

# Predicting Abnormal Urine Drug Testing in Patients on Chronic Opioid Therapy

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## BACKGROUND

The American Pain Society and the American Academy of Pain Medicine Guidelines for the Use of Chronic Opioid Therapy (COT) in Chronic Noncancer Pain state "In patients who are on COT who are at high risk or who have engaged in aberrant drug-related behaviors, clinicians should periodically obtain urine drug screens. In patients on COT not at high risk and not known to have engaged in aberrant behaviors, clinicians should consider periodically obtaining urine drug screens" (Chou et al., 2009). Several retrospective studies demonstrated that physicians are often unable to accurately assess the likelihood of drug misuse, abuse or diversion in patients on COT. In a study investigating urine drug toxicology results in 122 patients receiving chronic opioids over a three year period, aberrant drug-related behaviors were discordant with urine toxicology. Twenty seven percent of patients with no behavioral issues had an illicit or non-prescribed controlled substance in their urine (Katz & Fanciullo, 2002). Michna (2007) reported on 470 patients where 45% were found to have an illicit drug, a non-prescribed controlled substance, or the absence of the prescribed medication. No clear predictors of abnormal drug screens were identified based on the variables of gender, pain site, type of opioid, opioid dose, number of opioids prescribed, or prescribing physician.

## PURPOSE

This study was designed to assess how accurately clinicians can predict which patients on COT will have abnormal urine drug test results.

