Impact of A Retrospective Drug Utilization Review Program on Changing Opioid Prescribing Behavior

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Background

- The opioid epidemic has reached unprecedented heights, with deaths due to opioid medications having increased by over 200% in the last 10 years[1]
- Federal and state drug policy efforts have focused on improving opioid prescribing practices, and managed care organizations have responded to this crisis by developing a number of strategies to impact prescribing behavior[2-3]
- However, these provider-facing strategies have not been rigorously evaluated, thus little evidence exists on how to prevent the unsafe prescribing of opioids
- Moreover, there is mixed evidence on whether prescriber mailings have a measurable impact on behavior[4-5]

Objective

To determine the effectiveness of a retrospective drug utilization review (DUR) program in changing prescribing behavior among a large, national health plan's top 1% of opioid prescribers

Methods

Study Design

This was a retrospective, quasi-experimental study measuring the pre-post impact of Humana's *High Dose Prescriber Campaign* mailing versus no mailing on prescribing behavior

Outcome Measures

Primary

- Change in average daily morphine equivalent doses (MEDs) prescribed
- Change in number of prescriptions exceeding 50, 90 and 250 MEDs per day
- Change in percentage of patients with an opioid-related ADE

Secondary

- Change in percentage of opioid prescriptions for ER/LA opioids
- Change in percentage of patients with concurrent claims for BZDs
- Change in percentage of patients with concurrent claims for active CNS agents
- Change in percentage of patients with claims for naloxone
- Change in percentage of patients with claims for MAT

Data Source

This study utilizes administrative claims data from 1/1/16-8/31/17, with a pre-index measurement period (before mailing) of 1/1/16-8/31/16 and a post-index measurement period (after mailing) of 1/1/17-8/31/17

Statistical Analysis

All statistical testing were conducted using SAS version 9.1. Difference-in differences analyses were conducted to evaluate differences in the magnitude of change of the outcome measures of interest

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Program Description

The *High Dose Prescriber Campaign* was a DUR mailing program launched in 2016 which aimed to change the prescribing behavior among the health plan's providers prescribing the highest volumes of opioid medications (top 1% of prescribers), and includes the following components:

Identification of Providers

Inclusion criteria

- Prescribers of opioid medications to at least 15 unique patients and who have written for ≥ 100 prescriptions in the pre-index period

Exclusion criteria

- Oncology and hospice specialists
- Non-opioid prescribing provider specialties
- Prescribers from Puerto Rico
- Prescribers with missing demographic information

Patient inclusion criteria

- Patients who were continuously enrolled during the full study period (1/1/16-8/31/17)
- Patients aged 19-89 as of the index date

Once inclusion/exclusion criteria were applied, prescribers were sorted by average MEDs prescribed to establish the top 1% of prescribers based on administrative claims linked to each prescriber. Of the prescribers identified, 1,000 were randomly selected to be included in a control group for comparative purposes and did not receive the mailing intervention

Mailing Intervention

- A customized DUR scorecard was sent to each prescriber which detailed the opioid prescribing history and benchmarked each provider against the rates of prescribing of their peers (based on specialty), other Humana-network providers, and against national rates
- Patient-level claims information for up to 25 of each prescriber's patients were included in the scorecard to provide actionable insights to prescribers
- CDC opioid prescribing guidelines were also included with the mailing
- The mailing was sent to 6,000 prescribers

Results

Figure 1. Provider Demographics

Distribution of provider specialty type in the control (n=1,000) vs. intervention (n=6,000) groups

Family Practice* (22.3%, 23.9%)	Internal Medicine* (16.3%, 15.4%)	Pain Management* (12.2%, 13.6%)	Anesthesiology* (11.5%, 10.5%)	Nurse Practitioner* (10.5%,10.0%)
Physical Medicine and Rehabilitation* (9.9%, 8.3%)	Physician Assistant* (7.3%,7.3%)	General Practice* (2.3%, 2.5%)	Neurology* (1.6%,1.9%)	Rheumatology* (1.6%,1.7%)
Orthopedic Surgery (0.7%,1.1%)	General Surgery (0.4%,0.3%)	Psychiatry (0.3%,0.2%)	Registered Nurse (0.3%, 0.2%)	Geriatric Medicine (0.2%, 0.2%)
Osteopathic Medicine (0.2%, 0.1%)	Pulmonary Disease (0.2%, 0.1%)	Addiction Medicine (0.1%, 0.1%)	Allergy/ Immunology (0.1%, <0.1%)	Gastroenterology (0.1%, <0.1%)
Hematology (0.1%, <0.1%)	Radiology (0.1%,0.1%)	Urology (0.1%,<0.1%)	Sports Medicine (0%,<0.1%)	Specialist (0%,0.2%)
Pediatric Medicine (0%,0.1%)	Otolaryngology (0%,<0.1%)	Ophthalmology (0%,<0.1%)	Nephrology (0,<0.1%)	Licensed Practical Nurse (0,<0.1%)
Infectious Disease (0%,<0.1%)	Hospitalist (0%,<0.1%)	Endocrinology (0%,<0.1%)	Preventive Medicine (0.1%,0.1%)	Plastic/ Reconstructive Medicine (0.1%,0.1%)
Obstetrics/ Gynecology (0.1%,0.1%)	Cardiology (0.1%, 0.1%)	Neurosurgery (0.2%,0.4%)	Emergency Medicine (1.0%,1.0%)	

