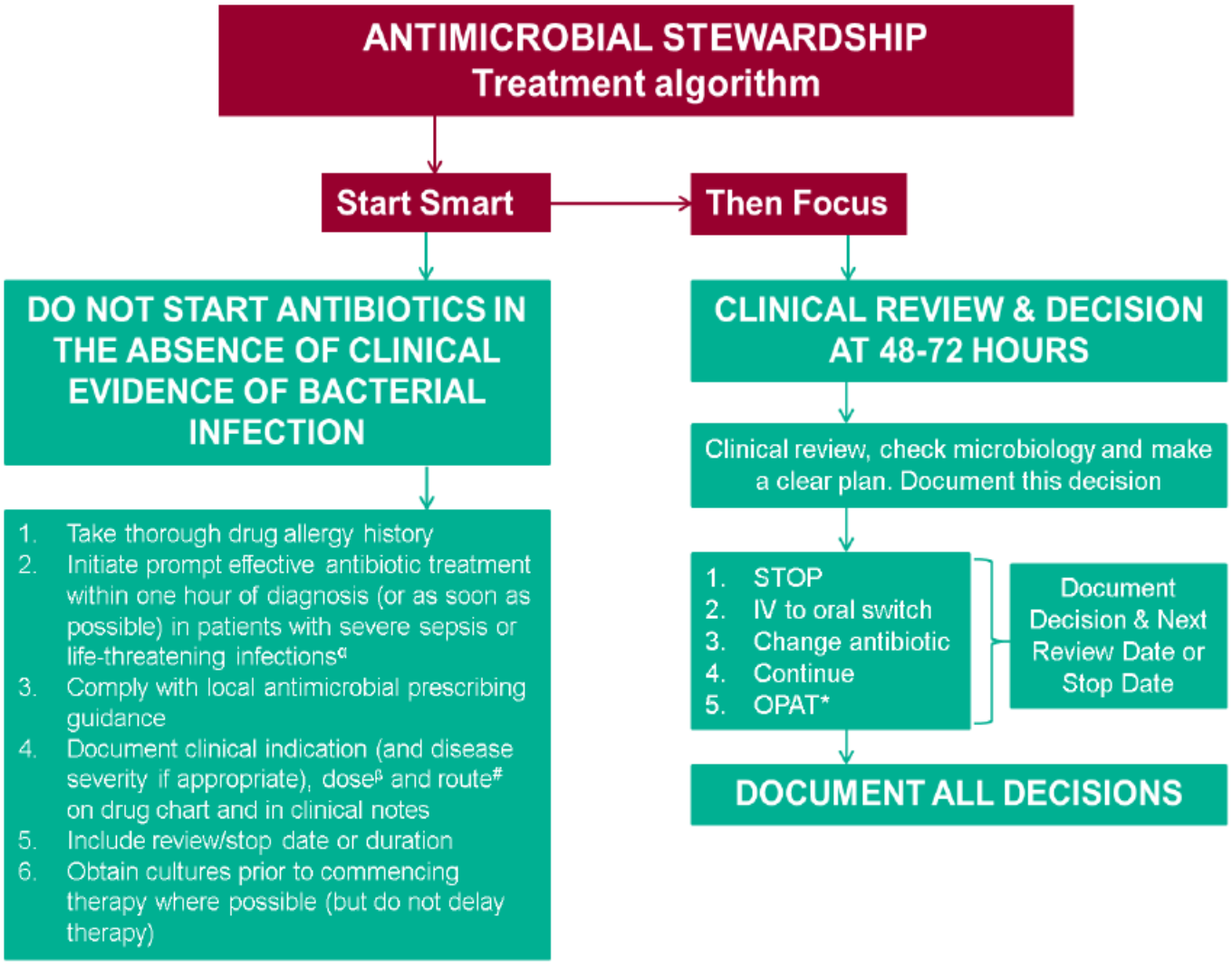
Antimicrobial Guidelines

GASTRO- INTESTINAL INFECTIONS (v5)

This section covers

Start Smart then Focus
A Start Smart - then Focus approach is recommended for all antibiotic prescriptions.

