10-2021

Skin Soft Tissue Infection: Antibiotics for Abscesses

Children's Mercy Kansas City

Office of Evidence Based Practice (EBP) – Critically Appraised Topic (CAT): Skin and Soft Tissue Infection (SSTI) Abscess Antibiotic Use

Specific Care Question: In pediatric patients with suspected Skin and Soft Tissue Infection (SSTI), should antibiotics be prescribed after the abscess is drained versus no antibiotics for the outcomes of cured at follow-up and rate of recurrence?

Recommendations from the Skin and Soft Tissue Infection CPG Team *A conditional recommendation is made for the use of antibiotics for abscesses, based on the GRADE Evidence to Decision instrument the Summary of Findings Table. The overall certainty in the evidence is low to very low. In pediatric patients, the use of antibiotics* ***following incision and drainage*** *was favorable for cure rate versus placebo. There is little evidence for or against antibiotics* ***following incision and drainage*** *for abscesses* ***<2cm.*** *(see Summary by Outcome for substantiation of recommendations).*

The SSTI CPG Subcommittee discussed additional considerations using the GRADE Evidence to Decision instrument[a] found in the appendix to recommend antibiotic therapy for abscess following incision and drainage at Children's Mercy based on feasibility, value, and compliance for all stakeholders.

Literature Summary

Background

Skin and soft tissue infection is a common presentation in pediatric emergency departments and ambulatory settings, of which almost half are abscesses (Gottlieb & Peksa, 2018; Taira et al., 2009). Standard clinical treatment for abscesses includes incision and drainage, but the utility of antibiotics for simple abscesses remains unclear (Singer & Talan, 2014). The Infectious Diseases Society of America recommends that incision and drainage is likely adequate for simple abscess (Stevens et al., 2014). A recent meta-analysis (Gottlieb & Peksa, 2018) of adults and pediatric patients found that systemic antibiotics for abscesses after incision and drainage increased clinical cure rates. This contrasts with a previous meta-analysis (Fahimi et al., 2015) of adults and pediatric patients that found no improvement in clinical cure rate. This review will summarize identified literature of pediatric patients to answer the specific care question on the topic.

Study characteristics. The search for suitable studies was completed on August 31, 2021. A. Nedved, MD and E. Scott, DO reviewed the 147 titles and/or abstracts found in the search and identified[b] one guideline and six single studies believed to answer the question. After an in-depth review of the guideline[d] and the single studies[c], four answered the question(s). Two systematic reviews (SR) (Fahimi et al., 2015; Gottlieb et al., 2019) were identified in the search. Both SRs included both adults and pediatric patients. Only the pediatric studies from the SRs were included in the current review.

Summary by Outcome

Cure Rate 7-10 days for Children, Trimethoprim / Sulfamethoxazole (TMP-SMX) versus Placebo

Two studies (Daum et al., 2017; Duong et al., 2010) measured cure rate at 7-10 days, (n = 329). For the outcome of cure rate at 7—10 days, the OR = 1.97, 95% CI [1.04, 3.73], p = .04, indicated the intervention of TMP-SMX was favorable to the comparator of placebo (see Figure 3 & Table 2). The use of TMP-SMX would result in a cure rate of 6 to 133 more patients per 1000.

> **Certainty Of The Evidence For Cure Rate at 7-10 days for Children.** The certainty of the body of evidence was low. The body of evidence was assessed to have no serious inconsistency, no serious indirectness, but was assessed to have serious risk of bias and serious imprecision. Risk of bias was serious as Duong et al. (2010) did not reach power and medication compliance was only 66%. Imprecision was serious due to the low number of events and participants (n = 329).

Cure Rate 7-14 days for Children and Adults, TMP-SMX versus Placebo

Three studies (Daum et al., 2017; Duong et al., 2010; Talan et al., 2016) measured cure rate at 7-14 days, (n = 1576). For the outcome of cure rate at 7—14 days, the OR = 1.55, 95% CI [1.22, 1.97], p = .0005, indicated the intervention of TMP-SMX was favorable to the comparator of placebo (see Figure 3 & Table 2). The use of TMP-SMX would result in a cure rate of 34 to 105 more patients per 1000.

> **Certainty Of The Evidence For Cure Rate at 7-14 days for Children and Adults.** The certainty of the body of evidence was low. The body of evidence was assessed to have no serious inconsistency and no serious imprecision, but was assessed to have serious risk of bias and serious indirectness. Risk of bias was serious due to potential selection bias (Talan et al., 2016). This study made up 86% of the final weight of the meta-analysis results. Indirectness was serious due to Talan et al. (2016) included both adults and children.

Recurrence at 3 months for Children, TMP-SMX versus Placebo for Children
One studies (Duong et al., 2010) measured recurrence at 3 months, (*n* = 98). For the outcome of recurrence at 3 months, the *OR* = 0.97, 95% CI [0.40, 2.34], *p* = .95, indicated the intervention of TMP-SMX was no different to the comparator of placebo (see Figure 5 & Table 2).

> **Certainty Of The Evidence For Cure Rate at 7-10 days for Children.** The certainty of the body of evidence was. The body of evidence was assessed to have no serious inconsistency, no serious indirectness, but was assessed to have serious risk of bias and serious imprecision. Risk of bias was serious due to Duong et al. (2010) not recruit enough study participants to detect significance and the medication compliance of the subjects was only 66%. Imprecision was serious due to the low number of events and participants (*n* = 98).

Adverse Events for Children, TMP-SMX versus Placebo
Two studies (Daum et al., 2017; Duong et al., 2010) measured adverse events, (*n* = 672). For the outcome of adverse events, the *OR* = 0.73, 95% CI [0.47, 1.15], *p* = .18, indicated the intervention of TMP-SMX was no different to the comparator of placebo (see Figure 4 & Table 2).

> **Certainty Of The Evidence For Adverse Events for Children.** The certainty of the body of evidence was. The body of evidence was assessed to have no serious inconsistency, no serious indirectness, but was assessed to have serious risk of bias and serious imprecision. Risk of bias was serious due to Duong et al. (2010) not recruit enough study participants to detect significance and the medication compliance of the subjects was only 66%. Imprecision was serious due to the low number of events (*n* = 186).

Adverse Events for Children and Adults, TMP-SMX versus Placebo
Three studies (Daum et al., 2017; Duong et al., 2010; Talan et al., 2016) measured cure rate at 7-14 days, (*n* = 1709). For the outcome of adverse events, the *OR* = 0.89, 95% CI [0.59, 1.35], *p* = .59, indicated the intervention of TMP-SMX was no different to the comparator of placebo (see Figure 4 & Table 2).

> **Certainty Of The Evidence For Adverse Events for Children and Adults.** The certainty of the body of evidence was very. The body of evidence was assessed to have no serious imprecision, but was assessed to have serious risk of bias, serious inconsistency, and serious indirectness. Risk of bias was serious due to potential selection bias of (Talan et al., 2016). This study made up 86% of the final weight of the meta-analysis results. Inconsistency was serious due to each study measuring adverse events differently and moderate heterogeneity based on I^2 of 77%. Indirectness was judged to be serious due to the inclusion of both adults and children (Talan et al. (2016).

Cure Rate 7-10 days for Children, Clindamycin versus Placebo
One study (Daum et al., 2017) measured cure rate at 7-10 days, (*n* = 190). For the outcome of cure rate at 7—10 days, the *OR* = 1.97, 95% CI [1.04, 3.73], *p* = .04, indicated the intervention of clindamycin was favorable to the comparator of placebo (see Figure 6 & Table 3). The use of clindamycin would result in a cure rate of 106 to 261 more patients per 1000.

