WHEN IS ANTIBIOTIC PROPHYLAXIS INDICATED IN ENDOSCOPY?

D SURRIDGE

MBChB, FCS (SA), MMed
Fellow in Colorectal Surgery, Department of Surgery
University of the Witwatersrand and Donald Gordon Medical Centre

Mucosal damage caused by endoscopy with or without intervention can result in inoculation of bacteria into the blood stream. This transient bacteraemia has been postulated to cause infections in distant tissues. Endoscopic instrumentation of an undrained sterile system can also result in infection. All of these factors need to be considered when subjecting a patient to the invasive procedure that is endoscopy.

ASGE 2008
The American Society for Gastrointestinal Endoscopy (ASGE) last published guidelines for the use of antibiotic prophylaxis in 2008

Infective Endocarditis (IE)
Prophylactic antibiotics are not recommended:

• Solely to prevent IE [1C+].

Prophylactic antibiotics are recommended:

• If bacterial infection of the GI tract has already been established and the patient has a high risk lesion (prosthetic cardiac valve/previous IE/cardiac transplant recipients with valvulopathy/congenital heart disease) [3].
Recommended Antibiotic: Ampicillin/Amoxicillin/Vancomycin.

**Endoscopic Retrograde Cholangio-Pancreateography (ERCP)**

**Prophylactic antibiotics**

Prophylactic antibiotics are not recommended:
- If the biliary system is completely drained or if no biliary obstruction is suspected [1C].

Prophylactic antibiotics are recommended:
- If the patient has known or suspected biliary obstruction that may not be drained completely (esp. hilar cholangiocarcinoma/primary sclerosing cholangitis) [2C].
- If there is communication with a cystic structure [3].

**Post ERCP antibiotics**

Post ERCP antibiotics are not recommended if drainage is complete [3].

Post ERCP antibiotics are recommended:
- If biliary drainage is not complete [3].
- If a drained or undrained post transplant biliary stricture is diagnosed [3]. Drainage should follow as soon as possible.

Recommended Antibiotic: Ampicillin/Amoxicillin/Vancomycin.

**Endoscopic Ultrasound (EUS)**

Prophylactic antibiotics are not recommended:
- If the EUS is diagnostic or FNA of a solid lesion is carried out [1C].
Prophylactic antibiotics are recommended:

- If FNA of a cystic lesion is performed [1C] to be continued for 3-5 days afterwards [1C].

Recommended Antibiotic: Fluoroquinolone.

**Percutaneous Endoscopic Gastrostomy (PEG)**

Prophylactic antibiotics are recommended:

- 30 Minutes before PEG insertion [1A].

Recommended Antibiotic: Cefazolin.

**Cirrhosis with luminal bleeding**

Prophylactic antibiotics are recommended on admission [1B].

Recommended Antibiotic: Ceftriaxone.

**Synthetic vascular grafts and non-valve cardiac devices**

Prophylactic antibiotics are not recommended [1C+].

**Orthopaedic prostheses**

Prophylactic antibiotics are not recommended [1C+].

Some data suggests benefit for prophylactic antibiotics if colonic polypectomy is performed within six months of prosthetic insertion (one study only).

**Natural Orifice Transluminal Endoscopic Surgery (NOTES)**

Insufficient data to comment.

**BSG 2009**

The British Society of Gastroenterology (BSG) followed suit with revised guidelines in 2009. As well as taking note of the AHA guidelines, the National Institute for Health and Clinical Excellence (NICE) guidelines for IE were considered.
The grade of recommendation is again given in square brackets:

**Infective Endocarditis (IE)**
Prophylactic antibiotics are not recommended [B].
Consider and treat IE if clinical features develop in the weeks following endoscopy [C].

**Endoscopic Retrograde Cholangio-Pancreatography (ERCP)**
Prophylactic antibiotics are not recommended:
- If the biliary system is completely drained or if no biliary obstruction is suspected [C].

Prophylactic antibiotics are recommended:
- If the patient has known or suspected biliary obstruction and inadequate drainage is anticipated (hilar cholangiocarcinoma/primary sclerosing cholangitis), has a history of liver transplantation, a pancreatic pseudocyst or neutropaenia [B].

Post ERCP antibiotics are not recommended:
- If drainage is impossible [C].

Post ERCP antibiotics are recommended:
- If biliary drainage is not adequate [C]. Drainage should follow as soon as possible.

Patients with cholangitis should already be on antimicrobial therapy [A] and additional prophylactic antibiotics are not recommended [C].

Recommended Antibiotic: Ciprofloxacin/Gentamycin.

**Endoscopic Ultrasound (EUS)**
Prophylactic antibiotics are not recommended:
- If the EUS is diagnostic or FNA of solid lesions performed (no grade).
Prophylactic antibiotics are recommended:

- If FNA or transgastric/enteric drainage of cystic lesions of the pancreas is performed [B].

Recommended: co-amoxiclav/ciprofloxacin.

**Percutaneous Endoscopic Gastrostomy (PEG)**

Prophylactic antibiotics are recommended:

- 30 Minutes min before PEG insertion [A].

Patients already receiving antimicrobials do not require an additional dose [C].

Recommended Antibiotics: Co-amoxyclov/cefuroxime/teicoplanin.

**Variceal bleeding**

Prophylactic antibiotics are recommended:

- Prior to endoscopy [A].

Recommended Antibiotics: Piperacillin/tazobactam/3rd generation cephalosporin.

**Synthetic vascular grafts**

Prophylactic antibiotics are not recommended (no grade given).

