What EM educators can learn from Bill Nye the Science Guy and the Khan Academy

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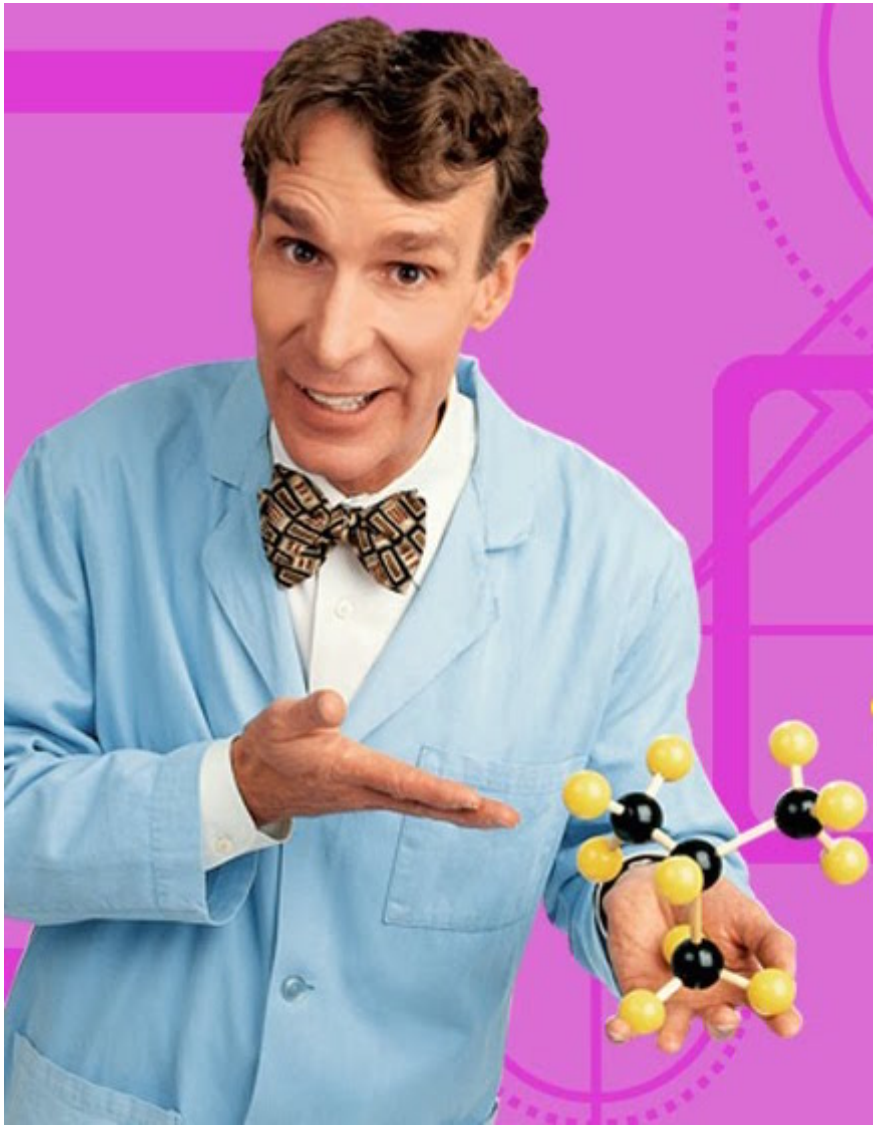
Conflicts of Interest

Objectives

- Understand terminology
  - asynchronous education
  - digital scholarship
- Be able to employ 3 DESIGN STRATEGIES for creating effective online learning materials
  - Be specific
  - Remember F tracking
  - Create a framework from visual cues


BILL NYE
the Science Guy®

KHAN ACADEMY

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ASYNCHRONOUS EDUCATION

= learning around cases, not according to a schedule or syllabus

How can I become an effective **online** educator?

