

**CASE SCENARIO**

A 52 yo female with a PMHx of significant weight loss and status post abdominal lipectomy 1 week ago presents complaining of abdominal incision site discharge and pain. Patient states she experienced acute postoperative bleeding that was resolved with vessel ligation and washout. The wound was closed with staples and treated with betadine and pain management. However, patients report drainage from the incision site four days after the operation with associated pain. The pain is dull, constant, and non-radiating. Patient denies fever, changes in urinary frequency, diarrhea, constipation, nausea, or vomiting.

**SEARCH QUESTION :**

Does the use of prophylactic antibiotic therapy reduce the risk of surgical site infection in patients who receive anesthetic operations?

**QUESTION TYPE :**

Prevalence                      Screening                      Diagnosis  
Prognosis                      Treatment                      Harms

**Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.**

I would prioritize meta-analysis or systematic review for this study. As surgical site infections are a very common complication, I believe there to be a large number of studies on the topic. A meta-analysis and systematic review would provide a high-level of study that includes the analysis of several of these studies to draw conclusions. If meta-analysis or systematic review are not available, I would expand my search to include randomized control trials. A randomized control trial would provide a control group that does not receive prophylactic therapy and an experimental group that receives prophylactic antibiotics to assess its efficacy in reducing surgical site infections.

**PICO SEARCH TERMS :**

<b>P</b>	<b>I</b>	<b>C</b>	<b>O</b>
Lipectomy patient	Prophylactic antibiotics	No antibiotic use	Reduced surgical site infection
Abdominoplasty patient	Post-op antibiotics	Pain control alone	Control Infection
Abdominal reconstruction	Antibiotic therapy	Betadine use alone	Lowered infection rates

patient			
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**SEARCH TOOLS & STRATEGIES USED :**

Please indicate what databases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters.

For this PICO search, I included systematic analysis, meta-analysis, and randomized controlled trials with a 2012-2022 filter to ensure the studies included were of high levels of study and based upon recent data. In terms of databases, I found PubMed to yield the strongest articles as it contained multiple filter options to best filter for the studies most suitable for this PICO search. To my surprise, there were not a large number of articles pertaining specifically to abdominoplasty. This extended my search to include antibiotic prophylaxis in abdominal trauma and plastic surgery. Although this was not precisely abdominoplasty, it still referred to a similar open wound with infectious risk factors. During the search period, additional prophylactic measures that I had not originally thought of came up in my search results. For example, the use of antibiotic-coated sutures presented as a study. Although this did not pertain to the original PICO train of thought in utilizing systemic antibiotics, it provided an alternative that could still yield promising results. Initially, I was able to find three articles (Carloni, Ahmed, Brand) that pertained exactly to abdominal surgery and the use of prophylactic antibiotics. Other articles in the initial search result did not exactly pertain to the clinical case scenario presented. For this reason, I expanded my search horizons to include strong studies that could still be pertinent to the patient presented. For example, I chose to include two systematic reviews on the prevention of surgical site infections and seroma development in plastic surgery (Ariyan). Although this did not directly address abdominal surgeries, they are high level studies that investigate the most frequent complications of abdominal surgery and still provide pertinent information. Finally, I included an article that was a prospective cohort study (Toia). Although this was a high level of study, it still investigated the impact of prophylaxis antibiotics on plastic surgery cases, including abdominoplasty.

Database	Filter	Terms Searched	Articles Returned
PubMed	Meta- Analysis Systematic Review Cohort Studies RCT 2012 - 2022	Prophylactic antibiotic cosmetic surgery	17
		Prophylactic antibiotic abdominal surgery	24
JAMA	Research	Prophylactic antibiotic cosmetic	33

	Review 2012 - 2022	surgery	
		Prophylactic antibiotic abdominal surgery	<b>29</b>
<b>Cochrane</b>	Review 2012 - 2022	Prophylactic antibiotic cosmetic surgery	<b>12</b>
		Prophylactic antibiotic lipectomy	<b>1</b>
<b>Google Scholar</b>	Review Articles 2012 - 2022	Abdominoplasty prophylactic antibiotics	<b>221</b>
<b>Google Scholar</b>	Review Articles 2012 - 2022	Prophylactic antibiotic lipectomy	<b>105</b>

## **RESULTS FOUND :**

### **Article 1 : Circumferential Contouring of the Lower Trunk: Indications, Operative Techniques, and Outcomes-A Systematic Review**

#### **Citation:**

Carloni R, De Runz A, Chaput B, Herlin C, Girard P, Watier E, Bertheuil N. Circumferential Contouring of the Lower Trunk: Indications, Operative Techniques, and Outcomes-A Systematic Review. Aesthetic Plast Surg. 2016 Oct;40(5):652-68. doi: 10.1007/s00266-016-0660-7. Epub 2016 Jun 10. Erratum in: Aesthetic Plast Surg. 2016 Oct;40(5):669. PMID: 27286851.

