Perioperative Antibiotics in Otosurgery

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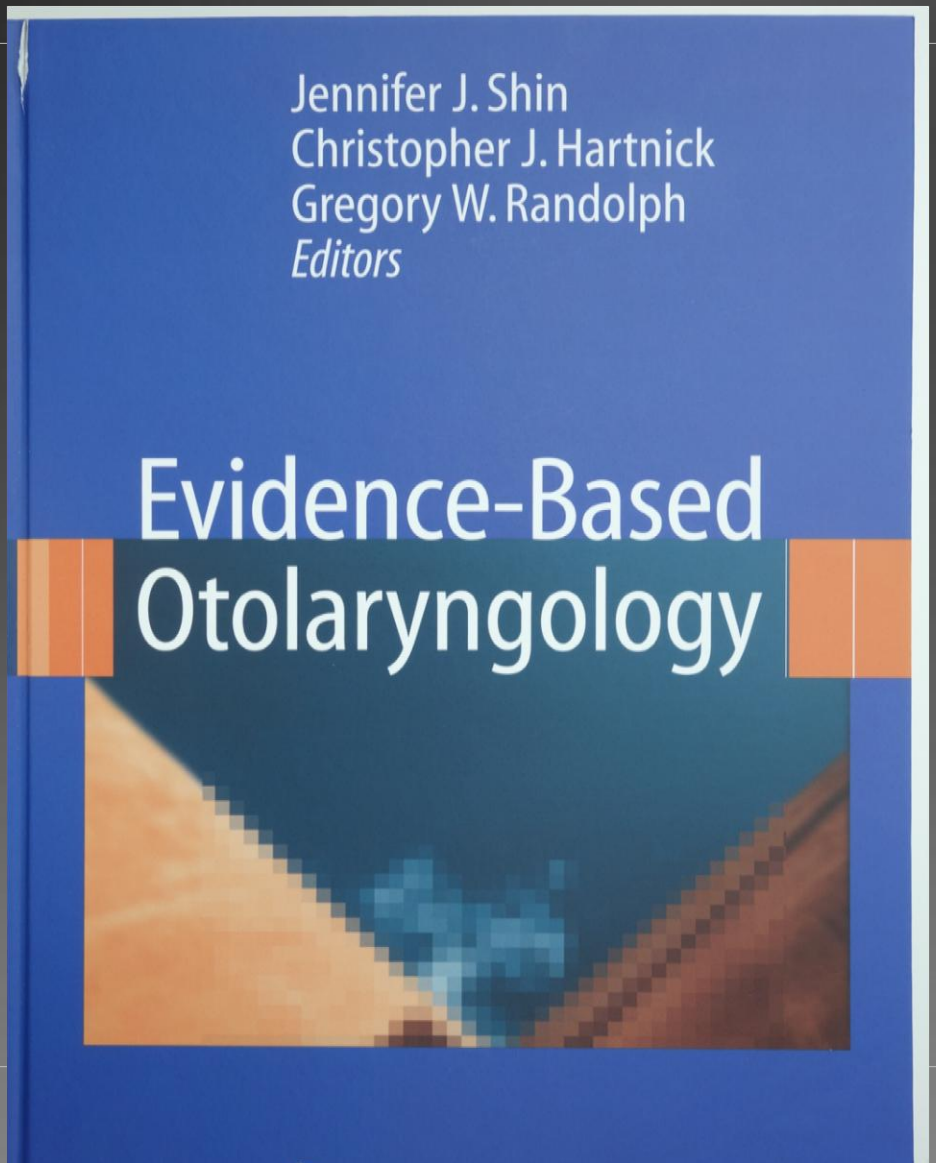
