Data-Driven Dental Antibiotic Stewardship:
State Survey Findings and Stewardship Resources

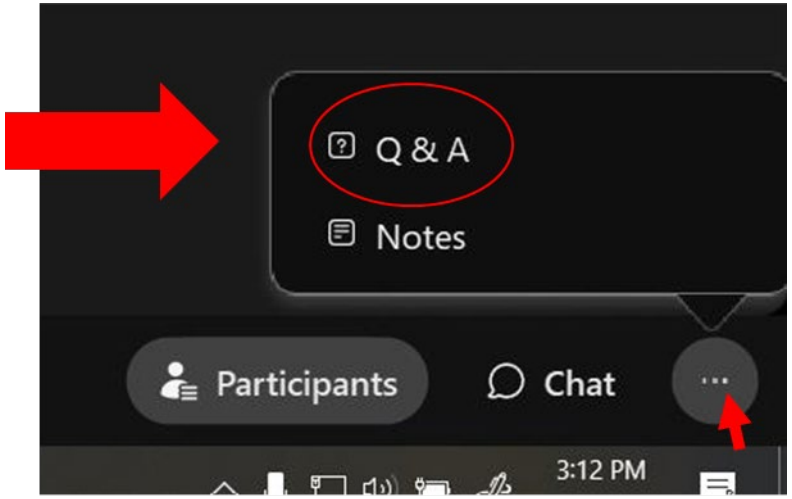
Nov. 15, 2024

DEPARTMENT OF HEALTH

health.state.mn.us

Introduction

- Thank you for joining us!
- Attendees are muted and the presentation will be recorded.
- Please submit questions for our presenters in the “Q&A” panel found at the bottom right of the WebEx screen.



Minnesota Dental Antibiotic Use & Stewardship Survey

Madeline Powers, MPH | CSTE Applied Epidemiology Fellow

Continuing Education

- Slides will be sent out next week following the webinar and a recording will be available a few weeks afterwards.
- An anonymous evaluation survey will be emailed out following the webinar.
  - 1 hour of fundamental Continuing Education (CE) credit from the MN Board of Dentistry will be available to claim for Minnesota dental professionals. Once you fill out the evaluation form, it will automatically route to the form to claim CE credit.

MINNESOTA
BOARD OF DENTISTRY

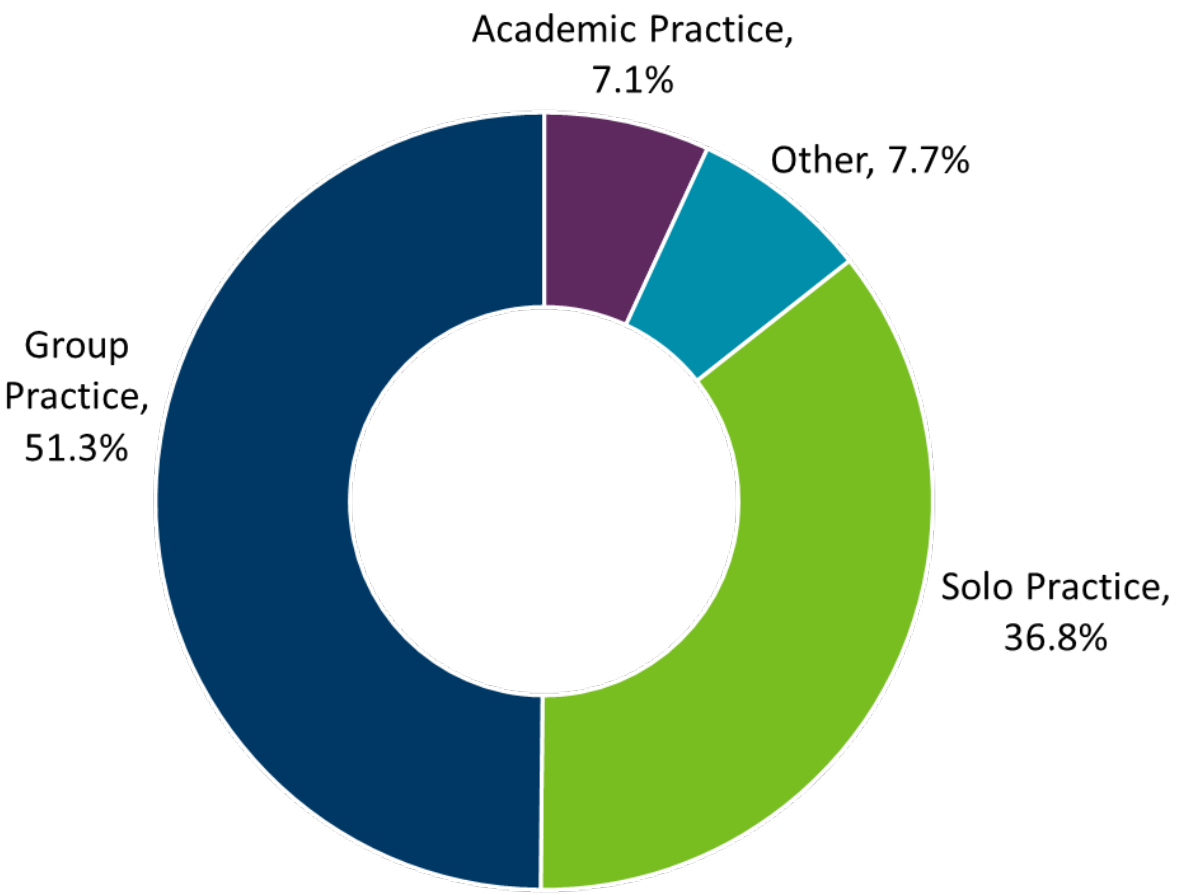
Survey Overview

Survey Overview

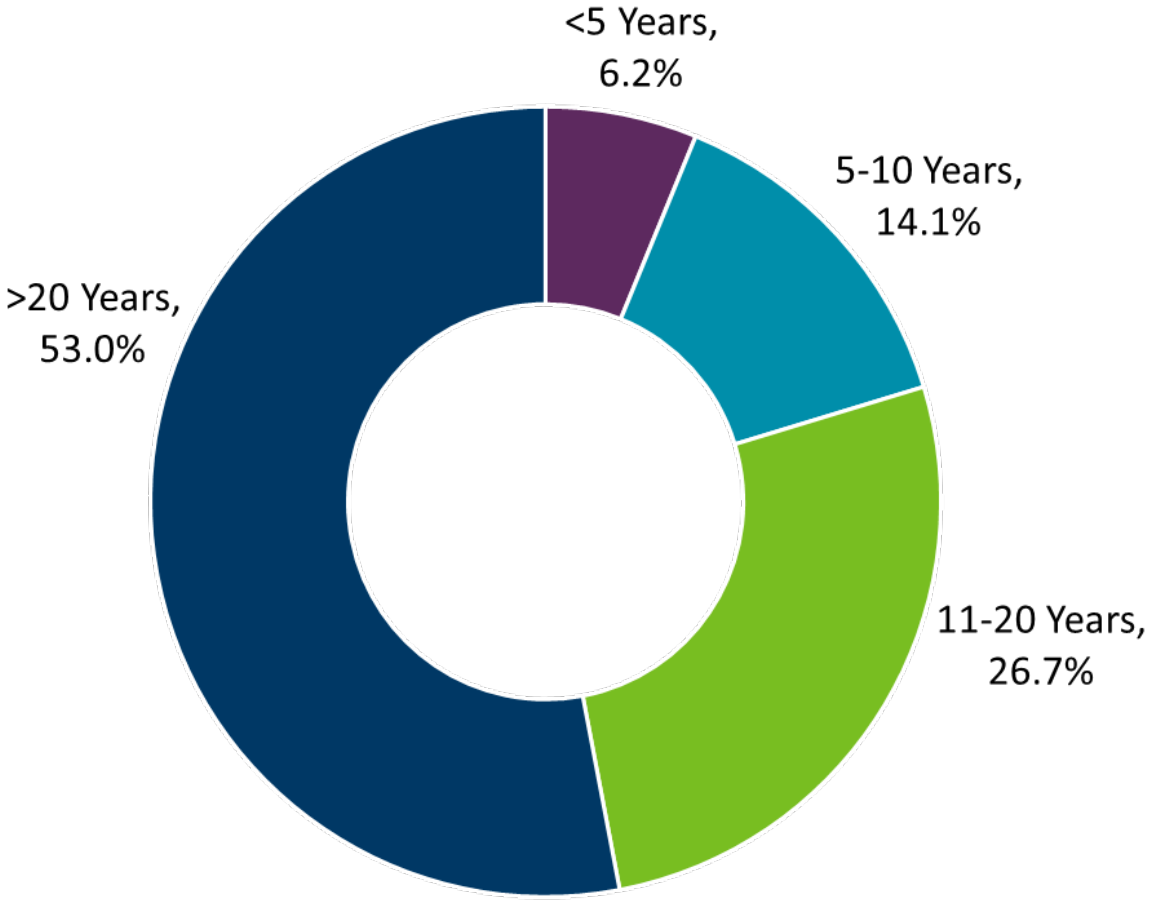
- **Goal:** Learn about knowledge, attitudes, and practices of Minnesota dentists on antibiotic use and stewardship
- Open from May 22 – July 12, 2024
- Number of survey responses: 468
  - 10.8% response rate
- Mirrored a similar survey conducted in 2015 to allow for comparisons between years

Demographics

Practice Type



Years in Practice



Certifications & Stewardship Training

- **Increase in respondents certified in a dental specialty**
  - 20.1% certified in 2024, compared to 14.9% in 2015
  - 2024 Breakdown: 5.1% oral and maxillofacial surgery, 4.9% pediatrics, 3.5% periodontics, 3.2% endodontics
- **High levels of specialized training in antimicrobial stewardship**
  - Nearly 70% of respondents indicated they have received some form of specialized training in antimicrobial stewardship
    - 45.3% took coursework in dental school
    - 43.6% self-studied antimicrobial stewardship content
    - 9.4% participated in a certificate program

Key Findings

1. Positive shifts in prescribing habits and factors

2. Improved awareness around antibiotic stewardship

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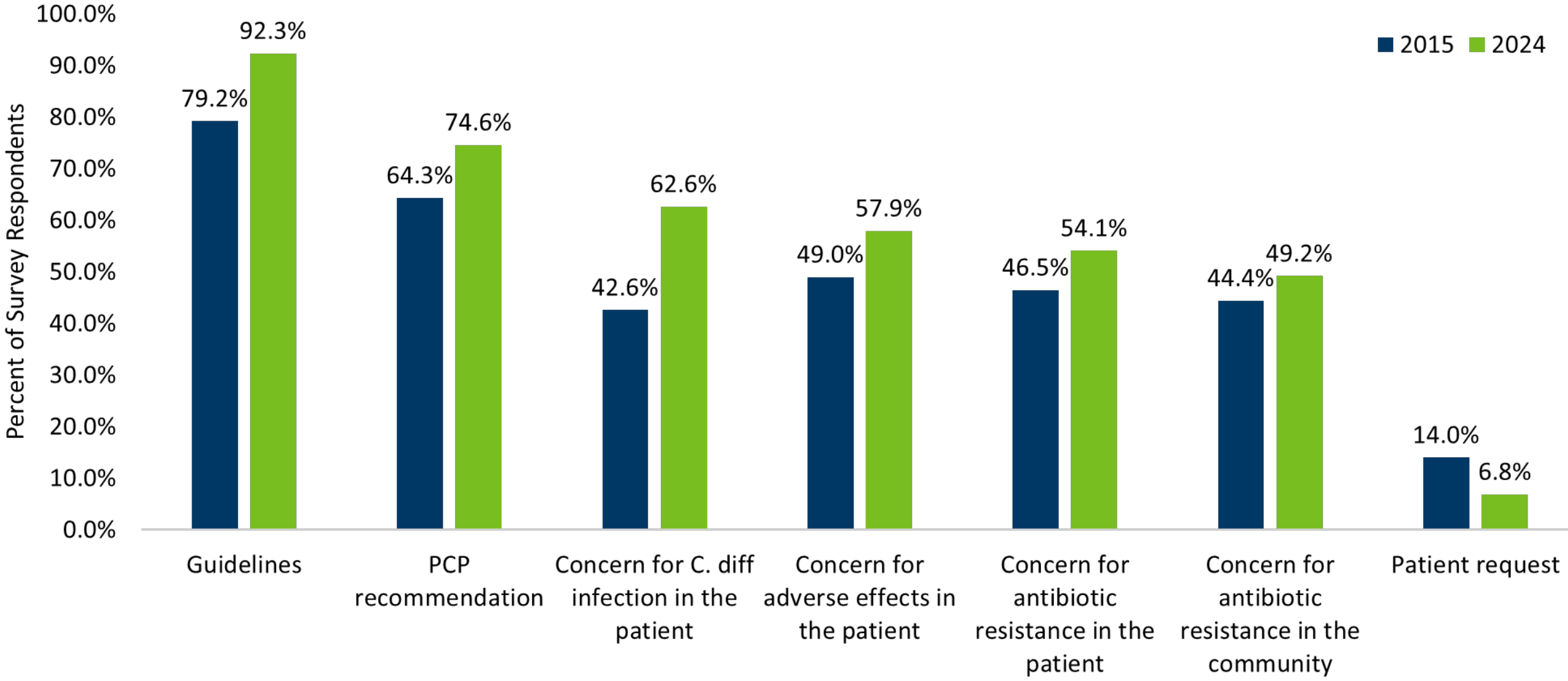
1. **Positive shifts in prescribing habits and factors**

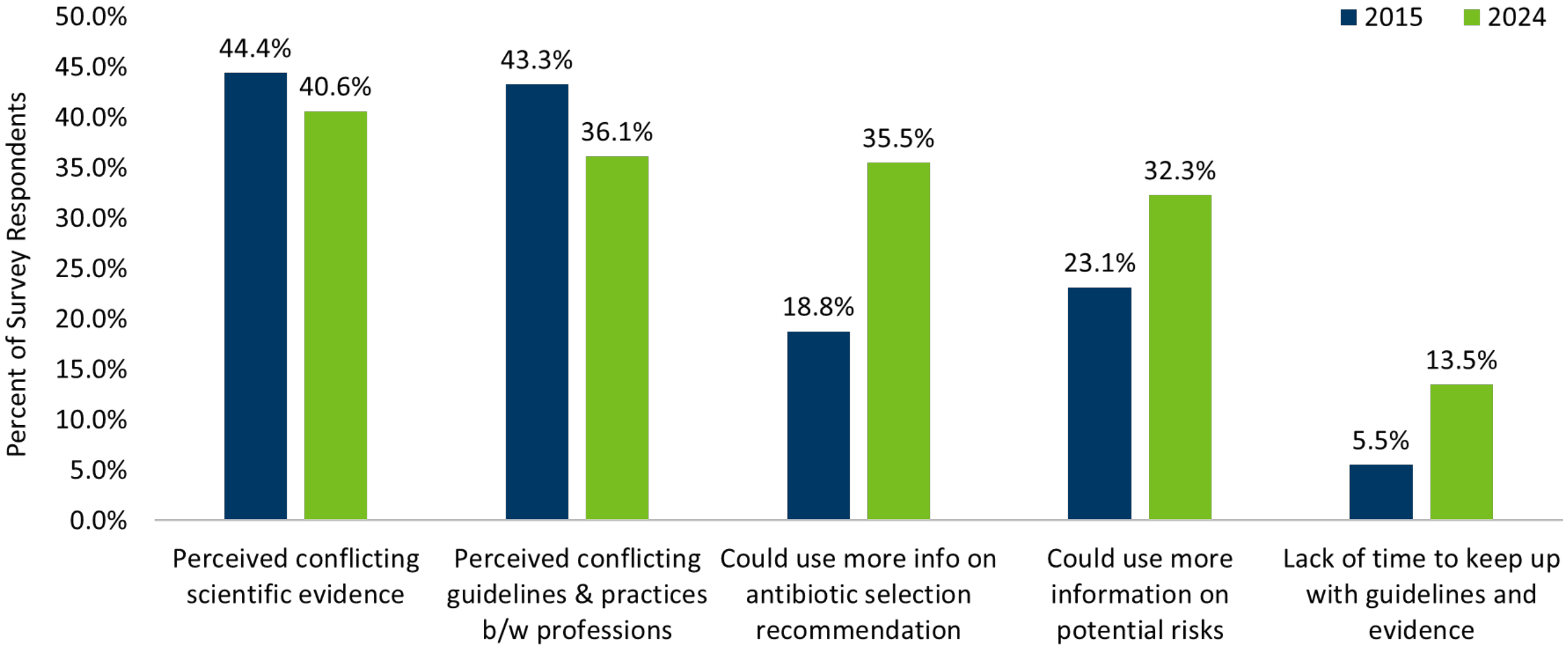
2. Improved awareness around antibiotic stewardship

Antibiotic Prescribing Practices

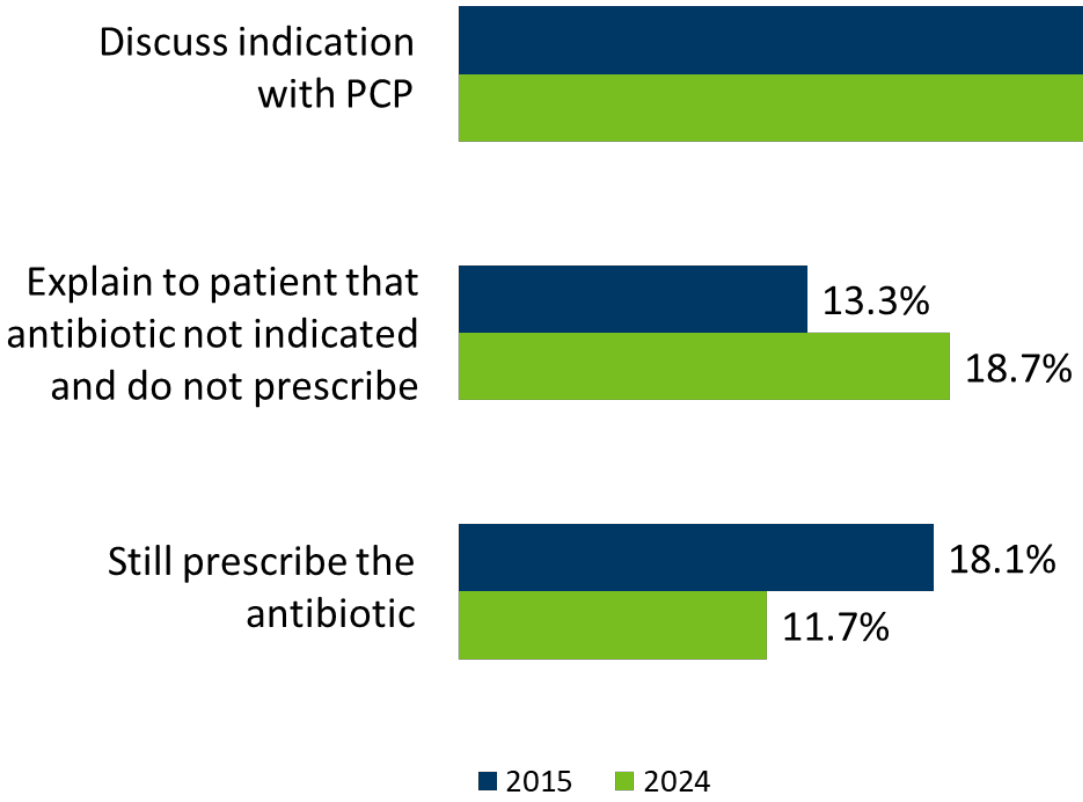
Factors that Influence Decision to Prescribe Antibiotics



Types of Challenges in Making Decisions About Antibiotic Use



Dentist Response to Situation Where PCP Recommends an Antibiotic When Not Recommended by Guidelines



"I tell pts my recommendations are based on ADA/AHA guidelines, not my opinion. If someone has a different opinion, I'm not going to argue with them, but they'll have to be the one who prescribes. I try to educate the patient about when they really are indicated and how the guidelines have changed with time."