**Type of Study:** Systematic Review

#### **Abstract:**

Abdominoplasty is a common aesthetic procedure performed after significant weight loss, childbirth, or from the results of aging by removing excess skin tissue around the lower trunk. Infection is a common complication following this surgical procedure. However, the use of

prophylactic antibiotics remains controversial in an uncomplicated operation as it may not be needed and result in antibiotic resistance. For these reasons, this study aims to study if antibiotic prophylaxis reduces the risk of infection following abdominoplasty.

**Methods :**

This systematic review was performed in 2015. Two independent reviewers screened for eligible studies.

The following databases were used to search for eligible studies :

- Pubmed
- Cochrane Library

The following criteria were used as inclusion factors :

- Original Articles
- Randomized Controlled Trials
- Controlled Clinical Trials
- Retrospective Observational Studies
- Prospective Observational Studies
- Case Reports
- Letters to the editor
- Technical Descriptions

The following criteria were used as exclusion factors :

- Two-step surgery
- Circumferential contouring of the upper trunk
- Isolated abdominoplasty
- Isolated buttock lift
- Circumferential liposuction without skin resection
- Studies in languages other than English or French

The following search terms were used :

- Bodylift OR body lift
- Circumferential body contouring OR circumferential abdominoplasty
- Lower body lift
- Bodylifting
- Circumferential contouring
- Belt lipectomy
- Circumferential dermolipectomy
- Truncal bodycountouring
- Circumferential belt lipectomy
- Circular lipectomy

**Results :**

This study ultimately included 42 studies with 1748 abdominoplasty patients. This study looked at patient indications for surgery and operative techniques (including antibiotic prophylaxis). All patients were treated with first or second generation cephalosporins. Prophylactic antibiotic use was given at a dose of 1 - 2 g peri-operatively and then followed by 1 g three times a day. Infection rate was reported at (7%[68]–8%[78]) among abdominoplasty patients. Antibiotic use was recommended as it was associated with a reduced number of infection rates.

**Reason for Selection:** This study was selected as it was a systemic review performed within the last 10 years that offered recent data at the highest level of study. Furthermore, this study focused primarily on abdominoplasties with an overview of the entire surgical process. The study looked at antibiotic prophylaxis given during and immediately after the operation and pertains to the clinical case scenario of this PICO study.

**Conclusion :**

This study showed antibiotic therapy using first and second generation cephalosporins peri-operatively and post-operatively was associated with lower risk of infection. However, this study aimed to study several aspects of abdominoplasty such as preoperative assessment, use of liposuction, antibiotic prophylaxis, and thromboprophylaxis. As a result, the study did not study in depth the use of antibiotic prophylaxis and only provided a general statement that antibiotic therapy was found to reduce infection rates and recommended. A meta-analysis that focused solely on the use of antibiotic prophylaxis would provide more detailed data and a stronger study.

**Key Points:**

- Most common complications of abdominoplasty included wound dehiscence, abscess, skin necrosis, fat necrosis, seroma evacuation, and hematoma
- The use of antibiotic prophylaxis with first and second generation cephalosporins was associated with reduced infection rates

**Article 2 - The use of triclosan-coated sutures to prevent surgical site infections: a systematic review and meta-analysis of the literature****Citation:**

Ahmed I, Boulton AJ, Rizvi S, Carlos W, Dickenson E, Smith NA, Reed M. The use of triclosan-coated sutures to prevent surgical site infections: a systematic review and meta-analysis of the literature. *BMJ Open*. 2019 Sep 3;9(9):e029727. doi: 10.1136/bmjopen-2019-029727. PMID: 31481559; PMCID: PMC6731927.

**Type of Study:** Systematic Review & Meta-Analysis

**Abstract:**

Surgical site infection remains one of the most common complications of surgical procedures. SSIs are associated with lengthened hospital stays, increased morbidity, and increased mortality. They also added additional medical costs, resources, and time to treat. One factor that must be considered to prevent infection is how the incision is closed. This study aims to study the use of antibiotic-coated sutures to see if they are more effective in reducing post-op surgical site infections.

**Methods :**

This systematic review was performed in 2019. The search for eligible articles was performed by two independent reviewers. Any discrepancies were resolved with a third independent reviewer.