DIGITAL SCHOLARSHIP

= the way we use technology to teach and learn online

Digital Scholarship

staple in EM Education

advantages over textbook based learning

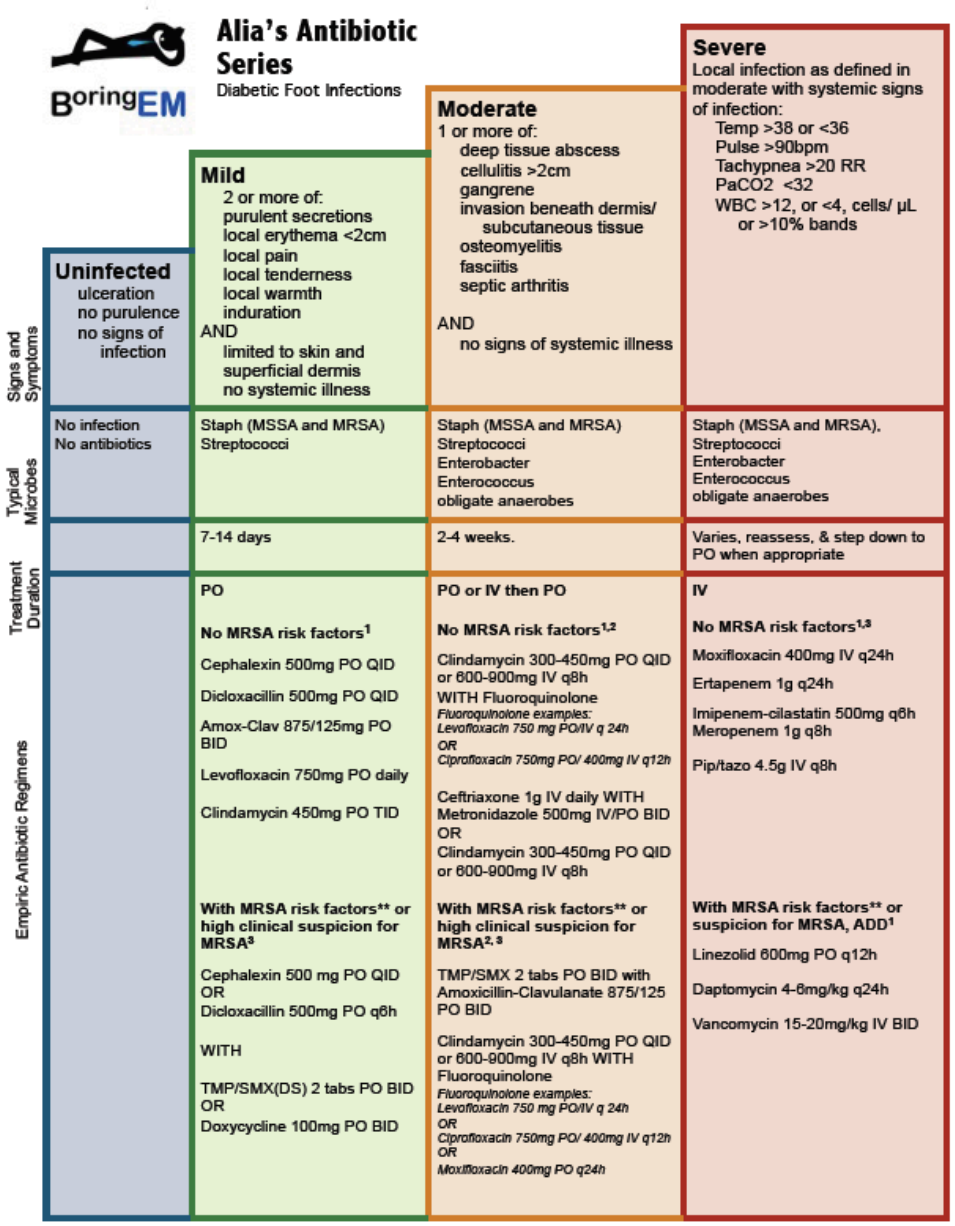
few resources to guide production of effective online learning materials

Objectives

develop a personal approach to DFI and SSTIs

understand digital scholarship in the context of asynchronous education

produce relevant online learning materials for DFI and SSTI



BoringEM
Alia's Antibiotic Series
Diabetic Foot Infections

Alia's Antibiotic Series

Skin and Soft Tissue Infections
Purulent, Abscesses

Mild
Purulent infection
Not a re-occurence
NO systemic signs of infection

Mild Infection: I&D with no antibiotics

Moderate
Purulent infection
Systemic signs of infection
- temp >38 degrees
- tachycardia >90 bpm
- tachypnea >24 breaths per minute
- leukocytes >12, <4, or >10% bands

Medical co-morbidities complicating healing (liver/renal disease, vascular insufficiency)

Moderate Infection: I&D with PO antibiotics

Consider Streptococcus A,B,C, G and Staphylococcus (MSSA, HA-MRSA, and CA-MRSA)

Treatment duration 5-7 days

Empiric Therapy
TMP/SMX 1-2 DS tablets PO BID
Doxycycline 100mg PO BID

Severe
Purulent infection with systemic signs of infection
- temp >38 degrees
- tachycardia >90 bpm
- tachypnea >24 breaths per minute
- leukocytes >12, <4, or >10% bands

Clinical signs of deeper infection
- bullae, skin sloughing, hypotension, end organ dysfunction, complicated or deep abscesses

Failure on PO antibiotics previously
Neutropenia
On chemotherapy
Immunocompromised or immunodeficiency
Malignancy
Immersion injury (susceptible to pseudomonas)
Recurrence after I&D with antibiotics

Severe Infection: I&D with IV antibiotics

Consider Streptococcus A,B,C, G and Staphylococcus (MSSA, HA-MRSA, and CA-MRSA), Pseudomonas

Treatment duration varies, reassess and step down to PO

Empiric Therapy
Vancomycin 30mg/kg/day in 2 divided doses IV
Daptomycin 4mg/kg q 24hours IV
Linezolid 600mg q12h IV or 600mg PO BID

