# Opioid Prescribing Behavior of Interventional Radiologists Across the United States

*Andrew B. Rosenkrantz, MD, MPA[a], J. David Prologo, MD[b], Wenyi Wang, MA[c], Danny R. Hughes, PhD[c,d], Zachary L. Bercu, MD[b], Richard Duszak Jr, MD[b]*

## Abstract

**Purpose:** To study opioid prescribing behavior of US interventional radiologists (IRs).

**Methods:** Using Medicare Physician and Other Supplier Public Use File claims, we identified 2,133 radiologists whose practice in 2015 comprised predominantly interventional radiology. Cross-linking the Medicare Part D Prescriber File, their opioid prescription writing behavior was characterized.

**Results:** Most (52.2%) IRs wrote 10 or fewer prescriptions total for Medicare beneficiaries. Of the 47.8% who wrote >10 prescriptions, 87.4% prescribed an opioid, most commonly hydrocodone with acetaminophen, at least once (71.3%, 1-10 opioid prescriptions; 27.4%, 11-100; 1.3%, ≥101). Overall, 23.0% of all prescriptions by those IRs writing >10 were for opioids, with an average 8.0-day prescription. Average opioid prescriptions per IR were significantly ($P \leq .015$) independently associated with their providing clinical evaluation and management (E&M) services (9.7 opioid prescriptions per IR with demonstrable E&M encounters versus 2.2 if not), practice size (12.6 for practices with ≤ 10 members versus 3.7-4.8 for larger groups), and geography (8.3 in the South versus 3.6-4.0 elsewhere). Rates were highest in Georgia (39.5) and lowest in Delaware (2.0). Higher opioid prescribing rates showed additional univariable associations with more years in practice and nonacademic practices.

**Conclusion:** Most IRs write few, if any, prescriptions for Medicare beneficiaries. Of those who do, the large majority writes for opioids, at rates higher than national physician benchmarks. IRs' opioid prescribing varies significantly based on physician and practice characteristics and particularly whether the IR provides clinical E&M services. In light of the nation's opioid epidemic, these observations may guide education, practice improvement, and policy efforts to optimize opioid prescribing.

**Key Words:** Opioids, interventional radiology, Medicare, prescriptions, health policy

*J Am Coll Radiol 2018;15:726-733.* 

## INTRODUCTION

Opioid overprescribing has been a key driver of the nation's current opioid epidemic [1]. Deaths from overdoses associated with opioid prescriptions have quadrupled since 1999 [1]. In addition, opioid prescriptions now account for almost half of all opioid overdose deaths in the United States and overall for over 180,000 total deaths since 1999 [1]. One study recently estimated that 75% of heroin users being treated for addiction were first introduced to opioids through a prescription [2]. Such figures are alarming given the estimated nearly two million individuals in the United States who are dependent on or abuse prescription opioids [3].

The opioid epidemic has received considerable attention by the medical and popular media alike and has been recently characterized as a national emergency [4-6]. Indeed, it is a leading priority of the White House [7] and the subject of an Opioid Policy Steering Committee recently created by the commissioner of the FDA [8]. This working group has prioritized targeted prescribing educational initiatives for health care professionals as well as policy efforts that more tightly regulate opioid

[a]Department of Radiology, NYU Langone Medical Center, New York, New York.

[b]Department of Radiology and Imaging Sciences, Emory University School of Medicine, Atlanta, Georgia.

[c]Harvey L. Neiman Health Policy Institute, Reston, Virginia.

[d]School of Economics, Georgia Institute of Technology, Atlanta, Georgia.

Corresponding author and reprints: Andrew B. Rosenkrantz, Center for Biomedical Imaging, Department of Radiology, NYU School of Medicine, NYU Langone Medical Center, 660 First Avenue, 3rd Floor, New York, NY 10016; e-mail: Andrew.Rosenkrantz@nyumc.org.

Andrew B. Rosenkrantz, MD and Richard Duszak, MD are supported by research grants from the Harvey L. Neiman Health Policy Institute. The authors have no conflicts of interest related to the material discussed in this article.