The following databases were used to search for eligible studies :

- MEDLINE
- Excerpta Medica Database
- Allied and Complementary Medicine
- Cochrane Central Register of Controlled Trials

The following search terms were used :

- Triclosan
- Anti-bacterial agents
- Anti-infective agents
- Local
- Coated materials
- Biocompatible
- Biomimetic Material
- Sutures
- Vicryl Plus
- Monocryl Plus
- PDS Plus
- Surgical Site Infection
- Surgical Wound Infection

**Results :**

The initial search yielded 357 articles of relevance. The study ultimately included 24 randomized controlled trials with 11, 957 participants. 6,008 participants received wound closure with triclosan-coated sutures. 5, 949 participants received wound closure with non-triclosan coated sutures. Patients were reviewed 30 days post-op for signs of infection. Patients who received triclosan-coated sutures were significantly reduced (RR 0.73, 95% CI 0.65 to 0.82). 420 out of the 6,008 participants who received triclosan-coated sutures experienced infection. In contrast, 581 of the 5, 949 participants who received standard sutures experienced infection.

**Reason for Selection:**

This study was selected as it was a systematic review meta-analysis performed within the last 10 years that offered recent data at the highest level of study. Although this study did not look specifically at abdominoplasty, it did study the closure of surgical wounds and is still applicable to the clinical case scenario presented. This also looked at an alternative route of delivery of antibiotic administration. When searching for a solution or treatment plan, I believe it is important to look at all available options to determine the best course of action.

**Conclusion :**

The use of triclosan-coated sutures was found to significantly reduce the risk of surgical site infections compared to use of standard sutures.

**Key Points:**

- Triclosan-coated sutures reduced the risk of surgical site infections
- 420/6,008 patients experienced SSIs with use of triclosan-coated sutures
- 581/5,949 patients experienced SSI with use of standard sutures

**Article 3 - Prophylactic antibiotics for penetrating abdominal trauma****Citation:**

Brand M, Grieve A. Prophylactic antibiotics for penetrating abdominal trauma. Cochrane Database Syst Rev. 2019 Dec 12;12(12):CD007370. doi: 10.1002/14651858.CD007370.pub4. PMID: 31830316; PMCID: PMC6907398.

**Type of Study: Randomized Controlled Trials**

**Abstract:** Abdominal trauma refers to when the peritoneal cavity has been exposed. As a result, the area becomes especially susceptible to infection as it is exposed to environmental elements. The use of antibiotics is heavily argued to determine its efficacy in reducing surgical site infection rate. Timing of antibiotic administration is also important on whether it is delivered prior to the surgery, during, or afterwards. This study aims to investigate the efficacy of antibiotic use in the setting of abdominal trauma to reduce infection.

**Methods :**

Participants with penetrating abdominal wounds who were not on antibiotics were included in this study. The trial group was given prophylactic antibiotic administration when presented to the ED or perioperatively. The control group was provided a placebo or no antibiotic. Infection rates were measured by assessing septic complications, intra-abdominal abscesses, wound infections, mortality, and septicemia.

**Results :**

This study found a 7 - 11% post-surgical infection with preoperative antibiotics. There was a 33 - 57% associated infection rate with intraoperative antibiotic administration and 30 - 70% infection rate with post-operative antibiotic administration. This study suggests that early antibiotic prophylaxis is associated with reduced surgical site infections.

**Reason for Selection:**

This study was selected as it was a randomized control trial performed in 2019 pertaining to prophylactic antibiotic use in the abdominal region. This pertains to the same anatomical region and similar type of exposure as referenced in the clinical case scenario. Although this is not the same surgical operation, it is still applicable due to the nature and area of the region with exposure to similar infectious risks.

**Conclusion :**

This study suggests that early prophylactic antibiotic administration is associated with lower rates of surgical site infection. However, there are several weaknesses in this study. The study does specify the type of antibiotic used, dosage of antibiotic used, or comorbidities in the patient. These all present as confounding factors that can drastically influence results. For this reason, a stronger study would keep more consistent across the board to ensure that antibiotic administration was the only major change influencing results. This would allow for better assessment on the efficacy of antibiotic prophylaxis on abdominal wound infection.

**Key Points:**

- Antibiotic administration pre-operatively was associated with the lowest rate of abdominal site site infection compared to peri-operatively and post-operatively.

**Article 4 - Antibiotic prophylaxis for preventing surgical-site infection in plastic surgery: an evidence-based consensus conference statement from the American Association of Plastic Surgeons**

**Citation:**

Ariyan S, Martin J, Lal A, Cheng D, Borah GL, Chung KC, Conly J, Havlik R, Lee WPA, McGrath MH, Pribaz J, Young VL. Antibiotic prophylaxis for preventing surgical-site infection in plastic surgery: an evidence-based consensus conference statement from the American Association of Plastic Surgeons. *Plast Reconstr Surg*. 2015 Jun;135(6):1723-1739. doi: 10.1097/PRS.0000000000001265. PMID: 25724064.