Conditions Where Dentist Would Choose to Prescribe Prophylaxis Before Invasive Dental Procedures

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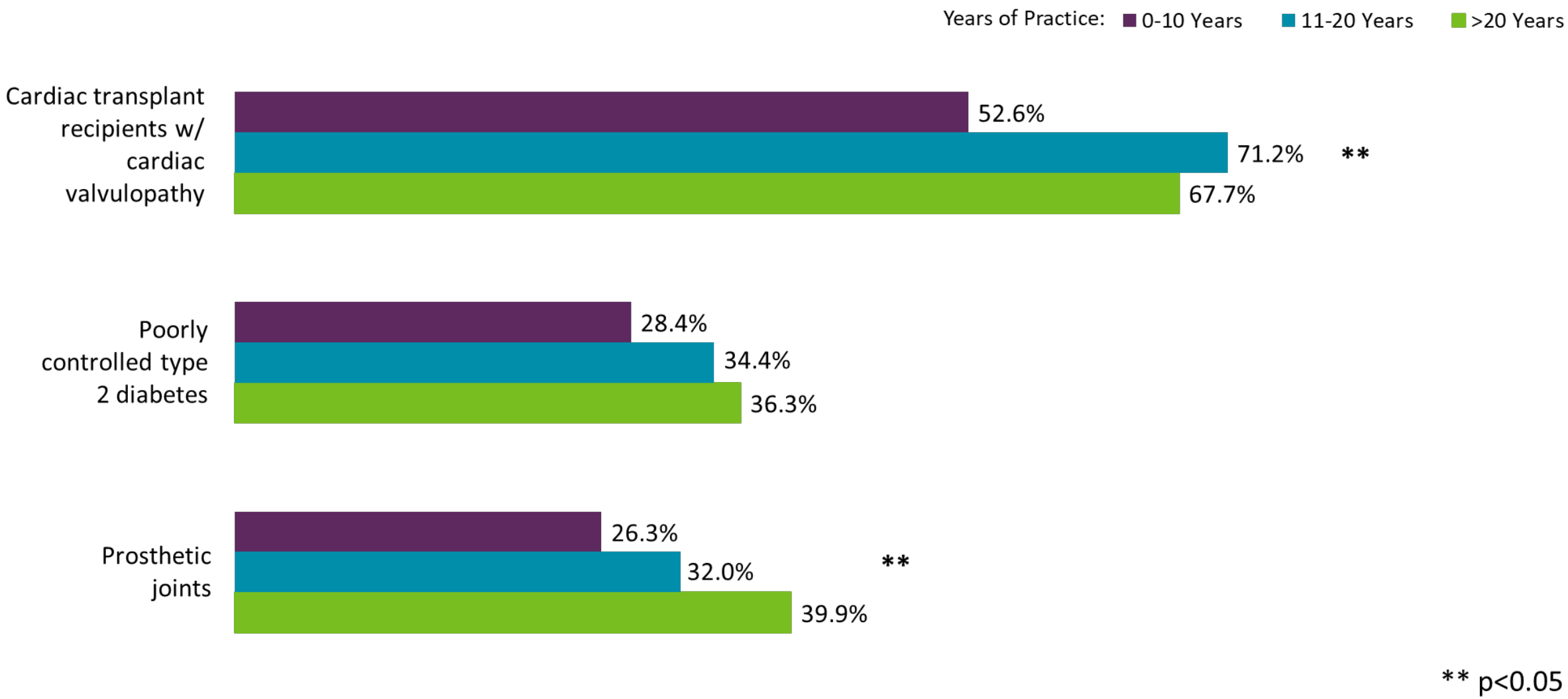
Conditions Where Dentist Would Choose to Prescribe Prophylaxis Before Invasive Dental Procedures



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First-Line Antibiotic Prescribing Choices

First-Line Antibiotic Prescribing

Asked about first-line antibiotic choice in various scenarios: prophylaxis, localized swelling, gingival pain, failed local anesthesia, patient vacation, legal concerns, patient expectation

- **Amoxicillin was the most common choice** across every scenario, if respondents indicated they would prescribe an antibiotic
- Scenarios of **prophylaxis and localized swelling had higher levels of prescribing in 2024** compared to 2015
- Scenarios of **gingival pain, patient expectation, and failed local anesthesia had lower levels of prescribing in 2024** compared to 2015
- Scenarios of patient vacation and legal concerns had similar levels of prescribing across 2024 and 2015

Key Findings

1. Positive shifts in prescribing habits and factors

2. **Improved awareness around antibiotic stewardship**

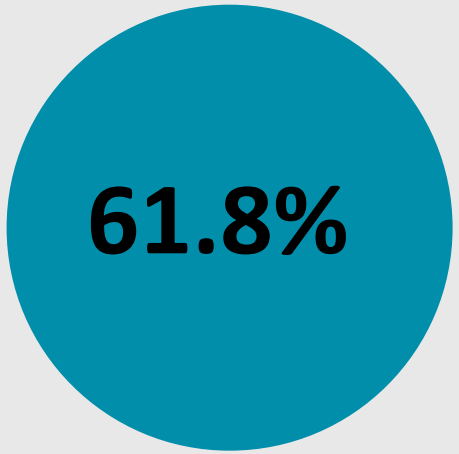
CDC Core Elements of Outpatient Antibiotic Stewardship

CDC Core Elements of Outpatient Antibiotic Stewardship

- In 2016, the CDC released the Core Elements of Outpatient Antibiotic Stewardship: **commitment, action for policy and practice, tracking and reporting, and education and expertise.**
- Provides guidance for AS in outpatient settings and a framework for establishing effective AS interventions for clinicians and facilities.
- In MN, over three quarters of dentists indicated that their practice had implemented at least one Core Element; however, **less than 10 percent had implemented all four Core Elements.**

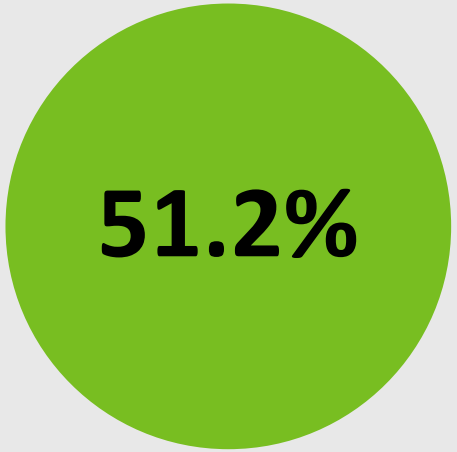
Core Elements of Outpatient Antibiotic Stewardship

Commitment



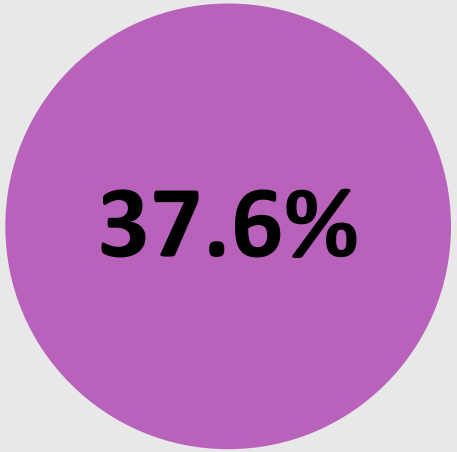
of practices can demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety related to antibiotics

Policy



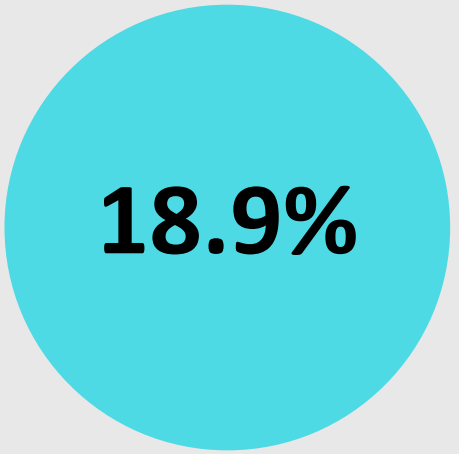
of practices have implemented at least one policy or practice to improve antibiotic prescribing

Education



of practices provide resources to clinicians and patients on evidence-based antibiotic prescribing

Tracking



of practices monitor at least one aspect of antibiotic prescribing

Insight from Free Response Questions

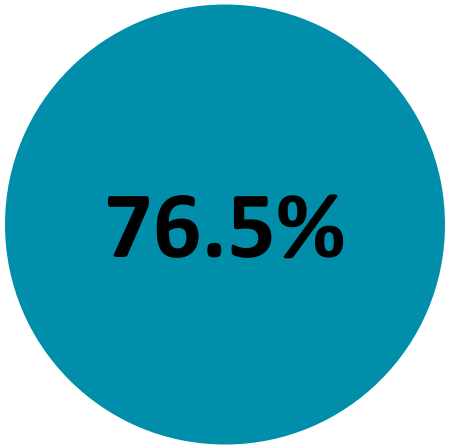
Themes from Free Response Questions

- **Recognition of importance of antibiotic stewardship**
  - Many dentists noted how they prescribe far fewer antibiotics than they used to
- **Specialists often request dentists to prescribe antibiotics in scenarios that go against guidelines**
  - Dentists feel caught in between what the guidelines say and what the other provider is recommending
- **Conflicting recommendations with other specialties is confusing and frustrating**
  - Lack of time to keep up with changes and differences between specialties

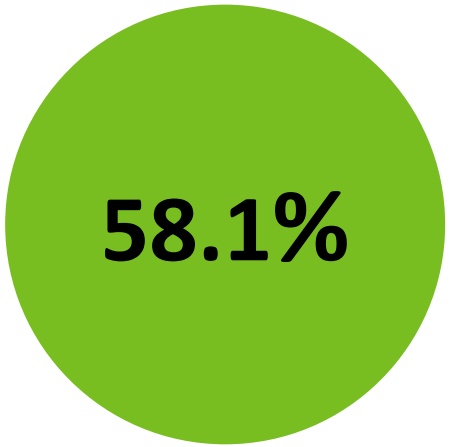
“I feel like dental is way more on top of abx guidelines than other fields. Orthopedic doesn't even follow their own guidelines. I constantly have joint replacement patients saying they need abx but almost always are happy to hear they don't need it. I rationalize that if they need abx to get their teeth cleaned then they should need abx to brush their teeth at home, which they obviously don't. This seems to make sense to them.”

Topics Interested in Learning More About

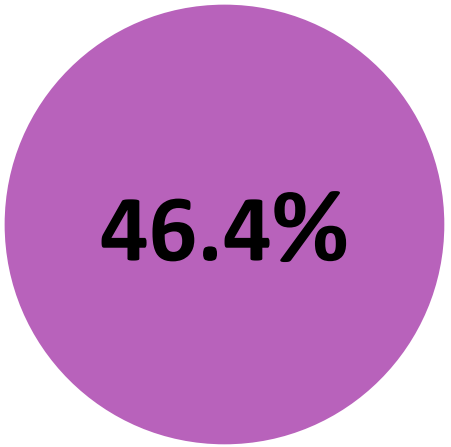
Overview of Current Prescribing Recommendations



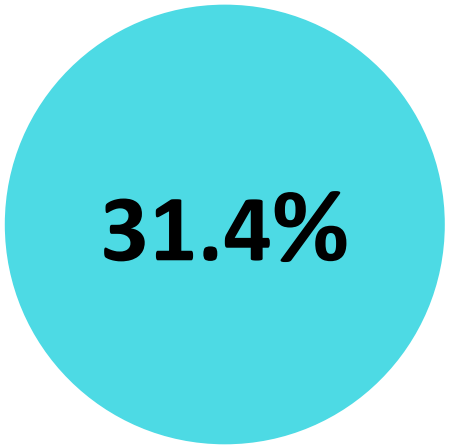
Antibiotic Stewardship Best Practices



CDC Core Elements of Antibiotic Stewardship

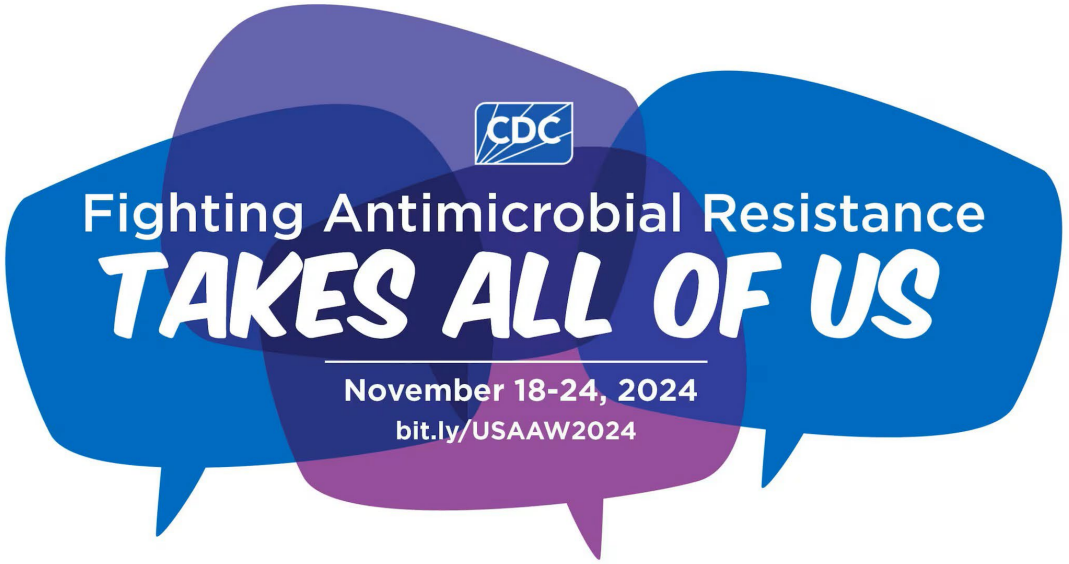


Mechanisms to Track Antibiotic Data



U.S. Antibiotic Awareness Week is November 18-24!

- Goal to raise awareness about the threat of antibiotic resistance and highlight the critical role antibiotics play in human health, environmental health, animal health, and beyond
- Subscribe to email updates to receive informational emails during USAAW from MDH
- On Nov. 19, look for Minnesota landmarks to light up purple for the “Go Purple” USAAW campaign!

