

Vince Gemma
PGY 4
Dept of Surgery

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Outline

Data Report
 Emergence of Heteromorphisms
 Hierarchy of Subsystems and Trauma
 Impact of Maltreatment



Impact of Meth Today

Impact of Meth Today

Next Steps

Questions?

Impact of Methamphetamine Abuse and Trauma

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Outline

- Case Report
- Emergence of Methamphetamine
- History of Substances and Trauma
- Impact of Meth Today
- Next Steps

Case Report



- Not found in T_H
- Poor CTL imaging - negative
- Self stimulation
- CD80/86 co-stimulatory
- Thrombo cyto
- Leukemia KIM



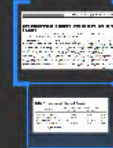
Emergence of Methamphetamines



History of Substance Abuse and Trauma



Impact of Meth Today



Next Steps



Outline

Case Report

Emergence of Methamphetamines

History of Substances and Trauma

Impact of Meth Today

Next Steps

Impact of Methamphetamine Abuse and Trauma

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Outline

- Case Report
- Epidemiology of Methamphetamine
- History of Substances and Trauma
- Impact of Meth Today
- Need Sleep

Case Report



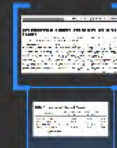
- Inhibitor in IT
- Fast CT imaging: Angiogram
- Self calibration
- Edge detection
- Thresholding
- Linear AHA



Emergence of Methamphetamines



Impact of Meth Today



History of Substance Abuse and Trauma



Next Steps



Report



54M

SW to L Scapula, ? Head injury

- Intubated in TB
- Pan CT imaging- negative
- Self extubation
- C-Spine clearance
- Threat to staff
- Leaves AMA

54M

SW to L Scapula, ? Head injury

- Intubated in TB
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ANOTHER SELF-EXTUBATION?!

COME ON GUYS!

54M

SW to L Scapula, ? Head injury

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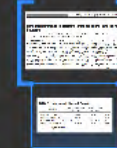
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- Poor CD4 imaging - negative
- Self stimulation
- Different cytokines
- Thrombocytosis
- Leucopenia



Emergence of Methamphetamines



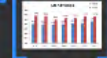
Impact of Meth Today



History of Substance Abuse and Trauma



Next Steps



Origins of Methamphetamine

1887 Germany:
Amphetamine

1893 Japan:
Methamphetamine

Tx asthma, hayfever

Military Use



Meth: Military Advantage

Stimulant Utility

- Alertness
- Endurance
- Decrease Hunger



<http://www.drugfreeworld.org/drugfacts/crystalmeth/history-of-methamphetamine.html>



Meth: Military Advantage

Stimulant Utility

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<http://www.drugfreeworld.org/drugfacts/crystalmeth/history-of-methamphetamine.html>

Methamphetamine Intoxication

Symptoms

- Diaphoresis
- HTN
- Tachycardia
- Psychosis
- Hyperthermia



Adverse (negative) effects of Methamphetamine

Psychological

- Insomnia
- Aggressive behavior
- Paranoia
- Incessant conversations
- Decreased appetite
- Increased alertness
- Irritability
- Slurred speech
- Dizziness
- Confusion
- Hallucinations
- Obsessive behaviors
- Depression
- Panic attacks

Systemic

- Hyperthermia
- Malnutrition
- Impaired immune system

Circulatory

- High blood pressure
- Vessel damage in brain
- Clotting and stroke

Heart

- Chest pain
- Rapid heart rate
- Heart attack

Liver

- Damage

Eyes

- Dilated pupils

Mouth

- Grinding of teeth

Skin

- Sweating
- Numbness

Respiratory

- Shortness of breath

Muscular

- Jerky movements
- Increased activity
- Convulsions
- Loss of coordination

Kidneys

- Damage



Meth Intoxication: Treatment Principles

- Control symptoms
 - HTN, BP
 - Psychosis, Agitation
 - Hyperthermia
- Withdrawal
 - Hypersomnia
 - Depression



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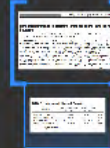
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Emergence of Methamphetamines



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History of Substance Abuse and Trauma



Next Steps



History of Substance Abuse and Trauma

ALCOHOL

METHAMPHETAMINE

COCAINE

MARIJUANA

BATH SALTS



Alcohol Withdrawal Syndrome: Turning Minor Injuries Into a Major Problem

Michael R. Bard, MD, FACS, Claudia E. Goettler, MD, FACS, Eric A. Toschlog, MD, FACS, Scott G. Sagraves, MD, FACS, Paul J. Schenarts, MD, FACS, Mark A. Newell, MD, FACS, Mark Fugate, MD, and Michael F. Rotondo, MD, FACS

Background: Abrupt cessation of chronic drinking patterns places hospitalized patients at risk for alcohol withdrawal syndrome (AWS). The purpose of this study was to investigate the effect of AWS on length of stay, morbidity, mortality, and cost in low injury acuity trauma patients.