**Type of Study:** Systematic Review



**Abstract:**

As there is a growing concern for antibiotic resistance, the use of prophylactic antibiotics is used with caution and hesitation. However, the surgical procedure places the patient at a heightened risk of infection with incision and exposure to environmental contaminants. This study investigates the use of prophylactic antibiotics in plastic surgery cases and its efficacy in reducing surgical site infections.

**Methods :**

This systematic review was performed in 2015. The study was performed by two independent reviewers.

The following databases were used to search for eligible studies :

- MEDLINE
- Cochrane Library
- Embase

Studies performed in all languages were included. All search terms that were synonymous with antibiotics were combined with terms used for relevant plastic surgery procedures in this search.

**Results :**

2, 042 studies were initially included. Of these, 67 studies were included and broken down as the following :

- 9 breast surgeries
- 17 head & neck surgeries
- 10 orthognathic surgeries
- 7 rhinoplasty/septoplasty
- 19 hand surgeries
- 5 skin surgeries
- 2 abdominoplasties

Antibiotic prophylaxis was given as a single dose or up to 24 hours of antibiotic prophylaxis perioperatively.

**Reason for Selection:**

This study was selected as it was a systematic review performed in 2015. This provides a high level of study that was performed in recent years with relevant data. Although this study examined multiple types of cosmetic surgeries, it paid particular attention to abdominoplasty and addresses the clinical case scenario presented in this PICO study.

**Conclusion :**

Antibiotic prophylaxis was recommended for clean breast surgery and contaminated surgery of the hand, head, and neck. However, it was not recommended to reduce infection in clean surgery cases of the hand, skin, head, neck, and abdominoplasty. With a focus on abdominoplasty, the use of prophylactic antibiotics was found to result in an insignificant reduction in surgical site infection (6.5% vs 13.0%; OR 0.47, 95% CI 0.18 - 1.23, p = 0.12).

**Key Points:**

- Prophylactic antibiotic therapy was recommended for contaminated surgery or hand, head and neck
- Prophylactic antibiotic therapy was not recommended for clean surgery cases of hand, skin, head, neck, abdominoplasty

**Article 5 - Strategies for Postoperative Seroma Prevention : A Systematic Review****Citation:**

Ariyan, Stephan M.D., M.B.A.; Martin, Janet Pharm.D.; Lal, Avtar Ph.D.; Cheng, Davy M.D.; Borah, Gregory L. M.D., D.M.D.; Chung, Kevin C. M.D., M.S.; Conly, John M.D.; Havlik, Robert M.D.; Lee, W. P. Andrew M.D.; McGrath, Mary H. M.D., M.P.H.; Pribaz, Julian M.D.; Young, V. Leroy M.D.. Antibiotic Prophylaxis for Preventing Surgical-Site Infection in Plastic Surgery: An Evidence-Based Consensus Conference Statement from the American Association of Plastic Surgeons. Plastic and Reconstructive Surgery: June 2015 - Volume 135 - Issue 6 - p 1723-1739  
doi: 10.1097/PRS.0000000000001265

**Type of Study:** Systematic Review

**Abstract:**

A common complication of surgeries is the formation of seromas. A seroma is build-up of bodily fluids in space where tissue has been removed. Seromas typically cause the patient discomfort and can require additional surgical procedures to treat. Furthermore, seromas carry the risk of becoming infected and forming an abscess For this reason, this study aims to investigate techniques that can reduce the formation of postoperative seromas and their associated adverse effects.

**Methods :**

This systematic review was performed in 2016. The study was performed by two independent reviewers.

The following databases were used to search for eligible studies :

- PubMed

The following search terms were used:

- Seroma
- Fibrin
- Quilting
- Progressive tension sutures
- Sclerosant

**Inclusion Criteria:**

- English language studies
- Randomized Controlled Trials
- Procective Studies

**This systematic review assessed seromas based on the following:**

- Use of drains
- Time to drain seroma
- Intensity of drain vacuum
- Method of tissue dissection (sharp tool vs. cautery vs. ultrasonic)
- Method of vessel ligation (cautery vs. suture vs. clip)
- Dissection Plane
- Use of quilting progressive tension sutures
- Use of sclerosant
- Use of fibrin
- Use of talc
- Post-op immobilization
- Post-op compression

**Results :**

This study was selected as it was a systematic review performed in 2016 that ultimately included 75 studies and 7, 173 participants. It concluded that the most protective methods in preventing seroma formation for abdominal surgeries were the use of close-suction drainage, talc, tension & quilted sutures, and bedrest for 48 hours were found to be most effective in reducing seroma formation. In contrast, the use of sclerosant was found with an increased risk of seroma formation. Post-operative compression also did not demonstrate effective risk reduction in the formation of seromas.