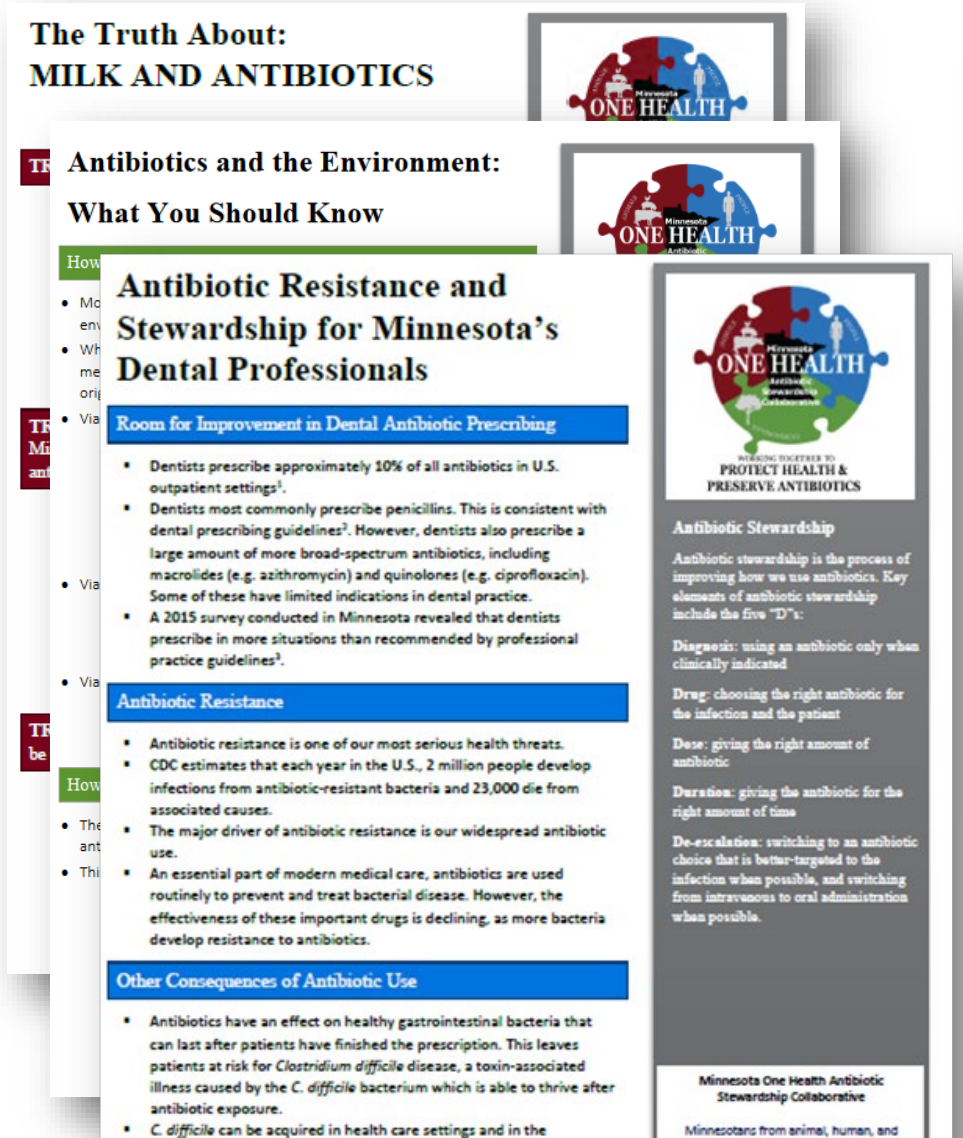


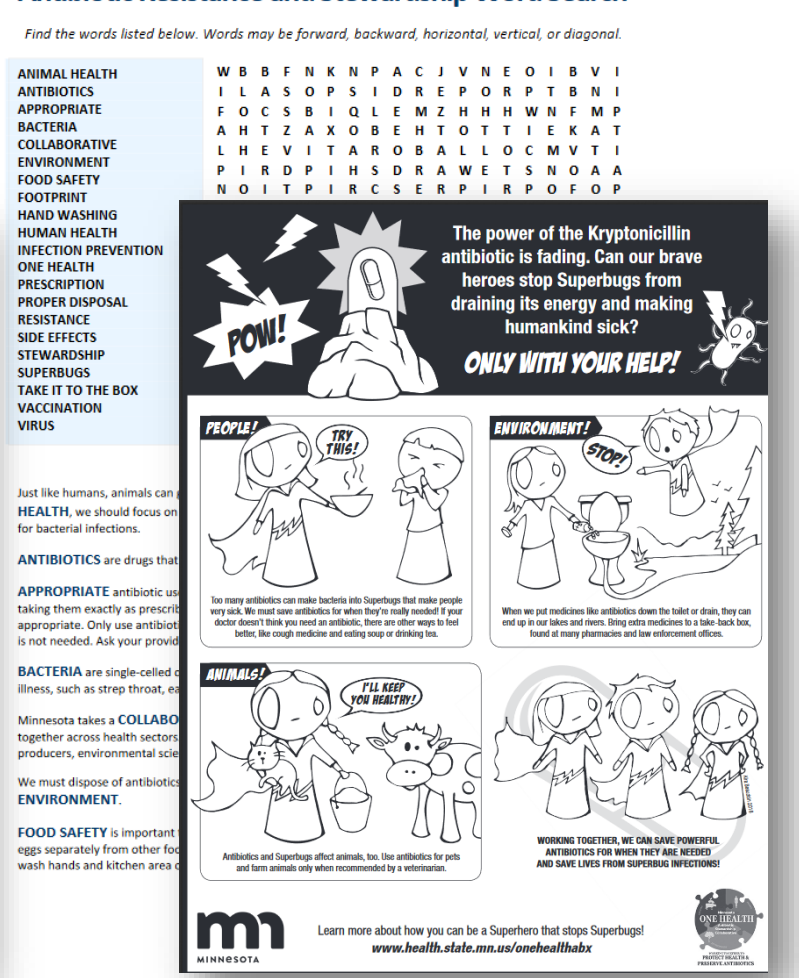
Learn more about the Minnesota One Health Antibiotic Stewardship Collaborative (MOHASC)!

Scan here to subscribe to the MOHASC newsletter!

- **Vision:** Minnesota leaders in human, animal, and environment health will work together to raise awareness and change behaviors to preserve antibiotics and treat infections effectively
- **Four workgroups:** Human, Animal, Environmental, and One Health
- Currently have over 150 members representing 64 organizations
- **Interested in joining MOHASC?**
  Visit MOHASC Partner Information Form (bit.ly/joinmohasc)
- **Website:**
  Minnesota One Heath Antibiotic Stewardship Collaborative (www.health.state.mn.us/communities/onehealthabx/index.html)

Antibiotic Stewardship Resources and Print Materials Available on the MDH Website





https://www.health.state.mn.us/communities/onehealthabx/materials.html

Thank You!

Madeline Powers, MPH

Madeline.Powers@state.mn.us

Data Driven Stewardship

Erinne Kennedy, DMD, MPH, MMSc

ADS
Association for Dental Safety

Speaker

Erinne Kennedy, DMD, MPH, MMSc

Disclosures: No relevant financial relationships to disclose

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Learning Objectives

- Discuss tools to demonstrate a stewardship commitment within the dental setting based on the data collected on antibiotic stewardship in Minnesota
- Identify resources to educate and train the entire dental team to promote responsible antibiotic prescribing
- Understand up and coming practices in antibiotic stewardship

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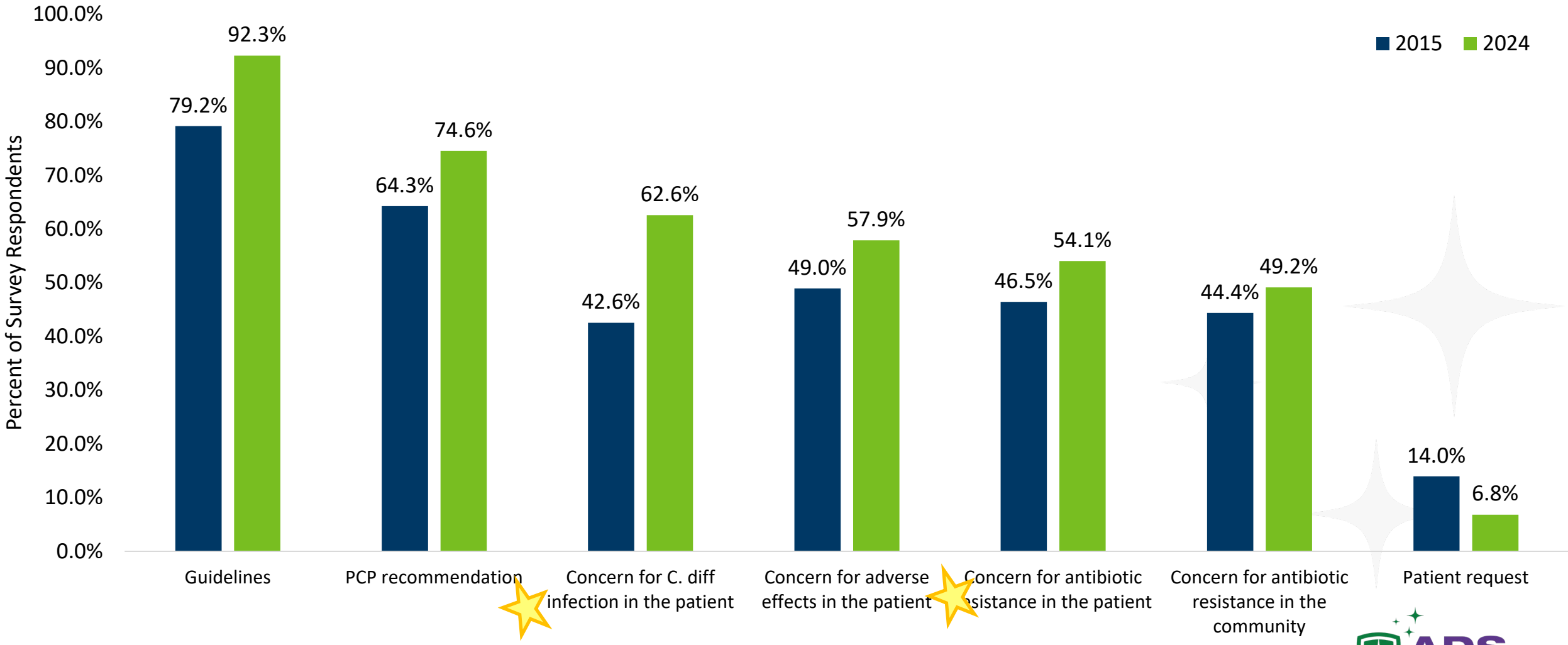
Factors that Influence Decision to Prescribe Antibiotics



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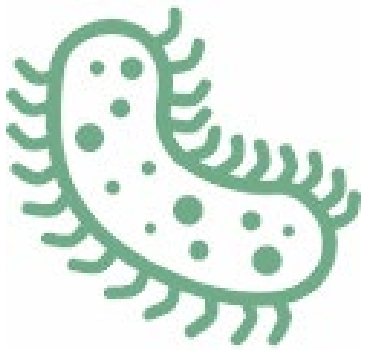
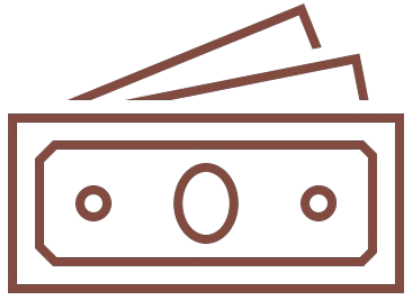
Undesirable Effects Associated with Antibiotic Therapy



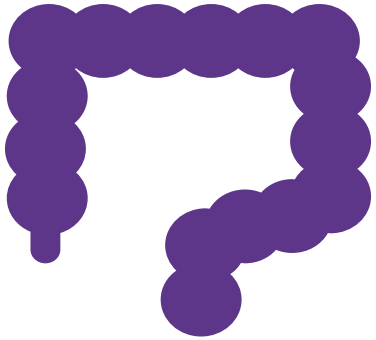
Antibiotic-resistant infections (e.g., MRSA)

Hospitalization



Costs

Opportunistic infections (e.g., *Clostridioides difficile*)



Adverse Reactions

Mortality

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1 out of every 1,000 antibiotic prescriptions leads to an Emergency Department visit.

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Trooths about Mortality

Antibiotic use is the primary driver of antibiotic resistance.

Annually:

2,868,700 infections

35,900 deaths

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Trooths about Antibiotic Resistance

- Antibiotic resistance is a public health concern around the world
- Antibiotic resistant bacteria may infect humans and animals
- The infections they cause are harder to treat
- The main cause of antibiotic resistance is antibiotic use
  - One dose of an antibiotic can result in bacteria becoming resistant
- Resistance genes can be transferred to different bacterial species
- Infection prevention is paramount in preventing spread of resistant organisms

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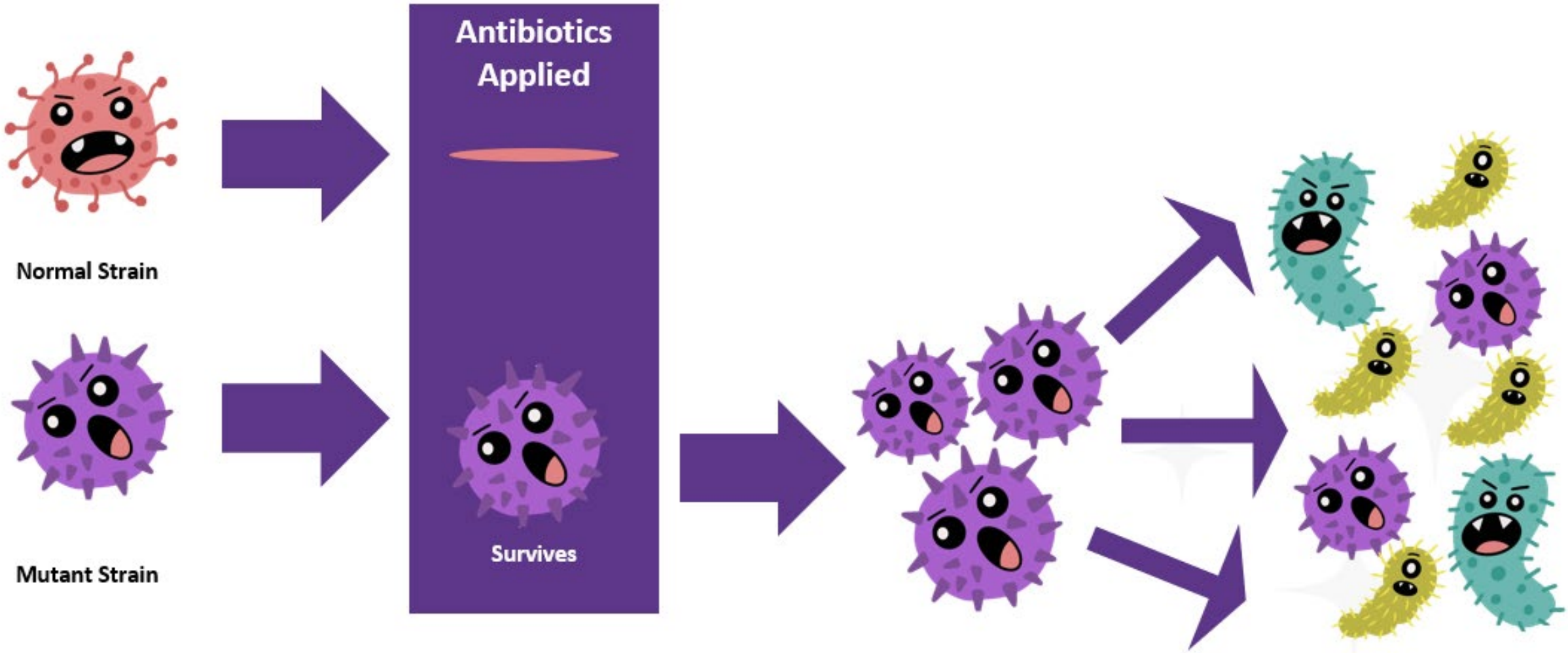
What is antibiotic resistance?



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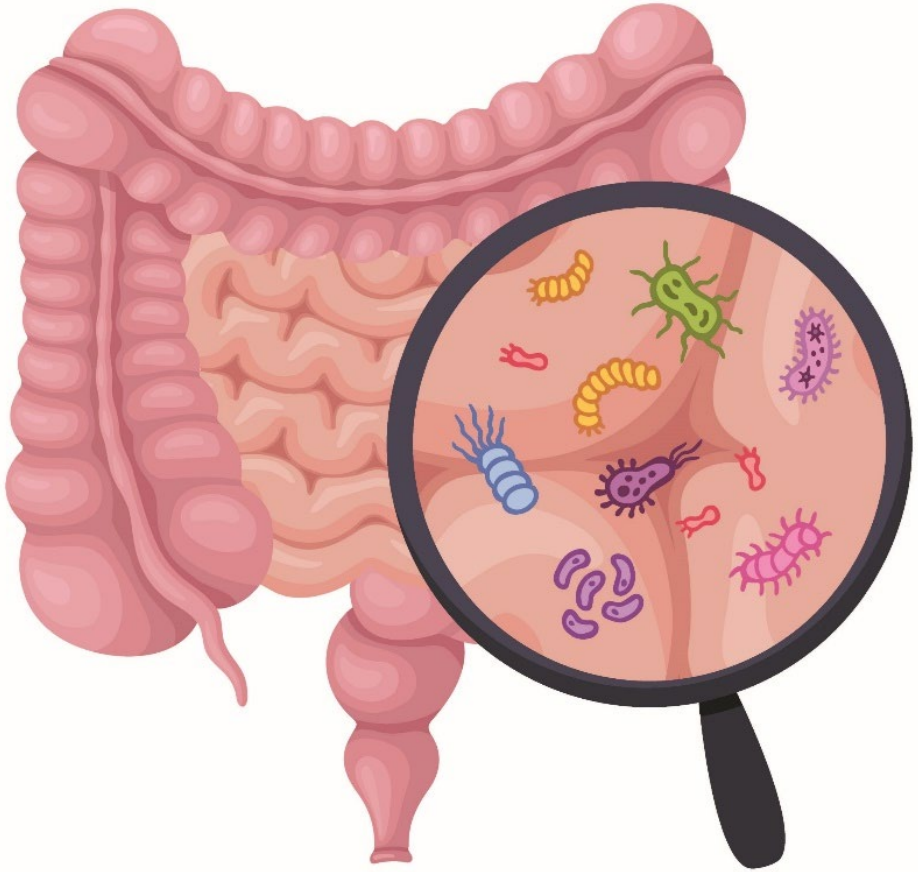
Antibiotic use is the most important modifiable risk factor for *Clostridioides difficile* infection.



7–10 times more likely to develop *C. difficile* while taking an antibiotic!

