

## In Conversation With... Katie J. Suda, PharmD, MS

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**Editor's Note:** Katie J. Suda, PharmD, MS is a professor at the University of Pittsburgh School of Medicine in the Division of General Internal Medicine. She is a pharmacist by training with a specialty in infectious diseases and a research concentration in the area of dental antibiotic and opioid stewardship. In her professional role, she also serves on a clinical practice guideline panel for the American Dental Association. We discussed antibiotic and opioid prescribing in dental care and challenges for implementing stewardship programs.

**Kendall Hall:** Please take a moment to introduce yourself and your area of research to provide some context for our discussion

**Katie Suda:** My name is Dr. Katie Suda and I am a professor at the University of Pittsburgh School of Medicine in the Division of General Internal Medicine. However, I'm actually a pharmacist by training with a specialty in infectious diseases.

**KH:** I was looking at your publications bibliography online and it looks like you've been working in the area of stewardship for quite a while. What was it that got you interested, in the area of dental antibiotic stewardship and opioid stewardship?

**KS:** I've been involved in stewardship for just over 20 years now and I became interested in infectious diseases and the spectrum of activity of antibiotics when I was a student pharmacist in my experiential rotations. I had an amazing preceptor who really lit the fire for me with this interest. When I was a resident, I implemented a stewardship program at a typical academic medical center and also at a somewhat large private hospital. It was really interesting to me how many patients received antibiotics that were unnecessary. If an antibiotic was started in the ED [emergency department], it was rare that the antibiotic was discontinued, even if we knew that the isolate that was cultured from the patient was resistant. There was more adding on layers of antibiotics versus removing antibiotics. I also saw how different this was at the academic medical center compared to the private hospital, and how we needed to standardize the services that we were providing. As a pharmacist, I found it so important to involve the infection prevention department at the hospital because antibiotic use directly correlated with the number of resistant organisms.

When I was a post-doctoral fellow, I had access to a dataset from a pharmacy benefits manager group that contained diagnostic information from outpatient visits. We were just amazed at the number of antibiotics that were prescribed, even for influenza or the common cold, when there were no other infectious disease diagnoses from that visit coded. That finding led to a collaboration with the Centers for Disease Control and Prevention (CDC) and a company called IQVIA. We reviewed outpatient antibiotic prescriptions and antimicrobial expenditures and found that the vast majority of antimicrobial expenditures were in the outpatient sector/healthcare setting. We extrapolated that finding to conclude that the vast majority of antibiotic use was in the community. We then used dispensed antibiotic data and found that while physicians prescribed the vast majority of antibiotics, there were also groups that we really didn't have a lot of data on. One of those groups was dentists. When I looked to see why dentists prescribed about 10% of antibiotics nationwide, there was really nothing published in the US on how or why dentists prescribed antibiotics.

So that's led me to this path of looking at prescribing by dentists, but in general I'm very interested in implementing antibiotic stewardship in outpatient healthcare settings. I recognize that there are currently many barriers and very few resources to assist outpatient providers to implement stewardship. We've implemented stewardship in academic clinics, academic primary care medical clinics, in the emergency department, and in a dental clinic. I've also worked with specific patient populations as well as some national groups to try to provide stewardship resources.

**KH:** When you're looking at barriers across these different settings, is there something that makes dental practices unique or do they share similarities with ambulatory medical practices? Are there examples of practices that might be different from what we're experiencing in other settings, or is it just a matter of dentistry needing to catch up to where we are in other settings?

**KS:** Not only does dentistry have the barriers that you see in primary care medical settings, but there are additional barriers. For example, the vast majority of dental practices in the United States are independently owned with maybe 1 to 3 practitioners. As a result, dentists are not only in charge of providing patient care, they're also the boss. That means they also have to do personnel management, handle insurance, and manage practice expenses like making sure rent and the heating bill are paid. Dentists have to handle all of that. Another big barrier is that dentists, in general, do not have access to your healthcare data. So while the vast majority of dental practices do use an electronic dental record, it's not the same as medical practices that are used to submitting measures, like for HEDIS [Healthcare effectiveness Data and Information Set], and getting data back. In general, dental practices also do not have access to a comprehensive electronic medical history. So all the information they get on the patient's comorbidities or past medical history, including their medication history, is by self-report, and we know that is not always very accurate.

Dentists not only have pressure to prescribe antibiotics from patients, they also have pressure from medical doctors to provide infection prophylaxis patients prior to dental visits, such as for patients with orthopedic implants. A lot of things that happen in medical care directly influence the way that dentists prescribe. For example, we know that way too many patients are labeled as penicillin-allergic and that this is typically done in medical settings, such as in a clinic, hospital, or in the ED. Very few of these patients are actually penicillin-allergic and mislabeling them increases the likelihood that a patient will receive clindamycin from

a dentist, which is generally only used to treat serious infections. [Dentists prescribe the vast majority of clindamycin](#) in the United States and it comprises about 15 to 20% of all antibiotics prescribed by dentists in the US.<sup>1,2</sup> Clindamycin is associated with an increased risk of *c. diff.*<sup>3</sup>

**KH:** One of the things we've seen in other care settings is that some clinicians who prescribed antibiotics more freely also tended to do the same with opioids. We've seen that it is a culture issue as well as their own individual practices. Does that hold true for dentistry?

