Introduction to Emergency Medicine
ED VISITS IN THE US

- Number of visits: 136.3 million
- Number of injury-related visits: 40.2 million
- Number of visits per 100 persons: 44.5
- Percent of visits with patient seen in fewer than 15 minutes: 27.0%
- Percent of visits resulting in hospital admission: 11.9%
- Percent of visits resulting in transfer to a different (psychiatric or other) hospital: 2.1%
## Characteristics of the population

<table>
<thead>
<tr>
<th>Age group</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 1 year</td>
<td>2.6</td>
</tr>
<tr>
<td>1-4 years</td>
<td>7.2</td>
</tr>
<tr>
<td>5-14 years</td>
<td>8.5</td>
</tr>
<tr>
<td>15-24 years</td>
<td>16.3</td>
</tr>
<tr>
<td>24-44 years</td>
<td>28.7</td>
</tr>
<tr>
<td>44-64 years</td>
<td>21.9</td>
</tr>
<tr>
<td>65 and over</td>
<td>14.9</td>
</tr>
</tbody>
</table>
### Characteristics of the population

<table>
<thead>
<tr>
<th>Female%</th>
<th>Male%</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.7</td>
<td>45.3</td>
</tr>
</tbody>
</table>
# Time spent in the ER

<table>
<thead>
<tr>
<th>Time</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 hour</td>
<td>11.9</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>24.3</td>
</tr>
<tr>
<td>2-4 hours</td>
<td>34.9</td>
</tr>
<tr>
<td>6 or more</td>
<td>28.9</td>
</tr>
</tbody>
</table>
## Most common causes of visits in the ER

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain/disconfort</td>
<td>8.1</td>
</tr>
<tr>
<td>Chest pain</td>
<td>5.2</td>
</tr>
<tr>
<td>Fever</td>
<td>3.7</td>
</tr>
<tr>
<td>Headache</td>
<td>3.2</td>
</tr>
<tr>
<td>Cough</td>
<td>3.0</td>
</tr>
<tr>
<td>Back pain</td>
<td>2.8</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>2.7</td>
</tr>
<tr>
<td>Pain non specific</td>
<td>2.2</td>
</tr>
<tr>
<td>Throat related symptoms</td>
<td>1.9</td>
</tr>
<tr>
<td>Vomits</td>
<td>1.8</td>
</tr>
</tbody>
</table>

OTHER REASONS ACCOUNT TO 65.4%
Primary diagnosis at the ER department

<table>
<thead>
<tr>
<th>Primary diagnosis</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious disease</td>
<td>2.9</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>0.2</td>
</tr>
<tr>
<td>Endocrine, nutritional, metabolic diseases, and immunity disorders</td>
<td>1.5</td>
</tr>
<tr>
<td>Mental disorder</td>
<td>3.9</td>
</tr>
<tr>
<td>Disease of the nervous system or sensory organ</td>
<td>4.7</td>
</tr>
<tr>
<td>Disease of the circulatory system</td>
<td>3.2</td>
</tr>
<tr>
<td>Diseases of the respiratory system</td>
<td>9.9</td>
</tr>
<tr>
<td>Disease of the digestive system</td>
<td>5.6</td>
</tr>
<tr>
<td>Diseases of the genitourinary system</td>
<td>5.3</td>
</tr>
<tr>
<td>Disease of the skin and subcutaneous tissue</td>
<td>3.9</td>
</tr>
<tr>
<td>Diseases of the musculoskeletal system and connective tissue</td>
<td>6.8</td>
</tr>
</tbody>
</table>
Primary diagnosis at the ER department

<table>
<thead>
<tr>
<th>Primary diagnosis</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms, signs and ill defined conditions</td>
<td>22.6</td>
</tr>
<tr>
<td>Injury and poisoning</td>
<td>22.5</td>
</tr>
<tr>
<td>- Fractures</td>
<td>3.0</td>
</tr>
<tr>
<td>- Sprains and strains</td>
<td>4.6</td>
</tr>
<tr>
<td>- Intracranial injury</td>
<td>0.4</td>
</tr>
<tr>
<td>- Open wounds</td>
<td>4.7</td>
</tr>
<tr>
<td>- Superficial injury</td>
<td>1.2</td>
</tr>
<tr>
<td>- Contusion with intact skin</td>
<td>3.4</td>
</tr>
<tr>
<td>- Foreign bodies</td>
<td>0.4</td>
</tr>
<tr>
<td>- Burns</td>
<td>0.4</td>
</tr>
<tr>
<td>- Trauma complications and unspecified injuries</td>
<td>1.4</td>
</tr>
<tr>
<td>- Poisoning</td>
<td>0.7</td>
</tr>
<tr>
<td>- Surgical or medical complication</td>
<td>0.4</td>
</tr>
</tbody>
</table>
ED MAJOR PROBLEMS
CHEST PAIN