**Reason for Selection:**

This study was selected as it focused on the reduction of seromas after surgery. Seromas are a common complication of surgical procedures and presented in the patient in the clinical case scenario. Furthermore, seroma formation was the source of surgical site infection. For this reason, this study was especially pertinent to assess how to reduce the risk of this common complication and its associated risk of infections.

**Conclusion :**

This study concluded that seromas are, indeed, a common complication of surgery. However, its formation can be drastically reduced with the implementation of simple strategies. This includes the use of post-operative compression, drainages, sclerosants, post-op mobilization, and fibrin/thrombin therapy. This study also showed that not all these strategies work the same across different types of surgeries. For abdominal surgeries, use of close-suction drainage, talc, tension & quilted sutures, and bedrest for 48 hours were found to be most effective in reducing seroma formation.

**Key Points:**

- Seroma formation is a common complication of surgical procedures and increases the risk of infection
- Closed-suction drainage, talc, tension & quilted sutures, and bedrest for 48 hours reduced seroma formation
- Use of post-op compression (ex. Abdominal binders) did not reduce risk of seroma formation
- Use of sclerosant increased risk of seroma formation

**Article 6 - Perioperative Antibiotic Prophylaxis in Plastic Surgery : A prospective study of 1100 adult patients****Citation:**

Toia F, D'Arpa S, Massenti MF, Amodio E, Pirrello R, Moschella F. Perioperative antibiotic prophylaxis in plastic surgery: a prospective study of 1,100 adult patients. J Plast Reconstr Aesthet Surg. 2012 May;65(5):601-9. doi: 10.1016/j.bjps.2011.11.038. Epub 2011 Dec 3. PMID: 22137974.

**Type of Study:** Prospective Cohort Study

**Abstract:**

Patients who chose to undergo elective plastic surgery have been on the rise. In the future, the number of plastic surgery cases is expected to increase. However, plastic surgery carries the risk for surgical site infection. This study aims to determine the efficacy of prophylactic antibiotic administration to prevent bacterial contamination of the surgical site and reduce postoperative infection. This study further breaks down the efficacy of antibiotic prophylaxis based on the type of plastic surgery performed.

**Methods :**

948 patients between April 2009 - April 2010 were enrolled in this study. These patients underwent elective reconstructive or cosmetic procedures. 550 of these patients were male and 428 of the patients were female. The mean age of the patients was 58.1 years with a mean hospital stay of 5.2 days.

The procedures were classified into the following groups :

- Superficial Skin surgery & simple mucosal excision (517) participants
- Rhinoplasty, lymphadenectomy, cosmetic procedures, breast, limb surgery (287 participants)

- Implants, Incisional Hernias, Osteoarticular Surgery (79 participants)
- Oral Cavity and Genitourinary System (95 participants)

Prophylactic antibiotics were administered preoperatively in 23.4% of cases based on an ASA score greater than 3. No patients in group 1 had an ASA score that indicates antibiotic use. Patients received a single dose of IV cefazolin 2g in groups 2 and 3 and 2.2g of amoxicillin clavulanate in group 4.

Patients were monitored in an outpatient setting 30 days after post-op for signs of infection.

**Results :**

This study showed the overall occurrence of surgical site infections was 1.4%. All infections that occurred were superficial and did not cause deep or organ infection. The most common source of infection was *S. aureus* at 65%. Patients who smoked cigarettes and procedures over two hours were associated with increased rates of infection.

**Reason for Selection:**

This study was selected as it was performed within the last ten years and looked at the effects of antibiotic prophylaxis on different plastic surgery types. This study also used the ASA score to decide which patient would receive prophylactic antibiotic therapy. This provides a recent study that looks at plastic surgery and antibiotic prophylaxis that pertains to the clinical case scenario. It further studies in detail as to which patient should receive such treatment.

**Conclusion :**

This study showed that no participants in group 1 (superficial, simple mucosal excisions) required prophylactic antibiotics. However, antibiotic prophylaxis was always indicated for patients who underwent prosthetic surgery, incisional hernias, osteoarticular surgery, oral surgery, and genitourinary surgery. Prophylactic antibiotics were also indicated if the operation lasted over 3 hours and if the patient's ASA (American Society of Anesthesiologists) score was 3 or greater.

**Key Points:**

- Antibiotic prophylaxis is always indicated in prosthetic surgery, incisional hernias, osteoarticular surgery, oral surgery, and genitourinary surgery
- Antibiotic prophylaxis is indicated when the operation lasts over 3 hours and if the patient has an ASA > 3
- Infection occurred in 1.4% of cases.
- The most common source of infection was *S. aureus* at 65%.
- Patients who smoked cigarettes and procedures over two hours were associated with increased rates of infection.

