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Liberty Mutual Research Institute for Safety

Slips, Trips, and Falls in Hospital Workers- Pilot Outcomes

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Research Units

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- Finnish Institute of Occupational Health

Cooperating Sites

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- U.S. Veterans Administration, VA Medical Centers

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Introduction - Slips, Trips and Falls

Slips, trips and falls (STF)

- Second largest source of annual, unintentional injury mortality. (Fingerhut et al., 1998)
- Leading reason for unintentional injury emergency department visits (21%). (Warner et al. 2000)

Occupationally

- Account for 20% to 40% of disabling occupational injuries in developed countries. (Courtney et al., 2001)

Same level falls

- 2nd most costly injury event type in US (after overexertion).
- Estimated $5.7 billion in US workers' compensation costs. (LM Workplace Safety Index, 2003)

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Introduction - Healthcare and STF

- The health services sector is the largest employer in US private industry (~10 million workers).
- In 2001:
  - More health care workers were injured than workers in any other sector.
  - Slips, trips and falls (STF) accounted for the largest proportion of lost time injuries (21%).
  - The estimated incidence rate of same level STF injuries in hospitals was almost twice that of private industry (38.6 vs. 20.8 per 10,000 FTEs).

(USDOL-BLS 2003)

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Introduction - Case-crossover design

- Proposed by M. Maclure (1991) as a method for studying transient effects on the risk of acute events.
- A scientific method to answer:

  "Was this event triggered by something unusual that happened just before?" (Maclure and Mittleman, 2000)

- Utilizes subject as her/his own control.
- Originally applied to acute myocardial infarction by heavy physical exertion. (Mittleman et al., 1993)
- First use in occupational injury examined transient risk factors for acute traumatic hand injury.

  (Sorock et al.2004a,b; Lombardi et al. 2002, 3)

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Objectives

A study of hospital worker STF was initiated to:

- Describe the circumstances of STF in the hospital environment.
- Evaluate the role of potential transient risk factors using the case-crossover study design.

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Method

Case definition

- Hospital workers who reported:
  - a S, T, and/or F event, with or without an injury
  - to the occupational health department of 1 of 7 participating hospitals from 8/01 to 2/04
  - within 24 hours of the event

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Method

Data collection

- With consent, case information form.
- Telephone interview within a month (median= 12 days).
- Photographs taken of event site and shoes at or near time of event.

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Method

Data collected

- Personal- occupation, age, gender, shoe type, other demographics
- Workplace- location, preceding events, fall characteristics, contaminant type, surface transitions.
- Transient exposures:
  - workplace related (contamination, unusual pathway)
  - work task/equipment related (pushing/pulling, carrying objects)
  - worker related (rushing, distraction)

Method

Case-crossover approach

- Control information sampled retrospectively for each case.
- Usual frequency analysis compares:
  - Exposure reported in hazard period (time of the injury)
  - Average exposure estimated from the control period (previous month)

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Results

To date:

- 90 hospital workers interviewed and analyzed.
- Mean, median time to interview: 14 days, 12 days
- Initial results presented:
  - Occupation breakdown
  - Event type and floor condition
  - Resulting injuries
  - Exposures in hazard vs. control periods

Table 1. Most frequent occupations (n > 2) *		
	Count	%
Registered nurses	29	32
Maids and housemen	9	10
Managers, medicine and health	5	6
Nursing aids, orderlies/attend (447), health aids (446)	5	6
Receptionists	5	6
Clerks (328, 335, 379)	4	4
Cooks (436), supervisors food prep (433)	4	4
Dieticians	4	4
Licensed practical nurses	4	4
Clinical lab technologists and technicians	3	3

* Census 1990 Occupation Titles

- Subjects (N=90) were predominantly female (90%) and white (70%) with a mean age of 47 (range 19-67).
- Most frequent occupations were *nurses* and *maids and housemen*.