Methods: A retrospective review of the National Trauma Registry of the American College of Surgeons database from July 1999 to February 2004 was performed. All patients 15 years or older admitted to our Level I trauma center with an Injury Severity Score (ISS) <16 were included. AWS patients were compared

with those without AWS. Demographics, mechanism of injury (MOI), ISS, revised trauma score, Glasgow Coma score, hospital course, morbidity, requirement of additional procedures, mortality, and cost were compared. Analysis was done with χ^2 test and Student's *t* test. A *p* value of ≤ 0.05 determined significance.

Results: Of 6,431 patients, 55 (0.9%) developed AWS. AWS patients were likely men ($p < 0.001$); had a higher ISS ($p = 0.001$) and lower Glasgow Coma score ($p = 0.01$); had more ventilator days ($p = 0.008$), intensive care unit days ($p < 0.0001$), and hospital days ($p < 0.0001$);

suffered more complications, including respiratory failure ($p < 0.0001$), pneumonia ($p < 0.0001$), urinary tract infection ($p = 0.0005$), sepsis ($p < 0.0001$), tracheostomy ($p < 0.0001$), and percutaneous endoscopic gastrostomy ($p < 0.0001$); and had higher cost ($p < 0.0001$). Mortality was similar ($p = 0.38$) among groups.

Conclusions: Low injury acuity patients with AWS have increased morbidity, leading to increased hospital stay and cost. To allow minor injuries to remain minor problems, the best modality to identify patients at risk and to achieve AWS prophylaxis require further investigation.

J Trauma. 2006;61:1441-1446.

Table 2 Hospital Course, Morbidity, Mortality, and Cost Data Between Groups

	AWS (n = 55)	No AWS (n = 6,376)	p
LOS	15.85 ± 16.37	4.85 ± 6.44	<0.0001*
ICU days	7.58 ± 6.07	3.30 ± 6.11	<0.0001*
Ventilator days	6.79 ± 10.08	3.47 ± 9.18	0.008*
Respiratory failure	13 (23.6%)	87 (1.4%)	<0.0001†
Pneumonia	10 (18.2%)	73 (1.1%)	<0.0001†
Urinary tract infection	5 (9.1%)	114 (1.8%)	0.0005†
Sepsis	4 (7.3%)	19 (0.3%)	<0.0001†
Acute renal failure	0 (0.0%)	14 (0.2%)	NS
Tracheostomy	7 (12.7%)	71 (1.1%)	<0.0001†
PEG	7 (12.7%)	55 (0.9%)	<0.0001†
Death	2 (3.6%)	85 (1.3%)	NS
Hospital charges	\$45,999 ± \$41,487	\$14,565 ± \$22,386	<0.0001*
Hospital cost	\$28,035 ± \$24,631	\$10,169 ± \$13,409	<0.0001*

All categories shown as mean ± standard deviation or number (%). Standard deviations are based on mean results for each category.

* Statistical significance determined using Student t test.

† Statistical significance determined using χ^2 analysis.

AWS, alcohol withdrawal syndrome; LOS, length of stay; ICU, intensive care unit; PEG, percutaneous endoscopic gastrostomy.

Alcohol Screening and Brief Intervention (SBI) for Trauma Patients

COT Quick Guide



Alcohol Screening and Brief Intervention in Trauma Centers: A Simple Three-Step Process



Step 1

Screen Patients

Screening for alcohol use identifies whether patients' drinking places them and others at risk and hence warrants brief interventions. Some screening instruments can also provide information about the severity of patients' problems and the likelihood of their being dependent on alcohol. This information is essential to delivering an appropriate intervention. If not obtained during screening, it can be acquired during the intervention itself.



Step 2

Conduct Brief Intervention



Step 2

Conduct Brief Intervention

In trauma centers, brief interventions capitalize on the fact that patients' injuries help motivate behavior change. Most people undergoing behavior change do not require formal treatment. Brief interventions are a way to help this large group of patients reduce or eliminate their at-risk drinking. Brief interventions typically use three components.

- a. **Information or feedback** about screening results, BAC upon admission, the link between drinking and injury, guidelines for low-risk alcohol consumption, methods for reducing or stopping drinking, etc.
- b. **Understanding the patient's view of drinking and enhancing motivation.** This part of the intervention encourages patients to think about and express how drinking may have contributed to their injury, what they like and dislike about their current drinking pattern, and how they might want to change to reduce their risks. This process engages patients in the conversation so that they can come to their own decisions about drinking.
- c. **Clear and respectful professional advice** about the need to reduce risk by cutting down or quitting drinking and to avoid high-risk alcohol-related situations. The patient/clinician interaction is also likely to require negotiating between what the clinician thinks is best and what the patient is willing and able to do. The optimal result is for patients to establish and articulate their own goals and a plan to achieve them.

to require negotiating between what the clinician thinks is best and what the patient is willing and able to do. The optimal result is for patients to establish and articulate their own goals and a plan to achieve them.

Step 3

Follow Up

Research indicates that patient outcomes improve when some follow up is provided. Trauma centers with sufficient resources can consider:

- Providing follow-up visits or telephone contact to reinforce the intervention.
- Recommending that patients consult their primary care providers or hospital specialists.
- Discussing options for additional services as needed, such as Alcoholics Anonymous or a local treatment organization.

