- Stay close to the subject.
- Keep your arms approximately the same distance apart.

Fig.9.1.2: Taking the patient on a cot

Reverse these steps whenever you are lowering the cost. You must remember to refrain from bending at the waist or twisting your body as you stand.

Whenever you are lifting a patient, you should employ the power grip to get maximum force. The arms and the hands get maximal lifting strength with the palm facing upwards. Whenever you hold a cot or a backboard, your hands should be kept a minimum of 10" apart. Each hand should be placed below the handle with the palm facing upwards and the thumb also extending upwards. Advance the hand till the thumb stops further insertion and the cylindrical handle lies firmly in the crease of the curved palm. Curl your fingers and thumb tightly over the top of the handle. Make sure all your fingers in the same angle. To have the proper power grip, make sure that the underside of the handle is fully supported on your curved palm with only the fingers and thumb preventing it from being pulled sideways or upward out of the palm.

If you must lift the object higher once you have lifted by extending your legs, you will be able to "curl" the object higher by using your biceps to flex the arms while maintaining the power grip and weight supported in the palm.

When lifting a patient placed in a sheet or a blanket, you should ensure that the patient is in the centre of the sheet and the extra cloth is rolled on both the sides. This forms a cylindrical handle that facilitates a firm and secure way to hold the fabric.

When lifting a patient directly, you must hold the patient firmly to ensure that you do not lose your grip on the patient.

9.1.4 Weight and Distribution

Whenever possible, you should utilize an equipment that can be rolled to shift a patient. However, if a wheeled equipment is not there for transit, you need to comprehend and follow some guidelines for transporting a patient on a cot.

Guidelines for Carrying a Patient on a Cot

- You must ensure that you are aware of or can deduce the weight to be lifted and the limitations of the team's abilities.
- You should always coordinate your body movements with the movements of the others performing the lifting task and regularly communicate with them.
- You should refrain from twisting your body.
- You have to try to keep the weight being carried as near to your body as possible. The back should be locked in position.
- You should flex at the hips and not at the waist. You must bend at the knees, while making sure that you do not overextend your back by bending back from your waist.

Fig.9.1.3: Moving patient using backboard or cot

If you lifting a patient using backboard or cot needs four rescuers to diamond carry, before with one CFW-ECS at the head end of the device, one at the foot end, and one at each side of the patient's torso.

Follow these steps to perform the diamond carry:

- **STEP 1:** To best balance the weight, the COVID Frontline Worker (Emergency Care Support) at each side should be located so that they are able to grasp the board or stretcher with one hand adjacent to the distal edge of the patient's pelvis and the other midthorax. All four lift the device while facing in toward the patient.
- **STEP 2:** Once the device has been lifted, the COVID Frontline Worker (Emergency Care Support) at the foot end turns around to face Forward.
- **STEP 3:** The COVID Frontline Worker (Emergency Care Support) at each side should grasp the backboard or cot with the head-end hand

- **STEP 4:** The CFW-ECS at the sides turn towards the patient's feet. All four CFW-ECS should be facing towards the same direction and should walk forward while carrying the patient.

When a patient placed on a backboard or a stretcher is being carried, the feet should be facing the direction of the movement to place the least weight on the CFW-ECS at the feet end. This person to be able to walk forward, has to turn and grip the handles with his or her back to the device. Carrying the patient feet first will also allow the patient to see in the direction of movement.

It is important that you and your team use the correct lifting techniques to lift the cot. You must also make sure that your team members are of the same approximate height and strength.

Fig.9.1.4: Performing a diamond carry

One method of lifting and carrying a patient on a backboard is the one-handed carrying technique. In this method, four or more CFW-ECS carry the backboard using only one hand each. Thus, they are able to look forward while walking.

Ensure that while picking and carrying the backboard your back is in the locked-in position. If you require to bend to counter a weight imbalance, you might have exceeded your weight limitation. If this occurs, you may need to add helpers or re-evaluate the carry, or you might injure yourselves or drop the patient.

When you have to go up and down a staircase or other inclined surface while carrying a patient, use a stair chair if possible. When you must use a backboard or stretcher, be sure that the patient is anatomically secured to the device in such a way that he or she cannot slide significantly when the stretcher is at an angle. Tighten a strap that passes across the upper torso and under each armpit, but not above the arms, to hold the patient in place while leaving the arms free. When you carry the patient down stairs or an incline, make sure the backboard or stretcher is carried with the foot end first so that the head end is raised higher than the foot end. When you carry a patient upstairs or an incline, the elevated head end of the backboard or stretcher should go first.

Fig.9.1.5: Position of CFW-ECS while moving patient

Fig.9.1.6: Safety while moving patient

It is helpful to put taller rescuers at the foot of the cot when moving a patient up and down steps. This minimizes bending while lifting and moving the patient.