**KS:** That is my hypothesis, that overprescribing two medication classes are associated. However, because of some data limitations we haven't been able to exactly answer that question within the private sector. We do know though that geographic areas with [higher dental prescribing of antibiotics are also the same areas in which we find higher prescribing of opioids](#). We just submitted another paper demonstrating this for peer review.

**KD:** Do dentists have the same access to prescription drug monitoring program as clinicians? If they do, do they know how to use it?

**KS:** Yes, in theory dentists have access to all 49 state-supported prescription drug monitoring programs [PDMPs]. However, Dr. McCauley out of MUSC [the Medical University of South Carolina] [published a study](#) showing that while dentists know that they have access, they don't always use it. I believe that study was limited to one state, but she did do a [national survey](#) of the National Dental Practice Based Research Network, which is funded by the NIH, and found that the majority of dentists do not actually utilize their state's PDMP regularly. She also found that dentists who do not use PDMPs had higher levels of opioid prescribing. Now that was published a couple of years ago and now some states mandate checking the PDMP for many clinicians, including dentists. There was a study published a few years ago of a state in the northeast who was an early adopter of mandating check of the PDMP. They first targeted dentists in their mandate and found a significant decrease in opioid prescribing after mandating query of the PDMP prior to prescribing an opioid.

**KH:** Has anybody looked at what the safety culture is within dental practices and how that correlates with prescribing behavior?

**KS:** It's interesting that you bring that up because I've been watching my own personal dentist. I'm very intrigued with how mechanistic they frequently are and the amazing infection prevention that they practice. The amount of times they wash their hands and glove and re-glove... After doing some infection prevention work in the acute care setting, it's really amazing to see how frequently dentistry washes their hands. For example, for a long time there's been a sink next to the dental chair, how long did it take us to get a sink in every patient room in the hospital?

**KH:** Do you think that this culture is a function of dental training that is instilled early on?

**KS:** I can't comment on the curriculum, unfortunately. Culture, as you know, is very hard to tease out, but we are conducting qualitative interviews of dentists throughout the United States to evaluate their perception of appropriate antibiotic and opioid prescribing, risks associated with antibiotic and opioid prescribing, and strategies to improve that prescribing. We have completed over 70 interviews and are currently analyzing that data.

**KH:** So we have talked about the challenges dentists face, but what about the solutions? How can we change the practice of those dentists with higher rates of prescribing either opioids or antibiotics?

**KS:** There are a few examples of opioid stewardship and antibiotic stewardship that have been tested in dentistry, including internationally. In both England and Scotland, the health system audited dentists and provided feedback on their findings. In some cases this also included education. They also had a public health campaign which was titled “Antibiotics Don’t Cure a Toothache.” Another thing that’s happening in the United Kingdom is that the British Society for Antimicrobial Chemotherapy will have an online course focused on antibiotic stewardship for dentists that will be launched in November this year.

In the United States, the CDC published a document called the [CDC Core Elements of Outpatient Antibiotic Stewardship](#), as well as similar documents for [acute care](#) and for [nursing homes](#). In this document, the CDC included dentists and dental practices as settings they recommend implementing antibiotic stewardship. The CDC also has a free online training program on antibiotic stewardship, and there's one module that is specific to dentists.

At my prior institution, the University of Illinois at Chicago (UIC), we implemented an antibiotic stewardship program in an academic dental practice using the [CDC Core Elements of Outpatient Antibiotic Stewardship](#) framework. We had a very strong commitment, which is the first core element, from leadership in the colleges of dentistry, pharmacy, and the co-directors of the antimicrobial stewardship program at the health system. We also identified a single stewardship leader, which was the director of the urgent care dental clinic. Without us actually knowing, the College of Dentistry included the implementation and maintenance of the dental antimicrobial stewardship program in their strategic plan. We also provided needed education and expertise, the second core element, from an endodontist, an oral surgeon, and an infectious disease pharmacist and infectious disease physician, who were co-directors of the antimicrobial stewardship program at the health system. We then took a multimodal approach to education. We provided live continuing education sessions (that were also recorded and available for on-demand viewing) on guidelines that were relevant to dentistry and on antibiotic stewardship more generally. The Associate Dean of Clinical Affairs, who oversaw the clinical enterprise, sent out a “Monday Minute” email every Monday morning for four months. They were designed to be read in under a minute and had key educational messaging focused on the epidemiology of resistant *C. difficile*, prescribing patterns by dentists, and general antibiotic stewardship messaging. We also used behavioral nudges to influence prescribing, including posters provided by the CDC, targeting both patients and dentists. For action for policy and practice, the third core element, we formulated local guidelines on the treatment of an oral infection, created a simple flowchart on paper of when an antibiotic is and is not needed, and hung that flowchart chairside within the dentist's view. For the fourth core element, tracking and reporting, we provided some data back to the dental staff to allow for peer comparison and to inform our efforts. At baseline, we looked at all antibiotic prescribing and saw that the urgent care dental clinic had the highest prescribing rate, so we focused our efforts there first. We reviewed those antibiotic prescriptions and found that the treatment of oral infection was an area for opportunity. We looked at this same data post-implementation and antibiotic prescribing decreased by 70% post implementation. We've now expanded this program to include antibiotic prescribing for prophylaxis and we also have tried a systematic process to engage medical clinicians when the dentist perceives a