1546-1440/18/$36.00 ■ https://doi.org/10.1016/j.jacr.2018.01.003

prescriptions [8]. Such efforts to combat the opioid epidemic could be informed by a robust understanding of the factors contributing to variation in opioid prescribing rates. For example, opioid prescribing varies substantially among medical subspecialties, possibly relating to different norms regarding the appropriateness of opioids for pain control [9].

In recent years, interventional radiology has increasingly evolved as a distinct specialty apart from diagnostic radiology. Although objective measures of how often interventional radiologists (IRs) provide nonprocedural clinical evaluation and management (E&M) services remain low [10,11], IR thought leaders are increasingly promoting the clinical practice of interventional radiology and encouraging their colleagues to assume an increased role in the longitudinal care of patients both before and after procedures. Such longitudinal care would be expected to involve writing prescriptions, which in turn would include prescriptions for opioids during at least the postprocedural period [12-14]. To date, however, IRs' opioid prescribing patterns remain poorly characterized. Therefore, the aim of this study was to assess the opioid prescribing behavior of IRs across the United States.

## METHODS

This study, using federally designated public use files, did not involve private identifiable information. Accordingly, this work did not constitute human subjects research and did not require local institutional review board approval.

### Physician Cohort Identification

First, all Medicare-participating radiologists were identified using the most recently available (2015) Medicare Provider Utilization and Payment Data: Physician and Other Supplier Public Use File (PUF) [15]. Using this file, each radiologist's Medicare claims were extracted and used to assign radiologists to subspecialties using a classification system based on the Neiman Imaging Types of Service [16]. Using this approach, IRs were defined as all radiologists billing the majority of their work relative value units (wRVUs) in services identified as related to vascular and interventional radiology, in a manner recently validated for both academic and private practice radiologists [17,18].

### Prescription Identification

Next, the most recent (2015) Medicare Provider Utilization and Payment Data: Part D Prescriber PUF was obtained from CMS [19]. The file contains information for 100% of prescription drug events for Medicare beneficiaries enrolled in the Medicare Part D program, whether through a stand-alone prescription drug plan or a Medicare Advantage prescription drug plan [20]. To prevent individual beneficiary re-identification and thereby protect patient privacy, CMS excludes from the file providers with 10 or fewer total attributable claims over the course of the year [20]. Although our analysis primarily focused on the Part D Prescriber Public Use File's Provider Summary Table, which aggregates information across select categories of drugs (including opioids) for 1,102,268 individual providers, it was supplemented by using the detailed data set, which provides total claims counts for individual drugs for individual providers when meeting a disclosure threshold of greater than 10 prescriptions for each specific drug.

### Physician and Prescription Data Set Cross-Linking

National provider identification numbers for all majority wRVU-defined IRs were then used to cross-link the separate claims files and prescriber public use files, thereby permitting identification of information for prescriptions written by IRs filled by Medicare beneficiaries. For those identified IRs who were included in the Part D PUF (ie, those who wrote more than 10 prescriptions in 2015), the following prescribing characteristics were extracted: total prescriptions written (original and refills); total opioid prescriptions (original and refills); total days supply of opioids; and opioid prescribing rate (the percentage of all prescriptions that were for opioids). Because of stated privacy rules, all opioid-related measures are suppressed for providers whose total opioid prescriptions were 10 or fewer. For these individuals, we followed the guidance provided by CMS [20] and adopted by other authors in a separate investigation [21], and we imputed a value of five for the number of opioid prescriptions. IRs not identified in the Part D Prescriber Public Use File were assigned a value of zero opioid prescriptions. For IRs writing over 10 opioid prescriptions (ie, the only ones for which this information was available), the average number of days supply per opioid prescription was computed.

### Physician Characteristics Identification and Cross-Linking

Using methods previously described [22,23], additional physician characteristics were extracted from the Physician and Other Supplier PUF and Medicare Physician Compare [24]: gender, year of medical school