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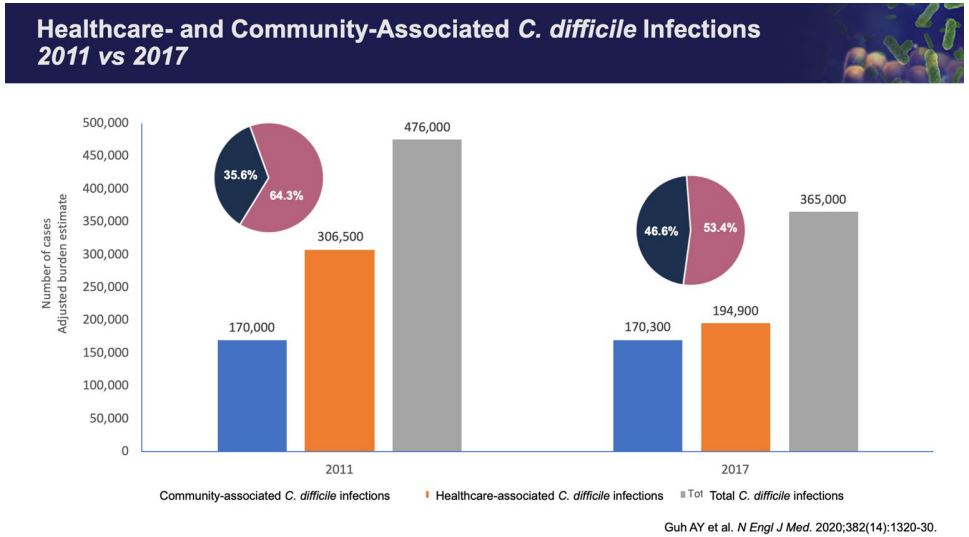
1 in 11 adults age 65+ die within 1 month of diagnosis

Community-associated CDI causes ~50% of cases

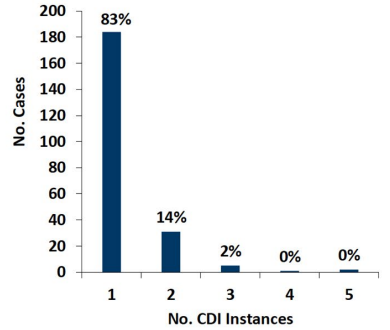


Guh AY et al. *N Engl J Med.* 2020;382(14):1320-30.

1 in 6 patients will have a recurrence within 2-8 weeks of diagnosis

Number of CDI Recurrences in CA-CDI Cases

- 20 (15%) of the cases who took antibiotics for a dental procedure had at least one recurrence
  - 70% of these cases had their first case of CDI after taking antibiotics for a dental procedure



M. Bye, personal communication, June 27, 2019

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Many Case Reports of CDI in Dental Patients Receiving Clindamycin (and other antibiotics)

C. DIFF STORIES

Kay

LOCATION: ARIZONA

AGE: NO

GENDER: F

LENGTH:

SOURCE: OTHER

I am a public health dentist and practiced clinical dentistry for nearly 30 years. On January 11, 2022, I underwent periodontal surgery (tooth extraction and socket graft). The periodontist prescribed clindamycin for 6 days. There was no infection present, it was a "prophylactic" protocol to prevent possible infection. I returned to the periodontist for a 1 month post-op evaluation on February 13 and 2 days later developed acute GI symptoms. I was misdiagnosed by urgent care, twice, as having IBS. A few days later, I saw a gastroenterologist. The GE believed it was C. diff, and unfortunately for me his diagnosis was correct.

NEWSLETTER SEARCH

Peggy Lillis Foundation

For C. diff Education & Advocacy

DONATE

ABOUT C. DIFF ABOUT PLF C. DIFF STORIES GET INVOLVED EVENTS MEDIA

C. DIFF STORIES

Peggy Lillis

LOCATION: NEW YORK

AGE: 56

GENDER: F

LENGTH: 6 DAYS

SOURCE: COMMUNITY ACQUIRED

As told by her son, Liam.

On Tuesday, April 13, my mom had a root canal, and the dentist prescribed the antibiotic Clindamycin to treat an abscess. The next day, she felt fine. On Thursday, mom came home from work and said she didn't feel well. Thinking she caught a bug from one of her students, she still went to her class at Touro that night.

The following day, though, my mom stayed home from work, which is something she almost never did. She ended up in bed all weekend with what she thought was a stomach virus. On Saturday, she spoke to her doctor by phone. He prescribed, by phone, a prescription strength anti-diarrhea medicine and told her she should see a GI doctor on Monday. She began taking the medication later that day. We came to find out later that an anti-diarrheal medicine is one of the worst things you can take when you have C. diff.

C. DIFF STORIES

ALL STORIES

FOR PATIENTS & FAMILIES

FOR HEALTHCARE PROFESSIONALS

FOR ADVOCATES

Peggy died 8 days after her first dose of clindamycin

[Peggy Lillis Foundation: C. diff Stories (https://peggyfoundation.org/c-diff-stories/all-stories/)](https://peggyfoundation.org/c-diff-stories/all-stories/)

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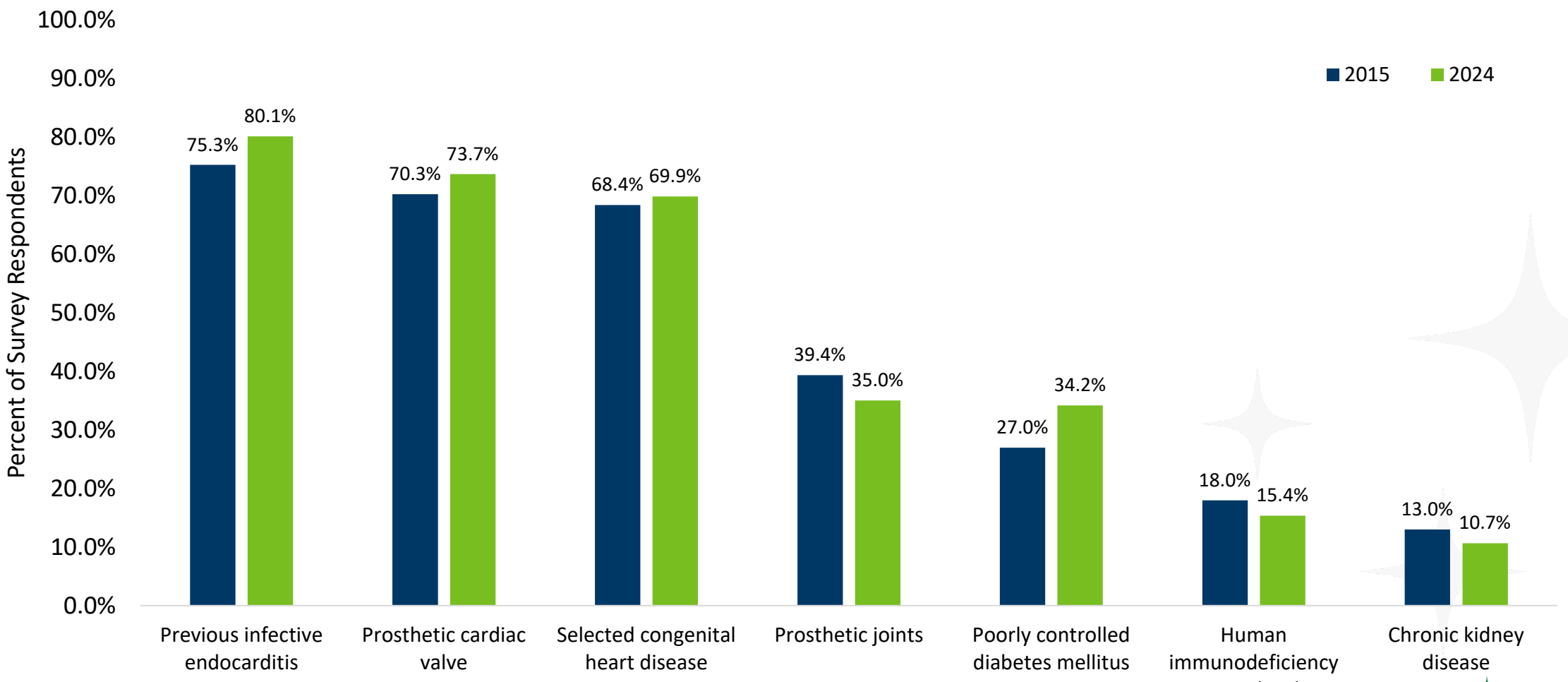
Conditions Where Dentist Would Choose to Prescribe Prophylaxis Before Invasive Dental Procedures



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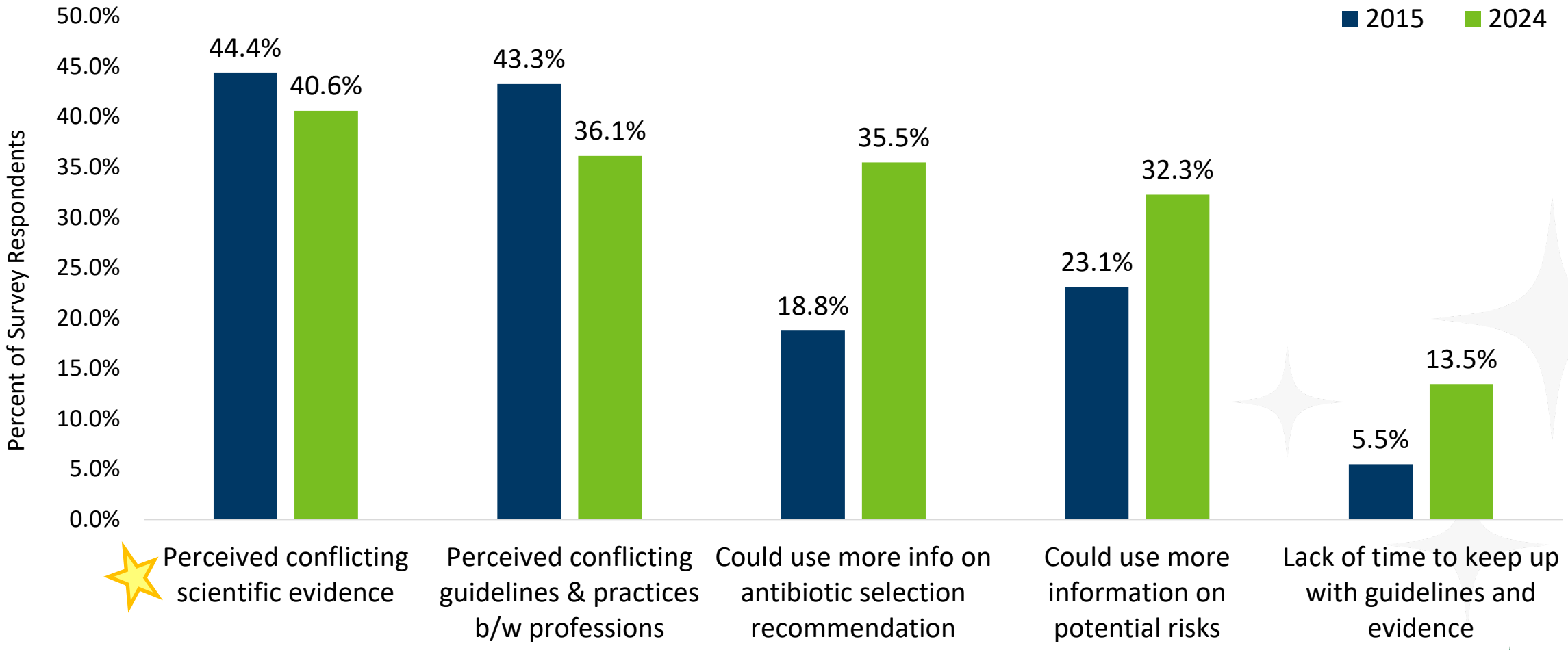
Types of Challenges in Making Decisions About Antibiotic Use



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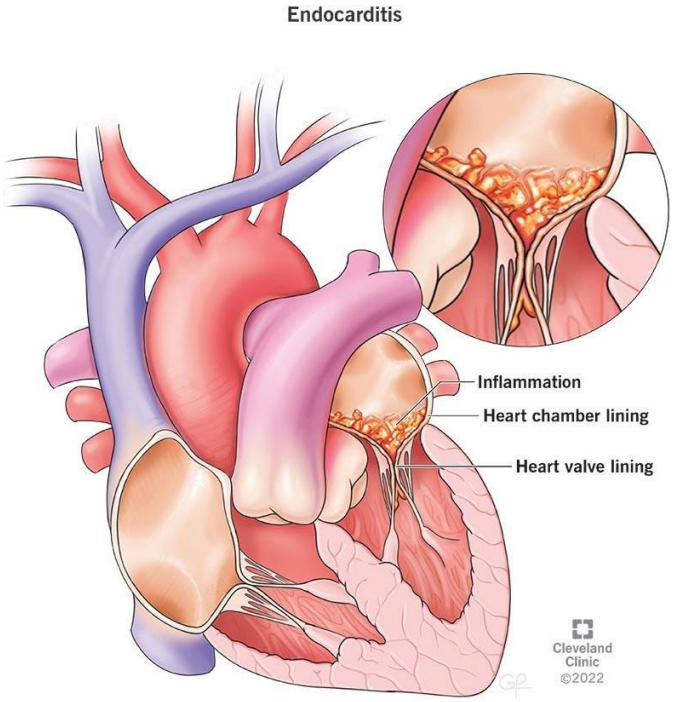
What is infective endocarditis?

Infective endocarditis is a bacterial infection that moves through the bloodstream and settles in a blood vessel, valve or heart tissue. This infection can also occur in areas of the cardiovascular system that have been repaired (ex. Valves).

Risk Factors:

- Artificial Heart Valves
- History of IE
- Congenital Heart Defects
- Heart Transplantation



Reference: American Heart Association: Cardiovascular Media Library (https://watchlearnlive.heart.org/index.php?moduleSelect=endcar)

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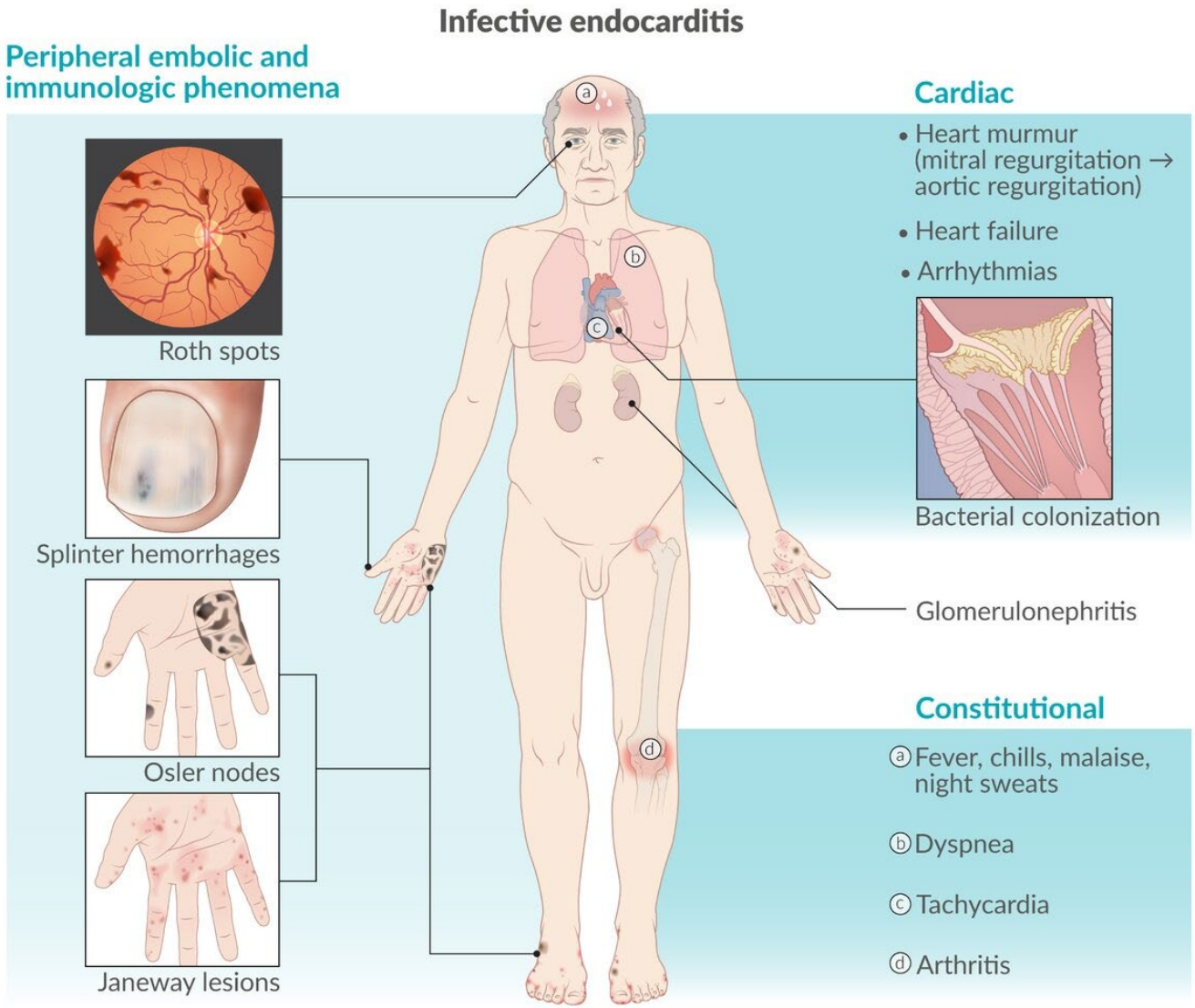
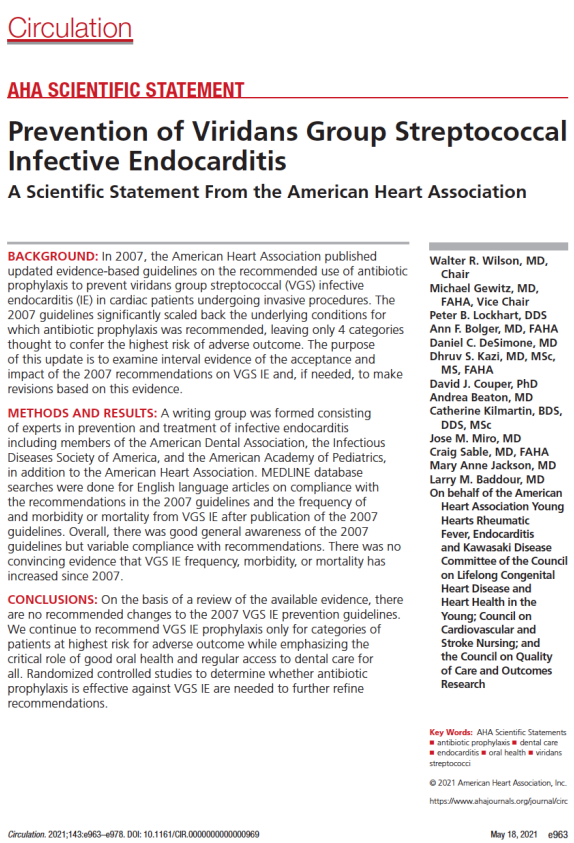
What is the clinical presentation of IE?

