

Johns Hopkins Center for Injury Research and Policy

Promoting Safety and Physical Activity: Integrating Injury Prevention in Active Living Research, Policy, and Practice

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**ALR Conference Workshop Sessions
1.5 Hour Workshop Session 2 (5:00pm-6:30pm)**

March 9, 2014



Workshop Overview

- Injury prevention 101
- Injury research tools and theories
- Interventions to address both physical activity and injury
- Interactive exercise
- Strategies to enhance collaborations
- Resources



Introductions

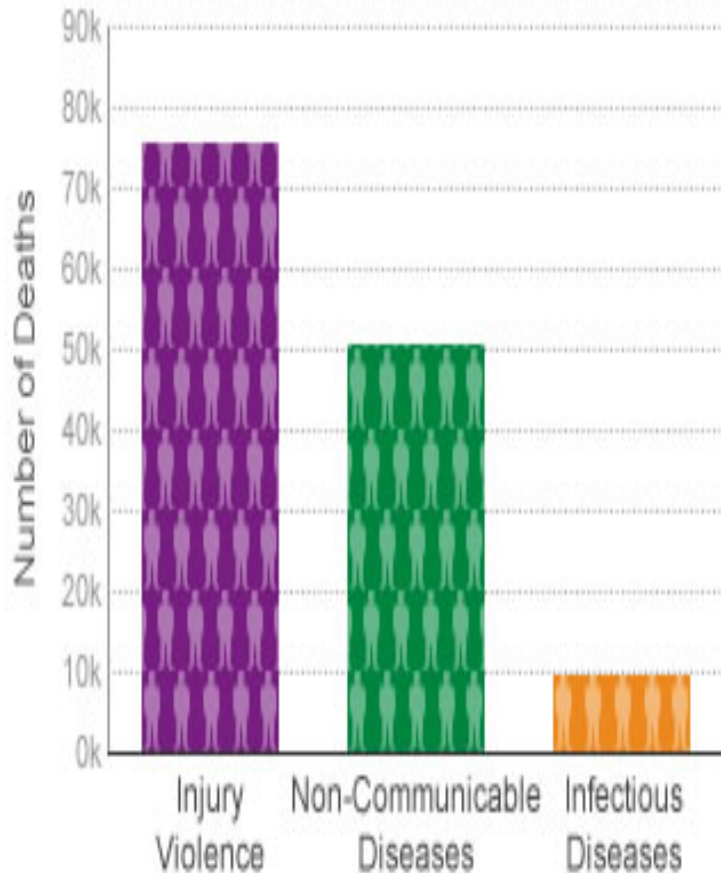
- Name
- Where you are from
- Why you are here for this Workshop



CDC's Injury Center

- National Center for Injury Prevention and Control (NCIPC)
- 1985: NRC/IOM report called for a coordinated effort to prevent injuries in the US; CDC best agency to lead injury research
- Mission: "...to prevent violence and injuries, and reduce their consequences"
- 1997, IOM's Committee on Injury Prevention and Control recommended that no one agency could effectively serve as the sole leader for injury; emphasized collaboration

Injury: Leading Cause of Death, Ages 1-44



- More than 180,000 deaths from injury each year
- Estimated 2.5 million people hospitalized with injury each year
- Estimated 31.6 million people treated in ED/year
- Violence and injuries cost more than \$406 billion in medical care and lost productivity each year

