

# Acute Pain Care for Older Adults in the Emergency Department Setting

HSR&D cyberseminars – Spotlight on Pain Management  
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School of  
Medicine at  
Mount  
Sinai

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# Today's talk...

- **Acute** ED pain care for older adults
- Constraints of pain care in the ED setting
  - ED crowding
  - Hip fracture care (geriatric condition)
  - General pain care (comparison with younger adults)
  - Prelim VA ED pain care findings

# Survey Question #1

- What best describes your VA role?
  1. Researcher
  2. Clinician/Patient-Aligned Care Team
  3. Clinician/Other
  4. Administrator/ Policymaker
  5. Other (including non-VA)

# Survey Question #2

- What department/division are you affiliated with?
  1. Internal Medicine
  2. Family Medicine
  3. Medicine Subspecialty
  4. Surgery
  5. Surgical Subspecialty
  6. Neurology
  7. Anesthesia
  8. Emergency Medicine
  9. Psychiatry/Psychology/Mental Health
  10. Ob/Gyn
  11. Radiology
  12. Pathology
  13. Other

# Survey Question #3

- How do you define acute pain care?
  1. Documentation of pain assessment
  2. Treatment of pain
  3. Both 1 & 2
  4. Other

# Older Adults in the ED

- In 2035, patients  $\geq 65$  yo will make up 26% of total ED visits  
(US Census Bureau, National Population Projections)
- $\geq 75$  yo most likely to have 1 ED visit over 1 yr  
(NCHS Data Brief, May 2010)
- Atypical presentations
- Cognitive and/or functional impairments
- Co-morbidities (multimorbidity)
- Polypharmacy



➔ ***VULNERABLE POPULATION***

# Geriatric Care in the ED

- Quality of care for older adults in the ED limited to focus group interviews and small surveys
- Slowly growing body of evidence
- Limited research evaluating the factors impacting clinical care and outcomes for geriatric ED patients
- Acute pain care as a model to evaluate general quality of care they receive

# Pain in the ED

- Pain as 5<sup>th</sup> vital sign
- Identified as an area for quality improvement
- Pain is common ED cc
  - 70% of ED conditions
  - 34% of all medications in ED for pain
- Inconsistent & inadequate analgesia (oligoanalgesia)

# Disparities in Analgesia

- Geriatric ED patients have greater rates of oligoanalgesia
  - Less likely to receive analgesics (any and opioid) (older vs. younger)
- Unrelieved acute pain is associated with adverse outcomes.
  - Development of persistent pain
  - Longer hospital lengths of stay
  - Delays to ambulation
  - Development of delirium



# Pain in Older Adults

- High prevalence of pain in older adults
  - Self-doubt, reluctant, and reticent to complain
- Co-morbidities, drug-drug interactions, age-related drug metabolism changes, and fear of adverse reactions makes giving analgesia a challenge
- 50% ED MDs uncomfortable giving analgesia to elderly

# Polypharmacy

- 90% older adults on  $\geq 1$  medications
- 40% on  $>5$  medications
- 30-50% receive new prescription at ED discharge
- Risk adverse drug reaction with
  - Multiple meds
  - Severity of illness
  - Multiple comorbidities
  - Changes in physiologic reserve

# Physiologic Reserve Loss

Lower body mass, total body water, hepatic and renal function,  
increased fatty tissue

- Pharmacodynamics

(how drugs act at receptor sites and affect the body)

- Pharmacokinetics

(drug distribution/elimination)

→ *Caution and awareness in analgesia choice and dosing*  
(do no harm...start low and go slow...)

# Geriatric ED Pain Care

- ***Frequent assessments***
- ***Do no harm***
- ***Start low and go slow***

Akin to management of DKA...

Without frequent assessments of fingersticks (pain level),  
no way to titrate insulin (analgesics)

# Geriatric ED Pain Care Quality Indicators

- Pain assessed <1 hour arrival
- F/U assessment <6 hours
- F/U prior to discharge if received pain med
- Pain med if mod-sev pain
- Avoid meperidine
- Bowel regimen if discharged with opioid Rx

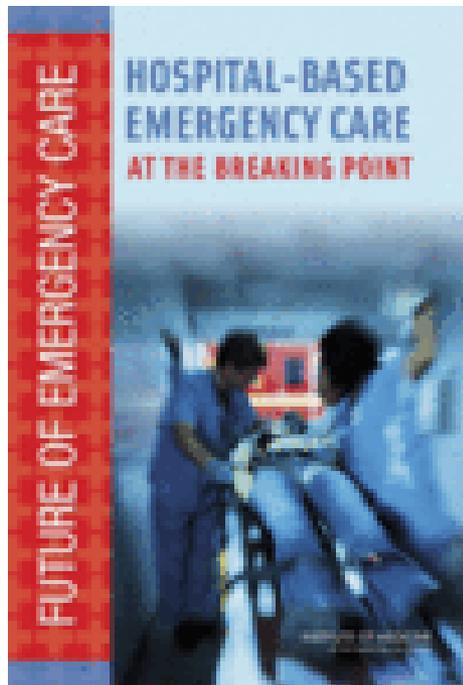
(Terrell KM, et.al. Quality indicators for geriatric emergency care.  
Acad Emerg Med. 2009)

# The Emergency Department (ED)



- Unique environment where specialized care delivered to acutely ill and injured
- **Safety net** care for disenfranchised and vulnerable populations

# IOM report on Emergency Care



- *Hospital-Based Emergency Care: At the Breaking Point*, June 2006
  - ↑ charity care and ↑ costs related to “elder and sicker patients” threaten academic medical centers as a safety net
  - Crowding has disproportionate impact on tertiary referral centers' ability to provide timely clinical care

# ED Crowding Outcomes

- **Increase**
  - Mortality rates with higher weekly visits
  - Inpatient mortality, LOS, costs
  - Thrombolytic delays for AMI with network ambulance diversion
- **Decreased**
  - CAP antibiotics in <4hours with greater numbers of boarders and ED LOS
  - Patient satisfaction



Is ED crowding associated with poorer pain care  
for older adults?

Are there differences in pain management for  
older adults in the ED?