Table 2. STF event type and floor condition (N=90)

Slip, Trip and/or Fall	Count*	%
Slipped	42 (7)	47
Tripped	24 (3)	27
Slipped and tripped	8 (2)	9
Fell w/o slip or trip	15	17

*12 individuals slipped and/or tripped without falling ( )

Floor Condition	Count	%
Clean and dry	42	47
Liquids on floor*	32	36
Frost, snow or ice	7	8
Solid contaminants	5	6
Don't know	3	3

*Liquids: water (n=14), cleaning solution (n=5), urine (n=1), grease (n=2), wax (n=3), water & grease (n=1), LPH liquid (n=1), don't know/missing (n=5)

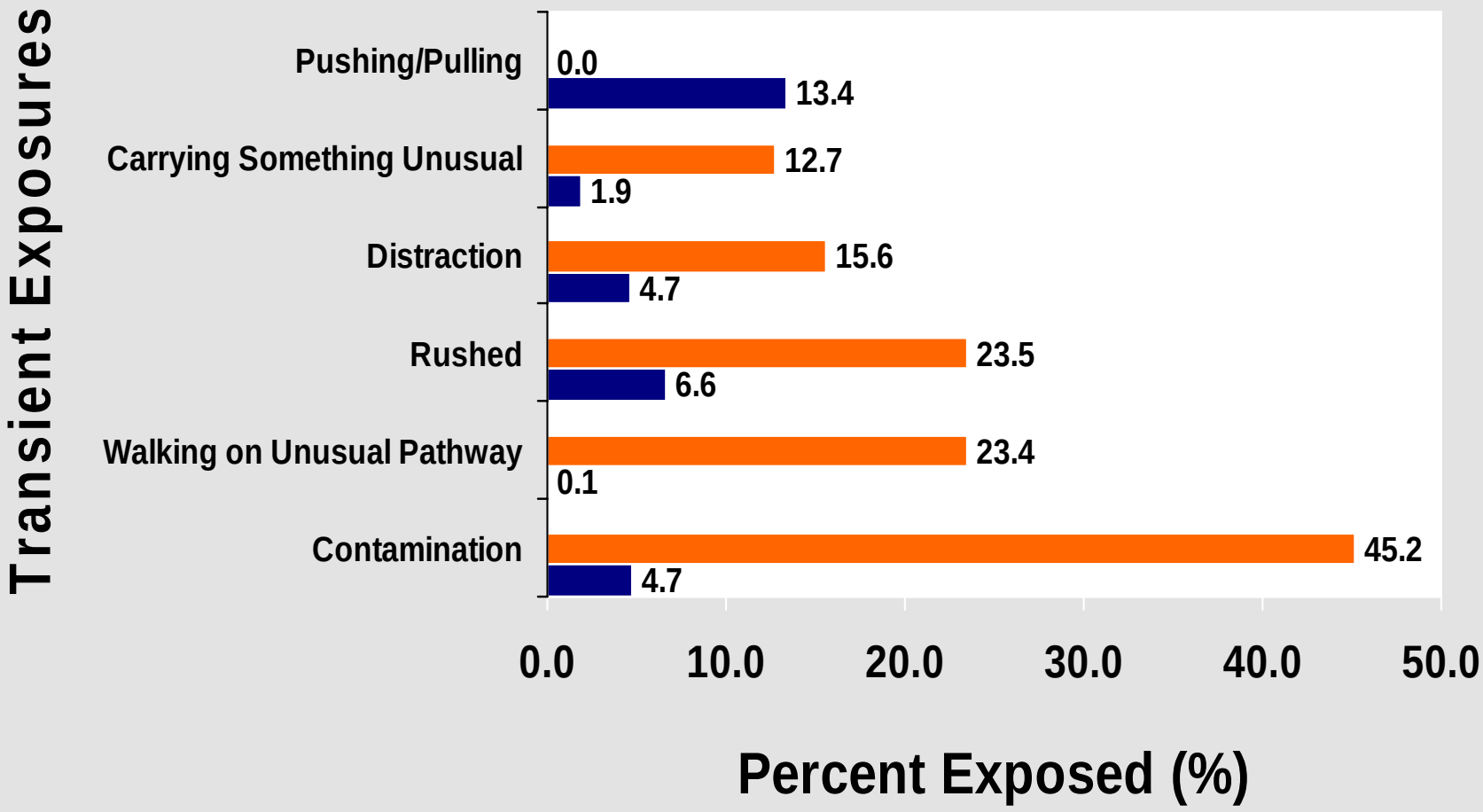
- Seventy-eight subjects (87%) fell, most often after slipping.
- Fifty-three percent of STF occurred at a transitional area, e.g., wet to dry (58%), one floor type to another (40%), or uneven surfaces (31%).