10 Leading Causes of Death by Age Group, United States – 2010

Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 5,107	Unintentional Injury 1,394	Unintentional Injury 758	Unintentional Injury 885	Unintentional Injury 12,341	Unintentional Injury 14,573	Unintentional Injury 14,792	Malignant Neoplasms 50,211	Malignant Neoplasms 109,501	Heart Disease 477,338	Heart Disease 597,689
2	Short Gestation 4,148	Congenital Anomalies 507	Malignant Neoplasms 439	Malignant Neoplasms 477	Homicide 4,678	Suicide 5,735	Malignant Neoplasms 11,809	Heart Disease 36,729	Heart Disease 68,077	Malignant Neoplasms 396,670	Malignant Neoplasms 574,743
3	SIDS 2,063	Homicide 385	Congenital Anomalies 163	Suicide 267	Suicide 4,600	Homicide 4,258	Heart Disease 10,594	Unintentional Injury 19,667	Chronic Low Respiratory Disease 14,242	Chronic Low Respiratory Disease 118,031	Chronic Low Respiratory Disease 138,080
4	Maternal Pregnancy Comp. 1,561	Malignant Neoplasms 346	Homicide 111	Homicide 150	Malignant Neoplasms 1,604	Malignant Neoplasms 3,619	Suicide 6,571	Suicide 8,799	Unintentional Injury 14,023	Cerebrovascular 109,990	Cerebrovascular 129,476
5	Unintentional Injury 1,110	Heart Disease 159	Heart Disease 68	Congenital Anomalies 135	Heart Disease 1,028	Heart Disease 3,222	Homicide 2,473	Liver Disease 8,651	Diabetes Mellitus 11,677	Alzheimer's Disease 82,616	Unintentional Injury 120,859
6	Placenta Cord. Membranes 1,030	Influenza & Pneumonia 91	Chronic Low Respiratory Disease 60	Heart Disease 117	Congenital Anomalies 412	HIV 741	Liver Disease 2,423	Cerebrovascular 5,910	Cerebrovascular 10,693	Diabetes Mellitus 49,191	Alzheimer's Disease 83,494
7	Bacterial Sepsis 583	Septicemia 62	Cerebrovascular 47	Chronic Low Respiratory Disease 73	Cerebrovascular 190	Diabetes Mellitus 606	Cerebrovascular 1,904	Diabetes Mellitus 5,610	Liver Disease 9,764	Influenza & Pneumonia 42,846	Diabetes Mellitus 69,071
8	Respiratory Distress 514	Benign Neoplasms 59	Benign Neoplasms 37	Benign Neoplasms 45	Influenza & Pneumonia 181	Cerebrovascular 517	HIV 1,898	Chronic Low Respiratory Disease 4,452	Suicide 6,384	Nephritis 41,994	Nephritis 50,476
9	Circulatory System Disease 507	Perinatal Period 52	Influenza & Pneumonia 37	Cerebrovascular 43	Diabetes Mellitus 165	Liver Disease 487	Diabetes Mellitus 1,789	HIV 3,123	Nephritis 5,082	Unintentional Injury 41,300	Influenza & Pneumonia 50,097
10	Necrotizing Enterocolitis 472	Chronic Low Respiratory Disease 51	Septicemia 32	Septicemia 35	Complicated Pregnancy 163	Congenital Anomalies 397	Influenza & Pneumonia 773	Viral Hepatitis 2,376	Septicemia 4,604	Septicemia 26,310	Suicide 38,364

Data Source: National Vital Statistics System, National Center for Health Statistics, CDC.

Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC using WISQARS™.



Centers for Disease Control and Prevention
National Center for Injury Prevention and Control

National Estimates of the 10 Leading Causes of Nonfatal Injuries Treated in Hospital Emergency Departments, United States – 2011

Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Unintentional Fall 147,819	Unintentional Fall 980,092	Unintentional Fall 659,063	Unintentional Fall 624,123	Unintentional Struck By/Against 1,039,781	Unintentional Fall 830,843	Unintentional Fall 795,173	Unintentional Fall 984,995	Unintentional Fall 909,229	Unintentional Fall 2,403,146	Unintentional Fall 9,256,761
2	Unintentional Struck By/Against 35,388	Unintentional Struck By/Against 381,370	Unintentional Struck By/Against 429,506	Unintentional Struck By/Against 615,721	Unintentional Fall 921,958	Unintentional Overexertion 675,342	Unintentional Overexertion 589,259	Unintentional Overexertion 498,178	Unintentional Struck By/Against 260,734	Unintentional Struck By/Against 269,421	Unintentional Struck By/Against 4,619,897
3	Unintentional Other Bite/Sting 15,525	Unintentional Other Bite/Sting 173,697	Unintentional Other Bite/Sting 116,853	Unintentional Overexertion 306,379	Unintentional Overexertion 724,410	Unintentional Struck By/Against 656,043	Unintentional Struck By/Against 493,018	Unintentional Struck By/Against 438,778	Unintentional Overexertion 256,738	Unintentional Overexertion 203,047	Unintentional Overexertion 3,440,314
4	Unintentional Foreign Body 11,120	Unintentional Foreign Body 143,838	Unintentional Cut/Pierce 116,813	Unintentional Cut/Pierce 137,359	Unintentional MV-Occupant 703,817	Unintentional MV-Occupant 572,542	Unintentional MV-Occupant 412,035	Unintentional MV-Occupant 383,832	Unintentional MV-Occupant 236,368	Unintentional MV-Occupant 194,678	Unintentional MV-Occupant 2,686,589
5	Unintentional Fire/Burn 10,634	Unintentional Overexertion 94,656	Unintentional Overexertion 86,337	Unintentional Pedal Cyclist 110,225	Other Assault* Struck By/Against 484,128	Unintentional Cut/Pierce 402,941	Unintentional Cut/Pierce 310,614	Unintentional Other Specified 337,326	Unintentional Cut/Pierce 193,449	Unintentional Cut/Pierce 148,065	Unintentional Cut/Pierce 2,165,207
6	Unintentional Other Specified 10,113	Unintentional Cut/Pierce 93,053	Unintentional Pedal Cyclist 84,581	Unintentional Unknown/Unspecified 89,404	Unintentional Cut/Pierce 460,128	Other Assault* Struck By/Against 351,852	Unintentional Other Specified 280,086	Unintentional Cut/Pierce 294,914	Unintentional Other Specified 160,776	Unintentional Poisoning 95,841	Unintentional Other Specified 1,616,657
7	Unintentional Cut/Pierce 7,754	Unintentional Other Specified 73,822	Unintentional MV-Occupant 63,463	Other Assault* Struck By/Against 79,735	Unintentional Other Specified 326,214	Unintentional Other Specified 305,592	Other Assault* Struck By/Against 219,531	Unintentional Poisoning 227,228	Unintentional Poisoning 115,844	Unintentional Other Bite/Sting 93,856	Other Assault* Struck By/Against 1,421,464
8	Unintentional Inhalation/Suffocation 7,501	Unintentional Fire/Burn 55,939	Unintentional Foreign Body 59,229	Unintentional MV-Occupant 78,610	Unintentional Other Bite/Sting 198,384	Unintentional Other Bite/Sting 186,631	Unintentional Poisoning 169,824	Other Assault* Struck By/Against 174,569	Unintentional Other Bite/Sting 93,876	Unintentional Other Specified 74,873	Unintentional Other Bite/Sting 1,231,686
9	Unintentional Overexertion 5,895	Unintentional Dog Bite 41,616	Unintentional Dog Bite 44,996	Unintentional Other Bite/Sting 67,546	Unintentional Unknown/Unspecified 153,778	Unintentional Poisoning 166,092	Unintentional Other Bite/Sting 135,948	Unintentional Other Bite/Sting 149,297	Other Assault* Struck By/Against 58,527	Unintentional Other Transport 66,445	Unintentional Poisoning 991,523
10	Unintentional MV-Occupant 5,342	Unintentional Unknown/Unspecified 41,408	Unintentional Other Transport 38,880	Unintentional Other Transport 48,903	Unintentional Poisoning 151,694	Unintentional Unknown/Unspecified 108,184	Unintentional Unknown/Unspecified 89,046	Unintentional Unknown/Unspecified 78,930	Unintentional Other Transport 50,660	Unintentional Unknown/Unspecified 56,754	Unintentional Unknown/Unspecified 703,763

*The "Other Assault" category includes all assaults that are not classified as sexual assault. It represents the majority of assaults.

Data Source: NEISS All Injury Program operated by the Consumer Product Safety Commission (CPSC).

Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC using WISQARS™.



Centers for Disease Control and Prevention
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What is Injury?

Is the result from an acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals, ionizing radiation in amounts or at rates above or below the threshold of human tolerance.

Traumatic in nature; sudden discernible transfer of energy

Does not include repetitive injury (MSDs, carpal tunnel, etc.)



Injury

The extent and severity of injury...

