Recorded Presentation: https://youtu.be/S6oVPqzpx0E

Long-term Care Syndromic Antimicrobial Stewardship Session #2

Focused Antibiotic Stewardship Initiatives Directed Towards Wounds, Skin and Soft Tissue Infections

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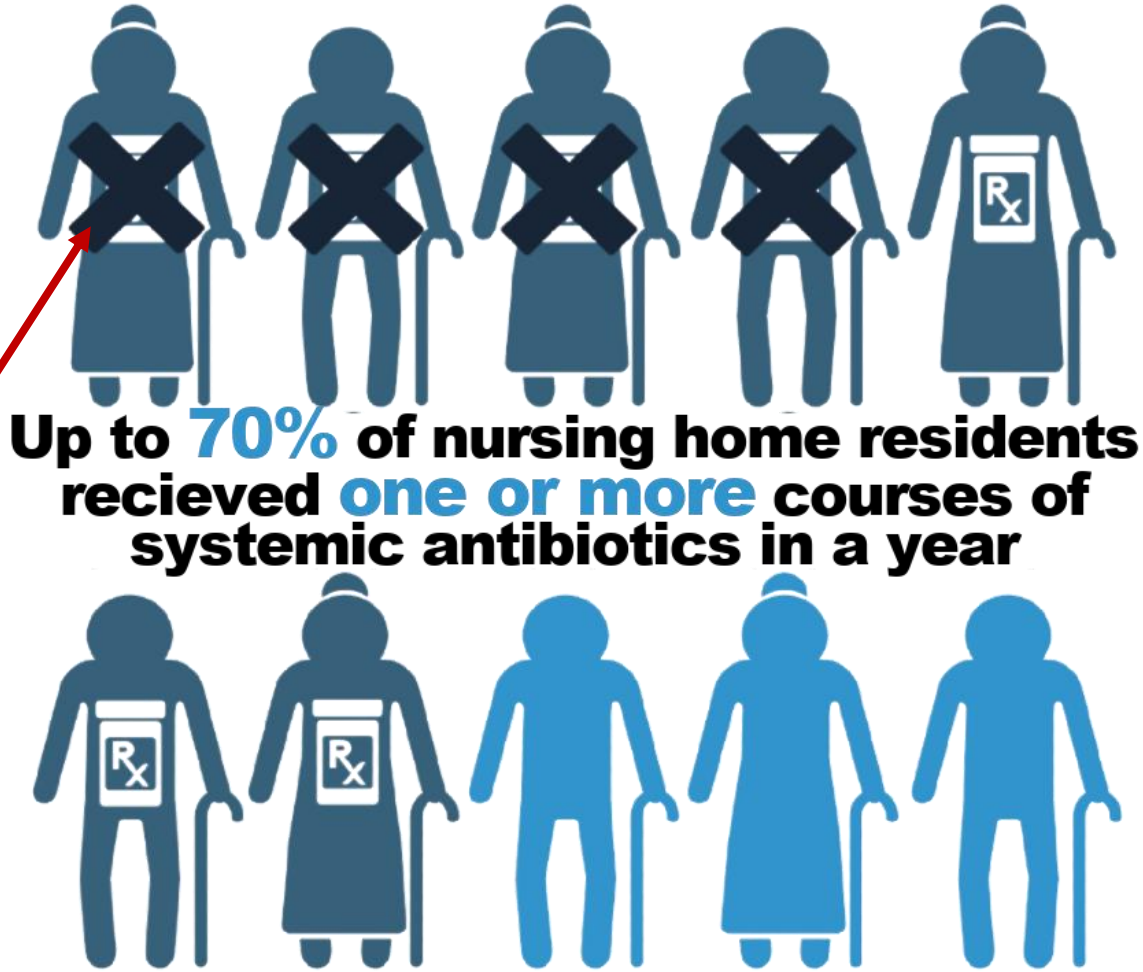
Objectives

- Discuss the epidemiology and pathogenesis of wounds, skin and soft tissue infections
- Identify and implement evidence based antibiotic stewardship initiatives directed towards wounds, skin and soft tissue infections
- Differentiate effective communication strategies for optimize antimicrobial choices

Epidemiology

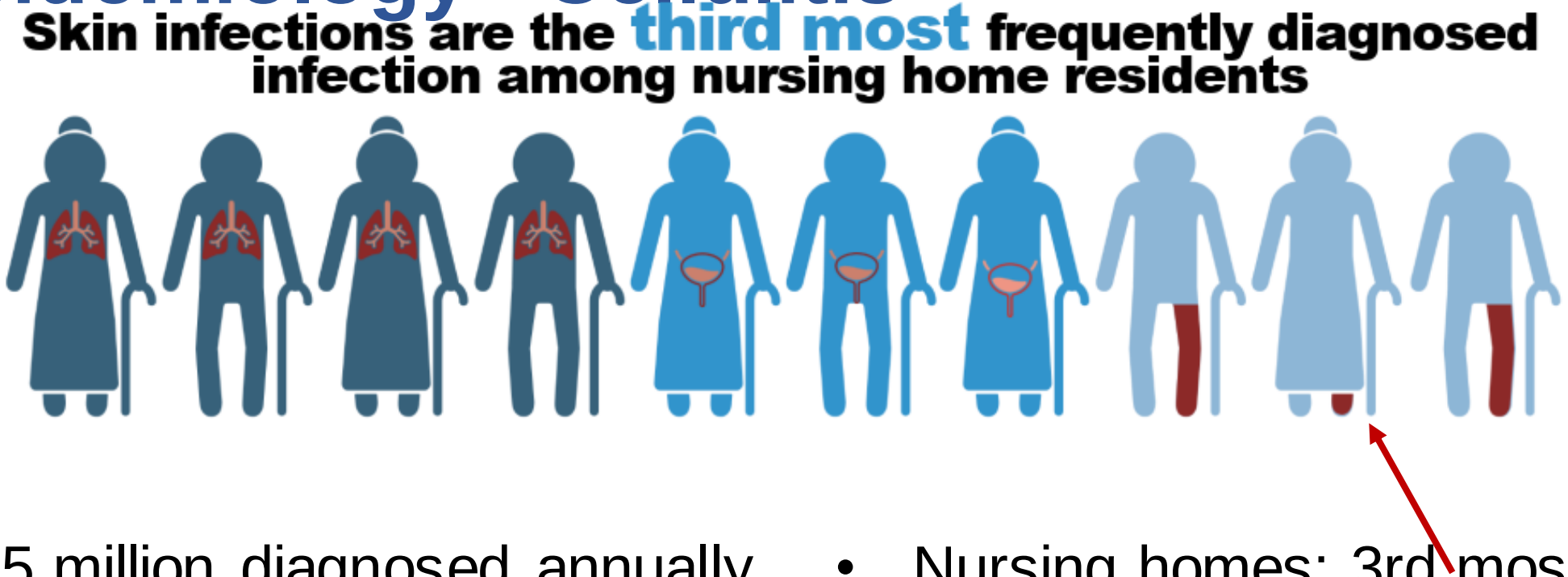
Antibiotic Rx for people > 65 between 2000 – 2010, abx:

- ⬆ 30% in antibiotics
- 1,048 Rx / 1000 persons
- 10% of NH residents are on an abx on any given day
- 30-50% of these abx are not indicated



Sources: Lee G., et al. BMC Med 2014; 12:96.
Hicks L, et al. CID 2015;60(9); 1308-16.
Pakyz A., et al. ICHE 2010; 31(6):661-62.

Epidemiology - Cellulitis



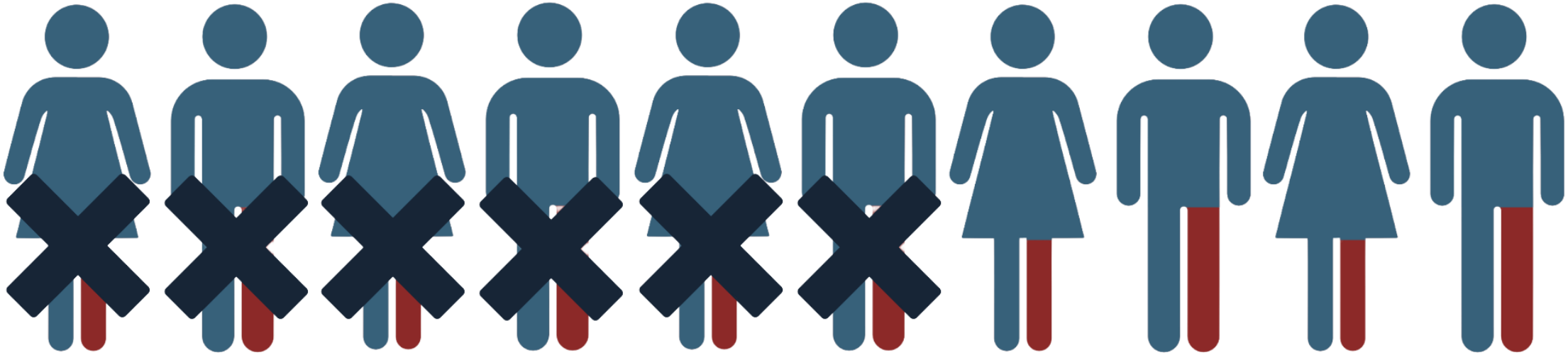
- 14.5 million diagnosed annually
- 650,000 hospital admissions
- 10% of all infectious disease related hospitalizations

- Nursing homes: 3rd most common infection diagnosed
- Most common skin diagnosis
  - >50% of abx Rx by off-site providers
  - <50% have documented follow-up

Sources: Cutler T., et al. J Hosp Med. 2023; 18; 254-61.
Yogo N., et al. Front Med 2016; 3(30).

Mimics

- Retrospective review: 31-74% patients initially diagnosed with cellulitis were given alternative diagnosis on further evaluation
- Cellulitis was the most frequently misdiagnosed condition among all dermatology consultations



Sources: Cutler T., et al. J Hosp Med. 2023; 18; 254-61.
Strazzula L, et al. J Am Acad Dermatol. 2015; 73(1):70-75.
Kroshinsky D., et al. JAMA Dermatol. 2016; 152:477-80.

Differential

Diagnosis	Cellulitis	Non-infectious
Location	• Unilateral	• Bilateral
Acuity	• Sudden	• Chronic
Associated Symptoms	• Warmth • Pain	• Itching • Burning (could be infection)
Appearance	• Well-demarcated	• Hyperpigmented • Flaky or shedding

Image Sources: Primary Care Dermatology Society (pcds.org)

Red Legs Differential

- **Chronic** (non-infectious)
  - **Stasis dermatitis**
  - **Bilateral**
    - **Lipodermato sclerosis**
  - **Unilateral**
    - **Contact dermatitis**
    - **Tinea**
- **Acute**
  - **Infectious**
  - **Non-infectious**
    - **Gout**
    - **Vasculitis**
    - **DVT**

Image Sources: Primary Care Dermatology Society (pcds.org)

Incontinence-Associated Dermatitis

Form of contact dermatitis

- Urine and feces are chemical and physical irritants
- ↑ skin pH → ↑ permeability → ↓ breakdown → friction → ↑ infections
- Wet, macerated in acute phase → dryness, peeling in chronic phase

Image Source: Derm Net (dermnetnz.org)

Surveillance Definitions

Caution: Diagnostic or Treatment Indications

Presence of organisms cultured from surface of wound are not sufficient evidence that the wound is infected

McGeer Criteria	Loeb Minimum Criteria
Pus at SSTI site OR 4 of the following 1) ↑ warmth 2) ↑ redness 3) ↑ swelling 4) ↑ tenderness 5) Serous drainage 6) Constitutional findings (temp, WBC)	New or increased purulence at SSTI site Or 2 of the following: 1) ↑ warmth 2) ↑ redness 3) ↑ swelling 4) ↑ tenderness 5) Fever (>100F)

Sources: Stone N., et al. ICHE 2012; 33(10):965-77.
Loeb M. et al. ICHD 2001; 22(2): 120-4.