gray area of whether or not the patient should receive prophylaxis.

A couple of years ago, the Ohio State University held an interdisciplinary community forum, a town hall for dentists and orthopedic surgeons to improve antibiotic stewardship prophylaxis, specifically targeted to those patients with orthopedic implants. They found that the two groups, dentists and the orthopedic surgeons, came to an improved understanding of when prophylaxis was- and was not- indicated in patients with orthopedic joints. But they also identified some gray areas where there was not sufficient evidence to either recommend prophylaxis or to discourage prophylaxis in certain patient populations.

The other thing I want to mention is the American Dental Association released [new guidelines](#) last year for the treatment of an oral infection. Interestingly, they have incorporated antibiotic stewardship principles into these guidelines. Additionally, the Association of State and Territorial Dental Directors, our state dental director's organization, have recently released [statements](#) supporting the implementation of antibiotics stewardship in dentistry. As did the [FDI \[Fédération Dentaire Internationale\] World Dental Congress](#).

For opioids, as I mentioned, some states have a mandate that dentists and other clinicians consult the PDMP before prescribing opioids. Here in Pittsburgh, a dental clinic embedded a pharmacist into the dental clinic and they found that there was improved prescribing and overall decrease in prescribing of opioids.

My team randomized a cohort of patients to look at the impact of a brief pre-visit intervention in patients scheduled for tooth extraction. In this intervention, the patients were instructed on what to expect post extraction, we provided non-opioid analgesic based on their comorbidities and what was appropriate, and also recommended non-drug remedies such as ice. We provided the patients with a contingency plan and information about what really bad pain was like and when they needed to contact the dentist. We found that the patients randomized to the intervention took fewer tablets of the opioid analgesic.

There are no guidelines in the US on the treatment of oral pain and I think that is something that is really lacking and hindering the profession from moving the field forward to improved prescribing. However, the American Dental Association is developing new guidelines that will address this. The ADA has also offered free online education where dentists can get CE [continuing education] through their website. There are also things individual dentists can do to decrease opioid prescribing. My personal dentist was proud to tell me that he now only prescribes 8 tablets, if he prescribes opioids at all, versus the 30 that he used to prescribe. The University of Pittsburgh's School of Dental Medicine actually went opioid free and stopped prescribing opioids for dental procedures. And then of course dentists should check the state PDMP before prescribing any controlled substance.

**KH:** What about the use of clinical decision support? This seems like an opportunity to incorporate clinical decision support and some of the tools that are out for ambulatory practices into the dentistry practice. Is that an up-and-coming area?

**KS:** It is in dentistry. Unlike in medicine, there are only two primary electronic dental record vendors that most dental practices use in the private sector, academic dental practice uses a third. So there are not as many as in medicine, and tools can be pushed out from the actual vendor, unlike some of the other big EHR systems where it has to be institution or health system specific. What we did at UIC is create an electronic clinical decision support tool for treatment of oral infections and antibiotic prophylaxis. It is a very large area of opportunity.

**KH:** Are there online resources you can access if you don't have that clinical decision support available in your EHR?

**KS:** The American Association of Orthopedic Surgeons has a [tool](#) for those gray areas of prophylaxis, they call it appropriate use criteria, and they have one that is specific to dentistry. They have an online widget where you can plug in the type of dental procedure and the patient's comorbidities, like if they have HIV or have some other kind of immunocompromised condition.

**KH:** You've answered all of the questions I had prepared, is there anything else we should talk about or include in this conversation?

**KS:** One thing that people are really surprised by is that dentists are very high prescribers of both of these medication classes. They prescribe one out of every 10 antibiotics and one out of every eight short-acting opioids. Now, similar to other clinicians, prescribing of opioids by dentists has decreased, but it was a little bit delayed as compared to physician providers. It is important for us to find out more about antibiotic prescribing and what works for dentists because what works in a medical clinic or in a hospital is unlikely to work in a dental practice. The workflow is different and the management is different. The independent dental practitioner is not going to be able to implement what a hospital will be able to implement. There's also this misperception among dentists that most of their patients only take one dose of an antibiotic before a procedure and that this can't cause any adverse drug reactions, but we know that antibiotics taken for short duration can and do cause adverse events.

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