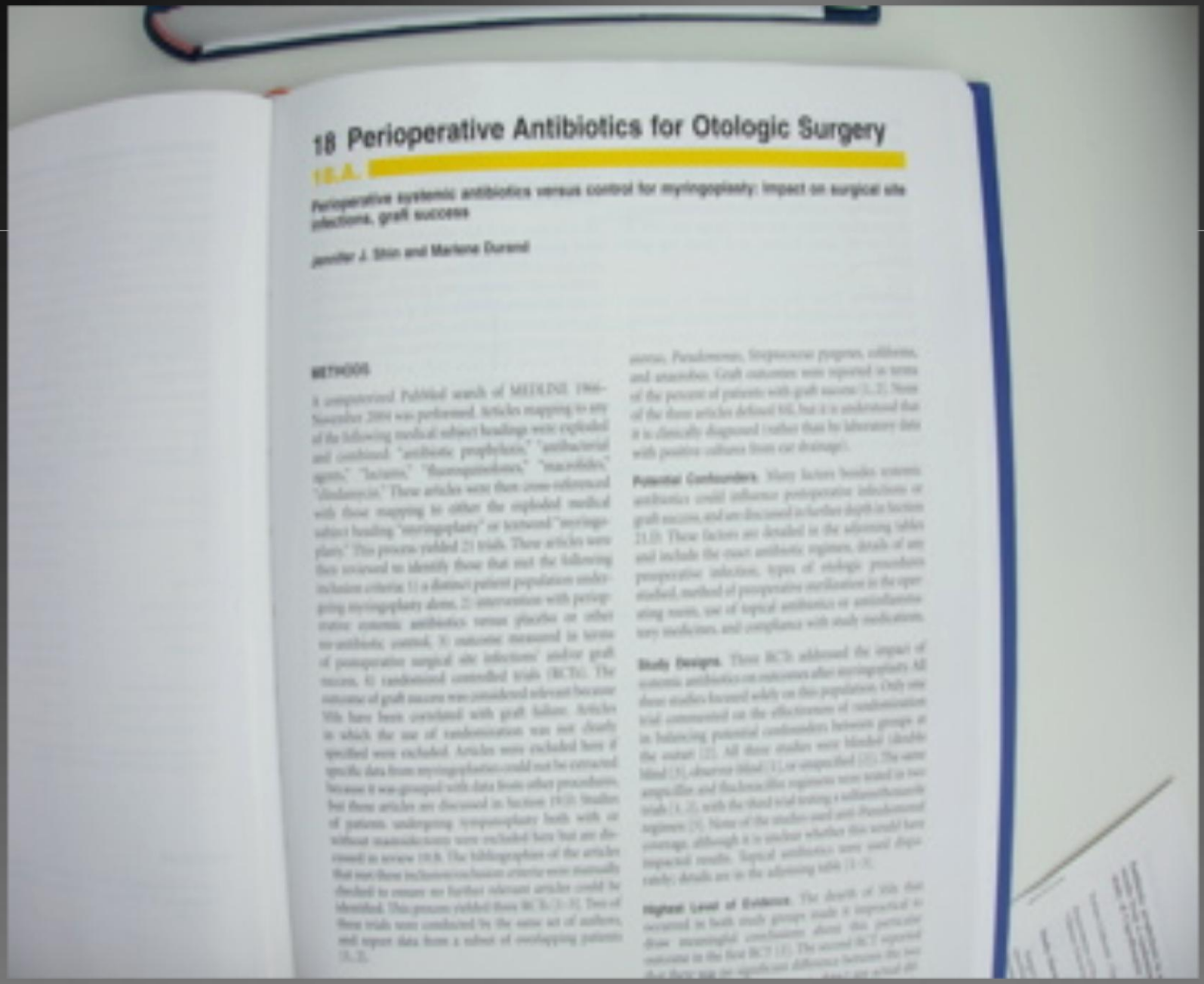
- **KEY MESSAGES:**
- DEFINITIONS??
- WIDESPREAD USE
- RECENT METAANALYSES
- LITTLE OR NO EVIDENCE OF EFFICACY