> **Certainty Of The Evidence For Cure Rate at 7-10 days for Children.** The certainty of the body of evidence was low. The body of evidence was assessed to not have serious risk of bias, nor serious inconsistency, or serious indirectness, but very serious imprecision. Imprecision was very serious due to the low number of events and participants (*n* = 190).

Adverse Events for Children, Clindamycin versus Placebo
One study (Daum et al., 2017) measured adverse events, (*n* = 190). For the outcome of adverse events, the *OR* = 3.76, 95% CI [1.74, 8.11], *p* = .005, indicated the intervention of clindamycin was not favorable to the placebo comparator (see Figure 7 & Table 3). The use of clindamycin would result in a 23 to 184 more adverse events per 1000 patients.

> **Certainty Of The Evidence For Cure Rate at 7-10 days for Children.** The certainty of the body of evidence was. The body of evidence was assessed to not have serious risk of bias, nor serious inconsistency, or serious indirectness, but had very serious imprecision. Imprecision was very serious due low number of events and participants (*n* = 190).

Recurrence at 1 year for Children, Antibiotics versus No-antibiotics

One study (Hogan et al., 2018) measured recurrence at 1 year, (*n* = 383). For the outcome of recurrence at 1 year, the *OR* = 0.37, 95% CI [0.17, 0.84], *p* = .02, indicated the intervention of antibiotics (clindamycin, TMP-SMX, vancomycin) was favorable to the comparator of no-antibiotics (see Figure 8 & Table 4).

Certainty Of The Evidence For Recurrence at 1 year for Children.

The certainty of the body of evidence was low. The body of evidence was assessed to have no serious inconsistency and no serious indirectness, but was assessed to have serious imprecision and serious risk of bias. Risk of bias was serious due to the low number of participants in the comparison group. Imprecision was serious due to the low number of events (*n* = 90).

Identification of Studies

Search Strategy and Results (see Figure 1)

("skin and soft-tissue infection*" OR "skin and soft tissue infection*" OR SSTI OR SSTIs OR "Soft Tissue Infections"[Mesh] OR "Skin Diseases, Infectious"[Mesh] OR "skin abscess*"[tiab] OR "skin lesion*"[tiab] OR "Subcutaneous abscess*"[tiab]) AND ("Drainage"[Mesh] OR "Incision and drainage" OR "I&D" OR "incision & drainage") AND ("Treatment Outcome"[MeSH] OR "Follow-Up Studies"[Mesh] OR follow-up OR "Watchful Waiting"[Mesh] OR "Anti-Bacterial Agents"[Mesh] OR "Recurrence"[Mesh] OR antibiotic*[tiab] OR outcome*[tiab]) AND (child OR children OR pediatr* OR paediatr* OR infant OR adolescence)

Records identified through database searching *n* = 147

Additional records identified through other sources *n* = 1

Studies Included in this Review

Citation	Study Type
Daum et al. (2017)	RCT
Duong et al. (2010)	RCT
Hogan et al. (2018)	Cohort
Talan et al. (2016)	RCT

Studies Not Included in this Review with Exclusion Rationale

Citation	Reason for exclusion
Gottlieb et al. (2019)	Pediatric study in the systematic review already included
Fahimi et al. (2015)	Pediatric study in the systematic review already included

Methods Used for Appraisal and Synthesis

[a]The GRADEpro Guideline Development Tool (GDT) is the tool used to create the Summary of Findings (SOF) table(s) for this analysis. Using the GDT, the author of this CAT rates the certainty of the evidence based on four factors: *within-study risk of bias*, *consistency among studies, directness of evidence*, and *precision of effect estimates*. Each factor is subjectively judged against the author's confidence of the estimated treatment effect. Confidence is assessed as not serious, serious or very serious. If the attribute of serious or very serious is assessed, the author will provide an explanation.

[b]Rayyan is a web-based software used for the initial screening of titles and / or abstracts for this analysis (Ouzzani, Hammady, Fedorowicz & Elmagarmid, 2017).

[c]Review Manager (Higgins & Green, 2011) is a Cochrane Collaborative computer program used to assess the study characteristics as well as the risk of bias and create the forest plots found in this analysis.

[d]The Appraisal of Guidelines Research and Evaluation II (AGREE II) is an international instrument used to assess the quality and reporting of clinical practice guidelines for this analysis (Brouwers et al. 2010).

[e]The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram depicts the process in which literature is searched, screened, and eligibility criteria is applied (Moher, Liberati, Tetzlaff, & Altman, 2009).

[a]GRADEpro GDT: GRADEpro Guideline Development Tool (2015). McMaster University, (developed by Evidence Prime, Inc.). [Software]. Available from gradepro.org.

[b]Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan-a web and mobile app for systematic reviews. *Systematic Reviews, 5*(1), 210. doi:10.1186/s13643-016-0384-4

[c]Higgins, J. P. T., & Green, S. e. (2011). *Cochrane Handbook for Systematic Reviews of Interventions [updated March 2011]* (Version 5.1.0 ed.): The Cochrane Collaboration, 2011.

[d]Brouwers, M.C. et al. for the AGREE Next Steps Consortium. (2010) AGREE II: Advancing guideline development, reporting and evaluation in healthcare. *Canadian Medical Association Journal, 182*, E839-842. Retrieved from https://www.agreetrust.org/wp-content/uploads/2017/12/AGREE-II-Users-Manual-and-23-item-Instrument-2009-Update-2017.pdf

[e]Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097 **For more information, visit www.prisma-statement.org.**

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Acronyms Used in this Document

Acronym	Explanation
AGREE II	Appraisal of Guidelines Research and Evaluation II
CAT	Critically Appraised Topic
EBP	Evidence Based Practice
MRSA	Methicillin-resistant S. aureus
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SSTI	Skin and Soft Tissue Infection
TMP-SMX	Trimethoprim / Sulfamethoxazole

Statistical Acronyms Used in this Document

Statistical Acronym	Explanation
CI	Confidence Interval
HR	Hazard Ratio
I^2	Heterogeneity test
M or $\bar{X}$	Mean
Mdn	Median
n	Number of cases in a subsample
N	Total number in sample
OR	Odds Ratio
P or p	Probability of success in a binary trial
RCT	Randomized controlled trial
SD	Standard deviation
SR	Systematic Review

Figure 1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRIMSA)[c]