Start Smart then Focus Treatment Algorithm



Fluoroquinolone antibiotics: In March 2019, the MHRA issued restrictions and precautions for the use of fluoroquinolone antibiotics because of rare reports of disabling and potentially long-lasting or irreversible side effects (see Drug Safety Update for details). NICE is currently reviewing recommendations relating to fluoroquinolone antibiotics.

IMPORTANT – Fluoroquinolone Antibiotics (MHRA March 2019)
Systemic (by mouth, injection, or inhalation) fluoroquinolones (Ciprofloxacin, Levofloxacin, Moxifloxacin, Ofloxacin, Delafloxacin) can very rarely cause long-lasting (up to months or years), disabling, and potentially irreversible side effects, sometimes affecting multiple systems, organ classes, and senses

Consideration should be given to official guidance on the appropriate use of antibacterial agents. The new EU restrictions closely align with existing UK national guidance. The restrictions should not prevent use of a fluoroquinolone for serious or severe infections if this is consistent with UK national guidance or where there are microbiological grounds, and where the benefit is thought to outweigh the risk.

If you have any queries on choice of antibiotic please consult a microbiologist

IV Antimicrobials
Prescribing and administration of IV antimicrobials must only happen in services where colleagues are trained and competent to prescribe and administer IV treatments

Guideline based on:

- NICE summary of antimicrobial prescribing guidance – managing common infections Antimicrobial prescribing table (bnf.org)

- NICE guideline NG199 – 'Clostridioides difficile infection: antimicrobial prescribing' published 23rd July 2021

Version	Change Detail	Date
1	Put in place for new organisation	November 19
2	Updated CDI guidance	August 2020
3	Updated CDI guidance C-Difficile changed to *Clostridioides difficile* infection Acute Diverticulitis – IV to oral switch therapy change	April 2021
4	Slight amendment to CDI guidance after publication of NG199. Clarification around treatment of 1st and 2nd line antibiotics are ineffective pg.9	August 2021
5	Reviewed – no clinical change	March 2023

For review November 2025

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TRAVELLER'S DIARRHOEA

Definition: **Traveller's diarrhoea** is a general term applied to the common problem of diarrhoeal illness experienced by travellers. Most is self-limiting in nature and does not require specific treatment other than hydration.

- Prophylaxis rarely indicated
- Only consider stand-by antibiotics for patients at high risk of severe illness or visiting high-risk areas

Traveller's diarrhoea

	Stand-by
	AZITHROMYCIN 500mg DAILY orally **Treatment duration: 1-3 days**
	Prophylaxis
	BISMUTH SUBSALICYLATE 525mg (2 tablets) FOUR TIMES A DAY (orally) **for 2 days**

INFECTIOUS DIARRHOEA

Definition:

- Acute diarrhoea is usually defined as: 3 or more episodes a day, lasting less than 14 days and stool takes the shape of the pot.
- Infectious diarrhoea is common but should be viewed as a differential diagnosis alongside other potential causes of diarrhoea as no infectious agent is found in 60% of diarrhoeal illnesses
- Most infectious diarrhoea is a self-limited, usually viral illness. Nearly half of episodes last less than one day.
- If diarrhoea has stopped, culture is rarely indicated unless there is a public health indication.
- Do not give empirical antibiotics unless *Clostridiidiodes difficile* or *Campylobacter spp*. are suspected.
- Although *Campylobacter* is not easily distinguishable from other infectious causes of diarrhoea such as Shigella or Salmonella; typical symptoms include a mean incubation period of three days (range one to seven days). Early symptoms include abrupt onset of abdominal pain and diarrhea. In about one-third of cases, a prodromal period characterized by high fever accompanied by rigors, generalized aches, dizziness, and delirium is observed. It may last for one day (rarely two or three days) prior to onset of gastrointestinal symptoms. Patients presenting with prodromal symptoms tend to have more severe disease than those presenting with diarrhea

Infectious Diarrhoea

	If the patient is systemically unwell and Campylobacter is suspected
Minor	**CLARITHROMYCIN 250mg - 500mg BD (orally)** **Treatment duration: 5-7 days**

ACUTE DIVERTICULITIS

Definition: Acute Diverticulitis is a condition where diverticula (sac-like protrusions of mucosa through the muscular wall of the colon) become inflamed and infected, typically causing severe lower abdominal pain, fever, general malaise, and occasionally rectal bleeding.

