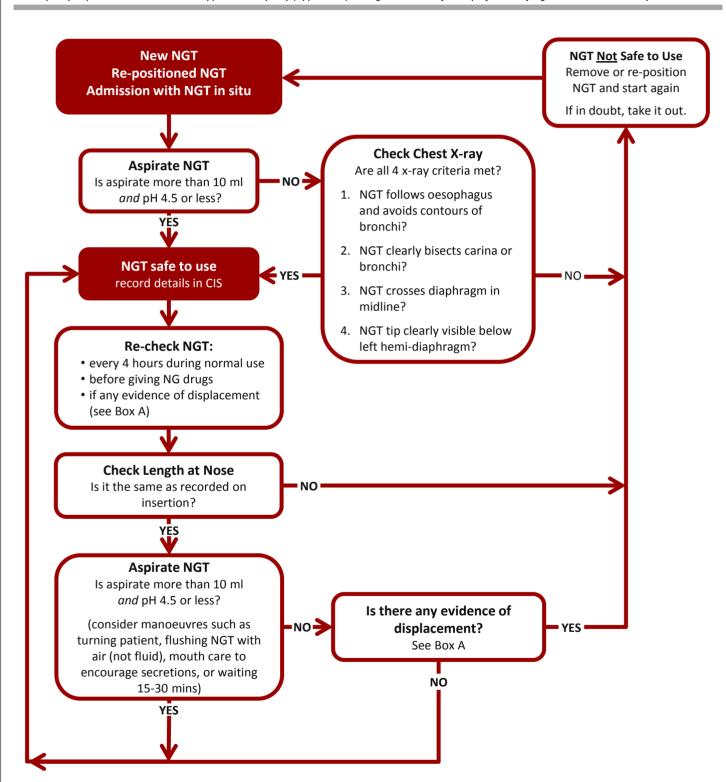
Nasogastric Tubes in Critical Care

Aim: To provide guidance on insertion, checking and continued care of nasogastric tubes (NGTs) in Critical Care.

Scope: All adult critical care patients with NGTs. This guideline should not be used outside Critical Care.

Version: 2.1 Ratified by: Critical Care Governance Group Authors: Dr P McQuillan, Dr N Tarmey
Ratified: 14 Jun 13 (Annex C: 27 Sep 13) Revision due: 14 Jun 15 Produced by: Critical Care Governance Group

An equality impact assessment has been applied to this policy (Appendix B). This guideline is subject to professional judgment and accountability.



Box A: Evidence of Displacement includes:

- · new hypoxia, possibly aspiration-related
- unusually severe coughing episode
- head down postural change (eg CVC insertion)
- loosened, tampered or dislodged securing method
- regurgitation or vomiting
- feed or gastric fluid in airway

Indications and Contraindications to NGT Insertion

Indications include:

- hydration & nutrition
- enteral drug administration
- confirming tolerance of enteral feeding
- · gastric decompression

Elective surgical admissions do not usually need an NGT

Seek senior advice if potential contraindications:

- head injury or base of skull fracture
- maxillofacial surgery (including flaps)
- oesophageal & gastric surgery
- recently bleeding oesophageal varices
- coagulopathy & thrombocytopenia
- agitation & confusion

Insertion Techniques

- 1. Seek verbal, informed consent if possible.
- Choose a radio-opaque NGT with numbered depth markings eg Salum Sump Drain for surgical drainage or Corflo size 12 or 14 for feeding in ICU.
- 3. Estimate distance from patient's nose, to ear, to xiphisternum (NEX length). This is the approximate length needed to reach the stomach (typically 50-60cm).
- 4. Consider local anaesthetic spray to nose or nasopharynx if patient is conscious.
- 5. Insert carefully along floor of nose- in posterior & caudal direction, not cranially.
- 6. Consider sip of water to aid swallowing.