**Summary of the Evidence:**

<i>Author (Date)</i>	<i>Level of Evidence</i>	<i>Sample/Setting (# of subjects/ studies, cohort definition etc)</i>	<i>Outcome(s) studied</i>	<i>Key Findings</i>	<i>Limitations and Biases</i>
Carlioni R, De Runz A, Chaput B, Herlin C, Girard P, Watier E, Bertheuil N. (2016)	Systematic Review	<ul style="list-style-type: none"> <li>- 42 studies (1, 748 abdominoplasty patients</li> <li>- All patients treated with 1st or 2nd cephalosporins</li> </ul>	<ul style="list-style-type: none"> <li>- Postoperative Infection rate</li> <li>- Postoperative complications (seroma, wound dehiscence, scar irregularities)</li> </ul>	<ul style="list-style-type: none"> <li>- Most common complications of abdominoplasty included wound dehiscence, abscess, skin necrosis, fat necrosis, seroma evacuation, and hematoma</li> <li>- The use of antibiotic prophylaxis with first and second generation cephalosporins was associated with reduced infection rates</li> </ul>	- This study included strong inclusion criteria for the types of procedures included and antibiotics administered. However, it did not specify age, gender, or comorbidities of participants. These factors could drastically influence results and should be included for a stronger study.
Ahmed I, Boulton AJ, Rizvi S, Carlos W, Dickenson E, Smith NA, Reed M. (2019)	Systematic Review & Meta-Analyses	<ul style="list-style-type: none"> <li>- <b>24</b> studies (randomized)</li> </ul>	<ul style="list-style-type: none"> <li>- Postoperative surgical site infection</li> </ul>	<ul style="list-style-type: none"> <li>- Triclosan-coated sutures reduced the</li> </ul>	- This study included strong inclusion criteria for the types of sutures used and suture technique. However, it did not specify age, gender, or

		<ul style="list-style-type: none"> <li>- controlled trials)</li> <li>- 11, 957 total participants</li> <li>- 6, 008 received triclosan-coated sutures</li> <li>- 5, 949 participants received non-triclosan coated sutures</li> </ul>	<ul style="list-style-type: none"> <li>- Incidence of superficial vs. deep infections</li> </ul>	<ul style="list-style-type: none"> <li>- risk of surgical site infections</li> <li>- 420/6,008 patients experienced SSIs with use of triclosan-coated sutures</li> <li>- 581/5,949 patients experienced SSI with use of standard sutures</li> </ul>	<p>comorbidities of participants. These factors could drastically influence results and should be included for a stronger study.</p>
Brand M, Grieve A. (2019)	Randomized Controlled Trials	<ul style="list-style-type: none"> <li>- Participants who had isolated penetrating abdominal wound and not on antibiotics</li> </ul>	<ul style="list-style-type: none"> <li>- Infection rates pre-op vs. post-op antibiotic administration</li> <li>- Mortality</li> <li>- Septicaemia</li> </ul>	<ul style="list-style-type: none"> <li>- Antibiotic administration pre-operatively was associated with the lowest rate of abdominal site infection compared to peri-operatively and post-operatively.</li> </ul>	<ul style="list-style-type: none"> <li>- This study did not provide standardization as to what type of antibiotics were used and its dosage. A stronger study would give the same type and amount of prophylactic antibiotic on the same surgery type and similar patients to observe the efficacy of antibiotic prophylaxis.</li> </ul>
Ariyan S, Martin J, Lal A, Cheng D, Borah GL, Chung KC, Conly J, Havlik	Systematic Review	<ul style="list-style-type: none"> <li>- 67 studies</li> </ul>	<ul style="list-style-type: none"> <li>- Antibiotic use effects on hand, head, neck, skin, breast, nose, and</li> </ul>	<ul style="list-style-type: none"> <li>- Prophylactic antibiotic therapy was recommended</li> </ul>	<ul style="list-style-type: none"> <li>- This study was strong in that it maintained a uniform administration of antibiotic type, dosage,</li> </ul>