Efficacy of perioperative ceftazidime in the surgical treatment of chronic otitis media due to Pseudomonas aeruginosa
Preoperative swabs for the tre
draining ears after middle ear
Antibiotic prophylaxis in middle ear surgery: a report of problems and results from a randomized placebo-controlled, double-blind, and multicenter study of Ciprofloxacin in surgery for chronic suppurative otitis media


Jennifer J. Shin
Christopher J. Hartnick
Gregory W. Randolph
Editors
Evidence-Based
Otolaryngology



18 Perioperative Antibiotics for Otologic Surgery

18.A.

Perioperative systemic antibiotics versus control for myringoplasty: impact on surgical site infections, graft success

Jennifer J. Shin and Marlene Durand

METHODS

A computerized PubMed search of MEDLINE 1966–November 2004 was performed. Articles mapping to any of the following medical subject headings were exploded and combined: "antibiotic prophylaxis," "antibacterial agents," "bacteria," "fluoroquinolones," "macrolides," "clindamycin." These articles were then cross-referenced with those mapping to either the exploded medical subject heading "myringoplasty" or textword "myringoplasty." This process yielded 21 trials. These articles were then reviewed to identify those that met the following inclusion criteria: 1) a distinct patient population undergoing myringoplasty alone, 2) intervention with perioperative systemic antibiotics versus placebo or other no-antibiotic control, 3) outcome measured in terms of postoperative surgical site infections and/or graft success, 4) randomized controlled trials (RCTs). The outcome of graft success was considered relevant because SSIs have been correlated with graft failure. Articles in which the use of randomization was not clearly specified were excluded. Articles were excluded here if specific data from myringoplasties could not be extracted because it was grouped with data from other procedures, but these articles are discussed in Section 19.D. Studies of patients undergoing tympanoplasty both with or without mastoidectomy were excluded here but are discussed in review 18.B. The bibliographies of the articles that met these inclusion/exclusion criteria were manually checked to ensure no further relevant articles could be identified. This process yielded three RCTs [1–3]. Two of these trials were conducted by the same set of authors, and report data from a subset of overlapping patients [1, 2].

aureus, Pseudomonas, Streptococcus pyogenes, coliforms, and anaerobes. Graft outcomes were reported in terms of the percent of patients with graft success [1, 2]. None of the three articles defined SSI, but it is understood that it is clinically diagnosed (rather than by laboratory data with positive cultures from ear drainage).

Potential Confounders. Many factors besides systemic antibiotics could influence postoperative infections or graft success and are discussed in further depth in Section 21.D. These factors are detailed in the adjoining tables and include the exact antibiotic regimen, details of any preoperative infection, types of otologic procedures studied, method of preoperative sterilization in the operating room, use of topical antibiotics or antiinflammatory medicines, and compliance with study medications.

Study Designs. Three RCTs addressed the impact of systemic antibiotics on outcomes after myringoplasty. All three studies focused solely on this population. Only one trial commented on the effectiveness of randomization in balancing potential confounders between groups at the outset [2]. All three studies were blinded (double blind [3], observer blind [1], or unspecified [2]). The same ampicillin and fluoroquinolone regimens were tested in two trials [1, 2], with the third trial testing a sulfamethoxazole regimen [3]. None of the studies used anti-Pseudomonal coverage, although it is unclear whether this would have impacted results. Topical antibiotics were used disparately; details are in the adjoining table [1–3].

Highest Level of Evidence. The dearth of SSIs that occurred in both study groups made it impractical to draw meaningful conclusions about this particular outcome in the first RCT [1]. The second RCT reported outcomes in the first RCT [1]. The second RCT reported that there was no significant difference between the two

Our Clinical Studies 1.

- Microbiology
- Pharmacokinetics
- Controlled clinical studies in subgroups:
  - Double-blind: Quinolone (Ciprofloxacin)
  - +/- P.aeruginosa
  - Open: Cephalosporins:
  - + P. aeruginosa (Ceftacidime=Fortum)
    - P. aerugionosa (Cefuroxime=Zinacef)

Our Clinical Studies 2.