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- Impact of Meth Today
- Need Sleep

Case Report



- 54M
- Sixty L Scorpions / Hourly try
- Not found in TE
- Poor CT imaging - irregular
- Self extinction
- Ejected vicariously
- Threat to staff
- Lowers KMA



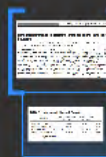
Emergence of Methamphetamines



History of Substance Abuse and Trauma



Impact of Meth Today



Next Steps



The Rise of Meth



Fastest rising drug of abuse worldwide

4.7 million Americans have used meth

Prolonged addiction, severe relapse

Difficulty in treatment and recovery

Methamphetamines in Trauma: Effect on Injury Patterns and Outcome

Pantelis Hadjizacharia, MD, Donald J. Green, MD, David Plurad, MD, Linda S. Chan, PhD, Kenji Inaba, MD, Ira Shulman, MD, and Demetrios Demetriades, MD, PhD, FACS

Background: The association of methamphetamine exposure and outcomes after trauma is not known.

Methods: This study included trauma patients who underwent alcohol and illicit drug screening. Patients who had a screen positive for Methamphetamine only [METH (+)] were compared with patients with a completely negative screen for illicit drugs or alcohol [TOX (-)]. Patients with polysubstance or alcohol abuse were excluded. Logistic regression was used to determine whether

METH (+) status was independently associated with injury patterns or outcomes. Associations were further evaluated by patient matching with respect to age, gender, mechanism, injured body area abbreviated injury scores, and injury severity.

Results: There were 5,372 patients eligible where 526 (9.8%) were METH (+). On multivariate analysis, the METH (+) group had a significantly higher adjusted rate of intensive care unit (ICU) admission but there was no difference in mortality or complications or ICU stay.

On matching, there was no difference in mortality (11.1% vs. 10.9%, $p = 0.87$), complication rate (5.6% vs. 4.2%, $p = 0.40$), and lengths of ICU and hospital stay but the METH (+) group had a higher rate of laparotomy.

Conclusion: Patients exposed to Methamphetamines do not have increased mortality or complications or lengths of ICU and hospital stay. However, they are more likely to require admission to the ICU.

Key Words: Methamphetamines, Trauma, Outcome.

Table 4 Outcomes of Matched Patients

Variable	Methamphetamine (n = 431)	Nonintoxicated (n = 431)	<i>p</i>
Mortality, % (n)	11.1 (48)	10.9 (47)	0.87
ICU Admission, % (n)	25.3 (109)	22.7 (98)	0.32
ICU LOS, mean $\pm$ SD	6.7 $\pm$ 6.7	7.9 $\pm$ 9.4	0.10
Hosp LOS, mean $\pm$ SD	7.5 $\pm$ 10.8	7.8 $\pm$ 13.6	0.45

LOS, length of stay.

The Scourge of Methamphetamine: Impact on a Level I Trauma Center

Sophia M. Swanson, BA, C. Beth Sise, JD, MSN, RN, Michael J. Sise, MD, Daniel I. Sack, BA, Troy Lisa Holbrook, PhD, MS, and Gabrielle M. Paci, BA

Background: Methamphetamine (METH) use is associated with high-risk behavior and serious injury. The aim of this study was to assess the impact of METH use in trauma patients on a Level I trauma center to guide prevention efforts.

Methods: A retrospective registry-based review of 4,932 consecutive trauma patients who underwent toxicology screening at our center during a 3-year period (2003–2005). This sample represented 76% of all trauma patients seen during this interval.

Results: From the first half of 2003 to the second half of 2005, overall use of METH increased 70% ($p < 0.001$), surpassing marijuana as the most common illicit drug used by the trauma population. Other illicit drug use did not significantly change during this interval.

METH-positive patients were more likely to have a violent mechanism of injury (47.3% vs. 26.3%, $p < 0.001$), with 33% more assaults ($p < 0.01$), 96% more gunshot wounds ($p < 0.001$), and 158% more stab wounds ($p < 0.001$). They were more likely to have attempted suicide (4.8% vs. 2.6%, $p < 0.01$), to have had an altercation with law enforcement (1.8% vs. 0.3%, $p < 0.001$), or been the victim of domestic violence (4.4% vs. 2.1%, $p < 0.001$). METH users had a higher mean Injury Severity Score (11.2 vs. 10.0, $p < 0.01$), were 62% more likely to receive mechanical ventilation ($p < 0.001$), and 53% more likely to undergo an operation ($p < 0.001$). They were more prone to leave against medical advice (4.9% vs. 2.1%, $p < 0.001$) and 113% more likely to die from their injuries (6.4% vs. 3.0%, $p <$

0.001). The average cost of care per METH user was 9% higher than that for nonusers, and METH users were more likely to be unfunded than nonusers (47.6% vs. 23.1%, $p < 0.001$). The annual uncompensated cost of care of METH users increased 70% during the study period to \$1,477,108 in 2005.

Conclusion: METH use in trauma patients increased significantly and was associated with adverse outcomes and a significant financial burden on our trauma center. Evidence-based prevention efforts must be a priority for trauma centers to help stop the scourge of METH.

Key Words: Trauma centers, Methamphetamine, Drug abuse and injury, Screening and brief intervention, Injury prevention.