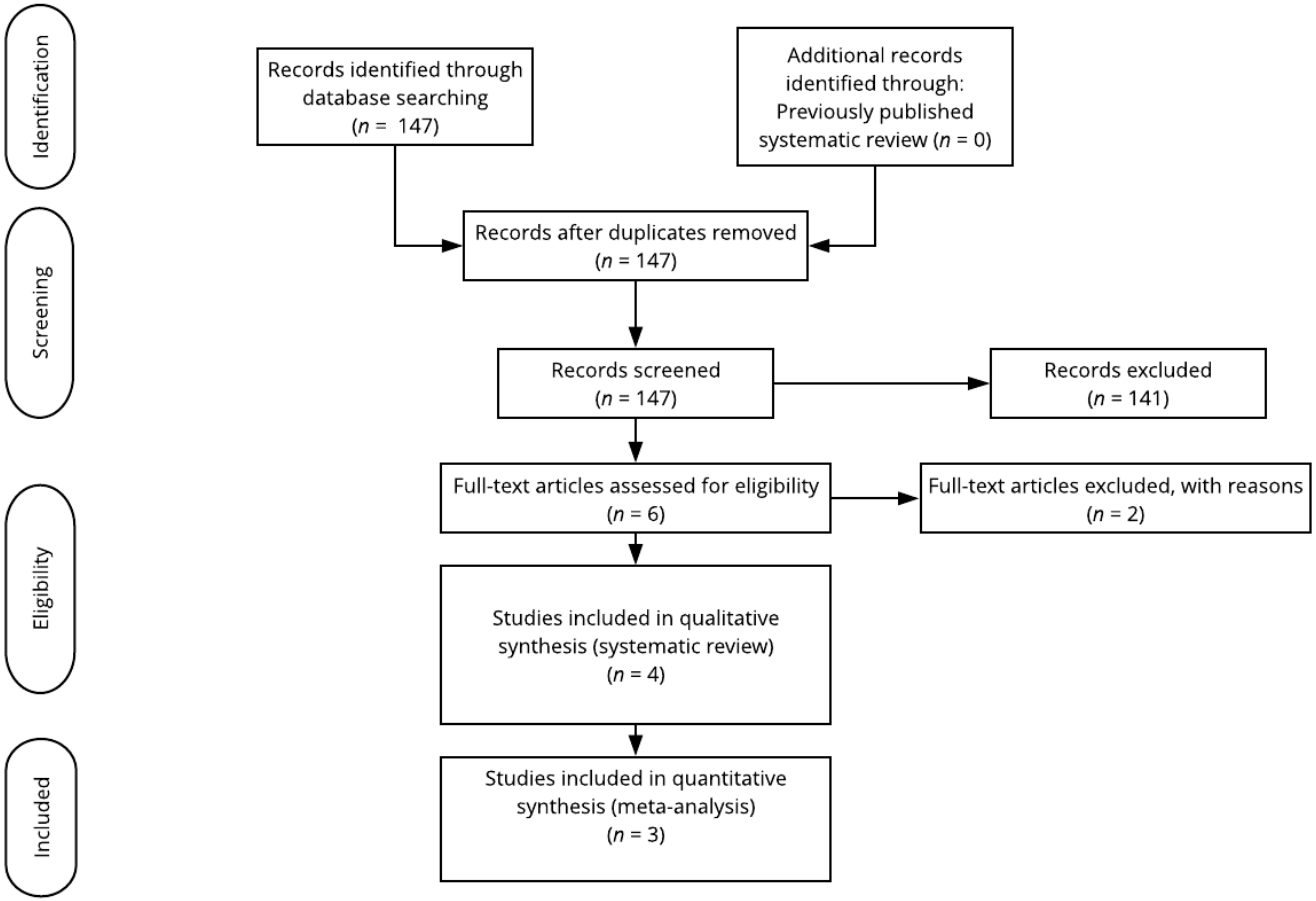


Table 1

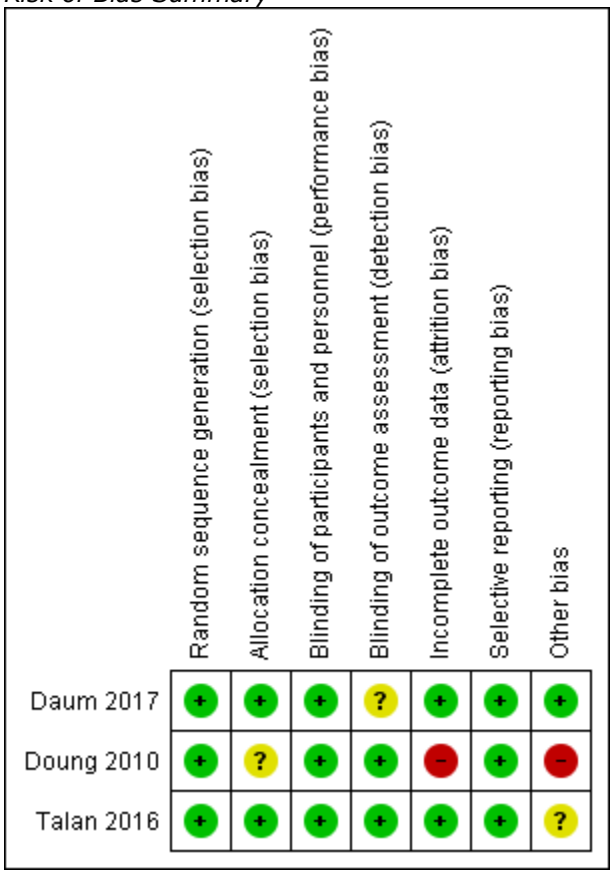
AGREE II[d] Summary for the IDSA Guideline (Stevens et al., 2014)

Domain	Percent Agreement	Percent Justification
Scope and purpose	99%	The aim of the guideline, the clinical questions posed, and target populations **were** identified.
Stakeholder involvement	58%	The guideline **did not** include appropriate stakeholders (such as nurses and pharmacist) nor the viewpoints if the intended user.
Rigor of development	79%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines **were** explicitly stated.
Clarity and presentation	100%	The guideline recommendations **are** clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	36%	The guideline **did not** address implementation barriers and facilitators, utilization strategies, nor resource costs associated with implementation.
Editorial independence	96%	The recommendations **were not** biased with competing interests.
Team's recommendation for guideline use	Yes with modifications	

Note: Four EBP Scholars completed the AGREE II on this guideline.

Figure 2

Risk of Bias Summary



Summary of Findings Table(s)
Table 2

Summary of Findings Table[a]: TMP-SMX compared to Placebo

Certainty assessment							Summary of findings				
							Study event rates (%)			Anticipated absolute effects	
Participants (studies) Follow-up	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall certainty of evidence	With Placebo	With TMP-SMX	Relative effect (95% CI)	Risk with Placebo	Risk difference with TMP-SMX
Cure Rate 7-14 days Children and Adults											
1576 (3 RCTs)	serious[a,b]	not serious	serious[c]	not serious	none	⊕⊕◯◯ Low	587/782 (75.1%)	652/794 (82.1%)	**OR 1.55** (1.21 to 1.97)	751 per 1,000	**73 more per 1,000** (from 34 more to 105 more)
Cure Rate 7-10 days Children											
329 (2 RCTs)	serious[b]	not serious	not serious	serious[d]	none	⊕⊕◯◯ Low	133/165 (80.6%)	145/164 (88.4%)	**OR 1.97** (1.04 to 3.73)	806 per 1,000	**85 more per 1,000** (from 6 more to 133 more)
Adverse Events Adults and Children											
1709 (3 RCTs)	serious[a,b]	serious[e]	serious[c]	not serious	none	⊕◯◯◯ Very low	102/837 (12.2%)	98/872 (11.2%)	**OR 0.89** (0.59 to 1.35)	122 per 1,000	**12 fewer per 1,000** (from 46 fewer to 36 more)
Adverse Events Children											
672 (2 RCTs)	serious[b]	not serious	not serious	serious[d]	none	⊕⊕◯◯ Low	99/333 (29.7%)	88/339 (26.0%)	**OR 0.73** (0.47 to 1.15)	297 per 1,000	**61 fewer per 1,000** (from 131 fewer to 30 more)
Recurrence 3 months Children											

Certainty assessment							Summary of findings				
98 (1 RCT)	serious[f]	not serious	not serious	serious[d]	none	⊕⊕◯◯ Low	15/52 (28.8%)	13/46 (28.3%)	**OR 0.97** (0.40 to 2.34)	288 per 1,000	**6 fewer per 1,000** (from 149 fewer to 198 more)

Explanations

a. Potential selection bias due to physicians ability to exclude patients at higher risk (Talan et al., 2016). Talan et al. (2016) study has 86% weight in meta-analysis.

b. Duong et al. (2010) not recruit enough study participants to detect significance and the medication compliance of the subjects was only 66%.

c. One study (Talan et al., 2016) included both adults and children.

d. Low number of events and subjects.

e. Adverse events measured differently in each study.

f. Study did not reach power and only a medication compliance rate of 66% (Doung et al., 2010).

