Legislative Impact on PDMP Utilization, Perceptions, and Prescriber Behavior in Kentucky

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Prescription Drug Monitoring Programs Training and Technical Assistance Center Webinar Series
Wednesday, September 30, 2015 at 1-2p ET
HB1 Impact Evaluation

• The overall goals of the project were to:
  – Evaluate the impact of HB1 on reducing prescription drug abuse and diversion in Kentucky
  – Identify unintended consequences associated with implementation of HB1 that impact patients, providers and citizens of the Commonwealth
  – Develop recommendations to improve effectiveness of HB1 and mitigate identified unintended consequences

• Three distinct projects were conducted 3rd quarter 2013 and 1st quarter 2015
HB1 Impact Evaluation: Specific Aim 1

• Changes in KASPER Utilization and CS Prescribing
  – Assess changes in KASPER utilization since implementation of HB1, including number of registrants, requests and geographic distribution of registrants
  – Assess changes in CS prescribing since implementation of HB1, including number of CS prescribed, drugs prescribed and geographic distribution of dispensed prescriptions
HB1 Impact Evaluation: Specific Aim 2

- Stakeholder Interviews and Survey of KASPER Registrants
  - Assess KASPER user perceptions of the effectiveness of KASPER and unintended consequences, including any chilling effect of HB1, utilizing surveys and stakeholder interviews
HB1 Impact Evaluation: Specific Aim 3

- Changes in prescriber behavior, patient behavior and outcomes
  - Assess changes in patient and prescriber behavior/characteristics, including doctor shopping and shifts in prescriber type and number and type of CS prescribed
  - Assess changes in morbidity/mortality indices since implementation of HB1, including Emergency Department visits and hospital discharges for CS overdose, admission to substance abuse treatment facilities and deaths due to CS overdose.
Key Findings: General Impact of HB1

- Total number of CS prescriptions dispensed decreased in the post-HB1 period
  - 4-8% depending on schedule and class
- HB1 preferentially impacted prescribing and dispensing of opioids and benzodiazepines with no impact on stimulant prescribing
  - Argues against a blanket chilling effect of HB1 on CS prescribing
- Initial confusion and workflow disruptions have largely resolved, and for the most part, have not negatively impacted health care professional practices
  - A minority of prescribers indicated they no longer prescribe CS or prescribe fewer CS as a result of the HB1 mandate
- Health professionals aren’t always confident in their ability to identify patients with dishonest drug-seeking behavior
## Number of Prescriptions Dispensed by Drug Class: KASPER, FY 2010 to FY 2013

<table>
<thead>
<tr>
<th>Drug Class Dispensed</th>
<th>FY 2010</th>
<th>Percent Change (FY10-11)</th>
<th>FY 2011</th>
<th>Percent Change (FY11-12)</th>
<th>FY 2012</th>
<th>Percent Change (FY12-13)</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioids</td>
<td>6,388,835</td>
<td>1.85%</td>
<td>6,506,976</td>
<td>2.02%</td>
<td>6,638,141</td>
<td>-8.86%</td>
<td>6,049,756</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>2,719,937</td>
<td>2.51%</td>
<td>2,788,275</td>
<td>2.05%</td>
<td>2,845,322</td>
<td>-7.65%</td>
<td>2,627,600</td>
</tr>
<tr>
<td>Stimulants</td>
<td>1,012,218</td>
<td>8.47%</td>
<td>1,097,981</td>
<td>6.15%</td>
<td>1,165,476</td>
<td>8.60%</td>
<td>1,265,747</td>
</tr>
<tr>
<td>Other</td>
<td>1,390,205</td>
<td>0.63%</td>
<td>1,398,976</td>
<td>2.10%</td>
<td>1,428,318</td>
<td>-4.98%</td>
<td>1,357,219</td>
</tr>
<tr>
<td><strong>Total dispensed</strong></td>
<td>11,511,195</td>
<td>2.44%</td>
<td>11,792,208</td>
<td>2.42%</td>
<td>12,077,257</td>
<td>-6.43%</td>
<td>11,300,322</td>
</tr>
</tbody>
</table>