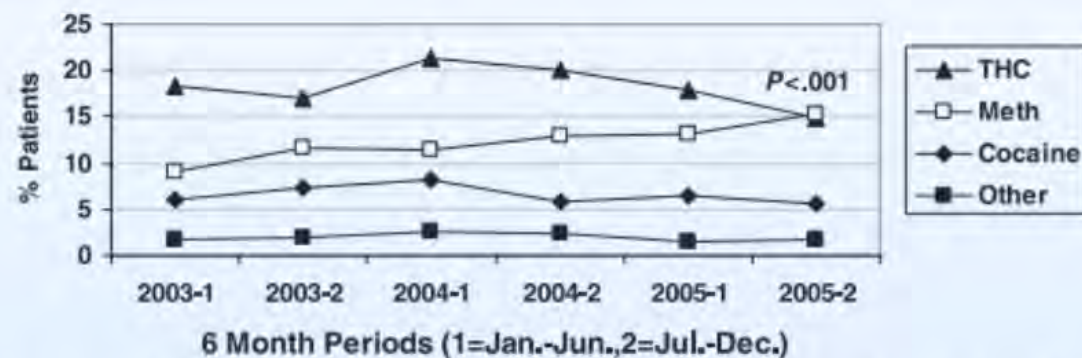


Fig. 1. Rates of positive drug test results. METH use increased significantly ($p < 0.001$). Despite variations, there was no significant increase in other drugs.

Table 2 Odds Ratios (ORs) and 95% Confidence Intervals (CIs) for the Association of METH Use With Mechanism of Injury, Clinical Course, and Outcomes

Variable	METH (+) (n = 609) (%)	METH (-) (n = 4,323) (%)	Unadjusted OR	95% CI	Adjusted OR*	(95% CI)
Violence	47	26	2.5 [†]	2.1–3.0	2.0 [†]	(1.6–2.4)
Suicide	5	3	1.9 [†]	1.2–2.9	1.7 [§]	(1.1–2.6)
Law enforcement involved	2	0.3	5.7 [†]	2.6–12.5	4.8 [†]	(2.1–10.8)
Domestic violence	4	2	2.2 [†]	1.4–3.3	2.5 [†]	(1.6–3.9)
Surgery	29	19	1.7 [†]	1.4–2.1	1.5 [†]	(1.2–1.9)
Mechanical ventilation	21	13	1.7 [†]	1.4–2.2	1.6 [†]	(1.3–2.1)
Mortality	6	3	2.2 [†]	1.5–3.2	2.3 [†]	(1.5–3.7)
Left against medical advice	5	2	2.4 [†]	1.6–3.7	2.2 [†]	(1.4–3.3)

* Adjusted OR was adjusted for other drugs, ISS, age, and sex. Results did not materially change when alcohol was added to the models.

[†] $p < 0.001$.

[‡] $p < 0.01$.

[§] $p < 0.05$.