Surveillance

LTC Skin, Soft Tissue, and Mucosal Infection Worksheet
(McGeer Criteria 2012)

Type of Infection:

Resident Name	MR#	Date of Admission	Resident Location (hall/room #)
Relevant findings (source, culture date, organism(s), vital signs, etc.) ☐ MDRO?		Date of ONSET of S&S	☐ ≤ 2 calendar days = Community Acquired ☐ > 2 calendar days after admit = Facility Acquired
Date of Infection		Person completing form	

Type of Infection	Signs and Symptoms	Comments
☐ Cellulitis, soft tissue, or wound	___ **MUST HAVE at least 1 of the following:** ___ Pus present at a wound, skin, or soft tissue site ___ New or increasing presence of at least 4 of the following: ☐ Heat at the affected site ☐ Redness at the affected site ☐ Swelling at the affected site ☐ Tenderness or pain at the affected site ☐ Serous drainage at the affected site ☐ One constitutional criterion (Refer to Appendix): ○ Fever* ○ Leukocytosis* ○ Acute change in mental status from baseline* ○ Acute functional decline*	Presence of organisms cultured from the surface (e.g., superficial swab sample) of a wound is **NOT** sufficient evidence that the wound is infected. **More than 1 resident with streptococcal skin infection from the same serogroup (e.g., A, B, C, G) in a long-term care facility may indicate an outbreak.**

Type of Infection	Signs and Symptoms	Comments
☐ Scabies	___ MUST HAVE a maculopapular and/or itching rash ___ MUST HAVE at least 1 of the following: ☐ Physician diagnosis ☐ Laboratory confirmation (scraping or biopsy) ☐ Epidemiologic linkage to a case of scabies with laboratory confirmation	An epidemiologic linkage to a case can be considered if there is evidence of geographic proximity in the facility, temporal relationship to the onset of symptoms, or evidence of common source of exposure (i.e., shared caregiver). Care must be taken to rule out rashes due to skin irritation, allergic reactions, eczema, and other noninfectious skin conditions.
☐ Fungal oral or perioral and skin	Oral candidiasis ___ MUST HAVE presence of raised white patches on inflamed mucosa or plaques on oral mucosa ___ MUST HAVE diagnosis by a medical or dental provider Fungal skin infection ___ MUST HAVE characteristic rash or lesions ___ MUST HAVE either a diagnosis by a medical provider or laboratory-confirmed fungal pathogen from a scraping or a medical biopsy	Mucocutaneous *Candida* infections are usually due to underlying clinical conditions such as poorly controlled diabetes or severe immunosuppression. **Although they are not transmissible infections in the healthcare setting, they can be a marker for increased antibiotic exposure.** Dermatophytes haven been known to cause occasional infections and rare outbreaks in the LTCF setting.
☐ Herpes virus skin	Herpes simplex infection ___ MUST HAVE a vesicular rash ___ MUST HAVE either physician diagnosis or laboratory confirmation Herpes zoster infection ___ MUST HAVE a vesicular rash ___ MUST HAVE either physician diagnosis or laboratory confirmation	Reactivation of herpes simplex ("cold sores") or herpes zoster ("shingles") is not considered a healthcare-associated infection. Primary herpes virus skin infections are very uncommon in a LTCF except in pediatric populations, where it should be considered healthcare associated.

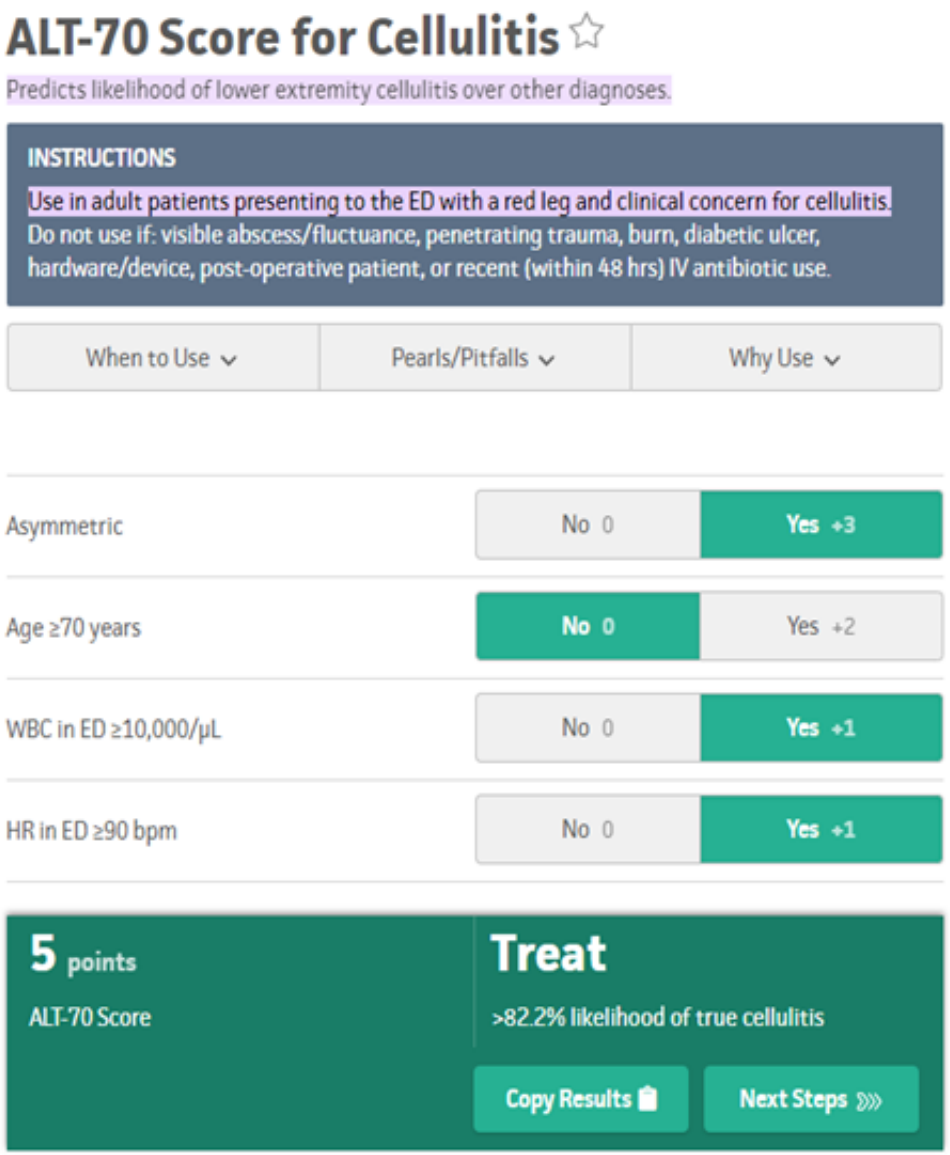
Download spice.unc.edu/wp-content/uploads/2017/03/Skin-Soft-Tissue-Mucosal-Infection-Worksheet-McGeer-SPICE.pdf_k

Diagnosis: ALT-70

Model for predicting presence of true cellulitis in the Emergency Department (ED)

- Asymmetry
- Leukocytosis
- Tachycardia
- Age

- 0-2: unlikely
- 3-4: indeterminate, consider alternatives
- 5-7: likely cellulitis



MDcalc.com

Sources: Raff A., et al. JAAD. 2017; 625.
Singer S et a. JAAD. 2019; 1252-56.
Li D., et al. JAAD. 2018;79(6):1076-80.

Polling Question

Does your facility have a guideline for cellulitis?

A. Yes

B. No

Guidelines

Example Guidelines				
Condition		**Pathogens**	**Treatment**	**Duration**
Impetigo		MSSA or MRSA Streptococcus pyogenes	Topical mupirocin 2% three times daily	5 days
If numerous lesions			Cephalexin 500 mg TID to QID or Cefadroxil 500 mg BID or Clindamycin 300 mg QID	
			Penicillin Allergic Alternative: Amoxicillin/clavulanate 875 mg BID	
Erysipelas		Streptococcus pyogenes Beta-hemolytic strep	Amoxicillin 500-875 mg BID to TID **Penicillin Allergic Alternative:** Amoxicillin/clavulanate 875 mg BID Clindamycin 300 mg QID	

Image Source: pcds.org & dermnetnz.org

Sources: Stevens D., et al. CID 2014; 59(2); e10-52; Stryjewski M., et al. CID 2008; 46 suppl 5: s368-77; Daum R et al. NEJM 2017; 376:2545-55;

Guidelines

Example Guidelines				
Condition		**Pathogens**	**Treatment**	**Duration**
Non-purulent cellulitis		Streptococcus pyogenes Beta-hemolytic strep Less: MSSA or MRSA	Cephalexin 500 mg TID to QID or Cefadroxil 500 mg BID	5 days (may extend based on response)
Non-purulent cellulitis with MRSA risk factors*		MSSA MRSA	Cephalexin or cefadroxil PLUS Bactrim 1-2 DS tab BID or Doxycycline 100 mg BID **Penicillin Allergic Alternative:** Clindamycin 300 mg QID	

* MRSA Risk factors: prior MRSA infection or colonization, close contact with MRSA, high community prevalence, crowded living conditions (homeless shelters, military barracks, prison), contact sports (wrestling, football), IV drug use

Sources: Stevens D., et al. CID 2014; 59(2); e10-52; Stryjewski M., et al. CID 2008; 46 suppl 5: s368-77; Daum R et al. NEJM 2017; 376:2545-55.

