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# Retrospective Analysis of Catastrophic Claims 2002-2010

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# #5 Plan and conduct a prospective evaluation of L&I's catastrophic care management



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- 1) To characterize the catastrophic injuries in WA state and to identify predictors of catastrophic injury in the WA workplace using data from 2002-2010
- 2) To describe long-term disability following catastrophic injury
  - a) In a severity adjusted analysis, to evaluate predictors of long-term disability
  - b) In a severity adjusted analysis, to evaluate modifiers of long-term disability
- 3) To evaluate the implementation of quality improvement measures intended to reduce morbidity and improve functional outcome following these catastrophic injuries



In 2014, L&I conducted a gap analysis of catastrophic claims to ensure that L&I is providing the highest quality, evidence-based services available to help injured workers heal and return to work or function.

The analysis revealed gaps in the following areas:

- 1) communication and coordination
- 2) data systems
- 3) access to care



# Motivation for a More Detailed Review of Catastrophic Claims

- In order to better understand work-related catastrophic injuries, the resulting claims, and to work towards prevention, we aimed to link L&I data with that from the Washington State Trauma Registry
- The Department of Health (DOH) captures state-wide data in the Trauma Registry
- This registry includes characteristics of the injury such as injury severity score, abbreviated injury score, and other specific hospital level injury data.
- These data are critical for L&I to better understand work-related catastrophic injury



# Washington State Trauma Registry Inclusion Criteria Presentation title

- Patients with certain discharge diagnosis codes indicating:
  - Injuries to specific body parts, unspecified multiple injuries or body region, or specific mechanisms of injury
- and
- Activation of trauma team,
- DOA, died in facility,
- transferred in to / or from another facility via EMS,
- flown to scene, more than 48 hours admission



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- Data collected and included in the Trauma Registry includes demographics, type of injury, location of injury, payer, disposition following discharge, among many others
- Injury specific information includes injury mechanism, place of injury, and injury scaling measures such as ISS
  - Injury Severity Score (ISS) was formulated in 1970s as a way to predict mortality following car crashes
  - Continues to be used extensively and is considered the gold standard in injury research
  - Non linear scale, algorithm that considers the 3 most severely injured body regions
  - Scale 0-75 with 1-9, 10-15, 16+



# Revised Retrospective Evaluation Inclusion Criteria. Presentation title

- L&I covered & accepted the injury
  - this included any of the following in DOH data:
    - Work related: yes OR
    - Payer Source: LNI OR
      - The code for L&I includes state fund, self-insured employers, and L&I crime victim's claims
    - Incident Location Type: workplace
- Date of injury between January 1, 2002-December 31 2010
- Working age population (18-65) at time of injury
- $\geq 3.5$  days of inpatient stay beginning within 24 hours of injury



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- Washington DOH IRB application, review, and approval
- Matched DOH trauma records with LNI claims data based on name, birthday, date of injury
- 3013 claims met criteria in L&I Data Warehouse
- Able to match 2117 of these to entries in DOH database
- Primary diagnosis description in LNI data was used to determine injury type
  - If more than one injury type occurred or if patient data seemed out of proportion to diagnosis, other variables as well as secondary and tertiary diagnoses were used to determine injury type



- Amputation
- Burn
- Traumatic Brain Injury
- Spinal Cord Injury
- Orthopedic / Multi-Ortho
- Multi-Trauma / other



# Injury Severity Scores

ISS score		2114 (%)	Fatalities(%)
1-8	mild	516 (24.4)	1 (4.5)
9-15	moderate	899 (42.5)	4 (18.2)
16-70	severe	699 (33.1.)	17 (77.3)



# Summary Statistics

Presentation title

		ISS 1-15 (n=1415)	ISS 16+ (n=699)	Total (n=2117)
Demographics	Age (mean)	40.9	41.4	41.1
	Race (% white)	74	78	75
	Sex (% male)	87	92	89
Injury Mechanism	Blunt (%)	83.4	92.3	86.4
	Penetrating (%)	8.1	3.0	6.4
	Other (%)	8.6	4.7	7.3
Hospital days	Med, IQR	6.1, 4.6-9.2	9, 5.9-16.9	6.8, 4.8-11.1
FIM		11.1	10.34	10.8
Claims closed	%	91.1	92.4	91.5



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# Injury types stratified by severity

		ISS 1-15 (n=1415)	ISS 16+ (n=699)	Total (n=2114)
Amputation	N, (%)	74 , (5.2)	25, (3.6)	99, (4.7)
Burn	N, (%)	30, (2.1)	112, (16)	142, (6.7)
TBI	N, (%)	148, (10.5)	134, (19.2)	282, (13.3)
SCI	N, (%)	77, (5.4)	13, (1.9)	90, (4.3)
Ortho	N, (%)	839, (59.3)	367, (52.5)	1206, (57)
Multi	N, (%)	247, (17.5)	48, (6.9)	295, (14)



# Injury Mechanisms

Mechanism		ISS 1-15	ISS 16+	Fatalities
Fall or jump	N, (%)	626, (44)	349, (5)0	14
Machinery or equipment	N, (%)	281, (20)	64, (9)	1
Blunt instrument	N, (%)	127, (9)	91, (13)	
Motor Vehicle	N, (%)	94, (7)	84, (12)	2
Burn	N, (%)	93, (7)	24, (3)	



# Disposition After Hospital Discharge

Presentation title

- 69% of mildly injured claimants & **50% of severely injured claimants** returned home without assistance
- 12% of mildly injured claimants & **5% of severely injured claimants** returned home with assistance or with rehab
- 6% of mildly injured claimants & **25% of severely injured claimants** entered inpatient rehab after hospital stay



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- Evaluate cohort referrals to mental health services, and timeliness of referral
- Evaluate cohort referrals to ancillary services, and timeliness of referral
- Evaluate results of injury severity in conjunction with Employment Security Department (ESD) data to better understand how time loss and return to work vary with these other factors
- Use our results to approach our prospective evaluation of catastrophic nurse case management services



To achieve secondary prevention of disability and tertiary prevention of ill effect of injury on the worker's life

- 1) effective early communication of prognosis and rehabilitation goals of care with patient and family
- 2) optimizing health care services and health care system integration during the acute, sub-acute, and chronic phases
- 3) optimizing the linkage between health care services and system and return to productivity and quality of life



# Summary of DOH Matched Claims 2002-2010

Presentation title

Injury type	Mean annual number of claims	total
Burns	15.8	142 (6.7%)
SCI	10	90 (4.25%)
Amputation	11.1	100 (4.7%)
Brain injury	31.3	282 (13.3%)
Multiple Ortho	134.2	1208 (57%)
Other trauma	31.6	284 (13.9%)
Total	235.2	2117



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# Summary of 2014 results

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Injury type	Mean number of claims	total
Burns	16	144 (5%)
SCI	10.7	96 (4%)
Amputation	9.3	84 (3)
Brain injury	29.2	263 (10)
Multiple trauma	216.7	1950 (73)
other	14.8	133 (5)
Total	296.7	2670



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