Goals

• Describe the epidemiology of gabapentin abuse/misuse
  – Literature review
  – Examination of FAERS database
• Examine gabapentin abuse/misuse in a cohort of rural drug users
  – Quantitative/qualitative
• Determine effect of scheduling gabapentin on continued abuse
What is Gabapentin?

• Gabapentin – commonly known by brand names, Neurontin®, Gralise®, Fanatrex®, Gabarone®
  – Classified as an anticonvulsant
  – FDA first approved in 1993
  – Indicated for:
    • Adjunctive therapy for control of partial seizures in patients with epilepsy
    • Postherpetic neuralgia (pain from shingles)
      – Approved in 2004
What Else is Gabapentin Used to Treat?

• Many **off-label** uses:
  • Diabetic peripheral neuropathy
  • Anxiety disorders
  • Insomnia
  • Borderline personality disorder
  • Hot flashes
  • Chronic pain
  • Pruritic disorders
  • Vertigo

**Reports that 83-95% of gabapentin use is off-label!**

Sources: Radley, 2006; Hamer, 2002
Does Gabapentin Have Abuse Potential?

• Currently, gabapentin is not a controlled substance – EXCEPT in Kentucky as of July 2017
  – CDC and UK National Institute for Clinical Excellence (NICE) recommend as a first-line pain treatment

• However, close structural relative, pregabalin, is controlled under Schedule V (abuse potential)
Review of Studies Noting Gabapentin Misuse/Abuse

• Literature searched for peer-reviewed manuscripts describing misuse/abuse of gabapentin

  – *Misuse/abuse*: taking larger doses than prescribed, taking without a prescription, and diversion

Smith, Havens and Walsh. *Addiction*, 2016
Figure 3.1. Flow diagram of systematic article selection

Smith, Havens and Walsh. *Addiction*, 2016
Data Sources

- 11 epidemiological studies and 47 case reports (from 23 articles) for a total of 33 included articles
- Epidemiological data arose from substance abuse populations, toxicology records, population-based survey sample, poison center reports, internet websites
- Case reports came from hospitals/general clinics, substance abuse clinics, psychiatric facilities, penal system, postmortem toxicology reports, poison center reports
- 36% were documented reports of overdose

Smith, Havens and Walsh. *Addiction*, 2016
Review of Studies Noting Gabapentin Misuse/Abuse

• Papers from US, UK, Germany, Finland, India, South Africa and France
• Only 1 study estimated national prevalence (in the UK) at 1.1%
• Prevalence higher in samples also abusing other prescription or illicit drugs

Smith, Havens and Walsh. *Addiction*, 2016
Demographic and Geographical Distribution Of Studies

- Mean age range: 21-43
- No gender trend identified

Smith, Havens and Walsh. *Addiction*, 2016
Review Results - Prevalence

• Lower than expected prevalence of gabapentin abuse in those with alcohol dependence; higher in those with opioid dependence

• A study conducted in Scotland found that more than 1% of deaths were attributable to gabapentin; 0.3% of post-mortem toxicology results positive for gabapentin in Finland

• Toxicological results from a study of U.S. drivers found 0.6% to be positive for gabapentin

Smith, Havens and Walsh. *Addiction*, 2016
Review Results: Doses, Cost, and Diversion

- Gabapentin misused/abused over a wide range of doses
  - Within therapeutic range and supratherapeutic doses
  - Higher than prescribed in those with prescriptions
- Sources: prescribers, family/friends, Internet, bought abroad, drug dealers
- Gabapentin valued <$1-7 on the street

Smith, Havens and Walsh. *Addiction*, 2016
Review Results: Combination with Other Substances

• Opioids (buprenorphine, tramadol, morphine, methadone)
  – US and UK studies found a greater likelihood for those misusing gabapentin to also be misusing prescription opioids
  – Potentiate effects of drug treatment (methadone)

Smith, Havens and Walsh. *Addiction*, 2016
Review Results: Drug Effects

- Euphoria (similar to opioids)
- High similar to cocaine
- Sedation/relaxation/calmness
- Improved sociability
- Marijuana-like “high”
- Amphetamine rush