*Taken together, accounts for > 95% of providers in both the control and intervention group

Specialty types represented in the intervention group but not the control group

Specialty types with significantly different baseline MED's prescribed between control and experimental group (based on observation)

Table 1. *High Dose Prescriber Campaign* Program Outcomes

	Control Group (n=1,000)		Intervention Group (n=6,000)		Difference-in-Differences			
Primary Outcome Measures	**Pre-mailing**	**Post-mailing**	**Pre-mailing**	**Post-mailing**	**Pre-mailing**	**Post-mailing**	**Pre-Post Δ**	**P-value***
Average daily MEDs prescribed	76.02	69.65	73.96	68.66	-2.06	-0.99	1.07	0.3016
Average number of prescriptions >50 MEDs/day	0.68	0.58	0.68	0.58	0	0	0	0.9325
Average number of prescriptions > 90 MEDs/day	0.37	0.31	0.36	0.30	-0.01	-0.01	0	0.9613
Average number of prescriptions > 250 MEDs/day	0.07	0.05	0.07	0.05	0	0	0	0.5236
Percentage of patients with an opioid-related ADE	11.53%	11.59%	11.34%	10.49%	-0.19%	-1.1%	-0.91%	0.0392
Secondary Outcome Measures								
Percentage of opioid prescriptions written for ER/LA opioids	17.58%	16.16%	17.21%	16.28%	-0.37%	0.12%	0.49%	0.0005
Percentage of patients with concurrent claims for BZDs	15.73%	15.28%	15.37%	15.02%	-0.36%	-0.26%	0.10%	0.3292
Percentage of patients with concurrent claims for active CNS agents	12.95%	13.39%	12.87%	13.85%	-0.08%	0.46%	0.54%	0.9498
Percentage of patients with claims for naloxone	0.31%	0.66%	0.25%	0.46%	-0.06%	-0.20%	-0.14%	0.4729
Percentage of patients with claims for MAT	0.14%	0.25%	0.16%	0.32%	0.02%	0.07%	0.05%	0.2442

*Difference-in-differences was modeled using a generalized linear model with a γ distribution and log link

Abbreviations: ADE = Adverse Drug Event; ER = Extended-Release; LA = Long-Acting; BZD = Benzodiazepine; CNS = Central Nervous System; MAT = Medication-Assisted Treatment; MED = Morphine Equivalent Dose

Conclusions and Future Directions

- The effect of the DUR mailing intervention on reducing opioid prescribing was unclear when using most established and exploratory[6] analytic measures, as there was no statistically significant effect observed for most measures
- However, there was a statistically significant difference for the change in percentage of patients with an opioid-related ADE between groups which indicates a possible positive effect of the mailing. Additionally, there was a statistically significant difference for the change in percentage of prescriptions written for ER/LA opioids between groups which indicates a possible negative effect of the mailing
- Rates of opioid prescribing trended downwards over time in both groups. This is likely due to the heightened public awareness and response to the opioid epidemic
- The specialty type of a prescriber may play a significant role in determining overall prescribing behavior. Further investigation is needed to explore differences among provider specialty types
- This is the first of several prescriber-facing interventions being evaluated by Humana

Limitations

- Baseline (pre-mailing) prescribing characteristics between the control and intervention group were expected to be similar, so statistical matching was not used in this initial analysis. Variation among provider specialty type and prescribing behavior between groups indicates that additional analyses, with matching, is warranted
- Other interventions from governmental entities, health care organizations or payers could have confounded effects of the mailing program on prescribing behaviors, despite inclusion of a control group
- This study assumed that a sufficient proportion of mailings were actually read by providers to illicit the desired effects; however, the number of providers receiving and actually reading the mailing were not measured

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