Initial Implementation of an antimicrobial stewardship program in an academic dental health clinic

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Learning Objectives

- Participants will become familiar with CDC core elements for initial implementation of an antibiotic stewardship program in an ambulatory clinic setting
- Participants will gain awareness of the positive experiences and challenges of an antibiotic stewardship implementation program piloted in a dental clinic
- Participants will be able to apply aspects of stewardship efforts to their own clinical environment.

University of Illinois at Chicago College of Dentistry

- One of seven health science colleges at the University of Illinois at Chicago Hospital and Health System
- Educational Program includes a traditional 4 year DMD and a 2.5 Year Advanced Standing DMD Program
- Post Graduate Specialty Programs: Oral and Maxillofacial Surgery, Orthodontics, Pediatric Dentistry, Endodontics, Periodontics and Prosthodontics
- 140,000 Annual Patient Visits, for 36,000 patients in 15 student and specialty clinics

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CDC core elements of Outpatient Antibiotic Stewardship

Initial steps for antibiotic stewardship:

- recognize opportunities to improve antibiotic prescribing practices by identifying high-priority conditions
- identifying barriers to improving antibiotic prescribing
- establishing standards for antibiotic prescribing

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Recognize opportunities to improve antibiotic prescribing practices by identifying high-priority conditions

High Priority Conditions in Dentistry

- Infection of Odontogenic Origin
- Antibiotic Prophylaxis for patients at risk for Infectious Endocarditis, history of Total Joint Replacement and/or complex medical conditions
- Surgical Antibiotic Regimen
- Periodontal and Soft Tissue Infection

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Identifying barriers to improving antibiotic prescribing

- Collaboration Required : Antimicrobial stewardship resources for UI Health
- Lack of Standardization, recognized during initial data analysis
- Lack of Communication

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Communication Enhancements

- Monday Minutes
- Presentations by Content Experts
- Signage

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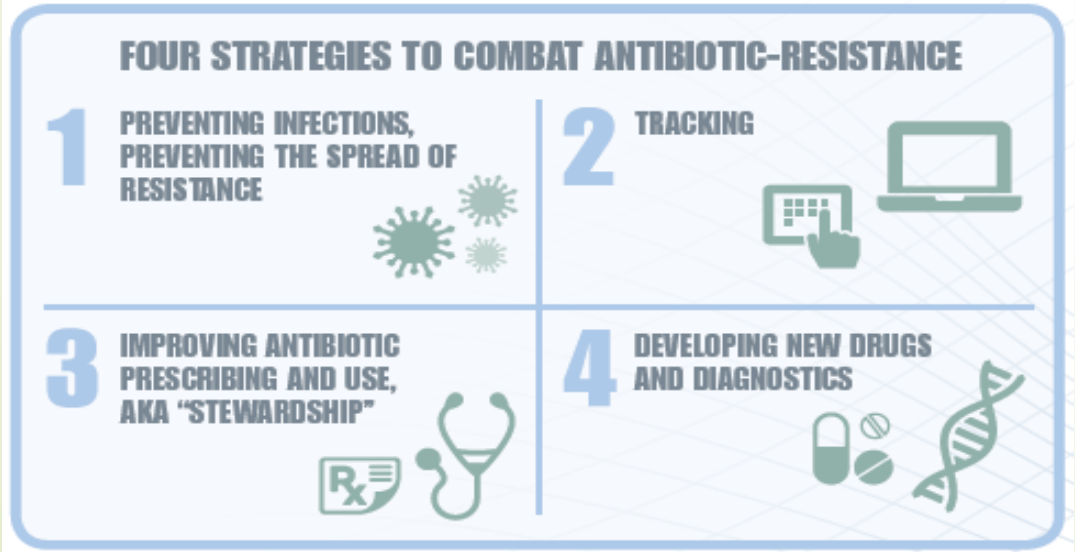
Monday Minutes

Monday, November 13, 2017:
Be Aware that Antibiotic Resistance Affects Us All

Antibiotic resistance can happen to your patient, your parent, your child, or yourself.
Antibiotic resistance is a problem we all must fight together.