# Hip fracture

- Condition relatively unique to older adults
- Model for evaluation of pain management



Hwang U, Richardson LD, Sonuyi TO, Morrison RS. The effect of emergency department crowding on the management of pain in older adults with hip fracture. *J Amer Geriatr Soc*. 2006;54:270-275

# Methods

Design: Review of ED care for 158 patients,  
>50yo, admitted for hip fracture (8/97-7/98)

Variables collected:

Age, gender, NH residence, triage level, dementia, APACHE critical care score, RAND co-morbidity score, ED crowding factors (census)

Outcomes:

Documentation of pain assessment, time to assessment, analgesia given, and time to pain treatment

# Findings

- 81% patients with documented complaint of pain
- Mean times to
  - pain assessment was 40 minutes
  - pain treatment was 141 minutes
  - Delay to treatment was 122 minutes
- Of those with pain:
  - 36% received no analgesia
  - 7% non-opioids
  - 57% opioids
    - 33% of these as meperidine

# Findings

- ED census levels >120% bed capacity associated with no pain documentation ( $p=0.05$ ) and longer times to pain assessment ( $p=0.01$ )

# Implications

- Hip fracture patients received relatively poorer pain management that is worsened during ED crowding
- By studying a condition relatively unique to the geriatric patient, it may be possible to develop models for future studies and target areas of quality improvement



What about general pain care?

# The Quality of Older Adult Pain Care in the ED Setting

Observational study of pain assessment and treatment for adult patients in the ED



Hwang U, Richardson LD, Livote E, Harris B, Spencer N, Morrison RS. Emergency department crowding and decreased quality of pain care. *Acad Emerg Med*. 2008;15:1248-1255.

# Research Objective

- To determine if older age and greater ED census are associated with poorer process of care measures for pain management within the ED setting

# Methods

## Design:

- Retrospective cohort review of adult patients with conditions warranting analgesia

# Methods

## Design:

- Retrospective cohort review of adult patients with conditions warranting analgesic
- [No chest pain (cardiac)]

## Time:

7/05 & 12/05

## Setting:

Mount Sinai ED

- Urban, academic, tertiary care ED
- 76,000 visits/annually
- Comprehensive electronic ED medical record (patient tracking, MD, RN documentation and order entry)



## Subjects:

- Adults ( $\geq 18$  yo) with a *chief complaint* involving pain AND a *final ED diagnosis* of a painful condition

## Examples:

- CC: toe pain, Final dx: gout → Included
- CC: toe pain, Final dx: CHF → Excluded

# Methods

## Data:

- Electronic ED medical record for patient demographic, clinical, and pain care data
- ADT (admission, discharge, transfer) registration data ED crowding factors *during the 1<sup>st</sup> hour of the index patient's arrival*

# Variables

- Primary independent variables:
  - ED census (total # all ED patients)
  - Age
    - 18-64 years (Younger (REF))
    - 65-84 years (Older)
    - $\geq 85$  years (Oldest)
- Covariates:
  - Gender
  - Race/Ethnicity
  - Triage score (Emergency Severity Index)
  - Degree of pain (none, mild, mod, sev)
  - *Comorbidity (Charlson score)*
  - *Number of prior medications*

