Injuries

Facilitator:

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Specific Learning Objectives

• At the end of session, the learner shall be able to describe:
  ➢ Types of injuries
  ➢ Risk factors of injuries
  ➢ Prevention of injuries
  ➢ Haddon matrix
Injuries

• Injuries are caused by acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals, and ionizing radiation interacting with the body in amounts or at rates that exceed the threshold of human tolerance. (by W.H.O.)

• In some cases (for example, drowning and frostbite), injuries result from the sudden lack of essential agents such as oxygen or heat” (by W.H.O.)
Types of Injury

• Unintentional (i.e. accidental)

• Intentional (i.e. deliberate):
  ➢ Interpersonal (e.g. Assault and homicide)
  ➢ Self-harm (e.g. Abuse of drugs and alcohol, self-mutilation, suicide)
  ➢ Legal intervention (e.g. Action by police or other law enforcement personnel)
  ➢ War, civil insurrection and disturbances (e.g. Demonstrations and riots);
Road Traffic Accidents

1.3 million deaths
20-50 million injured

- AIDS-related deaths
  UNAIDS 2008
  1.8

- Tuberculosis
  WHO 2007
  1.3

- Road traffic
  WHO 2009
  1.3

- Malaria
  WHO 2008
  <1

1.3 million people

Million people
• Road traffic accidents are the leading cause of death among young people, aged 15–29 years.

• 91% of the world's fatalities on the roads occur in low-income and middle-income countries, even though these countries have approximately half of the world's vehicles.
# Leading causes of death in world

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease or Injury</th>
<th>2004</th>
<th>Disease or Injury</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Cerebrovascular disease</td>
<td>2</td>
<td>Cerebrovascular disease</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Lower respiratory infections</td>
<td>3</td>
<td>COPD</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>COPD</td>
<td>4</td>
<td>Lower respiratory infections</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Diarrhoeal diseases</td>
<td>5</td>
<td>Road traffic injuries</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>HIV/AIDS</td>
<td>6</td>
<td>Trachea, bronchus, lung cancer</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Tuberculosis</td>
<td>7</td>
<td>Diabetes mellitus</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Trachea, bronchus, lung cancer</td>
<td>8</td>
<td>Hypertensive heart disease</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>Road traffic injuries</td>
<td>9</td>
<td>Stomach cancer</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Prematurity &amp; low-birth weight</td>
<td>10</td>
<td>HIV/AIDS</td>
<td>10</td>
</tr>
</tbody>
</table>
Goal of the Decade
To halt or reverse the predicted increase in road traffic fatalities around the world

Decade of Action for Road Safety 2011-2020: saving millions of lives

5 million lives saved
<table>
<thead>
<tr>
<th></th>
<th>India</th>
<th>Chandigarh</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of cases of Road Accidents</strong></td>
<td>440123</td>
<td>441</td>
</tr>
<tr>
<td><strong>Total Registered Motor Vehicles as on 31.03.2009 (in 000’)</strong></td>
<td>114953</td>
<td>747</td>
</tr>
<tr>
<td><strong>No. of deaths due to Road Accidents in 2011</strong></td>
<td>136834</td>
<td>136</td>
</tr>
<tr>
<td><strong>Rate of Accidental Deaths per 000’ vehicles</strong></td>
<td>1.2</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Rate of Deaths</strong></td>
<td>31.1</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Road user categories for road traffic deaths in India

- Unspecified (11%)
- Passenger cars and taxis (15%)
- Riders motorized 2- or 3-wheelers (27%)
- Pedestrians (13%)
- Cyclists (4%)
- Other (29%)

Global Status Report, 2009
Causes of RTA in India (2011)

- Fault of driver: 77.5
- Fault of cyclist: 1.3
- Fault of pedestrian: 2.4
- Defect in condition of Motor Vehicle: 1.6
- Defect in Road condition: 1.5
- Weather condition: 0.6
- All other causes: 14.8

Ministry of Shipping, Road Transport and Highways, New Delhi. Road Accidents in India, 2011
Place of death among fatal road traffic injuries

Bangalore Road Safety and Injury Prevention Programme (BRSIPP), NIMHANS
Bangalore
Risk Factors

1. Speed:
   likelihood of a crash occurring and to the severity of the consequences of the crash.

2. Drink–driving:
   risk of a crash and the likelihood that death or serious injury.

3. Motorcycle helmets:
   reduces the risk of death by 40% and of severe injury by 70%.

4. Seat-belts and child restraints:
   reduces the risk of a fatality among front-seat passengers by 40–50% and of rear-seat passengers by 25–75%.

