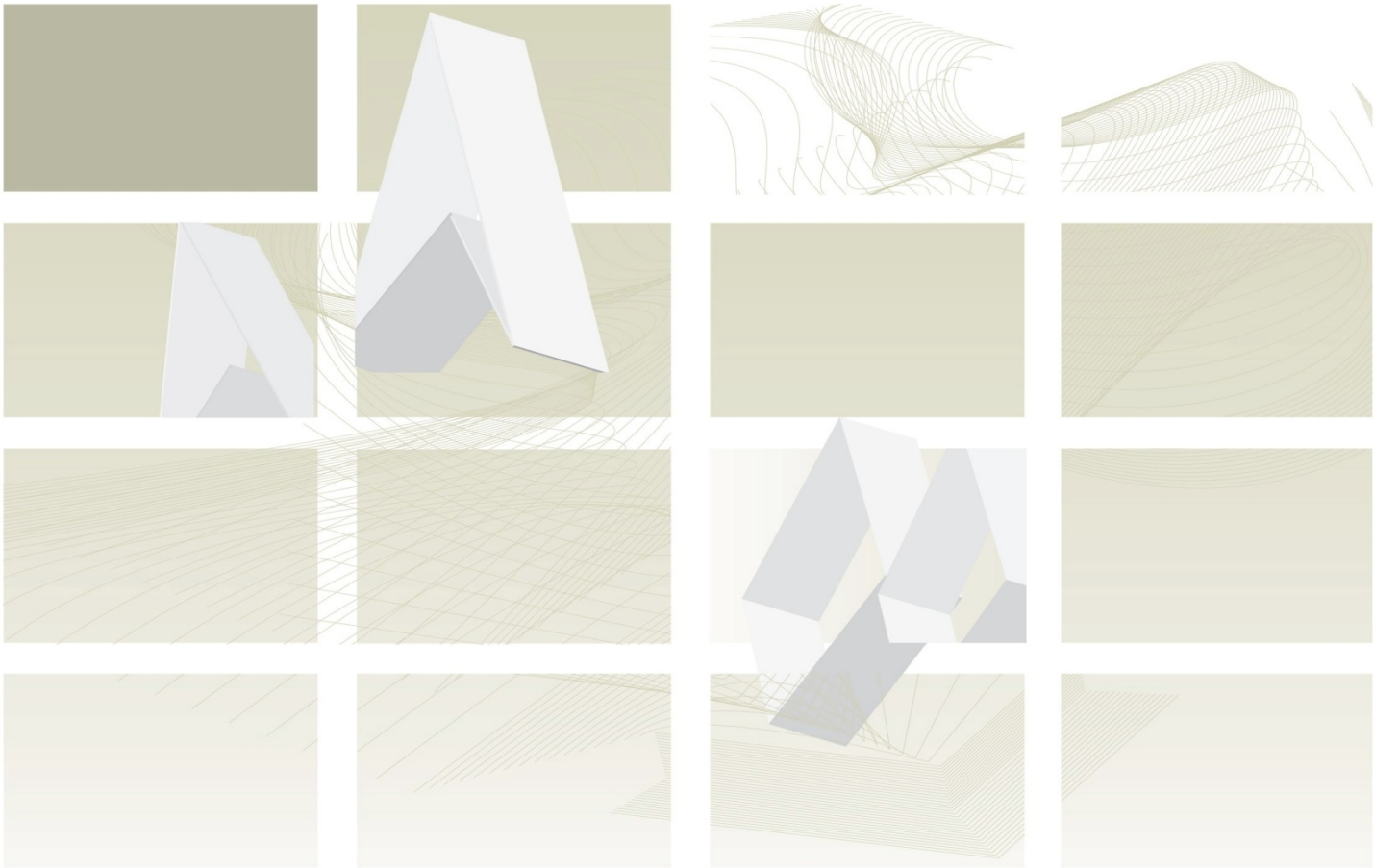
Public Health England

NHS

UK Standards for Microbiology Investigations

Review of Users' Comments received by
Joint Working Group for Syndromic Algorithms

S 7 Gastroenteritis and Diarrhoea



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1st CONSULTATION 16.12.11 – 08.02.12

PROPOSAL FOR CHANGES

Comment Number	**1**		
Date Received	17/12/2011	**Lab Name**	William Harvey Hospital
Section	Section – flow chart 1 (page 9 of 12)		
Comment			
Viral testing should be performed for community and hospitalised children <5yrs.			
Evidence			
B30			
Recommended Action	**ACCEPT** Flowcharts and footnotes updated.		

Comment Number	**2**		
Date Received	19/12/2011	**Lab Name**	NBT Microbiology
Section	Flow chart 1 and 2		
Comment			
Please could the Virology SOPs (e.g.V2 for Norovirus) be added?			
Recommended Action	**NONE** V2 and V3 withdrawn at VWG meeting in April 2011. The future of these documents will be decided following further discussion.		

Comment Number	**3**		
Date Received	19/12/2011	**Lab Name**	CEFAS Weymouth
Section	1. Flowchart 1 and associated text 2. S7 - scope		
Comment			
a. The standard gives “Culture of faeces” in the flowcharts as a generic consideration and seems to leave the selection of the appropriate culture methods to be used to B 30. That will only work if sufficient clinical details are given on the lab request form – in practice, this often doesn’t happen. b. The comment “It is recognised that the documents are best used when sufficient clinical details are provided at the time of sample submission.” is weak and there needs to be greater emphasis on the provision of appropriate clinical detail (including travel and seafood consumption, for example). If not, the interaction between the two standard methods should be reviewed. c. The exclusions from scope should also include diarrhoea due to algal toxins as this is not addressed in the document.			
Evidence			
Initiatives in support of international and European risk assessments have shown that targeted laboratory investigations are often not undertaken with respect to the testing of			

clinical samples for vibrios in relevant situations and this is often due to a lack of information being passed from the requesting clinician to the testing laboratory (although also due to many routine clinical laboratories not maintaining methods for the isolation of vibrios). It should also be noted that samples from bivalve shellfish-associated gastroenteritis are often submitted to laboratories without either the potential food association or a norovirus test request being made. Again, strengthening the recommendations with regard to the nature of the laboratory tests requested and the provision of relevant information would improve the laboratory role in diagnosis and outbreak investigation.	
Recommended Action	a. **ACCEPT** Flowchart and footnotes updated target organisms included in algorithm. b. **ACCEPT** All syndromic algorithm scopes and template to be updated to: 'clinical details are essential for the optimal processing samples'. c. **ACCEPT** Document updated.