Table 3

Summary of Findings Table: Clindamycin compared to Placebo

Certainty assessment							Summary of findings				
Participants (studies) Follow-up	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall certainty of evidence	Study event rates (%)		Relative effect (95% CI)	Anticipated absolute effects	
							With Placebo	With Clindamycin		Risk with Placebo	Risk difference with Clindamycin
Cure Rate 7-10 days											
190 (1 RCT)	not serious	not serious	not serious	very serious[a]	none	⊕⊕◯◯ Low	61/89 (68.5%)	90/101 (89.1%)	**OR 3.76** (1.74 to 8.11)	685 per 1,000	**206 more per 1,000** (from 106 more to 261 more)
Adverse Events											
523 (1 RCT)	not serious	not serious	serious[b]	very serious[a]	none	⊕◯◯◯ Very low	32/257 (12.5%)	58/266 (21.8%)	**OR 1.96** (1.22 to 3.14)	125 per 1,000	**93 more per 1,000** (from 23 more to 184 more)

Explanations

a. Low number of events and participants

b. Includes children and adults

Table 4

Summary of Findings Table: Antibiotics compared to No-Antibiotics

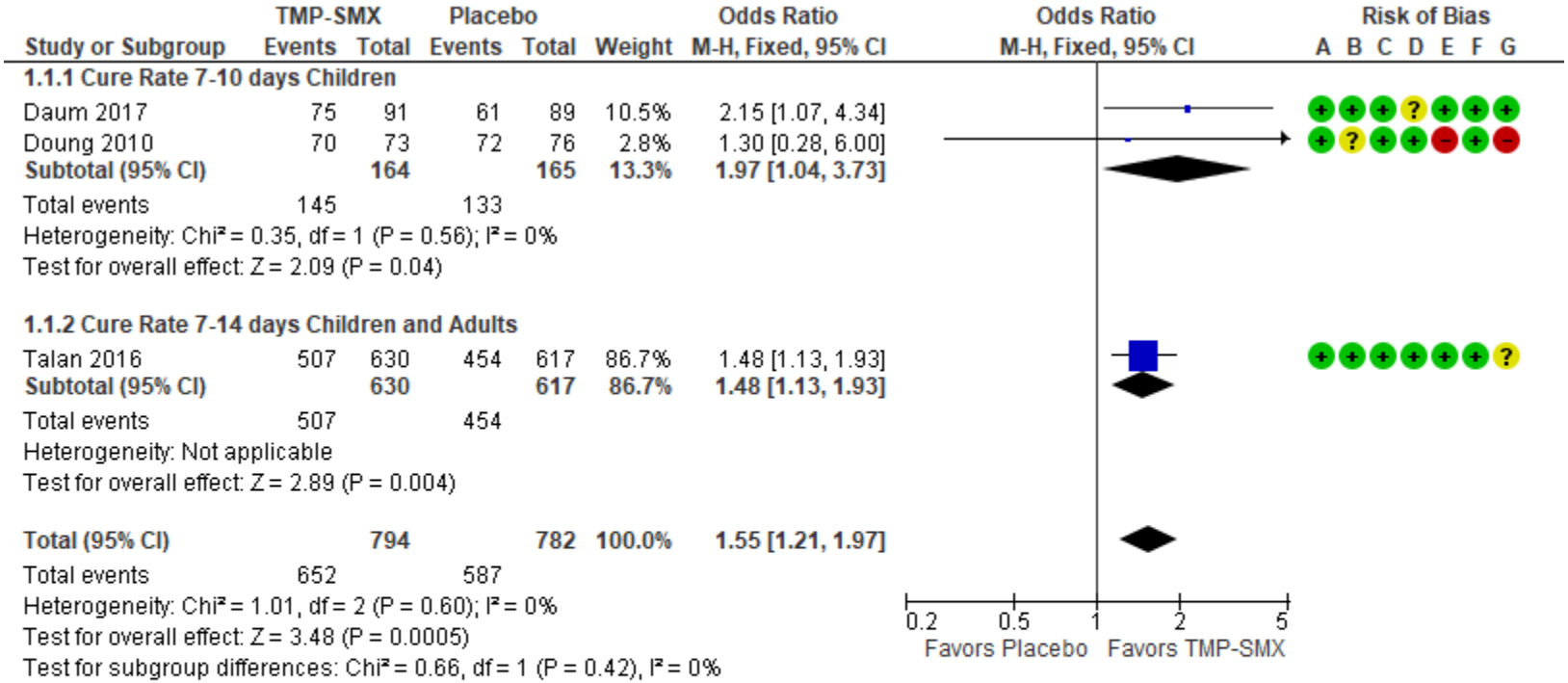
Certainty assessment							Summary of findings				
							Study event rates (%)			Anticipated absolute effects	
Participants (studies) Follow-up	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Publication bias**	**Overall certainty of evidence**	**With No-Antibiotics (observational study)**	**With Antibiotics**	**Relative effect (95% CI)**	**Risk with No-Antibiotics (observational study)**	**Risk difference with Antibiotics**
Recurrent SSTI at 1 year											
383 (1 observational study)	serious[a]	not serious	not serious	serious[b]	none	⨁◯◯◯ Very low	18/28 (64.3%)	143/355 (40.3%)	**OR 0.37** (0.17 to 0.84)	643 per 1,000	**243 fewer per 1,000** (from 409 fewer to 41 fewer)

Explanations

a. Low number of participants in the comparison group

b. Low number of events

Meta-analysis(es)
Figure *3*
Comparison: TMP-SMX versus Placebo, Outcome: Cure Rate



Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Figure *4*

Comparison: TMP-SMX versus Placebo, Outcome: Adverse Events

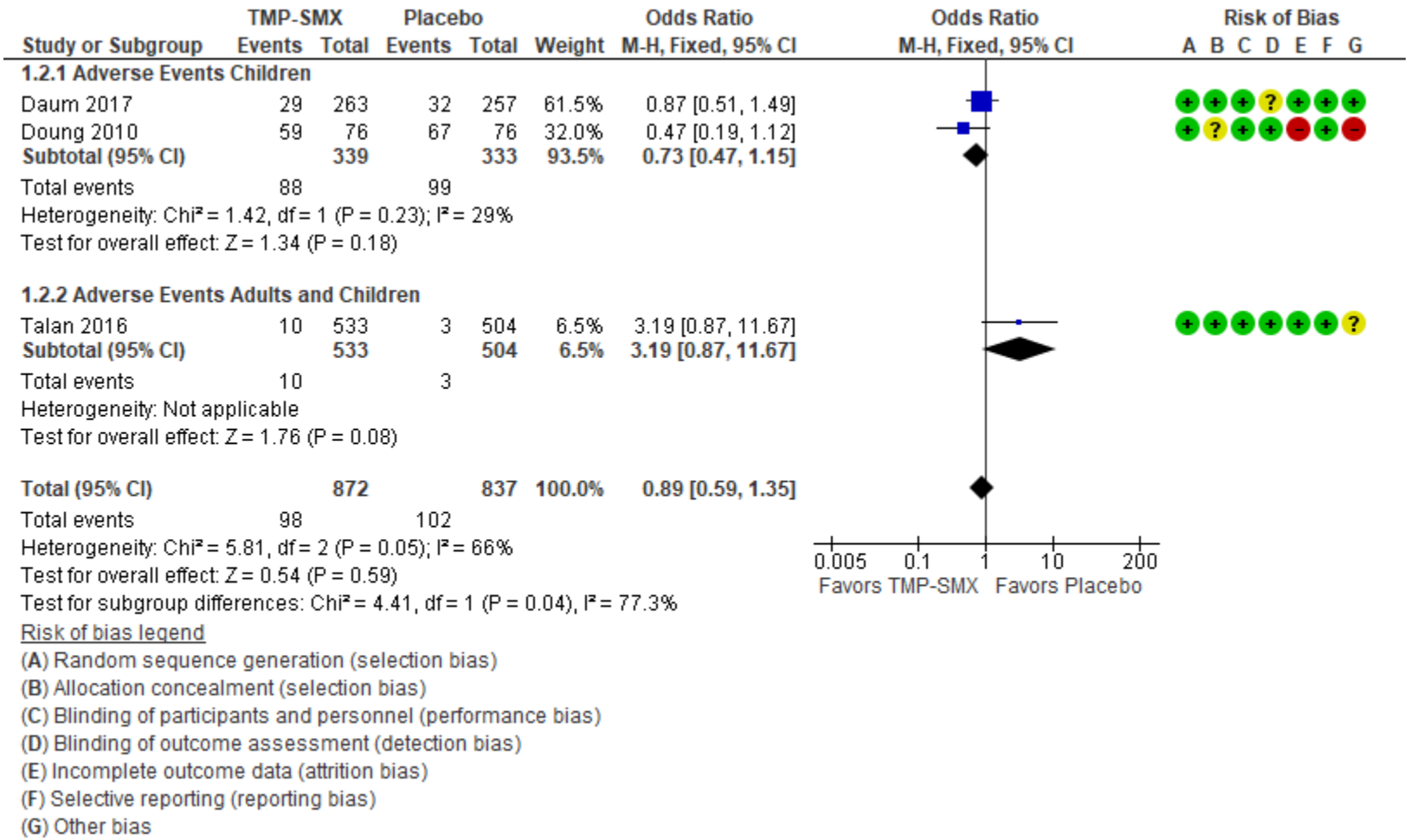
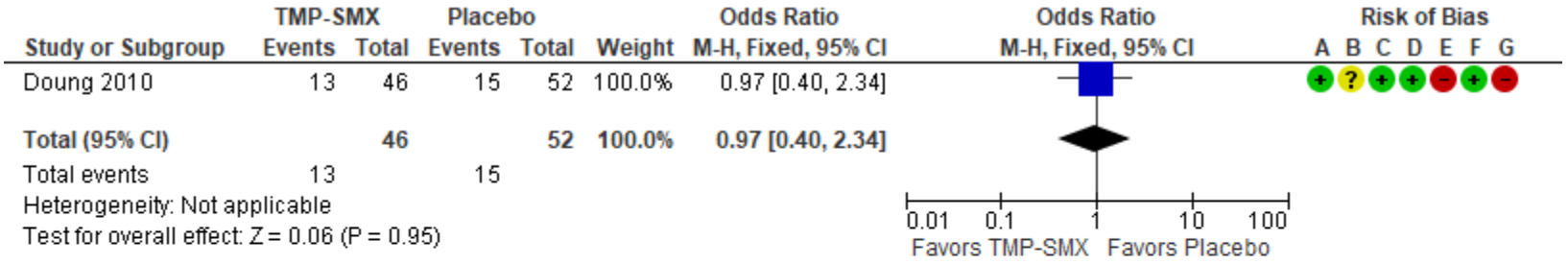


Figure *5*

Comparison: TMP-SMX versus Placebo, Outcome: Recurrence at 3 months

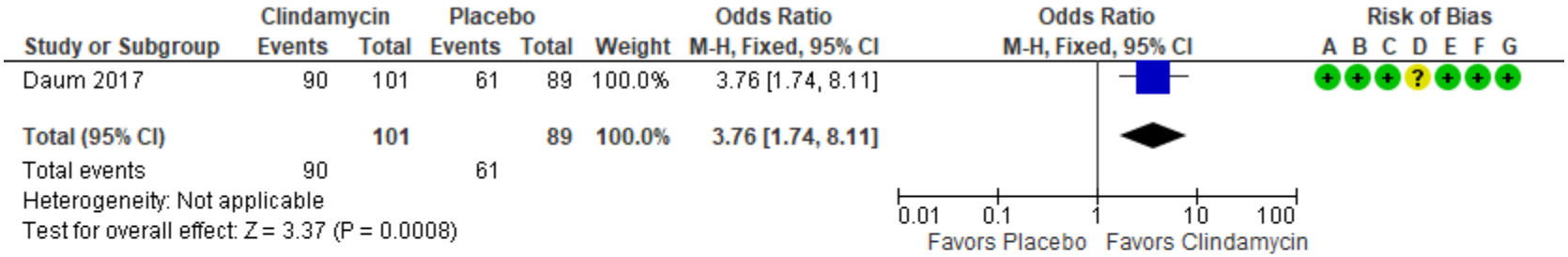


Risk of bias legend

(**A**) Random sequence generation (selection bias)
(**B**) Allocation concealment (selection bias)
(**C**) Blinding of participants and personnel (performance bias)
(**D**) Blinding of outcome assessment (detection bias)
(**E**) Incomplete outcome data (attrition bias)
(**F**) Selective reporting (reporting bias)
(**G**) Other bias

Figure *6*

Comparison: Clindamycin versus Placebo, Outcome: Cure Rate 7 to 10 days

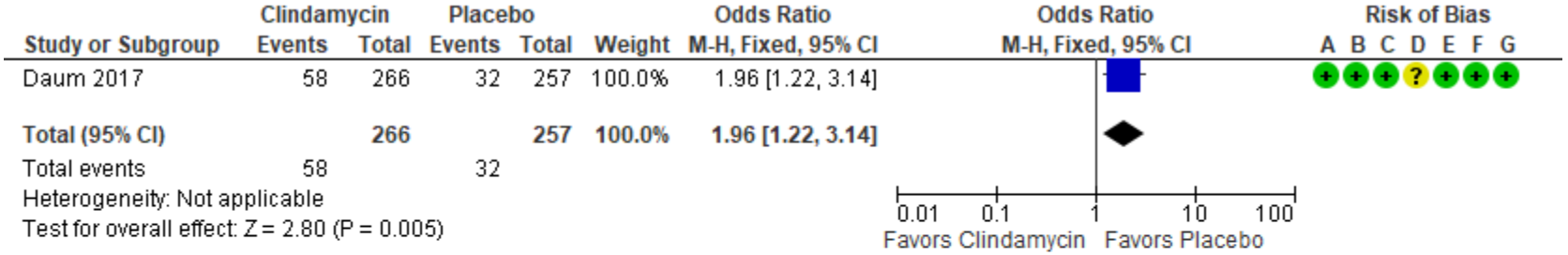


Risk of bias legend

(**A**) Random sequence generation (selection bias)
(**B**) Allocation concealment (selection bias)
(**C**) Blinding of participants and personnel (performance bias)
(**D**) Blinding of outcome assessment (detection bias)
(**E**) Incomplete outcome data (attrition bias)
(**F**) Selective reporting (reporting bias)
(**G**) Other bias

Figure *7*

Comparison: Clindamycin versus Placebo, Outcome: Adverse Events



Risk of bias legend

(**A**) Random sequence generation (selection bias)
(**B**) Allocation concealment (selection bias)
(**C**) Blinding of participants and personnel (performance bias)
(**D**) Blinding of outcome assessment (detection bias)
(**E**) Incomplete outcome data (attrition bias)
(**F**) Selective reporting (reporting bias)
(**G**) Other bias

Figure *8*

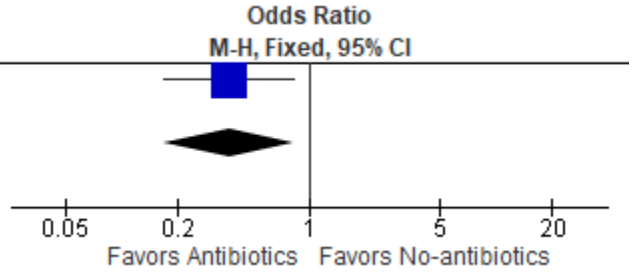
Comparison: Antibiotics versus No Antibiotics, Outcome: Recurrent SSTI at 1 Year

Antibiotics versus No-Antibiotics (observational study), outcome: 4.1 Recurrent SSTI at 1 year.