Table 3. Nature of injury

	Count	%
Number of Subjects with any Injury	85	94
Nature of Injury [1]		
Sprains, strains, tears	29	28
Bruises, contusions	28	27
Soreness, pain, hurt (excl. back)	22	21
Nonclassifiable	9	9
Fractures	6	6
Back pain, hurt back	4	4
Multiple surface wounds & bruises	4	4
Abrasions, scratches, lacerations	2	2
Avulsions	1	1

[1]Bureau of Labor Statistics Occupational Injury and Illness Classification System NOI codes.

- There were a total of 105 injuries among the 90 subjects.
- Ninety-four percent of subjects sustained an injury from their STF.



- All exposures were more frequently reported at the time of the event than in the prior work month except pushing/pulling.
- Rushing typically due to 'late/behind' or urgent patient needs.

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Discussion

- The findings suggest that the case-crossover study design is a feasible approach to the assessment of potential transient risk factors for STF.
- Severity of STF influenced by reporting mechanism.
- Case accrual slower than in prior study of hand injuries.
- Subject follow-up slower than prior study.
- HIPPA impacts.

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Discussion

- Continuing to add hospitals to study.
- Effects of time lag between STF event and interview will be investigated as more subjects are enrolled.
- To reduce lag, we are increasing number of trained interviewers, clarifying instructions to hospitals.
- Validation of self-reported exposures is a major challenge of retrospective study designs.
  - Photographs are available for validation of self-reported floor type, shoe type, tread.

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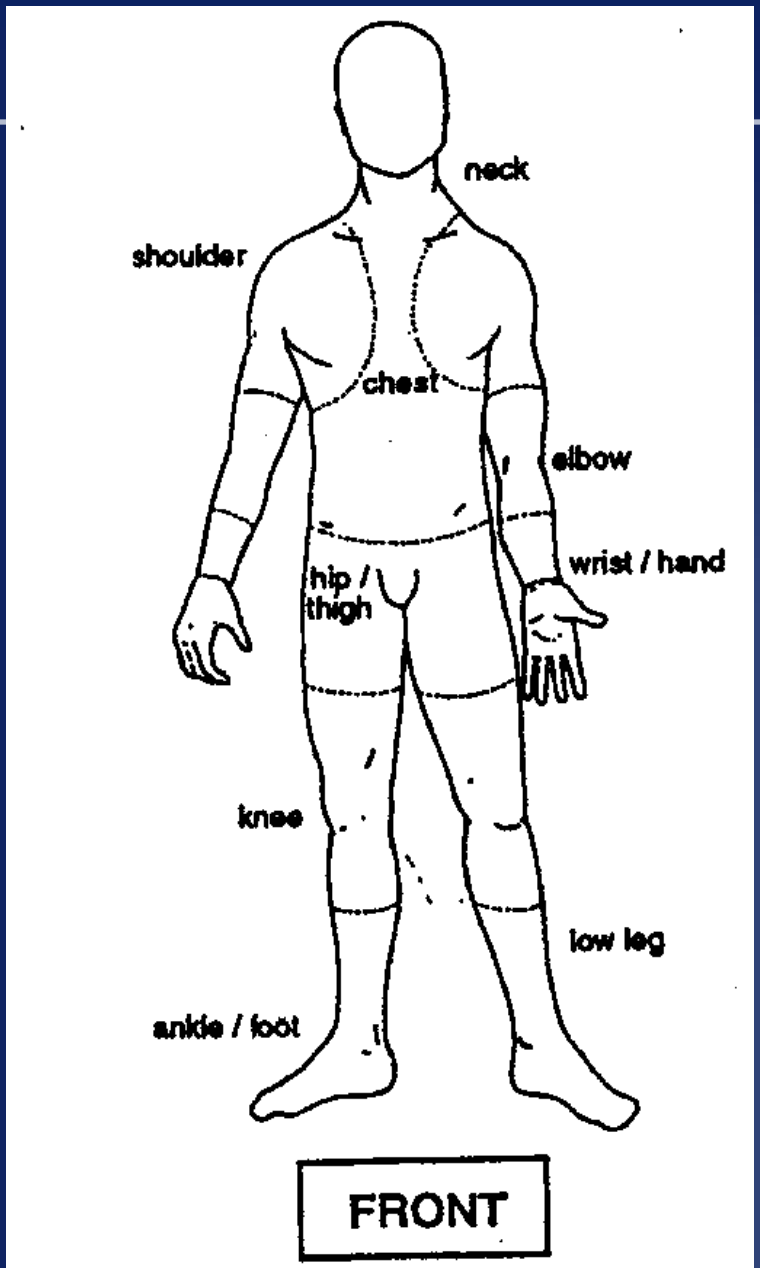