- Chest wall conditions
- Lung conditions
- Gallbladder problems
- Pancreas problems
- Gastroesophageal disorders

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MYOCARDIAL INFARCTION

• “Heart Attack”
• Impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation
• Obstruction due to:
  1) Thrombus
  2) Plaque rupture
  3) Vessel spasm
Symptoms

• Acute central chest pain not responding to nitrates
• Pain radiating to neck/left arm
• Associated with nausea/sweating/breathlessness/palpitations/collapse
• Silent MI (diabetics & elderly)

What can be done?

• Give semi-sitting position
• Reassure, immobilize
• Call Ambulance
• Angina medications – nitrates (sublingual tablets/sprays)
• Aspirin, chewable
• Monitor pulse & breathing
• CPR if necessary
UNRESPONSIVE??
SHOUT FOR HELP
OPEN AIRWAY BY  
HEAD TILT/CHIN LIFT
LOOK, LISTEN, FEEL  
IF BREATHING
FOR BREATHING  
IF NOT BREATHING
CALL FOR ASSISTANCE
30 CHEST COMPRESSIONS (AT RATE OF 100/MIN)
2 RESCUE BREATHS  
30 COMPRESSIONS
STROKE

- Rapidly developed clinical signs of focal disturbance of cerebral function lasting more than 24 hrs or leading to death, with no apparent cause other than vascular origin
- Recovery within 24 hrs – TIA, no residual deficit
- Causes – Thrombus/Embolus/Hemorrhage
Symptoms
• Sudden weakness of one side of the body (sign of paralysis)
• Difficulty in speaking/drooping mouth
• Dribbling of saliva from one side of mouth
• Blurred vision/partial loss of sight/flashlight lights
• Confusion and disorientation
• Sometimes loss of consciousness

What to do?
• If unconscious then place the person in recovery position
• If conscious, make him lie down with head and shoulders raised
• Monitor
• Reassure
• Call Ambulance
• Resuscitate if necessary
DSR ABCD

check for D danger
check S end for help
check R response
check A airways
check for B reathing
give C PR
apply a D defibrillator
Check for Danger (Hazards/Risks/Safety?)
  - to you
  - to others
  - to casualty

For example; electrical wires, gases, aggressive relatives, water, etc.

Remove yourself and the casualty to an area of safety
Response

Check the casualty for a response.

Use the COWS Method
- Can you hear me?
- Open your eyes
- What is your name?
- Squeeze my hand
  Gently squeeze shoulders
  (i.e. the trapezoid muscle)

If casualty is unresponsive call for help.
Check the airway is open and clear of obstructions.

Use a head tilt, chin lift to open the airway.

Use a jaw thrust for patients with suspected spinal cord, head, neck and facial trauma. (usually done on patient’s with a GCS < 8. Not recommended for unexperienced people).
In an unconscious patient, the tongue is the most common cause of obstruction.

Also check the airway for blood, vomit & any other foreign materials.

If breathing begins place in recovery position.
Look, listen and feel for breathing, up to 10 seconds.
- is chest rising and falling?
- can you hear or feel air from mouth or nose?

In clinical situations use a face mask to administer the breaths.

CPR should be the chief priority.
If no signs of life – unconscious, not breathing and not moving, start CPR (cardiopulmonary resuscitation)

CPR involves giving;
30 compression and 2 breaths
100 compressions per minute

The recommended point of compresions is the midline over the lower half of the sternum.
Remember to push hard and fast, straight arms.

Revival checks conducted every 2 minutes (look for pulse & signs of life)

Should swap person doing compressions every 2 min (so they don’t become tired and perform ineffective compressions)
Doing CPR on Infants
use two fingers instead of using hands 
to deliver compressions.

Give 30 compression & 2 breaths
100 compressions per minute

when delivering breaths do not overdo 
the amount, as you may cause a lung 
to rupture.