- 7. Consider a larger NGT or one stiffened by refrigeration if insertion is difficult.
- 8. Consider laryngoscope & Magill's forceps for intubated patients. Increased sedation may be needed.
- 9. Record the length of the NGT at the naris.
- 10.Occasionally an orogastric tube is needed. If so, record the length at the incisors and reconsider changing to an NGT daily.
- 11. Seek senior experienced help in case of difficulty.
- 12. Additional guidance is available in the Trust NGT Guideline (available on intranet).

Securing NGTs

- Use red "trouser" tapes from bridge of nose to NGT. Ensure tape is not bunched, and the NGT hangs free and does not put pressure on naris.
- Examine skin, mucosa and naris edge pressure areas at least daily and record findings.
- 3. Tape or adhesive dressing to the cheek can be used instead, but may be less secure.

- 4. Consider Cavalon to improve tape adherence.
- 5. Change NGT securing tapes daily.
- 6. If a patient dislodges their NGT repeatedly, consider alternative securing methods including a nasal bridle.

Confirming Position, Monitoring & Documentation

Competency

- NGT insertion, aspiration and pH testing may be performed by any competent Critical Care staff.
- Only the following staff may certify correct NGT placement based on a chest x-ray:
 - Radiologists
 - Critical Care doctors above FY1 who have completed a DCCQ-approved training package.

NGT Aspirates

- Gastric residual volumes should be recorded 4hourly to assess absorption & gastric emptying.
- Free drainage should only be used in case of obstruction or large gastric residual volumes.

Documentation

Documentation of placement should include:

- Name & grade of staff inserting & checking NGT
- · Length of NGT at naris
- Process and any difficulties during insertion
- Clinical assessment of placement:
 - · volume of aspirate
 - pH of aspirate
 - tests confirm acceptable placement (yes/no)
- If chest x-ray used to assess placement:
 - patient ID confirmed
 - most up-to-date image used
 - criteria for satisfactory placement (see flowchart)
 - x-ray confirms acceptable placement (yes/no)

Flushing and Maintaining Patency

- Do not flush the NGT with anything other than air until position has been confirmed.
- NGT patency is best maintained with a continuous infusion of NG feed.
- Where feeds are interrupted (eg for surgery or procedures), the NGT should be flushed with sterile water.
- When NG feeding is not given, NGTs should be flushed 4 hourly with sterile water after re-confirming acceptable position.
- NGTs should be flushed with sterile water before and after giving NG medications.

NGT Removal and Discharge from Critical Care

In all patients:

- The continued need for an NGT should be reassessed daily.
- NGTs that are no longer required should be removed without delay.

On discharge from Critical Care:

- the presence and rationale for any NGT should be be clearly documented and handed over.
- consider changing the NGT to the wardstandard 8 French Corflo tube if prolonged use is anticipated.
- complete DCCQ Temporary Enteral Feeding Regimen form (in discharge pack)

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1. INTRODUCTION

This is a local Critical Care Guideline which takes into account the special circumstances and difficulties in managing nasogastric tube (NGT) placement & maintenance in patients in Critical Care. This guideline is informed by national recommendations^{1,3} and Portsmouth Hospitals Trust guidelines,² with appropriate adaptations for Critical Care. Local adaptations are necessary for safe and effective care in Critical Care and are supported by the National Patient Safety Agency's recommendations.¹

Key issues relevant to NGT management in Critical Care include:

- Because of high acuity of critical care patients, it is not realistic to limit the insertion and checking of NGTs by x-ray to the hours of 08:00 to16:00, as recommended in the Trust NGT guideline. Based on the usual level of staffing and provision of 24-hour care in Critical Care, it is appropriate to insert and check NGTs at any time when clinically indicated and suitable staff are present.
- The majority of patients in Critical Care will have an NGT, the reverse of the situation on wards.
- Gastroparesis is common due to critical illness itself and the impact of medications (including opiates).
- Smaller or fine bore tubes used for feeding are routine in medical and surgical wards but
 are less reliable for maintaining patency to decompress or empty the stomach. The use of a
 larger bore or Ryle's tube initially is common Critical Care practice, until enteral feeding is
 established, when fine bore tubes may be substituted.
- Drugs used to raise gastric pH are used frequently in Critical Care, therefore the use of pH
 testing to confirm gastric aspirate may be problematic. Because gastric contents in Critical
 Care patients may be less acidic, it is more likely that a genuine gastric aspirate may be
 rejected on the basis of being too alkaline.
- Regurgitation, vomiting and changes in posture may cause displacement of NGTs and thus
 despite correct initial placement, NGTs can later migrate to the airway. These risks may be
 higher in Critical Care patients so a higher level of vigilance must be maintained than in
 standard ward practice.
- Frequent chest x-rays are not a realistic confirmatory technique for use at each feeding or drug administration episode, because of radiation exposure and the risks of delays in NGT use and disruption to other essential care.

At insertion and at every point of NGT usage (feed or enteral drugs), the nurse or doctor must ask the question – am I confident the NGT remains correctly sited and hence safe to use? Concerns and suspicions of the bedside or senior nurse must always be taken seriously and acted upon.

2. PURPOSE

The purpose of this guideline is to provide an evidence-based framework for the use of NGTs in Critical Care.

3. SCOPE

This guideline applies to all adult patients with an NGT in Critical Care. This guideline is for use in Critical Care only and is subject to professional judgement and accountability. The ability to comply with this guideline is unlikely to be affected by infection outbreak, flu pandemic or any major incident.

4. **DEFINITIONS**

DCCQ: Department of Critical Care, Queen Alexandra Hospital Portsmouth

PHT NGT Guideline: PHT clinical Policy for the insertion and maintenance of fine bore nasogastric

feeding tubes in adults. Version 9 dated January 2012 (reference 2)

NGT: Nasogastric Tube

5. DUTIES AND RESPONSIBILITIES

• The decision to implement this guideline is at the discretion of the on-call critical care consultant.

 Implementation of this guideline is the joint responsibility of appropriate critical care medical/ nursing staff.

This guideline is subject to professional judgment and accountability.

6. PROCESS (Recommendations & Justification) Summary Flowchart

Action (Recommendation)	Rationale (Justification)
Aspirate NGT -is aspirate more than 10 ml and pH 4.5 or less?	Unlike the PHT NGT guideline, ² dual criteria of aspirate >10ml and pH 4.5 or less have been chosen to confirm successful NGT placement. This is to provide additional assurance due to: a. The perceived increased risk of NGT displacement
	after successful insertion in critical care patients, when compared with ward patients.
	b. The need to use sterile water to flush NGTs in patients with compromised immune systems. ³ Sterile water can appear acidic on pH testing, resulting a theoretical risk of false positive confirmation of gastric aspirate. This risk should be reduced by the additional requirement for the aspirate to be 10ml or more in volume as any fluid used to flush the NGT will be diluted in a greater volume of aspirate.

Check Chest X-ray

Are all 4 x-ray criteria met?

- 1. NGT follows oesophagus and avoids contours of bronchi?
- 2. NGT clearly bisects carina or bronchi?
- 3. NGT crosses diaphragm in midline?
- 4. NGT tip clearly visible below left hemi-diaphragm?

These are the 4 criteria recommended by the NPSA in their 2011 Safety Alert on NGT misplacement.¹

Re-check NGT

- every 4 hours during normal use
- before giving NG drugs
- if any evidence of displacement

The frequency of regular checking of NGT position is increased from the PHT NGT guideline due to the perceived increased risk of NGT displacement after successful insertion in critical care patients.