- Dissociation
- MDMA-like “high”
- Increased energy and focus
- Improved quality of sleep
- More talkative

Smith, Havens and Walsh. *Addiction*, 2016
Review Results: Motivations for Misuse

- Recreational use
- Control mood/anxiety
- Potentiate effects of drug treatment
- Intentional self harm
- Reduce cravings for/manage withdrawal from other drugs
- Substitute for other drugs
- Addiction

Smith, Havens and Walsh. *Addiction*, 2016
Review Results: Discussion

• Developing a prominent place as a drug of abuse
  – Scottish prisons: top-requested prescription drug of abuse
  – Near 3000% increase in use in SNAP study from 2008-2014
• Motivations: (a) recreational; (b) self-harm; (c) self-medication
• Wide array of subjective experiences
• Risk factor – history of/current drug (opioid) abuse?

Smith, Havens and Walsh. *Addiction*, 2016
Pharmacovigilance (PhV)

• Collection, study, detection, and prevention of drug adverse events
• PhV studies usually attempt to identify a “signal”
• Signal – previously unknown possible causal association of an adverse event as a result from taking a drug
• Used for hypothesis-generation or hypothesis-support
Pharmacovigilence Assessment for Gabapentin in the United States

• Federal Adverse Event Reporting System (FAERS) data
  – Publicly available
  – Contains all adverse event (AE) and medication errors reported to FDA
  – Maintained by the FDA
  – AE reporting is voluntary
Flow of reports to FAERS

MedWatch Voluntary Report

About Patient

Patient Identifier:
Please do NOT enter the Patient's Name or Social Security Number

Age or Date of Birth:

Age
Unit

OR

Date of Birth (mm/dd/yyyy)

Sex:

Female
Male

Weight:

Unit

PhV: Traditional Signal Measures

- Disproportionality measures – is observed greater than expected?
- Based on the 2x2 table of adverse events

<table>
<thead>
<tr>
<th></th>
<th>AE+</th>
<th>AE-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug+</td>
<td>n_{11}</td>
<td>n_{12}</td>
<td>n_{1+}</td>
</tr>
<tr>
<td>Drug-</td>
<td>n_{21}</td>
<td>n_{22}</td>
<td>n_{2+}</td>
</tr>
<tr>
<td>Total</td>
<td>n_{+1}</td>
<td>n_{+2}</td>
<td>n</td>
</tr>
</tbody>
</table>
PhV: Novel Signal Measure

• Traditional measures only allow for analysis of a single drug-AE pair
• May be more useful to examine the joint occurrence of several AEs that help characterize misuse
• Loglinear modeling to assess concurrent reporting of an abuse-specific AE (AS-AE) and possible abuse indicator AE
PhV: FAERS Data

- Data from January 2005-December 2015 was obtained
  - Data released quarterly
  - Each quarterly data file has 7 data tables:
    1. Patient demographic and administrative information
    2. Drug/biologic information (associated with AE)
    3. Medical Dictionary for Regulatory Activities (MedDRA) terms for AE
    4. Patient outcomes for AE
    5. Report sources for AE
    6. Drug therapy start and stop date
    7. MedDRA terms for indications/diagnoses for use of AE-associated drug

Smith, *University of Kentucky*, 2016
PhV: FAERS Data Extraction

• Extract data associated with generic and brand names for gabapentin using fuzzy matching algorithms
  – Helps reduce effect of potentially misspelled words (e.g., “Neurtontin”)
• Repeat this process for the positive (pregabalin) and negative (duloxetine) control
• Case/non-case method
• Primary suspect, secondary suspect, interacting, and concomitant drugs considered for cases

Smith. *University of Kentucky*, 2016
PhV: Abuse-Related/Specific Adverse Events

- 41 terms: aggression, ataxia, confusional state, delirium, delusion, dependence, disorientation, dissociation, dizziness, drug abuse, drug abuser, drug dependence, drug diversion, drug tolerance, drug withdrawal syndrome, euphoric mood, elevated mood, fall, feeling abnormal, feeling drunk, feeling of relaxation, gait disturbance, hallucination, auditory hallucination, visual hallucination, mixed hallucination, incoherent, intentional (drug) misuse, intentional overdose, mood altered, multiple drug overdose, off label use, overdose, acute psychosis, rebound psychosis, substance-induced psychosis, somnolence, substance abuse, substance abuser, substance use, thinking abnormal
PhV: Signal Calculation