- You can see there there are many clinical features to IE.
- Often a patient will present with Fever, Chills, Fatigue, Weakness, Night sweats, and Joint pain.
- If you have a patient with these symptoms, referring them for immediate medical attention is key.





Circulation

AHA SCIENTIFIC STATEMENT

Prevention of Viridans Group Streptococcal Infective Endocarditis

A Scientific Statement From the American Heart Association

BACKGROUND: In 2007, the American Heart Association published updated evidence-based guidelines on the recommended use of antibiotic prophylaxis to prevent viridans group streptococcal (VGS) infective endocarditis (IE) in cardiac patients undergoing invasive procedures. The 2007 guidelines significantly scaled back the underlying conditions for which antibiotic prophylaxis was recommended, leaving only 4 categories thought to confer the highest risk of adverse outcome. The purpose of this update is to examine interval evidence of the acceptance and impact of the 2007 recommendations on VGS IE and, if needed, to make revisions based on this evidence.

METHODS AND RESULTS: A writing group was formed consisting of experts in prevention and treatment of infective endocarditis including members of the American Dental Association, the Infectious Diseases Society of America, and the American Academy of Pediatrics, in addition to the American Heart Association. MEDLINE database searches were done for English language articles on compliance with the recommendations in the 2007 guidelines and the frequency of and morbidity or mortality from VGS IE after publication of the 2007 guidelines. Overall, there was good general awareness of the 2007 guidelines but variable compliance with recommendations. There was no convincing evidence that VGS IE frequency, morbidity, or mortality has increased since 2007.

CONCLUSIONS: On the basis of a review of the available evidence, there are no recommended changes to the 2007 VGS IE prevention guidelines. We continue to recommend VGS IE prophylaxis only for categories of patients at highest risk for adverse outcome while emphasizing the critical role of good oral health and regular access to dental care for all. Randomized controlled studies to determine whether antibiotic prophylaxis is effective against VGS IE are needed to further refine recommendations.

Walter R. Wilson, MD, Chair
Michael Gewitz, MD, FAHA, Vice Chair
Peter B. Lockhart, DDS
Ann F. Bolger, MD, FAHA
Daniel C. DeSimone, MD
Dhruv S. Kazi, MD, MSc, MS, FAHA
David J. Couper, PhD
Andrea Beaton, MD
Catherine Kilmartin, BDS, DDS, MSc
Jose M. Miro, MD
Craig Sable, MD, FAHA
Mary Anne Jackson, MD
Larry M. Baddour, MD
On behalf of the American Heart Association Young Hearts Rheumatic Fever, Endocarditis and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; and the Council on Quality of Care and Outcomes Research

Key Words: AHA Scientific Statements ■ antibiotic prophylaxis ■ dental care ■ endocarditis ■ oral health ■ viridans streptococci

https://www.ahajournals.org/journal/circ

Circulation. 2021;143:e963–e978. DOI: 10.1161/CIR.0000000000000969

May 18, 2021 e963

Wilson WR et al. Circulation 2021;143;e963-e978

Update

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How can we prevent IE during dental procedures?

High Risk Condition +
Invasive Dental Procedures
= Prophylaxis

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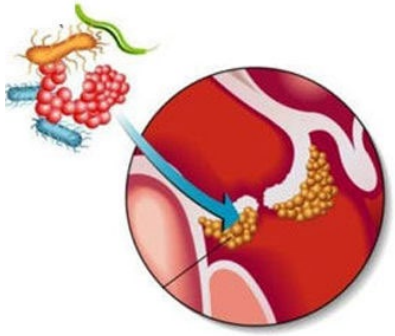
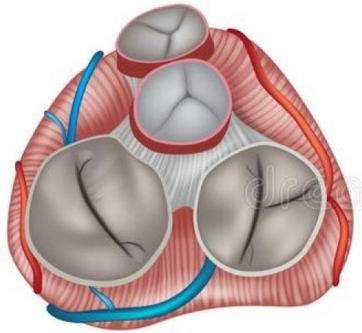
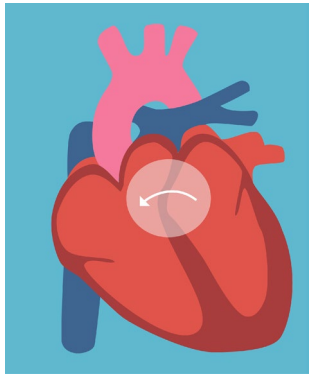
Cardiac Conditions At Highest Risk of Endocarditis







Prosthetic Cardiac Valve or Prosthetic Material Used for Valve Repair	Previous Infective Endocarditis	Cardiac Transplants Recipients That Develop Valvulopathy	Congenital Heart Disease (CHD) a) Unrepaired cyanotic CHD, including palliative shunts and conduit b) Repaired CHD defect with prosthetic material during first 6 months after procedure c) Repaired CHD with residual defects

Reference: ADA: Antibiotic Prophylaxis Prior to Dental Procedures (www.ada.org/en/member-center/oral-health-topics/antibiotic-prophylaxis)
Lockhart PB et al. JADA 2020;151(10)770-81 Wilson WR et al. Circulation 2021;143;e963-e978

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ADA Definition: “Invasive Dental Procedure”

“All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.”

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Invasiveness of Dental Procedures

Invasive Procedures

- SRP
- Extractions (with or without BG)
- Restorations (with band or cord placement)
- IND
- Implant Procedure (with or without BG)
- Pulpal Therapies
- Periodontal Surgeries (with or without BG)

Non-invasive Procedures

- Exam
- Radiographs
- Application of Preventive Materials (ex. SDF or FI Varnish)
- Simple Restorations
- Orthodontic band placement, adjustments

Reference: BMJ: Dental procedures, antibiotic prophylaxis, and endocarditis among people with prosthetic heart valves: nationwide population based cohort and a case crossover study (https://www.bmj.com/content/358/bmj.j3776/related#datasupp)

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Antibiotic Prophylactic Regimens for Invasive Dental Procedures

SITUATION	AGENT	ADULTS	CHILDREN
Oral	Amoxicillin	2 gm	50 mg/kg
Unable to take oral medication	Ampicillin OR Ceftriaxone	2 gm IM or IV 1 gm IM or IV	50 mg/kg IM or IV 50 mg/kg IM or IV
Allergic to PCN - oral	*Cephalexin OR Azithromycin	2 gm 500 mg	50 mg/kg 15 mg/kg
Allergic to PCN & unable to take oral	Ceftriaxone	1 gm IM or IV	50 mg/kg IM or IV
*Cephalosporins should be avoided in patients with a history of anaphylaxis to penicillin			

Single dose administered 30-60 minutes prior to procedure (AAOS update of 2007 AHA guidelines).

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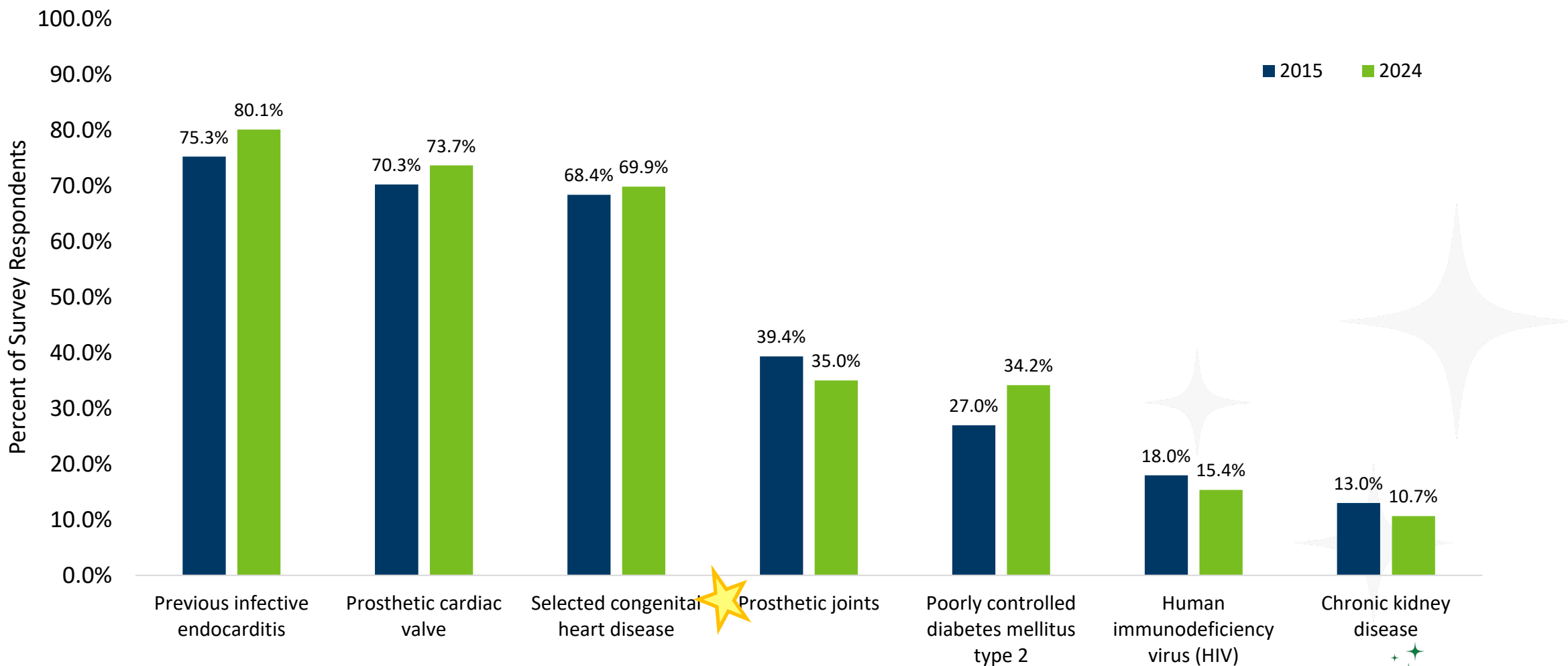
Conditions Where Dentist Would Choose to Prescribe Prophylaxis Before Invasive Dental Procedures



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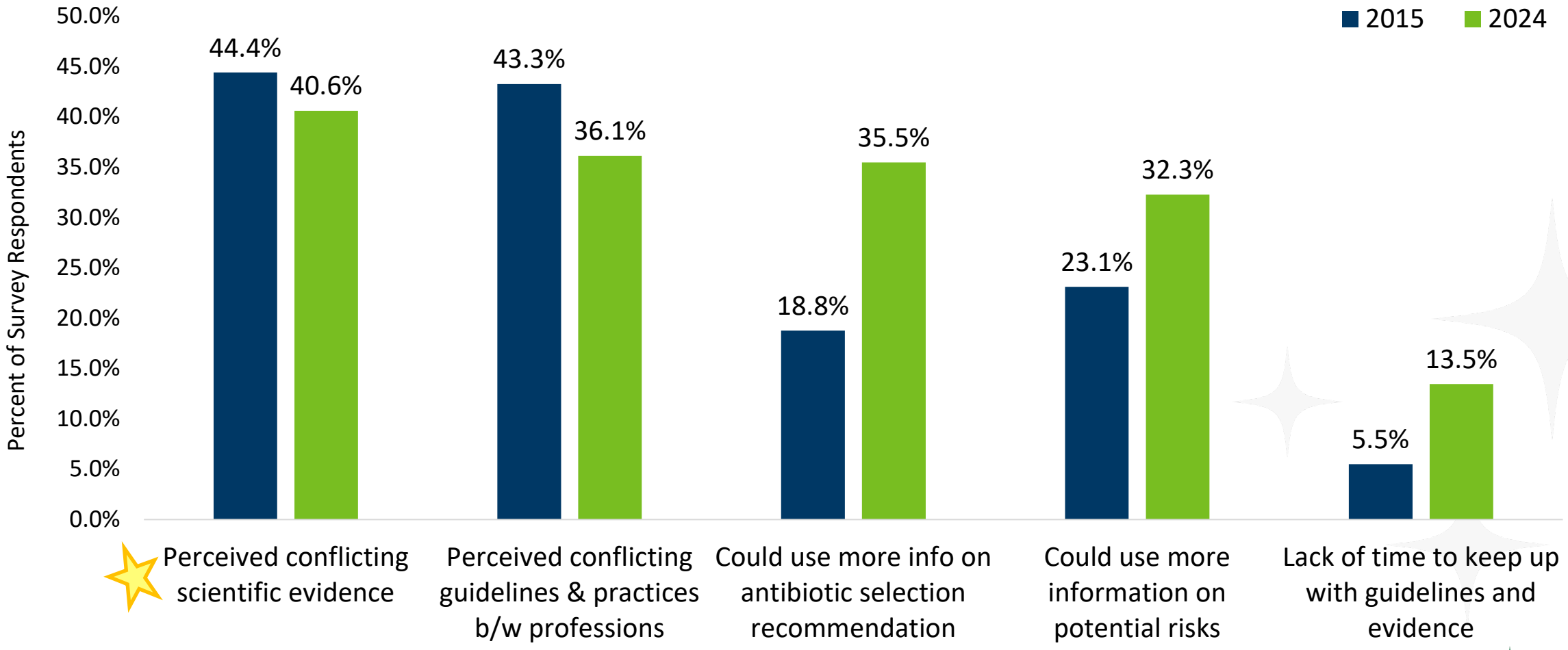
Types of Challenges in Making Decisions About Antibiotic Use



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Evolution of Dental Antibiotic Prophylaxis in Patients With Prosthetic Joints

2003

ADA & AAOS:

For 2 years after joint replacement

2009

AAOS:

Indefinitely after joint replacement

2012

ADA & AAOS:

Prophylactic recommendation unclear

2015

ADA:

Prophylaxis NOT generally recommended

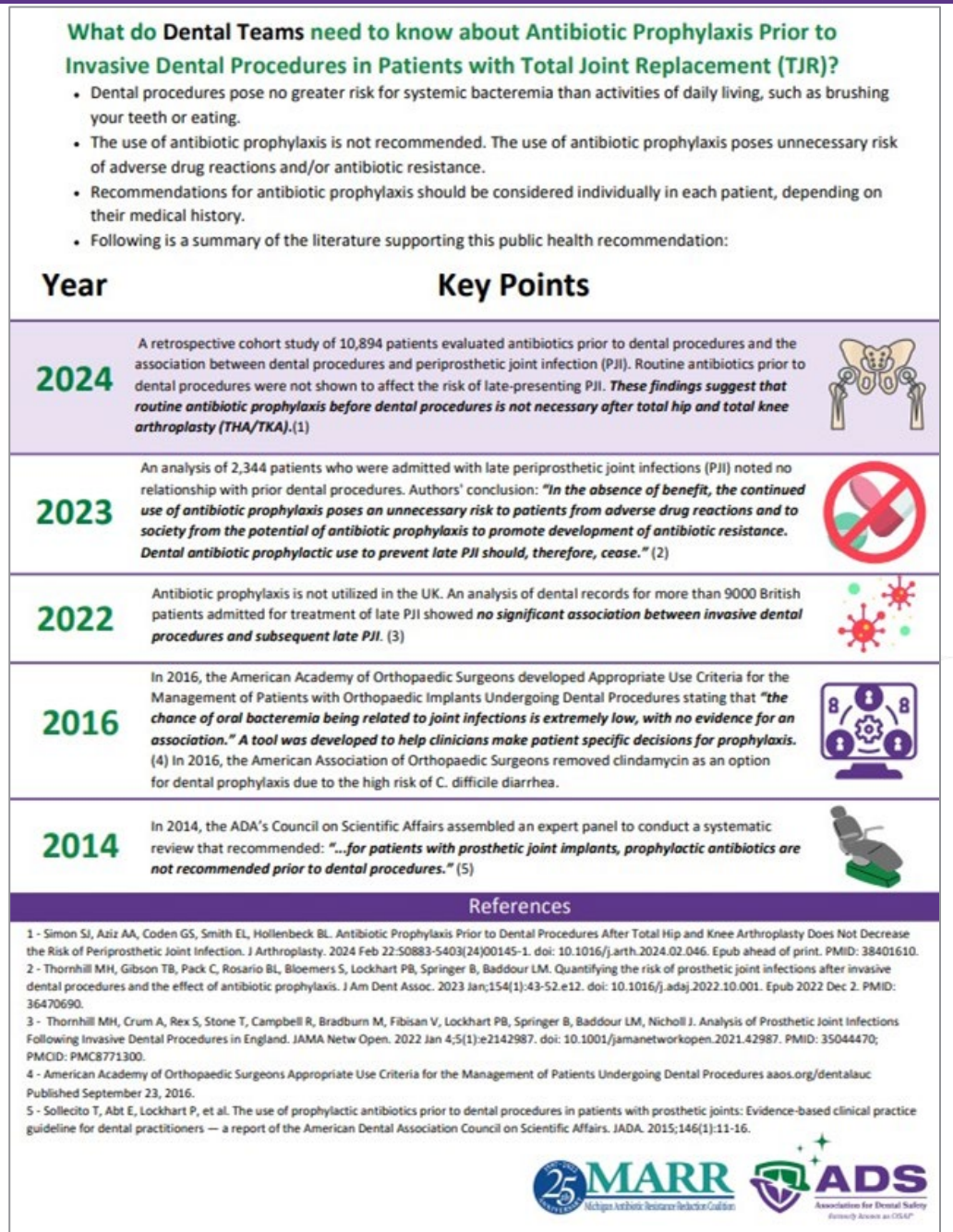
2016

AAOS:

Appropriate use criteria aligns with ADA; Clindamycin removed

Update on Prophylaxis

- Dental procedures pose *no greater risk* for systemic bacteremia than activities of daily living, such as brushing your teeth or eating.
- The use of antibiotic prophylaxis is *not recommended*.
- The use of antibiotic prophylaxis poses *unnecessary risk* of adverse drug reactions and/or antibiotic resistance.
- Recommendations for antibiotic prophylaxis should be considered individually in each patient, depending on their medical history.