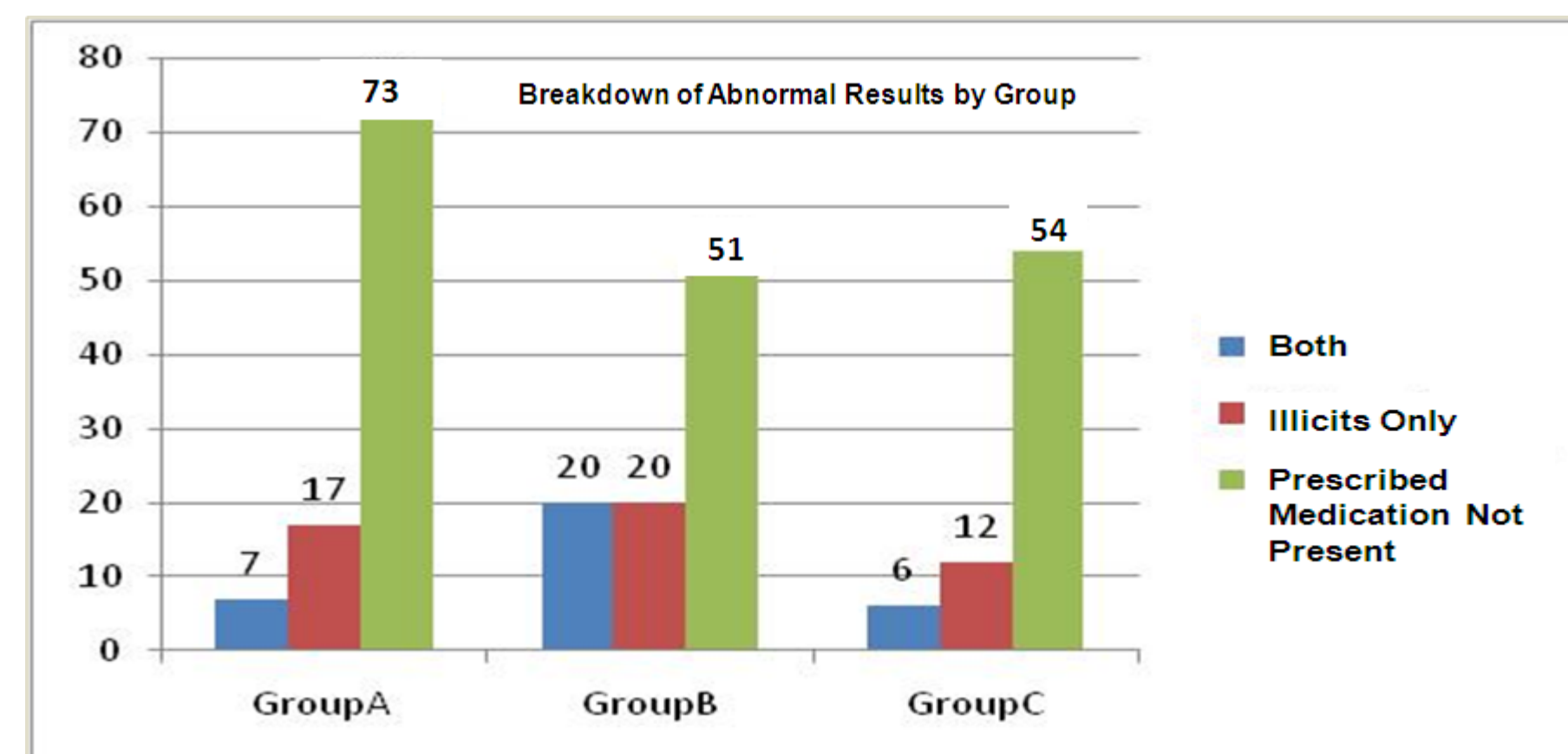
