

# Opioid Dependence as a Chronic Disease: The Interrelationships Between Length of Stay, Methadone Dose, and Age on Treatment Outcome at an Urban Opioid Treatment Program

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**ABSTRACT.** Data looking at the impact of length of stay in treatment, methadone dose, and age for treatment of opiate dependence have been evaluated separately, but the relative impact of these variables has not been examined. For this report, regression analyses of length of stay, methadone dose, and age were compiled to determine the relative effect of each variable on opiate toxicology results, which was the primary outcome measure. Regression analysis yielded statistical significance for length of stay ( $P < .001$ ) and methadone dose ( $P < .05$ ) but not for age. Comparing length of stay in treatment, methadone dose, and age to opiate toxicology results indicated that length of stay was the most important factor. These comparisons impact treatment strategies for opiate dependence, particularly when using a chronic disease model as a strategy for delivering care.

**KEYWORDS.** Length of stay, methadone dose, age, opioid/opiate, chronic diseases

## *INTRODUCTION*

Evaluated separately, there is evidence that length of stay in treatment, methadone dose, and age are equally and strongly correlated with negative opiate toxicology screen results.<sup>1–9</sup> However, we could find few studies that evaluated all three variables together to see the inter-

actions and determine the relative importance of each. These factors have taken on increasing importance over the past decade as addiction medicine specialists more aggressively seek to change perceptions of treatment strategies for opiate dependence from a repetitive acute care intervention to a chronic disease model.

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TABLE 1. Regression Analysis

Variables	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	Beta	t	Sig.
Constant	0.189	0.026		7.288	0.000
Length of stay	-1.993E-05	0.000	0.010	-8.467	0.000
Methadone DOSE	0.000	0.000	-0.158	2.149	0.032
Age	0.000	0.000	0.046	0.707	0.480

## METHODS

The Addiction Research and Treatment Corporation (ARTC) is a private, not-for-profit outpatient opioid treatment program with seven methadone maintenance clinics located in the boroughs of Brooklyn and Manhattan in New York City. The average daily census is approximately 3,000 adults, who are predominantly from minority populations. ARTC provides not only methadone maintenance, but also counseling, vocational programs, primary medical, and human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) care and HIV/AIDS case management. This retrospective review of patient data examined the interrelationships between length of stay, methadone dose, and age and the effect on opiate toxicology results. Data were gathered from all seven ARTC clinics for all patients enrolled for more than 30 days between July 1, 2006, to December 31, 2006. Regression analysis was done using SPSS version 11.5 for Windows (SPSS Inc., Chicago, IL).

All data gathered for this report were part of standard measures obtained at ARTC as part of normal operations. ARTC has its own Institutional Review Board, which evaluated the proposed project and determined that this study was exempt from review.

## RESULTS

Based on toxicology samples, there were 2,914 patients. The mean number of opiate toxicology swabs done for each patient was 11.87 (range = 5 to 21 swabs). For mean methadone dose, the number of patients who could be evaluated was 2,791 due to missing methadone dose

data. The mean methadone dose for this patient cohort was 90.23 mg. The mean age of the 2,914 patient cohort was 48.3 years. There were 1,869 males (64.1%) and 1,045 females (35.9%); 1,219 (41.8%) Blacks, 1,394 (47.8%) Hispanics, and 301 (10.3%) Whites/Other.

Regression analysis of length of stay, mean methadone dose, and age as related to opiate toxicology screen results yielded a highly statistically significant effect for length of stay ( $P < .001$ ), a statistically significant effect for mean methadone dose ( $P < .05$ ), but no statistically significant effect for age (Table 1).

## DISCUSSION

Regression analysis data compiled for this report showed that the effect of methadone dose and age on opiate toxicology results were not nearly as strong as length of stay. In the case of age, the effect did not reach statistical significance.

These results are in line with current treatment strategies for other chronic diseases, such as hypertension, diabetes mellitus, and hyperlipidemia, where medication dose and age are no longer viewed or discussed as distinct determinants of outcome goal.<sup>10-15</sup> Instead, the primary outcome goals of therapy have become target blood pressure, Hb A1C, or total cholesterol, respectively, using whatever dose of medication or other therapy is necessary in a well-tolerated regimen for as long as possible (generally for life). The rationale for achieving these outcome goals is that when met the incidence of atherosclerotic vascular disease morbidity and mortality is significantly reduced.

This is the basis of the chronic disease model. The results of this study support the treatment

of opiate dependence in an analogous way. In fact, comparing the ability to attain the treatment outcome goal for the former three diseases (blood pressure  $\leq$  140/90; Hb A1c  $<$  7%; and low density lipoprotein (LDL)-cholesterol  $<$  100 to 130 mg/dL, respectively), the results of this study (which are not shown) indicated that the primary outcome goal for opiate dependence (negative opiate toxicology screen results) was met at a far greater rate than for the other three chronic diseases.<sup>10–15</sup> This is despite the fact that the outcome goals for these three diseases are more widely known by both medical care providers and patients and successful treatment modalities are better established by evidence-based research than is the case for opiate dependence.

Of course, social and political considerations come into play to a much greater degree with opiate dependence than for most other medical conditions. This is largely due to resistance to classifying opiate dependence as a chronic disease. Society prefers to view addiction as a choice. However, it is well known that most cases of hypertension, type II diabetes mellitus, and hyperlipidemia are the direct consequence of lifestyle choices made by genetically susceptible patients. Although the genetic component of addiction is currently the subject of research, the evidence to date indicates that the genetic contribution conforms to that seen with these other diseases.<sup>16–18</sup> Therefore, the similarities in the chain of events leading up to all of these chronic conditions are becoming clearer, necessitating a reevaluation in how addiction is viewed, treated and outcome goals determined.<sup>19</sup>

## CONCLUSION

The findings presented here strongly support using the same chronic disease model for treatment of opiate dependence that is well established for hypertension, diabetes mellitus, and hyperlipidemia. For this to become the universally accepted standard of care, however, there must be a paradigm shift in the way opiate dependence is viewed by non-addiction healthcare providers, regulatory and accreditation bodies, and the public at large. This has

already occurred in the treatment of alcoholism where it is generally accepted that longer length of treatment leads to better outcomes.<sup>20</sup> Additional studies at other opioid treatment programs across the country are warranted to confirm these findings.

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