Treatment of Pain in Pediatric Long Bone Fractures- Does it Differ in General and Pediatric Emergency Departments?

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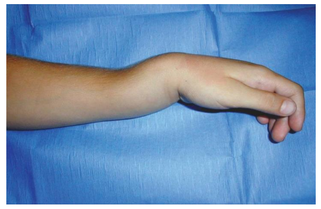
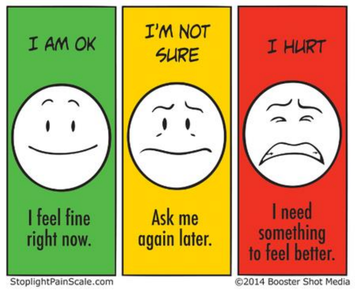
Background

- More than 80% of children receive care in general emergency departments (GEDs) as opposed to specialized pediatric emergency departments (PEDs)
- The most common pediatric complaint is injury; the most common injuries are long bone fractures
- Pain can be difficult to assess in children, especially in facilities where staff do not take care of children regularly
- Pain control is an important patient visit metric, and pain assessment and management are important parts of pediatric readiness and facility recognition
- Previous literature in this area is outdated and not reflective of current practice



Objectives

- Evaluate differences in pain medication administration patterns in pediatric patients presenting to PEDs and GEDs
- Examine differences in discharge prescriptions
- Use data to shape future outreach and efforts for improved pediatric pain management across emergency departments



Methods

Retrospective analysis of 3.5 million emergency department encounters from a large national emergency medicine group (USACS)

- Children aged 0-17.99 years diagnosed with single extremity long bone fracture(s) extracted using ICD9/10 visit codes (n=62,200)
- Excluded visits in facilities where medication data was not collected (n=15,267)
- Rates of analgesic administration were compared by facility type
- Logistic regression was used to generate adjusted odds ratios for predictive factors affecting medication administration and administration of medication within 30 minutes of arrival

	GED		PED	
	n	Percent	n	Percent
Total	34,519	73.55	12,414	26.45
Age (years)				
0-3	4,839	14.02	2,987	24.06
4-8	10,152	29.41	4,309	34.71
9-15	15,428	44.69	4,522	36.43
16-18	4,100	11.88	596	4.80
Gender				
Male	21,207	61.44	7,453	60.04
Disposition				
Discharge	31,156	90.28	9,921	79.96
Admission	1,372	3.98	2,349	18.93
Transfer	1,983	5.75	137	1.10
ESI triage level				
1	82	0.24	57	0.46
2	1,730	5.13	2,554	20.65
3	9,324	27.65	4,661	37.69
4	22,385	66.38	5,048	40.82
5	199	0.59	47	0.38
Payment source				
Commercial	13,958	40.44	4,026	32.43
Public Insurance	16,905	48.97	7,069	56.94
Self-Pay	2,651	7.68	1,155	9.30
Other	1,005	2.91	164	1.32
Clinician type				
Physician	18,990	55.01	10,464	84.29
APP	14,276	41.36	1,751	14.11
Both 50/50	1,253	3.63	199	1.60

Table 1. Demographic data of the studied patient visits

Results

	PED	GED	Difference	p-value
Any analgesia administered in the ED	0.745	0.696	0.049	0.000
Medication Types:				
Opioids	0.417	0.350	0.067	0.000
Ketamine	0.106	0.061	0.046	0.000
Sedative	0.075	0.040	0.035	0.000
Local	0.048	0.026	0.022	0.000
NSAID	0.597	0.634	-0.037	0.000
Tylenol	0.090	0.210	-0.120	0.000
Medication Routes:				
Route = PO	0.547	0.702	-0.155	0.000
Route = Parenteral	0.430	0.266	0.165	0.000
Route = SQ/Topical	0.002	0.001	0.001	0.085
Parenteral Routes:				
Route = IV	0.170	0.106	0.064	0.000
Route = IM	0.002	0.017	-0.015	0.000
Route = IN	0.000	0.001	-0.001	0.018
Route = Unknown	0.828	0.876	-0.048	0.000
Any sedation procedure	0.048	0.029	0.020	0.000
Opioid Rx at discharge	0.060	0.139	-0.079	0.000

Table 2. Medication administration stratified by facility type

- More children received pain medication in PEDs (74.5%) when compared to GEDs (69.6%), p<0.001
- However, presentation to a PED was not significantly correlated with receipt of pain medication in adjusted models (aOR 1.300, p=0.144)
- PEDs administered pain medications faster than GEDs
- Presentation to a PED was significantly correlated with medication administration in less than 30 minutes from arrival (aOR 2.29, p=0.006)

	PED	GED	Difference (PED-GED)	p-value
Median time to first medication (mins)	37.5	49.0	-11.6	0.000
Proportion of visits receiving pain med in <30 mins	0.402	0.273	-0.129	0.000

Table 3. Timeliness of pain medication administration compared by facility type

- Other variables significantly affecting pain medication administration and timeliness in adjusted models include:
  - Age: older patients more often received pain medication, and are more likely to receive medication within 30 minutes (aOR=1.165, p=0.048; aOR=1.227, p=0.005)
  - ESI triage level: only level 4 & 5 visits with significantly lower odds of receiving pain medication (aOR= 0.554, p=0.099; aOR=0.158, p<0.001)
  - Disposition: transferred patients more likely to receive medications, as well as receive medications within 30 minutes (aOR=3.008, p<0.001; aOR=1.234, p=0.002)

Conclusions

- Patients seen in PEDs more often received pain medication and received medication more quickly than in GEDs
- There are significant differences in the type of medications given when comparing GEDs to PEDs
- PEDs saw higher severity injuries, which may account for some differences in medication practices
  - ESI level 2 or 3 was not independently associated with pain medication administration in logistic regression models
  - PEDs had higher proportions of admitted patients, and higher proportions of sedation procedures
- Despite this, more opiates were prescribed on discharge from GEDs
- *Future outreach efforts should focus on timely assessment of pain and administration of pain medicatio[illegible] in GEDs*

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