- Diverticulosis should be managed with a high fibre diet
- Pain may occur in diverticulitis disease (without infection) that can be managed with oral paracetamol
- People with mild, uncomplicated acute diverticulitis can be managed at home with paracetamol, clear fluids and oral antibiotics (see G-care pathway)
- For suspected acute diverticulitis in a patient who is systemically unwell, immunosuppressed or has significant comorbidity: offer antibiotics.

Acute Diverticulitis

	1st line	Penicillin Allergy (see explanatory notes)
Moderate	**CO-AMOXICLAV 625mg THREE TIMES A DAY orally** **Treatment duration: 5 days**	**CEFALEXIN 500mg TWICE OR THREE OR FOUR TIMES A DAY orally** **Plus** **METRONIDZOLE 400mg THREE TIMES A DAY** **Treatment duration: 5 days** **OR** **TRIMETHOPRIM 200mg TWICE A DAY orally** **Plus** **METRONIDAZOLE 400mg THREE TIMES A DAY** **Treatment duration: 5 days**
Severe	**PIPERACILLIN-TAZOBACTAM 4.5g THREE TIMES A DAY IV**	**TEICOPLANIN every 12 hours IV for 4 doses then ONCE DAILY** **Dose** **Less than 50kg: 400mg** **50-74kg: 600mg** **75-100kg: 800mg** **more than 100kg: 1000mg** Maintain treatment pending pre-dose (trough) level on Day 5. Target level 15-60mg/L **Plus**

**remember safety issues if considering a fluoroquinolone		**METRONIDAZOLE 500mg IV THREE TIMES A DAY** **Plus** **CIPROFLOXACIN 400mg IV TWICE A DAY (**Fluoroquinolone antibiotic **)
IV to oral switch	**CO-AMOXICLAV 625mg THREE TIMES A DAY orally** **Plus** **METRONIDAZOLE 400mg THREE TIMES A DAY orally** **Typical treatment duration: total of 5 days (after 48 hours review IVs and switch to oral if clinically appropriate)**	**CIPROFLOXACIN 500MG TWICE A DAY** **Plus** **METRONIDAZOLE 400mg THREE times a day orally** **Typical treatment duration: total of 5 days (after 48 hours review IVs and switch to oral if clinically appropriate)**

CLOSTRIDIOIDES DIFFICILE Infection (CDI) IN ADULTS (over 18 years of age)

Definition: *Clostridioides difficile* is a cause of antibiotic associated diarrhoea that can range from mild diarrhoea to life-threatening pseudomembranous colitis.

Healthcare workers should use the 'SIGHT' mnemonic when managing suspected potentially infectious diarrhoea. Use the **Bristol Stool Chart** to monitor frequency and severity of diarrhoea

The Bristol Stool Form Scale (Bristol Stool Chart)

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces, a mushy stool
Type 7		Watery, no solid pieces ENTIRELY LIQUID

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S	**S**uspect that the diarrhoea may have an infective cause where there is no clear alternative cause for diarrhoeas (drugs e.g. laxative, underlying bowel disease)- if you suspect CDI on clinical grounds, start treatment for CDI empirically pending test results and then review that treatment when the results become available
I	**I**solate the patient immediately- consult the infection control team whilst determining the cause of the diarrhoea
G	**G**loves and aprons must be used for all contacts with the patient and their environment
H	**H**and washing with soap and water must be carried out before and after each contact with the patient and the patient's environment
T	**T**est the stool for evidence of toxigenic *Clostridiidiodes difficile*, by sending a specimen immediately