A wheeled ambulance stretcher or cot is specially designed for patient care. It can be rolled conveniently along the ground. Because its weight must be added to that of the patient, it is generally not taken up or down stairs or to other locations where the patient must be carried. When the patient is upstairs, you should bring the wheeled ambulance stretcher to the ground floor landing and prepare it for the patient. You should then take either a wheeled stair chair or a backboard upstairs. Both of these devices are considerably lighter than a wheeled cot and may be used to carry the patient down to the waiting cot. If a patient is able to sit, utilize the wheeled stair chair to transfer him or her to the cot. Once the cot has been reached, transfer the patient from the stair chair onto the cot.

9.1.5 Directions and Commands

To safely lift and carry a patient, you and your team must anticipate and understand every move, and each move must be executed in a coordinated manner. It is the team leader's duty to decide the location of each team member and then explain the sequence of steps to be carried out. This process ensures that the team becomes aware of what exactly they have to do before initiating the task. If patient is subjected to separate stages, the team leader should give abbreviated overview of the stages, followed by a more detailed explanation of each stage just before it will occur.

9.1.6 Principles of Safe Reaching and Pulling

When you utilize a body drag to shift a patient, your back should be locked and straight, not curved or bent laterally. You should refrain from twisting your body so as to keep the vertebrae in normal alignment. When you are reaching overhead, avoid hyperextending your back. When you are pulling a patient lying on the ground, you should kneel so that you do not have to lean much. To maintain your reach within the approved distance, bend forward and hold the patient such that your elbows lie just beyond the head of the patient.

Fig.9.1.7: Pulling a patient

When you are pulling a patient who is at a different height from you, bend your knees until your hips are just below the height of the plane across which you will be pulling the patient. During pulling, you should extend your arms no more than about 15" to 20" in front of your torso. Balance your feet (or knees, if kneeling) so that while pulling, the force will be felt equally between both the arms and the line of pull will be centred between them. Flex your arms slowly to start pulling the patient. When you are unable to pull any farther because your hands have reached the front portion of your torso, halt and then step back about 15" to 20". Then, position yourself properly and repeat the steps.

If you have to drag a patient across a bed, you should kneel on the bed to avoid reaching beyond the recommended distance. Then follow the steps described until the patient is within 15" to 20" of the bed's edge (see Figure 6-10). Dragging can be done when standing at the side of the bed. Use the sheet or blanket which is under the patient for this purpose.

Unless the patient is on a backboard, transfer a patient from the cot to a bed in the emergency department or the patient's hospital room with a body drag. With the cot at the same height as the bed and held firmly against its side, you and another CFW-ECS should kneel on the hospital bed and, in the manner previously described, drag the patient in increments until he or she is properly cantered on the bed. When transferring the patient onto a narrow examining table, rather than kneeling on the table, you can usually drag the patient while standing against the opposite side. A third person may need to take both sides of the head to move the patient safely.

Sometimes, while performing a body drag, you along with your colleague might need to pull a patient with you on one side of the patient and your colleague on the other. You must kneel beyond the shoulder of the patient and face towards his or her groin. By extending one arm across and in front of your chest, you can grasp the armpit and, with the other arm extended in front and to the side of the torso, the patient's belt. Then, by raising your elbows and flexing your arms, you can pull the patient with the line of force at the maximum angle possible.

In log rolling in a patient by their side, you have to reach 18 inch. When you bend forward, keep a straight back and lean just from the hips. Use the muscles of your shoulder to help with the roll.

Fig.9.1.8: Pulling a patient on stretcher

When you are rolling the wheeled ambulance stretcher, ensure that it is raised. The stretcher should be from the head end. If you are guiding the cot from the foot end, make sure your arms are held close to your body, and be careful to avoid reaching significantly behind you or hyperextending your back. Your back should be locked, straight, and untwisted. While you are walking and guiding the stretcher, bend slightly forward at the hips. You should try to keep the line of the pull through the centre of your body by bending your knees.

A second CFW-ECS should guide the head end and assist you by pushing with his or her arms held with the elbows bent so that the hands are about 12" to 15" in front of the torso. You must be sure that you push from the area of your body that is between the waist and shoulder. If the load you have to push is at a level below your waist, take a kneeling position. Be careful that you do not push or pull from an overhead position.

9.1.7 General Considerations

Moving a patient should normally be done in an orderly, planned and unhurried fashion. This approach will protect both you and the patient from further injury and eliminate the risk which can affect the patient health or condition when moving. te risk of worsening the patient's condition when he or she is moved. At a minimum, on most calls you will have to lift and carry the patient to the wheeled ambulance stretcher, move the stretcher and patient to the ambulance, and load the stretcher into the patient compartment.