The major driver of antibiotic resistance is use (and overuse) of antibiotics in healthcare and animals/agriculture.
Therefore, these precious resources should only be used to treat infections when needed.



Monday Minutes

The Monday Minute

Checklist for Antibiotic Prescribing in Dentistry

Prescribing

- Ensure evidence-based antibiotic references are readily available during patient visits.
- Avoid prescribing based on non-evidence-based historical practices, patient demand, convenience, or pressure from colleagues.
- Make and document the diagnosis, treatment steps, and rationale for antibiotic use (if prescribed) in the patient chart.
- Prescribe only when clinical signs and symptoms of a bacterial infection suggest systemic immune response, such as fever or malaise along with local oral swelling.
- Revise empiric antibiotic regimens on the basis of patient progress and, if needed, culture results.
- Use the most targeted (narrow-spectrum) antibiotic for the shortest duration possible (2-3 days after the clinical signs and symptoms subside) for otherwise healthy patients.
- Discuss antibiotic use and prescribing protocols with referring specialists.

http://tinyurl.com/dentalabxlist

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Monday Minutes

The Monday Minute

Antibiotic Prophylaxis 2017 Update Prophylaxis Recommendations

These recommendations are taken from 2017 American Heart Association and American College of Cardiology focused update of the 2014 AHA/ADA Guideline for Management of Patients with Valvular Disease and cited by the ADA.

Prophylaxis against infective endocarditis is reasonable before dental procedures that involve manipulation of gingival tissue, manipulation of the periapical region of teeth, or perforation of the oral mucosa in patients with the following:

1. Prosthetic cardiac valves, including transcatheter-implanted prostheses and homografts.
2. Prosthetic material used for cardiac valve repair, such as annuloplasty rings and chords.
3. Previous IE.
4. Unrepaired cyanotic congenital heart disease or repaired congenital heart disease, with residual shunts or valvular regurgitation at the site of or adjacent to the site of a prosthetic patch or prosthetic device.
5. Cardiac transplant with valve regurgitation due to a structurally abnormal valve.

AAE Quick Reference Guide on Antibiotic Prophylaxis 2017 Update

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Monday Minutes

Patients with Joint Replacement

The following recommendation is taken from the ADA Chairside Guide (© ADA 2015)

- In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.
- In cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and when reasonable write the prescription

Additional Considerations

The practitioner and patient should consider possible clinical circumstances that may suggest the presence of a significant medical risk in providing dental care without antibiotic prophylaxi as well as the known risks of frequent or widespread antibiotic use. As part of the evidence-based approach to care, this clinical recommendation should be integrated with the practitioner's professional judgment in consultation with the patient's physician, and the patient's needs and preferences.

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Excerpt from "The Use and Abuse of Antibiotics"

"The Proper Clinical Use of Antibacterial Drugs for acute apical abscesses with systemic symptoms:

Understanding the enemy is an important factor in winning any battle. The rational choice and use of antimicrobial agents begins with the knowledge of the microorganisms most likely responsible for common dental infections of pulpal origin. The bacterial flora found in endodontic infections is indigenous, mixed (Gram-positive and Gram-negative) and predominately anaerobic. Several species have been implicated with acute apical abscesses. These species include darkpigmented bacteria (Prevotella and Porphyromonas), eubacteria, fusobacteria and Actinomyces.

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Monday Minutes

The Monday Minute

This is the last Monday Minute in the series focusing on Antibiotic stewardship.

Updated information from the 2017 AAE Guidance on the Use of Systemic Antibiotics in Endodontics (thank you, Dr. Johnson!) (file:///Users/owner/Downloads/aae_systemic-antibiotics_2017.pdf)

Antibiotics should only be used as adjuvant therapies in cases with evidence of systemic involvement (fever, malaise, cellulitis and/or lymphadenopathies) following adequate endodontic disinfection and abscess drainage if swelling is present. In addition, patients who are immunocompromised or have predisposing conditions such as previous endocarditis should be medicated as a prophylactic measure.