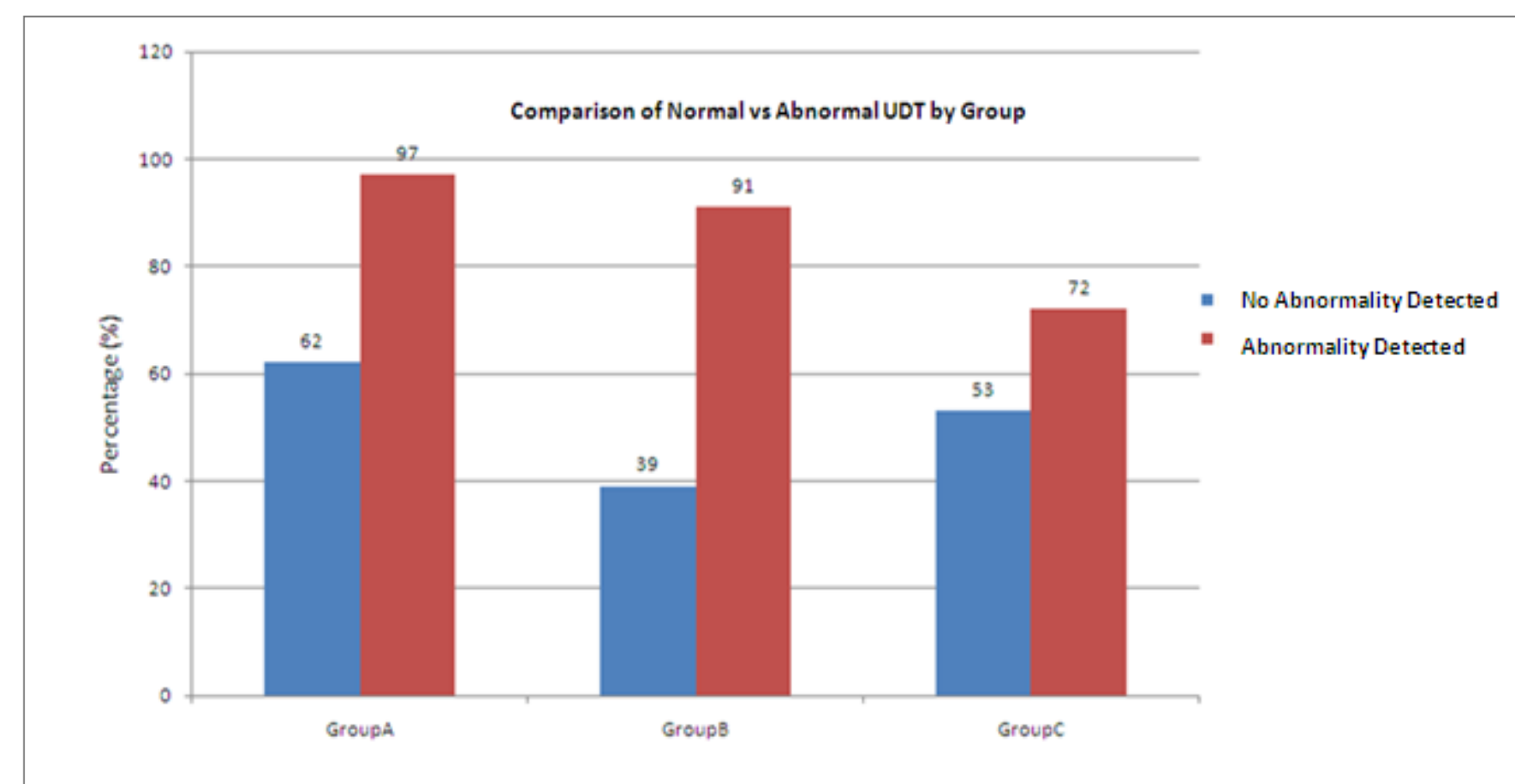