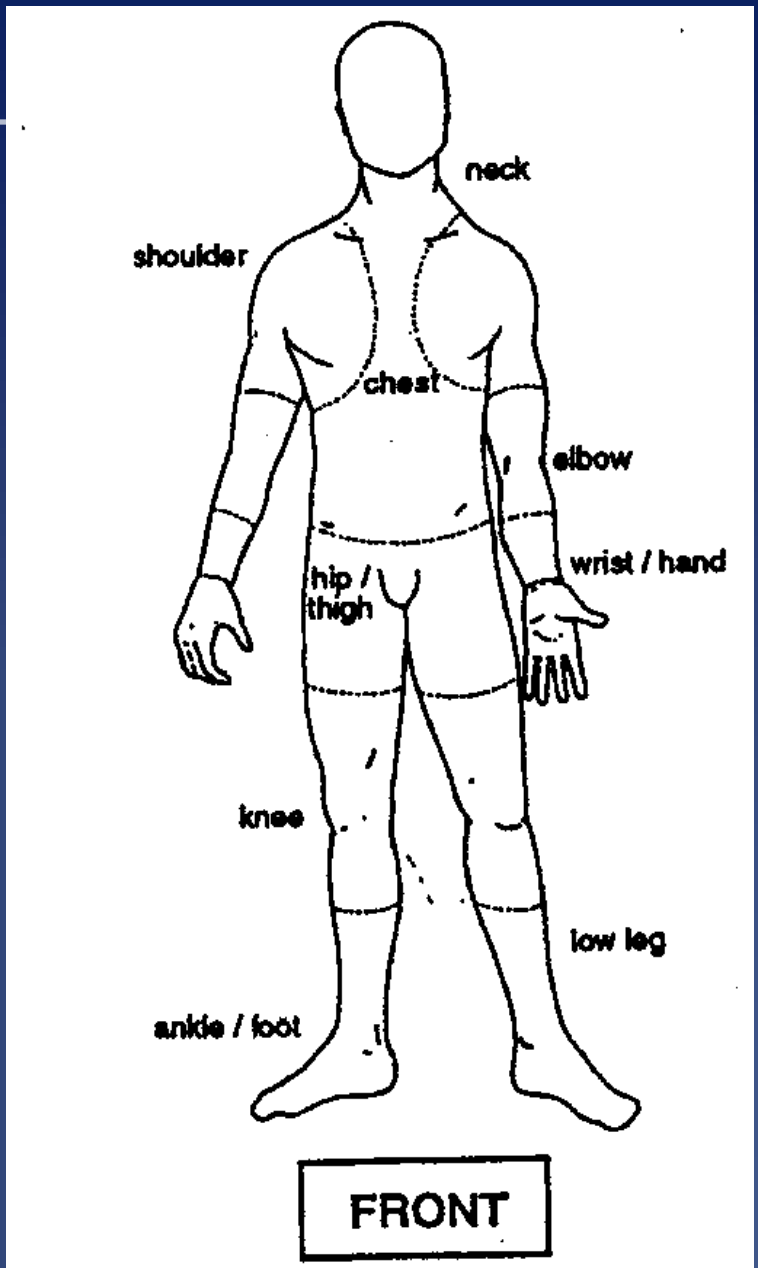

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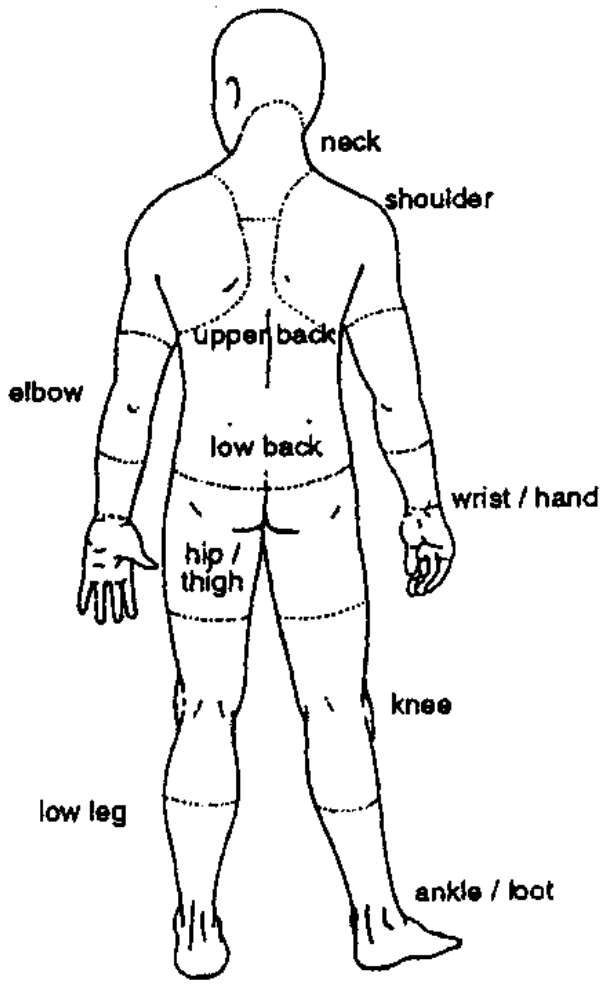