Penicillin VK and amoxicillin, both beta-lactam antibiotics, are the first line of antibiotics chosen as adjunct therapeutic agents in endodontics in the United States of America and Europe

Amoxicillin demonstrates greater efficacy and therapeutic value because:

1. It has broader spectrum and is more effective than penicillin VK against certain gram-negative anaerobes due to better microbial penetration;

2. It is more readily absorbed from the gastrointestinal (GI) tract than penicillin VK, which is poorly absorbed and its accumulation in the GI tract is associated with depletion of commensal flora and digestive disturbances;

3. Its absorption is not impaired by food reaching peak plasma levels within 2 hours of ingestion;
4. Only approximately 20% of absorbed amoxicillin is protein-bound in the plasma, being more readily available;

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Antibiotic Stewardship Presentations

Dr. Alan Gross

University of Illinois at Chicago Clinical Assistant Professor and Clinical Pharmacist for the Antimicrobial Stewardship Program, and Chair of the Antimicrobial Stewardship Committee for the Society of Infectious Diseases Pharmacists.

- Faculty, student and staff participation
- Recorded and maintained on Faculty Development Site

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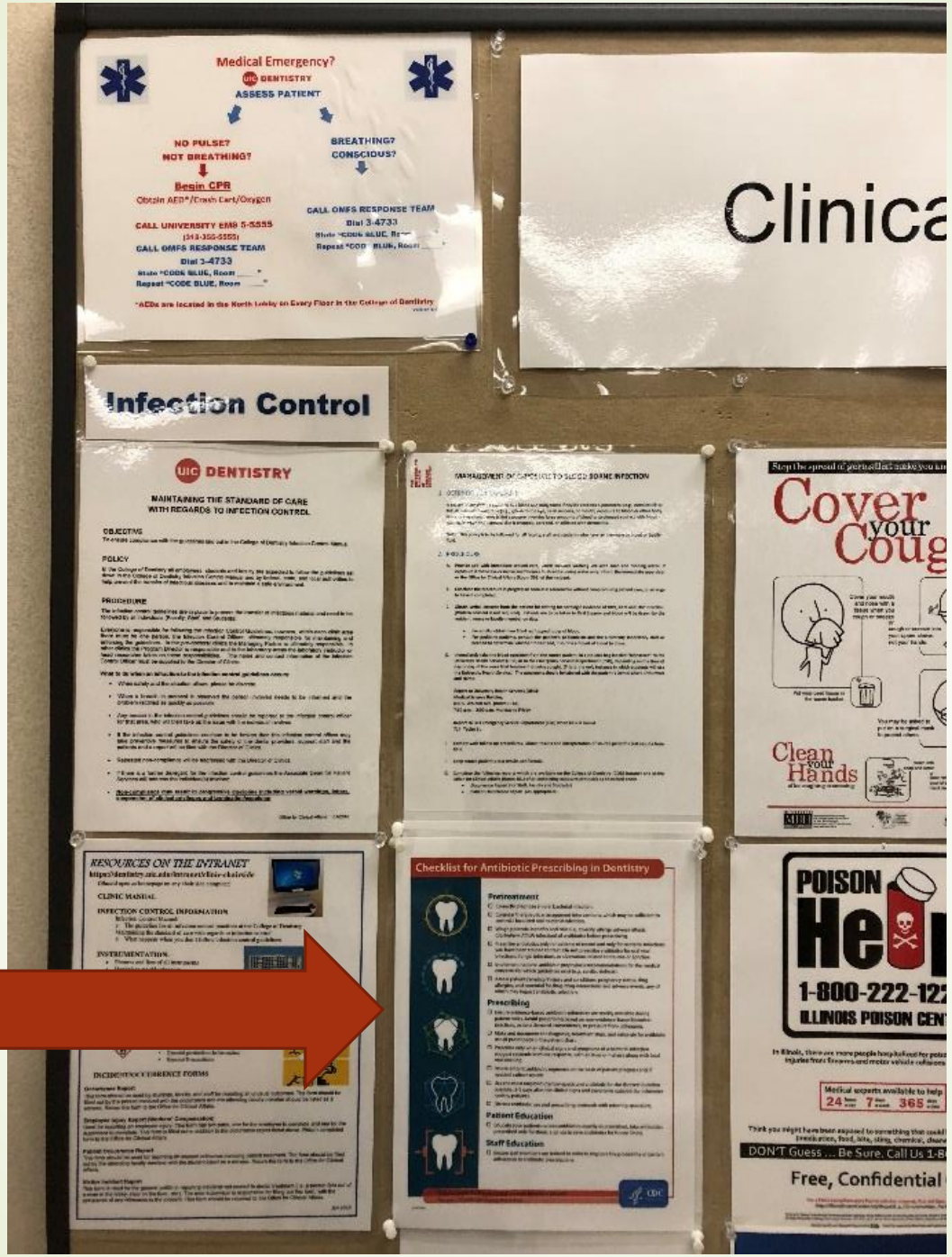
SIGNAGE