Comment Number	**4**		
Date Received	21/12/2011	**Lab Name**	Royal Infirmary of Edinburgh
Section	Scope		
Comment			
There is no mention of rejecting stool samples that are non-diarrhoeal (i.e. not taking the shape of the container). This is well established for *C. difficile*. I think there would be merit in applying this concept to other organisms when looked for as a cause of diarrhoea.			
Evidence			
DOH guidance on *C. difficile* which includes "Only test stools from symptomatic patients, i.e. only liquid/loose stools that take the shape of the container (Bristol Stool Chart types 5–7) should be examined" B10 on *C. difficile* testing states "Formed stools are unsuitable for investigation for *C. difficile*. These should be rejected with the appropriate comment appended to the report."			
Recommended Action	**PARTIAL ACCEPT** Formed stools from outbreak, screening and Norovirus cases may be positive. Therefore the sentence from B 30 with reference to *C. difficile* only will be included: 'Formed stools are unsuitable for investigation for *C. difficile*. These should be rejected with the appropriate comment appended to the report'		

Comment Number	5		
Date Received	09/01/2012	**Lab Name**	East of England HPA (& Regional HPS)
Section			
Comment			

Generally:

a. The grouping of the dimension of GI infection in two figures is hard to follow: would separate figures for each of the important dimensions help, such as important food borne pathogens, important water borne pathogens broken down as bacterial, viral, protozoan and parasitic.

b. Non -O157 VTECs and the importance of bloody diarrhoea and maroon coloured diarrhoea do not seem clearly emphasised in the document.

c. Why is *C. difficile* dependent on “local protocols”?

More specifically:

d. Hospital in the first section of flowchart 1 should have the same >48hrs as later if that’s what’s meant.

e. We think we don’t routinely get Adenovirus or Rotavirus testing offered.

f. Note that standard B 30 - culture of faeces - does specify that the *minimum* identification level ought to be genus for Salmonellae.

g. In flowchart 2, the order of institution/faeces tests has changed from that presented in flowchart 1 (i.e. serology/NAATs are above B10 & B30).

h. On the Gastroenteritis and Diarrhoea Flowchart 2, Institution pathway the virus screen is just for Norovirus, Adenovirus and Rotavirus. A few Sapovirus outbreaks have been reported recently.

Recommended Action	a. **NONE** This would not follow the template of the Syndromic Algorithms. b. **ACCEPT** Flowchart updated. c. **ACCEPT** Algorithm updated to reflect to DH guidelines, footnote added and box updated to NAATs/EIA. d. **ACCEPT** Flowchart since updated & redesigned. e. **NONE**

	Comments taken into consideration. f. **NONE** This comment refers to B 30 – the comment will be considered at the next review in 2016. g. **ACCEPT** Flowchart updated. h. **ACCEPT** Sapovirus testing added to secondary testing in outbreak algorithm and immunocompromised.

Comment Number	**6**		
Date Received	10/01/2012	**Lab Name**	Wye Valley NHS Trust
Section			
Comment			
Require evidence before increasing workload which this SOP would. a. Parasitology on almost all samples - Surely targeted on specific samples would be a better use of resources. b. Looking for Microsporidia in immunocompetent patients – Evidence? c. Testing children <5yrs. For *C. difficile* - significance of finding? – Evidence? d. Testing all hospital samples <48hr for rotavirus/adenovirus/norovirus this would again greatly increase workload what is the evidence that this would be cost effective.			
Recommended Action	a. **ACCEPT** OPC moved to secondary testing on all samples. Footnote added to Cryptosporidium/Giardia box 'if OCP required for primary testing a request must be submitted'. b. **PARIAL ACCEPT** Microsporidia in immunocompromised moved to secondary testing. It is not appropriate for all immunocompromised patients; footnote added for clarity. c. **ACCEPT** Footnote added referring to DH guidelines. Testing of *C. difficile* not routinely tested in those <2. d. **ACCEPT** Flowcharts have been redesigned and streamlined, and are based on best practice rather than cost effectiveness.		

Comment Number	7		
Date Received	13/01/2012	Lab Name	PHE Gastrointestinal Programme Board
Section			

Comment

This document is not suitable for the purpose for which it was drawn up, for the following reasons:

a. The restriction of samples to specific situations is unhelpful. Diarrhoeal diseases have been historically important with large outbreaks of cholera causing extensive deaths in the 19th century. Diarrhoeal diseases representing a very important component of preventable childhood morbidity and mortality and outbreaks of diarrhoea remain very high profile, particularly when linked to food or water. It is completely wrong to say (page 8) that "***The majority of cases of acute diarrhoea and vomiting do not require laboratory investigation*...”** because this implies that clinicians should be discouraged from diagnosing cases.

b. The nature of surveillance means that we pick up only a percentage of cases (Tam et al, 2011) and it therefore follows that the more sample that are tested, the more likely an outbreak is going to be identified. One of the main variables in surveillance of diarrhoeal diseases is the different attitudes of GPs to testing patients.

c. While the main target organisms are outlined in the text the flowcharts are not clear about what pathogens are tested for and which are not. The individual sections refer to other standards making the actual decisions opaque.

d. This is not based on a systematic review and the references are inadequate to support the conclusions.

e. The primary diagnosis of diarrhoeal diseases is at a watershed. Over the last half century there have been improvements in the range of pathogens examined and the methods used to detect them. We are now at a stage where molecular screening for a range of pathogens has become possible and this is changing our understanding of the occurrence of pathogens.

f. The IID2 study has emphasised the under diagnosis of enteric viruses in all age groups and there is now a need to improve primary detection of a wider range of pathogens in all samples from patients with diarrhoea. While this may not be achievable for cost reasons at present we need to identify that this is both desirable for improving the effectiveness of diagnosis and important for public health.

g. With the VTEC O104 outbreak in Germany there is an increased need for all laboratories to have a method for detecting non-O157 VTEC.

h. The flow charts are useless. I think primary diagnosis on all faecal samples should include (desirable but not essential in brackets):