Source: Cabinet for Health and Family Services, KASPER administrative dataset
Key Findings: General Impact of HB1

- HB1 significantly impacted:
  - KASPER registration
    - 262% increase in prescriber registrants
    - 322% increase in pharmacist registrants
  - KASPER queries
    - 650% increase in mean number of queries made annually by prescribers
    - 124% increase in mean number of queries made annually by pharmacists
  - KASPER utilization
    - Health care professional surveys indicated increased utilization of reports for treatment decisions and increased frequency of discussion of reports with patients and other health care providers

Total number of Kentucky Prescribers, Pharmacists, and Law Enforcement Queries to KASPER, July 2009 to July 2013
Key Findings: Impact on Prescriber Behavior

- Over 55,000 unique prescribers in KASPER dataset
- 14,000 in-state prescribers in dataset
  - Number of unique in-state prescribers increased each year of the study period
  - In-state prescribers issue 90% of the CS prescriptions dispensed in Kentucky and reported to KASPER
  - APRNs issue less than 10% of CS prescriptions, although their contribution increased over the study period
Key Findings: Impact on Prescriber Behavior

• HB1 preferentially impacts patient-level prescribing
  – Specific drug classes
    • Opioids and benzodiazepines impacted, stimulants not impacted
  – Specific drugs within a class
    • Oxycodone and hydrocodone, morphine not impacted
    • Alprazolam and diazepam, clonazepam less impacted

• Prescribing of CS in Kentucky is highly concentrated
  – 80-90% of dispensed CS prescriptions issued by the top decile of prescribers
  – For opioids, may represent referral to pain management specialists
### Number of Opioid Prescriptions Dispensed by Selected Drugs: KASPER, FY 2010 to FY 2013

<table>
<thead>
<tr>
<th>Selected Drugs Dispensed</th>
<th>FY 2010</th>
<th>Percent Change (FY10-11)</th>
<th>FY 2011</th>
<th>Percent Change (FY11-12)</th>
<th>FY 2012</th>
<th>Percent Change (FY12-13)</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocodone</td>
<td>3,558,356</td>
<td>3.23%</td>
<td>3,673,417</td>
<td>1.78%</td>
<td>3,738,910</td>
<td>-12.99%</td>
<td>3,253,144</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>909,322</td>
<td>12.72%</td>
<td>1,025,029</td>
<td>7.00%</td>
<td>1,096,830</td>
<td>-11.76%</td>
<td>967,893</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>92,119</td>
<td>-1.06%</td>
<td>91,145</td>
<td>5.48%</td>
<td>96,140</td>
<td>-4.00%</td>
<td>92,299</td>
</tr>
<tr>
<td>Morphine</td>
<td>120,518</td>
<td>2.69%</td>
<td>123,761</td>
<td>10.14%</td>
<td>136,316</td>
<td>2.41%</td>
<td>139,601</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>25,685</td>
<td>9.29%</td>
<td>28,072</td>
<td>9.05%</td>
<td>30,613</td>
<td>-0.57%</td>
<td>30,438</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>15,865</td>
<td>39.94%</td>
<td>22,202</td>
<td>24.26%</td>
<td>27,588</td>
<td>-36.09%</td>
<td>17,631</td>
</tr>
<tr>
<td>Codeine</td>
<td>353,311</td>
<td>-2.09%</td>
<td>345,938</td>
<td>-12.29%</td>
<td>303,421</td>
<td>-0.85%</td>
<td>300,842</td>
</tr>
<tr>
<td>Buprenorphine - Total</td>
<td>183,900</td>
<td>24.77%</td>
<td>229,458</td>
<td>47.02%</td>
<td>337,345</td>
<td>43.89%</td>
<td>485,406</td>
</tr>
<tr>
<td>Buprenorphine and Naloxone Combination Only</td>
<td>173,878</td>
<td>22.11%</td>
<td>212,323</td>
<td>44.45%</td>
<td>306,702</td>
<td>40.99%</td>
<td>432,409</td>
</tr>
<tr>
<td>Methadone</td>
<td>80,019</td>
<td>0.10%</td>
<td>80,099</td>
<td>4.05%</td>
<td>83,344</td>
<td>-7.08%</td>
<td>77,441</td>
</tr>
<tr>
<td>Tramadol</td>
<td>570,385</td>
<td>11.50%</td>
<td>635,960</td>
<td>5.57%</td>
<td>671,414</td>
<td>-12.41%</td>
<td>588,105</td>
</tr>
</tbody>
</table>