• Calculated for each gabapentin-AE pair, pregabalin-AE pair, duloxetine-AE pair
  – Proportional reporting ratio (PRR)
  – Reporting odds ratio (ROR)
  – Information component (IC)
  – Empirical Bayesian geometric mean (EBGM) to account for unstable estimators due to low drug-event counts

Smith. University of Kentucky, 2016
PhV: Time Trend of Reports

Smith. University of Kentucky, 2016
**PhV: Most Common AEs**

<table>
<thead>
<tr>
<th>Gabapentin (n)</th>
<th>Pregabalin (n)</th>
<th>Duloxetine (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug ineffective (10668)</td>
<td>Pain (11568)</td>
<td>Nausea (7945)</td>
</tr>
<tr>
<td>Pain (8370)</td>
<td>Drug ineffective (10199)</td>
<td>Dizziness (6307)</td>
</tr>
<tr>
<td>Nausea (7348)</td>
<td>Dizziness (7478)</td>
<td>Headache (5516)</td>
</tr>
<tr>
<td>Fatigue (6610)</td>
<td>Weight increased (6591)</td>
<td>Pain (5464)</td>
</tr>
<tr>
<td>Dizziness (5936)</td>
<td>Somnolence (5744)</td>
<td>Fatigue (5300)</td>
</tr>
<tr>
<td>Headache (5585)</td>
<td>Nausea (5119)</td>
<td>Drug ineffective (5291)</td>
</tr>
<tr>
<td>Fall (5285)</td>
<td>Malaise (4738)</td>
<td>Drug withdrawal syndrome (4870)</td>
</tr>
<tr>
<td>Dyspnea (5173)</td>
<td>Pain in extremity (4698)</td>
<td>Depression (4577)</td>
</tr>
<tr>
<td>Diarrhea (5130)</td>
<td>Fatigue (4687)</td>
<td>Insomnia (4481)</td>
</tr>
<tr>
<td>Depression (4899)</td>
<td>Feeling abnormal (4445)</td>
<td>Feeling abnormal (4106)</td>
</tr>
</tbody>
</table>
# PhV: Most Common AR-AEs

<table>
<thead>
<tr>
<th></th>
<th>Gabapentin</th>
<th>Pregabalin</th>
<th>Duloxetine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any AR-AE</td>
<td>Any AR-AE (23%)</td>
<td>Any AR-AE (26%)</td>
<td>Any AR-AE (29%)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Dizziness (5%)</td>
<td>Dizziness (7%)</td>
<td>Dizziness (8%)</td>
</tr>
<tr>
<td>Falls</td>
<td>Somnolence (5%)</td>
<td>Feeling abnormal (4%)</td>
<td>Drug withdrawal syndrome (6%)</td>
</tr>
<tr>
<td>Somnolence</td>
<td>Feeling abnormal (4%)</td>
<td>Feeling abnormal (5%)</td>
<td>Feeling abnormal (5%)</td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>Falls (4%)</td>
<td>Gait disturbance (3%)</td>
<td>Falls (4%)</td>
</tr>
<tr>
<td>Feeling abnormal</td>
<td>Feeling abnormal (3%)</td>
<td>Gait disturbance (3%)</td>
<td>Off label use (4%)</td>
</tr>
</tbody>
</table>