Table 1: Initial assessment and management
If CDI is suspected, send a stool (faeces) specimen to the microbiology lab and start antibiotic treatment **immediately** (see table 2). Review CDI therapy if initial test result is negative. If symptoms continue despite a negative result and clinical suspicion of CDI remains, send a further stool specimen for testing after 5 days. Repeat CDI testing during therapy or as a 'test of cure' is not required
Assess whether it is a first or further episode (relapse or recurrence of CDI infection) Relapse taken as within 12 weeks of previous symptom resolution Recurrence taken as more than 12 weeks after previous symptom resolution
Assess clinical severity of CDI at diagnosis and then daily **Mild CDI**: not associated with a raised WCC; typically associated with less than 3 stools of type 6-7 per day **Moderate CDI**: associated with a raised WCC less than 15 x10^9/L; typically with 3-5 stools of type 6-7 per day **Severe CDI**: if any of the following: White blood cell count greater than 15x10^9/L — Temperature greater than 38.5°C Albumin less than 20g/L — CRP greater than 200 Acutely rising serum creatinine (e.g. greater than 50% increase above baseline Evidence of severe colitis (abdominal signs, radiology, endoscopy) Life threatening CDI **if any of** hypotension, ileus, toxic megacolon, CT evidence of severe disease. NOTE: diarrhoea may be absent in life- threatening CDI due to ileus Request early gastroenterologist and/or surgical and/or critical care review in severe/life- threatening CDI
Fluid and electrolyte replacement and nutrition review as necessary
Isolate patient in a single room
Review current therapy: 1. Stop antibiotics and other drugs that might cause diarrhoea if possible 2. Stop PPIs/H2 antagonists unless required acutely 3. Review medicines with GI activity or adverse effects e.g. laxatives 4. Review medicines that may cause problems if people are dehydrated, e.g. non-steroidal anti-inflammatory drugs (NSAIDs), angiotensin- converting enzyme (ACE) inhibitors, angiotensin-2 receptor antagonists (A2As)
Avoid anti-motility drugs (e.g. Loperamide). Manage fluid loss as for acute gastroenteritis

Table 2: Specific Antibiotic Therapy for CDI

First episode of inpatient mild, moderate or severe infection
First Line : VANCOMYCIN 125mg orally or via NG tube FOUR TIMES A DAY for 10 -14 days (Do not administer vancomycin by the IV route for *C. difficile*. IV vancomycin may be given NG tube) **Second-line : FIDAXOMICIN 200mg orally TWICE A DAY for TEN DAYS** If increasing severity of CDI **OR** no response to therapy within 3-5 days **OR** fidaxomicin ineffective: • Discuss with consultant medical microbiologist
If first and second line antibiotics are ineffective:
Discuss with consultant medical microbiologist who may consider **VANCOMYCIN UP TO 500mg orally or via NG tube FOUR TIMES A DAY for 10 -14 days** **With or without** **METRONIDAZOLE 500mg IV THREE TIMES A DAY for 10 days**
Further episodes of CDI within 12 weeks of symptom resolution (relapse): mild, moderate or severe infection
FIDAXOMICIN 200mg orally TWICE A DAY FOR TEN DAYS If increasing severity if CDI **OR** no response to therapy within 3-5 days **OR** fidaxomicin ineffective • Discuss with consultant medical microbiologist and gastroenterologist If fidaxomicin given within the last 12 weeks do not repeat before consulting with the consultant medical microbiologist
Further episodes of CDI more than 12 weeks after symptom resolution (recurrence): mild or moderate infection
VANCOMYCIN 125mg orally or via NG tube FOUR TIMES A DAY for 10 days If increasing severity of CDI **OR** no response to therapy within 3-5 days **OR** vancomycin ineffective: • Discuss with consultant medical microbiologist and gastroenterologist • Obtain gastroenterologist review for all cases of recurrent CDI
Further episodes of CDI more than 12 weeks after symptom resolution (recurrence): severe infection
FIDAXOMICIN 200mg orally TWICE A DAY FOR TEN DAYS If increasing severity if CDI **OR** no response to therapy within 3-5 days **OR** fidaxomicin ineffective • Discuss with consultant medical microbiologist and gastroenterologist • Obtain gastroenterologist review for all cases of recurrent CDI

Use clinical judgement to determine whether antibiotic treatment for CDI is ineffective. It is not usually possible to determine this until day 7 as diarrhoea may take 7-14 days to resolve.