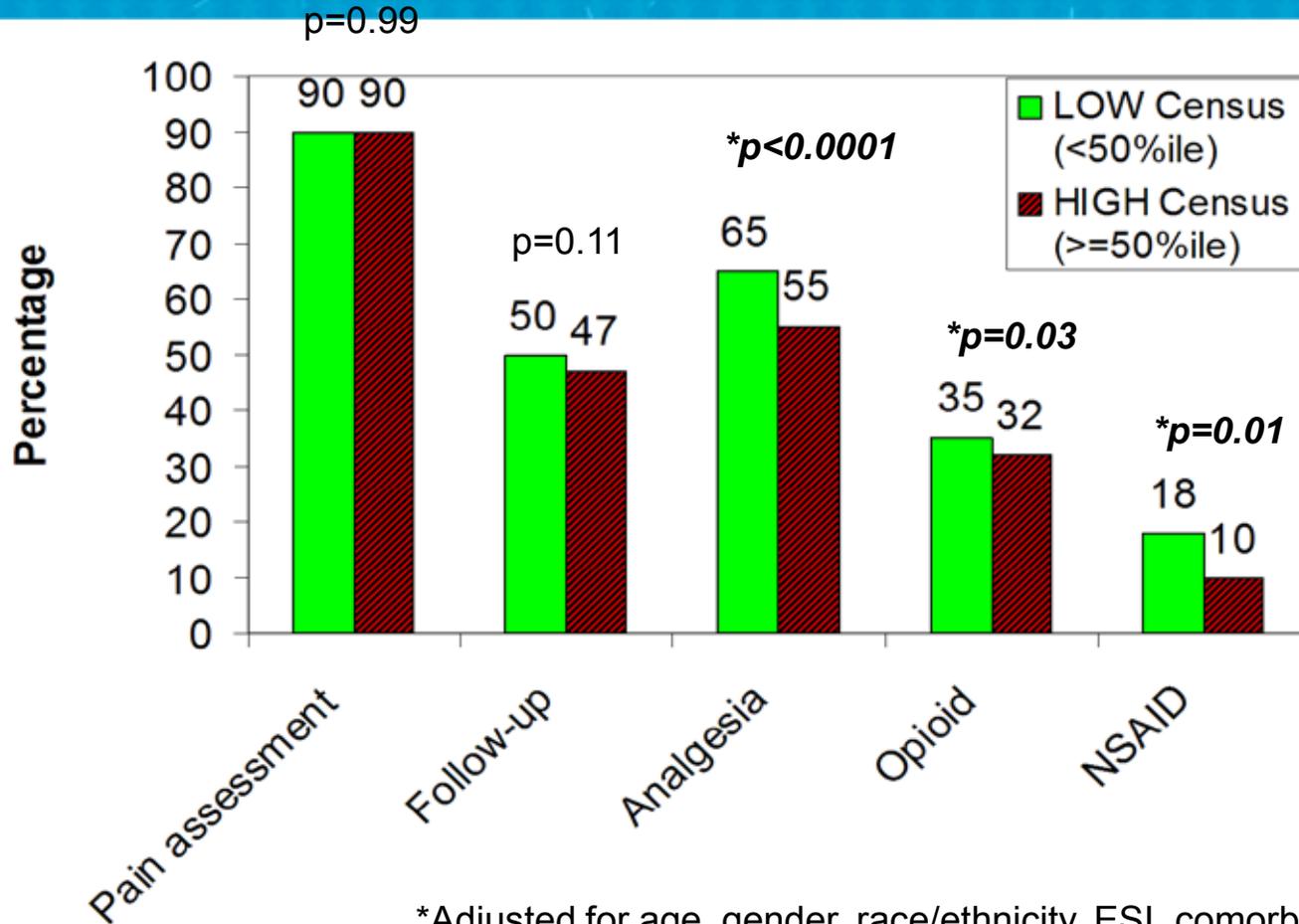
# Primary Outcome Measures

- Process of pain care measures:
  - Documented pain assessment
    - Any by MD
    - Any follow-up
  - Pain treatment
    - Any analgesia
    - Opioids
    - NSAIDs
  - Times of activities:
    - Triage to first MD documented pain assessment
    - Triage to first analgesia ordering
    - Triage to first analgesia administration

# ED Census, During 1<sup>st</sup> hour of Index Pain Patient

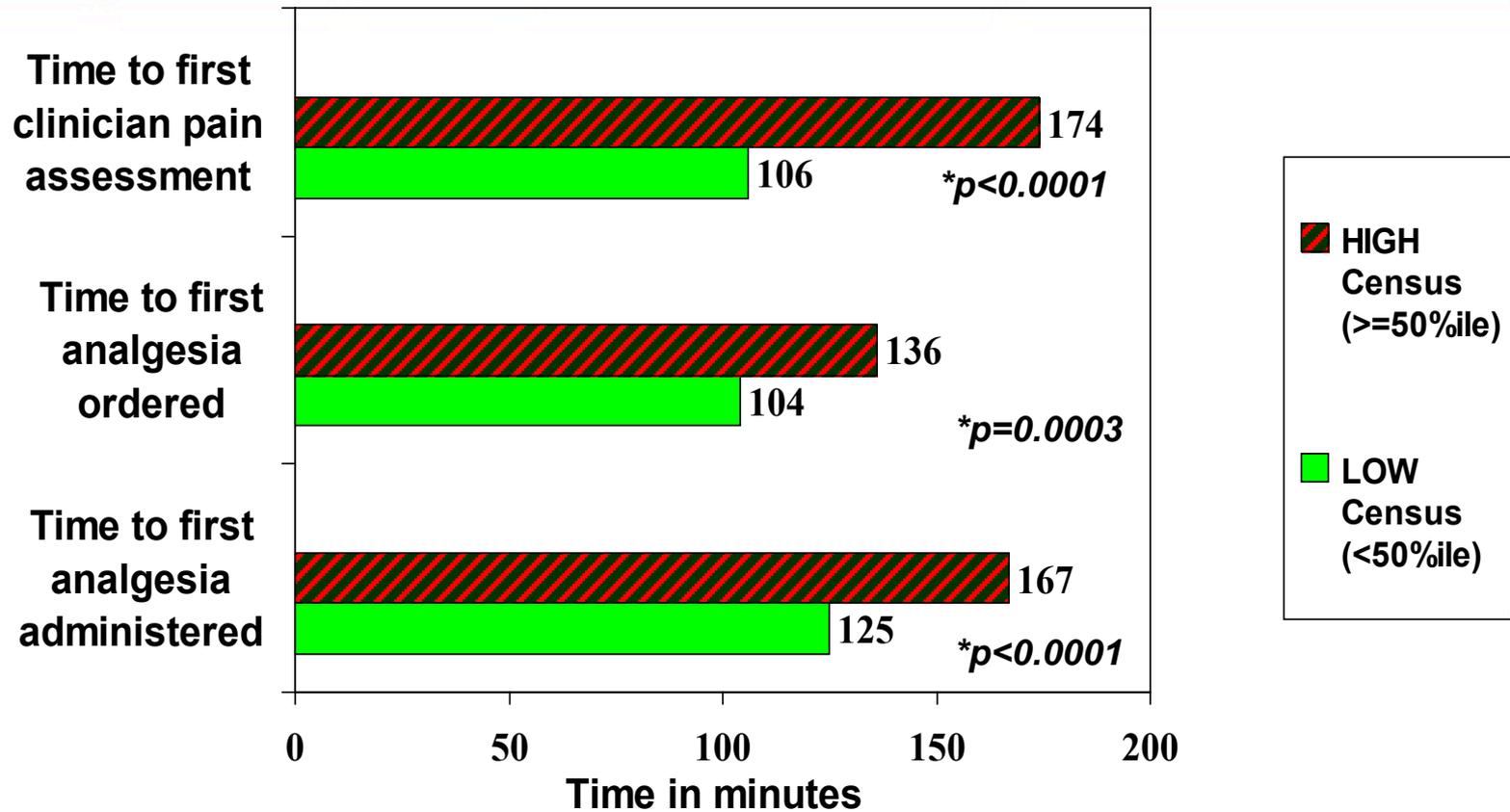
<b>Characteristic</b>	<b>N=1031</b>
ED square footage	4500 sq.ft.
Number of beds available	41
ED census, median=50%ile (iqr)	54 (40, 68)

# ED Census



\*Adjusted for age, gender, race/ethnicity, ESI, comorbidity, number of medications and significant pain

# Pain management times



\*Adjusted for age, gender, race/ethnicity, comorbidity, number medications, and reporting significant pain

# Findings

- Periods of HIGH ED census (above median levels) was associated with less analgesic treatment and significantly longer times to pain assessment and treatment

## Implications

- Identifying factors associated with quality of pain care can help identify and target interventions to improving care for older adults in the ED
- Managing ED volume
  - Interventions to get earlier pain treatment to patients (e.g., FNB for hip fracture patients, nurse initiated analgesics for select conditions)



What about patient-related factors?