<u>Evidence of displacement</u> includes:

- new hypoxia, possibly aspiration related
- unusually severe coughing episode
- head down postural change (eg CVC insertion)
- loosened, tampered or dislodged securing method
- · regurgitation or vomiting
- feed or gastric fluid in airway

These include indicators highlighted by the NPSA¹ and the PHT NGT Guideline.²

The absence of any evidence of displacement in an NGT that has previously been definitively confirmed as correctly positioned can be taken as confirmation that it remains in situ. This is true even if a reassuring NG aspirate can no longer be obtained. This represents a pragmatic balance between the risk of inadvertently using an NGT that has been displaced and the risks of performing frequent, repeated x-rays (considering radiation exposure, delays in NGT use and disruption to other essential care).

Indications and Contraindications to NGT Insertion

Action (Recommendation) Rationale (Justification) **Indications include:** hydration & nutrition These are all widely-accepted indications for NGT enteral drug administration insertion in critical care. confirming tolerance of enteral Elective surgical patients will only require an NGT in the feedina gastric decompression presence of a discrete indication. If placed unnecessarily, an NGT may interfere with normal oral Elective surgical admissions do not intake. usually need an NGT

<u>Seek senior advice if potential</u> <u>contraindications:</u>

- head injury or base of skull fracture
- maxillofacial surgery (including flaps)
- oesophageal & gastric surgery
- recently bleeding oesophageal varices
- coagulopathy & thrombocytopenia
- agitation & confusion

These are all recognised relative or absolute contraindications to NGT placement, however an NGT may be essential for safe and effective care in certain patients. In these cases an individual risk/benefit assessment must be made by a senior doctor.

Insertion Techniques

Action (Recommendation)

- 1. Seek verbal, informed consent if possible.
- Choose a radio-opaque NGT with numbered depth markings eg Salum Sump Drain for surgical drainage or Corflo size 12 or 14 for feeding in ICU.
- 3. Estimate distance from patient's nose, to ear, to xiphisternum (NEX length). This is the approximate length needed to reach the stomach.
- Consider local anaesthetic spray to nose or nasopharynx if patient is conscious.
- 5. Insert carefully along floor of nose- in posterior & caudal direction, not cranially.
- 6. Consider sip of water to aid swallowing.
- 7. Consider a larger NGT or one stiffened by refrigeration if insertion is difficult.
- Consider laryngoscope & Magill's forceps for intubated patients. Increased sedation may be needed.
- 9. Record the length of the NGT at the naris.
- 10.Occasionally an orogastric tube is needed. If so, record the length at the incisors and reconsider changing to an NGT daily.
- 11.Seek senior experienced help in case of difficulty.

Rationale (Justification)

- 1. In keeping with the Mental Capacity Act (2005) and GMC guidance on invasive procedures.
- Smaller or fine bore tubes for feeding are routine in medical and surgical wards but are less reliable for maintaining patency to decompress or empty the stomach. The initial use of a larger bore or Ryle's tube is standard practice in critical care, until enteral feeding is established and fine bore tubes may be substituted.

We have been unable to source large-bore NGTs that are both radio-opaque and have depth labelled every centimetre. The most appropriate alternatives include the Salum Sump drain (ref 8888-264887) with markings at 75, 65, 55 and 45 cm from the tip.

The standard NGT for ward use is an 8Fr Corflo and towards Critical Care discharge it may be appropriate to change to this standard tube, confirming position in the normal way.

- 3. Although only a rough approximation, this is not relied upon exclusively and may help to achieve correct first-time insertion.
- 4. To improve patient comfort.
- 5-8. Recognised standard practice for NGT insertion.
- 9. To highlight subsequent displacement.
- 10.An orogastric tube may be necessary in the short term, but it is less comfortable and more prone to displacement than an NGT.
- 11.To minimise the number of unsuccessful attempts.