MRSA Risk Factors

Hospital Acquired-MRSA
- Hospitalization
- Long-term care
- Recent antibiotic therapy
- Hemodialysis

Community Acquired-MRSA**
- HIV infection
- Men who have sex with men
- Injection drug use
- Unsanitary/cramped living conditions
- Incarceration
- Military service
- Sharing sports equipment
- Diabetes

**Avoid Clindamycin if suspected CA-MRSA due to inducible resistance*

DISCLAIMER: *Always refer to your local antibiograms to guide your choices for clinical care. Susceptibility of various organisms may vary due to local resistance patterns.*

References
1. Levine, B. (2008). EMRA antibiotic guide. Irving, TX (1125 Executive Cir., Irving 75038-2522): EMRA.
2. MSH+UHN Antimicrobial Stewardship,. (2014). Skin and Soft Tissue Infections. Toronto. Retrieved from http://www.antimicrobialstewardship.com/sites/default/files/asp_simple_messaging_-_skin_and_skin_structure_infections.pdf
3. Stevens, D., Bisno, A., Chambers, H., Dellinger, E., Goldstein, E., & Gorbach, S. et al. (2014). Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. Clinical Infectious Diseases, 59(2), e10-e52. doi: 10.1093/cid/ciu296
4. Baddour, L. Uptodate.com. (2014). Cellulitis and erysipelas. Retrieved 28 December 2014, from http://www.uptodate.com/contents/cellulitis-and-erysipelas

Alia's Antibiotic Series

Skin and Soft Tissue Infections
Non-purulent

Mild
Typical, localized cellulitis
No purulent focus

Mild Infection: PO antibiotics

Consider Strep A, B, C, G

Treatment duration 5 days, extend if no clinical improvement

Empiric therapy:
Cephalexin 500mg PO QID
Dicloxacillin 500mg PO QID

If penicillin allergic:
Clindamycin 300mg QID
Levofloxacin 750mg PO daily

Moderate
Typical cellulitis with systemic signs of infection
- temp >38 degrees
- tachycardia >90 bpm
- tachypnea >24 breaths per minute
- leukocytes >12, <4, or >10% bands

Medical co-morbidities complicating healing (liver/renal disease, vascular insufficiency)

Moderate Infection: IV antibiotics

Consider Strep A, B, C, G, MSSA

Treatment duration minimum 5 days, extended if no clinical improvement

Empiric therapy:
Ceftriaxone 1gm IV q8 hours
Cefazolin 1gm IV q8 hours

If penicillin allergic:
Clindamycin 600-900mg IV q8 hours

If known MRSA colonization (from previous infection, or nasal swabs):
TMP/SMX 1-2 DS tablets PO BID

Severe
Purulent infection with systemic signs of infection
- temp >38 degrees
- tachycardia >90 bpm
- tachypnea >24 breaths per minute
- leukocytes >12, <4, or >10% bands

Clinical signs of deeper infection
- bullae, skin sloughing, hypotension, end organ dysfunction, complicated or deeb abscesses

Patients who have failed previous PO antibiotics
Neutropenia
On chemotherapy
Immunocompromised or immunodeficiency
Malignancy
Immersion injury (susceptible to pseudomonas)
Recurrence after I&D with antibiotics

Severe Infection: IV antibiotics, r/o necrotizing disease

Consider Strep A, B, C, G, MSSA, MRSA, Pseudomonas

Treatment duration varies, reassess, await culture results, and step down to PO

Empiric therapy:
Vancomycin 30mg/kg IV divided into 2 doses AND
Piperacillin/Tazobactam 3.375mg IV q6hours

If penicillin allergic:
Vancomycin 30mg/kg IV divided into 2 doses AND
Imipenem 1g IV q6-8hours
Vancomycin 30mg/kg IV divided into 2 doses AND
Meropenem 1g IV q8hours

If concerns for necrotizing disease:
Stat surgical consult
Piperacillin/Tazobactam 4.5mg IV and Clindamycin 600-900 mg IV

DISCLAIMER: *Always refer to your local antibiograms to guide your choices for clinical care. Susceptibility of various organisms may vary due to local resistance patterns.*

References
1. Levine, B. (2008). EMRA antibiotic guide. Irving, TX (1125 Executive Cir., Irving 75038-2522): EMRA.
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Alia's Antibiotic Series