# Characteristics of Study Sample

<b>Patient characteristics N=1031</b>	<b>Younger (&lt;65 years) n=813</b>	<b>Older (65-84 year) n=168</b>	<b>Oldest (≥85 years) n=50</b>	<b>p-value</b>
Female	63%	73%	76%	0.02
Race ethnicity				
White	22%	31%	53%	<0.01
Black	32	30	26	
Hispanic	37	33	16	
Other	9	6	5	
Emergency Severity Index, mean SD [1=acute, 5=non-acute],	3.27 (0.65)	3.09 (0.54)	3.00 (0.55)	<0.0001

# Characteristics of Study Sample

<b>Patient characteristics N=1031</b>	<b>Younger (&lt;65 years) n=813</b>	<b>Older (65-84 year) n=168</b>	<b>Oldest (≥85 years) n=50</b>	<b>p-value</b>
Charlson score, mean (SD)	0.70 (1.68)	1.58 (1.82)	1.22 (1.25)	<0.0001
Number of prior meds, mean (SD)	1.77 (2.49)	4.44 (4.16)	5.12 (3.44)	<0.0001
ED pain diagnoses				
Musculoskeletal	25%	42%	44%	<0.0001
Abdominal	47	38	36	
Back	15	5	8	
Fall	1	6	8	
Renal	5	5	0	
Head	7	4	4	

# Characteristics of Study Sample

<b>Patient characteristics N=1031</b>	<b>Younger (&lt;65 years) n=813</b>	<b>Older (65-84 year) n=168</b>	<b>Oldest (≥85 years) n=50</b>	<b>p- value</b>
Difference initial to final pain score, mean (sd)	1.89 (4.45)	0.83 (4.69)	0.20 (4.56)	<0.01
Times to pain assessment, median (iqr)	91 (55,153)	96 (64, 151)	77 (55, 148)	0.42
Time to analgesic administration, median (iqr)	112 (68, 175)	124 (73, 185)	112 (94, 259)	0.35

# Pain Assessment

Pain care	All patients N=1031	Age Category*		
		Younger (<65 years)	Older (65-84 year) OR (95% CI)	Oldest (≥85 years) OR (95% CI)
Documented pain assessment*	92%	Ref	1.19 0.60, 2.33)	1.88 (0.38, 9.25)
Follow-up pain assessment † (excluding those reporting no pain)	41%	Ref	1.09 (0.74, 1.63)	1.16 (0.58, 2.33)

\* Adjusted for comorbidity, number of medications, gender, race/ethnicity, ESI, final diagnoses, and clustering effects of treating clinician

† Adjusting for \* plus degree of pain

# Pain Treatment

Pain care* (excluding those with “no pain”)	All patients N=926*	Age Category		
		Younger (<65 years)	Older (65-84 year) OR (95% CI)	Oldest (≥85 years) OR (95% CI)
Received pain medication (n=515)	61%	Ref	1.28 (0.83, 1.96)	1.15 (0.65, 2.03)
Initially received Opioid	57%	Ref	<b>0.59</b> <b>(0.35, 0.98)</b>	0.81 (0.37, 1.76)
Initially received NSAID	25%	Ref	1.70 (0.91, 3.19)	1.85 (0.68, 5.03)
Initially received nonNSAID	18%	Ref	1.31 (0.73, 2.34)	0.72 (0.25, 2.07)

\* Adjusted for comorbidity, number of medications, gender, race/ethnicity, ESI, final diagnoses, degree of pain & clustering effects of treating clinician

# Pain Treatment

Pain care*	Age Category		
	Younger (<65 years)	Older (65-84 year) OR (95% CI)	Oldest (≥85 years) OR (95% CI)
Initially received NSAID for mild pain (1-3 of 10) (n=180)	Ref	1.42 (0.49, 4.14)	<b>3.72</b> <b>(0.97, 14.24)</b>
Initially receive opioid for moderate to severe pain (4-10 of 10) (n=335)	Ref	<b>0.44</b> <b>(0.22, 0.88)</b>	1.21 (0.41, 3.5)

\* Adjusted for comorbidity, number of medications, gender, race/ethnicity, ESI, final diagnoses & clustering effects of treating clinician

# Findings

- Older adults had lower reduction of pain scores and decreased opioid use
- Trend with preferential use of NSAIDs in the initial treatment of mild pain for older adults

# Implications

- With acute pain, older adults had lower reduction of pain scores and decreased opioid use
- Do these differences represent disparities or inadequate ED pain care?

# Survey Question #4

- What medications do preferentially use to treat acute pain?
  1. Acetaminophen (Tylenol)
  2. NSAIDs
  3. Opioids
  4. Others
  5. None



# What about multicenter studies?

# The Quality of Acute Pain Care for Older Adults in the ED

Multicenter observational study of pain assessment and treatment for adult patients in the ED



# Research Objectives

- Questions:
  1. ED pain care processes:
    - geriatric vs. younger adult patients?
  2. Patient-related characteristics:
    - which ones unique to geriatric patients
    - influence the quality of ED pain care?
- Hypothesis: Pain care is poorer for geriatric patients than for younger patients:
  - ↓ pain assessments
  - ↓ analgesic medications
  - ↓ opioids, ↑ NSAIDs
  - ↓ reduction in pain scores
  - Dependent on type of presenting pain?

# Methods

- Study design:

- Retrospective observational cohort review
- Adult ( $\geq 18$  years age) ED visits
- Chief complaint of pain
- Final diagnosis of abdominal or fracture pain

- Setting:

- Five US EDs
- 2009  
(Jan, Apr, Jul, Oct)



# Methods

- Outcome measures:
  1. ED documentation of initial pain assessment and follow-up
  2. Analgesic medications administered
  3. Reduction in pain scores
- Primary predictor:
  - Age: **young** (18-64 years), **older** (65-84 years), **oldest** ( $\geq 85$  years)
- Covariates:
  - Gender
  - Race/ethnicity
  - Triage severity
  - Initial reported pain
  - Comorbidity
  - Number of medications
  - Clustering by clinician
  - Clustering by site level