Securing NGTs

Action (Recommendation)

- Use red "trouser" tapes from bridge of nose to NGT. Ensure tape is not bunched, and the NGT hangs free and does not put pressure on naris.
- Examine skin, mucosa and naris edge pressure areas at least daily and record findings.
- 3. Tape or adhesive dressing to the cheek can be used instead, but may be less secure.
- 4. Consider Cavalon to improve tape adherence.
- 5. Change NGT securing tapes daily.
- If a patient dislodges their NGT repeatedly, consider alternative securing methods including a nasal bridle.

Rationale (Justification)

- 1, 3, 4 & 6. Although an adhesive dressing applied to the cheek is the preferred method for securing NGTs in ward patients, trouser tapes are usually more appropriate in Critical Care where the likelihood and consequences of accidental displacement justify a more secure method of taping.
- 2 & 5. Critical Care patients are at increased risk of pressure injuries, including at the site of NGT insertion. Tapes should therefore be changed daily and a high level of vigilance must be maintained for pressure injury.

Position Confirmation, Monitoring & Documentation

Action (Recommendation)

Competency

- NGT insertion, aspiration and pH testing may be performed by any competent Critical Care staff.
- Only the following staff may certify correct NGT placement based on a chest x-ray:
 - a. Radiologists
 - b. Critical Care doctors above FY1 who have completed a DCCQ-approved training package.

Rationale (Justification)

- 1. Critical Care staff who have been trained and assessed as competent should be capable of inserting and managing NGTs in accordance with this guideline.
- 2. Checking NGT position on chest x-ray is a safetycritical activity with potentially fatal consequences in the event of error.
- a. Trained radiologists are competent to do this because of their specialist training.
- b. Although all Critical Care doctors above the grade of FY1 should be capable of interpreting a chest x-ray, experience has shown that even senior doctors can make major errors when NPSA guidance on assessing a chest x-ray for NGT insertion is not followed. Seniority of doctor is not, in itself, a guarantee of competency in assessing a chest x-ray. We have therefore mandated that all doctors checking these chest x-rays in the ICU must have successfully completed a DCCQ-approved training package (eg. www.trainingngt.com as recommended by NPSA)¹

NGT Aspirates

- Gastric residual volumes should be recorded 4-hourly to assess absorption & gastric emptying.
- Free drainage should only be used in case of obstruction or large gastric residual volumes.

This is standard Critical Care practice to monitor for clinically-relevant delayed gastric emptying, while minimising unnecessary gastric drainage.

<u>Documentation of placement</u> should include:

- Name & grade of staff inserting & checking NGT
- · Length of NGT at naris
- Process and any difficulties during insertion
- Clinical assessment of placement:
- volume of aspirate
- pH of aspirate
- tests confirm acceptable placement (yes/no)
- If chest x-ray used to assess placement:
- · patient ID confirmed
- most up-to-date image used
- criteria for satisfactory placement (see flowchart)
- x-ray confirms acceptable placement (yes/no)

Clear and complete documentation is necessary for identification of subsequent displacement, as well as for quality assurance purposes.

Flushing and Maintaining Patency

Action (Recommendation)

Do not flush the NGT with anything other than air until position has been confirmed

- NGT patency is best maintained with a continuous infusion of NG feed.
- Where feeds are interrupted (eg for surgery or procedures), the NGT should be flushed with sterile water.
- When NG feeding is not given, NGTs should be flushed 4 hourly with sterile water after reconfirming acceptable position.
- NGTs should be flushed with sterile water before and after giving NG medications.

Rationale (Justification)

NGTs are prone to blockage in the absence of continual NG feeding so, after confirmation of position, routine flushing with water is required.

Department of Health guidelines (High Impact Intervention for Enteral Feeding) recommend that sterile water should be used for all hospitalised and immunocompromised patients.³

The PHT NGT guideline recommends using tap water to flush NGTs because sterile water can produce a falsely-acidic result on CE-certified pH paper, as used in the hospital.

For Critical Care patients, the balance of risks appears to be in favour of using sterile water due to:

a. the increased frequency of immunocompromise in Critical Care patients, potentially increasing the

risk of infection due to non-sterile water. b. the additional safeguards used in this guideline, including the requirement that NG aspirates are both >10ml in volume and pH 4.5 or less.