Diabetic Foot Infections

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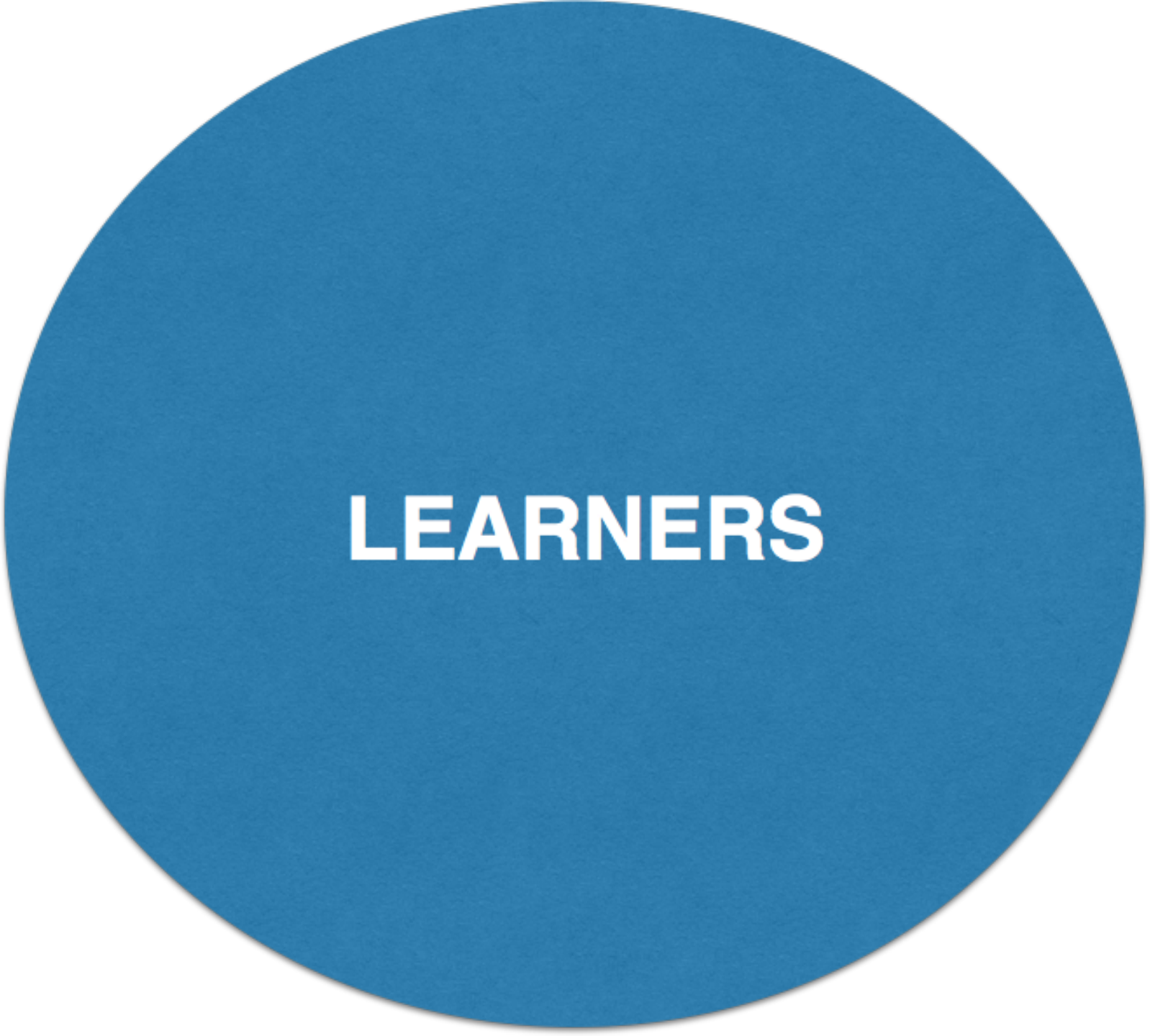
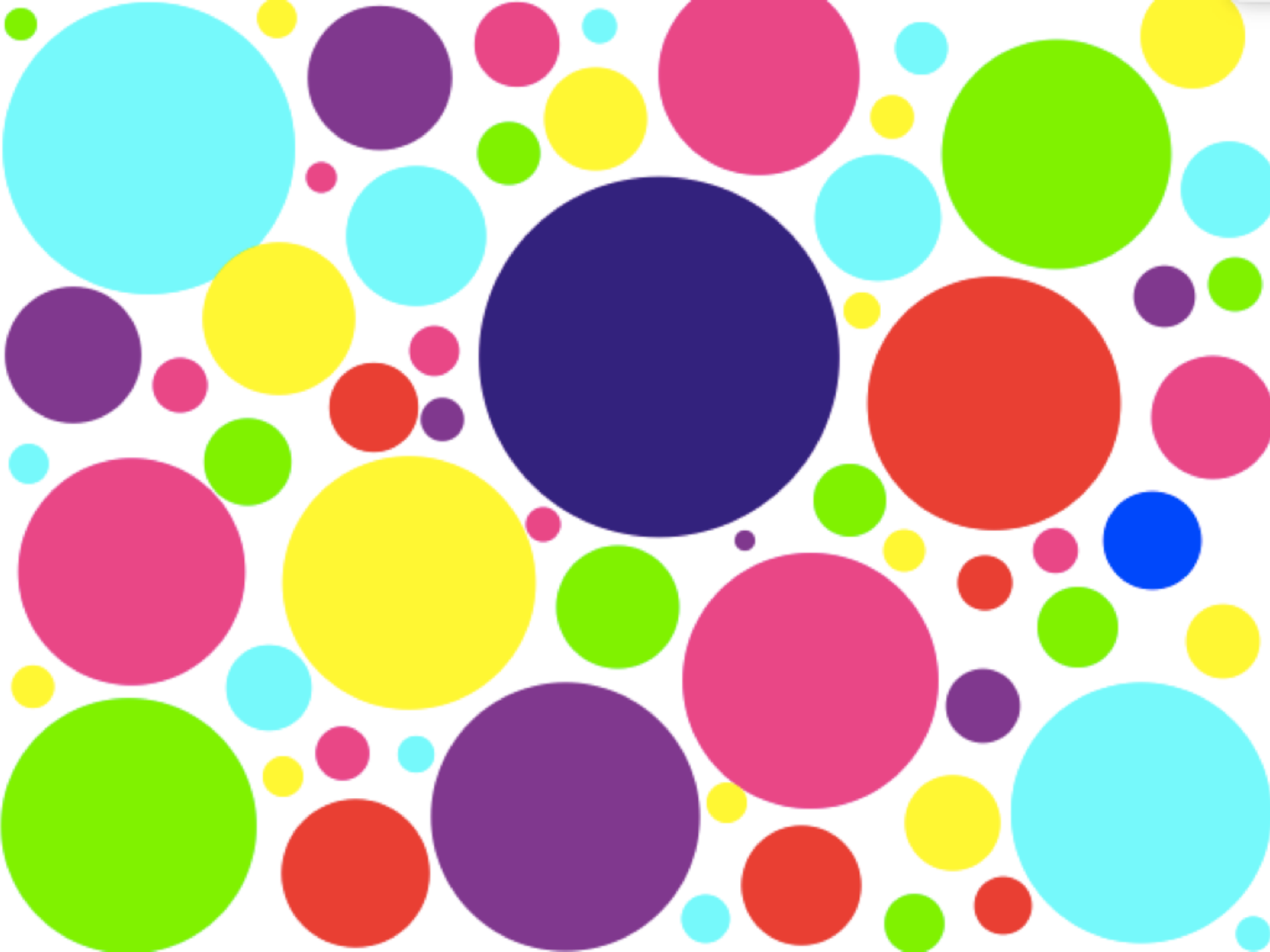
BoringEM