Source: Cabinet for Health and Family Services, KASPER administrative dataset
### Number of Benzodiazepine Prescriptions Dispensed by Selected Drugs: KASPER, FY 2010 to FY 2013

<table>
<thead>
<tr>
<th>Selected Drugs Dispensed</th>
<th>FY 2010</th>
<th>Percent Change (FY10-11)</th>
<th>FY 2011</th>
<th>Percent Change (FY11-12)</th>
<th>FY 2012</th>
<th>Percent Change (FY12-13)</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alprazolam</td>
<td>1,029,327</td>
<td>4.39%</td>
<td>1,074,479</td>
<td>-0.23%</td>
<td>1,071,987</td>
<td>-10.72%</td>
<td>957,067</td>
</tr>
<tr>
<td>Diazepam</td>
<td>461,329</td>
<td>0.35%</td>
<td>462,949</td>
<td>1.34%</td>
<td>469,143</td>
<td>-9.55%</td>
<td>424,360</td>
</tr>
<tr>
<td>Clonazepam</td>
<td>571,601</td>
<td>5.71%</td>
<td>604,214</td>
<td>5.88%</td>
<td>639,712</td>
<td>-2.98%</td>
<td>620,628</td>
</tr>
</tbody>
</table>

Source: Cabinet for Health and Family Services, KASPER administrative dataset
# Number of Stimulant Prescriptions Dispensed by Selected Drugs: KASPER, FY 2010 to FY 2013

<table>
<thead>
<tr>
<th>Selected Drugs Dispensed</th>
<th>FY 2010</th>
<th>Percent Change (FY10-11)</th>
<th>FY 2011</th>
<th>Percent Change (FY11-12)</th>
<th>FY 2012</th>
<th>Percent Change (FY12-13)</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed amphetamine salts</td>
<td>250,450</td>
<td>8.25%</td>
<td>271,117</td>
<td>10.32%</td>
<td>299,104</td>
<td>11.37%</td>
<td>333,117</td>
</tr>
<tr>
<td>Dextroamphetamine</td>
<td>12,696</td>
<td>1.94%</td>
<td>12,942</td>
<td>-7.97%</td>
<td>11,911</td>
<td>-18.15%</td>
<td>9,749</td>
</tr>
<tr>
<td>Lisdexamfetamine</td>
<td>149,529</td>
<td>18.23%</td>
<td>176,789</td>
<td>8.27%</td>
<td>191,404</td>
<td>3.60%</td>
<td>198,300</td>
</tr>
<tr>
<td>Methylphenidate</td>
<td>305,147</td>
<td>4.60%</td>
<td>319,169</td>
<td>5.03%</td>
<td>335,218</td>
<td>6.66%</td>
<td>357,534</td>
</tr>
</tbody>
</table>

Source: Cabinet for Health and Family Services, KASPER administrative dataset
### Number and Percent of Prescriptions Dispensed Issued by Top Ten Prescribers: KASPER, FY 2010 – FY 2013