# Cohort Characteristics by Age Category

N=6944	Young (<65 years) N=5892 (85%)	Older (65-84 years) N=828 (12%)	Oldest (≥85 years) N=224 (3%)
Female	58%	64%	73%
Race/ethnicity	43%	47%	64%
White	22%	19%	12%
Black	23%	22%	17%
Hispanic	12%	12%	7%
Other/Unknown			
ESI, mean (SD) [1=acute, 5=non-acute]	3.07 (0.53)	2.93 (0.54)	2.73 (0.48)
Number of current medications, mean (SD)	1.95 (3.28)	4.02 (4.08)	4.90 (4.22)
Charlson score, mean (SD)	0.56 (1.40)	1.31 (1.66)	1.38 (1.54)

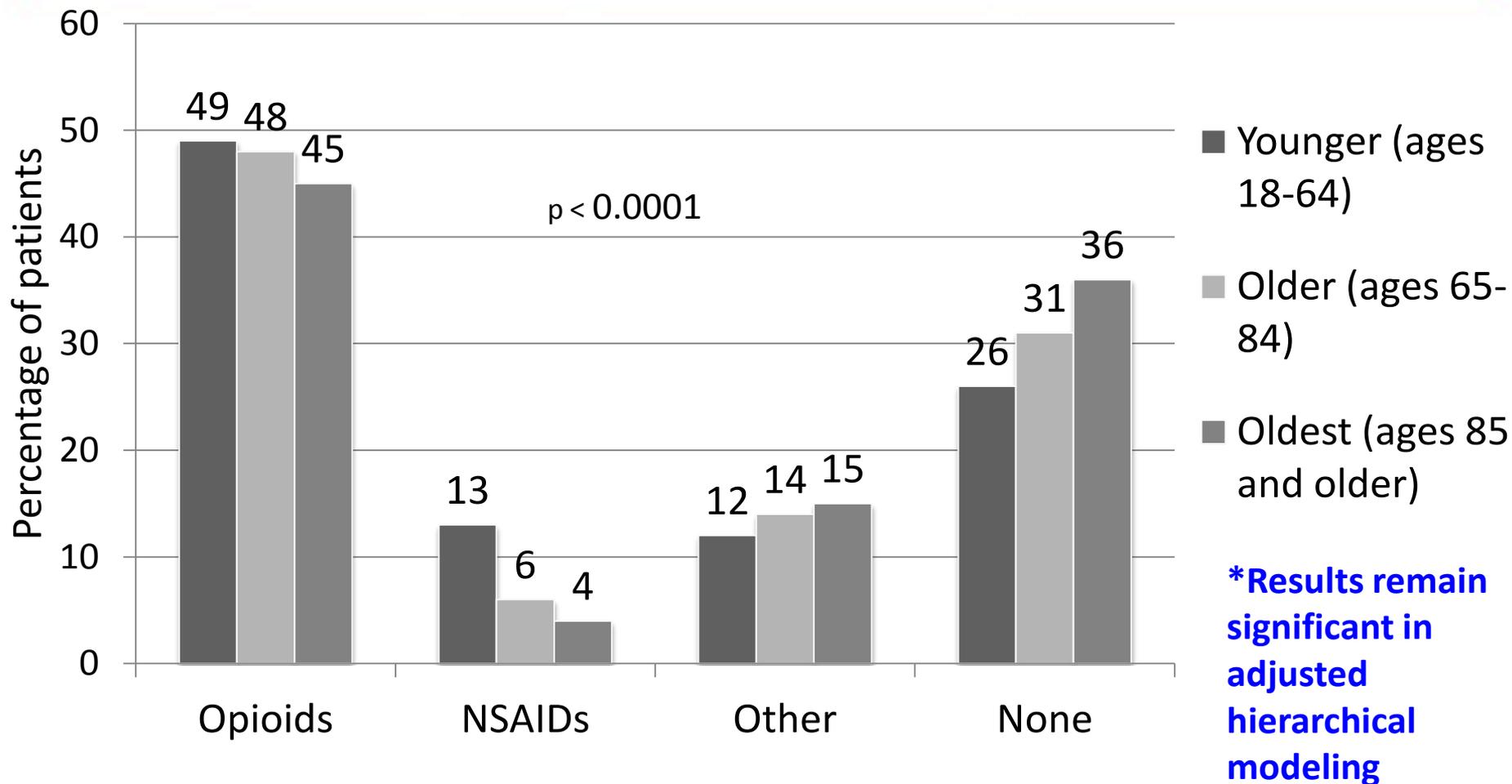
Results in **RED** indicate statistically significant differences ( $p < 0.05$ )

# Results: Pain Care Outcomes by Age Category

	Young (<65 years) N=5892 (85%)	Older (65-84 years) N=828 (12%)	Oldest (≥85 years) N=224 (3%)
N=6944			
Had initial pain assessment documentation, n (%)	5650 (96)	780 (94)	205 (92)
Had any pain assessment documentation, n (%)	5834 (99)	818 (99)	221 (99)
Had follow-up pain documentation, n (%)	5030 (86)	732 (89)	206 (93)
Received analgesia, n (%)	4367 (74)	570 (69)	143 (63)

Results in **RED** indicate statistically significant differences (p<0.05)