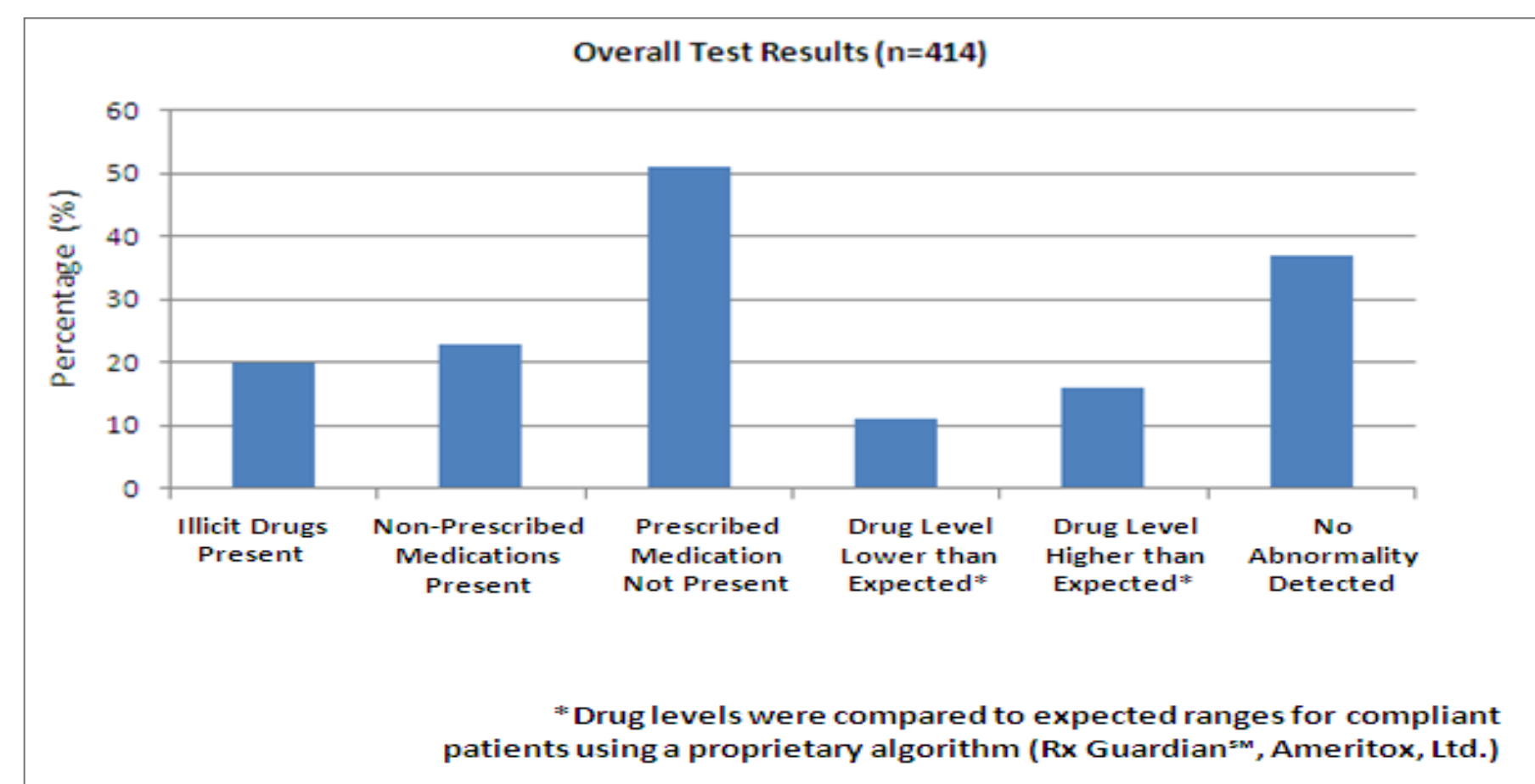
## DESIGN