DESIGN STRATEGIES:

1) Be specific about your audience


LEARNERS



Design Strategy 1: Understanding your audience

Who will use this handout?

How much time will they spend using it?

When and **Where** will they use it?

How will they access it?

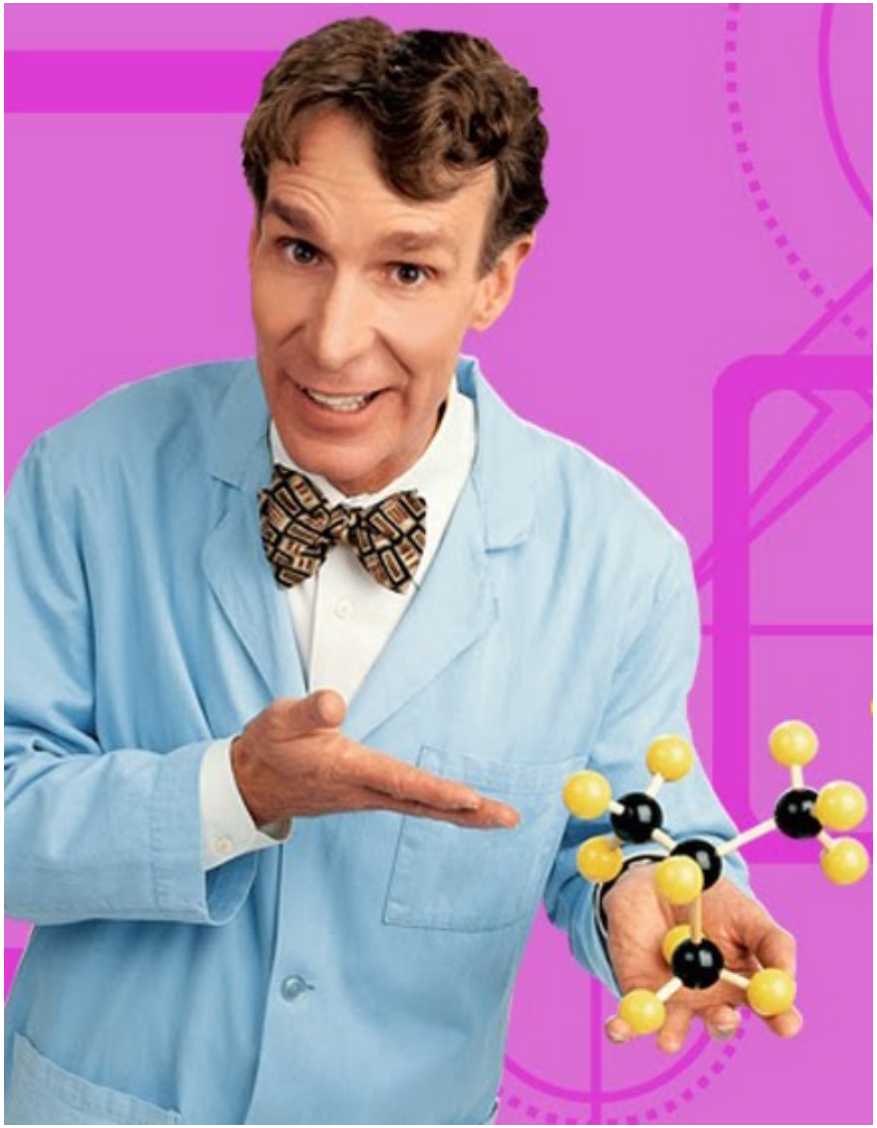
Questions	Diabetic Foot Pocket Card
Who will use it?	junior learners in ED R1 CC4 CC3
How much time will they spend using it?	about 10 minutes
When will they use it? And where?	In the ED quick guide to read before presenting to get ready for pimping probably minor area, high volume
How will they access it?	iPhone/small screen stored on evernote stored on phone