If antibiotics are started for suspected CDI and subsequent stool sample test do not confirm CDI infection, consider stopping the antibiotics

Potential additional /alternative therapy options for recurrent CDI

- **Vancomycin po / NG up to 500mg FOUR TIMES A DAY.** If this dose used then perform Vancomycin therapeutic drug monitoring is required
  Pre-dose (trough) Vancomycin levels should be maintained below 20mg/L.
  N.B. lower doses of oral / NG Vancomycin do not require TDM.
- **6 week tapering doses**
  Week 1 -2- Vancomycin 125mg orally FOUR TIMES A DAY FOR 7 -14 days (until improvement seen) then
  Week 2- Vancomycin 125mg orally THREE TIMES A DAY FOR 7 days
  Week 3- Vancomycin 125mg TWICE A DAY FOR 7 DAYS
  Week 4 - Vancomycin 125mg ONCE DAILY FOR 7 DAYS
  Week 5 - Vancomycin 125mg ON ALTERNATE DAYS FOR 7 DAYS
  Week 6- Vancomycin 125mg EVERY THIRD DAY FOR 7 days

- **Pulsed fidaxomicin-** 200mg orally TWICE A DAY for days 1 to 5 then 200mg ONCE A DAY from day 7 to day 25

- **Faecal microbiota transplantation (FMT**) [refer to the acute trust],

Oral and NG administration of vancomycin

Vancomycin 500mg injection can be used orally/enterally - some brands are licensed for this use - (Wockhardt, Flynn and Bowmed Ibisqus)
Reconstitute 500mg vial with 10mls of water for injection. At the time of administration each dose can be further diluted to 30ml if desired to aid administration (some brands allow flavouring syrups to be added - Wockhardt and Flynn). Keep reconstituted vial in fridge for maximum 24hrs for subsequent doses.

NB: Administer using an oral syringe

Nastro Gastric (NG) administration of fidaxomicin

Cut the tablet in half, crush well and disperse in water to administer via enteral tubes.
There is limited information available regarding this.

ORAL CANDIDIASIS

Definition: Oral Candidiasis is a mycosis (**yeast**/fungal infection) of **Candida** species on the mucous membranes of the **mouth**. ***Candida*** *albicans* is the most commonly implicated organism in this condition

Oral Candidiasis

Mild **1st line**	**MICONAZOLE oral gel 2.5ml of 24mg/ml FOUR TIMES A DAY (advise patient to hold in the mouth after food)** **Treatment duration: 7 days and then continue for 7 days after resolved**
Mild **2nd line**	**If Miconazole not tolerated use:** **NYSTATIN SUSPENSION 1ml (100,000 units/ml) FOUR TIMES A DAY (half in each side)** **Treatment duration: 7 days and then continue for 7 days after resolved**
Moderate/severe	**FLUCONAZOLE 50mg (increasing to 100mg if HIV or immunocompromised) ONCE A DAY** **Treatment duration: 7-14 days**

Note that oesophageal candidiasis requires higher dose Fluconazole – usually 400mg DAILY orally but discuss with a Consultant Medical Microbiologist as required.

THREADWORM

Definition: **Threadworm** or **pinworm** (*Enterobius vermicularis*) is a common parasitic worm which infests the human gut. **Threadworms** have a white, thread-like appearance — adult males are 2–5 mm in length and adult females 8–13 mm. **Threadworm** eggs are not visible to the naked eye and can survive for up to 2 weeks

- Treat all household contacts at the same time
- Advise hygiene measures for 2 weeks (hand hygiene, pants at night, morning shower including perianal area)
- Wash sleepwear, bed linen and dust and vacuum bed and mattress
- Children under 6 months old, advise perianal wet wiping or washing 3 hourly

	Children and adults 6 months and over
	MEBENDAZOLE 100mg as a SINGLE DOSE (orally) repeat in 2 weeks if persistent
	Children under 6 months old and pregnant women
	HYGIENE MEASURES ONLY for 6 weeks

ERADICATION OF *HELICOBACTER PYLORI*

Definition: ***Helicobacter pylori*** is a Gram-negative, microaerophilic bacterium usually found in the stomach. Eradication of *Helicobacter pylori* reduces recurrence of gastric and duodenal ulcers and the risk of rebleeding. It also causes regression of most localised gastric mucosa associated lymphoid-tissue (MALT) lymphomas.