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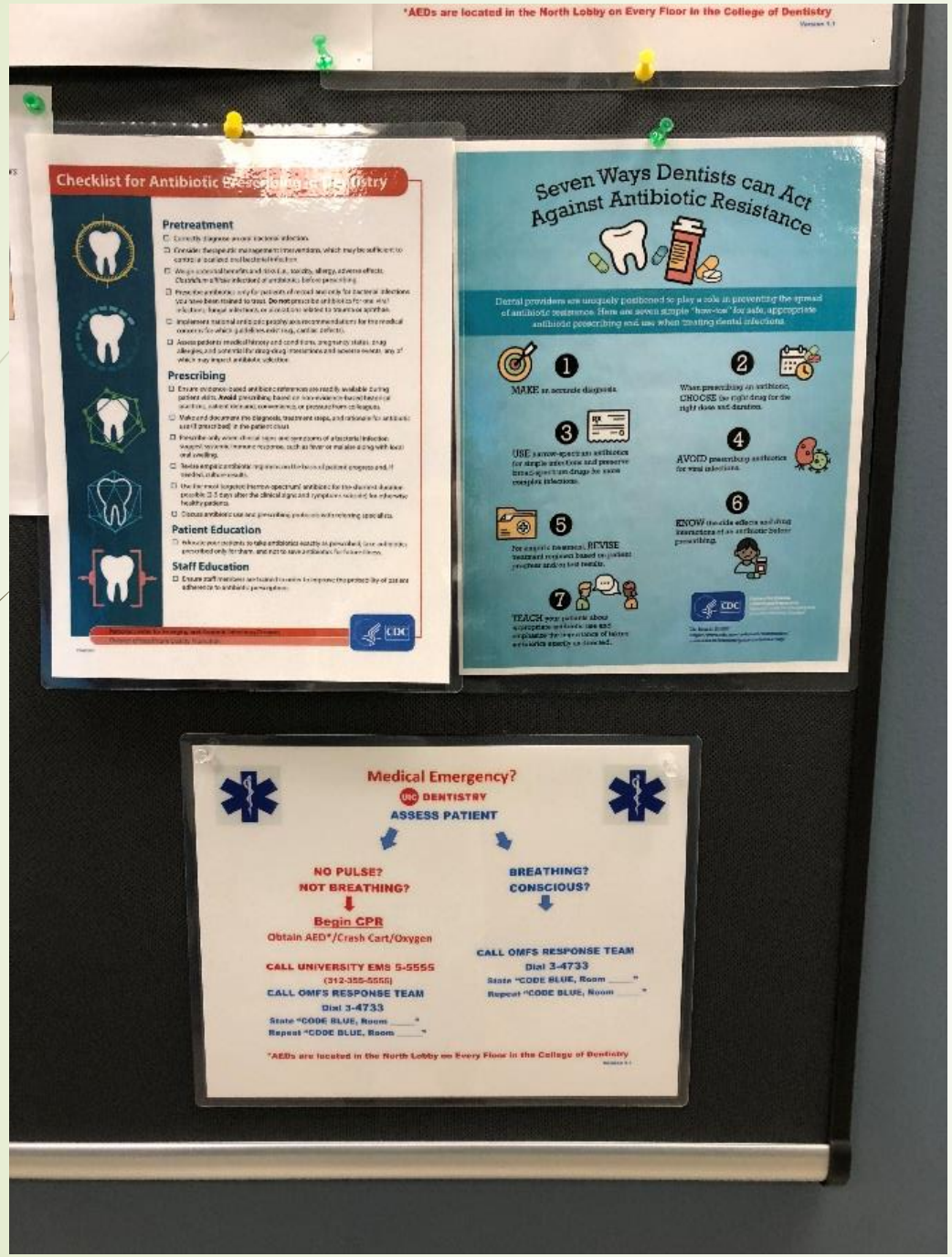