Smith. *University of Kentucky*, 2016
# PhV: Signals

<table>
<thead>
<tr>
<th></th>
<th>Gabapentin</th>
<th>Pregabalin</th>
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<tbody>
<tr>
<td>Abnormal thinking</td>
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</tr>
<tr>
<td>Confusional state</td>
<td>Confusional state</td>
<td>Confusional state</td>
<td>Confusional state</td>
</tr>
<tr>
<td>Disorientation</td>
<td>Disorientation</td>
<td>Disorientation</td>
<td>Disorientation</td>
</tr>
<tr>
<td>Euphoric mood</td>
<td>Euphoric mood</td>
<td>Euphoric mood</td>
<td>Euphoric mood</td>
</tr>
<tr>
<td>Feeling drunk</td>
<td>Feeling drunk</td>
<td>Feeling drunk</td>
<td>Feeling drunk</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>Hallucinations</td>
<td>Hallucinations</td>
<td>Hallucinations</td>
</tr>
<tr>
<td>Ataxia</td>
<td>Ataxia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug dependence</td>
<td>Drug dependence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug tolerance</td>
<td>Drug tolerance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>Gait disturbance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somnolence</td>
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<td></td>
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Smith. *University of Kentucky*, 2016
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<td>Euphoric mood</td>
<td>Hallucinations</td>
<td>Hallucinations</td>
</tr>
<tr>
<td>Feeling drunk</td>
<td>Feeling drunk</td>
<td>Hallucinations</td>
<td>Hallucinations</td>
</tr>
<tr>
<td>Ataxia</td>
<td>Ataxia</td>
<td>Drug dependence</td>
<td>Drug dependence</td>
</tr>
<tr>
<td>Drug dependence</td>
<td>Drug dependence</td>
<td>Drug tolerance</td>
<td>Drug tolerance</td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>Gait disturbance</td>
<td>Gait disturbance</td>
<td>Gait disturbance</td>
</tr>
<tr>
<td>Somnolence</td>
<td>Somnolence</td>
<td></td>
<td></td>
</tr>
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Smith. University of Kentucky, 2016
## PhV: Signals

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<td>Confusional state</td>
<td>Disorientation</td>
</tr>
<tr>
<td>Disorientation</td>
<td>Disorientation</td>
<td>Euphoric mood</td>
<td>Euphoric mood</td>
</tr>
<tr>
<td>Euphoric mood</td>
<td>Feeling drunk</td>
<td>Hallucinations</td>
<td>Feeling drunk</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>Visual hallucinations</td>
<td>Visual hallucinations</td>
<td>Hallucinations</td>
</tr>
<tr>
<td>Ataxia</td>
<td>Ataxia</td>
<td>Drug dependence</td>
<td>Drug dependence</td>
</tr>
<tr>
<td>Drug dependence</td>
<td>Drug tolerance</td>
<td>Drug tolerance</td>
<td>Drug tolerance</td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>Gait disturbance</td>
<td>Somnolence</td>
<td>Somnolence</td>
</tr>
<tr>
<td>Somnolence</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PhV: Signals

• Unique to gabapentin
  – Falls
  – Incoherence
  – Multiple drug overdose
  – Substance-induced psychosis
PhV: Signals from Regression Analysis

• Compared to duloxetine, gabapentin had significantly increased odds of AS-AE co-report with:
  – Drug withdrawal syndrome; aggression; auditory hallucinations; delusions; euphoric mood; ataxia; somnolence
PhV: Discussion

• Pregabalin and gabapentin shared many of the same signals

• Increased odds of co-reports of AS-AE and drug withdrawal syndrome, aggression, auditory hallucinations, delusions, and euphoric mood for gabapentin and pregabalin
  – May give insight to sought effects

• Increased odds of co-reports of AS-AE and ataxia and somnolence for gabapentin, not pregabalin
  – Similarity to alcohol intoxication
PhV: Limitations

• Low spontaneous reporting rate (~6%)
• External factors may impact FAERS reporting
• Confounding effects from drug interactions, disease symptoms, and others
Longitudinal Study to Determine Vulnerabilities to Prescription Opioid Abuse in Rural Appalachia

• Social Networks among Appalachian People (SNAP) study
• Purpose: determine prevalence and incidence of HCV, HIV and HSV-2 in relation to social network characteristics among rural drug users and track longitudinal trends in drug abuse

Young, Rudolph, Quillen and Havens. J Epidemiol and Community Health, 2014
Eligibility Criteria

• Age 18+
• English-speaking
• PWID (initial seeds)
• Use of at least 1 of the following drugs to get high in prior 30 days:
  – Rx opioids (illicit use)
  – Cocaine
  – Heroin
  – Methamphetamine
Data Collection Procedures