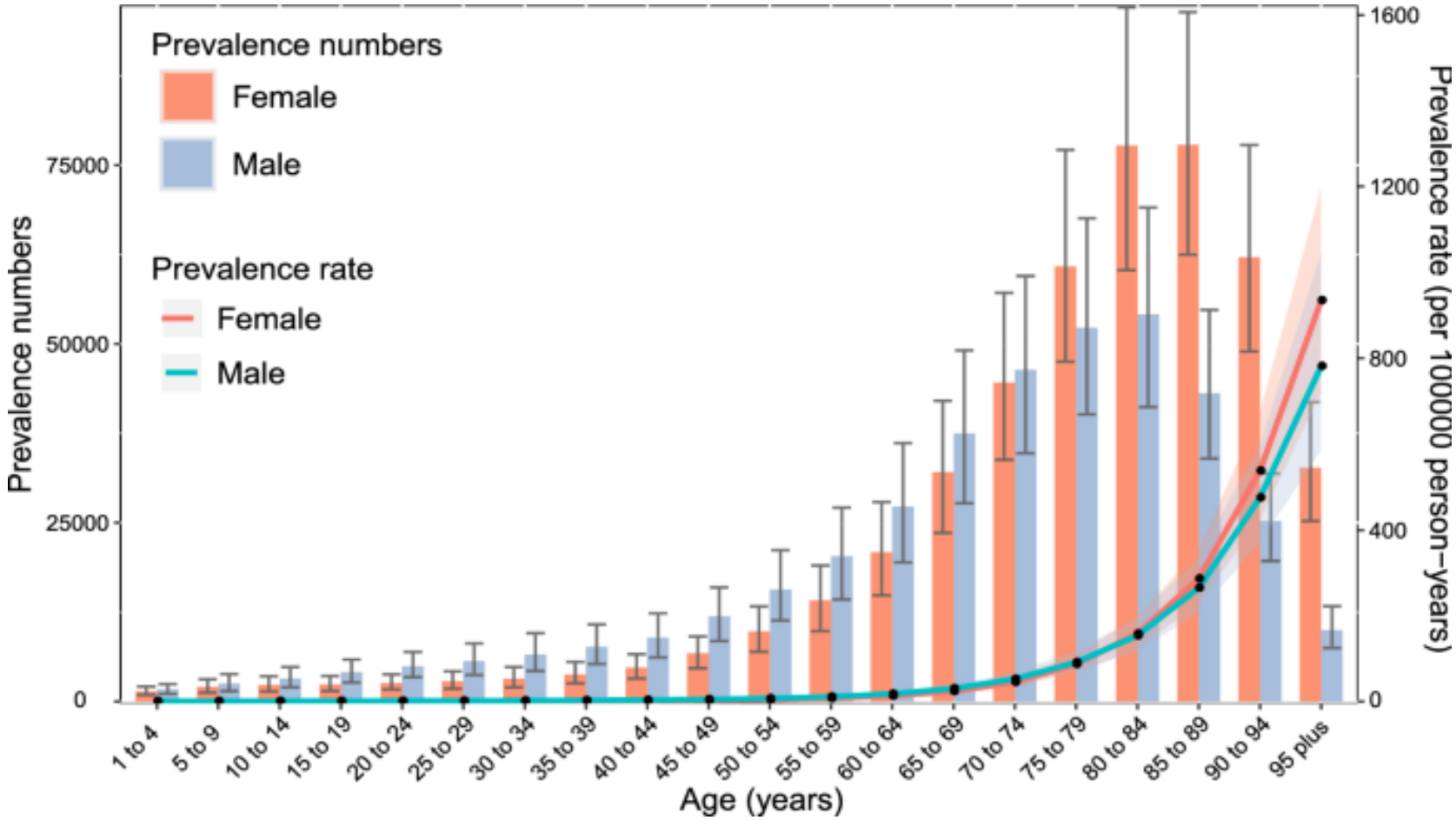
Guidelines

Example Guidelines			
Condition	**Pathogens**	**Treatment**	**Duration**
Purulent cellulitis with drainable collection	MSSA MRSA Less: Beta-hemolytic strep	**Perform Incision and Drainage (I&D) Adjunctive antibiotics are recommended in certain scenarios if drained***	**5 days (may extend based on response)**
		* abscesses >2 cm, extensive disease (multiple abscesses or multiple sites of infection), clinical signs or symptoms of infection, inadequate response following I&D, immunosuppression	
Purulent cellulitis WITHOUT drainable fluid collection	MSSA MRSA Less: Beta-strep	**Bactrim 1-2 DS tabs BID** **or** **Doxycycline 100 mg BID**	

Sources: Stevens D., et al. CID 2014; 59(2); e10-52.
Stryjewski M., et al. CID 2008; 46 suppl 5: s368-77.
Daum R et al. NEJM 2017; 376:2545-55.

Epidemiology - Pressure Ulcers (PU)

- 2.5 million per year
- 130 incident cases per 100,000
- 60,000 deaths annually
  - 4.5 x mortality than those with same risk factors but w/o PU



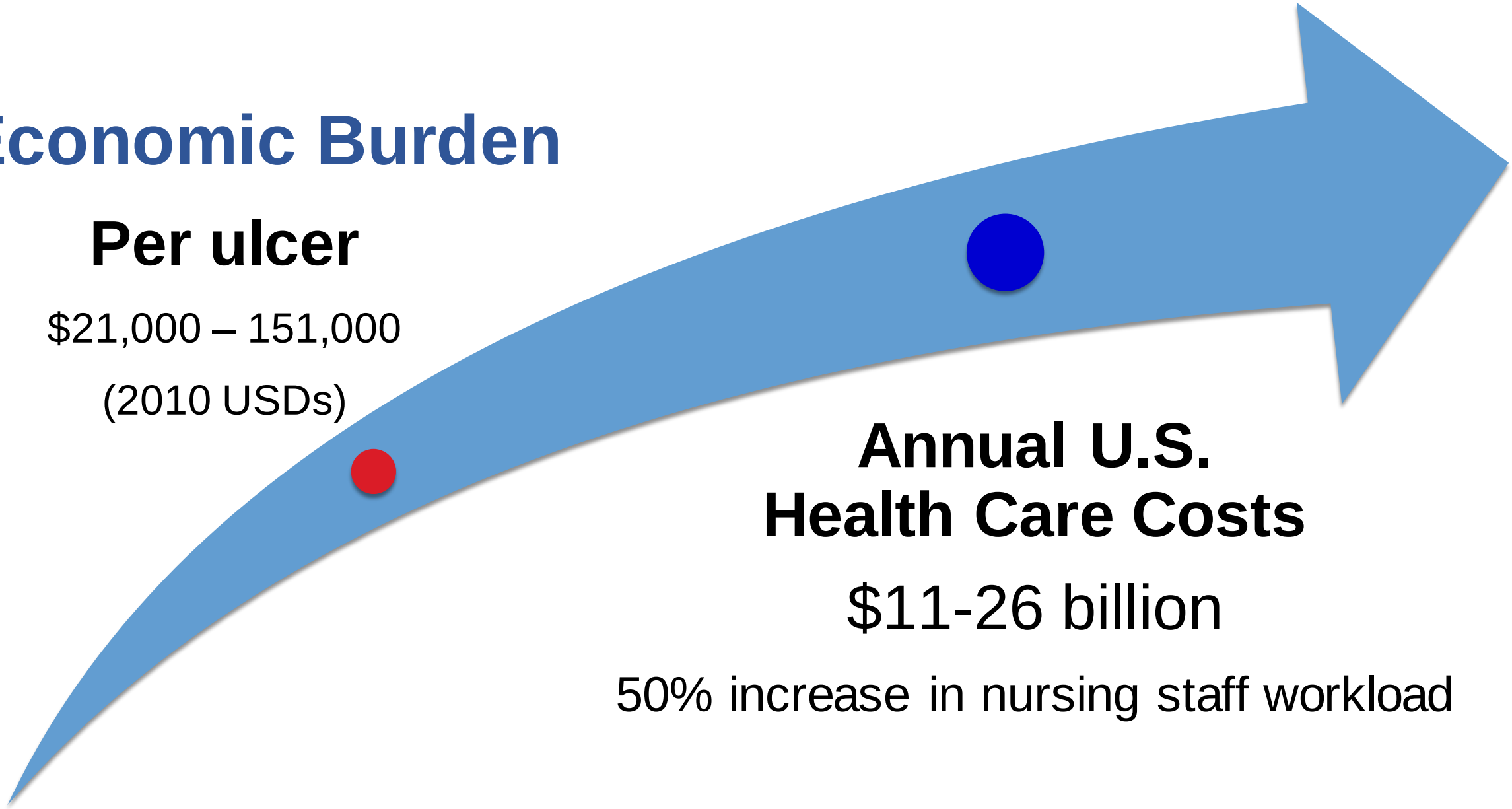
Sources: Zhang X., et al. Sci Reports; 2021;11(21750).
Borojeny L., et al. Int J Prev Med. 2020;11:171.
Kaka A. et al. Open Forum Inf Dis. 2019.
AHRQ Decubitus Ulcer, updated 2014.

Economic Burden

Per ulcer

$21,000 – 151,000

(2010 USDs)



Annual U.S. Health Care Costs

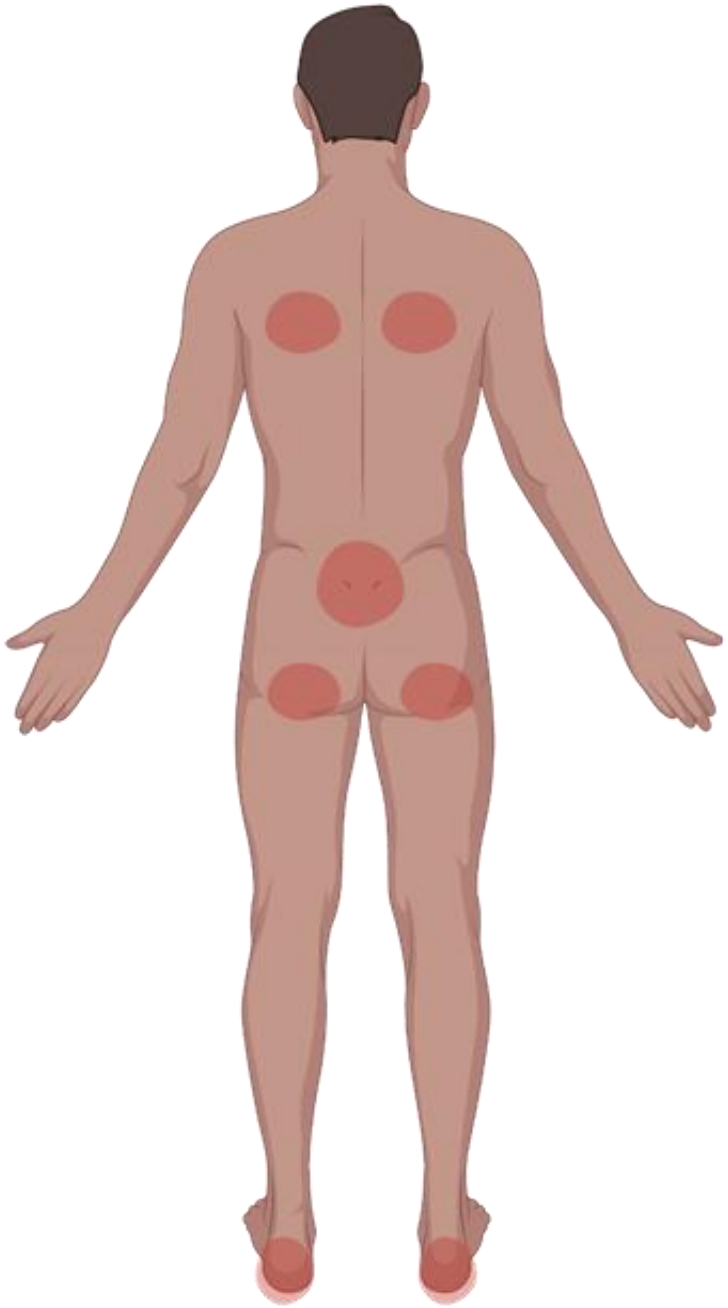
$11-26 billion

50% increase in nursing staff workload

Sources: Driver et al., Vasc Surg 2010;52(3)::17s-22s.
Rice J., et al. Diabetes Care. 2014;32(3):651-8.
Apelqvist J., et al. J Intern Med. 1994;255(5):463-71.

Pressure Ulcer Locations

- Ischium
- Sacrum
- Buttocks
- Trochanter
- Heels
- Malleolus
- Scapula
- Elbow



Source: Borojeny L., et al. Int J Prev Med. 2020;11(5):171.

Polling Question

Which of the following are factors in development of a pressure ulcer?

