Changes in age-specific rates of doctor-shopping for opioids following introduction of reformulated OxyContin® tablets

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BACKGROUND

- In August 2010, Purdue Pharma introduced a reformulated extended-release oxycodone (OxyContin®) in the US, which is intended to deter crushing and forms a gel when dissolved to deter abuse.
- The introduction of reformulated OxyContin has resulted in declines in indicators of diversion:
  - 60% reduction in reports of drug diversion by law enforcement
  - 80% reduction in prescriptions for high dosage OxyContin prescriptions by potentially problematic prescribers
- Is there a similar decline in diversion through "doctor-shopping" and how do changes in rates of doctor-shopping vary by age?

DOCTOR-SHOPPING

- Obtaining prescriptions from multiple prescribers and/or pharmacies:
  - For personal abuse
  - For distribution to others who intend to abuse the drugs
  - Generally involves multiple overlapping prescriptions from more than one prescriber and multiple pharmacies (Cepeda et al., 2012, Journal of Clinical Pharmacology)

OBJECTIVES

- To characterize and estimate changes in age-specific rates of doctor-shopping for OxyContin and other opioids before versus after introduction of OxyContin reformulated with abuse deterrent properties in Aug 2010
- To compare rates of doctor-shopping for OxyContin and other single-entity (SE) opioid products, often abused through non-oral routes (eg, snorting and injecting), and combination opioid products (with acetaminophen [APAP]), often abused orally by ingesting intact tablets
- To estimate changes in doctor shopping by additional characteristics associated with abuse/diversion
  - Cash payment
  - High dosage strength
- To compare the magnitude in change of doctor-shopping rates for more versus less sensitive thresholds defining doctor-shopping

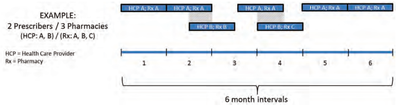
METHODS

- Data Source: IMS LRx database
  - Patient de-identified data from sample of IMS Health retail universe
  - Direct feeds from retail pharmacies
  - Encryption algorithm to de-identify and assign each patient a unique ID
  - Covers approximately 65% of all retail prescriptions filled in the US
  - More than 150 million unique de-identified patients
  - More than 1 million prescribers
- Estimated rates of doctor shopping in six-month intervals before and after introduction of ORF
  - Pre-reformulation: July 2009 to June 2010
  - Transition: July to December 2010
  - Post-reformulation: January 2011 to June 2013
- For each six-month calendar period (January-June, July-December), identify all possible "overlap" events for OxyContin and comparator products:
  - Start date of each prescription and days supply
  - Overlapping prescriptions are determined by multiple prescriptions for the same patient where number of days supply of the prescriptions overlap by at least one day
  - Comparators include: Immediate-release (IR) single entity (SE) oxycodone, IR oxycodone/APAP, IR hydrocodone/APAP
- For each overlap event
  - Count number of unique prescribers
  - Count number of unique pharmacies

METHODS (CONT.)

- Doctor shopping threshold
  - Sum total number of unique prescribers and pharmacies across all overlap events in six-month period
  - If number of prescribers/pharmacies reaches a specified threshold then patient is coded as positive for doctor shopping
  - Initial threshold = at least 2 prescribers and 3 pharmacies (Cepeda et al., 2012, Journal of Clinical Pharmacology
  - All combinations of prescribers and pharmacies examined
- Doctor shopping rate
  - Number of doctor shoppers/number of individuals with a prescription of specified product in specified time interval

Figure 1. Doctor-shopping example of a patient with two overlap events involving prescriptions from 2 unique prescribers and 3 unique pharmacies in a six-month period



RESULTS

Table 1. IMS: Rate of Doctor-shopping for OxyContin by Time Period

	Pre-Reformulation	Transition	Post-Reformulation
Number of OxyContin Patients Included in Study	849,860	447,569	2,130,955
Number of Patients with 2+ Prescribers/ 3+ Pharmacies	2,087	977	2,606
Doctor-shopping rate	0.25%	0.22%	0.12%

Table 2. Changes in Rates of Doctor-shopping for OxyContin and Opioid Comparators (at least 2 prescribers and 3 pharmacies)

	Pre-period (July'09 – June'10)	Post-period (Jan'11 – June'13)	Percent change (95% CI)	Relative Risk (95% CI)	Ratio of Relative Risk	Ratio of Relative Risk (95% CI)
All Doctor-Shopping Events						
OxyContin	0.25%	0.12%	-50 (-53, -47)	0.498 (0.470, 0.528)		
IR SE oxycodone	0.34%	0.36%	5 (2, 9)	1.053 (1.022, 1.085)	0.47	0.473 (0.443, 0.505)
Oxycodone APAP	0.13%	0.10%	-23 (-25, -21)	0.772 (0.755, 0.789)	0.65	0.645 (0.606, 0.686)
Hydrocodone APAP	0.15%	0.13%	-13(-14, -12)	0.866 (0.856, 0.876)	0.58	0.575(0.542, 0.609)

RESULTS (CONT.)