<p>R, Lee WPA, McGrath MH, Pribaz J, Young VL (2015)</p>			<p>abdominal surgery</p> <ul style="list-style-type: none"> <li>- Post-operative surgical site infection rate</li> </ul>	<p>for contaminated surgery or hand, head and neck</p> <ul style="list-style-type: none"> <li>- Prophylactic antibiotic therapy was not recommended for clean surgery cases of hand, skin, head, neck, abdominoplasty</li> </ul>	<p>and timing. However, inclusion criteria did not identify patient age, gender, comorbidities or factors in surgical techniques. These are all possible confounding factors that could have skewed results.</p>
<p>Ariyan, Stephan M.D., M.B.A.; Martin, Janet Pharm.D.; Lal, Avtar Ph.D.; Cheng, Davy M.D.; Borah, Gregory L. M.D., D.M.D.; Chung, Kevin C. M.D., M.S.; Conly, John M.D.; Havlik, Robert M.D.; Lee, W. P. Andrew M.D.; McGrath, Mary H. M.D., M.P.H.; Pribaz, Julian M.D.; Young, V. Leroy M.D. (2015)</p>	<p>Systematic Review</p>	<ul style="list-style-type: none"> <li>- 75 studies (randomized-controlled trials, prospective studies)</li> <li>- 7, 173 total participants who received surgical procedures</li> </ul>	<ul style="list-style-type: none"> <li>- Assessed effects of using close-suction drains, method of tissue dissection, method of vessel ligation, dissection plane, quilted sutures, sclerosants, fibrin/thrombin, immobilization, compression, &amp; talc</li> <li>- Postoperative seroma formation</li> <li>- Postoperative infection rate</li> </ul>	<ul style="list-style-type: none"> <li>- Seroma formation is a common complication of surgical procedures and increases the risk of infection</li> <li>- Closed-suction drainage, talc, tension &amp; quilted sutures, and bedrest for 48 hours reduced seroma formation</li> <li>- Use of post-op compression (ex. Abdominal binders) did not reduce risk</li> </ul>	<ul style="list-style-type: none"> <li>- This study covered a wide range of surgery types. A stronger study could have looked specifically at abdominoplasties and ensured all patient types, surgical techniques, and antibiotic administration remained uniform to assess for the efficacy of antibiotic administration.</li> </ul>



				<ul style="list-style-type: none"> <li>- of seroma formation</li> <li>- Use of sclerosant increased risk of seroma formation</li> </ul>	
<p>Toia F, D'Arpa S, Massenti MF, Amodio E, Pirrello R, Moschella F. (2012)</p>	<p>Prospective Cohort Study</p>	<ul style="list-style-type: none"> <li>- 948 patients between April 2009 - April 2010 who underwent elective reconstructive or cosmetic procedures.</li> <li>- 550 male participants</li> <li>- 428 female participants</li> <li>- Mean age of the patients was 58.1 years</li> </ul>	<ul style="list-style-type: none"> <li>- Prophylactic Antibiotic Use in Plastic Surgery</li> <li>- Post-Op outpatient surgical site infection rate after 30 days</li> </ul>	<ul style="list-style-type: none"> <li>- Infection occurred in 1.4% of cases.</li> <li>- The most common source of infection was <i>S. aureus</i> at 65%.</li> <li>- Patients who smoked cigarettes and procedures over two hours were associated with increased rates of infection.</li> <li>- Antibiotic prophylaxis is always indicated in prosthetic surgery, incisional hernias, osteoarticular surgery, oral surgery, and genitourinary surgery</li> </ul>	<ul style="list-style-type: none"> <li>- This study covered a wide range of surgery types. A stronger study could have looked specifically at abdominoplasties and ensured all patient types, surgical techniques, and antibiotic administration remained uniform to assess for the efficacy of antibiotic administration.</li> <li>- This study also did not include a detailed post-op care guideline. Patients could have adhered to different post-op treatments that could have drastically affected infection outcomes.</li> </ul>

		- Mean hospital stay of 5.2 days		- Antibiotic prophylaxis is indicated when the operation lasts over 3 hours and if the patient as an ASA > 3	
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**Conclusion(s):**

**Weight of Evidence:**

**The articles were organized from strongest to weakest weight of evidence.**

I would weigh Article 1, **Circumferential Contouring of the Lower Trunk: Indications, Operative Techniques, and Outcomes-A Systematic Review** as the strongest study. This was a systematic review that focused on every aspect of the abdominoplasty procedure. Although antibiotic prophylaxis was only a portion of this study, the study provided an overall holistic perspective of the procedure, what it entailed, and how to best provide a favorable patient outcome. Furthermore, the study was a systematic review performed in 2016 to provide a high level of study with recent data. This article concluded that antibiotic therapy using first and second generation cephalosporins peri-operatively and post-operatively was associated with lower risk of infection.

Next, I would rank Article 2, **The use of triclosan-coated sutures to prevent surgical site infections: a systematic review and meta-analysis of the literature** as the next strongest study. This study also presented as a high-level of study as a systematic review and meta-analysis performed within the last 10 years. However, it delivered antibiotic therapy through an unconventional method of wound closure instead of systemic delivery. This study addressed the PICO case scenario but through an alternative delivery method. For this reason, it still presents as a strong case with slight deviation from the original suggested treatment therapy. This article showed that the use of triclosan-coated sutures was found to significantly reduce the risk of surgical site infections compared to use of standard sutures.