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Establishing standards for antibiotic prescribing

- developing an evidence-based institutional guideline,
- gaining consensus among providers,
- preparing education,
- measuring rates of antibiotic prescribing before and after implementation of the guideline/education.

First step- developing clinical practice decision tool

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Establishing standards for antibiotic prescribing

Collaborative Efforts in the development of the Clinical Practice Tool

- University Health and Hospital Systems Content Experts
  - **Dr. Katie Suda**, UIC Associate Professor Pharmacy, Researcher, and on the CDC panel targeting the reduction of inappropriate antibiotic use in outpatient settings
  - **Dr. Alan Gross**, UIC Assistant Professor and UI Health Antibiotic Stewardship Director
- College of Dentistry Content Experts
  - **Dr. Danny Hanna**, Clinical Associate Professor and Dentist Director of the Urgent Care Program at the College
  - **Dr. William Flick**, Clinical Professor and Oral and Maxillofacial Surgeon
  - **Dr. James Bahcall**, Clinical Associate Professor and Endodontist

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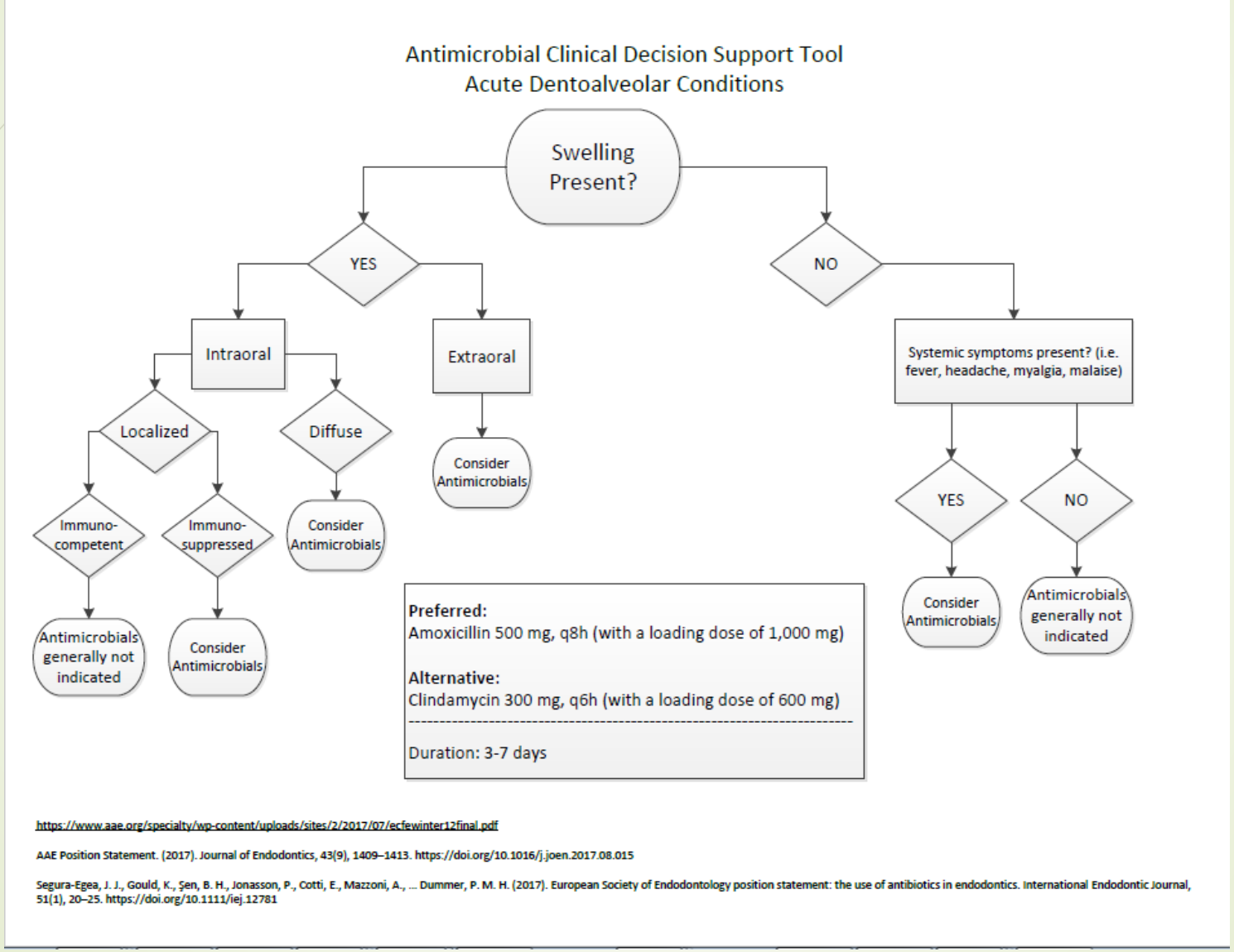
Evidence Based Clinical Decision Support Tool