You will often have to include several additional steps to place the patient onto a backboard and/or carry him or her down a flight of stairs. You should do proper planning and choose the techniques that will entail minimum lifting and carrying. Remember to always consider whether there is an options that will cause less strain to you and the other CFW-ECS.

9.1.7.1 Emergency Moves

You might have to use an emergency move to quickly shift a patient even prior to performing initial assessment. This will be required if some potential danger exists and moving to a secure place is imperative to avoid serious harm or even death. Existence of fire, explosives and hazardous substances are all situations which demand an emergency move.

Fig.9.1.9 (a): Pulling a patient in emergency

Fig.9.1.9 (b): Pulling a patient in emergency

Fig.9.1.9©: Pulling a patient in emergency

Fig.9.1.9 (d): Pulling a patient in emerge

You should also use an emergency move if you are unable to properly assess the injury of the patient or give prompt emergency treatment due to the location or position of the patient

If you are alone and danger at the scene makes it necessary for you to use an emergency move, regardless of a patient's injuries, you should use a drag to pull the patient along the long axis of the body. This will help to keep the spinal column in line as much as possible. When performing an emergency move, one of your primary concerns is the danger of aggravating an existing spinal injury.

9.1.7.2 Urgent Moves

An urgent move may be necessary for moving a patient with an altered level of consciousness, inadequate ventilation, or shock (hypoperfusion). An extreme weather condition may also make an urgent move necessary. In some cases, patients must be urgently moved from the location or position in which they are found. If there is a situation in which a patient who is lying in a car and has to be urgently moved, you should utilize the rapid extrication technique.

Tips

- Mobility of patient is done through:
  - Ambulance
  - Stretcher
  - Wheelchair
  - Stretcher to the Bed
  - Bed to Stretchers
- Acquire all the important information regarding the patient's condition before transferring them.
- Be sensitive to the movements of the painful areas of patient while transferring.
- Do not hold and lift patients by their armpits while lifting them from a wheelchair.
- Avoid undue restrain on your back while using the transfer equipment.
- Hold the patient closely to your body and do not let the patient slip or roll away.

Exercise

1. One of the three situations that may require the use of an emergency move is:
   a. Extrication in rain or snow
   b. Needing to return to service quickly.
   c. The need to reach other seriously injured patients
   d. Your patient's being in pain

2. When using the power lift technique, your feet should be apart.
   a. A comfortable width
   b. Shoulder-width
   c. 12 inches
   d. 24 inches

3. The primary difference between an emergency move and urgent move is that an urgent move is:
   a. Performed much quicker than an emergency move
   b. Always accomplished without equipment.
   c. Is performed with precautions for spinal injury
   d. Uses a short backboard or vest to remove the patient from a vehicle

4. The proper use of your body to facilitate lifting and moving is called:
   a. Body stature.
   b. Body stability.
   c. Body mechanics
   d. Body motion.

Skills Practical: Role Play

Transporting Patient

1. In groups of four prepare a role play around transporting the patient using a wheelchair and stretcher.

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10. Patient Assessment

Unit 10.1- Patient Assessment (Documentation)

HSS/N2304

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe kinetics of trauma
2. Identify bleeding and shock trauma
3. Define soft tissue injuries and burn
4. Define musculoskeletal care

UNIT 10.1: Patient Assessment (Documentation)

Unit Objectives

At the end of this unit, you will be able to:

1. Analyse minimum data set

10.1.1 Minimum Data Set

- The information related to the patient collected at the time of your first communication with patient at scene, during interventions, and on reaching the facility:
  - Chief complaint
  - Level of consciousness (AVPU)—mental status
  - Systolic blood pressure for patients older than 3 years
  - Skin perfusion (capillary refill) for patients younger than 6 years
  - Skin colour and temperature
  - Pulse rate
  - Respiratory rate and effort
- Administrative information on Time incident reported to Time unit notified
  - Time of arrival at patient
  - Time unit left scene
  - Time of arrival at destination
  - Time of transfer of care
  - Accurate and synchronous clocks

10.1.1.1 PreHospital Care Report

Functions of the prehospital care report:

- Ensuring continuity of care
- A form that might be referred to later for important information
- A legal document
- A good care report has record of the emergency medical care that was given and the condition of the patient on arrival at the scene as well as any changes in the condition on reaching the medical facility
- The person who filled the form must generally go to the court with it
- Information should be clear and include both objective and subjective matter
- Educational:
  - Used as a sample to demonstrate how documentation should be done and how to handle rare cases