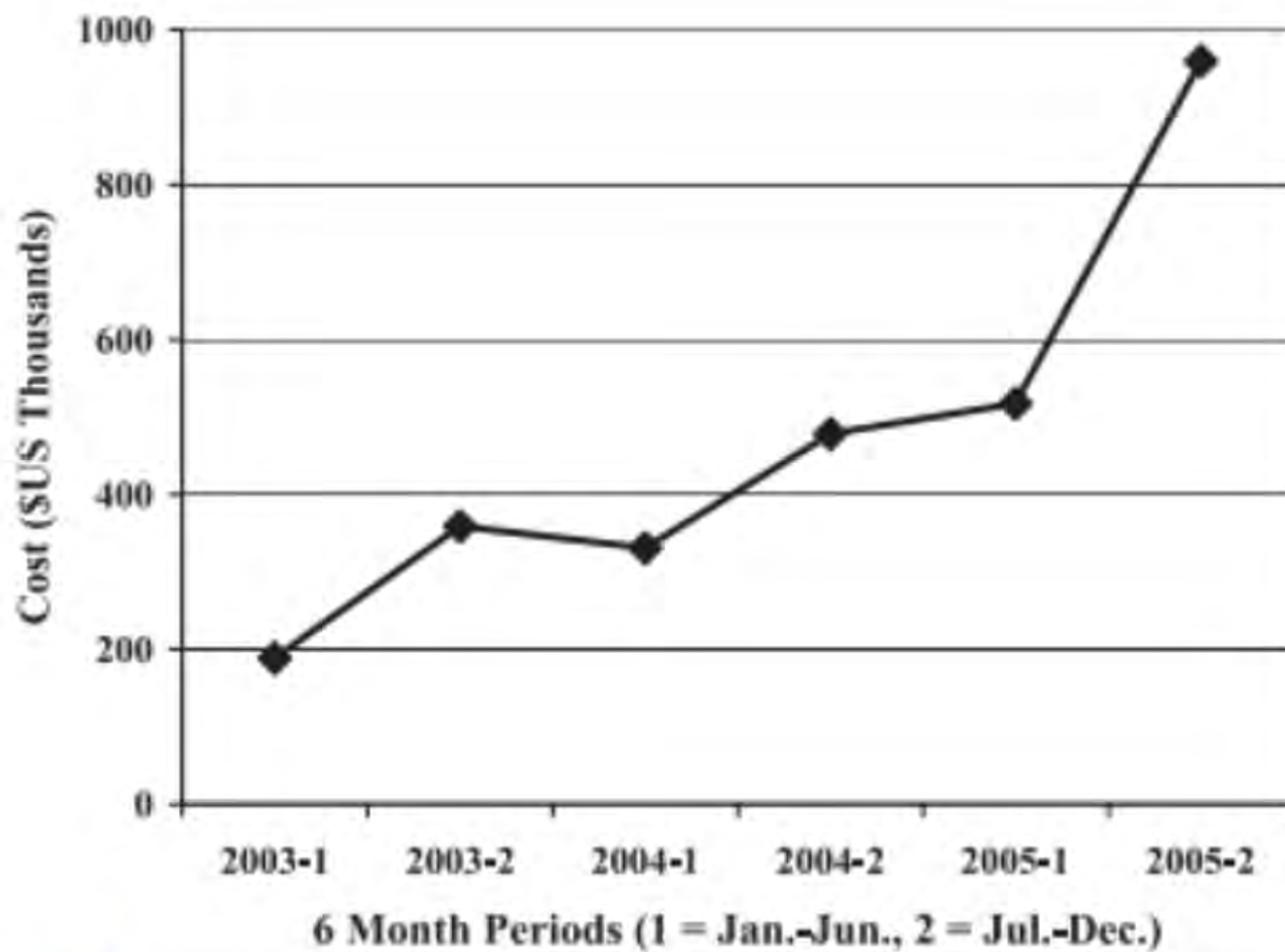


Fig. 2. *Increasing uncompensated cost of care of METH users at our Level I trauma center.*

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- Impact of Meth Today
- Need Sleep

Case Report



- 54M
- Sixty L Scorpions / Hourly try
- Infrared in TV
- Four CT imaging - regular
- Self extinction
- Eighteen video shot
- Three to staff
- Learn KMA



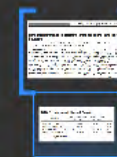
Emergence of Methamphetamines



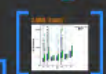
History of Substance Abuse and Trauma



Impact of Meth Today



Next Steps



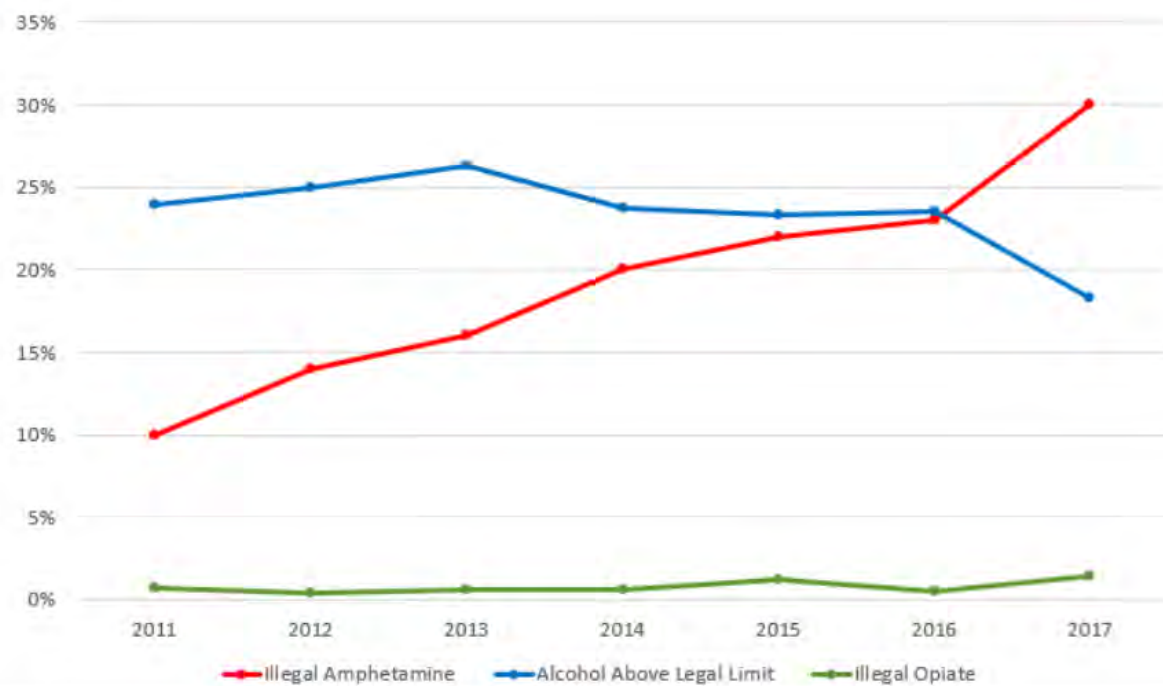
Our Institution...