https://www.aae.org/specialty/wp-content/uploads/sites/2/2017/07/ecfewinter12final.pdf

AAE Position Statement. (2017). Journal of Endodontics, 43(9), 1409–1413. https://doi.org/10.1016/j.joen.2017.08.015

Segura-Egea, J. J., Gould, K., Şen, B. H., Jonasson, P., Cotti, E., Mazzoni, A., ... Dummer, P. M. H. (2017). European Society of Endodontology position statement: the use of antibiotics in endodontics. International Endodontic Journal, 51(1), 20–25. https://doi.org/10.1111/iej.12781

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Progress Thus Far

	Sept '17	Sept. '17	Sept. 17	May '18	May '18	May '18
Instructor	Urgent Care Visits	# of Antimicrobials prescribed during Urgent Care Visits	Average	Urgent Care Visits	# of Antimicrobials prescribed during Urgent Care Visits	Average
593	27		0.00%	52	2	3.85%
597	33	1	3.03%	23		0.00%
598	14	1	7.14%	42	2	4.76%
599	6	1	16.67%	22	1	4.55%
605	6	2	33.33%	19		0.00%
606	27	3	11.11%	16		0.00%
19280	20	6	30.00%	No visits		
20500	20	2	10.00%	3		0.00%
21140	13	4	30.77%	17	1	5.88%
23280	30	2	6.67%	44		0.00%
26800	5		0.00%	No visits		
27760	33	1	3.03%	36		0.00%
28800	4		0.00%	8		0.00%
30940	11		0.00%	7		0.00%
30941	9	1	11.11%	18	1	5.56%
30942	7		0.00%	22		0.00%
30980	9		0.00%	10		0.00%
31021	9		0.00%	13	1	7.69%
Total	283	24		352	8	
Average for all Providers			8.48%			2.27%

Future Efforts

- Disseminate the Evidence Based Clinical Decision Support Tool
- Ongoing Data Collection and Analysis
- Curricular Enhancements