Salmonella spp.	Direct and enrichment culture

Shigella spp.	Direct culture
Campylobacter spp.	Direct culture
VTEC O157	Direct culture (and enrichment)
Cryptosporidium spp.	Direct microscopy (modified ZN or auramine) EIA
Giardia intestinalis	Wet film (and concentration) EIA
(Norovirus)	PCR or EIA
(Rotavirus)	PCR or EIA

i. For people who have recently returned from abroad the following should be added:

Enteric parasites	Wet film and concentration
Vibrio spp.	Enrichment culture

j. For immunocompromised patients include:

Microsporidia	Modified Trichrome or equivalent
Enteric viruses	PCR
Enteric parasites	Wet film and concentration

k. Some of the less common pathogens we have a rather arbitrary approach to and it is not clear whether there are any systematic rules to testing. These include:

Organism	**Situation**
Adenovirus 40/41	Usually tested in children only
Bacillus cereus group	Often restricted to outbreaks.
Campylobacter fetus	Usually diagnosed by isolation from blood but occasional faecal isolates.
Clostridium difficile	One of the commonest enteric pathogens but testing is frequently restricted to hospitalised patients.
Clostridium perfringens A	Often restricted to outbreaks but can occur in diarrhoea in older patients. A common cause of diarrhoea.
Clostridium perfringens C (pigbel)	Rarely tested for.
Cyclospora cayetanensis	Usually picked up by accident on examination of stained faecal smears or concentrates.
E. coli EAEC	Rarely tested for.
E. coli EIEC	Rarely tested for.
E. coli EPEC	Rarely tested for.
E. coli ETEC	Rarely tested for.
Mycobacterium avium	Commonly tested for by culture only in HIV patients with diarrhoea.
Plesiomonas shigelloides	Usually a chance finding on culture for *Salmonella* & *Shigella*.

Sapovirus	Comparatively rarely tested for and usually only in young children. IID2 shows this pathogen is common.
Staphylococcus aureus	Often restricted to outbreaks.
Vibrio spp.	Only usually screened for in travellers or outbreaks where seafood is suspected.
Yersinia spp.	Usually picked up on media for *Salmonella* & *Shigella* but occasionally tested by cold enrichment. May be tested for in arthritis and mesenteric adenitis.

l. For hospital patients testing should include:

Rotavirus	PCR
Adenovirus 40/41	PCR
Astrovirus	PCR
Sapovirus	PCR
Clostridium difficile	Toxin testing

m. Detecting WBCs and RBCs in faeces can be useful for differentiating bacillary from amoebic dysentery but has relatively little additional diagnostic value in diarrhoeal diseases.

n. In the document it is unclear what criteria are used for deciding what secondary testing should be undertaken.

o. Most enteric pathogens can infect all age groups. Some viruses are more common in young children (e.g. Rotavirus) whilst others pathogens are more common in older people (e.g. *C. difficile*). However, testing in a restricted manner will miss cases.

p. On page 9 the document says: "*Stool samples are usually referred for investigation in the following circumstances*". To the given reasons should be included:
   - Where the clinician requires a microbiological diagnosis.
   - Where public health requires sampling to be carried out.

   The other criteria are secondary to these.

q. The issues with the flowcharts are:
   i. Two flow lines for Community which are identical.

   ii. Children <5 and >5 with same flow lines.

   iii. No parasite examination in food poisoning or seafood consumption.

   iv. No culture for bacteria in Hospital patients >48 hours.

   v. No indication of what Local Protocol or NAATs means.

vi. Why no Microsporidia testing in immunocompromised patients? vii. Other virus testing in immunocompromised patients. viii. Inconsistent testing of WBCs. r. This does not seem to fit with some of the other recent standard documents including B 30.	
Recommended Action	a. **PARTIAL ACCEPT** The text reflects HPA primary care guidelines. The sentence has been modified to: 'Not all community cases of acute diarrhoea and vomiting require laboratory investigation….' b. **NONE** c. **ACCEPT** Flowchart updated. Majority of organisms listed in the algorithm (some in footnotes). d. **NONE** The UK SMIs cross-referenced in the document are well referenced and evidence based ie B 30 – Investigation of Faecal Specimens for Enteric Pathogens and B 31 – Investigation of Specimens other than Blood for Parasites. Guidelines are referenced in S7 where applicable. e. **ACCEPT** Addition of footnote which refers to alternative diagnostic techniques and their potential advantages/disadvantages, these methods may be considered where available. Eg multiplex PCR. f. **ACCEPT** Flowchart redesigned. Virus testing in <5 only in specific clinical features arm of algorithm. g. **ACCEPT** Update algorithm *E. coli* VTEC (including O157). h. **PARTIAL ACCEPT** Target organisms added to flowchart. Flowchart to be updated: Crypto/Giardia Wet Prep or EIA Rotavirus NAATs/EIA Norovirus moved to secondary testing Rotavirus <5 only Footnote to be added regarding Crypto/Giardia methodology.

	i. **ACCEPT** Flowchart updated. j. **ACCEPT** Flowchart updated. Microsporidia and enteric viruses moved to secondary testing. k. **PARTIAL ACCEPT** Flowchart updated. Diagnosis of disseminated *Mycobacterium avium* intracellulare complex infection should not be made on the basis of either sputum or stool culture alone and is not promoted by BHIVA guidelines. Definitive diagnosis requires culture of the organism from a sterile body site. Refer to B 40 – Investigation of Specimens for *Mycobacterium* species. British HIV Association and British Infection Association Guidelines for the Treatment of Opportunistic Infection in HIV-seropositive Individuals 2011. HIV Medicine (2011), 12 (Suppl. 2), 1–5. DOI: 10.1111/j.1468-1293.2011.00944.x Sapovirus to be added as secondary testing in the outbreak algorithm. Food Water Poisoning - move to outbreak from sporadic algorithm. l. **ACCEPT** Flowchart updated. m. **ACCEPT** Flowchart updated; WBCs and RBCs removed. Added to text of scope 'microscopy for WBS and RBCs is no longer recommended as it is of no clinical value'. n. **NONE** This is covered in the scope: 'If the primary testing set does not identify a causative pathogen, secondary testing should be performed if clinical and/or epidemiological features support such testing.' o. **ACCEPT** Restricted testing will miss cases, however this is not considered a relevant issue in sporadic cases; in sporadic cases virus testing should be carried out in those <5. Footnote added:

	'The algorithm recognises that sporadic causes of viral infection managed in the community will only be diagnosed in those aged <5 years.' There is however no age restriction for testing in outbreak situations. p. **ACCEPT** Text updated. q. i. **ACCEPT** Flowchart redesigned. ii. **ACCEPT** Flowchart redesigned. iii. **ACCEPT** Flowchart updated, food poisoning arm to be moved to outbreak algorithm. iv. **ACCEPT** Flowchart updated to move to outbreak algorithm ACCEPT – 3 day rule footnote expanded**.** v. **ACCEPT** *C. difficile* boxes changed to NAATs/EIA and reference to DH guidelines footnote added. vi. **ACCEPT** Flowchart and footnote updated. vii. **ACCEPT** Flowchart updated. viii. **ACCEPT** WBC removed from algorithm. r. **ACCEPT** S7, B30 and B31 were compared and updated where appropriate. A full comparison will undertake at the next review in 2016.

Comment Number	**8**		
Date Received	19/01/2012	**Lab Name**	Virus Reference Department, Colindale
Section			
Comment			
It seems to omit many of the virology findings from IID2.			
Recommended Action	**ACCEPT** Flowchart updated, reference to IID2 included. Virus testing revised.		

Comment Number	9		
Date Received	21/01/2012	Lab Name	North East HPU
Section	Whole Document		
Comment			

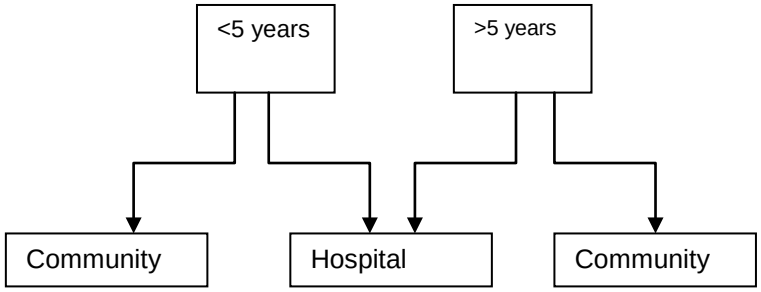
a. In flowchart 1 it may be useful to clarify that this refers to sporadic cases (rather than outbreaks) if that is the case.

b. In flowchart 1 for patients who have been in hospital for >48 hours. It is of concern that Culture and Sensitivity (C & S) is not recommended for this group – they may have come in incubating food poisoning or VTEC or other GI pathogen or have acquired it in hospital (e.g. Stanley Royd Salmonella Outbreak) and it will not be detected if C&S is not done.

c. One could argue the same for ova, cysts and parasites.

d. The title of the box needs clarifying – is it intended to refer to a patient who has been admitted with diarrhoea and you are testing >48 hours after admission or that the patient developed diarrhoea >48 hours after admission.
It may be better in practice just to have the one set of actions for all hospital specimens and remove this column.

e. In flowchart 1 the arrowed lines above the boxes saying Community, Hospital, Community could be confusing. It would be clearer if they were redrawn to prevent someone following the wrong route down.



f. In flowchart 1 the Food poisoning box states seafood consumption which looks slightly odd – does it just mean suspected food poisoning thought to be due to seafood consumption? Or food poisoning in someone who has eaten seafood (plus presumably other foods)?

g. Food poisoning is also due to Norovirus and Cryptosporidium (from water) so it seems odd only to do C&S and Norovirus.

h. It may be better to remove this column?

Recommended Action	a. **ACCEPT** Flowchart updated. 'Sporadic' added to flowchart title. b. **ACCEPT** Flowchart and footnotes updated to clarify 3 day rule. Application of the 3 day rule is dependent on local discussion.

	c. **ACCEPT** Flowcharts updated Cryptosporidium/Giardia Primary testing and Ova, Cysts, and Parasites secondary. d. **ACCEPT** Footnote expanded and 3 day rule clarified. Flowchart redesigned. e. **ACCEPT** Flowchart redesigned. Separate arm in special clinical features for <5yrs. f. **ACCEPT** Flowchart since updated and redesigned. Food poisoning and shellfish consumption separated and moved to outbreak flowchart. g. **ACCEPT** Flowchart (outbreak) updated. h. **NONE** Arm moved to outbreak flowchart.

Comment Number	**10**		
Date Received	27/01/2012	**Lab Name**	Leeds Teaching Hospitals
Section			
Comment			
I think consideration should be given to testing immunocompromised patients with chronic diarrhoea for Norovirus.			
Evidence			
There is evidence, though it is poor quality, that Norovirus is associated with chronic diarrhoea in immunocompromised patients. Clin Infect Dis. 2009 Oct 1;49(7):1061-8. Allogeneic hematopoietic stem cell transplantation and Norovirus gastroenteritis: a previously unrecognized cause of morbidity. Roddie C, Paul JP, Benjamin R, Gallimore CI, Xerry J, Gray JJ, Peggs KS, Morris EC, Thomson KJ, Ward KN.			
Recommended Action	**ACCEPT** Algorithm updated and reference included.		

Comment Number	**11**		
Date Received	30/01/2012	**Lab Name**	Withybush
Section	Overview Flowchart 1		
Comment			
a. This would be improved by splitting clinical presentation into diarrhoeal illness with or without vomiting. First line investigation then becomes Norovirus or *C. difficile* toxin			

respectively for hospital-acquired infection. b. It is not clear whether you are promoting a "3 day rule" for hospital-acquired diarrhoea. c. First column suggests full culture + ova, cysts and parasites, later column suggests *C. difficile* test +/- Norovirus only.	
Evidence	
Clinical presentation of the two infections: vomiting rare in *C. difficile*, near universal in Norovirus.	
Recommended Action	a. **NONE** Norovirus outbreaks have been observed where no vomiting occurred. This therefore can not be used as a differentiator. b. **ACCEPT** Footnote added regarding the '3 day rule' expanded and clarified. The decision to apply the three day rule is down to local policy. c. **ACCEPT** Flowchart redesigned.