A. Immobility and debility

B. Infrequent off-loading

C. Malnutrition

D. Urinary and/or fecal incontinence

E. All of the above

Polling Question

Which of the following are factors in development of a pressure ulcer?

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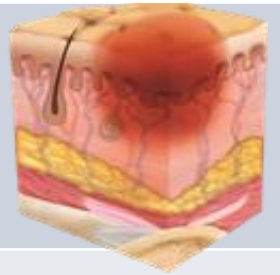
E. All of the above

Pressure Ulcer Risk Factors

Risk Factor	OR (95% CI)
Antibiotic resistant infection	2.85 (2.1-3.7)
Underweight	2.2 (1.2-4.2)
Paraplegia > Quadriplegia	2.3 (1.8 – 2.4)
Malnutrition	2.1 (1.6-2.8)
Diabetes	1.7 (1.4-2.3)
Male	1.6 (1.4-1.8)
Black	1.5 (1.3-1.7)
Chronic Obstructive Pulmonary Disease (COPD)	1.5 (1.3-1.7)
Bowel incontinence	1.3 (1.1-1.6)
Obese	0.5 (0.3-0.9)

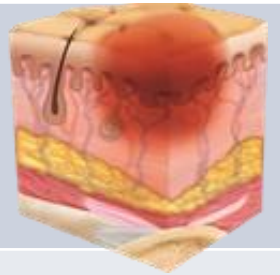
Source: Cowan L. et al. Advin Skin and Wound Care. 20199;32(3):122-30.

Pressure Ulcer Classification

Stage	Description	
1	**Intact skin**, non-blanchable redness an hour after pressure relief	
2	Partial thickness loss of **dermis**	
3	Full-thickness tissue loss, possible visible **fat, muscle**	
4	Full-thickness tissue loss, involvement of **bone, tendon, joint**	

Source: NPIAP 2020; https://npiap.com/page/PressureInjuryStages

Pressure Ulcer Classification

Stage	Description	
1	Intact skin, non-blanchable redness an hour after pressure relief	
2	Partial thickness loss of dermis	
	,	
		

Stage 3 & 4
Level of injury nearly always require surgical management to achieve wound closure

Source: NPIAP 2020; https://npiap.com/page/PressureInjuryStages

Polling Question

True or False: In a chronic wound the only good bacteria are dead bacteria?

A. True

B. False

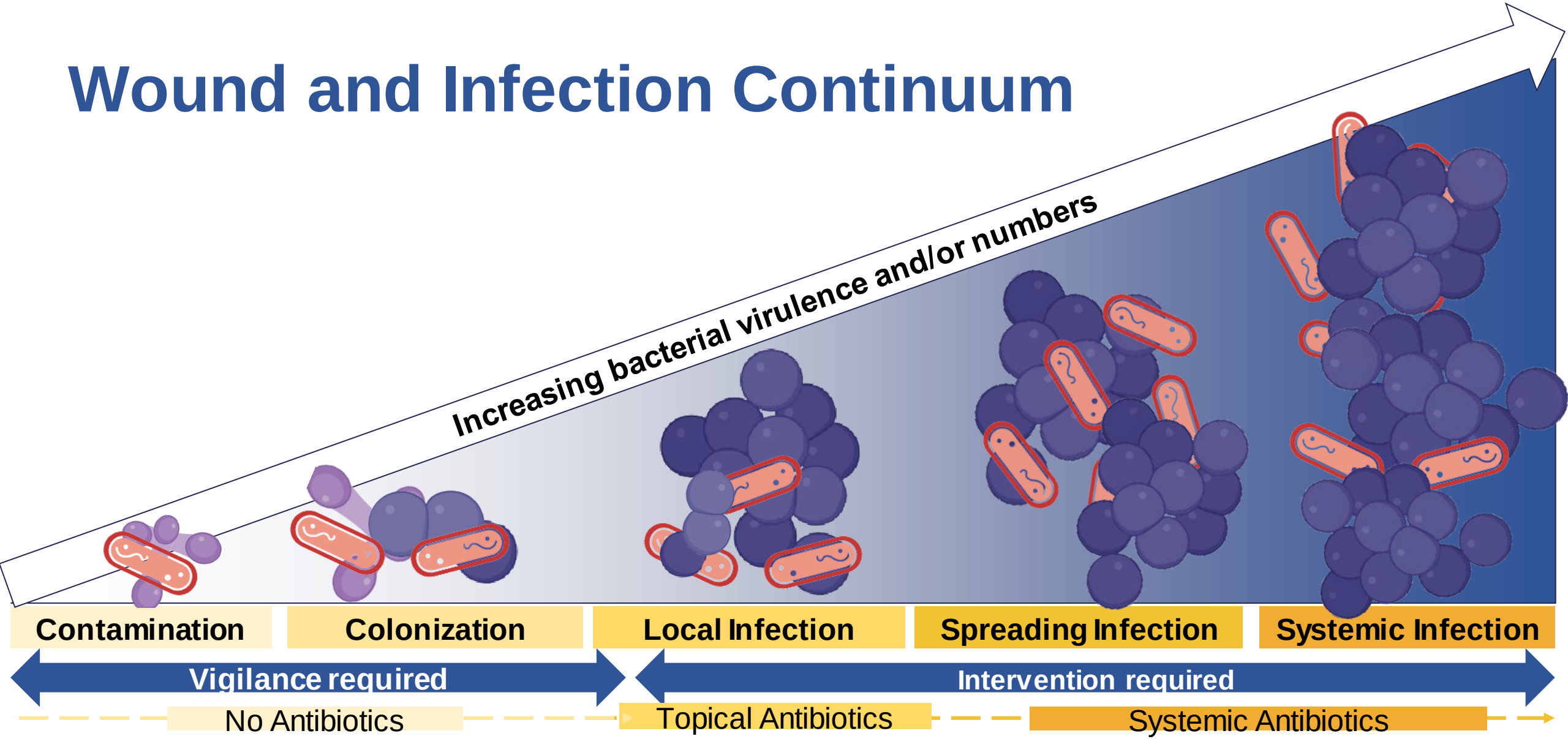
Polling Question

True or False: In a chronic wound the only good bacteria are dead bacteria?

A. True

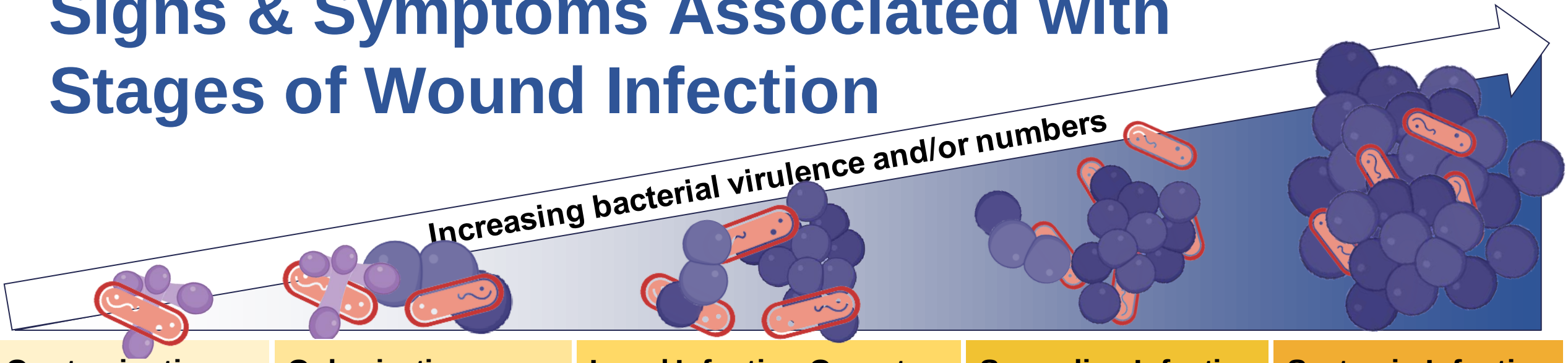
B. False

Wound and Infection Continuum



Source: International Wound Infection Institute, Principles of Best Practice: Wound Infection in Clinical Practice, International Consensus Update 2022

Signs & Symptoms Associated with Stages of Wound Infection



Contamination
- Nonproliferating bacteria or yeast in wound
- No healing delay

Colonization
- Microorganisms present with limited proliferation
- No delay in healing

Local Infection Covert (subtle)
- Hyper granulation, bleeding, friable, exudates
- Delayed wound healing **Overt (classic)**
- Erythema, warmth, swelling,
- purulent discharge, wound breakdown, enlargement, increased or new pain, malodor

Spreading Infection
- Extending induration, erythema >2 cm from wound edge
- crepitus, wound breakdown or dehiscence
- Lymphangitis

Systemic Infection
- Malaise, lethargy
- Loss of appetite
- Fever, sepsis, septic shock, organ failure, death

Source: International Wound Infection Institute, Principles of Best Practice: Wound Infection in Clinical Practice, International Consensus Update 2022

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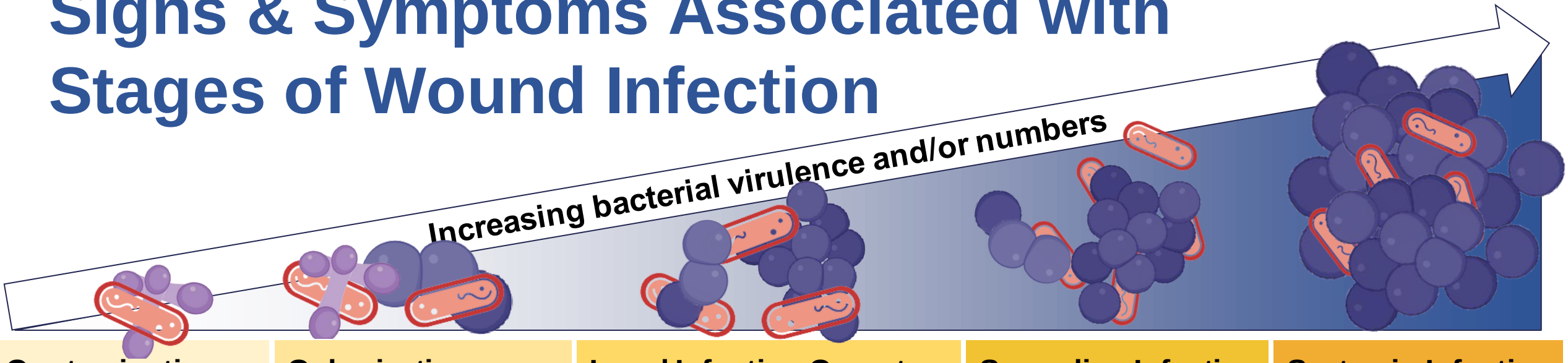

Contamination
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Spreading Infection
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- crepitus, wound breakdown or dehiscence
- Lymphangitis

