

Prophylactic antibiotics

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Prophylactic antibiotics are used when there is a risk of wound contamination with bacteria during surgery. The theoretical Council (USA) over 40 years ago, relates well to infection rates (Table 5.2). The value of antibiotic prophylaxis is low in non-prosthetic clean surgery, with most trials showing no clear benefit because infection rates without antibiotics are so low. The exception to this is where a prosthetic implant is used, as the results of infection are so catastrophic that even a small risk of infection is unacceptable. There is undisputed evidence that prophylactic antibiotics are effective in reducing the risk of infection in clean-contaminated and contaminated operations. When wounds are heavily contaminated or when an incision is made into an abscess, a 5-day course of therapeutic antibiotics may be justified on the assumption that the wound is inevitably infected and so treatment is needed rather than prophylaxis. - If antibiotics are given to prevent infection after surgery or instrumentation, they should be used before bacterial growth becomes established (i.e. within the decisive period). Ideally, maximal blood and tissue levels should be present at the time at which the first incision is made and before contamination occurs. Tissue levels of the antibiotic should remain high throughout the operation and antibiotics with a short tissue half-life should be avoided. Intravenous administration at induction of anaesthesia is therefore optimal, as unexpected delays in the timing of surgery may occur before then and antibiotic tissue levels may fall off before the surgery starts. In long operations or when there is excessive blood loss, or instrument - when unexpected contamination occurs, antibiotics may be repeated at 4-hourly intervals during the surgery because tissue antibiotic levels often fall faster than serum levels. There is no evidence that further doses of antibiotics after surgery are of any value in prophylaxis against infection and the practice can only encourage the development of antibiotic resistance. The choice of an antibiotic depends on the expected spectrum of organisms likely to be encountered, which will depend on the site and type of surgery and whether the patient has any antibiotic allergies. Hospitals in the UK and across Europe now have standardised antibiotic prophylaxis policies that take account of the above factors and are only deviated from with microbiological advice. Patients with known valvular disease of the heart (or with any implanted vascular or orthopaedic prosthesis) should have prophylactic antibiotics during dental, urological or open

TABLE 5.2 Surgical site infection rates relating to wound contamination with and without using antibiotic prophylaxis

Infection Type	Type of surgery	Infection rate without prophylaxis (%)	rate with prophylaxis (%)
Clean (no viscus opened)	1-2	1-2	Clean-contaminated (viscus 3 6-9 opened, minimal spillage) 6 13-20
Contaminated (open viscus with spillage or in inflammatory disease)			Dirty (pus or perforation, or 7 40 incision through an abscess)

prosthesis during the transient bacteraemia which can occur during such surgery (Summary box 5.12). Summary box 5.12 Antibiotic prophylaxis

Not required in clean surgery unless a prosthesis is implanted Use antibiotics that are effective against expected pathogens within local hospital guidelines Plan for single-shot intravenous administration at induction of anaesthesia Repeat only during long operations or if there is excessive blood loss Patients with heart valve disease or a prosthesis should be protected from bacteraemia caused by dental work, urethral instrumentation or visceral surgery

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Infection Type of surgery	Infection rate without prophylaxis (%)	rate with prophylaxis (%)
Clean (no viscus opened)	1-2	1-2
Clean-contaminated (viscus opened, minimal spillage)	3-6	6-9
Contaminated (open viscus with spillage or in /f_ l ammatory disease)	6-13	13-20
Dirty (pus or perforation, or 7 40 incision through an abscess)	40	7

prosthesis during the transient bacteraemia which can occur during such surgery (Summary box 5.12). Summary box 5.12 Antibiotic prophylaxis /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

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Clean (no viscus opened)	1-2	1-2
Clean-contaminated (viscus 3 opened, minimal spillage)	6-9	3-6
Contaminated (open viscus with spillage or in /f_ l ammatary disease)	13-20	6-13
Dirty (pus or perforation, or 7 incision through an abscess)	40	7-10

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