Specific

Intentional

DESIGN THINKING

= the creating products with the end user in mind

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DESIGN STRATEGIES:

1) Be specific about your audience

Metrics

SSTI Pocket Cards

814 page views in 55 countries

Diabetic Foot Pocket Cards

989 page views in 35 countries

LITFL mention

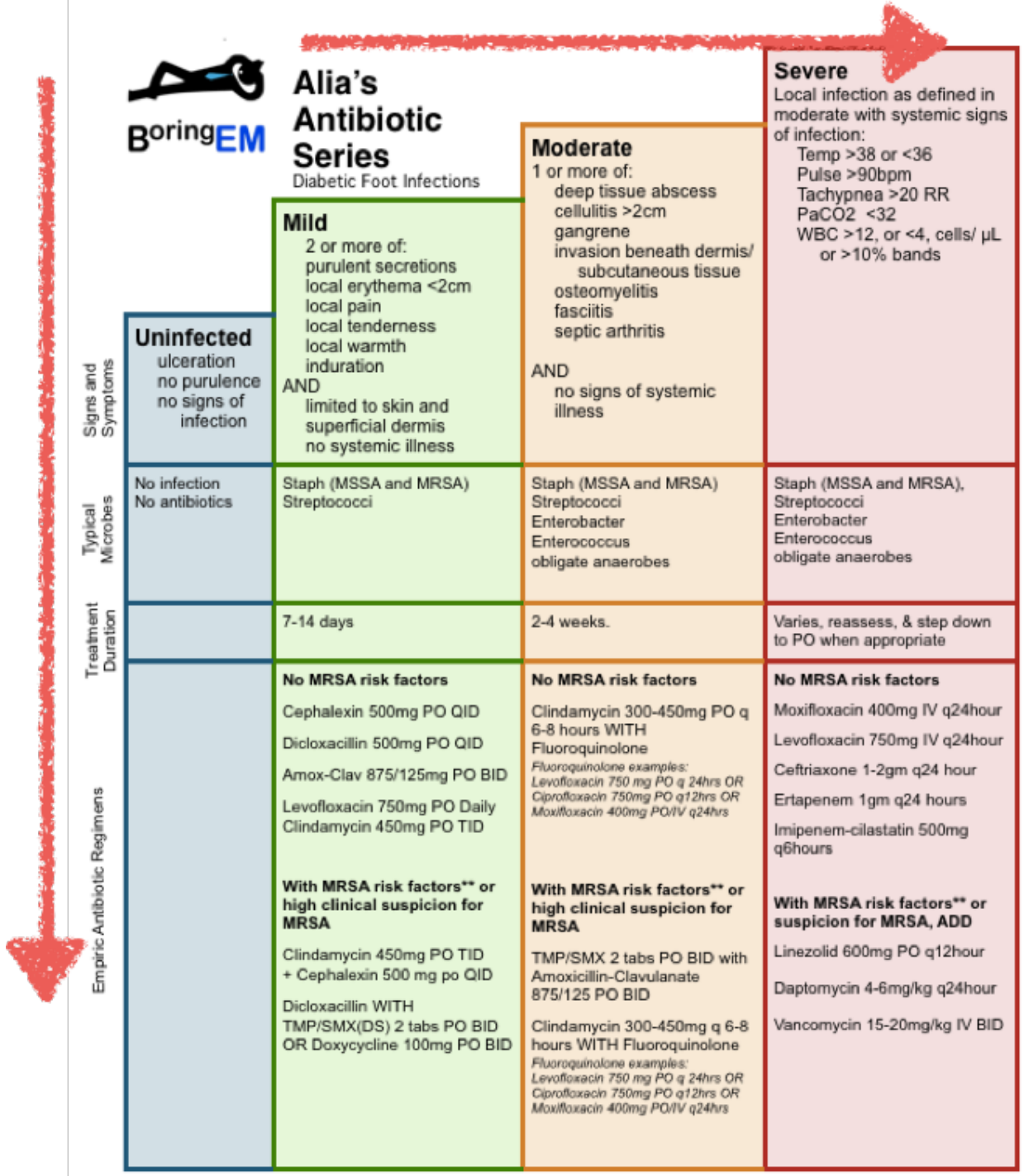
Average time spent on page: 3-5 minutes

DESIGN STRATEGIES:

1) Be specific about your audience

2) Remember F scanning

Design Strategy 2: Remember F Scanning


BoringEM
Alia's Antibiotic Series
Diabetic Foot Infections
Signs and Symptoms
Typical Microbes
Treatment Duration
Empiric Antibiotic Regimens
Uninfected
ulceration
no purulence
no signs of infection
No infection
No antibiotics
Mild
2 or more of:
purulent secretions
local erythema <2cm
local pain
local tenderness
local warmth
induration
AND
limited to skin and superficial dermis
no systemic illness
Staph (MSSA and MRSA)
Streptococci
7-14 days
No MRSA risk factors
Cephalexin 500mg PO QID
Dicloxacillin 500mg PO QID
Amox-Clav 875/125mg PO BID
Levofloxacin 750mg PO Daily
Clindamycin 450mg PO TID
With MRSA risk factors** or high clinical suspicion for MRSA
Clindamycin 450mg PO TID + Cephalexin 500 mg po QID
Dicloxacillin WITH TMP/SMX(DS) 2 tabs PO BID OR Doxycycline 100mg PO BID
Moderate
1 or more of:
deep tissue abscess
cellulitis >2cm
gangrene
invasion beneath dermis/ subcutaneous tissue
osteomyelitis
fasciitis
septic arthritis
AND
no signs of systemic illness
Staph (MSSA and MRSA)
Streptococci
Enterobacter
Enterococcus
obligate anaerobes
2-4 weeks.
No MRSA risk factors
Clindamycin 300-450mg PO q 6-8 hours WITH Fluoroquinolone
Fluoroquinolone examples:
Levofloxacin 750 mg PO q 24hrs OR
Ciprofloxacin 750mg PO q12hrs OR
Moxifloxacin 400mg PO/IV q24hrs
With MRSA risk factors** or high clinical suspicion for MRSA
TMP/SMX 2 tabs PO BID with Amoxicillin-Clavulanate 875/125 PO BID
Clindamycin 300-450mg q 6-8 hours WITH Fluoroquinolone
Fluoroquinolone examples:
Levofloxacin 750 mg PO q 24hrs OR
Ciprofloxacin 750mg PO q12hrs OR
Moxifloxacin 400mg PO/IV q24hrs
Severe
Local infection as defined in moderate with systemic signs of infection:
Temp >38 or <36
Pulse >90bpm
Tachypnea >20 RR
PaCO2 <32
WBC >12, or <4, cells/ µL or >10% bands
Staph (MSSA and MRSA),
Streptococci
Enterobacter
Enterococcus
obligate anaerobes
Varies, reassess, & step down to PO when appropriate
No MRSA risk factors
Moxifloxacin 400mg IV q24hour
Levofloxacin 750mg IV q24hour
Ceftriaxone 1-2gm q24 hour
Ertapenem 1gm q24 hours
Imipenem-cilastatin 500mg q6hours
With MRSA risk factors** or suspicion for MRSA, ADD
Linezolid 600mg PO q12hour
Daptomycin 4-6mg/kg q24hour
Vancomycin 15-20mg/kg IV BID

IDSA, 2012

DESIGN STRATEGIES:

1) Be specific about your audience

2) Remember F scanning

DESIGN STRATEGIES:

1) Be specific about your audience

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3) Create a framework from visual cues

Design Strategy 3: Visual Cues

Diabetic Foot Infections

Classification

- Uninfected- ulceration with no purulent secretions, no signs of local infection
  - no antibiotics needed
- Mild- 2 or more signs of inflammation (below) AND infection limited to skin and superficial dermis, with no local complications or systemic illness
  - purulent secretions
  - erythema
  - pain
  - tenderness
  - warmth
  - induration
  - systemic signs of infection
- Moderate- at least 1 of:
  - cellulitis > 2 cm
  - spread beneath fascia
  - deep tissue abscess
  - gangrene
  - muscle, tendon, bone involvement
- Severe- evidence of local infection as in moderate, AND signs of systemic toxicity
  - fever
  - chills
  - vomiting
  - leukocytosis
  - acidosis
  - hyperglycemia
  - azotemia

Mild, parenteral antibiotics (1-2 weeks treatment)
-suspect Staph. (MSSA and MRSA), Strep.