You should check
for vital signs every
2 minutes.

CPR should continue until the
return of spontaneous 
circulation or you are relieved 
by a qualified professional.
If Defibrillator is available, apply and follow voice prompts.

Remember when shocking to get everyone to stand well back.

Keep checking for signs of life.
Airway Management

• Note the next two slides are specific to allied health professionals and medical students. It is a reminder of some devices used for airway management.

- Oropharyngeal Airway (guedels)
- Nasopharyngeal Airway
- Endotracheal tube
- Laryngeal mask

Images from wikipedia & flickr
Airway Management

• Once the Guedel or Nasopharyngeal airway is in place,
  o Apply face mask
  o Use the resuscitator to provide ventilations
  o Attach 15L of oxygen to resuscitator

If performing ventilation manually ensure a tight seal between the mask and the face.

Where possible have one person firmly holding the face mask down and the other ventilating.
Severe Bleeding

• Anyone with gushing or spurting blood or bleeding that cannot be controlled needs medical assistance immediately

• Have the patient hold something over the bleeding area e.g. paper towels, a clean towel, a clean article of clothing
  - Pressure must be put on the area to try and stop the flow of blood
Care for bleeding...

1. Apply Pressure to the Wound
2. Raise and Support injured part
3. Bandage Wound
4. Check Circulation below wound
5. If severe bleeding persists, give nothing by mouth & call emergency services
1. Assess Casualty (DRSABCD)

2. Call emergency

3. Position Casualty
   - Keep the casualty lying down if possible.
   - Elevate legs 10-12 inches unless you suspect a spinal injury

4. Treat any other injuries

5. Ensure Comfort
   - Cover casualty to maintain warmth
   - Provide casualty with fresh air

6. Monitor & Record breathing and pulse

When the face is pale, raise the tail
Signs & Symptoms of Shock...

1. Weak rapid pulse
2. Cold, clammy skin
3. Rapid breathing
4. Faintness/dizziness
5. Nausea
6. Pale face, fingernails, lips
Sprains & Strains...

R – I – C – E

**R est**

**I ce**, apply a cold pack. Do not apply ice directly to skin.

**C ompress**, use an elastic or comforting wrap – not too tight.

**E levate**, above heart level to control internal bleeding.
Follow **DRSABCD**. Then proceed with **I A-C-T.**

**I** mmobilise area. Use jackets, pillows, blankets and so on. Stop any movement by supporting injured area.

**A** ctivate emergency services.

**C** are for shock. See care for shock slide.

**T** reat any additional secondary injuries.

**Dislocations & Fractures**
Alcohol Intoxication

- Alcohol intoxication can vary depending on how much alcohol was consumed.
- Signs of severe intoxication include:
  - Vomiting
  - Slurred speech
  - Loss of balance
  - Cognitive impairment
  - Loss of consciousness
  - Decreased respirations
  - Cool, clammy skin

- Do not allow the person to sleep or close their eyes.
  - Keep talking to them until EMS arrives.
Drug Overdose

• Each drug is unique in how it affects the body

• Be cautious that drugs can cause a person’s behavior to change quickly
  o Always speak to them slowly with a calm voice
  o Once again, treat any persons needing medical attention with the utmost respect

• Each drug causes different symptoms when an overdose occurs
  o Stimulants cause an increased amount of energy which can be erratic and unpredictable
  o Depressants can cause a person to lose consciousness with difficulty breathing
Poisoning

Follow DRSABCD & Check Materials Safety Data Sheet if possible.

**Signs & Symptoms**

- Abdominal pain
- Drowsiness
- Nausea/vomiting
- Burning pains from mouth to stomach
- Difficulty in breathing
- Tight chest
- Blurred vision
- and so on....
1. **Remove Casualty from Danger**  
   (follow **DRSABCD** & remember STOP, DROP & ROLL)

2. **Cool the burnt area**  
   (hold burnt area under cold running water for a minimum of 20 minutes.)

3. **Remove any constrictions**  
   (e.g. clothing & jewellery)

4. **Cover Burn**  
   (place sterile, non-stick dressing over burn)

5. **Calm Casualty**
Diabetic Emergency

Follow DRS ABCD

2. Try to determine whether the individual is suffering from a high (e.g. thirsty) or a low (hungry) blood sugar.

3. If you are unsure, then the best option is to give the person a sweet drink, as it is more important to maintain minimum blood sugar levels.