- Administrative:
  - Billing
  - Service statistics
  - Research

10.1.1.2 Traditional Format

- Traditional written form with check boxes and a section for narrative
- Sections
- Run data
  - Date, times, service, unit, names of crew
- Sections
- Patient data
- Patient name
- Address
- Date of birth
- Insurance information
- Sex
- Age
- Nature of call
- Mechanism of injury
- Location of the patient
- Treatment administered prior to arrival
- Signs and symptoms observed
- Care administered
- Baseline vital signs noted
- SAMPLE history collected
- Changes in status of the patient

Narrative section (if applicable)

- Describe, taking care to :
  - Include relevant negatives
  - Record essential observations related to the scene such as a suicide note or a weapon
  - Stay away from radio codes
  - Use only standard abbreviations
  - While documenting sensitive information, note down the source of that particular information (e.g., Infectious diseases)
  - Spell words correctly, especially the medical words
  - For every reassessment, record the time and the findings

10.1.1.3 Patient Care Reports

Confidentiality

- The form itself and the information on the form are considered confidential

Distribution

- Local and state protocol and procedures will determine where the different copies of the form should be distributed

10.1.1.4 Documentation of Patient Care

- When an error or omission happens, you should not try to hide it
- Instead, document what you did or did not do and what corrective measures were taken
- Providing false information on the prehospital care report may get your CFS-ECS certification/ license to be revoked or lead to your suspension
- Poor patient care may occur due to other health care providers getting a false idea about the assessment findings or initial treatment given
- Specific areas of difficulty:
  - Vital signs—document only those vital signs that were really observed
  - Treatment—if a treatment like oxygen supply was omitted, do not record that the patient was administered oxygen

10.1.1.5 Correction of Documentation

- Errors made while the report form is being filled:
  - Draw a single horizontal line across the error, sign it, and then write the correct information alongside it
  - Do not attempt to erase the error—this may be interpreted as a cover up for a mistake
- Errors detected after the report form is submitted:
  - Draw a single line across the error with a different ink, if possible. Sign it and write the date. Add a note providing the right information
  - If information was missing, add a note with the right information, put down the date, and then sign it

10.1.1.6Documentation of Refusal

- Try to urge the patient to visit a hospital
- Ensure that the patient is capable of making a logical, informed decision
- Apprise the patient about why going to a hospital is important and the consequences of not going there
- Consult medical personnel

10.1.1.7. Documentation of Refusal

- Record the assessment findings and the emergency medical care provided. Then, make the patient sign the refusal form
- Get a member of the patient' family, a police officer, or a bystander to sign the refus al form as a witness
- In case the patient declines to sign the refusal form, get a family member, a police officer, or a bystander to sign the form. This would verify that the patient declined to sign the refusal form
- Complete the prehospital care report
- Complete patient assessment
- Care CFW-ECS wished to provide for the patient
- Provide the statement that you informed the patient the harmful results of failing to take treatment, including possible death
- Suggest other methods of getting treatment
- State your willingness to come back

10.1.1.8. Special Situations

- When multiple-casualty incidents occur
- When sufficient time is not there to complete the form before the next call, you will require to complete the report later on
- The local MCI plan must possess a temporary method to record vital medical information (e.g., triage tag) which can be used to fill the form later.
- Form filling in MCI is not same as that of a typical call.
- There should be certain instruction and guide on local plan
- It is utilized to record events that must be reported to the local authorities or to supplement the primary report
- On time submission is required.
- Should be accurate and objective
- There should always be a copy of your own records
- Report can be sent to any authority based on the local protocol
- Examples of incidents requiring special reports:
    - Exposure
    - Injury
    - Equipment failure
    - Ambulance crash

10.1.1.9. Continuous Quality Improvement

- Information collected from the prehospital care report can be used to analyse various aspects of the EMS system
- This content can then be used to improve different components of the system and prevent occurrence of problems.

Exercise

1. The functions of the pre-hospital care report include:
   a. Providing information to the media regarding the call.
   b. Being a source of statistics for analysis and research.
   c. Documentation of the CFW-ECS opinions about the patient and the situation.
   d. Verification of the patient's HIV status.

2. An example of a situation that might require a special report is:
   a. Child or elder abuse.
   b. Injuries on public property.
   c. Industrial accidents.
   d. Alcohol intoxication.

3. If you make an error while writing a pre-hospital care report, you should:
   a. Completely obliterate the error, initial it, and write in the correct information.
   b. Draw a single horizontal line through the error, date and initial it, and write the correct information.
   c. Destroy the report and start a new one.
   d. Use a commercial "white-out" product on the error, and write the correct information over it.

4. If a patient refuses transport to the hospital, you should:
   a. Document actions you have taken to persuade the patient to go to the hospital.
   b. Inform the patient of potential results of refusing care.
   c. Still perform an assessment if possible.
   d. All of the above

5. The description in the traditional format should include:
   a. Relevant negatives
   b. Essential observations related to the scene such as a suicide note or a weapon
   c. Radio codes
   d. Standard abbreviations

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