- Always test for *H. pylori* before giving antibiotics
- Eradication is beneficial in known Duodenal Ulcer (DU), Gastric Ulcer (GU) or low grade MALToma
- Consider test and treat in persistent un-investigated dyspepsia
- Do not offer eradication for Gastro- Oesophageal Reflux Disease (GORD)
- Do not use Clarithromycin, Metronidazole or quinolone if used in the past year for any infection

Relapse:

- Du/GU relapse: test for *H. pylori* using breath test or faecal antigen test (if available) or consider endoscopy for biopsy culture and sensitivity
- NUD: do not retest

Following eradication of *H. pylori* associated with duodenal ulcers uncomplicated by haemorrhage or perforation, the British Society of Gastroenterology

Eradication of Helicobacter *Pylori*

1st line	Penicillin Allergy (see explanatory notes)
OMEPRAZOLE 20mg TWICE a day (orally) **Plus** **AMOXICILLIN 1g TWICE A DAY (orally)** **Plus** **CLARITHROMYCIN 500mg TWICE A DAY (orally)** **OR** **OMEPRAZOLE 20mg TWICE a day (orally)** **Plus** **AMOXICILLIN 1g TWICE A DAY (orally)** **Plus** **METRONIDAZOLE 400mg TWICE A DAY (orally)** **Treatment duration: 7days (for MALToma treat for 14 days)**	**OMEPRAZOLE 20mg TWICE a day (orally)** **Plus** **CLARITHROMYCIN 500mg TWICE A DAY (orally)** **Plus** **METRONIDAZOLE 400mg TWICE A DAY (orally)** *If previous treatment with CLARITHROMYCIN* **OMEPRAZOLE 20mg TWICE a day (orally)** **Plus** **METRONIDAZOLE 400mg TWICE A DAY (orally)** **Plus** **TETRACYCLINE 500mg TWICE A DAY (orally)** **Plus** **BISMUTH SUBSALICYLATE 525ng FOUR TIMES A DAY (orally)** **Treatment duration: 7days (for MALToma treat for 14 days)**

<table>
<tr><th colspan="2">Relapse</th></tr>
<tr><td><u>USE REGIME NOT PREVIOUSLY USED</u>

OMEPRAZOLE 20mg TWICE a day (orally)
Plus
AMOXICILLIN 1g TWICE A DAY (orally)
Plus
CLARITHROMYCIN 500mg TWICE A DAY (orally)

OR

OMEPRAZOLE 20mg TWICE a day (orally)
Plus
AMOXICILLIN 1g TWICE A DAY (orally)
Plus
METRONIDAZOLE 400mg TWICE A DAY (orally)

Treatment duration: 14 days (for MALToma treat for 14 days)</td><td><u>IF NO EXPOSURE TO QUINOLONES</u>

OMEPRAZOLE 20mg TWICE a day (orally)
Plus
METRONIDAZOLE 400mg TWICE A DAY (orally)
Plus
LEVOFLOXACIN ((Fluoroquinolone antibiotic **) 250mg TWICE A DAY (orally)

<u>IF EXPOSURE TO QUINOLONES</u>

OMEPRAZOLE 20mg TWICE a day (orally)
Plus
METRONIDAZOLE 400mg TWICE A DAY (orally)
Plus
TETRACYCLINE 500mg TWICE A DAY (orally)
Plus
BISMUTH SUBSALICYLATE 525ng FOUR TIMES A DAY (orally)

Treatment duration: 14 days (for MALToma treat for 14 days)</td></tr>
<tr><td>Relapse and previous metronidazole and clarithromycin</td><td></td></tr>
<tr><td>OMEPRAZOLE 20mg TWICE a day (orally)
Plus
AMOXICILLIN 1g TWICE A DAY (orally)
Plus
TETRACYCLINE 500mg TWICE A DAY (orally)

OR if Tetracycline not tolerated

OMEPRAZOLE 20mg TWICE a day (orally)
Plus
AMOXICILLIN 1g TWICE A DAY (orally)
Plus
LEVOFLOXACIN ((Fluoroquinolone antibiotic **) 250mg TWICE A DAY (orally)

Treatment duration: 14 days (for MALToma treat for 14 days)</td><td></td></tr>
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