Comment Number	**12**		
Date Received	31/01/2012	**Lab Name**	Dundee
Section	1. Flowchart 1 2. Flowchart 2		
Comment			
Flowchart 1: a. If a child with diarrhoea is to be investigated it makes little sense to me to exclude the most common causes, that is viral causes. In children under 2, viral causes are 22 times more common than bacterial. b. Hospitalised adults with diarrhoea, I would not test for rotavirus or Adenovirus. Flowchart 2: c. I would test family outbreaks for Rotavirus and Adenovirus on the assumption it would include children. d. Cytomegalovirus testing in immunocompromised should be by PCR of blood and stool.			
Recommended Action	a. **ACCEPT** Virus testing in < 5 added as arm of 'specific clinical features' in the sporadic flowchart. b. **ACCEPT** Flowchart updated. c. **ACCEPT** Flowchart updated.		

	d. **ACCEPT** Algorithm updated and footnote added regarding sample type.

Comment Number	**13**		
Date Received	31/01/2012	**Lab Name**	Royal Infirmary of Edinburgh
Section	Flowchart 1		
Comment			
a. The flowchart is confusing. It is possible to follow multiple routes with the same patient in parallel rather than flowing from decision point to decision point. For example what investigations do I do on a > 5 year old with food poisoning acquired outside the UK? b. The diagram requires more work to be done than is our current practise for example *Giardia* wet preps on stools; in an inconsistent manner. If we are going to do this we should be doing this on community samples. Where is the evidence and resource for this? c. The diagram can be read as requiring formol ether concentrations for parasites on a wide range of samples. We would only test for *Cryptosporidium* unless there was a specific request for parasites. d. The amount of virology done on a stool sample from a hospitalised patient is more than would be normal outside an outbreak. It implies we should be doing Norovirus, Rotavirus and Adenoviruses on all acute admissions to hospital. e. The recommendation not to look for Salmonella in patients hospitalised more than 48 hours would be regarded as 'sporting' in some circles. See the Watt Report into a *Salmonella* outbreak at a Hospital in Glasgow. f. The flowchart includes nothing about not testing formed stool samples in non high risk patients. Current recommendations from the HPA GP microbiology group are not to send samples in non high risk group if the diarrhoea has settled. Not testing formed stool is standard practice for *C. difficile* and we are looking at the yield from formed stools for other pathogens.		
Recommended Action	a. **ACCEPT** Algorithm redrafted. Flowchart updated to include specific clinical features. b. **ACCEPT** Algorithm redrafted. Best practise recommended. c. **ACCEPT** Ova, cysts and parasites removed from primary testing on most samples. Ova, cysts and parasites tested on request following consultation with microbiologist. d. **ACCEPT** Virus testing criteria updated in the flowchart.		

	e. **ACCEPT** Algorithm update to remove '<48 hr' label from the hospital arm. Footnotes updated to clarify the '3 day rule'. f. **PARTIAL ACCEPT** Algorithm updated. Not testing formed stool samples for *C. difficile* added to scope.

Comment Number	**14**		
Date Received	06/02/2012	**Lab Name**	Grupo de Microbiología Instituto Nacional de Salud, Colombia
Section	Genotypic surveillance of Enteropathogens		
Comment			
a. Include *Salmonella*, *Shigella*, *Campylobacter* and *E. coli* testing in the Flowcharts. b. Include post analytical stages ie reporting (network/surveillance) for pathogens identified. c. Include if necessary the study of those in contact with cases (in outbreak situations).			
Recommended Action	a. **ACCEPT** Algorithm updated. b. **NONE** Included in scope and refer to individual bacteriology (B) documents. c. **NONE** This is a primary diagnostic document, not managing outbreak, some information included in scope.		

Comment Number	**15**		
Date Received	09/02/2012	**Lab Name**	Coordinadora Grupo de Parasitología
Section			
Comment			
a. It is important to remind that diagnosis of cyst of *Entamoeba histolytica/Entamoeba* dispar complex and *Giardia* by microscopy/wet preparation is better if some concentration method is done. However, if the patient has diarrhoea it will find trophozoites more than cysts. In this case, I suggest doing trichrome stain previous fixation of the parasites in faeces using PVA or Schaudinn fixatives in order to identify trophozoites of parasites and differentiate them of macrophages. b. Diagnosis of *Cryptosporidium* is done by Ziehl-Neelsen method because wet/preparation is not useful.			
Evidence			
Recommended Action	a. **PARTIAL ACCEPT** This is outside of the scope of this document.		

	The comment will be assessed against B 31 – Investigation of Faeces for Parasites at its next review. a. **ACCEPT** Information regarding methods for the detection of *Cryptosporidium* species updated. For detailed information refer to B 31 – Investigation of Faeces for Parasites.

2nd CONSULTATION 21.12.12 – 08.03.13

PROPOSALS FOR CHANGE: GENERAL COMMENTS

Comment Number	**1**		
Date Received	31/12/2012	**Lab Name**	Gastrointestinal, Emerging and Zoonotic Infections Department, Colindale
Section	Scope		
Comment			
a. Plesiomonas is mentioned in the flow diagram for immunocompetent people (but not in the list of main organisms). b. Regarding WBC and RBC - I agree with this but this is useful in the primary diagnosis of amoebiasis. This is rare in the UK but does still occur in people returning from abroad. c. There are a number of species of Cryptosporidium that can cause human infections (change *Cryptosporidium parvum* to *Cryptosporidium* species). d. Regarding infection type 3: i. What about the other Yersinia (*Y. pseudotuberculosis, Y frederiksenii, Y. kristensenii)*? ii. *Vibrio vulnificus* should be in here as, although rare, the disease has a high mortality in people with liver dysfunction. iii. *Mycobacterium avium* intracellulare complex can be associated with intestinal and systemic infection in HIV related immunosuppression. e. Regarding 'not covered in the document' - Surely advice on this (*C. perfringens*) is needed if labs are testing for *C. perfringens* related food poisoning?			
Recommended Action	a. **ACCEPT** List updated. b. **NONE** No action required. c. **ACCEPT** Text updated. d. **PARTIAL ACCEPT** Examples of organisms are given in this section; it is not an exhaustive list. Text updated to: 'The enteric diseases covered include three types of infections; examples of causative organisms are given		

	below' i. **NONE** as above ii. **ACCEPT** *Vibrio vulnificus* added. iii. Diagnosis of disseminated *Mycobacterium avium* intracellulare complex infection should not be made on the basis of either sputum or stool culture alone and is not promoted by BHIVA guidelines. Definitive diagnosis requires culture of the organism from a sterile body site. British HIV Association and British Infection Association Guidelines for the Treatment of Opportunistic Infection in HIV-seropositive Individuals 2011. HIV Medicine (2011), 12 (Suppl. 2), 1–5. DOI: 10.1111/j.1468-1293.2011.00944.x Scope updated - *Mycobacterium* species added to section relating to what is not covered by this document and link to B 40 – Investigation of Specimens for *Mycobacterium* species added. e. **NONE** Statement refers to overgrowth of *C. perfringens*, not isolation of toxin producing strains.