Clinicians prospectively classified COT patients who were about to have a random urine drug test into one of 3 groups: Group A: those patients thought to be compliant with prescribed therapy, Group B: those patients thought to be misusing medications or using illicit drugs, and Group C: a random, unclassified group of patients for comparison. The clinics assessed risk in patients by whatever methods they normally used in that practice. Over a 2 month period 51 prescribers from 39 clinics submitted urine samples for analysis. Data was analyzed on 414 unique patient samples. Urine drug monitoring results were categorized as normal or abnormal, with abnormal consisting of samples with the prescribed opioid medication not found and/or an illicit drug present

## RESULTS

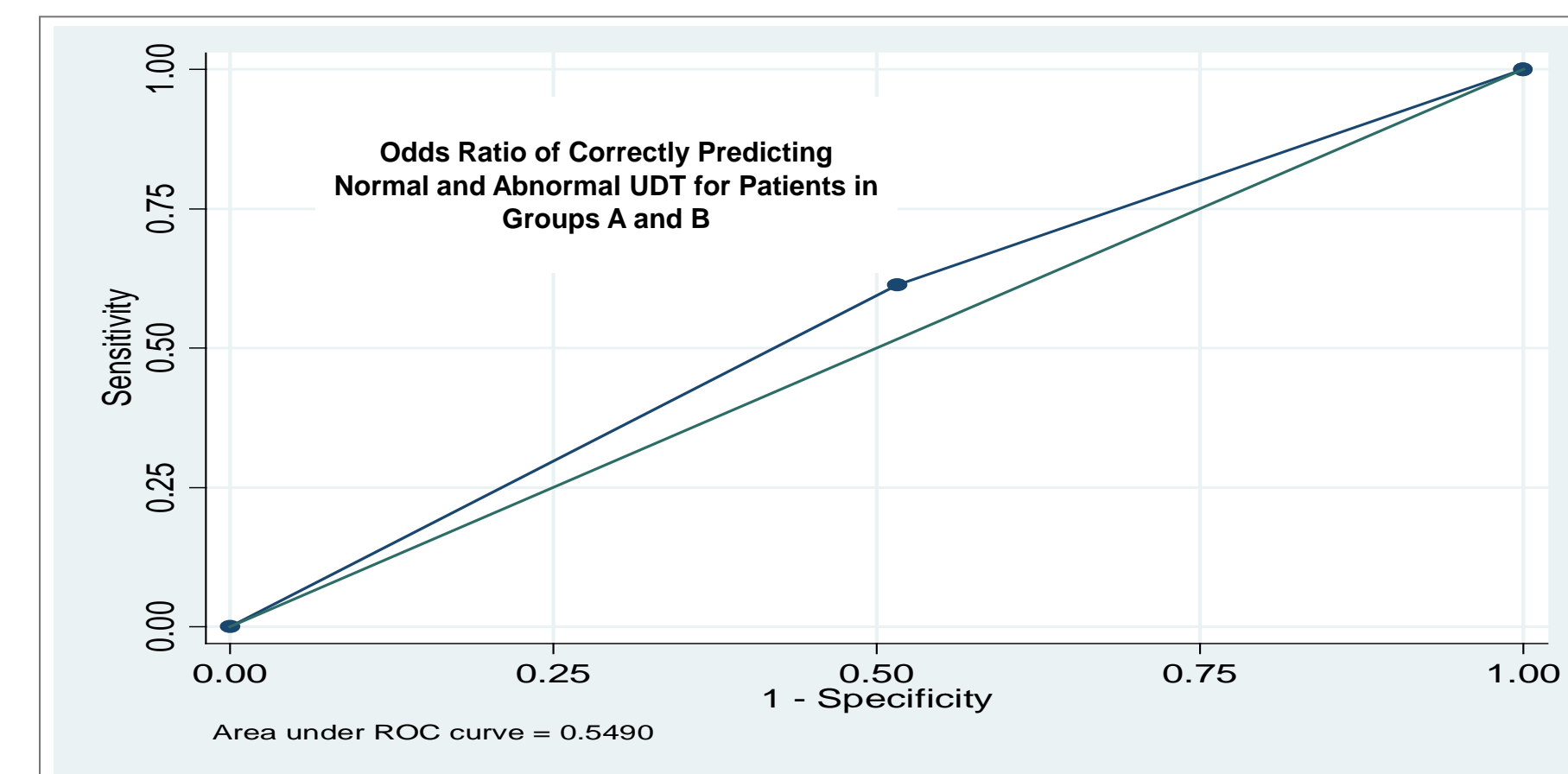
Of the 414 samples, 159 were classified as coming from patients thought to be compliant (Group A), 130 classified as coming from patients suspected of medication misuse (Group B), and 125 random samples (Group C). In Group A (N=159), clinical assessment was correct in the 62 patients (39%) who had a normal urine drug screen and incorrect in 97 patients (61%) who had either illicit present, prescribed drug absent from the urine or both. Prediction accuracy increased in the group suspected of misusing their medications. Predictions of misuse from Group B (N=130) were correct in 91 samples (70%) that had abnormal urine drug monitoring, again classified as having illicit present, missing prescribed drug or both. Results of the unclassified samples in Group C (N=125) showed 72 (58%) were abnormal. In the group thought to be compliant (Group A), the prescribed medication was missing in 73 patients; illicit drugs were present in 17 patients and 7 patients had an illicit drug present and were also missing prescribed opioid medication. Clinical accuracy in this group was comparable to the data from the random group