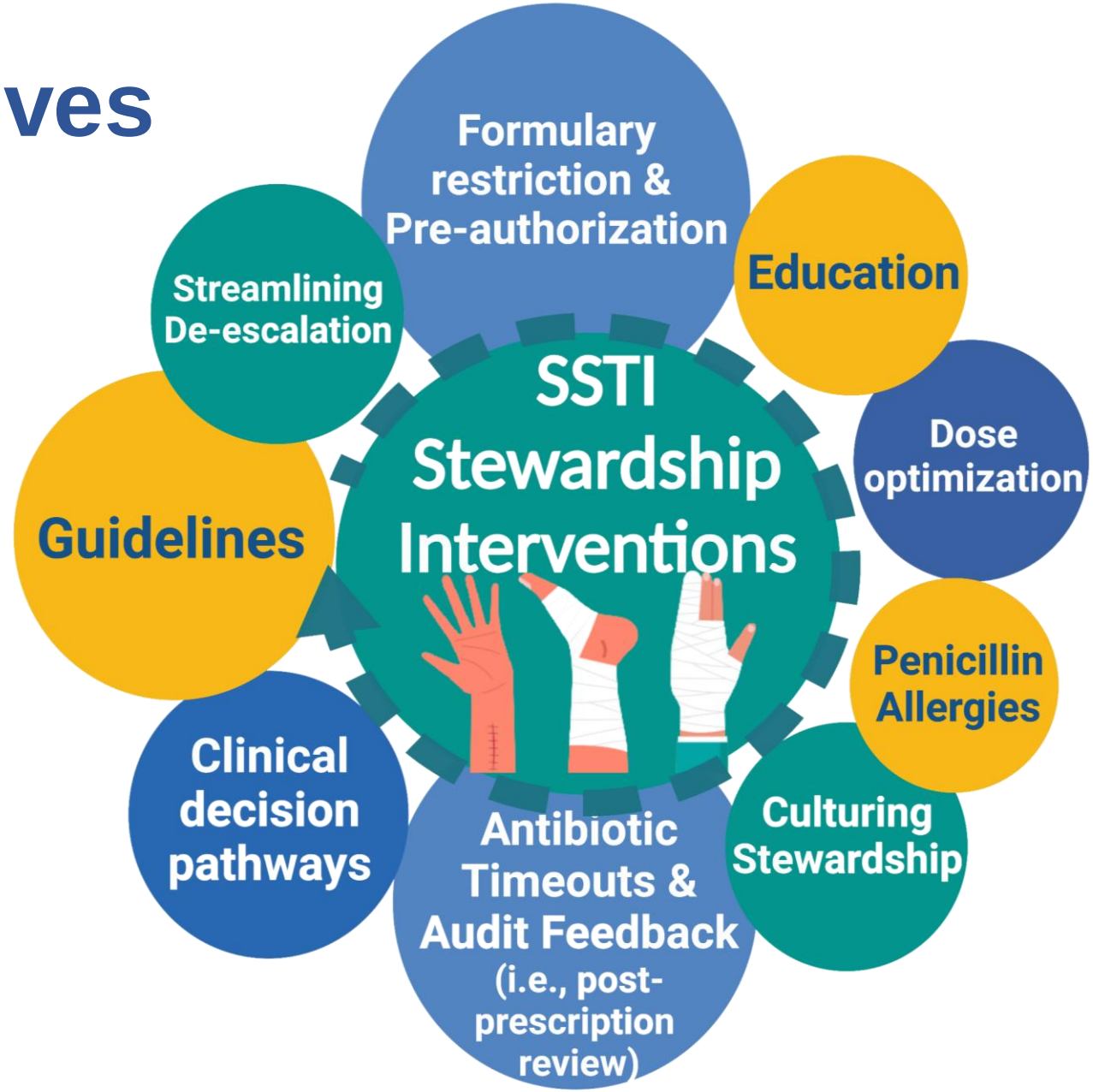
Systemic Infection
- Malaise, lethargy
- Loss of appetite
- Fever, sepsis, septic shock, organ failure, death

No antibiotics indicated
Yet represent ⅔ antibiotics prescribed

Source: International Wound Infection Institute, Principles of Best Practice: Wound Infection in Clinical Practice, International Consensus Update 2022

Stewardship Initiatives

- Culturing stewardship
- Facility guidelines
- Clinical Decision Support
- Bundles
- Communication Strategies
- Education

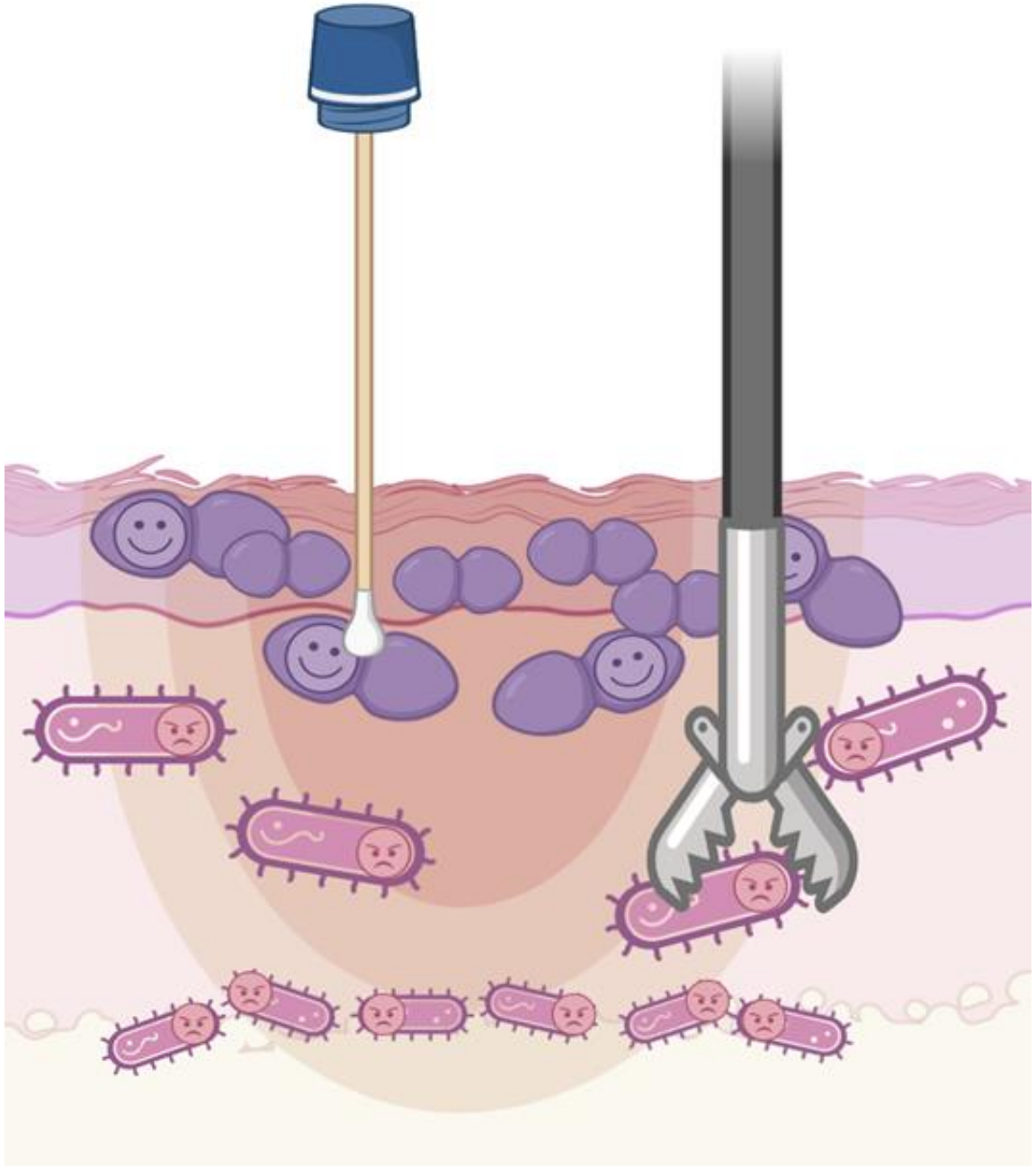


Culturing Stewardship

Surface wound culture results ≠ true infection

- Sensitivity 49%
- Specificity 62%

If/when swabs are obtained, rotate swab over a 1-cm square area with sufficient pressure to express fluid from within wound or tissue

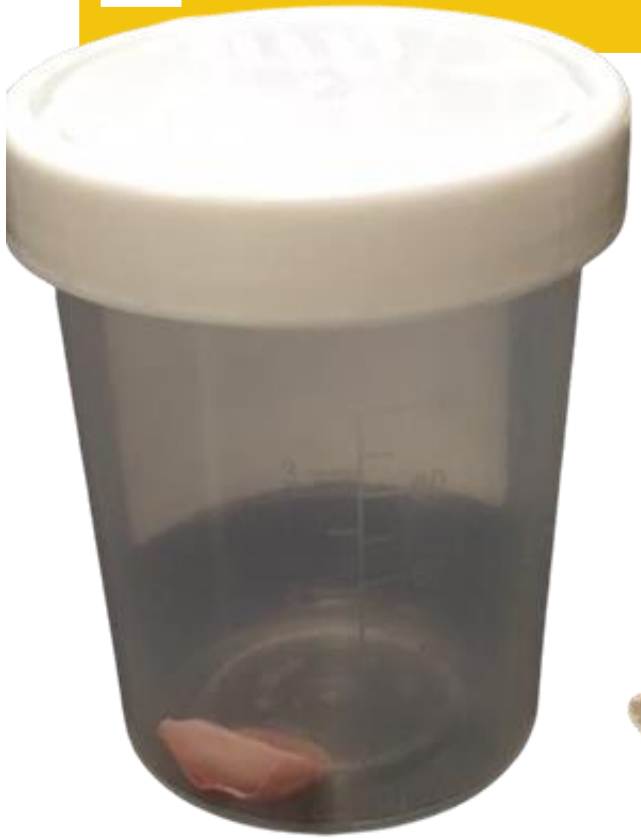


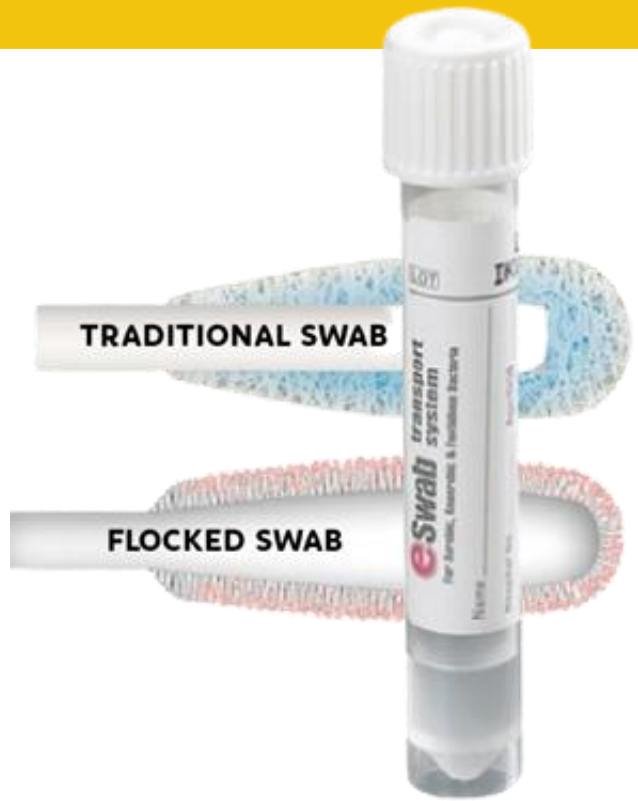
Culturing

Best

Collection Devices

tissue/pus/fluid >>>> swabs





Diagnostic Stewardship

Pre-Analytic	Analytic	Post-Analytic
Ordering: Focus on testing only high pretesting probability **Collecting**: Sample collection and transport to optimize yield, reduce contamination **Testing**: Only dependent upon symptoms; avoid blanket or repeated wound cultures. **Technique**: Sampling from wound or sending optimal intraoperative cultures	**Lab Processing**: Use adjunctive tests distinguish colonization from infection **Culturing criteria:** Only if signs of infection	**Reporting**: Resulted in format that guides appropriate practice **Micro-nudges/comments:** E.g., "multiple organisms reflecting contamination" **Cascading Antibiotic Choices:** Display only preferred antibiotics

Source: Morgan D., et al. JAMA 2017;3187):607-608.