What do Dental Teams need to know about Antibiotic Prophylaxis Prior to Invasive Dental Procedures in Patients with Total Joint Replacement (TJR)?

- Dental procedures pose no greater risk for systemic bacteremia than activities of daily living, such as brushing your teeth or eating.
- The use of antibiotic prophylaxis is not recommended. The use of antibiotic prophylaxis poses unnecessary risk of adverse drug reactions and/or antibiotic resistance.
- Recommendations for antibiotic prophylaxis should be considered individually in each patient, depending on their medical history.
- Following is a summary of the literature supporting this public health recommendation:

Year	Key Points
2024	A retrospective cohort study of 10,894 patients evaluated antibiotics prior to dental procedures and the association between dental procedures and periprosthetic joint infection (PJI). Routine antibiotics prior to dental procedures were not shown to affect the risk of late-presenting PJI. ***These findings suggest that routine antibiotic prophylaxis before dental procedures is not necessary after total hip and total knee arthroplasty (THA/TKA).*** (1)
2023	An analysis of 2,344 patients who were admitted with late periprosthetic joint infections (PJI) noted no relationship with prior dental procedures. Authors' conclusion: ***"In the absence of benefit, the continued use of antibiotic prophylaxis poses an unnecessary risk to patients from adverse drug reactions and to society from the potential of antibiotic prophylaxis to promote development of antibiotic resistance. Dental antibiotic prophylactic use to prevent late PJI should, therefore, cease."*** (2)
2022	Antibiotic prophylaxis is not utilized in the UK. An analysis of dental records for more than 9000 British patients admitted for treatment of late PJI showed ***no significant association between invasive dental procedures and subsequent late PJI.*** (3)
2016	In 2016, the American Academy of Orthopaedic Surgeons developed Appropriate Use Criteria for the Management of Patients with Orthopaedic Implants Undergoing Dental Procedures stating that ***"the chance of oral bacteremia being related to joint infections is extremely low, with no evidence for an association." A tool was developed to help clinicians make patient specific decisions for prophylaxis.*** (4) In 2016, the American Association of Orthopaedic Surgeons removed clindamycin as an option for dental prophylaxis due to the high risk of C. difficile diarrhea.
2014	In 2014, the ADA's Council on Scientific Affairs assembled an expert panel to conduct a systematic review that recommended: ***"...for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures."*** (5)

References

1 - Simon SJ, Aziz AA, Coden GS, Smith EL, Hollenbeck BL. Antibiotic Prophylaxis Prior to Dental Procedures After Total Hip and Knee Arthroplasty Does Not Decrease the Risk of Periprosthetic Joint Infection. J Arthroplasty. 2024 Feb 22:S0883-5403(24)00145-1. doi: 10.1016/j.arth.2024.02.046. Epub ahead of print. PMID: 38401610.
2 - Thornhill MH, Gibson TB, Pack C, Rosario BL, Bloemers S, Lockhart PB, Springer B, Baddour LM. Quantifying the risk of prosthetic joint infections after invasive dental procedures and the effect of antibiotic prophylaxis. J Am Dent Assoc. 2023 Jan;154(1):43-52.e12. doi: 10.1016/j.adaj.2022.10.001. Epub 2022 Dec 2. PMID: 36470690.
3 - Thornhill MH, Crum A, Rex S, Stone T, Campbell R, Bradburn M, Fibisan V, Lockhart PB, Springer B, Baddour LM, Nicholl J. Analysis of Prosthetic Joint Infections Following Invasive Dental Procedures in England. JAMA Netw Open. 2022 Jan 4;5(1):e2142987. doi: 10.1001/jamanetworkopen.2021.42987. PMID: 35044470; PMCID: PMC8771300.
4 - American Academy of Orthopaedic Surgeons Appropriate Use Criteria for the Management of Patients Undergoing Dental Procedures aaos.org/dentalauc Published September 23, 2016.
5 - Sollecito T, Abt E, Lockhart P, et al. The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints: Evidence-based clinical practice guideline for dental practitioners — a report of the American Dental Association Council on Scientific Affairs. JADA. 2015;146(1):11-16.

MARR Michigan Antibiotic Resistance Reduction Coalition

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Updated Letter Template

Given the evolution of prophylaxis guidelines by the American Dental Association (ADA) and American Academy of Orthopaedic Surgeons (AAOS), the AAOS Appropriate Use Criteria (AAOS AUC)[1], and recent scientific evidence suggesting no benefit of antibiotic prophylaxis [2,3], we have discussed with the patient their antibiotic prophylaxis regimen. The evidence suggests that the risk of antibiotic prophylaxis outweighs the benefits for this patient.

Dental Office Name
Dentist Name
Address

Dear Colleague,

We are writing in regards to your patient, (insert Name/DOB) who receives dental care in our office. Based on their medical history, this patient received their most recent total joint replacement in [INSERT MM/YYYY]. Given the evolution of prophylaxis guidelines by the American Dental Association (ADA) and American Academy of Orthopaedic Surgeons (AAOS), the AAOS Appropriate Use Criteria (AAOS AUC)[1], and recent scientific evidence suggesting no benefit of antibiotic prophylaxis [2,3], we have discussed with the patient their antibiotic prophylaxis regimen. The evidence suggests that the risk of antibiotic prophylaxis outweighs the benefits for this patient.

As outlined in the AAOS AUC Criteria, there may be rare circumstances that antibiotic prophylaxis prior to an invasive dental procedure may be considered in a patient who is more than one year post prosthetic device implant. Should you feel this is the case with (Insert patient name), we kindly request that you communicate the specific circumstances to our office, as well as to the patient. This will allow us to better coordinate care and provide consistent patient education.

If you have any questions or concerns regarding the patient's dental health, please feel free to contact us.

Sincerely,

[Insert Dentist Signature]

[Insert Dentist Name]

1. https://aaos.webauthor.com/go/auc/terms.cfm?actionxm=Terms&auc_id=224995
2. *JADA 2023:154(1):43-52*
3. *JAMA Network Open. 2022;5(1):e214298*

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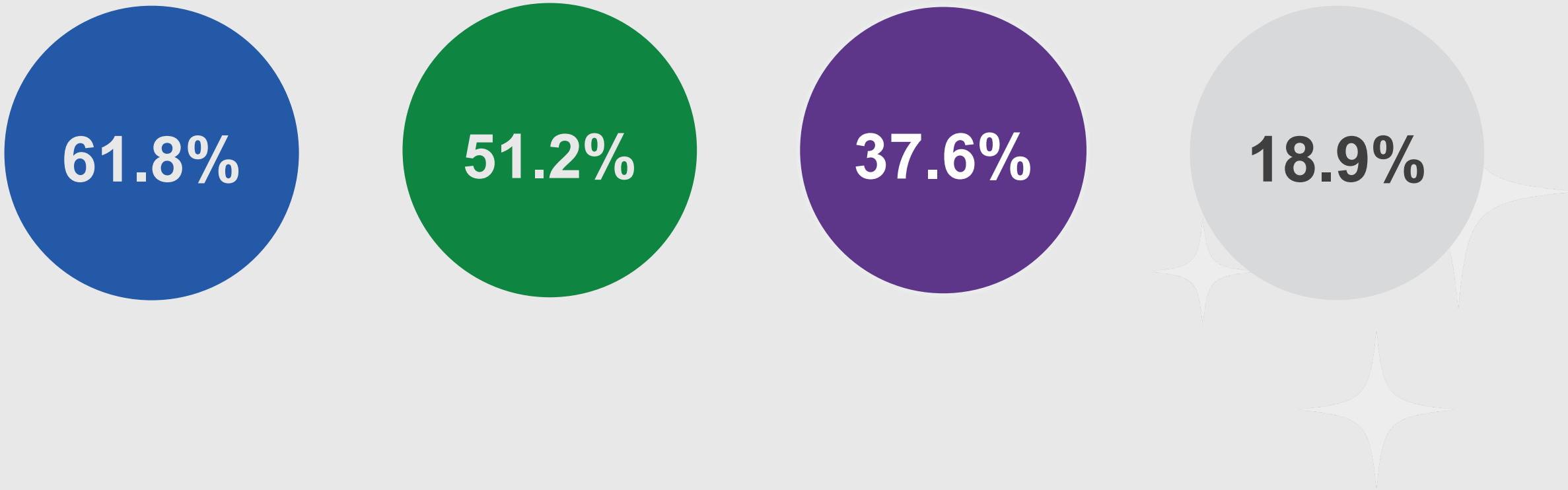
Core Elements of Outpatient Antibiotic Stewardship



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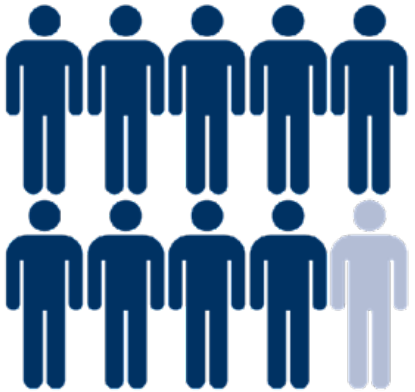
What are Penicillin Allergies?

Penicillin is the most commonly reported drug allergy.[1]

of patients in the US report penicillin allergy.[1]

9 out of 10 reporting penicillin allergy are not truly allergic.[4]



80% of patients with IgE-mediated penicillin allergy lose the sensitivity after 10 years.[4]

Shenoy, ES, Evaluation and Management of Penicillin Allergy. JAMA, 2019

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What is the Spectrum of Allergic Reactions?

SEVERE - Type II-IV

Steven Johnson Syndrome
Serum Sickness
Toxic Epidermal Necrolysis
Drug Rash Eosinophilia
Systemic Hemolytic Anemia
Drug Fever

SEVERE - IgE Mediated

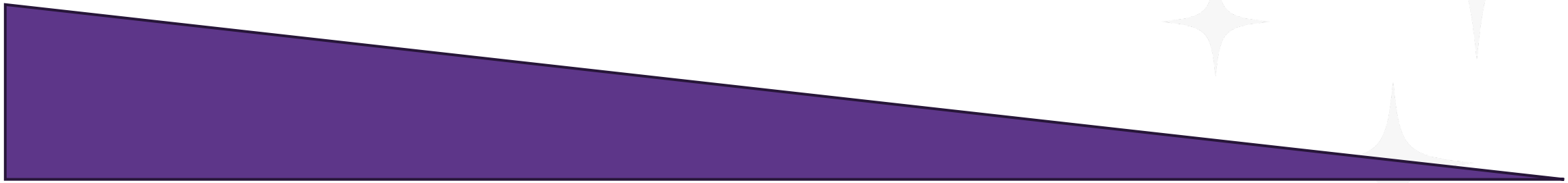
Anaphylaxis
Angiodema
Wheezing or shortness of breath
Laryngeal edema
Hypotension
Hives/Urticaria

Mild to Moderate

Non-immediate onset, non-urticarial mild rash

Non-Allergy/ Drug Side Effects

Stomach Upset
Nausea
Diarrhea
Abdominal Pain
Headache
Chills
Fatigue



More Severe

Less Severe

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How and Why are patients mislabeled?

- Chart Error
- Reaction has waned with no follow up or medical review
- Poor Patient History (ex. My aunt mentioned…)
- Viral Rash mislabeled as antibiotic allergy
- Others

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What are the consequences of inaccurate Penicillin Allergy Labels?

- Treatment failure
- Adverse drug events
- Antibiotic resistance e.g., MRSA, VRE
- Surgical site infection
- Mortality

One dose of clindamycin has an equivalent risk of *C. diff* diarrhea compared with a prolonged course of other antibiotics

Antibiotic Class	*Risk of CDI Odds Ratio, (95% CI)*
Clindamycin	20.43 (8.50–49.09)
Cephalosporins	4.47 (1.60–12.50)
Penicillins	3.25 (1.89–5.57)
Macrolides	2.55 (1.91–3.39)
Tetracyclines	0.91 (0.57–1.45)

Surgical site infections after Oral and Maxillofacial Surgery

	SSI	No SSI	Total
Reported Penicillin Allergy	13 (4.1)	305 (95.9)	318 (100.0)
Non-Penicillin Allergic	27 (1.6)	1,713 (98.4)	1,740 (100.0)

Number (%) shown. Relative Risk of 2.63 (95% CI 1.37-5.05, $P = .004$).

Zhang J. Antimicrob Agents Chemother 2022 66(12):
Deshpande A, *J Antimicrob Chemother*. 2013 Sep;68(9):1951-61
Samarakoon U et al. *Ann Allergy Asthma Immunol*. 2022 Dec 20;S1081-1206(22)02006-3
Roistacher DM et al. *J Oral Maxillofac Surg*. 2022 Jan;80(1):93-100

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Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Safe Healthcare Blog

Antibiotic Stewardship when an Allergy Label is Present Improves Our Antibiotic Care and Treatment Outcomes

November 2, 2023 by Guest Author: Cosby Stone, Jr. MD, MPH, is an Assistant Professor of Medicine in the Division of Allergy, Pulmonology, and Critical Care Medicine within the Department of Medicine at Vanderbilt University Medical Center

Did You Know?

Although 10% of the population in the U.S. reports a penicillin allergy, less than 1% of the population is truly penicillin allergic. Broad-spectrum antibiotics are often used as an alternative to penicillins. The use of broad-spectrum antibiotics in patients labeled "penicillin-allergic" is associated with higher healthcare costs, increased risk for antimicrobial resistance, and suboptimal antibiotic therapy.[1,2,3]

10% of the population reports a penicillin allergy but <1% of the whole population is truly allergic.

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American Academy of Allergy Asthma & Immunology

Penicillin Allergy Evaluation Should Be Performed Proactively in Patients With a Penicillin Allergy Label

American Academy of Allergy, Asthma, and Immunology Milwaukee, Wis

AAAAI Position Statements, Work Group Reports, and Systematic Reviews are not to be considered to reflect current AAAAI standards or policy after five years from the date of publication. The statement below is not to be construed as dictating an exclusive course of action nor is it intended to replace the medical judgment of healthcare professionals. The unique circumstances of individual patients and environments are to be taken into account in any diagnosis and treatment plan. The statement reflects clinical and scientific advances as of the date of publication and is subject to change.

Penicillin allergy is the most common drug allergy in the US population. A penicillin allergy label is associated with poor patient outcomes including increased hospital length of stay, increased perioperative infections, and overall increased mortality. A penicillin allergy evaluation accurately identifies approximately 9 of 10 patients who, despite reporting a history of penicillin allergy, can receive penicillins safely. Penicillin allergy evaluations should be offered proactively to healthy patients during routine visits, including children and pregnant women, in advance of antibiotic need. (J Allergy Clin Immunol Pract 2023;11:3626-8)

confirmed penicillin allergy include mislabeling of a side effect as an allergy (eg, gastrointestinal upset) or a coincidental event (eg, headache or cutaneous eruption due to underlying infection), reduced rates of exposure to parenteral penicillins, and loss of sensitization with avoidance of penicillins over time.[5]

A penicillin allergy label is associated with poor patient outcomes including increased hospital length of stay, increased perioperative infections, and overall increased mortality.[5,6] The use of alternative antibiotics can be associated with higher costs (due to the use of more expensive broad-spectrum antibiotics), inferior efficacy, and/or greater risk for untoward effects including antibiotic resistance, *Clostridium difficile,* and side ef-

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Evidence Supports Penicillin Allergy Evaluations in Multiple Healthcare Settings

- Emergency clinicians
- Internists
- Intensivists
- Pharmacists
- Infectious diseases specialists

Why not dental clinics?

1.Shenoy ES et al. *JAMA* 2019; 321:188-199.
2. Raja AS et al. *Ann Emerg Med* 2009; 54:72-77.
3. Rimawi RH et al. *J Hosp Med* 2013;8:341-345.
4. Arroliga ME et al. *Chest* 2000;118:1106-1108.
4. Wall GS et al. *Am J Health Syst Pharm* 2004;61:1271-1275.
5. Chen JR et al. *J Allergy Clin Immunol Pract* 2017;5:686-693.
6. Heil EL et al. *Open Forum Infect Dis* 2016;ofw155.
7. Leis JA et al. *Clin Infect Dis* 2017;65:1059-1065.