Comment Number	**2**		
Date Received	31/12/2012	**Lab Name**	Gastrointestinal, Emerging and Zoonotic Infections Department, Colindale
Section	Flowcharts and Footnotes		
Comment			

a. Outbreak flowchart - With shellfish consumption consideration should be given to sending samples to Weymouth for dinoflagellate toxin testing.

b. Immunocompromised flowchart - Should include *Mycobacterium avium intracellulare* blood or faeces culture.

c. Footnote 'a' – updated to: 'For gastroenteritis and diarrhoea acquired in a hospital setting, clinicians and laboratories should consult local policy on the ''three day rule'' for the culture of faeces samples in their department **to avoid unnecessary laboratory testing**. It suggests that faecal samples from patients **with diarrhoea should be tested for *C. difficile* but** should not be cultured **for the normal enteric pathogens** except under the following circumstances….. Suspected nosocomial outbreak **(eg Salmonella).**'

d. Footnote 'f' – What are these additional details telling us to test for and what additional testing is needed? *Aeromonas* and *Edwardsiella* are mostly occasionally found through normal faecal testing rather than in response to a specific search based on clinical information. However, non-O157 VTEC should be tested on all samples that are bloody at the least.

e. Footnote ‘q’ – There is no reference to what NAATs is (Nucleic Acid Amplification Testing).	
Recommended Action	a. **NONE** Not within the scope of the document. Comment will be transferred to B30 – ‘Investigation of faecal specimens for enteric pathogens’ for consideration at the next review. b. **PARTIAL ACCEPT** Diagnosis of disseminated *Mycobacterium avium* intracellulare complex infection should not be made on the basis of either sputum or stool culture alone and is not promoted by BHIVA guidelines. Definitive diagnosis requires culture of the organism from a sterile body site. British HIV Association and British Infection Association Guidelines for the Treatment of Opportunistic Infection in HIV-seropositive Individuals 2011. HIV Medicine (2011), 12 (Suppl. 2), 1–5. DOI: 10.1111/j.1468-1293.2011.00944.x Scope updated - *Mycobacterium* species added to section relating to what is not covered by this document and link to B 40 – Investigation of Specimens for *Mycobacterium* species added. c. **PARTIAL ACCEPT** Section reworded following consultation. ‘eg Salmonella’ added to text. d. **NONE** This wording was discussed at the meeting and the included text agreed. e. **ACCEPT** Text updated.

Comment Number	**3**		
Date Received	02/01/2013	**Lab Name**	Centre for Environment, Fisheries and Aquaculture Science
Section	a. General. b. Table 1.		
Comment			
a. General: it would be useful to use the document to include guidance to the physician on the inclusion of relevant clinical details on the submission form, especially those relevant to the test selection process. b. Table 1: Elsewhere, where more Vibrio infections either occur and/or are detected, significant numbers associated with seafood have been shown to be sporadic rather than outbreak-associated.			
Evidence			
a. General: personal observation of lab request forms completed with regard to me or family members. Relevant details other than D&V are rarely included.			

b. Table 1: Martha Iwamoto, Tracy Ayers, Barbara E. Mahon, and David L. Swerdlow. Epidemiology of Seafood-Associated Infections In the United States. Clin. Microbiol Rev. 2010 April; 23(2): 399. 411.	
Recommended Action	a. **ACCEPT** List included in the scope, primary care guidelines referenced. b. **ACCEPT** Flowchart updated; seafood consumption included in sporadic flowchart as well as outbreak flowchart.

Comment Number	**4**		
Date Received	10/01/2013	**Lab Name**	Manchester Royal infirmary
Section	Table on page 12 and table on page 17.		
Comment			
Should *Aeromonas* species be included?			
Recommended Action	**NONE** The main, common enteric pathogens are listed in the algorithm. Aeromonas species is covered in footnote 'f': 'Testing for other organisms such as…. Aeromonas species and Edwardsiella tarda may be required depending on clinical details' Further information regarding Aeromonas species is available in B 30 - Investigation of faeces for enteric pathogens. If present, Aeromonas species should be detected following this syndromic algorithm; it is up to the reporting laboratory to decide its significance.		

Comment Number	**5**		
Date Received	22/02/2013	**Lab Name**	Virology, Edinburgh Royal Infirmary
Section	Gastroenteritis And Diarrhoea - Sporadic Cases (Immunocompromised).		
Comment			
No consideration was given in this document to turnaround time (TAT) for norovirus PCR for outbreaks (flowchart, page 11). In Scotland we are aiming for TAT of 12 hours for outbreak results. We could not deliver this service AND test all routine sporadic GI cases. Routine testing for norovirus - sporadic immunocompetent hospital cases of gastroenteritis (page 14, footnote 'm'). This will dramatically slow up the turnaround time for testing outbreak cases for norovirus.			
Evidence			
We don't have sufficient molecular equipment or lab staff, to offer routine testing for norovirus in sporadic immunocompetent hospital cases of gastroenteritis (page 14, footnote 'm').			
Recommended Action	**NONE** Norovirus testing is included for children <5 and as secondary testing for sporadic hospital patients. Footnote 'o' (previously 'm') suggests laboratories should consider testing for Norovirus in all		

	hospital inpatients. Laboratories should carry out local operational risk assessments and consult their business plans to assess local testing capabilities and requirements with regards to Norovirus testing and locally agreed turnaround times.