Figure 2. Changes in rates of doctor-shopping by age group before versus after reformulation of OxyContin

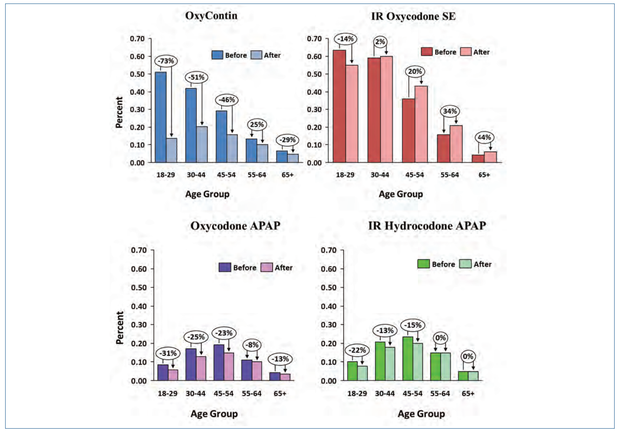


Figure 3. Changes in rates of doctor-shopping for Oxycontin for overlap events that involve at least one cash payment, 80 mg dosage strength, and both cash payment and 80 mg dosage strength: a) All ages and b) 18-29 year olds

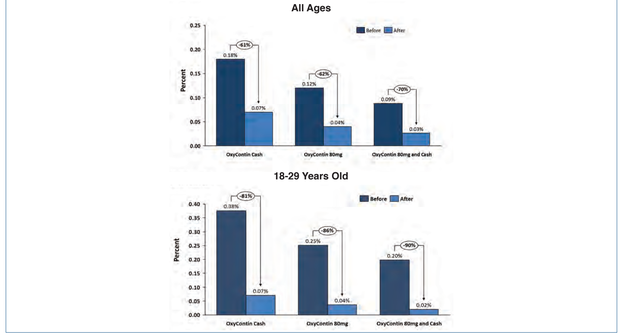


Table 3. Change in Rates of doctor-shopping (95% CI) for OxyContin Before Versus After Reformulation by Shopping Threshold

	At Least:				
At Least:	1 Pharmacy	2 Pharmacies	3 Pharmacies	4 Pharmacies	5 Pharmacies
1 Prescriber	-2% (-2, -1)	0% (-1, -1)	-43% (-46, -41)	-72% (-76, -67)	-81% (-89, -67)
2 Prescribers	5% (4, 6)	-4% (-5, -2)	-50.2% (-53, -47)	-75% (-80, -69)	-80.8% (-90, -63)
3 Prescribers	-32% (-35, -29)	-44% (-47, -40)	-58% (-62, -54)	-78% (-83, -71)	-75% (-88, -48)
4 Prescribers	-67% (-74, -58)	-69% (-76, -60)	-74% (-81, -64)	-73% (-82, -59)	-82% (-93, -52)
5 Prescribers	-78% (-90, -52)	-73.41% (-88, -41)	-77.21% (-90, -46)	-73% (-89, -35)	-75% (-92, -24)

SUMMARY

- Declines in rates of doctor-shopping from 1 year before (July 2009 to June 2010) to 2.5 years after reformulation (January 2011 to June 2013) were of larger magnitude for OxyContin than other opioids.
- Factors that have been previously shown to be associated with doctor-shopping and abuse (Cepeda et al., 2012, Journal of Clinical Pharmacology; Coplan et al., 2013, Pharmacoepidemiology and Drug Safety) had larger declines in rates post-reformulation
  - 18-29 years old
  - Cash payment
  - High dosage strength
- The age-specific profile of doctor-shopping rates of OxyContin was consistent with that of other single entity opioids (IR single entity oxycodone) before reformulation but was more similar to opioid combination products (hydrocodone and oxycodone with APAP) after reformulation
- Magnitude of decline in doctor-shopping rates increased as threshold for doctor-shopping increased

CONCLUSIONS

- Larger declines for characteristics associated with abuse and diversion supports construct validity of changes in rates of doctor-shopping for reformulated OxyContin.
- The reduction in doctor-shopping supports the hypothesis that the reformulation of OxyContin deters abuse.

Disclosure Statement

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