• Interviewer-administered questionnaire
  – Computer-assisted personal interview (CAPI) via tablet PC

• Serologic testing (with pre- and post-test counseling – all rapid tests)
  – HIV
  – HCV
  – HSV-2 (through 2016)
  – Syphilis (2017 – on)
### Participant Characteristics

**N=503**

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>286</td>
<td>56.7</td>
</tr>
<tr>
<td>Age, median (IQR)</td>
<td>31</td>
<td>94.2</td>
</tr>
<tr>
<td>Employed Full-Time</td>
<td>173</td>
<td>34.4</td>
</tr>
<tr>
<td>Lifetime Injection Drug Use</td>
<td>394</td>
<td>78.3</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Buprenorphine (illicit)</td>
<td>Not queried</td>
<td>26.5</td>
</tr>
<tr>
<td>Methadone (illicit)</td>
<td>60.8</td>
<td>11.0</td>
</tr>
<tr>
<td>Heroin</td>
<td>4.4</td>
<td>0.1</td>
</tr>
<tr>
<td>OxyContin</td>
<td>69.8</td>
<td>0.1</td>
</tr>
<tr>
<td>Roxicodone</td>
<td>72.4</td>
<td>18.6</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>81.3</td>
<td>28.1</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>3.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Cocaine</td>
<td>22.5</td>
<td>7.2</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>0</td>
<td>14.7</td>
</tr>
</tbody>
</table>

1Lofwall and Havens. *Drug and Alcohol Depend*, 2012
Gabapentin Misuse

- Neurontin (gabapentin)
  - 165% increase in abuse between 2013 and 2014
  - 2950% increase in abuse between 2008 and 2014
  - Participants reporting a mean of 25 days of use in past 30
  - More likely (p<0.05) to also be abusing IR oxycodone, buprenorphine and benzodiazepines

Gabapentin abuse among SNAP cohort by source, 2008-2014

Number of respondents (n)

Interview Wave

Doctor Other
Qualitative Analysis of Gabapentin Misuse

- Data collected from two active cohorts in Appalachian Kentucky
- Eligibility criteria: recent (< 1 year) gabapentin abuse
- 33 participants (5 males, 27 females) across four focus groups conducted at field site in Hazard, KY
- March – September 2015

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Theme 1: Initiation

• Majority began use >10 years ago
• First source: prescription from a doctor; family/friend
• Reasons for 1st use: prescribed for presenting symptoms (anxiety, lupus, bladder pain); word of mouth
• First experience:
  – Muscle relaxation, pain reduction, hallucination, sleep induction, feeling drunk, feeling “high”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Qualitative Analysis of Gabapentin Abuse

- **Initiation**: 5-10 years since first use
- **Source**: prescription for nerve-related pain, mental health disorders

“That’s how everybody got introduced to gabapentin, it’s through doctors”

- Family/friends also mentioned as initial source of gabapentin

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Qualitative Analysis of Gabapentin Abuse

• Reasons for First Use: legitimate medical concern and hearing about it from peers

“I mean, it’s like more and more and more... as years went on, people just started gabapentin. You’d hear other people talking about taking them, and I was like “well let me try it” and it went from there”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Theme 2: Motivations for Continued Use

• Primarily for pharmacodynamic effects
  – Easing pain better than opioids
  – Help withdrawal from other substances (cocaine, buprenorphine, oxycodone)
  – “You can use them to get high on if you want to, ease pain, it’s just all the above.”