Comment Number	**6**		
Date Received	26/02/2013	**Lab Name**	Brighton and Sussex University Hospital (NHS) Trust
Section	Flow charts.		
Comment			
In the flow charts *Salmonella, Campylobacter, Shigella, E. coli* VTEC (including O157) are outlined in green suggesting that a culture method be applied. Many labs are now using PCR methods and then only culturing positive samples if the isolate is required for further epidemioloical typing.			
Evidence			
Validation data available from EntercBio. Also http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2772650/			
Recommended Action	**NONE** The colour codes reflect 'most achievable, best practise', they are not mandatory. Alternative methods are available (footnote'd'), which may perform better than conventional methods; laboratories should validate methods prior to implementation.		

Comment Number	**7**		
Date Received	06/03/2013	**Lab Name**	Cryptosporidium Reference Unit, Public Health Wales Microbiology, Swansea
Section	a. Check entire document. b-d. Flow diagrams.		
Comment			
a. Replace *Cryptosporidium parvum* with *Cryptosporidium* spp. b. Flow diagram ova, cyst and parasites will not detect Cryptosporidium. Do not put them in the same box. c. Also Microscopy/wet prep same issue. Wet prep will not detect Cryptosporidium. d. For Immunocompromised patients, Microsporidia should also be considered.			
Evidence			
a. Species can only be identified by typing, not undertaken in routine labs by diagnostic tests. c. Casemore DP, Armstrong M, Sands RL. Laboratory diagnosis of cryptosporidiosis. J Clin Pathol. 1985;38(12):1337-41.			
Recommended Action	a. **ACCEPT** Scope updated. b. **ACCEPT** Flowcharts updated.		

	c. **ACCEPT** Wet prep removed from key. Orange colour represents 'Microscopy'. d. **NONE** Microsporidia is currently included in the secondary testing for immunocompromised patients. Second line tests may be carried out same time as the primary testing set dependent on local epidemiological information and laboratory operational capabilities (refer to scope).

PROPOSALS FOR CHANGE: POINTS TO CONSIDER

What are your thoughts on the 'three day rule' as detailed in footnote a?
This rule is dependent on the laboratory receiving accurate information about the admission date of the patient, and the date of symptom onset.
Your thoughts on the usefulness of these selection criteria are requested.

Comment Number	**8**		
Date Received	10/01/2013	**Lab Name**	Manchester Royal infirmary
We rarely get this information routinely, although it might be worth persuing if these two questions could be mandatory when requesting a faeces for examination.			
Recommended Action	**NONE** This was discussed, no action required.		

Comment Number	**9**		
Date Received	25/02/2013	**Lab Name**	Sunderland
The 3 day rule should be more explicit: footnote 'a' says specimens should not be cultured, it should also say no other tests (including Cryptosporidium and Giardia) is required except *C. difficile* and, when appropriate, Norovirus.			
Recommended Action	**ACCEPT** Footnotes clarified. Footnote 'a' updated. 'Culture' replaced with 'microbiological investigation' to cover testing for Cryptosporidium and Giardia. The footnote clearly states that the three day rule does not apply to *C. difficile*. Cross reference to Norovirus footnote 'o' added.		

Comment Number	**10**		
Date Received	26/02/2013	**Lab Name**	Brighton and Sussex University Hospital (NHS) Trust
We are unable to obtain any useful information on how long patients have been admitted therefore all samples get processed in full in case they have been admitted within 3 days.			
Recommended Action	**NONE** Pathology hand book/instruction to users may be used to encourage the inclusion of patient history. No action required.		

Comment Number	**11**		
Date Received	01/03/2013	**Lab Name**	Sunderland
It appears entirely appropriate.			
Recommended	**NONE**		

Action	No action required.

Comment Number	**12**		
Date Received	06/03/2013	**Lab Name**	Cryptosporidium Reference Unit, Public Health Wales Microbiology, Swansea
If laboratories consider applying the three day rule, they should undertake analysis of their submission and positivity data and undertake an informed risk assessment. Clusters of diarrhoea cases must be investigated.			
Recommended Action	**ACCEPT** Footnote 'a' updated to include: 'Laboratories considering applying the three day rule should undertake analysis of their submission and positiivity data and undertake an informed risk assessment. Clusters of diarrhoea cases must be investigated.'		

Testing criteria for Cryptosporidium

In the sporadic cases algorithm, testing is recommended on all semi-formed or diarrhoeal stools from symptomatic patients with no age or travel-related selection criteria applied.

Please comment.

Comment Number	**13**		
Date Received	10/01/2013	**Lab Name**	Manchester Royal infirmary
All faecal samples are tested for Cryptosporidia using the DS2.			
Recommended Action	**NONE** No action required		

Comment Number	**14**		
Date Received	25/02/2013	**Lab Name**	Sunderland
The algorithm appears to suggest all community stools should be tested for Cryptosporidium and Giardia, but footnote 'i' says that only Cryptosporidium testing is mandatory, whereas opportunistic Giardia testing is presented as an option if EIA testing is adopted for Cryptosporidium. My impression is that Cryptosporidium EIA testing is not cost- effective (microscopy can be cheaper) unless Giardia testing is mandatory. Bearing in mind the current financial pressures, nobody wants to do more than what is required or recommended as good practice. The case for universal Giardia testing could be based on: • Number of cases (we only tests for Cryptosporidium, but are labs testing for both not finding more Giardia cases?). • Being able to treat: Giardia is treatable with metronidazole, Cryptosporidium is not treated. • Broader public health implications (is Cryptosporidium more likely to be implicated in controllable outbreaks?). I am happy to go along with the standard, but would welcome a clearer statement as to whether universal testing of community stools for Giardia is recommended or not.			
Recommended Action	**ACCEPT** However, due to the fact that the prevalence of Giardia is similar to that of Cryptosporidium, laboratories should be given the option to add it to the primary testing set dependent on local risk assessments. The flowchart has been updated; Giardia has been removed		

	from the primary testing set of the flowchart for sporadic gastroenteritis and diarrhoea, and is now only included in the secondary testing set and for outbreaks associated with waterborne/farm animal exposure. Footnote 'k' has been updated to: 'Giardia has been shown to be of similar prevalence to Cryptosporidium; laboratories may wish to consider adding Giardia to the primary testing set based on local risk assessment and operational capabilities.' It is stated in the scope of the syndromic algorithm that: 'If the primary testing set does not identify a causative pathogen, secondary testing should be performed if clinical and/or epidemiological features support such testing. Laboratories may wish to undertake second line tests either after, or at the same time as, the primary testing set according to the clinical and local epidemiological setting and laboratory operational capabilities.' Infectious Intestinal Disease 2 study reference regarding prevalence added to footnote 'k': Tam CC, Rodrigues LC, Viviani L, Dodds JP, Evans MR, Hunter PR, et al. Longitudinal study of infectious intestinal disease in the UK (IID2 study): incidence in the community and presenting to general practice. GUT 2011;61:69-77

Comment Number	**15**		
Date Received	26/02/2013	**Lab Name**	Brighton and Sussex University Hospital (NHS) Trust
We have in the past tested only selected patients for Cryptosporidium but have found the time taken to make the selection exceeds the time taken to perform Cryptosporidium test on all samples other than those which request either *Clostridium difficile* test (CDT) only or OCP (Oocysts, Cysts and Parasites) only or are clearance/outbreak samples.			
Recommended Action	**NONE** This was discussed; as this is a local operational issue it does not directly affect the algorithm. No action required.		