	Antibiotics		No antibiotics			Odds Ratio
Study or Subgroup	**Events**	**Total**	**Events**	**Total**	**Weight**	**M-H, Fixed, 95% CI**
Hogan 2018	143	355	18	28	100.0%	0.37 [0.17, 0.84]
Total (95% CI)		**355**		**28**	**100.0%**	**0.37 [0.17, 0.84]**
Total events	143		18			

Heterogeneity: Not applicable

Test for overall effect: Z = 2.40 (P = 0.02)



Characteristics of Intervention Studies

Daum et al. (2017)

Methods	**Randomized Control Trial**
Participants	**Participants:** Outpatient adults and Children May 2009 through January 2015 **Setting:** Urgent care clinics, emergency departments, and affiliated clinics at six sites: the University of Chicago Medical Center, Chicago; San Francisco General Hospital, San Francisco; Harbor–University of California, Los Angeles, Medical Center, Torrance; Vanderbilt University Medical Center, Nashville, Washington University, St. Louis and Morehouse School of Medicine Emory University, Atlanta **Randomized into study:** *N* = 786 • **Group 1, Clindamycin:** *n* = 266 • **Group 2, TMP-SMX:** *n* = 263 • **Group 3, Placebo:** *n* = 257 **Completed Study:** *N* = 678 • **Group 1:** *n* = 234 • **Group 2:** *n* = 226 • **Group 3:** *n* = 218 **Gender, males (as defined by researchers):** • **Group 1:** *n* = 140 (52.6%) • **Group 2:** *n* = 152 (57.8%) • **Group 3:** *n* = 156 (60.7%) **Race / ethnicity or nationality (as defined by researchers):**

Race or ethnic group - no	Clidamycin	TMP-SMX	Placebo	All Groups
Native American or Alaskan	0	2	1	3
Asian	8	4	2	14
Hawaiin or Pacific Islander	2	4	2	8
Black or African American	165	152	167	484
White	80	87	73	240
Multiracial	5	11	8	24
Other	6	3	4	13

Age

	<table><tr><th>Age - no</th><th>Clidamycin</th><th>TMP-SMX</th><th>Placebo</th><th>All Groups</th></tr><tr><td><1 yr</td><td>6</td><td>9</td><td>2</td><td>17</td></tr><tr><td>1 to 8 yr</td><td>56</td><td>51</td><td>59</td><td>166</td></tr><tr><td>9 to 17 yr</td><td>39</td><td>31</td><td>28</td><td>98</td></tr></table>
	Inclusion Criteria:
	• Single abscess (defined as a circumscribed, drainable collection of pus) with a greatest diameter of 5.0 cm or less (≤3 cm for participants 6 to 11 months of age and ≤4 cm for participants 1 to 8 years of age),
	• Evidenced by two or more of the following signs or symptoms for at least 24 hours:
	  ○ Erythema
	  ○ Swelling or induration
	  ○ Local warmth
	  ○ Purulent drainage
	  ○ Tenderness to pain or palpation
	Exclusion Criteria:
	• Superficial skin infections (e.g., impetigo)
	• Infection at a body site requiring specialized management (e.g., perirectal, genital, or hand infection)
	• Human or animal bite
	• Oral temperature higher than 38.5°C (or >38.0°C for children 6 to 11 months of age)
	• Presence of systemic inflammatory response syndrome criteria
	• Immunosuppressive therapy or an immunocompromising condition (e.g., diabetes or chronic renal failure),
	• Body-mass index (the weight in kilograms divided by the square of the height in meters) higher than 40
	• Surgical site or prosthetic device infection
	• Systemic anti-staphylococcal antibacterial therapy in the previous 14 days
	• Required hospitalization
	• Lived in a long-term care facility
	• cancer
	• Inflammatory disorder treated
	Power Analysis: The trial was designed as a superiority trial with 80% power to detect a 10-percentage-point absolute difference in cure rates (e.g., 85% vs. 95%), 786 participants were required (262 per group).

Interventions	**Both:** After incision and drainage of the abscess and determination of the size of the abscess, participants were randomly assigned in a 1:1:1 ratio to receive placebo, clindamycin, or TMP-SMX. Participants were seen at the end of treatment (day 12), at the test-of-cure visit (7 to 10 days after the prescribed 10-day course of therapy), and at the 1-month follow-up (day 40). • **Group 1:** Clindamycin was given as two 150-mg tablets three times daily • **Group 2:** TMP-SMX was given as two tablets (containing 80mg of trimethoprim and 400 mg of sulfamethoxazole) twice daily plus one dose of placebo pills • **Group 3:** Two placebo pills given three times daily
Outcomes	**Primary outcome(s):** • Clinical cure by day 7 to 10 days* **Secondary outcome(s)** • Clinical cure at day 40*

	Safety outcome(s): • Adverse events* *Outcomes of interest to the CMH CPG or CAT development team

Notes	• Ten days after therapy in the intention-to-treat population, the cure rate:
	  ○ Clindamycin: 221 of 266 participants [83.1%]
	  ○ TMP-SMX: 215 of 263 participants [81.7%]
	  ○ Placebo: 177 of 257 participants [68.9%], $p < .001$ for both comparisons
	• New infections at 1 month of follow-up
	  ○ Clindamycin: 15 of 221, 6.8%
	  ○ TMP-SMX: 29 of 215, 13.5%, $p = .03$
	  ○ Placebo: 22 of 177, 12.4%, $p = .06$
	• Adverse events
	  ○ Clindamycin: 58 of 265, 21.9%
	  ○ TMP-SMX: 29 of 261, 11.1%
	  ○ Placebo 32 of 255, 12.5%

Risk of bias

Bias	**Judgment**	**Support for judgment**
Random sequence generation (selection bias)	Low risk	Variable-block randomization
Allocation concealment (selection bias)	Low risk	Allocation determines by independent statistics and data-coordinating center
Blinding of participants and personnel (performance bias)	Low risk	Participants and all study staff were unaware of the study-group assignments
Blinding of outcome assessment (detection bias)	Unclear risk	Staff assessing outcomes were unaware of study groups
Incomplete outcome data (attrition bias)	Low risk	Intention-to-Treat was used for primary outcome
Selective reporting (reporting bias)	Low risk	All outcomes reported
Other bias	Low risk	

Duong et al. (2010)