• Negative effects?
  – “Twitch,” “smothering,” “couldn’t move,” painful withdrawal

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Qualitative Analysis of Gabapentin Abuse

• Other reasons for continued use:
  • Pain relief
  • Withdrawing from other substances such as cocaine, buprenorphine and oxycodone

• Getting high with gabapentin is “cheap” and “always available”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Qualitative Analysis of Gabapentin Abuse

- **Physical experience**: muscle relaxation, pain reduction, hallucinations, sleepiness, feeling drunk or high
- Participants likened high to that of opiates
- Some described stimulant-like effects

“[like a] shot of cocaine”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Qualitative Analysis of Gabapentin Abuse

• Physical Effects: reports of both stimulant and depressive effects
  “Just keeps you wanting to move”

• Reports of depressant effects consistent with side effect profile
  “Relaxes your body” and “helps with rest”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Qualitative Analysis of Gabapentin Abuse

• Characteristics of Abuse: use of tolerance to enhance high
  “You wait a few days and don’t take any, then you take some – you feel good”

• Route of administration: primarily oral, some snorting
  – Effect enhanced with concomitant use of caffeine
  – Used as a way to come down from cocaine

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Theme 3: Increased Profile of Gabapentin

• Rise in use over last 2 years
  “They’re actually harder to find than 30s [Percocet] now”

• Observed increased use among younger individuals
  – “And then…all these younger people are abusing [gabapentin] so now that puts us in a messed up situation”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. *Psychology of Addictive Behaviors*, 2018
Qualitative Analysis of Gabapentin Abuse

• Longitudinal Trends: long-standing awareness of drug, but noted increases in popularity in community starting in 2012-13

• Concern about becoming scheduled (which did occur in July, 2017)

“And that why they gonna make them scheduled…cause everybody’s getting them”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Qualitative Analysis of Gabapentin Abuse

- Recognition of misuse by providers:
  - “I don’t feel like they do because they’re still writing them like crazy…”
  - “Yeah, all I done was walk in and said ‘Hey, I need some Neurontin.’ They’s like ‘What Milligram?’ I was like ‘800’s.’”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Qualitative Analysis of Gabapentin Abuse

• Recognition of misuse by providers:
  – “Tell them that it worked for you before, and because of the Neurontin, gabapentin epidemic, they’re calling it, they won’t write them for you”
  – “I have been to Doctor X and he gave me everything under the sun, and I went there trying to get Neurontins. Did this, dealt with the man for 6 months, and he still would not come off with the Neurontin – not one.”

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens. Psychology of Addictive Behaviors, 2018
Changes in Laws to Curb Opioid Abuse – Unintended Consequences?

- Changes in opioid epidemic – prescription drugs to heroin; mitigated by changes in laws and practices increasing scarcity of prescription opioids
- Similarly, changes in laws around opioid prescribing/PDMP may be driving use of gabapentin in rural areas
- Now scheduled in Kentucky as of 7/2017 – Have preliminary data demonstrating effects of scheduling
Impact of Scheduling on Misuse of Gabapentin

• In 2015-17, 47.3% of rural opioid users indicated they had misused gabapentin

• Since November, 2017 (5 months after scheduling the drug), 49.1% of opioid users indicated they had misused gabapentin

3% INCREASE in misuse since scheduling
Changes in Source of Gabapentin Since Scheduling

- Physician: 2015-17 (blue) vs. 2017-current (brown)
- Dealer: 2015-17 (blue) vs. 2017-current (brown)
- Family/Friends: 2015-17 (blue) vs. 2017-current (brown)
User Perceptions of Gabapentin Scheduling

Participants were asked whether they thought gabapentin was more difficult to acquire after scheduling in July of 2017

53.9% of participants said NO
Conclusions

• Gabapentin is misused for a variety of reasons throughout the US and internationally

• Uncontrolled status and recommendation to use as an alternative to opioids for pain have contributed to its diversion

• Misuse appears to be on the rise; increased reports in the popular media as well as the scientific literature
  – Toxicology reports
Prevalence of gabapentin in drug overdose postmortem toxicology testing results

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Recommendations

- Gabapentin should be prescribed with caution, especially for individuals with a history of opioid misuse
  - Prescribers should be aware that it is misused
- Controlled pharmacological experiments are needed to better understand risks associated with gabapentin misuse
- Reexamination of gabapentin’s abuse liability and consideration of its scheduling are warranted
Acknowledgements

• Dr. Rachel Vickers Smith
• NIH/NIDA (R01-DA024598 and R01-DA033862)
• Drs. April Young, Hannah Knudsen, Michelle Lofwall, Sharon Walsh (Co-Investigators)
• Study Staff – Hazard and Lexington
• Study Participants