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Opportunities for PCN Allergy Reassessment *in Dental Clinics*

Study Design

- Retrospective cross-sectional analysis
- VA data for adult patients
- Dental clinic visit between 2015 and 2018

Primary Objective: Identify the rate of true PCN allergy among patients receiving dental care and to evaluate how many patients would be eligible for skin testing or oral PCN challenge

Secondary Objective: Identify the frequency of allergic reactions and explore the differences in characteristics in PCN-allergic patients who received a cephalosporin

Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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Opportunities for PCN Allergy Reassessment *in Dental Clinics*

Patients meeting the following criteria:

1. Recent dental visit
2. Antibiotic prescribed by a VA dentist within 7 days of visit
3. Documented, nonanaphylactic, PCN allergy

Cohort 1: 100 patients that did not receive a cephalosporin

Cohort 2: 200 patients that did receive a cephalosporin

Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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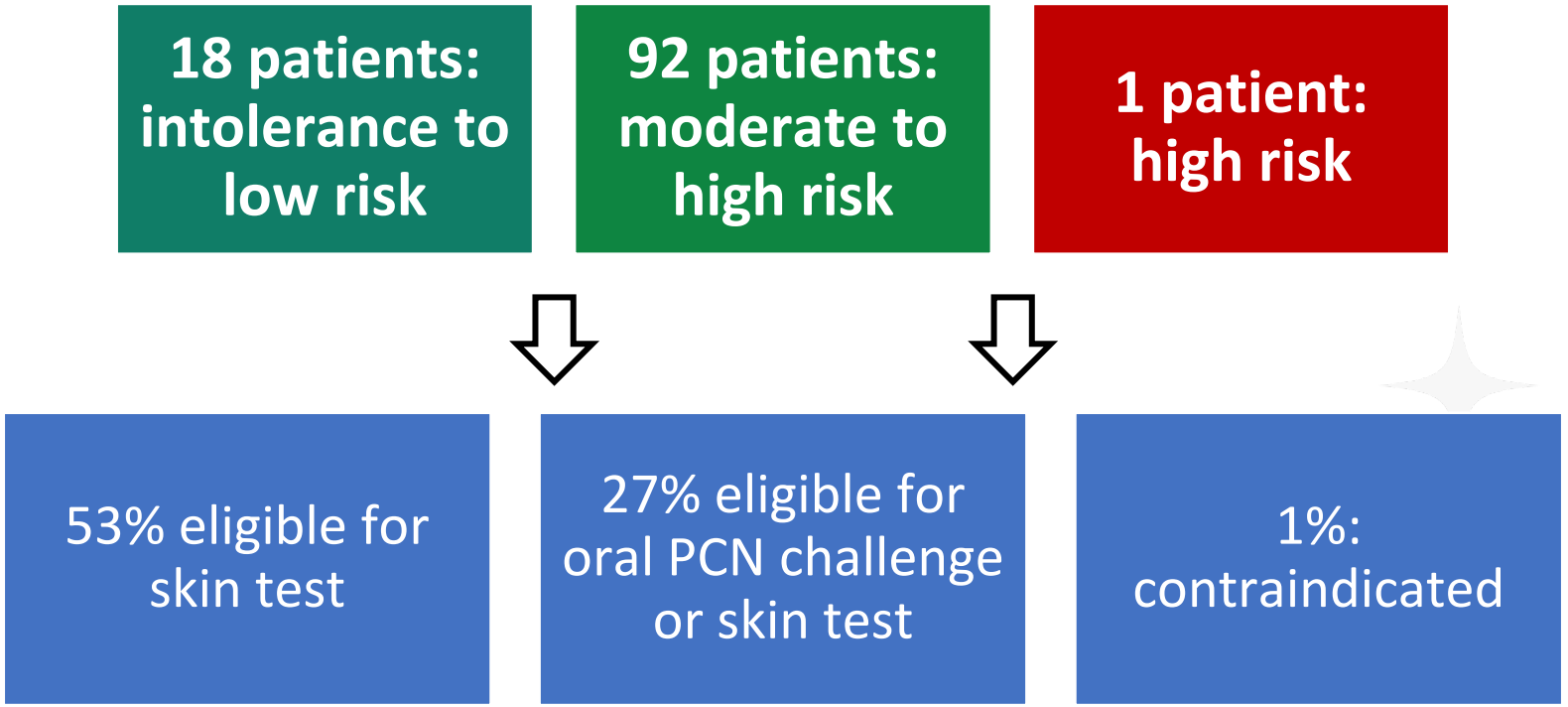
Opportunities for PCN Allergy Reassessment *in Dental Clinics*

Cohort 1: 100 patients who ***did not*** receive a cephalosporin



Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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Opportunities for PCN Allergy Reassessment *in Dental Clinics*

Cohort 1: 100 patients who ***did not*** receive a cephalosporin

Demographics

- 92% male
- 70% white
- 59% >64 years

Visit type

- 12% extraction
- 52% invasive procedure with gingival manipulation
- 68% diagnostic
- 24% oral and maxillofacial surgery

Antibiotic prescribing

- 83% clindamycin
- 9% amoxicillin

Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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Opportunities for PCN Allergy Reassessment *in Dental Clinics*

Cohort 2: 200 patients who ***did*** receive a cephalosporin

Factors associated with decreased odds of receiving a cephalosporin

- Male sex (OR, 0.44; 95% CI, 0.20-0.99)
- African American (OR, 0.40; 95% CI, 0.21-0.76)
- No macrolide allergy
- Higher Elixhauser comorbidity score (OR, 0.87; 95% CI, 0.76-0.98)

Within 30 days of the antibiotic dispense date, 1 patient who received a cephalosporin had a non-anaphylactic allergic reaction

Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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Opportunities for PCN Allergy Reassessment *in Dental Clinics*

TAKEAWAY POINTS

1. 10% of patients had a pseudo allergy
2. Most non-anaphylactic allergies were rashes
3. 19% of patients did not have an allergic reaction documented
4. Some dentists are already informally evaluating PCN allergy status

Vivo A et al. *Antimicrob Steward Healthc Epidemiol* 2022;2(1):e58.

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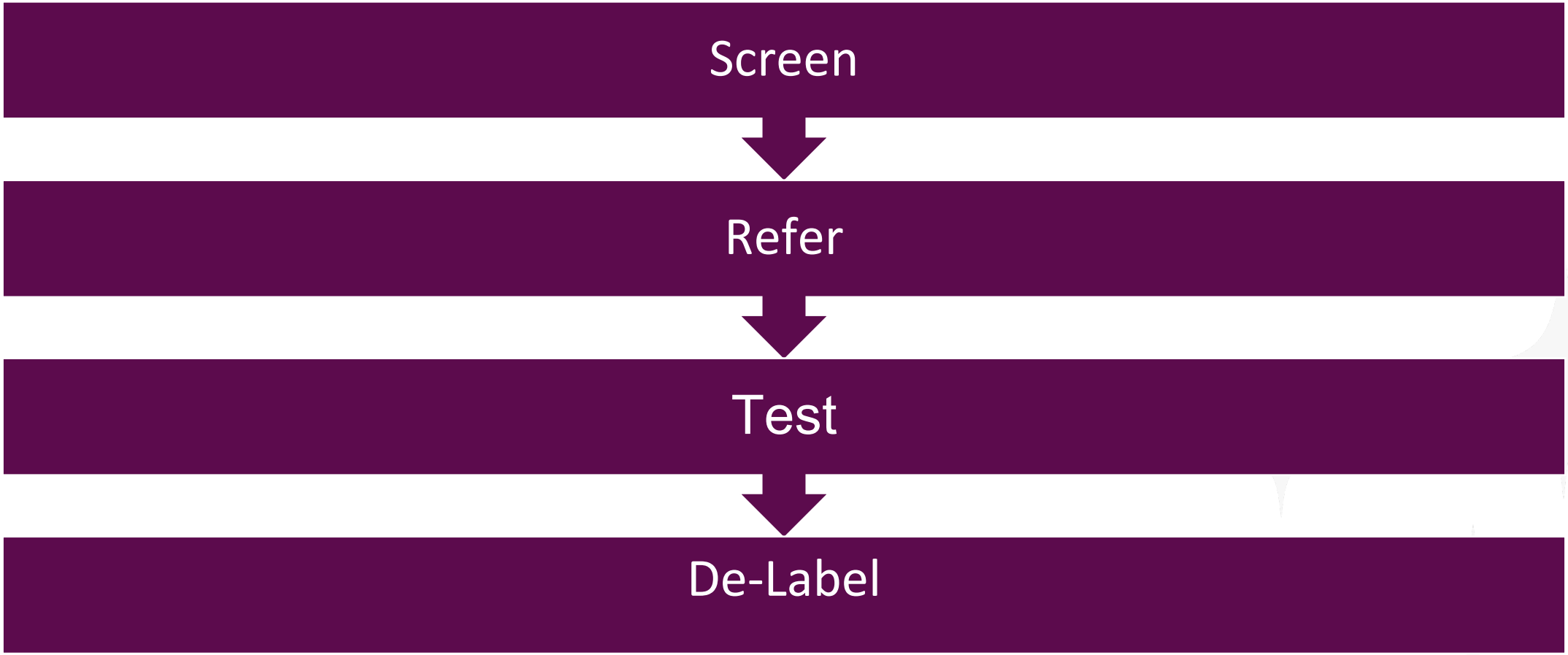
How to: Penicillin Allergy Stewardship in the Dental Office



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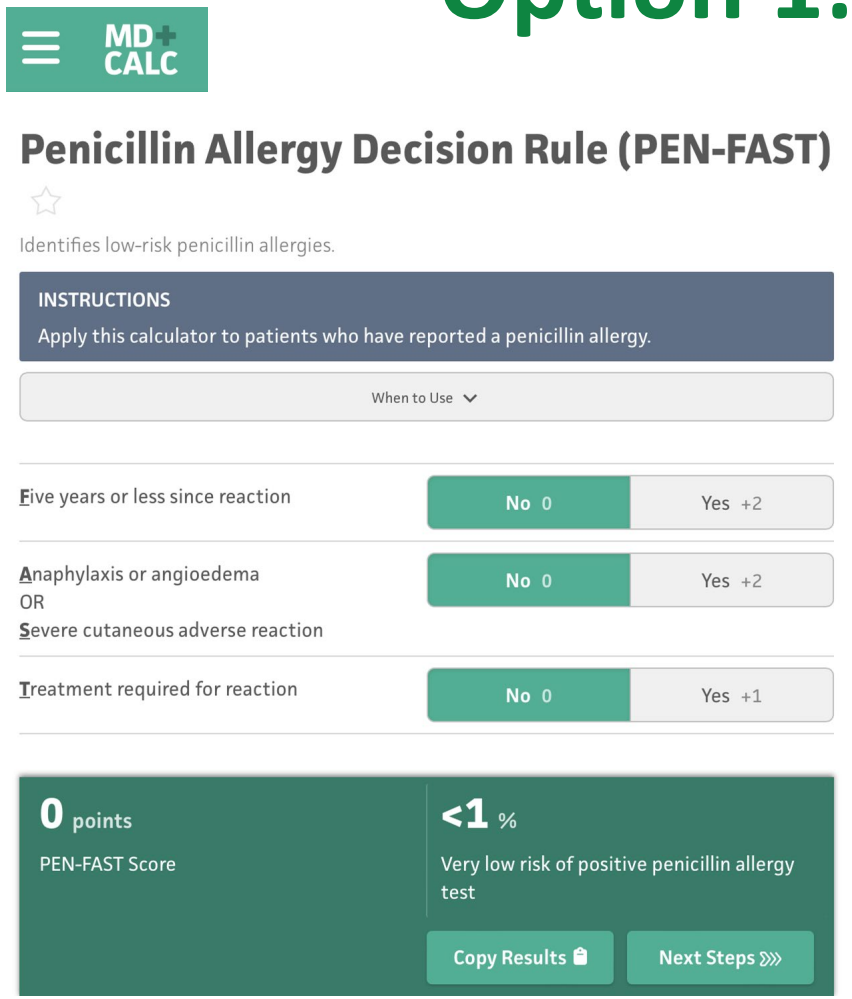
Option 1: PEN-FAST Tool



- A score of less than 3 is associated with a low-risk patient, who can safely be re-challenged!

Trubiano JA et al. *JAMA Intern Med* 2020;180[5]:745-752

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PEN-FAST for PCN Challenge

Direct oral PCN challenge vs. standard of care PCN skin testing

- Patient population: Patients with a low-risk PCN allergy
- Definition of low risk PCN allergy: PEN-FAST score < 3

Randomized clinical trial

- 382 patients
- 6 centers in 3 countries

Results

- An immune-mediated reaction occurred in 0.5% of both groups
- Direct oral challenge was noninferior to PCN skin challenge

Copaescu AM et al. *JAMA Intern Med*. 2023;183(9):944-952.

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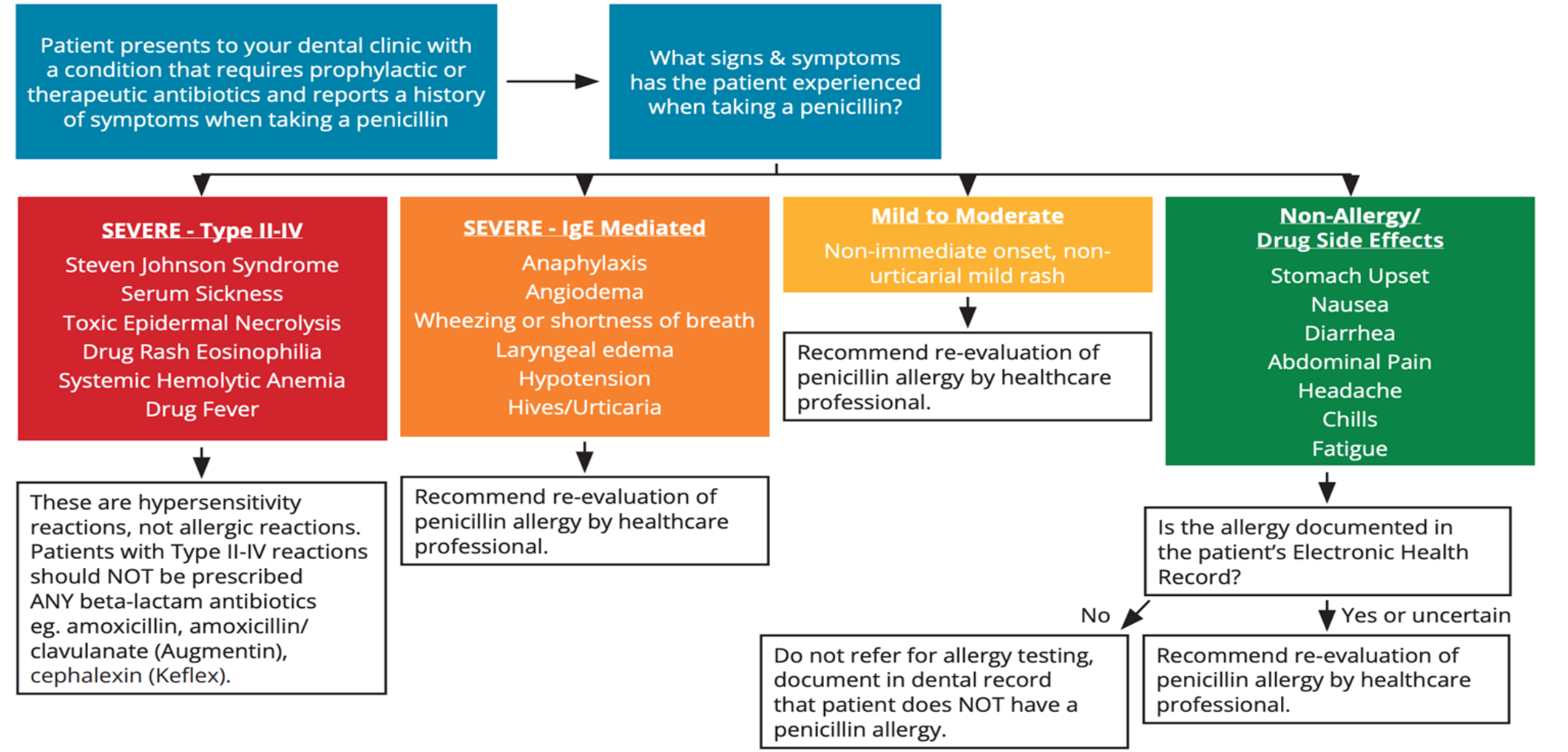
Option 2: Penicillin Allergy Assessment Tool Kit (PAAT)



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ANTIBIOTIC MANAGEMENT

Penicillin Allergy Assessment and Medical Referral to Promote Antibiotic Stewardship

By Elaine Bailey, PharmD, Mackenzie Connell, Marie Fluent, DDS, and Erinne Kennedy, DDS, MPH, MMSC

4 W's

- Who
- What
- When
- Who

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Follow ADA, AAOS & AAHA Guidelines

If a patient has NOT experienced an IgE-mediated reaction:

- Risk of cross-reactivity between cephalosporins and penicillins occurs in 2% (previously reported as 8%)
- Cephalexin (Keflex) may be safely prescribed
- *Reminder: Augmentin is amoxicillin + clavulanate*

If a patient HAS experienced an IgE-mediated reaction:

- Azithromycin (Z-Pak) is preferred over clindamycin in patients with dental pain
- Clindamycin is NOT indicated for prophylaxis

Note: *Advise patient to seek further allergy assessment by primary care provider or allergist*

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Antibiotic Therapy in Pediatric Dental Patients

Per AAPD Guidelines

Penicillin → Penicillin Allergy? → **Doxycycline**

Appropriate Antibiotics Use According to the "**5 Rights**"

1. **Patient**
2. **Drug**
3. **Time**
4. **Dose**
5. **Route**

"Individuals suspected to have an allergy to antibiotics should receive testing to confirm or refute the presence of a true allergy."

American Academy of Pediatric Dentistry 2023:537-41.