# Results: Analgesics Given to Cohort



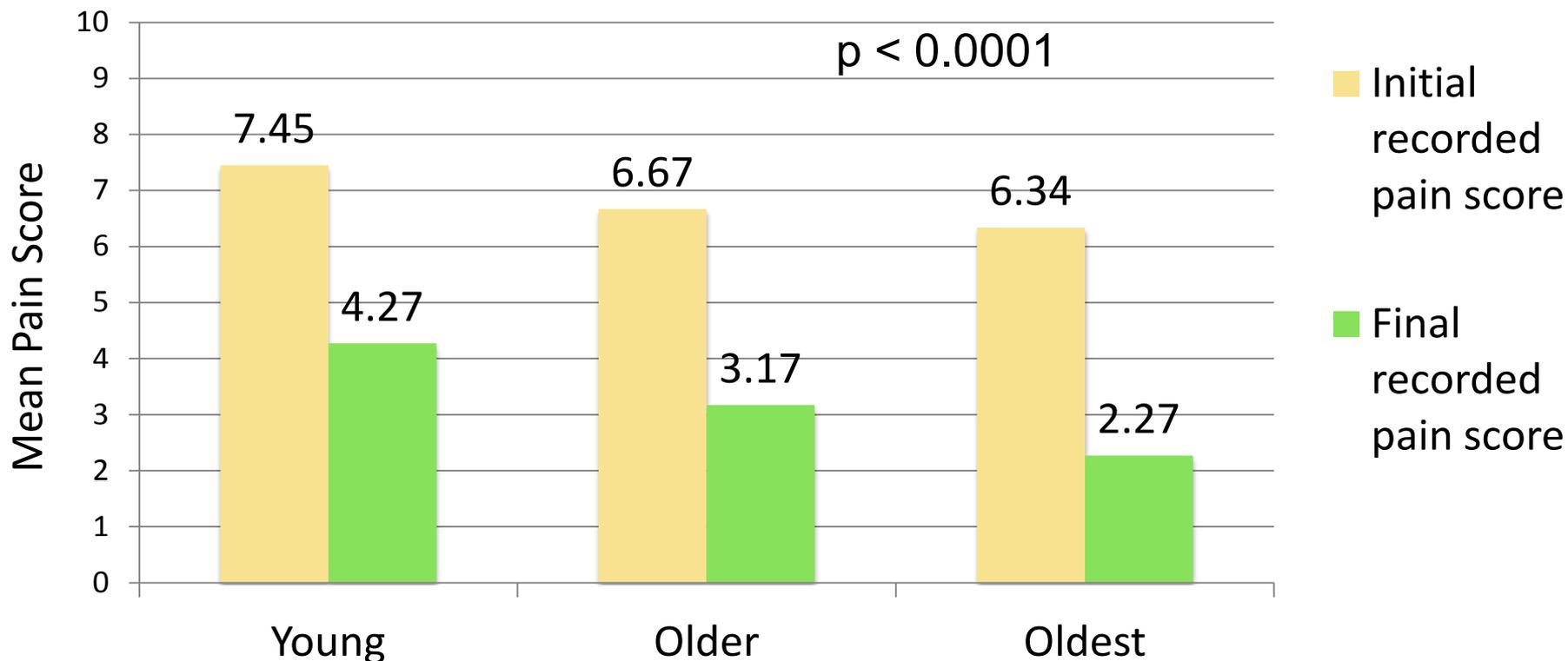
# Results: Initial vs. Final Pain Scores

Reduction in pain score  
(final-initial), mean (SD)

-3.12 (3.56)

-3.42 (3.82)

-3.84 (3.64)



# Results:

## Pain Care Outcomes by Condition and Age Category

N=6944	Fracture N=1720 (25%)			Abdominal Pain N=5224 (75%)		
	Young N=1335 (78%)	Older N=278 (16%)	Oldest N=107 (6%)	Young N=4557 (87%)	Older N=560 (11%)	Oldest N=117 (2%)
Had initial pain assessment documentation, n (%)	1288 (96)	266 (96)	100 (93)	4362 (96)	514 (93)	105 (90)
Had any pain assessment documentation, n (%)	1308 (98)	274 (99)	104 (97)	4526 (99)	544 (99)	117 (100)
Had follow-up pain documentation, n (%)	840 (63)	205 (75)	92 (88)	4190 (93)	527 (97)	114 (97)

Results in **RED** indicate statistically significant differences (p<0.05)

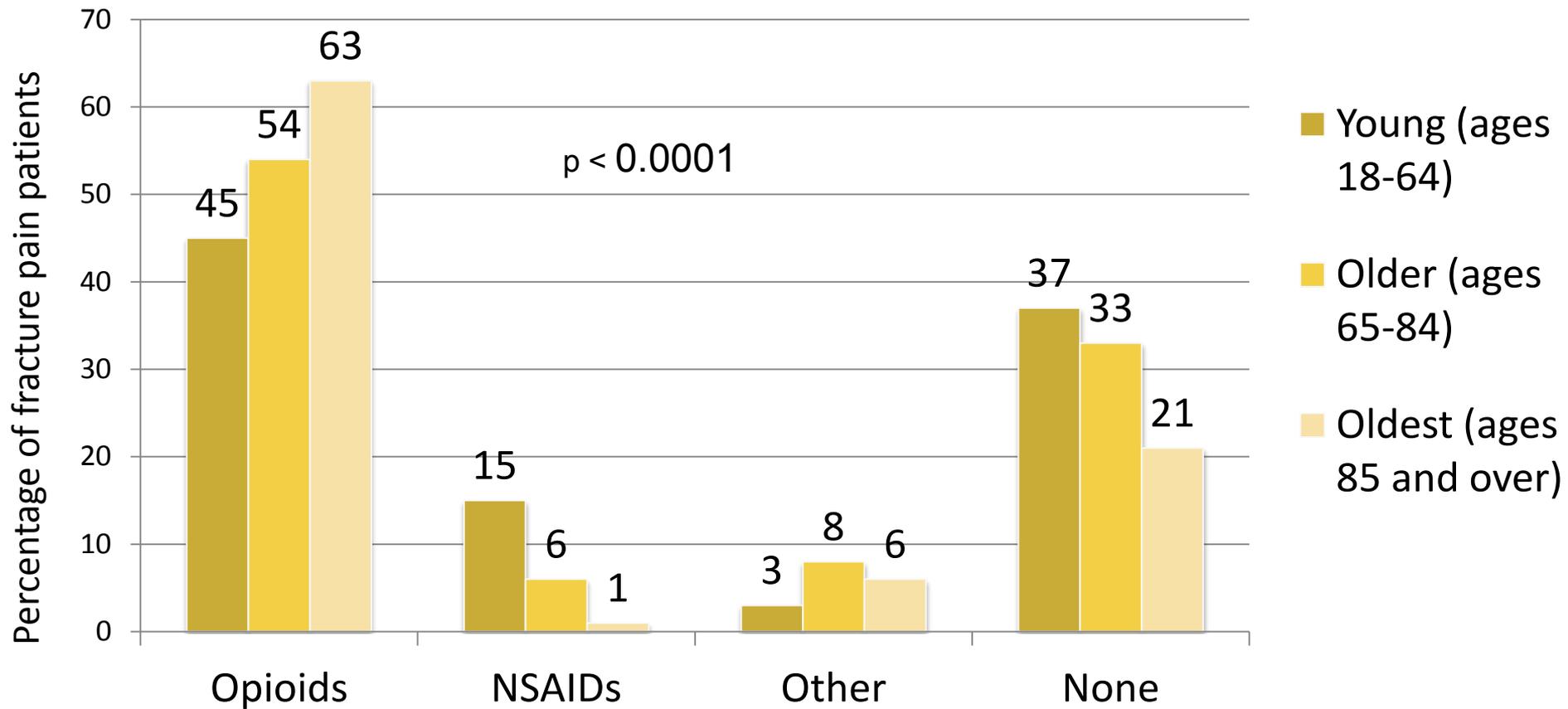
# Results:

## Pain Care Outcomes by Condition and Age Category

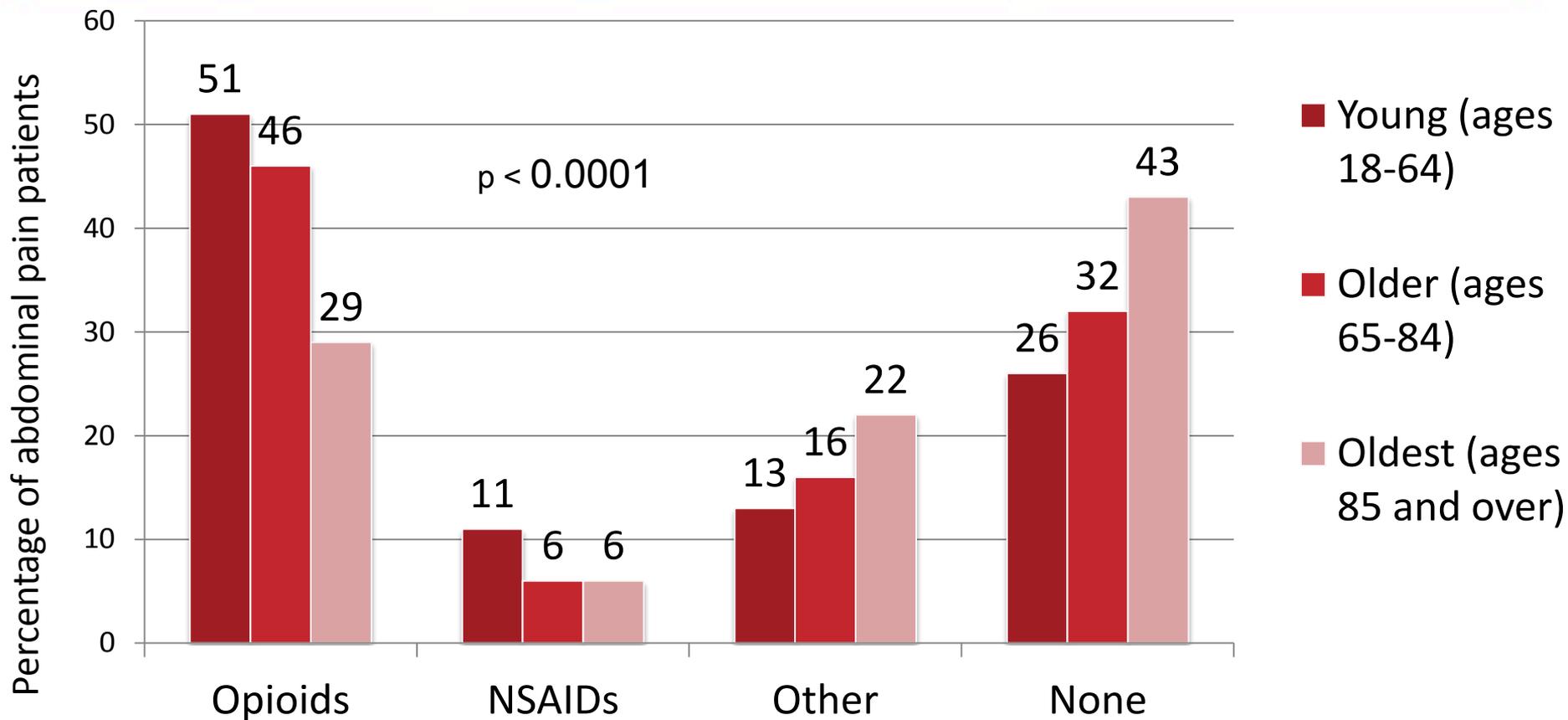
N=6944	Fracture N=1720 (25%)			Abdominal Pain N=5224 (75%)		
	Young N=1335 (78%)	Older N=278 (16%)	Oldest N=107 (6%)	Young N=4557 (87%)	Older N=560 (11%)	Oldest N=117 (2%)
Received analgesic, n (%)	859 (63)	184 (66)	78 (73)	<b>3508 (77)</b>	<b>386 (70)</b>	<b>65 (56)</b>
Reduction in pain score (final–initial), mean (sd)	<b>-1.42 (2.73)</b>	<b>-1.79 (3.32)</b>	<b>-3.64 (3.59)</b>	<b>-3.62 (3.63)</b>	<b>-4.62 (3.79)</b>	<b>-4.03 (3.70)</b>

Results in **RED** indicate statistically significant differences (p<0.05)

# Results: Analgesics Given to Fracture Pain



# Results: Analgesics Given to Abdominal Pain



# Conclusions

- Older adults receive poorer pain care
  - Less likely to receive initial pain assessment
  - Less likely to receive analgesics overall
- Results are dependent on the type of presenting pain
- Overall, older adults had better reduction in pain scores

# Implications

- Could improvement of pain care lead to even greater pain score reductions?
- Why are different types of pain not treated equally?
- What should be the benchmark for pain care quality?