- Level 1 Trauma
- 7678 patients
- 2011-2017
- Outcomes?
 - Meth vs. Non-meth

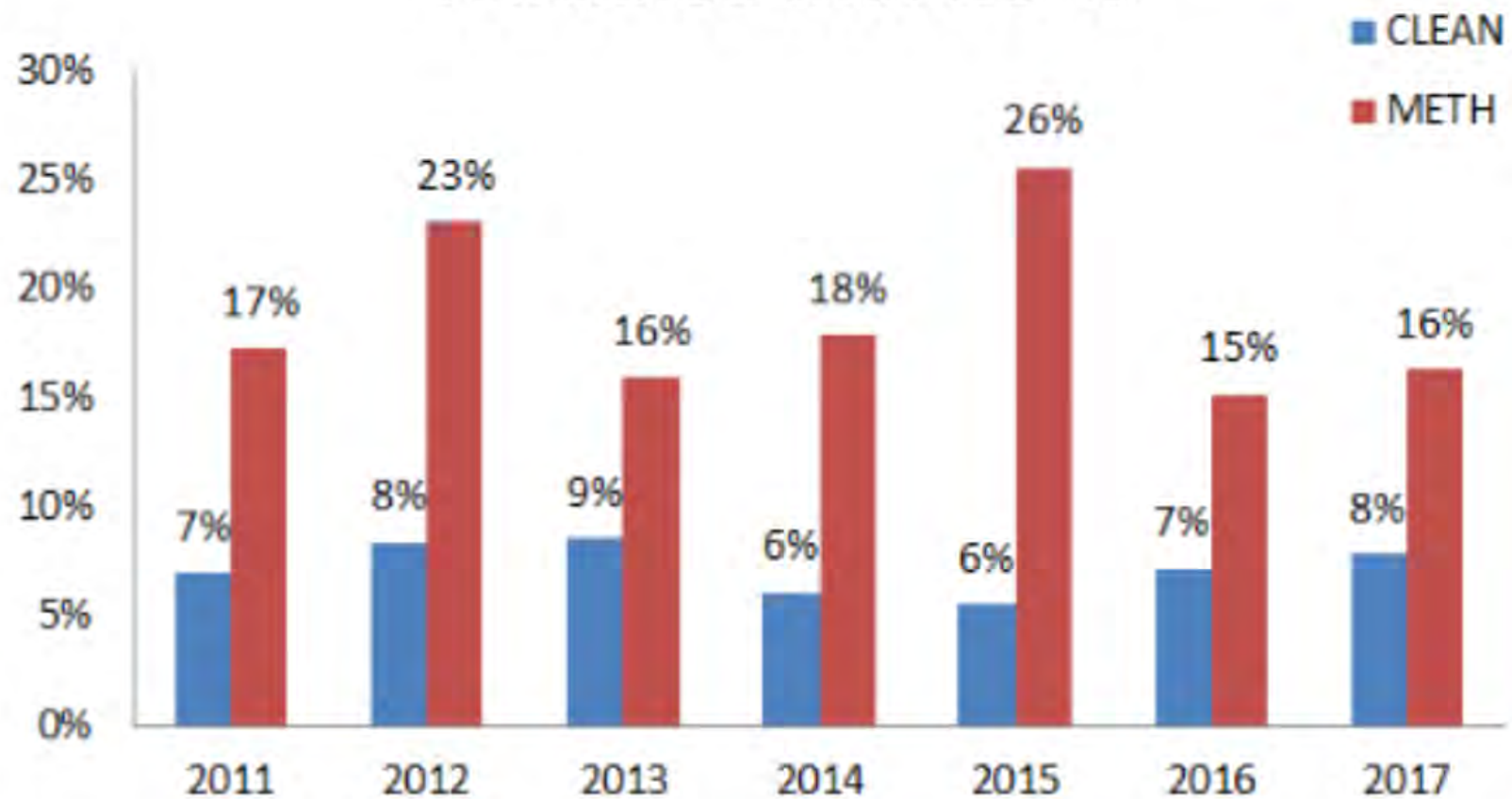
SJHMC Trauma

Illicit Drug and Alcohol Use by Fiscal Year Among St. Joe's Trauma Admissions

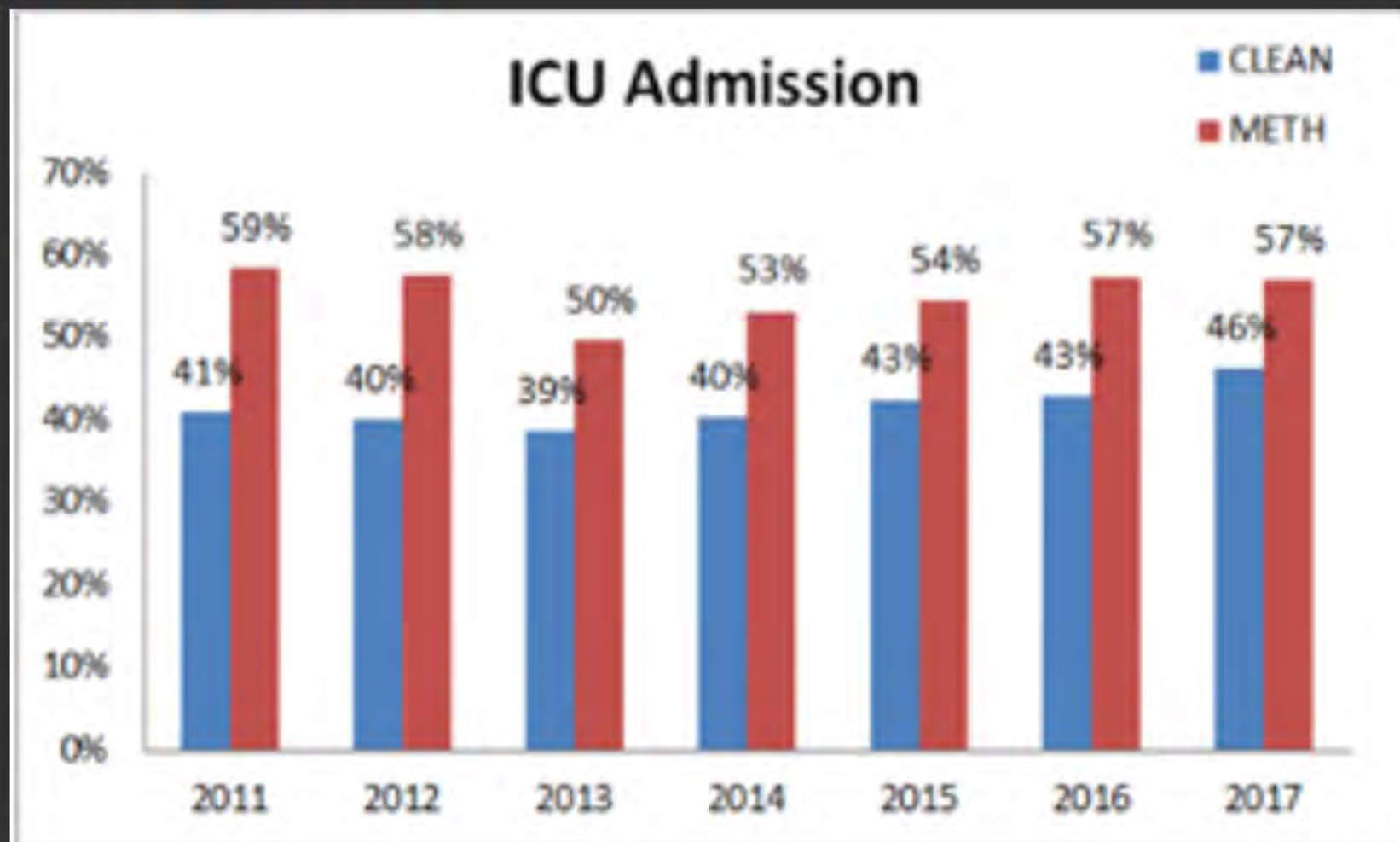


SJHMC Trauma

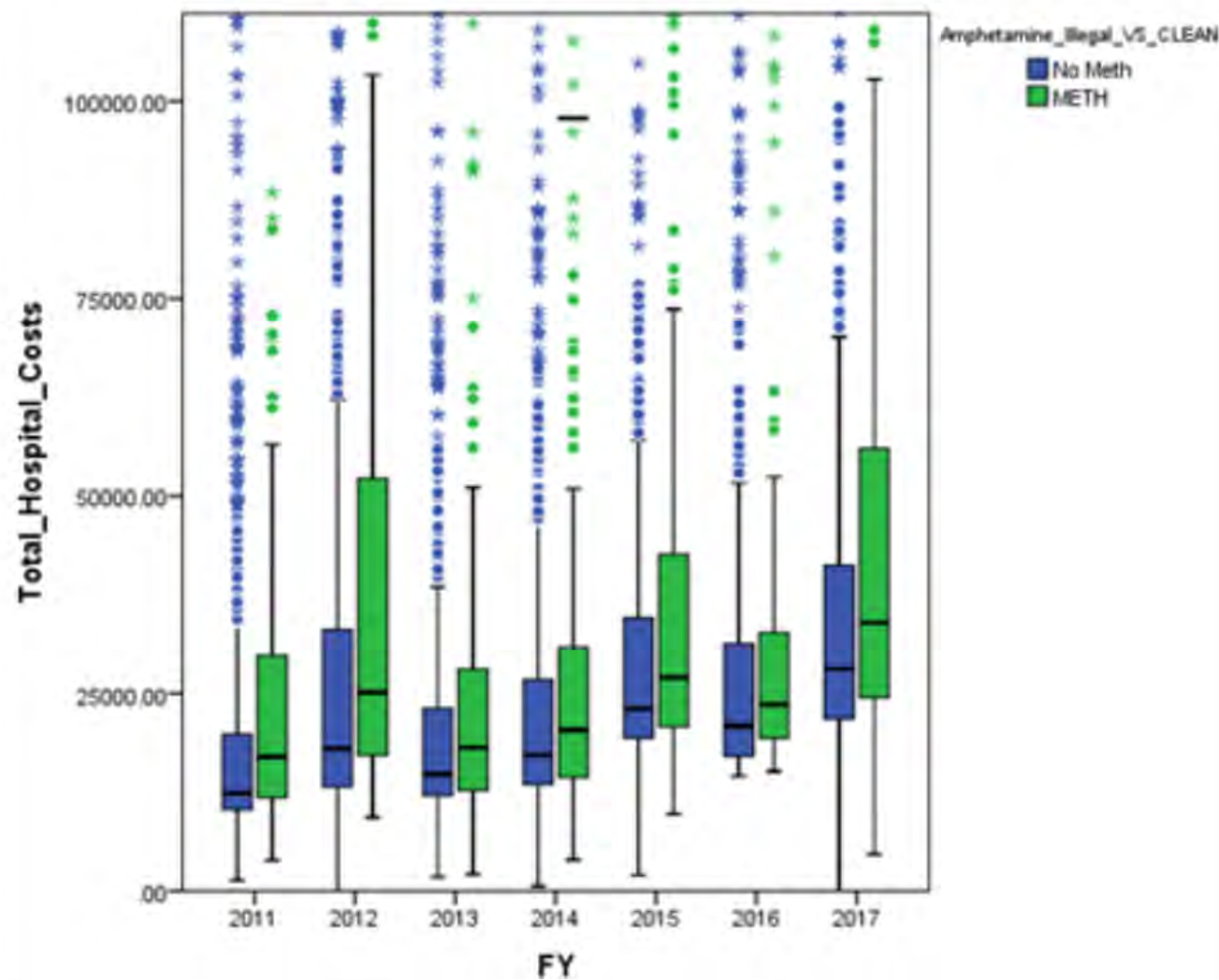