5. Distracted driving:
   Drivers using a mobile phone are 4 times more likely to be involved in a crash.
### Haddon Matrix

<table>
<thead>
<tr>
<th>Phase</th>
<th>Human</th>
<th>Vector (Vehicle)</th>
<th>Physical Environment</th>
<th>Socioeconomic Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Injury</td>
<td>Alcohol intoxication</td>
<td>Instability</td>
<td>Poor visibility</td>
<td>Lack of knowledge regarding injury risks hazards</td>
</tr>
<tr>
<td>Injury</td>
<td>Not wearing seat belt</td>
<td>No airbag</td>
<td>Tree too close to the road</td>
<td>Lack of enforcement safety belt legislation</td>
</tr>
<tr>
<td>Post-Injury</td>
<td>Elderly, pre-existing medical condition</td>
<td>Rapidity of energy</td>
<td>Slow Emergency response</td>
<td>Lack of funding for emergency medical and rehabilitation services</td>
</tr>
</tbody>
</table>

**Prevention**

- **Primary Prevention**
  - Pre-Injury: Alcohol intoxication, Instability, Poor visibility
  - Injuries: No airbag, Tree too close to the road
  - Post-Injury: Rapidity of energy, Slow Emergency response

- **Secondary Prevention**
  - Pre-Injury: Lack of knowledge regarding injury risks hazards
  - Injuries: Lack of enforcement safety belt legislation
  - Post-Injury: Lack of funding for emergency medical and rehabilitation services

- **Tertiary Prevention**
  - Pre-Injury: Alcohol intoxication, Instability, Poor visibility
  - Injuries: No airbag, Tree too close to the road
  - Post-Injury: Rapidity of energy, Slow Emergency response
Best buys in road safety

- Speed reduction
- Seat-belts
- Child-restraints
- Helmets
- Drinking and driving
  - Low cost engineering measures
  - Safer vehicles
  - Pre-hospital Trauma care
Violence

• Over 1.5 million deaths per year.
• Suicide and homicide account for more than 80% of violence-related deaths
• 90% of deaths due to violence occur in low- and middle-income countries
• Mainly impacts young, economically productive people
• The health impact of violence is not limited to physical injury
Prevention

- Violence is preventable and its impacts can be reduced
- Individuals can benefit from violence prevention programmes in schools
- Promoting positive, nurturing relationships within families can prevent violence
- Community programmes can play a role in preventing violence
- Societies can prevent violence by reducing risks such as alcohol, guns, and economic and gender inequality
Violence against women

- Particularly intimate partner violence (IPV) and sexual violence against women - are major public health.
  - 15–71% of women aged 15-49 years reported physical and/or sexual violence by an intimate partner at some point in their lives.
  - between 0.3–11.5% of women reported experiencing sexual violence by a non-partner since the age of 15 years
- Approximately 20% of women and 5–10% of men report being victims of sexual violence as children.
- Result in physical, mental, sexual, reproductive health and other health problems.
Risk factors

- Lower levels of education;
- Exposure to child maltreatment;
- Witnessing family violence;
- Antisocial personality disorder;
- Use of alcohol;
- Having multiple partners or suspected by their partners of infidelity; and
- Attitudes that are accepting of violence and gender inequality.
Prevention

• Currently, there are few interventions whose effectiveness has been proven through well designed studies.
• Primary prevention strategies those:
  – that combine microfinance with gender equality training;
  – that promote communication and relationship skills within communities;
  – that reduce access to, and harmful use of alcohol; and
  – that change cultural gender norms,

have shown some promise but need to be evaluated further.
• It is important to:
  – enact legislation and develop policies that protect women;
  – address discrimination against women and promote gender equality; and
  – help to move towards more peaceful cultural norms.
Domestic Accidents