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>FY 2010</th>
<th>FY 2011</th>
<th>FY 2012</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Prescriptions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>2.37%</td>
<td>2.39%</td>
<td>2.49%</td>
<td>2.76%</td>
</tr>
<tr>
<td>Number</td>
<td>272,449</td>
<td>281,721</td>
<td>301,046</td>
<td>311,626</td>
</tr>
<tr>
<td><strong>Opioids</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>2.71%</td>
<td>2.77%</td>
<td>2.88%</td>
<td>3.72%</td>
</tr>
<tr>
<td>Number</td>
<td>173,092</td>
<td>180,267</td>
<td>190,828</td>
<td>224,852</td>
</tr>
<tr>
<td><strong>Hydrocodone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>2.85%</td>
<td>2.64%</td>
<td>2.67%</td>
<td>3.38%</td>
</tr>
<tr>
<td>Number</td>
<td>101,438</td>
<td>97,058</td>
<td>99,740</td>
<td>110,020</td>
</tr>
<tr>
<td><strong>Oxycodone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>6.22%</td>
<td>6.54%</td>
<td>8.04%</td>
<td>8.93%</td>
</tr>
<tr>
<td>Number</td>
<td>56,540</td>
<td>66,999</td>
<td>88,232</td>
<td>86,426</td>
</tr>
<tr>
<td><strong>Benzodiazepines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>3.16%</td>
<td>3.38%</td>
<td>3.35%</td>
<td>2.79%</td>
</tr>
<tr>
<td>Number</td>
<td>85,925</td>
<td>94,160</td>
<td>95,312</td>
<td>73,308</td>
</tr>
<tr>
<td><strong>Stimulants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>9.95%</td>
<td>10.38%</td>
<td>10.79%</td>
<td>10.90%</td>
</tr>
<tr>
<td>Number</td>
<td>100,722</td>
<td>113,977</td>
<td>125,796</td>
<td>137,998</td>
</tr>
</tbody>
</table>
Key Findings: Impact on Prescriber Behavior

• HB1 significantly impacted potentially inappropriate prescribing
  – One-third of prescribers report prescribing fewer CS since passage of HB1
  – High-dose oxycodone prescribing decreased post-HB1
  – Number of patients receiving concurrent therapy with the ‘holy trinity’ decreased by 30% post HB1

• Significant increases in buprenorphine/naloxone prescribing noted across the study period
  – Over 40% increase in number of buprenorphine prescriptions
  – Could represent increase in number of patients seeking treatment for opioid-use disorders
Number of Patients and Mean Daily MME for Patients Receiving Oxycodone Prescriptions by Quarter, KASPER, FY10 - FY13

Number of Patients Receiving Oxycodone Prescriptions with Mean Daily MME Above and Below 100 Units by Quarter, KASPER, FY10 - FY13
Figure 28: Number of Patients Receiving Concurrent Prescriptions of an Opioid, Alprazolam and Carisoprodol (OAC) in a Month: KASPER, FY 2010 to FY 2013
Kentucky Buprenorphine/Naloxone Prescribing Patterns: KASPER, KY 2010 to FY 2013
Key Findings: Impact on Patient Behavior

• HB1 significantly impacted doctor shopping behavior
  – 50% decrease in number of patients meeting doctor shopping criterion* in post HB1 period
  – Decreases in number of patients receiving oxycodone prescriptions from multiple prescribers
    • 25% decrease in patients seeing 5-10 prescribers
    • 64% decrease in patients seeing 11-15 prescribers
  – Decreases in number of patients receiving hydrocodone prescriptions from multiple prescribers
    • 35% decrease in patients seeing 5-10 prescribers
    • 85% decrease in patients seeing 11-15 prescribers

*Defined as patient receiving multiple prescriptions from four or more prescribers filled at 4 or more pharmacies with a three month period
Doctor Shopping, Number of Patients and Prescriptions: Patients Having Prescriptions Prescribed by Four or More Prescribers and being Dispensed from Four or More Pharmacies in One Three-Month Period (Quarter): KASPER, FY 2010 to FY 2013
### Doctor Shopping, Number of Patients Receiving Prescriptions from Five or More Unique Prescribers in One Fiscal Year: KASPER, FY 2010 to FY 2013

