RESEARCH LETTER

Physician Capacity to Treat Opioid Use Disorder With Buprenorphine-Assisted Treatment

Buprenorphine, a medication effective in treating individuals with opioid use disorders,1 can be prescribed in the United States by addiction specialists or by physicians who complete an 8-hour course and obtain a US Drug Enforcement Administration waiver. Waivered prescribers have been restricted to treating up to 30 patients with an opioid use disorder concurrently; after a year, physicians could request that the limit be increased to 100 patients. Policymakers have prioritized increasing capacity to provide buprenorphine to fight the opioid epidemic but lack adequate information about how to do so effectively. Patient censuses of buprenorphine prescribers were examined to provide information on whether patient limits have been a barrier to buprenorphine treatment.

Methods | Symphony Health Solutions’ Integrated Dataverse was used.2 It contains pharmacy retail transactions from more than 80% of pharmacies nationwide, including high-volume national chain pharmacies, resulting in information on approximately 90% of prescriptions filled at retail pharmacies in the United States. Missing pharmacies are generally independent or part of small chains. Symphony obtains pharmacy data directly from prescription drug claim processors and payers, using the same data that get verified against standard reporting information to the US government. Data files with more than 1% to 2% errors in required fields must be resubmitted by the pharmacy.

Data from 7 states with the most buprenorphine-waivered physicians (California, Florida, Massachusetts, Michigan, New York, Pennsylvania, Texas) were analyzed. Pharmacy claims for buprenorphine formulations without a US Food and Drug Administration indication for treatment of pain were used to create patient treatment episodes. Episodes started with the first observed buprenorphine claim from January 2010 to December 2013 following a 30-day absence of supplied prescribed buprenorphine. Episodes ended with a 14-day gap in days supplied or at June 30, 2014. Each patient episode was assigned to the prescriber. Episodes with multiple prescribers were assigned to the physician writing the first prescription. In each month, the number of patient episodes for each prescriber was summed to calculate monthly patient census. To focus on physicians who prescribed over a substantial period, analysis was restricted to those prescribing in both January 2010 and December 2013.

A standard count data model was used to characterize prescribers’ monthly patient counts, controlling for state and year. Incident rate ratios, reflecting the estimated patient count for each group relative to the reference group, were calculated with 2-tailed significance tests using an α = .05. Analyses were performed in SAS (SAS Institute), version 9.3. The RAND Institutional Review Board determined the research exempt.

Results | We identified 3234 buprenorphine prescribers with 245,016 patients receiving a new prescription of buprenorphine (Table). Prescribers’ median monthly patient census was 13 patients (interquartile range [IQR], 5-36), and median episode duration was 53 days (IQR, 20-120). Twenty-two percent of prescribers had monthly censuses of 1 to 3 patients, 49% had 4 to 30 patients, 20% had 31 to 75 patients, and 9% had more than 75 patients.

Regression analyses showed an increase in patient census in years subsequent to 2010 (Table). Censuses were lowest in California and highest in Massachusetts and Pennsylvania.