- Falls
- Burns
- Drowning
- Poisoning
- Injuries from sharp or pointed instruments
- Bites and other injuries from animals
Fall Related Injuries

• Falls usually in and around the home, with significant proportion being associated with fall from heights including rooftops and trees are common in younger people in developing countries.
Risk factors for Falls

• Low bone density;
• Poor nutritional status and low body mass index;
• Low calcium intake;
• Co morbid conditions like hypertension and diabetes;
• Low levels of physical activity;
• Poor cognitive function and vision;
• Environmental factors affecting balance or gait;
• Alcohol consumption.
Prevention & Control of Fall related injuries

• Interventions proven effective for preventing falls in older people in developed countries include:
  ➢ Muscle strengthening and balance retraining that is individually prescribed at home by a trained health professional;
  ➢ Home hazard assessment and modification that is professionally prescribed for older people with a history of falling; and
  ➢ Multidisciplinary, multi-factorial health and environment risk factor screening and intervention programs, both for community dwelling older people in general and for older people with known risk factors.
• In relation to fall related injuries among young children, increased supervision of children and the importance of appropriate ground surfacing to prevent playground injuries are effective and relevant.
Burn Related Injuries

• In China and particularly India, fire related injuries clearly outweigh scald-related injuries.
• Overall women are at greater risk of fire related injuries than men.
• Environmental risk factors that have been identified include lack of water supply, storage of inflammable substances at home, cooking equipments in kitchen in the reach of children, and housing that is located in slums and congested areas.
Indian Scenario

- Total Number of Burn Injuries cases annually in India is approximately 70 lakhs and the cases are on increase.
- Approximately 1.4 lakhs people die on burn every year
- More than 7 lakhs burn injuries case require admission every year.
- 70% of all burn injuries cases occur in most productive age group (15-35 years)
- 4 out of 5 burnt cases are women & children.
- 80% of cases admitted are a result of accidents at home (kitchen related mishaps).
- Amongst all traumas, burn cases have highest duration of Hospital bed occupancy.
Common causes

• Scalds are caused by:
  – upsetting cups, especially containing hot tea and coffee;
  – upsetting large containers of boiling liquid from stove tops;
  – upsetting large containers of hot liquids from other places, such as pots of hot coffee on table tops;
  – hot tap water.

• Contact burns occur from:
  – irons;
  – stoves, especially electrical coils on the stove surface;
  – stoves used for heating.

• Fireworks during celebration of Diwali.
Prevention & Control of Burn related injuries

• These interventions include
  – separating cooking areas from living areas,
  – including efforts to reduce the use of indoor fires for cooking,
  – ensuring that cooking surfaces are at heights,
  – reducing the storage of flammable substances in households, and
  – supervising young children more effectively.

• The introduction, monitoring, and enforcement of standards and codes for and the wearing of fire retardant garments have also been proposed.
Safer Stoves and Lamps

Safe stove

Safe Bottle lamp
Prevention from burns

Smoke Alarms

Nonflammable Fabrics

Making fireworks safer
Drowning

- Drowning incidents:
  - In low middle income countries are associated with every day activities near water bodies, including rivers, wells, and ponds;
  - In developing countries being commonly associated with recreation or leisure activities.
- Men account for a higher proportion of drowning incidents, and children aged one to four and young people appear to be at greater risk.
- Those living in rural areas are at a greater risk than their urban counterparts, probably indicating greater exposure to unprotected water surfaces.
Prevention & Control of Drowning related injuries

• Covering wells with grills,
• Fencing nearby lakes or riverbanks,
• Fencing domestic swimming pools, and
• Building flood control embankments.
Prevention and Control of Accidents & Injuries

- A cycle of surveillance
- Risk factor identification
- Intervention implementation
- Evaluation.
“4 Es” for Injury Prevention

• One framework for conceptualizing the many approaches to injury prevention is termed the “4Es,” which consist of the following:
  - Education
  - Environmental modification
  - Enforcement
  - Engineering

Thanks...