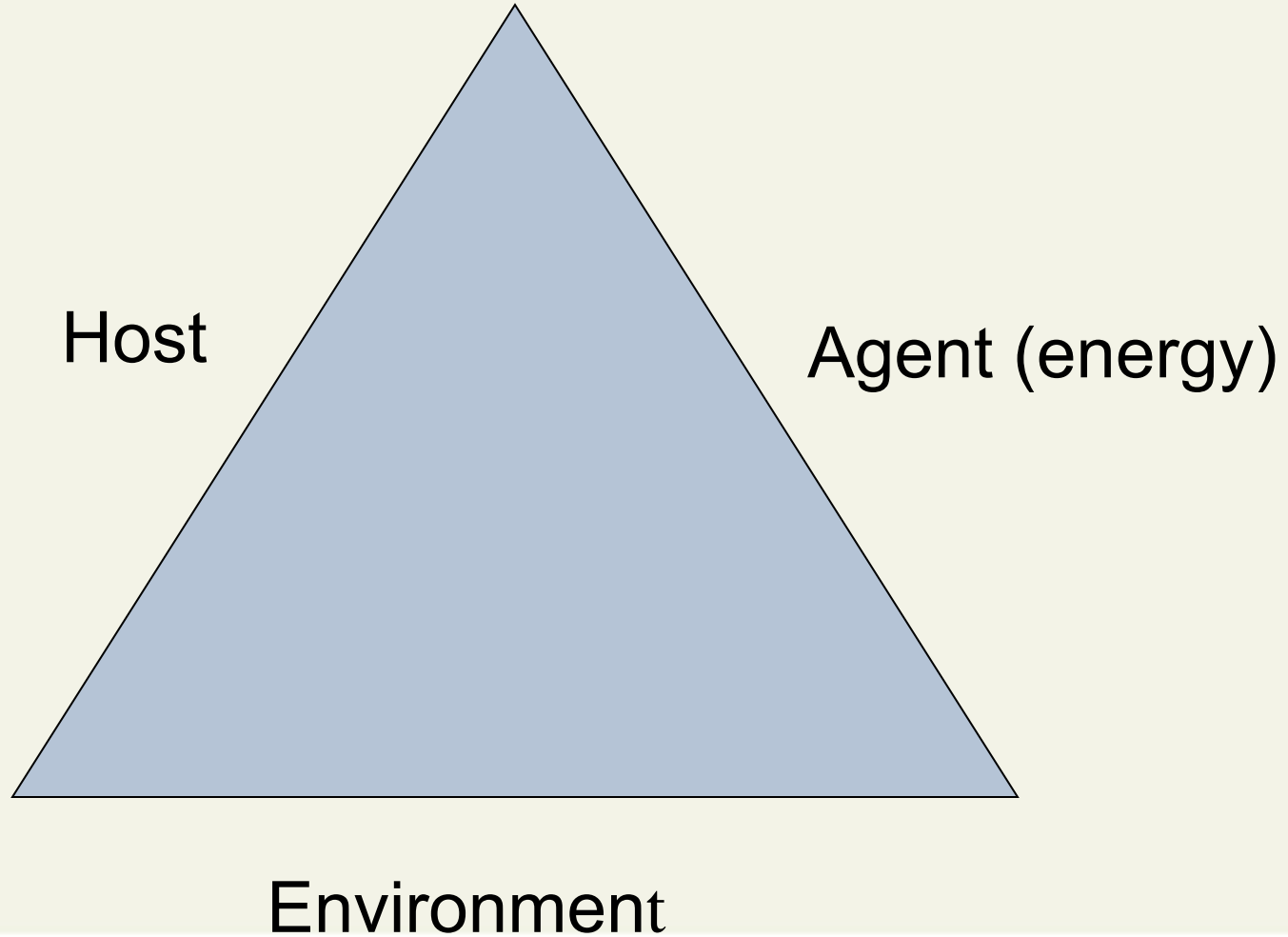
- are largely determined by the amount of energy that is concentrated outside the band of human tolerance, *but*
- both exposure to energy and the consequences of the exposure are influenced by a variety of factors



Injury Categorization

- Mechanism
- Intent (unintentional and intentional)
- Place of occurrence
- Body Region
- Nature (type)
- Severity

Epidemiological framework





Some Relevant Sources of Injury Data

- Fatality Analysis Reporting System (FARS)
- National Electronic Injury Surveillance System (NEISS)
- Behavioral Risk Factor Surveillance Survey (BRFSS)
- National Health Interview Survey (NHIS)
- Emergency department data (E-codes)
- Hospital discharge data
- CDC WISQARS (available on on iPad)



CDC WISQARS

- CDC's WISQARS™ (Web-based Injury Statistics Query and Reporting System) is an interactive, online database
- Users can search, sort, and view the injury data and create reports, charts, and maps based on the following:
 - Intent of injury; mechanism (cause) of injury; body region; nature (type); geographic location (national, regional, state) where the injury occurred; sex, race/ethnicity, and age of the injured person

<http://www.cdc.gov/injury/wisqars>



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Other Types of Traffic-Related Data

- Police Data
 - Crash reports, usually completed by the officer at the scene of the crash
 - Usually crude description of injury severity (no injury, possible injury, fatal)
- Ambulance Data
 - Runsheets
- Trauma Registry
- Data linkage strategies

Injury data and ALR-Related Metrics

- Map injury events
- Pedestrian Environmental Quality Index (2.0)
 - SFDPH
 - Quality of the built environment for pedestrians, perceived safety and intersection safety

Pedestrian Environmental Quality Index (PEQI)





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Haddon's Matrix

- William Haddon Jr.
- The Haddon Phase-Factor Matrix
- The Haddon Factors
 - Human (individual) factors
 - Agent and carrier factors
 - Environmental factors

Haddon's Matrix

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event				
Event				
Post-Event				

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event	Will an injury event - with the potential to cause injury – occur?			
Event				
Post-Event				

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event				
Event	Will an injury occur?			
Post-Event				

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event				
Event				
Post-Event	What will the outcome be?			