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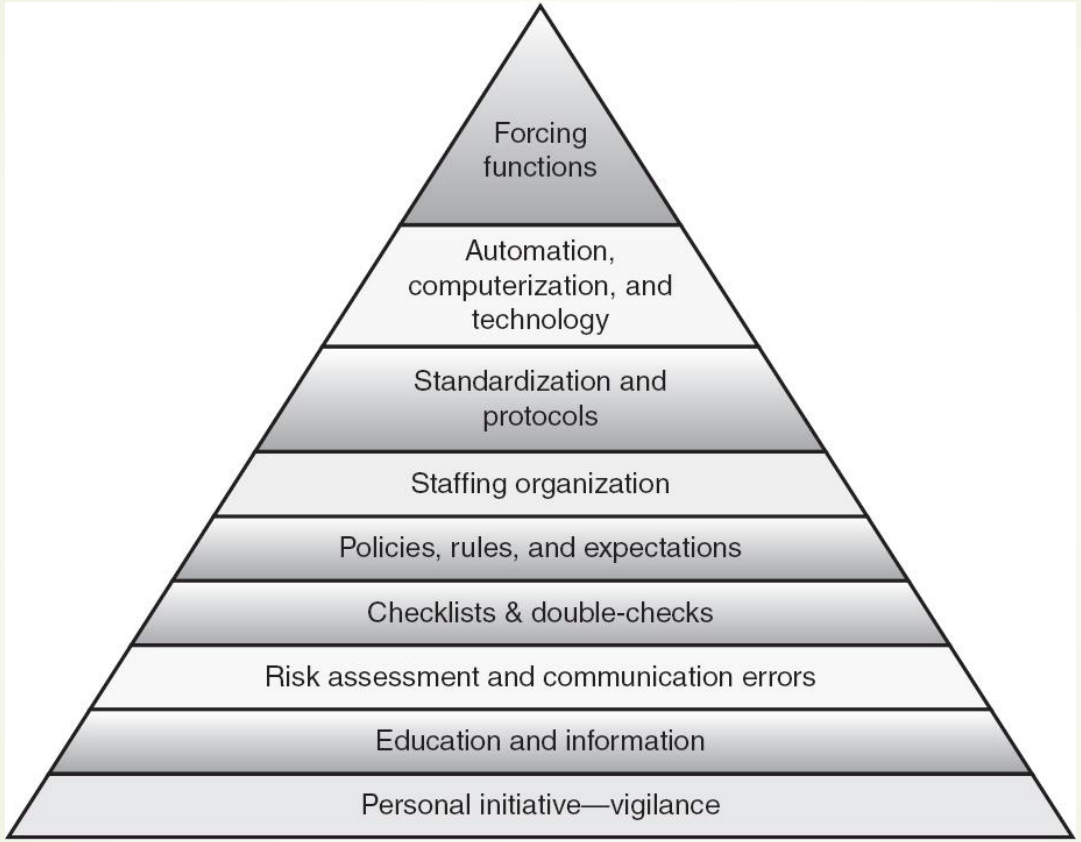
Automation within the Electronic Health Record



Error Prevention and Risk Management

Suzanne B. Evans and Derek Brown

Future Focus

- Focus on other high priority conditions
  - Antibiotic Prophylaxis for patients at risk for Infectious Endocarditis, history of Total Joint Replacement and/or complex medical conditions
  - Surgical Antibiotic Regimen
  - Periodontal and Soft Tissue Infection

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References

- *AAE Quick Reference Guide on Antibiotic Prophylaxis 2017 Update*
- Centers for Disease Control and Prevention: https://www.cdc.gov/antibiotic-use/community/programs-measurement/measuring-antibioticprescribing.html
- Checklist for Antibiotic Prescribing in Dentistry at http://tinyurl.com/dentalabxlist
- Evans, S., Derek Brown. Error prevention and risk management. Accessed www.demosmedical.com/media/samplechapters/.../9781620700747_Chapter1.html
- Guidance on the Use of Systemic Antibiotics in Endodontics, Users/owner/Downloads/aae_systemic-antibiotics_2017.pdf
- The Use and Abuse of Antibiotics, https://www.aae.org/specialty/wp-content/uploads/sites/2/2017/07/ecfewinter12final.pdf