<table>
<thead>
<tr>
<th>Hydrocodone</th>
<th>FY 2010</th>
<th>Percent Change (FY10-11)</th>
<th>FY 2011</th>
<th>Percent Change (FY11-12)</th>
<th>FY 2012</th>
<th>Percent Change (FY12-13)</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10 prescribers</td>
<td>19,002</td>
<td>-2.27%</td>
<td>18,571</td>
<td>1.25%</td>
<td>18,803</td>
<td>-34.86%</td>
<td>12,249</td>
</tr>
<tr>
<td>11-15 prescribers</td>
<td>654</td>
<td>-8.72%</td>
<td>597</td>
<td>-6.87%</td>
<td>556</td>
<td>-85.43%</td>
<td>81</td>
</tr>
<tr>
<td>16-20 prescribers</td>
<td>103</td>
<td>-10.68%</td>
<td>92</td>
<td>-20.65%</td>
<td>73</td>
<td>-87.67%</td>
<td>9</td>
</tr>
<tr>
<td>21-50 prescribers</td>
<td>58</td>
<td>-24.14%</td>
<td>44</td>
<td>-13.64%</td>
<td>38</td>
<td>-97.37%</td>
<td>1</td>
</tr>
<tr>
<td>51 + prescribers</td>
<td>2</td>
<td>-50.00%</td>
<td>1</td>
<td>-100.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxycodone</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10 prescribers</td>
<td>3,879</td>
<td>24.85%</td>
<td>4,843</td>
<td>15.09%</td>
<td>5,574</td>
<td>-25.55%</td>
<td>4,150</td>
</tr>
<tr>
<td>11-15 prescribers</td>
<td>83</td>
<td>28.92%</td>
<td>107</td>
<td>20.56%</td>
<td>129</td>
<td>-64.34%</td>
<td>46</td>
</tr>
<tr>
<td>16-20 prescribers</td>
<td>7</td>
<td>57.14%</td>
<td>11</td>
<td>81.82%</td>
<td>20</td>
<td>-85.00%</td>
<td>3</td>
</tr>
<tr>
<td>21-50 prescribers</td>
<td>4</td>
<td>0.00%</td>
<td>4</td>
<td>50.00%</td>
<td>6</td>
<td>-100.00%</td>
<td>0</td>
</tr>
<tr>
<td>51 + prescribers</td>
<td>0</td>
<td>100.00%</td>
<td>1</td>
<td>-100.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
</tr>
</tbody>
</table>
Key Findings: Patient Outcomes

- Indicators of prescription opioid abuse are decreasing while indicators of heroin abuse are increasing
  - Substance abuse treatment admissions
  - Hospital discharges
  - Overdose deaths
  - Changes noted prior to implementation of HB1 and appear temporally related to reformulation of OxyContin

- Prescribers and pharmacists refer few patients to substance abuse treatment and HB1 did not impact their perceived rate of referrals
  - Opportunity for policy intervention?
Kentucky Substance Abuse Treatment Admissions, TEDS, 2009-2013

Hospital Discharges for Overdose in Kentucky, by Substance: FY 2010 to FY 2013

Source: Kentucky inpatient hospital discharge data, Office of Health Policy, 2014.
Overdose Deaths in Kentucky, by Substance: FY 2010 to FY 2013

Summary of Impact

• Mandatory use of KASPER resulted in:
  – Decreased prescribing of CS overall
  – Decreased inappropriate prescribing
  – Decreased doctor-shopping behavior

• High volume prescribers contribute significantly to the overall prescribing of CS in Kentucky
  – CHFS should continue to identify and investigate top prescribers for appropriate prescribing practices
Unintended Consequences?

- Increase in heroin abuse indices noted across the study period
  - Occur prior to implementation of HB1
  - Appear temporally related to the reformulation of OxyContin®

- Although HB1 clearly decreased opioid supply, it should not be characterized as the sole contributor to the rise in heroin abuse in Kentucky
Abuse Deterrents?

Recommendations

• Supply side interventions such as HB1 should be accompanied by demand-side interventions to increase long-term effectiveness
  – Treatment
  – Prevention

• Continued analyses of prescribing behavior, patient behavior and outcomes are warranted to determine if the supply side impacts observed are sustained
Research Team

- University of Kentucky, Institute for Pharmaceutical Outcomes and Policy
  - Patricia Freeman, PhD, RPh
  - Jeff Talbert, PhD
  - Amie Goodin, MPP, PhD
  - Suzanne Troske, MS