Clinical Practice Guidelines

- Guideline development for cellulitis and abscesses
- Order set
- Educational campaign
  - e-mail
  - intranet
  - work areas

Outcomes

Cultures

- 14% (80%--> 66%, p=0.003)

Imaging

- 14% cellulitis (94%->80%, p=0.03)

+ 11% abscesses (69%->80%, p=0.09)

Source: Jenkins T., et al. Arch Intern Med. 2011;171:1072-79.

Clinical Practice Guidelines

Guideline development for pressure ulcers in NH

- Education package
- Care plan
- Practice policy
  - Prevention
  - Management
- Electronic risk tool
  - Risk status
  - Assessment using Braden Scale "Silver Chain Pressure Ulcer Risk Assessment (PURA) Tool

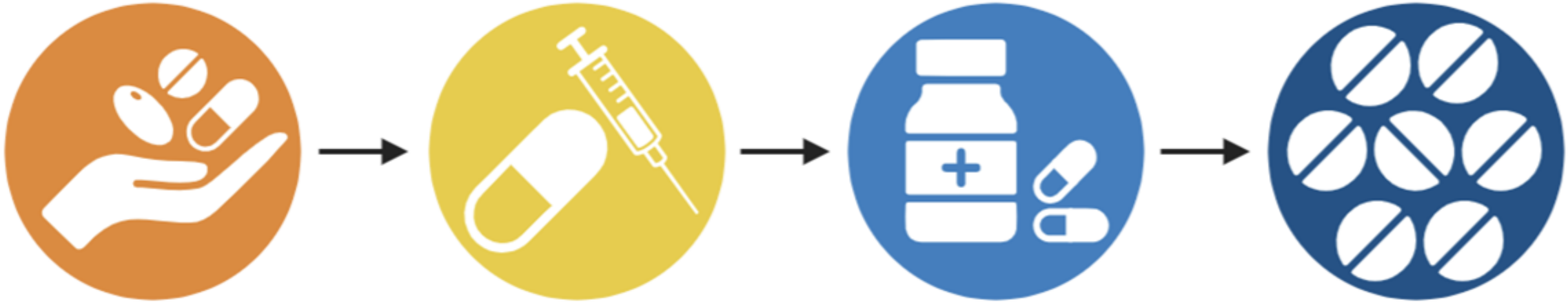
Outcomes

Perceptions

- **100% nurse agreement the tool helped to identify at risk**
- **95% agreed improved new workflow and guideline implementation**

Source: Kapp S. J Eval Clin Pract 2013; 19(5):895-901.

Antibiotic Optimization Opportunities

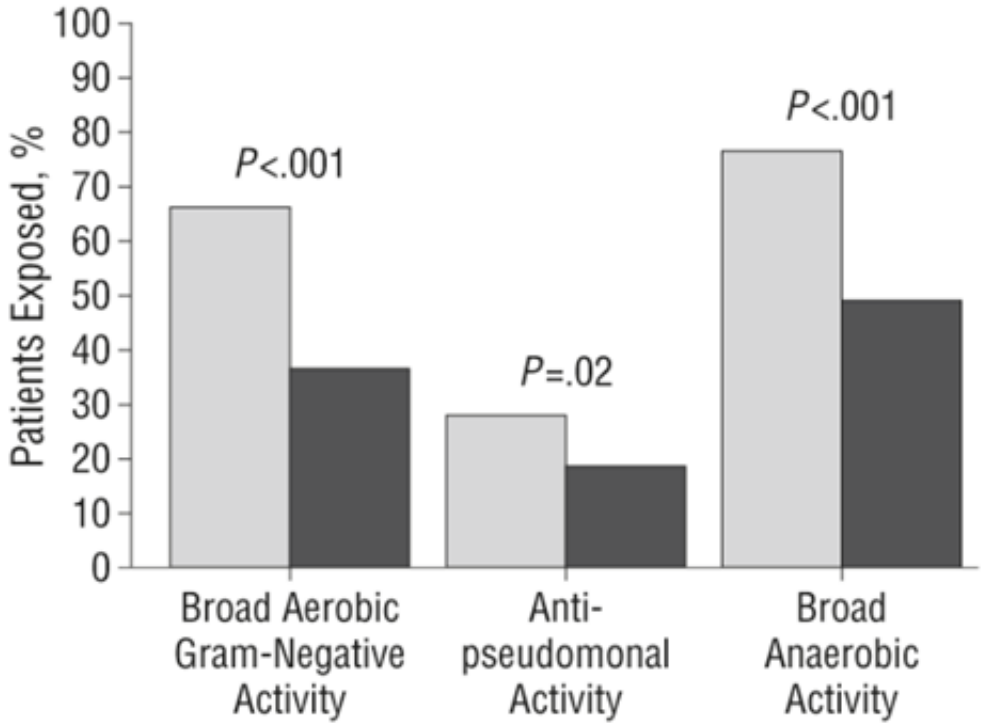


- Strep >> staph
- Purulent cellulitis no *P.aeruginosa* or anaerobic coverage

- Uncomplicated skin and soft tissue infections: equal efficacy IV and PO
- Fewer complications with PO, decreased costs

- Four randomized controlled trials: 5 vs 10 days - no change in cure

Clinical Practice Guidelines



Outcomes

Anti-pseudomonal use

- **10%** (28%->18%, p=0.02)

Duration

- **3 days** (13 [IQR 10-15] -> 10 [IQR 9-12], p<0.001)
- **24% reduction prolonged >10 day courses** (38%->14%, p=0.001)

Source: Jenkins T., et al. Arch Intern Med. 2011;171:1072-79.

Clinical Decision Support Systems

- Clinical Decision Support System (CDSS) for empiric antibiotic prescribing non-purulent cellulitis
- Pulls in EHR data to provide real-time recommendations (e.g. prior micro, prior antibiotics, renal function)

Outcomes

Length of Stay

- 47% (0.53, 95% CI -0.97 to -0.09, p=0.018)

30-day readmission

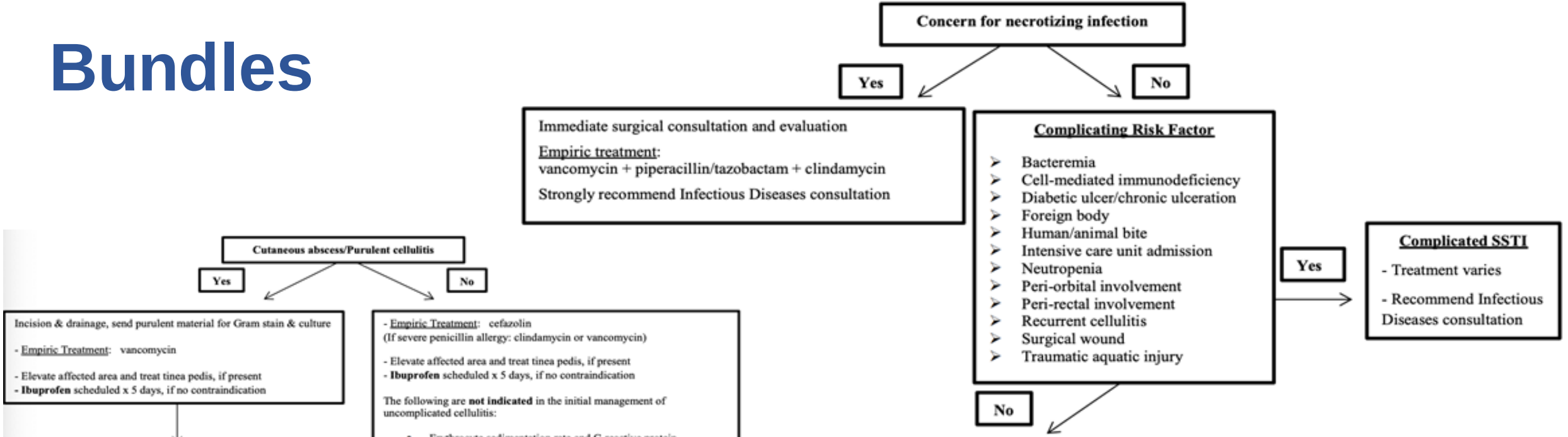
No change (CI 10.38%->10.58%, p=0.8180)

30-day mortality

No change (CI 5.37%->5.49%, p=0.8730)

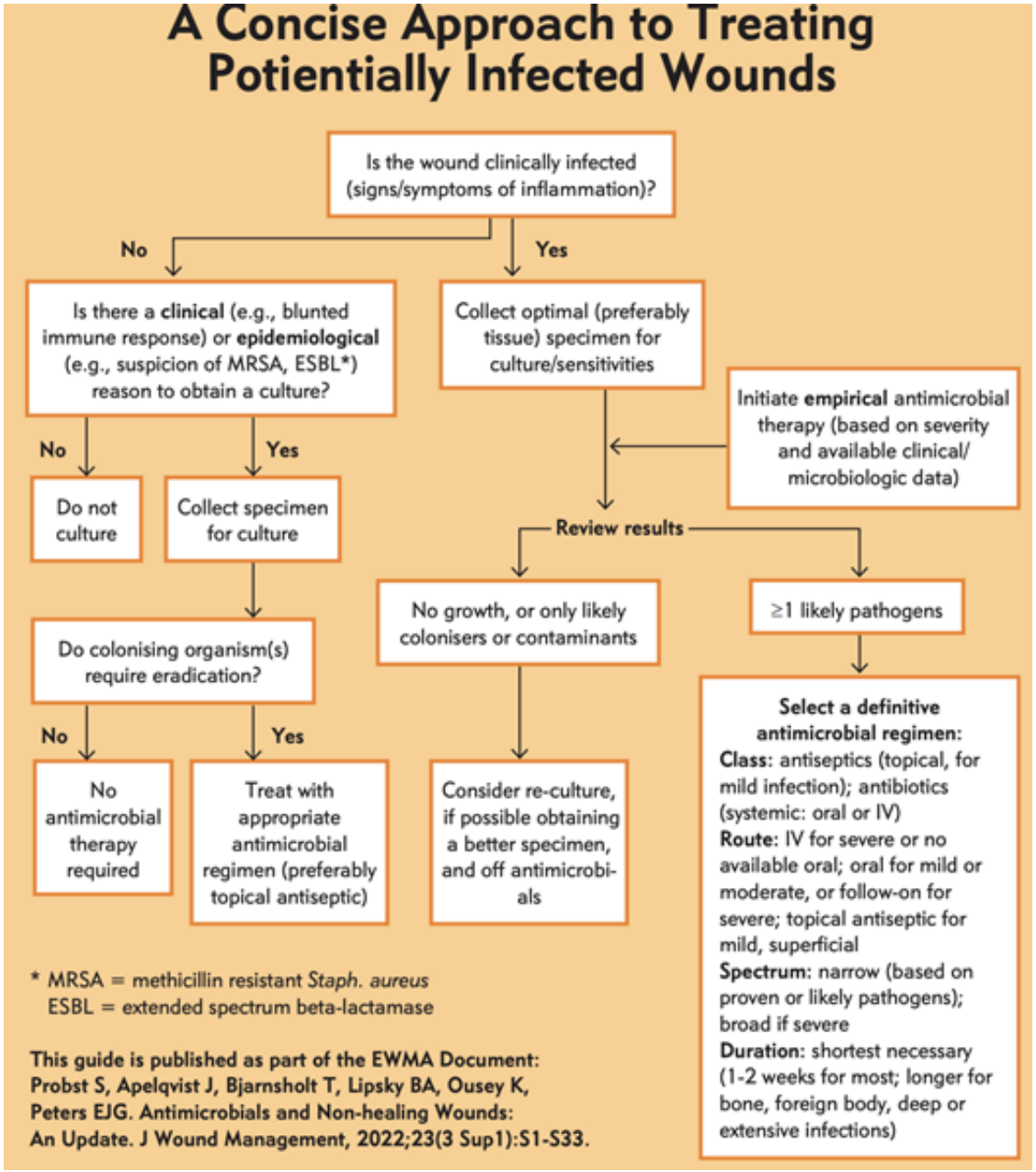
Source: Ridgway J, et al. CID; 2021;4;72(9):e265-71.