**Neutropaenic patients**

Prophylactic antibiotics are recommended for WCC<0.5x10^9/L [C].

**BEYOND GUIDELINES**

If the reader passes just a cursory glance over the above guidelines, it can be seen that, on the topic of prophylactic antibiotic use in endoscopy, some concordance on both sides of the Atlantic has been met.
In the situation where a patient with previously known IE presents for endoscopy and who is used to receiving prophylactic antibiotics before any procedure, then some discussion of the evidence as well as risk/benefit may be needed².

NEWER CONSIDERATIONS
Neither of the above sets of guidelines has been reviewed before going to print. However, new and interesting data have been published in this field and are presented below.

PEG
The need for prophylactic antibiotics before placement of a PEG has been well documented and is widely accepted¹-⁴. The causative organism in parastomal infection post PEG insertion correlates strongly with organisms in the upper aerodigestive tract and not skin commensals from the site of insertion⁵. Since many patients requiring PEG have poor oral hygiene and protracted hospital stays, should a sputum sample from each be taken before PEG insertion?

Several other methods to prevent contamination of the stoma have been described.

The use of a scope overtube has been shown to reduce parastomal infection as the gastrostomy tube is shielded from the oropharyngeal secretions⁶. Instead of pulling the tube through the mouth, an introducer may be passed through the abdominal wall and the tube inserted via the introducer⁷. The relatively new technique of PEG gastropexy in which the stomach is sutured to the abdominal wall and a PEG passed through the same introducer as previously described has been shown to have similar parastomal infection rates whether prophylactic antibiotics are used or not in high risk patients⁸.

MRSA represents a significant risk factor in this group of patients⁴,⁹. It has been shown that despite prophylactic antibiotic usage, a positive MRSA culture on nasal and oral swabs results in a 100% parastomal infection rate⁹.
If the patient has MRSA eradication of the nasopharynx before Peg insertion, this infection rate drops to 8%\(^9\).

These methods are not discussed in any of the guidelines above. Since the process of eradicating MRSA from a patient may be expensive and laborious, the newer methods of PEG insertion may find an indication in high risk patients or patients with colonised with MRSA.

**Endoscopic Submucosal Dissection (ESD)**

ESD is a technique that has come to the fore in the literature (predominately Japanese) in recent years. Owing to the relatively extensive dissection when compared with more conventional endoscopic interventions, the question must be asked as to the impact that this technique has had on the septic complications of endoscopy.

Studies have not been done to answer this but it has been shown that these patients have no more bacteraemia than any other patient undergoing endoscopy without ESD\(^{10,11}\).

Since bacteraemia is not the only factor determining septic complications this information does not rule out the possibility of an increase in infection. It does, however, reassure the clinician that there is probably no more risk than an average patient undergoing conventional endoscopy.

**Colonic stenting**

Colonic stenting for obstruction has also not been shown to increase bacteraemia \(^{12}\).

**Bronchoscopy**

A surgeon may, occasionally, be called upon to perform a bronchoscopy for a patient. Bronchoscopy can cause a bacteraemia at a rate of about 1%\(^{13}\) and result in postbronchoscopy fever in 10-25%\(^{13,14}\). However, prophylactic antibiotics have not been shown to decrease septic complications or postbronchoscopy fever\(^{14}\).
Continuous Ambulatory Peritoneal Dialysis (CAPD)
Colonoscopy in patients with CAPD has a 6.3% chance of developing peritonitis\textsuperscript{15}. Polypectomy did not increase this rate\textsuperscript{15}. Lower gastrointestinal endoscopy has been found to have significantly higher rates of peritonitis than upper endoscopy but were effectively prevented with prophylactic antibiotics\textsuperscript{16}.

ERCP
The usefulness of prophylactic antibiotics in ERCP has been called into question.

Fewer septic events and bacteraemia have been seen with the use of antimicrobials but there seems little use in patients who are adequately drained\textsuperscript{17}. However, the ability to prevent cholangitis in the undrained patient has been questioned\textsuperscript{18}. It is for this reason that the guidelines above still recommend drainage of this group of patients and to continue antibiotics until it is achieved\textsuperscript{1,2}. Whether the antibiotics should be given before ERCP or upon realisation that drainage is not possible, is still not known\textsuperscript{18}.

CONCLUSION
The ASGE and the BSG have similar guidelines. There is a clear benefit for prophylactic antibiotics in PEG placement and during endoscopy of cirrhotic patients. The role of prophylactic antibiotics ERCP is less important than achieving adequate drainage. The antibiotics choice is dictated by the endogenous flora present at the site of endoscopic instrumentation.
Table 1. Levels and grades of evidence
(NICE Guideline development methods (NICE, 2005), based on SIGN 50 (19))

<table>
<thead>
<tr>
<th>Grades of recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: the grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.</td>
</tr>
</tbody>
</table>

A
At least one meta-analysis, systematic review, or RCT rated as 1**; and directly applicable to the target population; or a body of evidence consisting principally of studies rated as 1*; directly applicable to the target population, and demonstrating overall consistency of results

B
A body of evidence including studies rated as 2**; directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1** or 1*

C
A body of evidence including studies rated as 2*; directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2**

D
Evidence level 3 or 4; or extrapolated evidence from studies rated as 2*

Key to evidence statements and grades of recommendations

1** High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1* Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1. Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2** High-quality systematic reviews of case–control or cohort studies
2+ Well conducted case–control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2- Case–control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3 Non-analytic studies, e.g. case reports, case series
4 Expert opinion

REFERENCES