## RESULTS CONTINUED



Group A = NOT Suspected of medication misuse  
Group B = Suspected of medication misuse  
Group C = Randomly selected

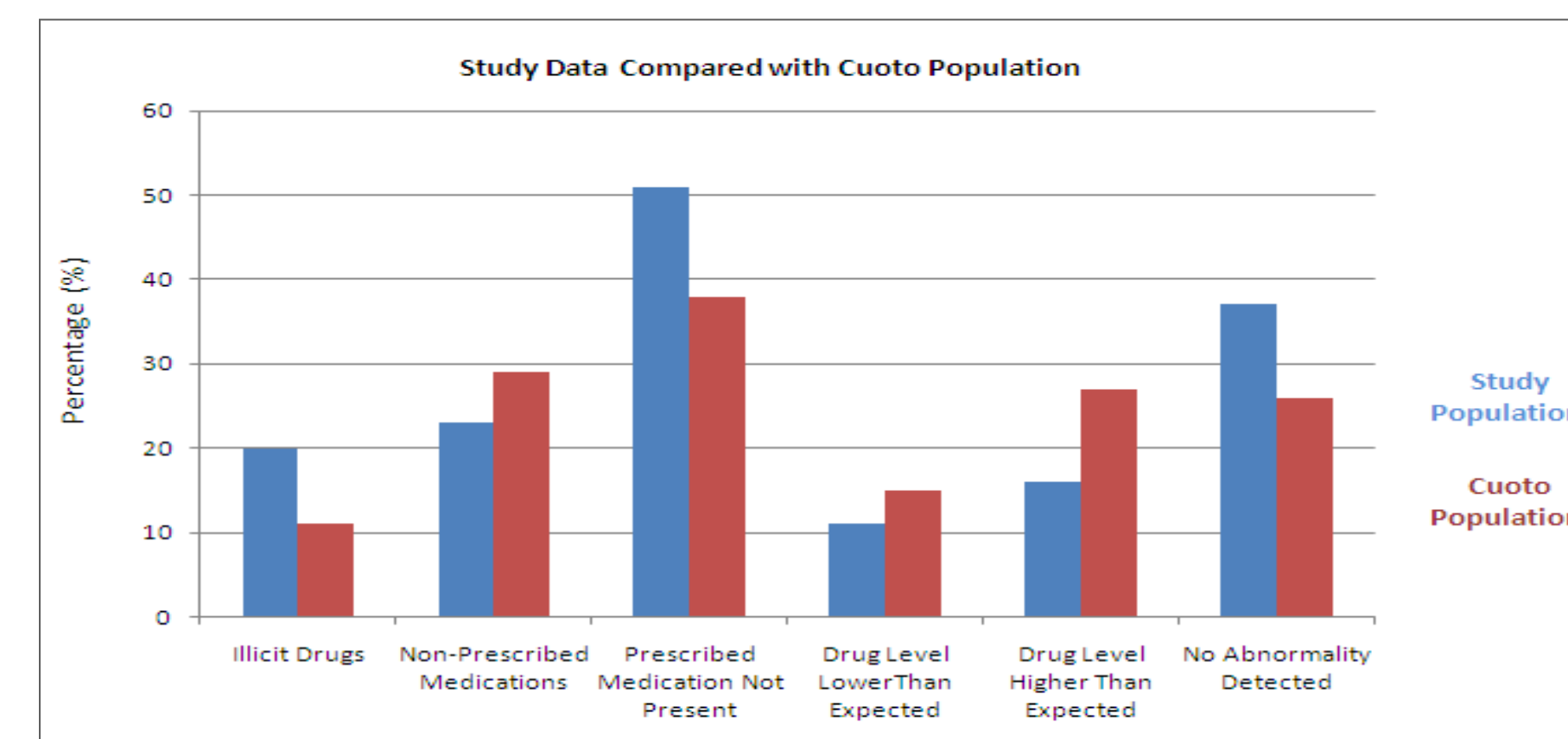
## RESULTS CONTINUED



	Obs	Area	Std. Err.	[95% Conf. Interval]
Study Data	289	0.5490	0.0304	0.48929 0.60861

For any given patient, the clinician has a 50-50 chance of being right in correctly identifying which group the patient should be placed, A or B. In terms of odds ratios, the Receiver Operating Characteristic curve demonstrates that physician categorization of patients into Group A or B was only slightly better (.54) than by chance (.50)

- Prevalence = all actual non-compliers divided by total population N
- Sensitivity is the proportion of actual non-compliant patients correctly identified = a/(a+b)
- Specificity is the proportion of actual compliant patients correctly identified = d/(c+d)
- The ROC (Receiver Operating Characteristic curve) area is (for this simple test) the average of sensitivity and specificity.
- The likelihood ratio of a positive "guess" (LR+) is the ratio of the probability (likelihood) of a positive "guess" result in an actual non-compliant patient and in a compliant patient = Sensitivity/(1-specificity).
- The odds ratio (OR) defined as (A/B)/(C/D) is also equal to LR+/LR-.
- The positive and negative predictive values (PPV & NPV) show the probability of the patient actually being non-compliant following a + or a - "guess".



In comparing this data with previously published information on rates of inappropriate drug use, the rates of illicit drugs, medication not present and no abnormality detected were higher than those reported by Couto (2009). All other categories were lower than those reported in that study. This data finding may be due to clinicians being asked to specifically identify patients they thought were taking their medication correctly and those that were misusing their medications.

## CONCLUSIONS

It is difficult to predict which patients are likely to be misusing opioids or taking an illicit drug. Clinicians who suspected patients of medication misuse were correct 70% of the time when urine drug testing was abnormal. In patients who were not suspected of medication misuse, clinicians were correct only 39% of the time. Thus, if a clinician suspects a patient of misusing medications urine drug testing will commonly confirm medication misuse or use of illicit drugs.

However, clinicians only testing patients suspected of misusing medications based on clinical judgment are missing a significant group (61% in this study) of patients that are misusing their medications without any identifiable risk behaviors. Overall, clinician accuracy in correctly identifying patient categorization was only slightly better than by chance alone. This data reinforces the need for physicians to test all patients on chronic opioid therapy.

## LIMITATIONS

This study utilized a small sample size and a limited number of clinics. It should be replicated with a larger sample and include more clinics.

Clinicians categorized patients for risk of medication abuse or misuse by whatever methodology their practice currently utilizes. As this was not a uniform process across clinicians, some methods may work better than others at categorizing risk, but this was not able to be analyzed in this study.

## MEETING INFORMATION

PAIN Week '10  
September 8 – 11, 2010  
Red Rock Casino, Las Vegas, NV  
Contact Information: Kathryn.Bronstein@ameritox.com

## REFERENCES

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- Michna E, Jamison RN, Pham LD, et al. *Clin J Pain.* 2007;23:173-179.
- Couto J, Romney M, Leider H, Sharma S, Goldfarb N, *Population Health Management.* 2009;12(4): 185-190.