HYPOGLYCEMIA

• Low blood sugar level
• Causes
  1) Diabetics on Insulin
  2) Starvation
  3) Excessive alcohol intake
  4) Less common causes – liver failure, sepsis, endocrine tumors
Symptoms
• History of diabetes
• Excess hunger
• Feeling faint or dizzy
• Strange behavior – Confusion, aggression
• Palpitations, tremors
• Pale, cold, sweaty skin
• Loss of consciousness
• e/o diabetes – medic alert/syringe in bag

What should be done
• If conscious, give GLUCOSE orally till person feels better
• If unconscious, monitor airway and breathing and seek medic help
• Give glucagon inj (keep prefilled syringe in c/o diabetes)
• If possible, IV glucose
SEIZURES

• Seizure – paroxysmal event due to abnormal, excessive, hyper synchronous discharges from an aggregate of CNS neurons
• Epilepsy – a condition in which a person has recurrent seizures due to a chronic, underlying process
Symptoms

• Aura
• Sudden rigidity of body – tonic phase
• Collapse due to which injuries may be sustained
• Floppy body periodic relaxation of muscles – clonic phase
• Tongue bite
• Bowel and bladder incontinence
• Post ictal exhaustion & confusion/headache
• Other types – absence seizure, partial seizure, secondary generalized etc

First Aid

• Move person away from danger e.g. fire, water, furniture
• Don’t try to restrain
• Don’t insert anything in mouth
• After convulsion ceases, give recovery position
• Ensure airway is clear
• Don’t leave person alone even after seizure
• Reassure, support
• If seizure persists >5 min/recurs w/o regaining consciousness call Ambulance
ASTHMA

• Disease of airways characterized by increased responsiveness of the tracheobronchial tree to a variety of stimuli

• Clinical Course – Acute exacerbations with remissions / Continuous episode (status asthmaticus)

• Causes – genetic (hereditary)
  allergic
  idiopathic
Triggers

- **Allergens** due to weather & season change, animal fur & dander, smoke, dust
- Pharmacologic agents - aspirin, coloring agents
- Air pollutants – ozone, nitrogen dioxide, sulfur dioxide
- Occupational asthma
- Infections – influenza, parainfluenza
- Exercise
- Emotional upsets
Symptoms

• Shortness of breath
• Cough
• Chest tightness
• Wheezing
• Associated symptoms – inability to speak, pale skin, blueness, distress, confusion
• Ultimately – unconscious & ceases to breathe

What you should do:

• Move away from the thing that triggered the episode
• Take a quick relief asthma medication
• Stay calm so that breathing gets better
• Call Ambulance if:
  1. No response to medication
  2. Lips/fingernails turn blue or grey
  3. It is hard to talk
  4. Nasal flare
  5. Skin is pulled around the neck & ribs when person breathes
  6. Heartbeat/pulse is too fast
ROAD TRAFFIC ACCIDENTS

• **Critical four minutes**: One of the most common causes of a road accident death is due to loss of oxygen supply. Normally it takes less than four minutes for a blocked airway to cause death.

• **The 'golden hour'**: The first hour after the trauma is called the 'golden hour'
What can you do?

- Beware of further collisions and fire
- Alert oncoming traffic to the danger ahead
- Don’t allow anyone to smoke
- Get assistance from bystanders
- Call Ambulance
- Don’t move casualties who remain in their vehicles, unless they are in danger by doing so.
- Never remove a motorcyclist’s helmet unless deemed necessary.
- Avoid unnecessary movements
- Reassurance
Contd.

• If person responsive, ask questions/shake gently by shoulders and ensure airway is open
• If breathing but unconscious put in recovery position
• If not responsive then start CPR
• In case of bleeding-
  ✓ check if there are any objects in the wound
  ✓ If the wound is clear of objects apply firm pressure over the wound
  ✓ If there are objects embedded in the wound do not press them, and build up padding around the object
Contd.

• In case of burns-
  ✓ Cool it by clean cold water for at least 10 mins
  ✓ Don’t remove anything that may be stuck to it
Suicide Attempts

• Anyone who has attempted to harm themselves needs greater care than can be given by a regular person
• EM will maintain any injuries and will call for Fire Rescue to transport the patient to the most appropriate facility
• Never let the patient leave your sight even when calling security for EM