- Microbiology: Retrospective comparison of pre- and postoperative cultures from ears draining postop (N=80)

- Pharmacokinetics: Peroperative assay of Ceftazidime
  - Ear fluid: 7.9 (MIC90 1.1 P.aeruginosa at oxygen levels like middle ear cavity)
  - MIC90 P.aeruginosa at atmospheric oxygen level 0.7

Our Clinical Studies
"CIPROTO" STUDY

- Quinolone (Ciprofloxacine)

  4 centers

- 2 groups : active / placebo
- perioperative treatment 10 days

- randomized, double-blind design (N=204)
- endpoint 3 months

"CIPROTO" study

Rates of clinical success with regard to treatment group and center

Center	*No.*	*Rates of clinical success*		*Chi-square P*
		active group	*placebo group*	
A	77	25/41 (0.61)	31/36 (0.86)	0.001
B	27	12/14 (0.86)	9/13 (0.69)	0.30
C	43	17/22 (0.77)	14/21 (0.67)	0.44
D	57	25/33 (0.76)	14/24 (0.58)	0.16

"CIPROTO" study

Comparison of rates of clinical success in various groups of patients from centers BCD

Group of patients	*Clinical success treatment group*		*Therapeutic gain*		*Chi-square analysis P*
	active	*placebo*	*%*	*95% confidence limits*	
Total=127	54/69	37/58	14	-1% to +30%	0.08
Operation: tympanoplasty or radical	45/58	30/51	18	+2% to +35%	0.04
Drainage during operation	35/49	22/41	17	-2% to +38%	0.08

Our Clinical Studies
"OTOCEFT" STUDY

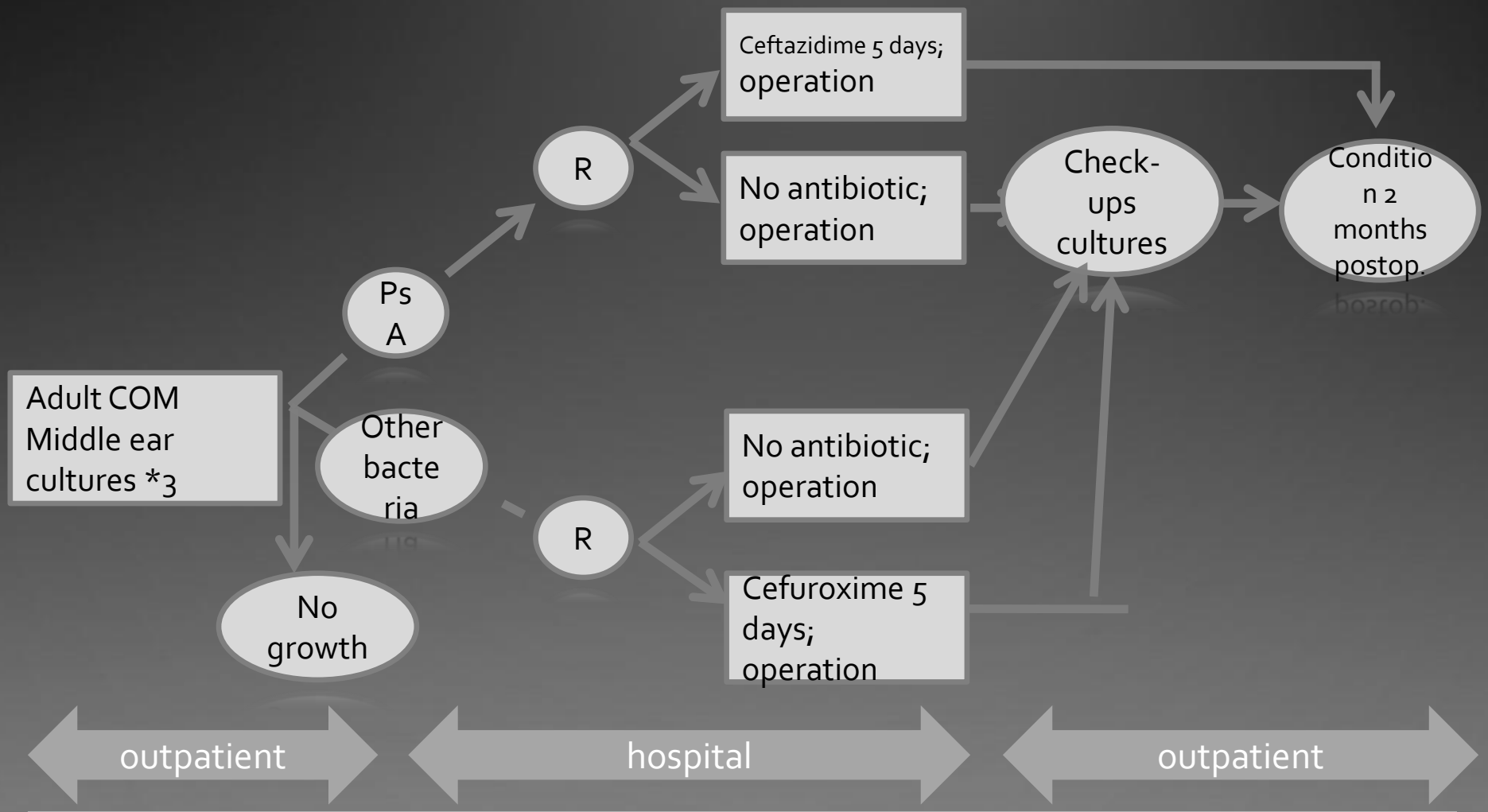
- 2 centers
- 4 groups:

  +/- treatment perioperatively (5 days)

  P. aeruginosa / other bacteria at preop culture

- Randomized, open design (N=95)
- Endpoint 2 months postop

"OTOCEFT" study DESIGN:



"OTOCEFT" STUDY: THE CLINICAL AND MICROBIOLOGICAL EVALUATION AT 2 MONTHS POSTOP.

Treatment	**Otomicro-**	**….scopy**	**Micro-**	**…biology**
N=60	*DRY*	*DRAINING*	*Other/Sterile*	*P.Aeruginosa*
CEFUROXIME	27 (0.9)	3	27 (0.9)	3
CONTROLS N=35	25 (0.8)	5	24' (0.9)	3'
CEFTAZIDIME	17 (0.9)	2	13 (0.7)	6
CONTROLS	7 (0.4)	9	4 (0.3)	12

ratio (fixed-effect) was 1.55 (95% CI 0.45 to 5.28), which is not significant.

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Discussion

This review included 11 randomised controlled trials comparing a certain antibiotic in a certain regime/dosage pattern with a control group. These patterns were investigated during different otologic surgical procedures (clean as well as contaminated types of surgery). Often no subgroup analysis was presented with regard to type of surgery, e.g. clean or clean-contaminated. This is also the reason why, unfortunately, we could not perform any sub-analysis with regard to type of surgery. This is specifically the case in Jackson 1988. This well-designed and performed study investigated 3481 patients and included some procedures which we did not investigate. The authors' most important conclusion, however, is that there is no need at all for the use of antibiotic prophylaxis in ear surgery in terms of reducing postoperative complications such as infection and graft failure. We have, however, been able to assess subgroup analyses with regard to the method of administration of the antibiotic, e.g. systemic and/or local.

The methodological quality of the included studies, scored by the use of a list of validity criteria, was fair to good. Often insufficient detail was given on methodological procedures. This could, of course, enhance bias. Nevertheless, it was the authors' opinion that none of the included studies contained fatal flaws.

Many studies differed in the definition of certain outcome measures, or did not define them at all. This made the pooling of results difficult. However, the authors believed that the character of the subject of this review allows more differences in defining these measures than other subjects, therefore allowing the pooling of results. One has to realise, however, that when we pooled results to evaluate an effect within three weeks, some studies had an evaluation after two weeks, while another study could have evaluated after two and a half weeks.

None of the trials in itself showed any significant difference in any of their outcome measures, independent of the quality of the study. Pooling of results did not change any of those views. Therefore, on the basis of the data available, there seems no significant contribution for antibiotic prophylaxis in ear surgery, in term of reduction of postoperative complications such as infection and graft failure.

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Authors' conclusions

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Implications for practice

There is no evidence that the use of prophylactic antibiotics in clean or clean-contaminated ear surgery, in any regimen, is helpful in reducing postoperative complications such as wound infection, discharge from the outer ear canal, labyrinthitis and graft failure.

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Forslag til UDTALELSE fra DOKS

- Generelt foreligger der ikke indikation for brug af rutinemæssig perioperativ antibiotika behandling.
- I særlige tilfælde af præ - eller peroperativ infektion kan lokal eller systemisk antibiotika overvejes.