Table. Buprenorphine-Prescribing Physicians’ Monthly Patient Censuses

<table>
<thead>
<tr>
<th></th>
<th>Monthly Patient Census, Median (IQR)</th>
<th>Incident Rate Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All prescribers (n = 3234)</td>
<td>13 (5-36)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>State</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>7 (4-17)</td>
<td>0.69 (0.58-0.83)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Florida</td>
<td>11 (4-30)</td>
<td>1.10 (0.91-1.33)</td>
<td>.32</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>22 (8-59)</td>
<td>1.87 (1.55-2.65)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Michigan</td>
<td>11 (4-26)</td>
<td>1 [Reference]</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>11 (4-27)</td>
<td>1.04 (0.87-1.25)</td>
<td>.66</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>18 (6-46)</td>
<td>1.51 (1.25-1.82)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Texas</td>
<td>10 (4-29)</td>
<td>1.05 (0.85-1.29)</td>
<td>.67</td>
</tr>
<tr>
<td>Year Buprenorphine Treatment Episode Began</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>9 (4-22)</td>
<td>1 [Reference]</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>10 (4-27)</td>
<td>1.23 (1.20-1.26)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2012</td>
<td>12 (4-33)</td>
<td>1.41 (1.37-1.45)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2013</td>
<td>14 (5-37)</td>
<td>1.48 (1.43-1.53)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviations: IQR, interquartile range; NA, not applicable.
Discussion | The monthly patient censuses for buprenorphine-prescribing physicians were substantially below patient limits at the time; more than 20% treated 3 or fewer patients, and fewer than 10% treated more than 75 patients. The median treatment duration (53 days) was lower than expected given clinical recommendations of maintenance treatment for up to 12 months and evidence linking longer treatment to better outcomes. The findings are limited in that prescriber waiver status is unknown as is patient clinical status; we cannot exclude the possibility that buprenorphine was prescribed off-label for pain.

Novice prescribers cite insufficient access to more experienced prescribers and insufficient access to substance abuse counseling for patients as barriers to treating more patients. Such barriers might be addressed by web-based or tele-counseling for patients and by programs providing mentoring and telephone consultation from more experienced prescribers. Strategies to help current prescribers treat more patients safely and effectively could complement policy initiatives designed to increase access to treatment by increasing patient limits and number of waivered prescribers.

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Author Contributions: Drs Dick and Stein had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Stein, Dick, Pacula, Gordon. Acquisition, analysis, or interpretation of data: All authors. Drafting of the manuscript: Stein, Burns, Gordon. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Stein, Sorbero, Dick, Pacula, Burns. Obtaining funding: Stein, Dick, Pacula. Administrative, technical, or material support: Stein, Burns, Gordon. Study supervision: Stein.

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COMMENT & RESPONSE

Timing of Initiation of Renal Replacement Therapy in Critically Ill Patients With Acute Kidney Injury

To the Editor Timing of initiation of renal replacement therapy (RRT) in patients with severe acute kidney injury (AKI) remains controversial. Several well-designed, randomized clinical trials have been published or are ongoing. The single-center Early vs Late Initiation of Renal Replacement Therapy on Mortality in Critically Ill Patients With Acute Kidney Injury (ELAIN) trial found an early strategy of initiating RRT compared with a delayed strategy reduced mortality in patients who were critically ill.

In addition to the limitations mentioned by the authors and editorialists, the selection of patients may have contributed to the positive result. Although eligible patients were at Kidney Disease: Improving Global Outcomes (KDIGO) stage 2, they had a high baseline Sequential Organ Failure Assessment (SOFA) score of 15.6 to 16.0. The Artificial Kidney Initiation in Kidney Injury (AKIKI) trial found a negative result for early vs delayed initiation of RRT. Patients enrolled in the AKIKI trial were at KDIGO stage 3 and had lower SOFA scores (10.8-10.9) and SOFA scores without the renal component than patients in the ELAIN study. Therefore, the patients enrolled in the ELAIN study were at an earlier AKI stage but had more serious systemic disease. These 2 studies may have come to different conclusions because the patients in each study were different. The ELAIN study suggests that AKI patients with serious systemic disease might benefit more from early RRT than patients with less-severe systemic disease. The authors proposed that the potential benefit of early RRT in the ELAIN study might be attributed to fluid control and the attenuation of both kidney-specific and non-kidney organ injury. Further evidence is needed.

In addition, plasma neutrophil gelatinase-associated lipocalin (NGAL) was used to detect patients with deteriorating AKI in this study. The authors proposed that an NGAL level greater than 150 ng/mL might be related to a higher probability of RRT initiation. However, an ongoing study used a higher level of plasma NGAL (≥400 ng/mL) for eligibility. Additional study is needed to define the appropriate plasma NGAL level to improve the timing of RRT initiation.

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