Trauma care and insurance coverage: the relationship between insurance type and diagnostic imaging over the course of care.

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Presenter Disclosures

- The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Background

- Large body of literature on disparities in trauma outcomes (i.e. mortality) and lack of health insurance [1-7]
- Fewer evaluations of outcomes according to the type/ frequency of interventions received during care.

Rationale for study

- Uninsured patients are known to receive fewer radiographic studies during trauma care [8-10].
  - Our objective: determine whether there are differences across multiple insurance types and different periods of care.

Study population (n = 3,621)

- Adults ages ≥ 18 years
- ACS Level I Trauma Center (2011/12)
- Length of stay ≥ 23 hours
  - Excluded:
    - burns/asphyxia
    - in-hospital deaths
    - missing data: ISS, age, AMA.

Methodology (1 of 2)

- Insurance type: (1) commercial indemnity; (2) Medicare; (3) Medicaid; (4) None; (5) Government (military/TRICARE/prison).
- Covariates: Sex, Age, Race/Ethnicity, ISS, comorbidity, complications, LOS, mechanism
- Unadjusted and adjusted odds ratios (OR) using negative binomial logistic regression

Methodology (2 of 2)

- Primary analyses:
  (1) Differences across entire hospital stay
  (2) Differences during first 24 hours
  (3) ISS > 15 (n = 596)
  (4) Blunt force mechanism (n = 3,058)

- Sub-analyses:
  (5) Differences in 6 different CT scans

Select demographic / clinical variables

Diagnostic imaging	Commercial	Medicare	Medicaid	None	Government
All imaging (entire stay)	17.3	13.5	20.6	13.8	10.8
All imaging (< 24 hours)	8.7	6.1	8.4	7.5	6.5
CT imaging (< 24 hours)	2.4	1.6	2.2	2.2	1.9
White	63.6%	71.9%	37.4	37.4%	57.6%
Black	31.4%	25.5%	56.2%	52.6%	36.8%
Hispanic	2.3%	0.7%	2.6%	6.8%	3.0%
Age	42.0	71.9	39.4	36.6	38.8
Male	67.7%	50.5%	61.5%	82.4%	81.0%
Blunt force	88.9%	94.6%	81.9%	75.9%	81.8%

All differences significant ($p < 0.05$)

Primary results: imaging for entire stay

Insurance Type	All imaging	p value
Commercial	--	--
Medicare	0.85 (0.78 - 0.93)	<0.001
Medicaid	0.89 (0.81 - 0.99)	0.003
No Insurance	0.90 (0.85 - 0.96)	<0.001
Government	0.81 (0.72 - 0.90)	<0.001

Adjusted for: age, sex, race/ethnicity, injury severity score, injury mechanism, comorbidity, complications, and hospital LOS

Primary results: imaging < 24 hrs.

Insurance Type	All imaging	p value
Commercial	--	--
Medicare	0.78 (0.71 - 0.86)	<0.001
Medicaid	0.95 (0.85 - 1.06)	0.363
No Insurance	0.96 (0.89 - 1.03)	0.239
Government	0.83 (0.74 - 0.94)	0.003

Adjusted for: age, sex, race/ethnicity, injury severity score, injury mechanism, comorbidity, complications, and hospital LOS

Primary results: < 24 hrs. + ISS > 15

Insurance Type	All imaging	p value
Commercial	--	--
Medicare	0.85 (0.68 - 1.06)	0.145
Medicaid	0.82 (0.66 - 1.03)	0.091
No Insurance	0.84 (0.72 - 0.97)	0.016
Government	0.72 (0.55 - 0.94)	0.016

Adjusted for: age, sex, race/ethnicity, injury severity score, injury mechanism, comorbidity, complications, and hospital LOS

Primary results: < 24 hrs. + blunt force

Insurance Type	All imaging	p value
Commercial	--	--
Medicare	0.77 (0.70 - 0.84)	<0.001
Medicaid	0.91 (0.82 - 1.02)	0.109
No Insurance	0.94 (0.88 - 1.01)	0.085
Government	0.85 (0.76 - 0.96)	0.006

Adjusted for: age, sex, race/ethnicity, injury severity score, injury mechanism, comorbidity, complications, and hospital LOS

Secondary results: Select CT scans ($p < 0.05$)

Insurance type	ABD Pelvis w/contrast	chest/abd/pel w/contrast CP	cerv spine w/recons CP	facial bones w/o contrast	head w/o contrast
Commercial	--	--	--	--	--
Medicare	X	X	X		
Medicaid					
No Insurance					
Government	X	X			

Discussion

- Insurance status is a determining factor in delivery of radiographic imaging after adjustment for clinical and demographic factors.
- Mixed evidence that radiographic evaluations are driven by factors other than patient pathology during acute care.

Implications

- Expand the time period of the analysis (pre and post Health Exchange)
- Do differences stem from physician or patient discretion, or both?
- Investigate possibility of over treatment?

Thank You

Acknowledgements:

- Palmetto Health Richland Hospital Trauma Registry
- Injury Control and Emergency Health Services reviewers

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