Comment Number	**16**		
Date Received	01/03/2013	**Lab Name**	Sunderland
Agree.			
Recommended Action	**NONE** No action required.		

Comment Number	**17**		
Date Received	06/03/2013	**Lab Name**	Cryptosporidium Reference Unit, Public Health Wales Microbiology, Swansea
Testing of semi-formed or diarrhoeal stools should be a minimum requirement. Ideally all stools should be tested as symptoms relapse and remit in about a third of cases during the course of an infection and oocysts can be shed for a couple of weeks after symptoms have resolved. Stool consistency is not a good selection criterion.			

Casemore DP, Armstrong M, Sands RL. Laboratory diagnosis of cryptosporidiosis. J Clin Pathol. 1985;38(12):1337-41.	
Recommended Action	**NONE** The reference submitted includes two patients without diarrhoea in whom Cryptosporidium was isolated. This algorithm is designed to predominately investigate gastroenteritis and diarrhoea evidenced by stools which take the shape of the container. It is recognised that pathogens may be detected in semi formed or other stools. Only formed stools received for the investigation of *Clostridium difficile* should be rejected (as stated in the scope). Currently the document recommends testing on all symptomatic patients with semi-formed or diarrhoeal stools for Cryptosporidium. Following discussions this has been changed to: 'all symptomatic patients with stools that take the shape of the container'.

Testing method for Cryptosporidium

Recent research has shown that the sensitivity of modified Ziehl Neelsen microscopy is significantly less than other tests. Enzyme immunoassays (EIA) for example perform better than conventional methods, and should therefore be considered for use where available (see footnote 'i').

Please comment.

Comment Number	**18**		
Date Received	10/01/2013	**Lab Name**	Manchester Royal infirmary
Agree 100% (although Auramine is more sensitive than Ziehl Neelsen).			
Recommended Action	**NONE** No action required. Footnote 'j' does not specify which tests are more sensitive. Refer to reference: Chalmers RM, Campbell BM, Crouch N, Charlett A, Davies AP. Comparison of diagnostic sensitivity and specificity of seven Cryptosporidium assays used in the UK. J Med Microbiol 2011;60:1598-604.		

Comment Number	**19**		
Date Received	25/02/2013	**Lab Name**	Sunderland
My understanding is that auramine microscopy is as sensitive as EIAs according to: Chalmers RM, Campbell BM, Crouch N, Charlett A, Davies AP. Comparison of diagnostic sensitivity and specificity of seven Cryptosporidium assays used in the UK. J Med Microbiol 2011;60:1598-604. My BMSs tell me auramine microscopy (including labour) is cheaper than EIA testing: if they are right, then EIA testing is preferable only if Giardia testing is mandatory.			
Recommended	**ACCEPT**		

Action	B31 – Investigation of faeces for parasites includes auramine phenol and modified Ziehl Neelsen staining. Footnotes 'i- l' separated for clarity. Reference submitted included in footnote 'j'.

Comment Number	**20**		
Date Received	26/02/2013	**Lab Name**	Brighton and Sussex University Hospital (NHS) Trust
Currently we use an auramine stain but are considering an alternative method and have a staff member undertaking a project in this area.			
Recommended Action	**NONE** No action required.		

Comment Number	**21**		
Date Received	01/03/2013	**Lab Name**	Sunderland
Agree.			
Recommended Action	**NONE** No action required.		

Comment Number	**22**		
Date Received	06/03/2013	**Lab Name**	Cryptosporidium Reference Unit, Public Health Wales Microbiology, Swansea
EIA use must be supported by the application of appropriate confirmatory tests for EIA positive reactions. At the reference unit we find immunofluorescence microscopy is very good. Note the data from Preston regarding increased detection of Giardia cases : Ellam et al., 2008. Surveillance of giardiasis in Northwest England 1996-2006: impact of an enzyme immunoassay test. Euro Surveill 13, pii518977			
Recommended Action	**PARTIAL ACCEPT** This is outside of the scope of this document. The comment will be assessed against B31 – Investigation of faeces for parasites at its next review.		

Virus Testing

Please comment on the viruses included in the primary testing set for healthcare/institution acquired and viral gastroenteritis in the outbreak flowchart.
Is this an achievable suite of tests for a routine testing laboratory?

Comment Number	**23**		
Date Received	10/01/2013	**Lab Name**	Manchester Royal infirmary
Virus detection done by Virology laboratory, therefore no comment.			
Recommended Action	**NONE** No action required.		

Comment Number	**24**		
Date Received	26/02/2013	**Lab Name**	Brighton and Sussex University Hospital (NHS) Trust
Unsure.			
Recommended Action	**NONE** No action required.		

Comment Number	**25**		
Date Received	01/03/2013	**Lab Name**	Sunderland
Yes - should be achievable in most laboratories.			
Recommended Action	**NONE** No action required.		

RESPONDENTS INDICATING THEY WERE HAPPY WITH THE CONTENTS OF THE DOCUMENT

Overall number of comments: 5			
Date Received	07/01/2013	**Lab Name**	Not given
Date Received	12/02/2013	**Lab Name**	Golden Jubilee National Hospital
Date Received	22/02/2013	**Lab Name**	Edinburgh Scientific Services
Date Received	24/02/2013	**Lab Name**	ex microbiologia ospedale Careggi Firenze
Date Received	08/03/2013	**Lab Name**	Newcastle Hospitals NHS Foundation Trust