Bundles



- Clinical decision-making algorithm
- Antibiotic choice and duration
- Adjuncts (elevation, incision & drainage, NSAIDs)
- 3-pronged approach:
  - Disseminate via e-mail
  - Annual antimicrobial guide (print + intranet)
  - Laminated copies in work areas
  - Education resident and faculty
  - Prospective audit with real-time feedback by ASP team (Mon-Fri) via phone or text

Source: Walsh T., et al. Mayo Clinn Proc Qual; 2017;1-9



Algorithm from the European Wound Management Association (EWMA)

Download

ewma.org/fileadmin/user_upload/EWMA.org/EWMA_Documents_PDF/Antimicrobial_Stewardship_in_Wound_Care_UK.pdf

Bundling Interventions

Outcomes

Length of Stay

- 1.4 day (3.6 +/- 2.5 -> 2.2+/- 1.3 days, p<0.001)

30-day mortality

- 1.4% (6.3% -> 4.9%, p=0.64)

30-day readmission

- 2% (3.8% -> 1.8%, p=0.22)

Outcomes

Total Antibiotic Duration

- 29% (12.5 +/- 3.8 days -> 8.8 +/- 2.2 days, p<0.001)

Gram-negative Antibiotics

- 56% (71%->15%, p<0.001)

Anaerobic Antibiotics

- 47% (63%->16%, p<0.001)

Source: Walsh T., et al. Mayo Clinn Proc Qual; 2017;1-9

Micro Nudges

Endorsed by IDSA/SHEA and CLSI

Goal: Guide prescribers towards certain antibiotics

- Selective or cascading reporting are most common
- Should be interdisciplinary (developed by lab, stewardship, end-users)
- Can be implemented at different timepoints inpatient care: initial work-up, antibiotic-initiation/selection or end (duration)

Three forms:

1- **Present desirable** options, and **mask undesirable** options
2- Frame recommendations with comments to guide decisions
3- **Visually enhance desired** options

Source: Langford B et al. ICHE 2019;40(12):1400-06

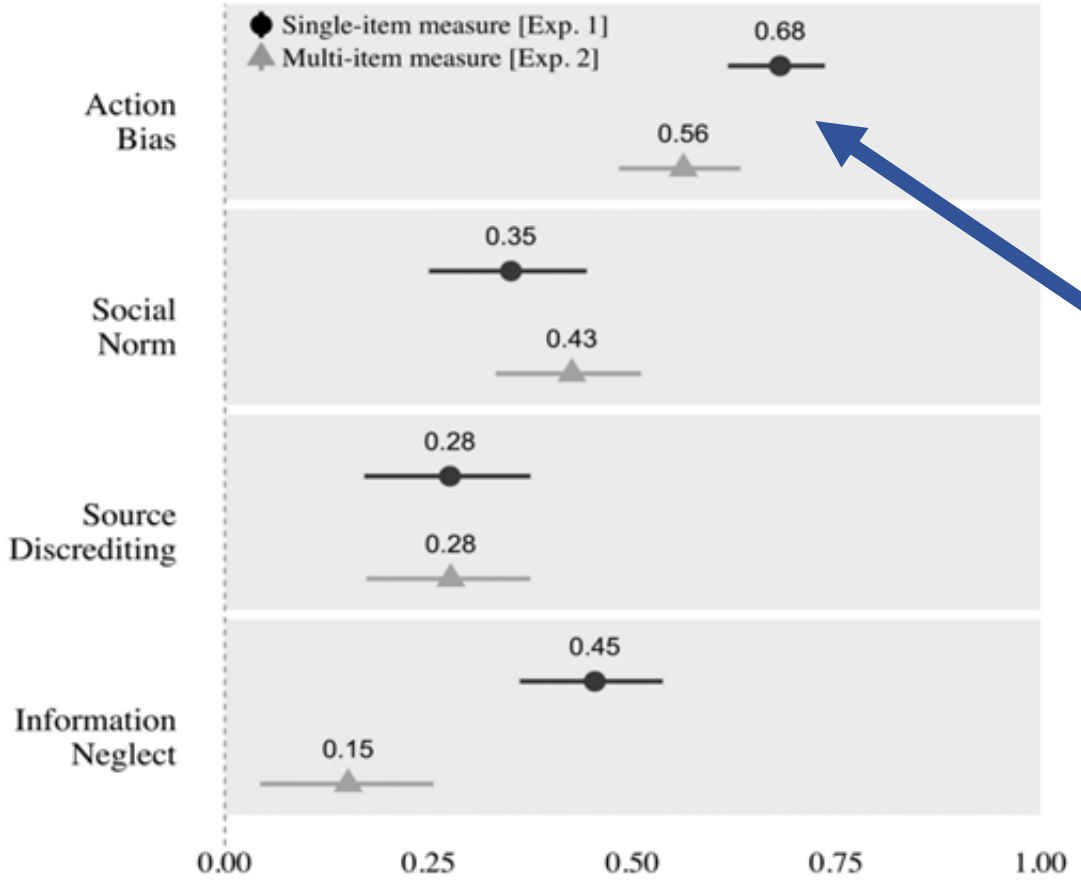
Reporting Nudges

Leverage the Laboratory to Improve Antibiotic Use

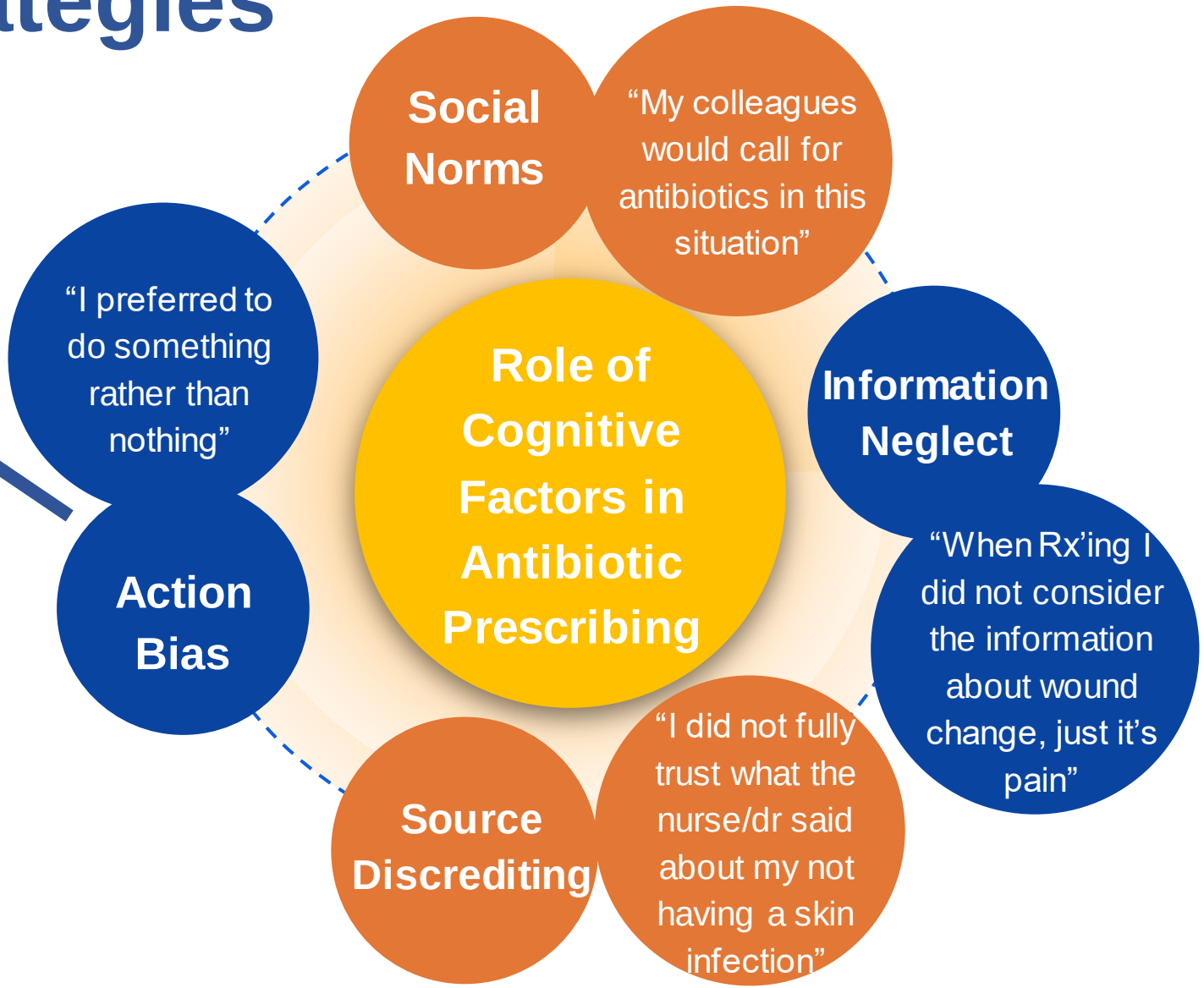
- **Result** text interpretation
- “No MRSA/no Pseudomonas identified”
- “No neutrophils or pus cells identified in the sample indicating minimal inflammation possibly consistent with normal flora or contamination”
- “This specimen will not be processed further as the microscopic exam shows epithelial cells with minimal inflammation. Culture may represent bacterial colonization”

Communication Strategies

Correlation for cognitive bias with the decision to take antibiotics



Source: Thorpe A et al. J Exp Psychol Applied, 2020;26(3): 422-31.