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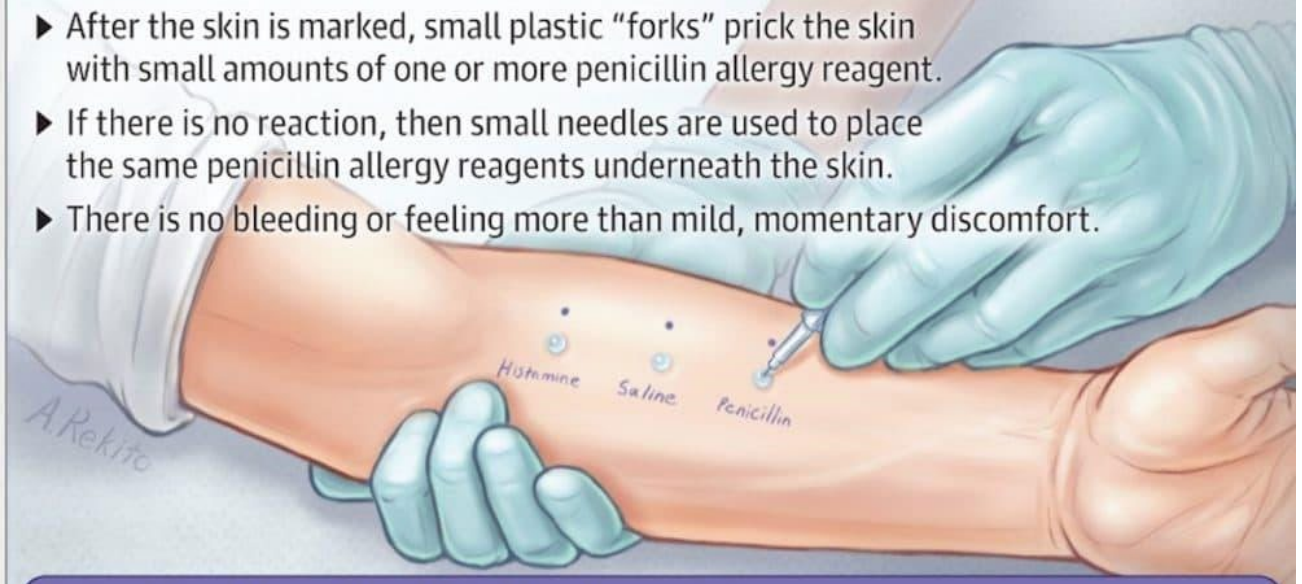
Penicillin Allergy Skin Testing

is a procedure recommended for some patients with a history of allergic reaction such as itching, hives, rash, swelling, or shortness of breath.

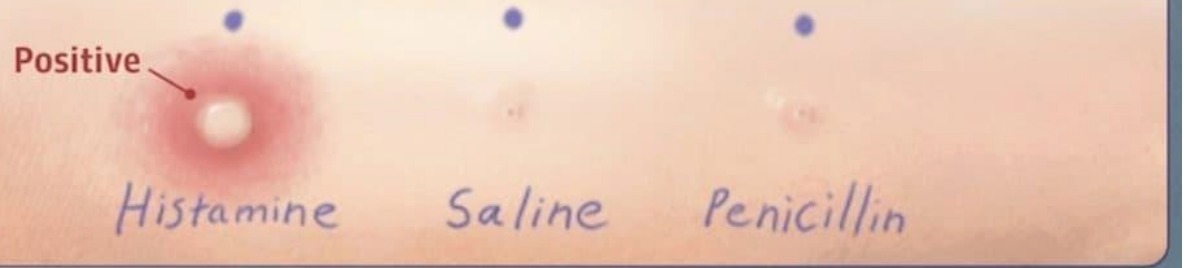
- After the skin is marked, small plastic "forks" prick the skin with small amounts of one or more penicillin allergy reagent.
- If there is no reaction, then small needles are used to place the same penicillin allergy reagents underneath the skin.
- There is no bleeding or feeling more than mild, momentary discomfort.



In less than 1 hour, the skin testing is complete.

Negative reaction: No reaction at the penicillin testing sites. You will be given amoxicillin by mouth and observed to confirm you are not allergic to penicillin drugs.

Positive reaction: Itching, redness, and hive at any penicillin testing site confirms you are allergic to penicillin. These reactions usually resolve in under 1 hour.



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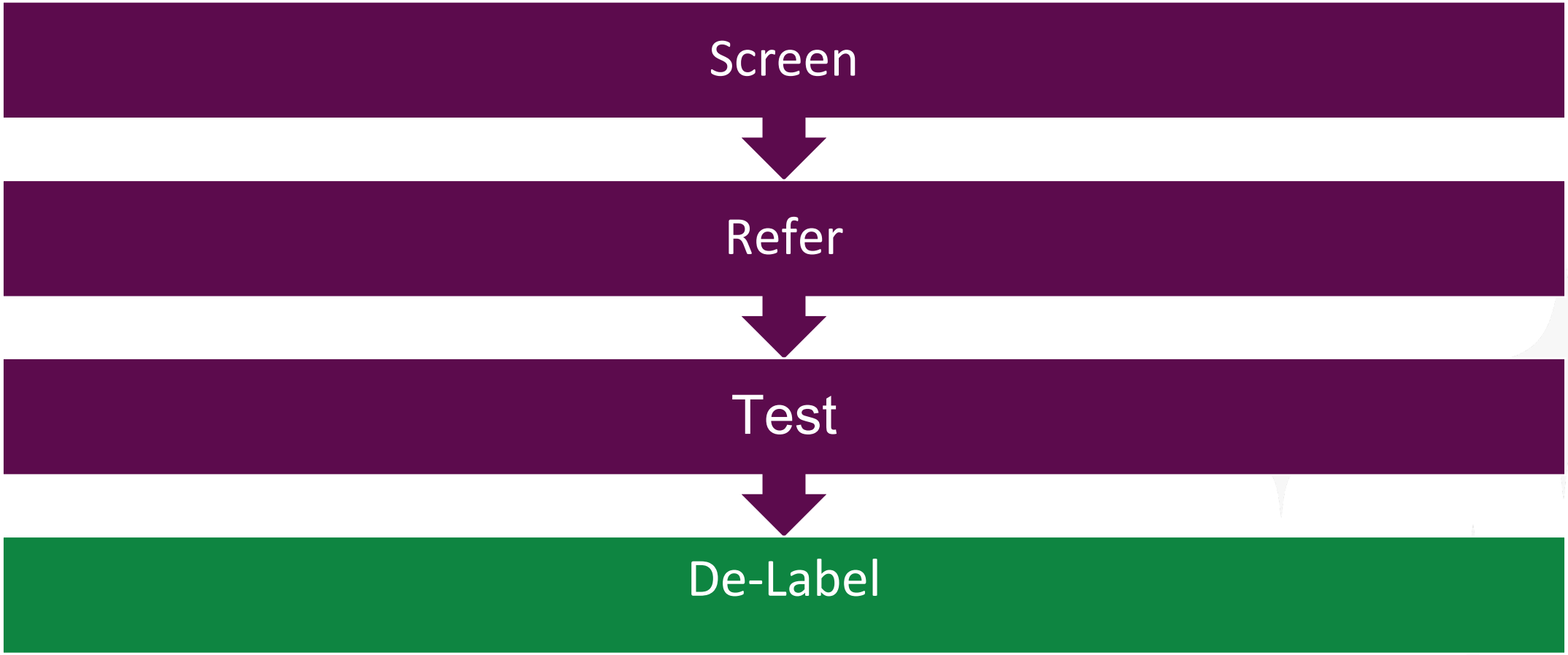
How to: Penicillin Allergy Stewardship in the Dental Office



Penicillin Allergy Reassessment for Treatment Improvement (PARTI) Tool

- Objective: To collect and evaluate clinician and patient feedback to facilitate collaborative communication about PCN allergy labels

Semi-quantitative questionnaire to a multidisciplinary group of healthcare workers

+

Semi-structured focus groups of patients with PCN allergies

Kunz Coyne AJ et al. Penicillin Allergy Reassessment for Treatment Improvement (PARTI): A Dental Office Tool to Support Appropriate Penicillin Allergy Labeling In press. *JADA* 2024

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Penicillin Allergy Reassessment Tool (PART)

Step 1 — Dentist

I believe this patient is a candidate for allergy reassessment because: (check all that apply)

___ Not true allergy ___ Waning Immunity ___ Error in Chart

Dentist:_____ Date:_____

Step 2 — Patient

The **Patient** will schedule a follow up to discuss this with their primary care physician

Clinician: _____

Date: _____ Location: _____

Step 3 — Healthcare Provider

I agree that this patient: (check all that apply)

___ Has a true Penicillin Allergy

___ Requires further allergy testing, Date: _____

___ Does not have a true Penicillin Allergy

Why does this matter? See reverse side.

MARR

ADS

Front

Allergies are rare.

1% of the population has a true penicillin allergy

Compared to an almost 10% of the population that thinks they have a penicillin allergy. Around 85% of patients who suspect they are penicillin allergic have negative results in a skin test.

The Benefits.

Other antibiotics in the penicillin family, like Amoxicillin, are more targeted, and therefore, are less associated with harsh side effects.

The Risks.

Antibiotics prescribed when the patient is allergic to penicillins are often associated with higher healthcare costs and increased risk for antibiotic resistance. Your medical history may be unreliable and can result in being prescribed more toxic antibiotics.

Patient Followup Checklist

Communicate your updated allergy status with your providers who can update your **Electronic Health Records**

____ Dentist

____ Pharmacist

____ Primary Care Physician

Source • MARR, OSAP

Back

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ADS Association for Dental Safety

Penicillin Allergy Reassessment for Treatment Improvement (PARTI) Tool

Methods for Primary and Secondary Data Collection

Sources of Data	Population	Date range	Sample size	Recruitment
Primary data collection				
Focus group discussions	Patients with a self-identified PCN allergy	February to March 2023	15	Convenience sampling
Online cross-sectional survey	HCWs involved in evaluating PCN allergy labels in medical records	February to March 2023	50	Electronic invitation to HCWs

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Patient Focus Group Feedback

"Straightforward, easy to follow"

"extremely helpful"

"Every healthcare worker should have access to the PARTI tool to start the conversation anywhere."

"Why does the process start in the dental office?"

"I learned so much from this one tool!"

"This tool will prompt me to ask my doctors and nurses about my allergy record."

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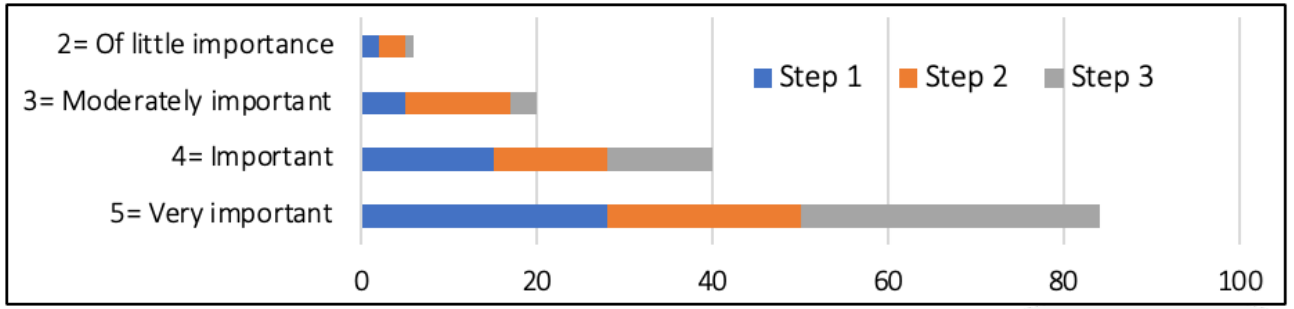
Penicillin Allergy Reassessment for Treatment Improvement (PARTI) Tool

Place of Work	
Academia	6 (12)
Ambulatory clinic	4 (8)
Dental office	13 (26)
Hospital	12 (24)
Military	1 (2)
Pharmacy	12 (24)
Retired	1 (2)
State	1 (2)
Occupation	
Clinical researcher	2 (4)
Dentist	9 (18)
Dental hygienist/assistant	5 (10)
Front desk staff	3 (6)
Infection prevention	2 (4)
Nurse	5 (10)
Pharmacist	15 (30)
Physician/Advanced practice provider	9 (18)

Healthcare Worker Questionnaire Feedback



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Penicillin Allergy Reassessment for Treatment Improvement (PARTI) Tool

DENTIST

PART 1 (Completed by the dentist)

You are a candidate for allergy reassessment because (check all that apply):

- ☐ Not a true allergy
- ☐ Allergic reaction was >5 years ago
- ☐ Error in chart
- ☐ Allergy does not prevent penicillin use
- ☐ Other – Please specify: _____

Dentist Name: _____

Dentist Contact info: _____

PATIENT

PART 2 (Completed by the patient)

Patient Name: _____

You will discuss allergy reassessment with a healthcare provider and/or allergist.

Healthcare Provider Name: _____

Healthcare Provider Contact info: _____

Appointment date(s) for allergy reassessment and/or testing*

Healthcare provider: _____

Allergist: _____

**It may take multiple visits for you to receive allergy testing.*

HEALTHCARE PROVIDER

PART 3 (Completed by healthcare provider that completes allergy testing)

I agree that you (check all that apply):

- ☐ Have a true penicillin allergy.
- ☐ Require further allergy testing.
- ☐ Do not have a true penicillin allergy.

Why Does This Matter?

Allergies Are Rare.

WHO: You are a patient that has been identified as benefitting from allergy testing for using penicillin

WHY: Antibiotics are prescribed when a patient is allergic to penicillin and are often associated with harsh side effects

WHAT: Only 1% of the population has a true penicillin allergy

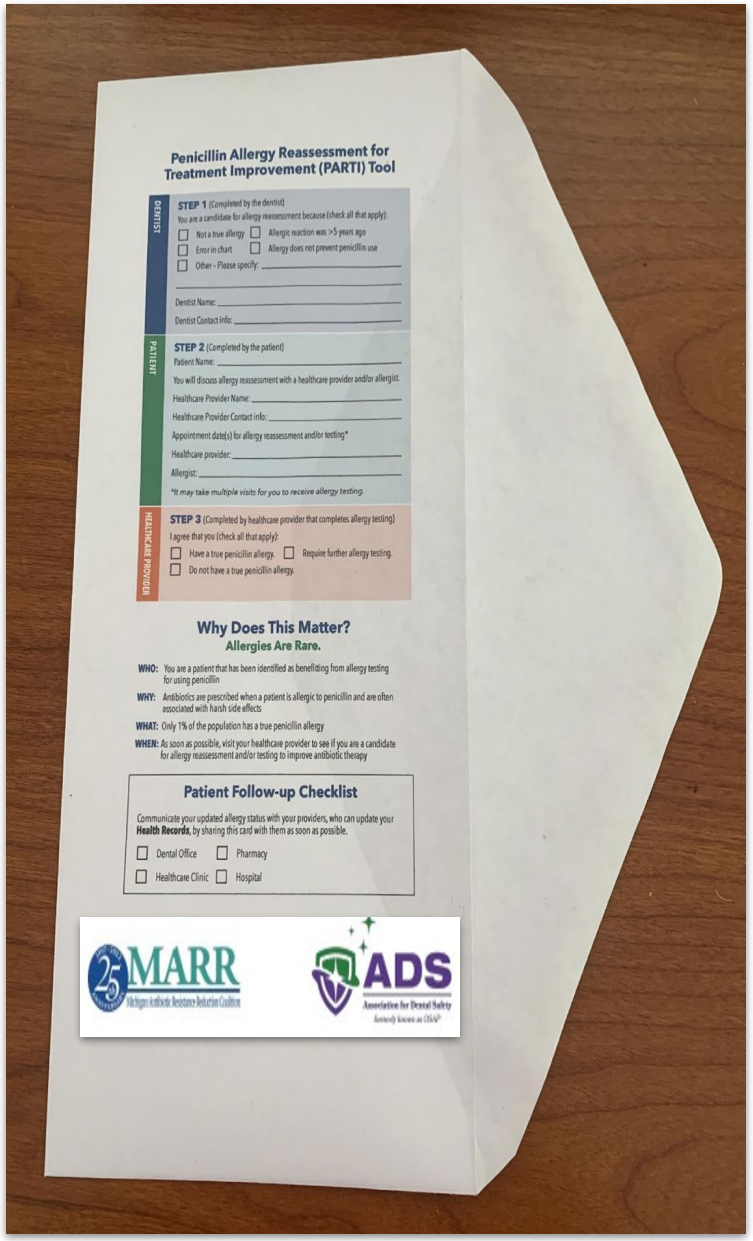
WHEN: As soon as possible, visit your healthcare provider to see if you are a candidate for allergy reassessment and/or testing to improve antibiotic therapy

Patient Follow-up Checklist

Communicate your updated allergy status with your providers, who can update your **Health Records**, by sharing this card with them as soon as possible.

- ☐ Dental Office
- ☐ Pharmacy
- ☐ Healthcare Clinic
- ☐ Hospital

DISCLAIMER: This is a tool for penicillin allergy screening, communication, and documentation and is not designed for risk assessment or diagnosis.



[ADS: Antibiotic Stewardship for the Dental Team (www.myads.org/antibiotic-stewardship-for-the-dental-team)](www.myads.org/antibiotic-stewardship-for-the-dental-team)

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Patients with Penicillin Allergies

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CDC is working with ADS to improve dental antibiotic prescribing

CDC funding ADS to:

- Update and develop new communication materials and website content
- Disseminate antibiotic stewardship resources, tools, and clinical practice guidelines

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ADS Online Education

Resources and tools with up-to-date information:

- Prescribers
- Dental Team
- Policymakers
- Patients

bitly

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2025 Antibiotic Stewardship Summit

- **Registration Opens:** Mid-September 2024
- **Date/Location:** February 2, 2025
  Atlanta, GA

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Thank you!

Questions?

health.stewardship@state.mn.us