Methods	**Randomized Control Trial**
Participants	**Participants:** Pediatric Patients July 2006 through February 2008 **Setting:** Emergency Department in Saint Louis Medical Center **Randomized into study:** *N* = 161 • **Group 1, TMP-SMX:** *n* = 77 • **Group 2, Placebo:** *n* = 85 **Completed Study:** *N* = 149 • **Group 1:** *n* = 73 • **Group 2:** *n* = 76 **Gender, males (as defined by researchers):** • **Group 1:** *n* = 28 (39%) • **Group 2:** *n* = 34 (45%) **Race / ethnicity or nationality (as defined by researchers):** • Black: 128/149 (85%) **Age, (<5 years)** • **Group 1:** 40/76 (53%) • **Group 2:** 39/73 (53%) **Inclusion Criteria:** • Diagnostic criteria for skin abscess included the presence of all of the following features: ○ Acute onset within 1 week ○ Fluctuance, ○ Erythema ○ Induration ○ Tenderness, with or without purulent drainage. **Exclusion Criteria:** • Chronic health problems • Immunosuppressive medications • Current antibiotic usage • Contraindication to TMP-SMX • Minor or superficial skin infections **Power Analysis:** The sample size of 81 per group was calculated according to assumed treatment failure rate of 3.3% with antibiotics, an equivalence threshold of 7% (allowing up to 10.3% failure rate with placebo), to achieve a power of 0.80 (0.05).
Interventions	**Both:** • Ultrasonography was available, measurements were made in 2 dimensions, diameter and depth. Local anesthetic or procedural sedation was used at the discretion of the attending physician • The skin overlying all skin abscesses was cleansed with 10% povidone iodine solution and then incised with a no. 11 blade, probed for loculations, and irrigated with normal saline solution.

	• Abscess cultures obtained immediately after surgical incision and sent for culture and antibiotic sensitivity testing. ▪ **Group 1:** TMP-SMX dose for mild bacterial infections (10-12 mg trimethoprim/kg/ day divided into 2 doses, with a maximum dose of 160 mg trimethoprim/dose). ▪ **Group 2:** The placebo consisted of a Maalox and tonic water combination that resembled the antibiotic in color, texture, and taste.
Outcomes	**Primary outcome(s):** • Clinical resolution or failure at 10 days* **Secondary outcome(s)** • New Lesions on day 10 • New lesions on day 3-months **Safety outcome(s):** • Adverse events* *Outcomes of interest to the CMH CPG or CAT development team
Notes	• The failure rates were 5.3% (*n* = 4/76) and 4.1% (*n* = 3/73) in the placebo and antibiotic groups, respectively, yielding a difference of 1.2. • New lesions occurred at the 10-day follow-up: 19 on placebo (26.4%) and 9 on antibiotics (12.9%), yielding a difference of 13.5. • At the 3-month follow-up, 15 of 52 (28.8%) in the placebo group and 13 of 46 (28.3%) in the antibiotic group developed new lesions. The difference was 0.5%.

Risk of bias

Bias	**Judgment**	**Support for judgment**
Random sequence generation (selection bias)	Low risk	Computer randomization program
Allocation concealment (selection bias)	Unclear risk	Not discussed
Blinding of participants and personnel (performance bias)	Low risk	Participants and personal blinded
Blinding of outcome assessment (detection bias)	Low risk	The patient, parents, and clinician who assessed the clinical outcome were blinded to group assignment
Incomplete outcome data (attrition bias)	High risk	Per-protocol and study did not meet power
Selective reporting (reporting bias)	Low risk	All outcomes reported
Other bias	High risk	Low compliance rate of medications of 66%

Hogan et al. (2018)

Methods	**Cohort, prospectively**
Participants	**Participants:** <21-year-old, 2008-2016 **Setting:** ED or outpatient setting, St Louis, Missouri and Springfield, Illinois **Number enrolled into study:** *N* = 357 • **Group 1, Antibiotics:** *n* = 331 • **Group 2, No Antibiotics:** *n* = 26 **Gender, males (as defined by researchers):** • *n* = 167 (40%) **Race / ethnicity or nationality (as defined by researchers):** • White *n* = 143 (37%) • African American or biracial *n* = 237 (62%) • Asian *n* = 2 (1%) **Inclusion Criteria:** • <21 years old with community-onset *S. aureus* SSTI and *S. aureus* colonization • Presented with acute, community-onset SSTI for which an Incision and drainage procedure was performed **Exclusion Criteria:** • Immunodeficiency • Hospitalized within the previous 14 days • Decolonization measures (with mupirocin ointment, chlorhexidine gluconate, or bleach baths) in the prior month **Covariates Identified:** • Age • Race • Methicillin susceptibility of the SSTI isolate (MRSA vs methicillin-susceptible S. aureus) • Prescription of decolonization measures for baseline SSTI • Burden (i.e., number of anatomical sites) of S. aureus colonization at baseline
Interventions	**Both:** Incision and Drainage • **Group 1:** Received guideline-recommended empiric systemic antibiotics ○ Clindamycin, *n* = 220 (57%) ○ TMP-SMX, *n* = 199 (52%) ○ Vancomycin *n* = 19 (5%) ○ β-lactam *n* = 12 (3%) • **Group 2:** Did not receive guideline-recommended empiric systemic antibiotics
Outcomes	**Primary outcome(s):** • Colonized with *S. aureus* at follow-up **Secondary outcome(s):** • Recurrent SSTI at 1 year
Notes	**Results:** • Antibiotics for purulent SSTI were less likely to remain colonized at follow-up sampling, adjusted hazard ratio (aHR) = 0.49; 95% CI [.30, .79]

	• Antibiotics are less likely to have recurrent SSTI, aHR = 0.57, 95% CI [.34, .94] • Clindamycin was more effective than TMP-SMX in eradicating S. aureus colonization (44% vs 57% remained colonized, p = .03) and preventing recurrent SSTI (31% vs 47% experienced recurrence, p = .008). **Limitations:** • Limited number of antibiotic free patients • Only looked at patients with *S. aureus*

Talan et al. (2016)

Methods	**Randomized Control Trial**
Participants	**Participants:** Adults and children older than 12 years of age, April 2009 to April 2013 **Setting:** Five US Emergency Departments **Randomized into study:** *N* = 1265 • **Group 1, TMP-SMX:** *n* = 636 • **Group 2, Placebo:** *n* = 629 **Completed Study:** *N* = 1013 • **Group 1:** *n* = 504 • **Group 2:** *n* = 509 **Gender, males (as defined by researchers):** • **Group 1:** *n* = 364 (57.8%) • **Group 2:** *n* = 362 (58.7%) **Race / ethnicity or nationality (as defined by researchers):** • Not reported **Age, Median (IQR)** • **Group 1:** 35 (26-47) • **Group 2:** 35 (26-48) **Inclusion Criteria:** • Older than 12 years of age • Cutaneous lesion that was suspected to be an abscess on the basis of physical examination and ultrasonography or examination alone • Purulent material on surgical exploration • Lesion present for less than 1 week • At least 2.0 cm in diameter • Intended outpatient treatment. • Agreed to return for reevaluation **Exclusion Criteria:** • Indwelling device; suspected osteomyelitis or septic arthritis; diabetic foot, decubitus, or ischemic ulcer; mammalian bite; wound with organic foreign body; infection of another organ system/site; perirectal, perineal or paronychial location; intravenous drug use within previous month and fever; underlying skin condition; long-term care residence; incarceration; immunodeficiency; creatinine clearance <50 mL/min; cardiac condition with risk of endocarditis; allergy or intolerance to trimethoprim-sulfamethoxazole; taking warfarin, phenytoin, or methotrexate; known G-6-PD or folic acid deficiency; pregnant or lactating; trimethoprim-sulfamethoxazole treatment within 24 hours; concurrent treatment with topical or systemic antibiotic; or enrolled in the study within 12 weeks. **Power Analysis:** Enrollment of 590 participants would provide a power of 90% to detect an absolute between-group difference of 7.5 percentage points, assuming a cure rate of 90%
Interventions	**Both:** Incision and drainage of abscess