- Without MRSA Coverage
  - Cephalexin 500mg PO QID x 7-14 days
  - Dicloxacillin 500mg PO QID x 7-14 days
  - Amox-Clav 875/125mg PO BID x 7-14 days
  - Levofloxacin 750mg PO Daily x 7-14 days
  - Clindamycin 450mg PO TID x 7-14 days
- Suspect MRSA
  - Clindamycin 450mg PO TID x 7-14 days
  - Cephalexin OR Dicloxacillin WITH TMP/SMX (DS) 2 tabs PO BID x 7-14 days
  - Cephalexin OR Dicloxacillin WITH Doxycycline 100mg PO BID x 7-14 days

Moderate to Severe
-treatment duration 2-4 weeks
-PO; or IV followed by PO
-suspect Staph (MSSA, MRSA), Streptococci., Enterobacter, Enterococcus, obligate anaerobes

- Moderate, do not suspect MRSA
  - Levofloxacin 750mg PO q24hours with Clindamycin 300-450mg PO q 6-8 hours x 2-4 weeks
  - Ciprofloxacin 750mg PO q12hours with Clindamycin 300-450mg PO q 6-8 hours x 2-4 weeks
  - Moxifloxacin 400mg PO/IV q24hours x 2-4 weeks
- Moderate, suspect MRSA
  - TMP/SMX 2 tabs PO BID + Amoxicillin-Clavulanate 875/125 PO BID x 2-4 weeks
  - Clindamycin 300-450mg q 6-8 hours x2-4 weeks WITH
    - Moxifloxacin 400mg PO q 24hours x2-4 weeks OR
    - Levofloxacin 400 mg PO q 24hours x2-4 weeks OR
    - Ciprofloxacin 750mg PO q12hours x2-4 weeks

Diabetic Foot Infections

- Severe, without MRSA, IV
  - Moxifloxacin 400mg IV q24hours
  - Levofloxacin 750mg IV q24hours
  - Ceftriaxone 1-2gm q24 hours
  - Ampicillin-sulbactam 3gm IV q6 hours
  - Ertapenem 1gm q24 hours

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Alia's Antibiotic Series

Diabetic Foot Infections

	Uninfected	Mild	Moderate	Severe
Signs and Symptoms	ulceration no purulence no signs of infection	2 or more of: purulent secretions local erythema <2cm local pain local tenderness local warmth induration AND limited to skin and superficial dermis no systemic illness	1 or more of: deep tissue abscess cellulitis >2cm gangrene invasion beneath dermis/ subcutaneous tissue osteomyelitis fasciitis septic arthritis AND no signs of systemic illness	Local infection as defined in moderate with systemic signs of infection: Temp >38 or <36 Pulse >90bpm Tachypnea >20 RR PaCO2 <32 WBC >12, or <4, cells/ µL or >10% bands
Typical Microbes	No infection No antibiotics	Staph (MSSA and MRSA) Streptococci	Staph (MSSA and MRSA) Streptococci Enterobacter Enterococcus obligate anaerobes	Staph (MSSA and MRSA), Streptococci Enterobacter Enterococcus obligate anaerobes
Treatment Duration		7-14 days	2-4 weeks.	Varies, reassess, & step down to PO when appropriate
Empiric Antibiotic Regimens		**No MRSA risk factors** Cephalexin 500mg PO QID Dicloxacillin 500mg PO QID Amox-Clav 875/125mg PO BID Levofloxacin 750mg PO Daily Clindamycin 450mg PO TID **With MRSA risk factors** or high clinical suspicion for MRSA** Clindamycin 450mg PO TID + Cephalexin 500 mg po QID Dicloxacillin WITH TMP/SMX(DS) 2 tabs PO BID OR Doxycycline 100mg PO BID	**No MRSA risk factors** Clindamycin 300-450mg PO q 6-8 hours WITH Fluoroquinolone *Fluoroquinolone examples:* *Levofloxacin 750 mg PO q 24hrs OR* *Ciprofloxacin 750mg PO q12hrs OR* *Moxifloxacin 400mg PO/IV q24hrs* **With MRSA risk factors** or high clinical suspicion for MRSA** TMP/SMX 2 tabs PO BID with Amoxicillin-Clavulanate 875/125 PO BID Clindamycin 300-450mg q 6-8 hours WITH Fluoroquinolone *Fluoroquinolone examples:* *Levofloxacin 750 mg PO q 24hrs OR* *Ciprofloxacin 750mg PO q12hrs OR* *Moxifloxacin 400mg PO/IV q24hrs*	**No MRSA risk factors** Moxifloxacin 400mg IV q24hour Levofloxacin 750mg IV q24hour Ceftriaxone 1-2gm q24 hour Ertapenem 1gm q24 hours Imipenem-cilastatin 500mg q6hours **With MRSA risk factors** or suspicion for MRSA, ADD** Linezolid 600mg PO q12hour Daptomycin 4-6mg/kg q24hour Vancomycin 15-20mg/kg IV BID

DESIGN STRATEGIES:

1) Be specific about your audience

2) Remember F scanning

3) Create a framework from visual cues

Future growth

Guidelines for creating effective content

Staff and mentor support

Assess validity and impact

Objectives

- Understand terminology
  - asynchronous education
  - digital scholarship
- Be able to employ 3 DESIGN STRATEGIES for creating effective online learning materials
  - Be specific
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Acknowledgements

Dr. Andrew Petrosoniak, St Michael's Hospital

Dr. Teresa Chan, McMaster University

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