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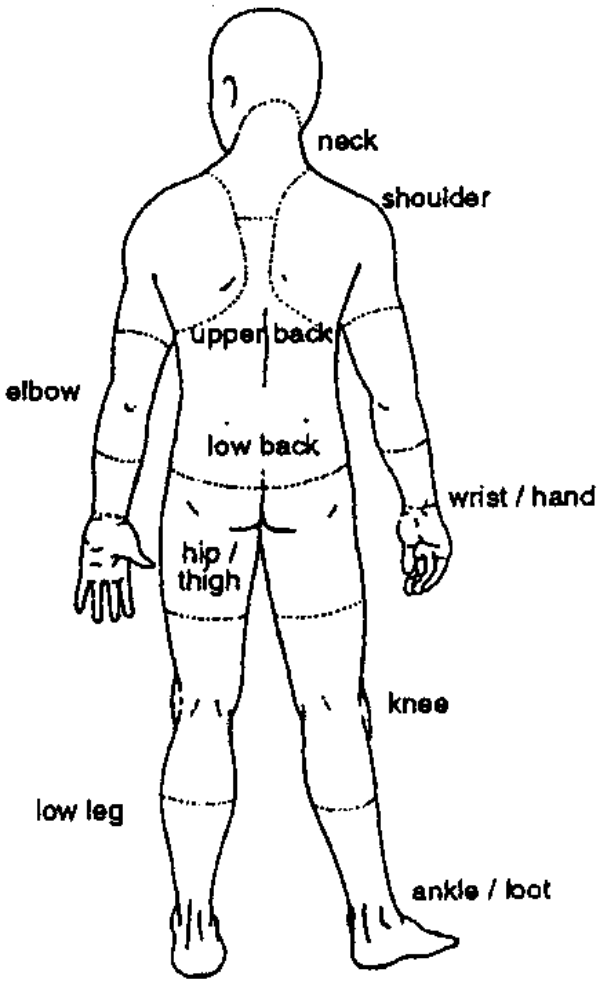