	• **Group 1:** 7-day course of trimethoprim–sulfamethoxazole (four single-strength pills, each containing 80 mg of trimethoprim and 400 mg of sulfamethoxazole, twice daily) • **Group 2: P**lacebo (four pills containing microcrystalline cellulose, twice daily).
Outcomes	**Primary outcome(s):** • Clinical cure of abscess, assessed 7 to 14 days **Secondary outcome(s)** • Subsequent surgical drainage procedures • Skin infections at new sites **Safety outcome(s):** • Adverse events *Outcomes of interest to the CMH CPG or CAT development team
Notes	

Risk of bias table

Bias	**Judgment**	**Support for judgment**
Random sequence generation (selection bias)	Low risk	Web-based randomization, assigned participants in a 1:1 ratio
Allocation concealment (selection bias)	Low risk	Drug package identical
Blinding of participants and personnel (performance bias)	Low risk	Participants and personnel blinded
Blinding of outcome assessment (detection bias)	Low risk	Outcome assessors blinded
Incomplete outcome data (attrition bias)	Low risk	Intention-to-treat, secondary outcome per-protocol
Selective reporting (reporting bias)	Low risk	All outcomes reported
Other bias	Unclear risk	potential selection bias due to physicians' ability to exclude patients at higher risk.

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Reference marked with an asterisk indicate study included in the meta-analysis.

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Appendix

ASSESSMENT

Problem Is the problem a priority?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ○ Probably yes ● Yes ○ Varies ○ Don't know	Skin and soft tissue infection is a common presentation in pediatric emergency departments and ambulatory settings, of which almost half are abscesses (Gottlieb & Peksa, 2018; Taira et al., 2009). Standard clinical treatment for abscesses includes incision and drainage, but the utility of antibiotics for simple abscesses remains unclear (Singer & Talan, 2014). The Infectious Diseases Society of America recommends that incision and drainage are likely adequate for simple abscesses (Stevens et al., 2014).	
Desirable Effects How substantial are the desirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Trivial ○ Small ● Moderate ○ Large ○ Varies ○ Don't know	Desirable effects of giving antibiotics • Clinical Cure • Decreased recurrence • Improvement in pain	
Undesirable Effects How substantial are the undesirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Large ○ Moderate ○ Small ○ Trivial ● Varies ○ Don't know	Undesirable effects of giving antibiotics • Adverse Events • Increase in bacterial resistance Varies by antibiotic type	TMP-SMX and clindamycin have different side effect, but the risk of Steven Johnson Syndrome or Toxic Epidermal Necrolysis are the potential adverse events of greatest concern with TMP-SMX. Additionally, the poor palatability of clindamycin may negatively impact medication compliance.
Certainty of evidence What is the overall certainty of the evidence of effects?		

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Very low ● Low ○ Moderate ○ High ○ No included studies	Certainty of evidence for TMP-MPX and clindamycin following incision and drainage on clinical cure and three-month recurrence is low	
Values Is there important uncertainty about or variability in how much people value the main outcomes?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Important uncertainty or variability ○ Possibly important uncertainty or variability ● Probably no important uncertainty or variability ○ No important uncertainty or variability	Probably no important uncertainty or variability in how much people value the main outcome	
Balance of effects Does the balance between desirable and undesirable effects favor the intervention or the comparison?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ Don't know	Clinical cure versus all undesirable effects (adverse events) • Probably favors the intervention of antibiotics	
Resources required How large are the resource requirements (costs)?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**

○ Large costs ○ Moderate costs ● Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know	Cost is negligible	There is cost associated with antibiotics, but there are generic, inexpensive formulations of both TMP-SMX and clindamycin. According to the CM standard charges for 2022, self-pay costs per unit include: Clindamycin 150mg capsule – $7.07 Clindamycin 300mg capsule - $10.13 Clindamycin 75mg/5ml liquid - $2.55 TMP 40mg, SMX 200mg/5ml liquid - $2.64 TMP 80mg, SMX 400mg tablet - $$7.79

Certainty of evidence of required resources
What is the certainty of the evidence of resource requirements (costs)?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Very low ○ Low ○ Moderate ● High ○ No included studies	There is certainty in the required resources	

Cost effectiveness
Does the cost-effectiveness of the intervention favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ○ Probably favors the intervention ● Favors the intervention ○ Varies ○ No included studies	Cost favors the intervention	While cost is associated with the antibiotic prescription, it is negligible compared to the cost of treatment failure (repeat clinic or ED visit, readmission, and/or repeat incision and drainage).

Equity
What would be the impact on health equity?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

○ Reduced ○ Probably reduced ○ Probably no impact ○ Probably increased ○ Increased ● Varies ○ Don't know	The cost of medication without insurance could impact subgroup populations. Subgroups may have less reliable transportation to a pharmacy. Subgroups may also have language or literacy barriers that impact the efficacy of prescription instructions.	Please see standard costs above.

Acceptability
Is the intervention acceptable to key stakeholders?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	Families and clinicians are likely to accept the intervention.	

Feasibility
Is the intervention feasible to implement?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ○ Probably yes ● Yes ○ Varies ○ Don't know	The intervention is feasible	

SUMMARY OF JUDGEMENTS

	JUDGEMENT						
PROBLEM	No	Probably no	Probably yes	**Yes**		Varies	Don't know
DESIRABLE EFFECTS	Trivial	Small	**Moderate**	Large		Varies	Don't know
UNDESIRABLE EFFECTS	Large	Moderate	Small	Trivial		**Varies**	Don't know
CERTAINTY OF EVIDENCE	Very low	**Low**	Moderate	High			No included studies

	JUDGEMENT						
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	**Probably no important uncertainty or variability**	No important uncertainty or variability			
BALANCE OF EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	**Probably favors the intervention**	Favors the intervention	Varies	Don't know
RESOURCES REQUIRED	Large costs	Moderate costs	**Negligible costs and savings**	Moderate savings	Large savings	Varies	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	Very low	Low	Moderate	**High**			No included studies
COST EFFECTIVENESS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	**Favors the intervention**	Varies	No included studies
EQUITY	Reduced	Probably reduced	Probably no impact	Probably increased	Increased	**Varies**	Don't know
ACCEPTABILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know
FEASIBILITY	No	Probably no	Probably yes	**Yes**		Varies	Don't know

TYPE OF RECOMMENDATION

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	**Conditional recommendation for the intervention**	Strong recommendation for the intervention
○	○	○	●	○

CONCLUSIONS

Recommendation

A conditional recommendation is made for the use of antibiotics for abscesses, based on the GRADE Evidence to Decision instrument the Summary of Findings Table. The overall certainty in the evidence is low to very low. In pediatric patients, the use of antibiotics ***following incision and drainage*** *was favorable for cure rate versus placebo. There is little evidence for or against antibiotics* ***following incision and drainage*** *for abscesses* ***<2cm.*** *(see Summary by Outcome for substantiation of recommendations).*

The SSTI CPG Subcommittee discussed additional considerations using the GRADE Evidence to Decision instrument[a] found in the appendix to recommend antibiotic therapy for abscess following incision and drainage at Children's Mercy based on feasibility, value, and compliance for all stakeholders.