Haddon's Matrix: Cycling and Injury

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event	<ul style="list-style-type: none"> - Alcohol and/or Substance Use - Visibility (clothing) 	<ul style="list-style-type: none"> - Brakes - Condition and maintenance - Size and visibility 	<ul style="list-style-type: none"> - Surface - Traffic - Bike lanes (type) 	<ul style="list-style-type: none"> - Laws - Culture - Risk of assault
Event	<ul style="list-style-type: none"> - Protective gear (helmet, other) 	<ul style="list-style-type: none"> - Airbags? 	<ul style="list-style-type: none"> - Surface - Traffic 	<ul style="list-style-type: none"> - Helmet laws - Norms re: helmet use - Incentives
Post-Event	<ul style="list-style-type: none"> - Biking alone - Cell phone - Self-care options 	<ul style="list-style-type: none"> - Emergency call button/system (OnStar for bikes) 	<ul style="list-style-type: none"> - Traffic (re-injury) 	<ul style="list-style-type: none"> - Emergency response - Proximity to care

General Principles for Assessing Injury Prevention Interventions

- Passive strategies are preferred over active.
- Combination of strategies is usually most effective.
- Upstream solutions can have long-term impacts.
- Partnerships can strengthen intervention implementation and impact.
- Look to the literature for evidence-based interventions.

Haddon's Matrix: Cycling and Injury

	Human	Agent and Carrier	Environment	
			Physical	Social
Pre-Event	<ul style="list-style-type: none"> - Alcohol and/or Substance Use - Visibility (clothing) 	<ul style="list-style-type: none"> - Brakes - Condition and maintenance - Size and visibility 	<ul style="list-style-type: none"> - Surface - Traffic - Bike lanes (type) 	<ul style="list-style-type: none"> - Laws - Culture - Risk of assault
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The Revised Intervention Decision Matrix © Johns Hopkins University
 Fowler CJ & Dannenberg AL, 1995. Revised 1998, 2000, 2003 & 2010

Intervention	Option1	Option 2	Option 3
Effectiveness			
Feasibility			
Cost Feasibility			
Sustainability			
Ethical Acceptability			
Political Will			
Social Will			
Potential for Unintended Benefits			
Potential to “Do No Harm” (there is little potential for unintended risks)			
Final Priority Rating			

Compare each intervention against the criteria (NOT against other options). Rate each High, Medium or Low. Do not assign a numeric score as the criteria are not equally important. Ethical acceptability must always score high; if it does not the intervention cannot be considered.

Case Example





Your Recommendations



Some Resources

National Center for Injury Prevention and Control

<http://www.cdc.gov/injury/index.html>

Injury Control Research Centers

<http://www.cdc.gov/injury/erpo/icrc/>

Safe States Alliance

<http://www.safestates.org/>

National Highway Transportation Safety Administration

<http://www.nhtsa.gov/>



JOHNS HOPKINS

BLOOMBERG SCHOOL of PUBLIC HEALTH

Johns Hopkins Center for Injury Research and Policy Summer Institute Principles and Practice of Injury Prevention, June 1st - 4th, 2014

REGISTRATION IS NOW OPEN!

- “Principles & Practice of Injury Prevention” is an intensive, competency-based course designed to enhance participants’ knowledge and skills in injury and violence prevention.
 - Lecture and discussions covering core competencies in the field are led by Center faculty and other experts.
 - Small group exercises enable participants to use what they are learning in lecture through hands-on practical application.

WHO SHOULD ATTEND

- Epidemiologists, first responders, trauma professionals, nurses, physicians, health department personnel, health & safety educators, fire and injury prevention professionals, and public health practitioners and students.
- Please note that registration is on a first-come, first-serve basis. We cannot hold spaces. The maximum number of participants is 65.

RATES

Registered and paid **on or before April 15, 2014** (non-credit) \$ 975
Early bird discount!

Registered and paid **after April 15, 2014** (non-credit) \$1,200

For Academic Credit: Johns Hopkins University tuition cost per credit is \$987.00*. The Institute may be taken for 3 credits for a cost of \$2,961.00. *This rate is subject to change.

For more information on the Institute and how to register, please click [here](#).



Thank you!

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