Ventilated with ISS <9



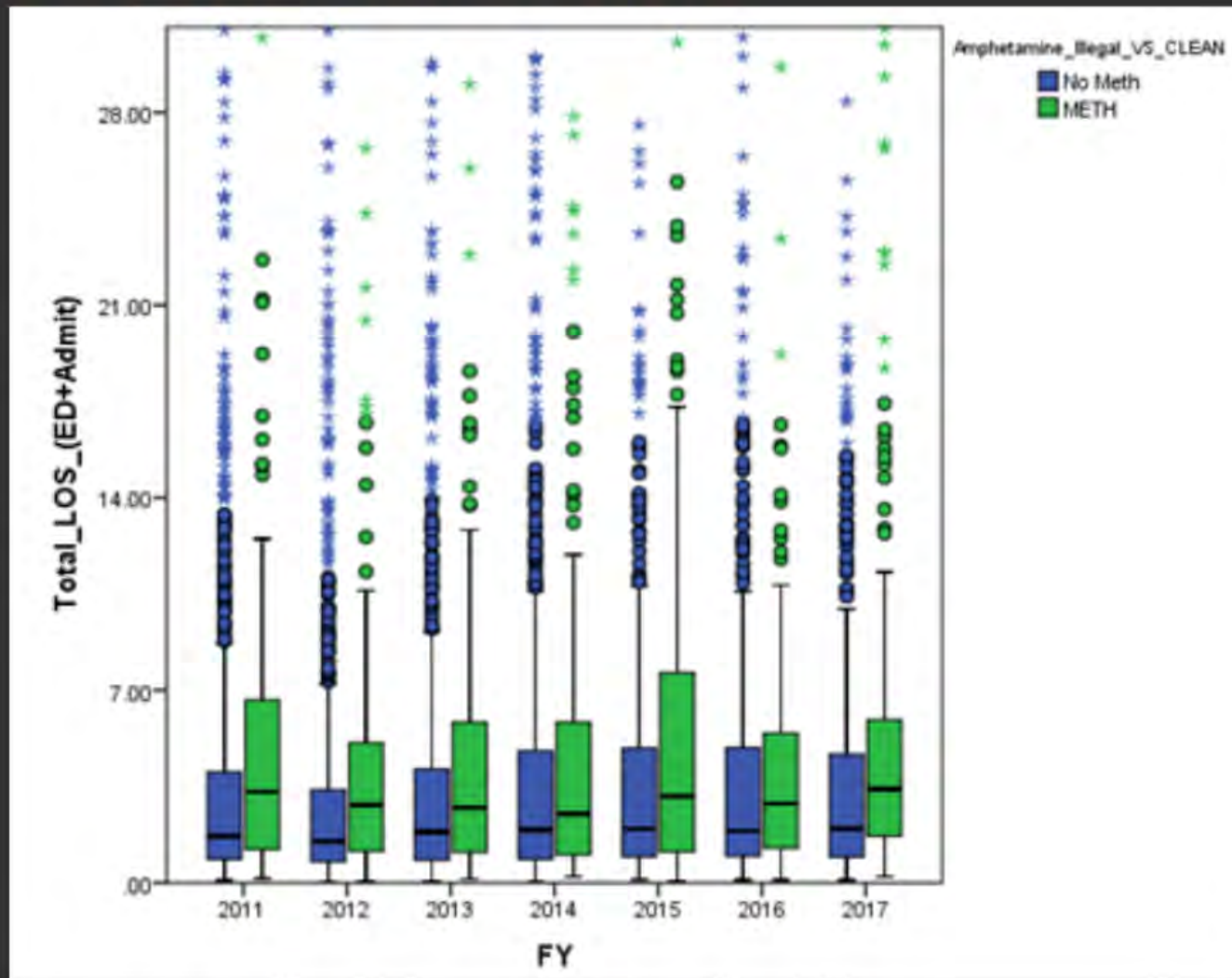
SJHMC Trauma



SJHMC Trauma



SJHMC Trauma



Moving forward...

- Addressing a growing problem
- Screening
- Intervention
- Care



Impact of Methamphetamine Abuse and Trauma

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- Noot Sleeps

Case Report



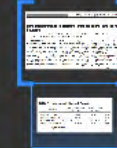
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Emergence of Methamphetamines



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History of Substance Abuse and Trauma



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Questions?