Communication Strategies

Reframe the Inaction Message - Prescriber

- "Watch and wait"
- "Wait for cultures"

- "Cultures are negative there is nothing more to do"

- "Start elevating your legs at least 2 times a daily, avoid dangling, and start wearing compression stockings"

- "Good news! Although we probably did not need cultures since the wound has not changed recently, they confirm it is only normal skin bacteria in the wound. Let me know if you develop symptoms of a skin infection (spreading redness, warmth, increased drainage or fevers)"

Communication Strategies

Reframe the Inaction Message - Nurse

- "Likely not an infection, call back if symptoms change"
- "Cultures are negative there is nothing more to do"
- "The chronic drainage is because the wound is open, but unless you develop symptoms of redness, increased pain, warmth or fevers or other new or concerning symptoms, the antibiotics will not help. Let's get you over to wound clinic to help heal this wound"
- "Given symptoms are inconsistent with wound infection I am documenting that no McGeer criteria are met"

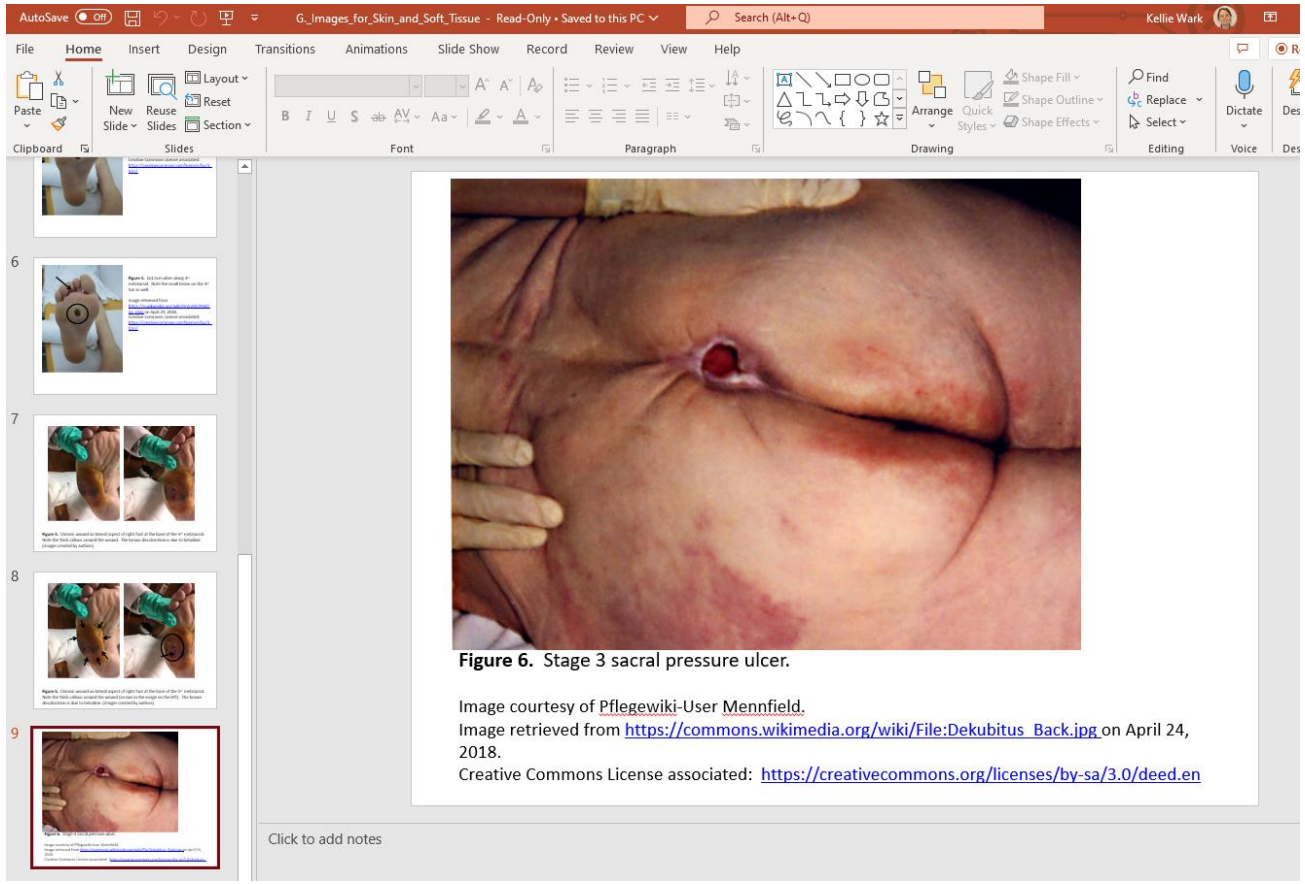
Education

Case-based discussions, 1-hour x 5 sessions

- Recognition, diagnosis, management of NH residents
  - Small group discussions
  - Video-conferencing
- Attendants self-rated as more likely to make changes
  - Rated 2.89 (3 on Likert scale was “highly likely to make changes”)

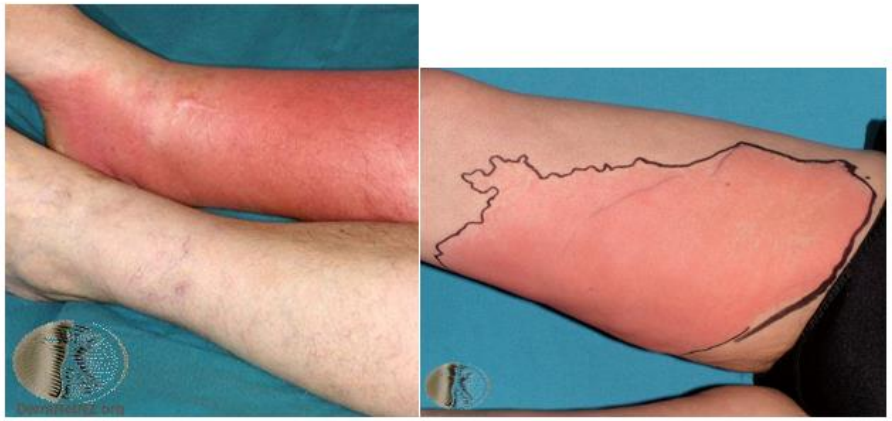
Source: Michener A., et al. MedEdPORTAL. 2018;14:10754.

Education



Case 1

An 68 year-old male with congestive heart failure, chronic lower extremity edema, diabetes mellitus and end-stage renal disease treated with intermittent hemodialysis through a tunneled right internal jugular central venous catheter presents to the emergency room with abrupt onset of right lower extremity pain associated with redness and swelling that evolved over a period of several hours (Figure 1a & 1b).



Figures 1a & 1b: Notice the integrity of the skin, the ill-described border of the lesion and that the erythema extends up medial aspect of the leg.
Images courtesy of DermNetNZ.org; Images retrieved from https://www.dermnetnz.org/imagedetail/3583 (Figure 1a) and https://www.dermnetnz.org/imagedetail/3587 (Figure 1b) on April 24, 2018.
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The patient has a low-grade temperature (99.9°F) at presentation but is otherwise hemodynamically stable. His white blood cell count (WBC) is slightly elevated (10.6 cells/μL).

What is the most likely diagnosis?

What is the most likely causative pathogen?

Download the Cases, Discussion Script & Presentation ncbi.nlm.nih.gov/pmc/articles/PMC6346280/bin/mep-14-10754-s001.zip

Source: Michener A., et al. MedEdPORTAL. 2018;14:10754.

Education

EWMA Wound and Infections

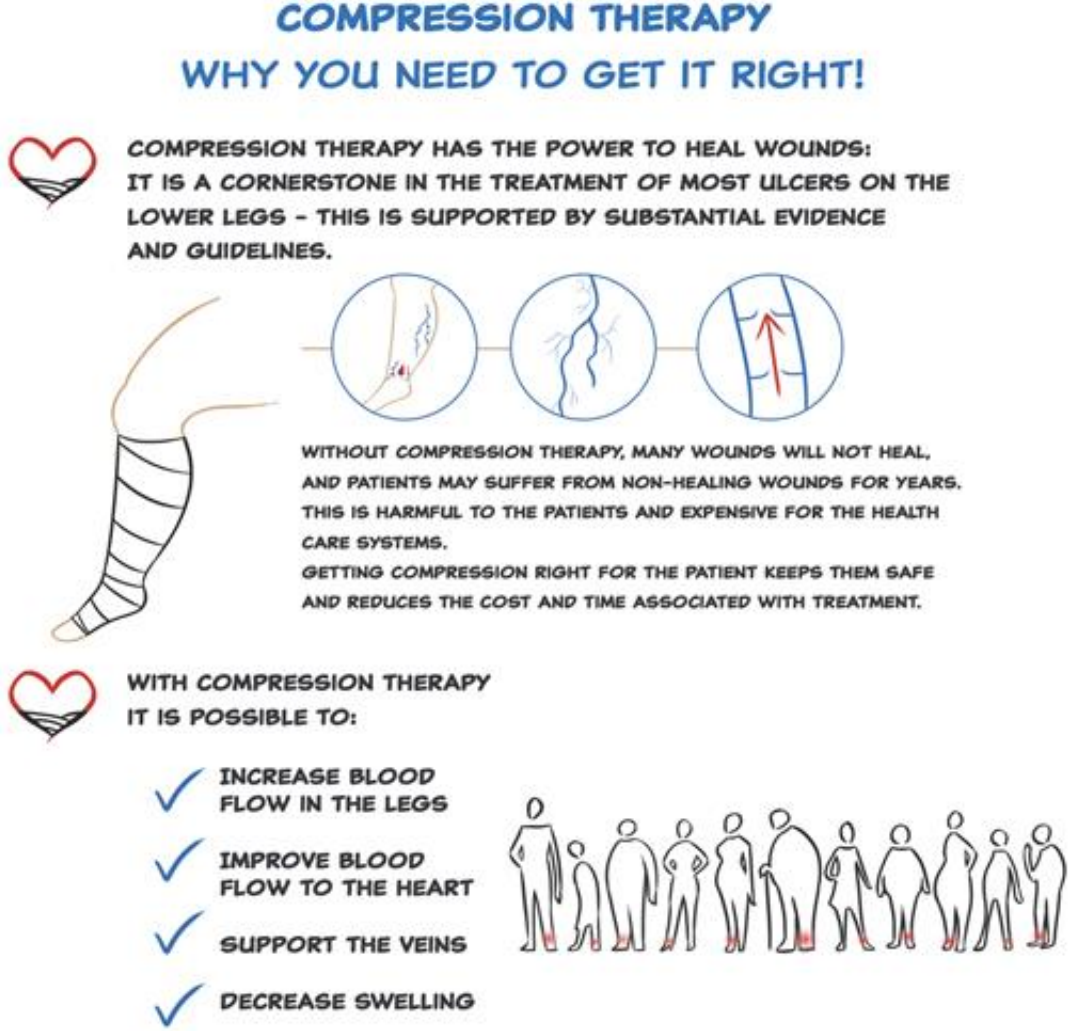
3-weeks, 2 hours/week

- Antibiotic Stewardship in wound management
- Identifying wound infections and prevention of infection, identify early signs of infection
- Cases, change management strategies

E-learning (free) futurelearn.com/courses/antimicrobial-stewardship-in-wound-management/2

Webinars ewma.org/what-we-do/education/on-demand-webinars

Patient Education



E-learning

youtube.com/watch?v=9F7GbCoiAIM&t=45s

Infographics

- legsmatter.org/help-information/resources-for-healthcare-professionals/advice-for-how-patients-can-care-for-a-leg-ulcer-at-home-during-the-coronavirus/
- ewma.org/what-we-do/compression-therapy/campaign-materials

Practice Changes

Workflow Algorithms

- Review diagnostic/treatment tools or algorithms to determine if outdated or not evidence based
- Quit the dipsticks
- Obtain and store cultures properly
- Multidisciplinary approach (wound clinic for chronic wounds, vascular/podiatry for foot wounds)

Guidelines

- Include **not** treating colonized wounds (and exceptions)

Decision Support

- Results message-framing, nudging
- Diagnostic pathways

Communication

- Prompts
- Alternative treatment tools

Education

- Staff + patients
- Peer education
- Providers re: guidelines

Thank You!

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