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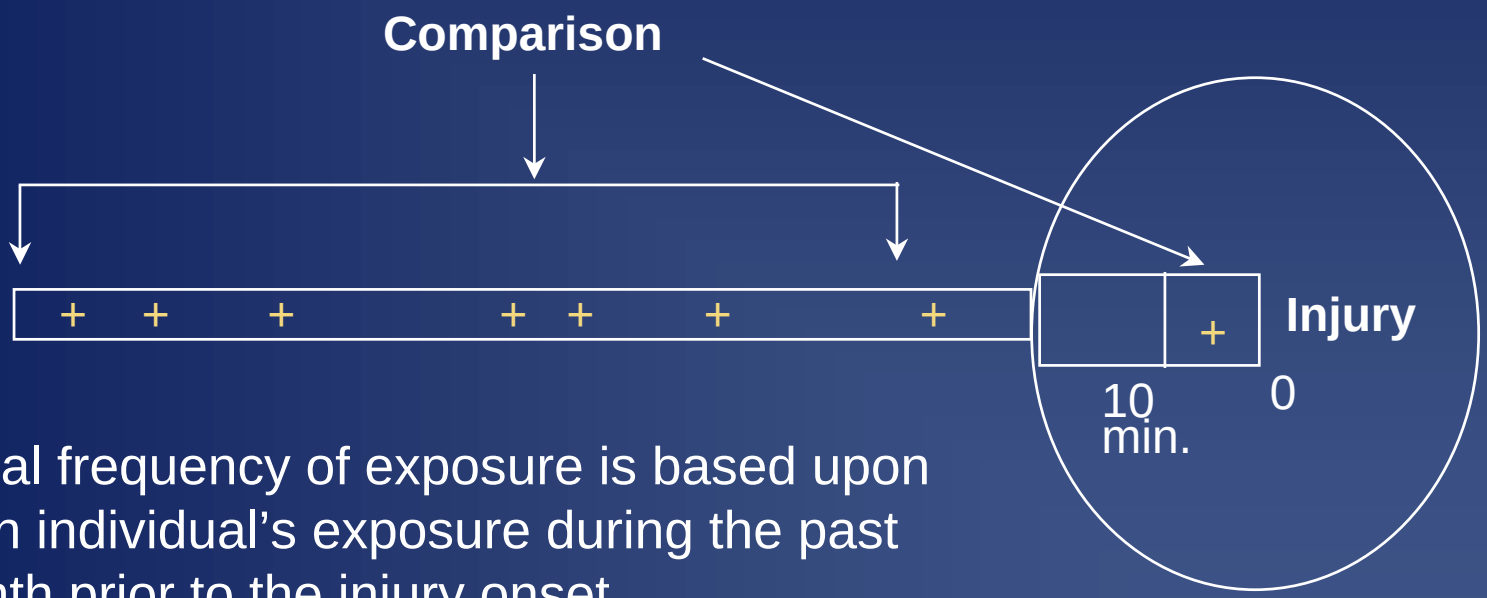
Usual Frequency Approach

- The Usual Frequency Approach contrasts exposure in the hazard period with the expected exposure



Usual frequency of exposure is based upon each individual's exposure during the past month prior to the injury onset

(from Sorock GS, Lombardi DA, et al., Am J Ind Med 2001)