# Survey Question #5 & 6

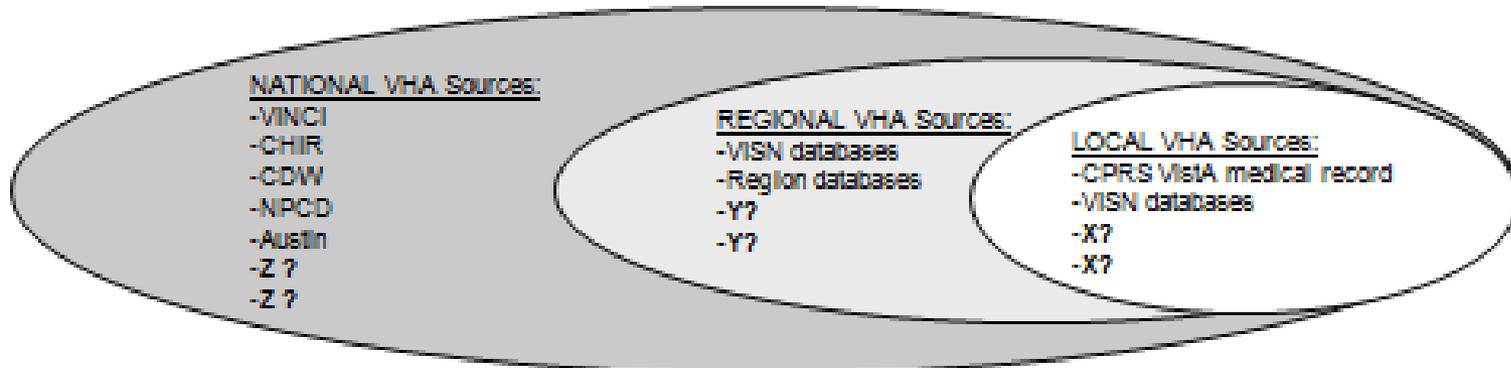
- Have you treated acute pain care in the ED setting?
  1. Yes
  2. No
- If Yes to the above, did you routinely document a pain assessment in your clinical note ?
  1. Yes
  2. No



What about the quality of VA ED pain care?

# Studying Veteran ED Pain Care with an Electronic Pain Care Abstraction Tool

Pilot project assessing the feasibility of collecting Veteran ED pain care data to develop an electronic medical record abstraction technique for pain care data



# Specific Aim 1

To assess the feasibility of extracting process of pain care measures with HUMAN RECORD REVIEW

## Specific Aim 2

To explore sources and types of data required to extract process of pain care measures using ELECTRONIC ABSTRACTION data by:

1. Identifying alternate data sources of VA ED pain care from local (X), regional (Y), and national (Z) VA sources
2. Identifying the data types available (non-structured, semi-structured, structured) and how to efficiently and effectively access them

## Specific Aim 3

- To provide recommendations on improving, modifying, or structuring VA data for accurate and consistent electronic abstraction of process of pain care data
- [Future grant for long-term development of the electronic medical record abstraction instrument]

# Method

## Time:

Randomly selected adult ED visits 2009 at:

## Settings:

- West Haven (10,000 annual ED visits)
- West Los Angeles (25,000 )
- Bronx VA (10,000)

Review of ED CPRS medical records each site

# Method

## Exploration and comparison of alternate data sources:

- Veterans' Informatics, Information & Computing Infrastructure (VINCI)
- Corporate Data Warehouse (CDW)
- VistA Data
- National VHA Data – Austin Automation Center
- National Patient Care Database (NPCD)
- Decision Support System (DSS)

# Results

- 435 randomly selected ED visits reviewed (trained research assistant, 2 investigators)
- 61% involved chief complaint of painful condition
  - 80% of these had pain scores from national database sources
  - Mean score 5.85 (0 – 10 scale)
  - 38% had physician documentation of pain assessment in text note
  - 45% received analgesics
  - Mean time to analgesics 101 min (sd 101)
- By site, significant variation in pain assessment documentation (range 8 to 64%) and receiving analgesics (range 14 to 41%)
- No differences in acute pain care by age, race, gender

# Implications

- Difficulty for natural language processing automated evaluation of pain documentation
- Earlier steps to improve pain assessment in ED setting
- Future (later) steps to then focus on interventions to improve pain treatment

# Summary

- Acute pain care involves both the assessment and treatment of patient pain
- Without pain assessment, we cannot treat the pain
- Acute pain care in the ED setting is influenced by environmental factors and patient-related characteristics
- ED crowding worsens the quality of pain care
- Older adults receive disparate acute pain care
- Differences in pain care based not only on age (surrogate for comorbidities, polypharmacy), but also presenting condition

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- National Institute on Aging
- VA HSR&D

Thank you for your attention!

?'S

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# Beers Criteria

- Consensus based pharmacologic guidelines for older adults
- Defines potentially “*inappropriate use of medications*”
- 53 medications to avoid
- Most recent update in 2012

# Beers Analgesics and Muscle Relaxants to Avoid

- Meperidine (Demerol)
- Non-COX-selective NSAIDs (avoid chronic use)
  - ASA >325md/d
  - **Ibuprophen**
  - **Naproxen**
  - Diclofenac
  - Meloxicam
- ***Ketorolac (Toradol) (GI bleed)***
- Indomethacin (Indocin) (GI bleed)
- Petazocine (Talwin) (Confusion and hallucinations)
- Muscle relaxants/antispasmodics (sedation and risk of fracture)
- Long-acting benzodiazepines
- High-doses of short-acting benzodiazepines
  
- GI ulcers or on anticoagulation, avoid NSAIDS and ASA
- Heart Failure, Stage IV and V chronic kidney disease, avoid NSAIDS
- Cognitive Impairment, falls/fractures avoid benzodiazepines

# Non-Opioid Analgesia

- Acetaminophen
  - Highest safety profile
  - Drug of first choice for mild-moderate pain
- [NSAIDS]
  - Effective for mild-moderate inflammation pain
  - Risk of azotemia, GI toxicity, worsen HTN and CHF for elderly
  - Ceiling effect

# Opioid Analgesia

- Opioids drug of choice for moderate-severe pain
- Mild opioids (e.g. hydrocodone) as 2<sup>nd</sup> line
- Stronger opioids (e.g. morphine, hydromorphone) as 3<sup>rd</sup> line
- *Avoid:*
  - Meperidine
  - Codeine (delirium, hip fracture, cognitive fx.)