I would select Article 3, **Prophylactic antibiotics for penetrating abdominal trauma**, as the next strongest study. This study addressed open wounds in the abdominal region and prophylactic abdominal therapy. However, as this was a trauma associated with abdominal opening, there is greater risk of infection as it occurred in a non-sterile setting. Factors such as time between trauma and medical intervention and object of trauma can drastically influence results. This article suggests that early prophylactic antibiotic administration is associated with lower rates of surgical site infection.

Next, Article 4, **Antibiotic prophylaxis for preventing surgical-site infection in plastic surgery: an evidence-based consensus conference statement from the American Association of Plastic Surgeons**, presents as a weaker study. This is due to the fact that the study investigated multiple plastic surgery types with a low emphasis on abdominoplasties. Although it addresses the PICO clinical case scenario, greater research

design geared towards abdominal surgery would have yielded stronger and more conclusive data. This would include a greater sample size of patients receiving abdominoplasties. Participants would be within the same age group with similar comorbidities and receive the same type and dosing of prophylactic antibiotics. This article concluded that prophylactic antibiotics are not recommended to reduce infection in clean surgery cases of the hand, skin, head, neck, and abdominoplasty.

I would then rank Article 6, **Perioperative Antibiotic Prophylaxis in Plastic Surgery : A prospective study of 1100 adult patients**, as the next strongest study. This was a prospective cohort study that is a lower level of study compared to systematic review and meta-analyses. Furthermore, the study did not look specifically at abdominoplasties. However, it did include abdominoplasties among the plastic surgery cases reviewed. The study was strong in that it detailed its methods and indications for prophylactic antibiotic therapy. But this study was weak in its inclusion criteria for patients included, did not factor out comorbidities, and did not have a detailed guideline for post-operative care and determination of infection. This article showed that antibiotic prophylaxis is indicated when the operation lasts over 3 hours and if the patient has an ASA > 3

Last, I would select Article 5, **Strategies for Postoperative Seroma Prevention : A Systematic Review**, as the weakest study. This is due to the fact that this study did not look directly at antibiotic therapy and its effects on abdominoplasty. However, it did investigate prevention techniques on the development of seromas. Seromas are, indeed, a common complication of surgeries that lead to infections and presented in the clinical case scenario. For this reason, this study tangentially addressed the question addressed in this PICO study. I included this study as it still provided pertinent information and alternative strategies to reduce infection after abdominoplasty. When determining the efficacy of a treatment option, it is important for a medical provider to consider and implement additional measures to help reduce adverse effects for optimal patient care. This article demonstrated that closed-suction drainage, talc, tension & quilted sutures, and bedrest for 48 hours were most effective in reducing seroma formation.

Overall, 3 of 6 articles recommended the use of prophylactic antibiotics for the reduction of infection. 1 of 6 articles did not recommend the use of antibiotics and 1 of 6 was inconclusive.

### **Clinical Bottom Line:**

#### **Magnitude of any effects**

At this point, I would rate the magnitude of effects as moderate. Four of the five articles demonstrated lower rates of postoperative infection with the administration of antibiotic prophylaxis. However, I would argue that there are limitations to these studies as they did not have strong inclusion criteria for participants studies and standardized surgical technique. Although there appears to be a strong association between prophylaxis antibiotics use and reduced abdominal surgery infections, stronger studies need to take place to confidently advocate its benefits.

**Clinical significance (not just statistical significance)**

The clinical bottom line is that the use of prophylactic antibiotic therapy remains controversial in abdominoplasty. The studies show conflicting recommendations on whether the use of antibiotics actually reduces the risk of surgical site infections. As there is conflicting evidence on the efficacy of systemic antibiotic therapy, I would not recommend its use as the cons of developing antibiotic resistance outweighs and administering unnecessary medications outweighs the pros of reducing infections. Among the studies, alternative measures such as using antibiotic-sutures show promising outcomes. For this reason, I would recommend the use of antibiotic-coated sutures and sterile operative techniques as the main line of defense against surgical site infections. As a provider, I would only recommend systemic antibiotic therapy to patients with significant comorbidities that may interfere with the healing process and increase risk of infection.

**Any other considerations important in weighing this evidence to guide practice**

For abdominoplasty surgeries, I would heavily consider the type of patient encountered. This type of surgery is often used for cosmetic purposes. I would assess whether the surgery is necessary for the patient and if the patient is capable of postoperative care. As abdominoplasty is an invasive and intensive procedure, compliance from the patient is just as important as surgical technique to ensure safe and effective surgical outcomes.