NGT Removal and Discharge from Critical Care

Action (Recommendation)	Rationale (Justification)
 In all patients: The continued need for an NGT should be re-assessed daily. NGTs that are no longer required should be removed without delay. 	All NGTs create risks to patient safety due to the potential for displacement and pressure injury.
 On discharge from Critical Care: The presence and rationale for any NGT should be be clearly documented and handed over. Consider changing the NGT to the ward-standard 8 French Corflo tube if prolonged use is anticipated. 	8 French Corflo NGTs may be more comfortable for patients and more familiar to ward staff. However, exchange of NGTs is likely to be uncomfortable and carries its own risks. An individual risk/benefit assessment should therefore be made at the time of discharge from Critical Care.

7. TRAINING REQUIREMENTS

All Critical Care staff will be informed of the content of this guideline and how to access it via the Critical Care Guidelines and SOPs intranet page. All staff involved in inserting and checking NGTs will be given appropriate training, managed by the Critical Care Education Team. Doctors will only be permitted to confirm NGT based on chest x-ray appearances after completing an appropriate training course approved by the Critical Care Education Team.

8. MONITORING COMPLIANCE WITH, AND THE EFFECTIVENESS OF, PROCEDURAL DOCUMENTS

This guideline will be reviewed initially at 6 months and thereafter 2 yearly by the Critical Care Governance Group. Measurement of compliance will be achieved by unit-based audit. Results reviewed will be fed back to members of the senior medical /nursing team and the Critical Care Governance Group.

9. REFERENCES AND ASSOCIATED DOCUMENTATION

- 1. Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants. National Patient Safety Agency Alert NPSA/2011/PSA002 dated 10 March 2011
- 2. PHT clinical Policy for the insertion and maintenance of fine bore nasogastric feeding tubes in adults. Version 9 dated January 2012.
- 3. High Impact Intervention: Enteral feeding care bundle. Department of Health 2011

Appendix A

Checklist for the Review and Ratification of Procedural Documents and **Consultation and Proposed Implementation Plan**

To be completed by the author of the document and attached when the document is submitted for ratification: a blank template can be found on the <u>Trust Intranet</u>. Home page -> Policies -> <u>Templates</u>

	TITLE OF DOCUMENT BEING REVIEWED:	YES/NO N/A	COMMENTS
1	Title		
	Is the title clear and unambiguous?	Yes	
	Will it enable easy searching/access/retrieval??	Yes	
	Is it clear whether the document is a policy, guideline, procedure, protocol or ICP?	Yes	
2	Introduction		
	Are reasons for the development of the document clearly stated?	Yes	
3	Content		
	Is there a standard front cover?	Yes	
	Is the document in the correct format?	Yes	
	Is the purpose of the document clear?	Yes	
	Is the scope clearly stated?	Yes	
	Does the scope include the paragraph relating to ability to comply, in the event of a infection outbreak, flu pandemic or any major incident?	Yes	
	Are the definitions clearly explained?	Yes	
	Are the roles and responsibilities clearly explained?	Yes	
	Does it fulfill the requirements of the relevant Risk Management Standard? (see attached compliance statement)	Yes	
	Is it written in clear, unambiguous language?	Yes	
4	Evidence Base		
	Is the type of evidence to support the document explicitly identified?	Yes	
	Are key references cited?	Yes	
	Are the references cited in full?	Yes	
	Are associated documents referenced?	Yes	
5	Approval Route		
	Does the document identify which committee/group will approve it?	Yes	Critical Care Governance Group
6	Process to Monitor Compliance and Effectiveness		Severnance Group
	Are there measurable standards or KPIs to support the monitoring of compliance with the effectiveness of the document?	Yes	
7	Review Date		
	Is the review date identified?	Yes	
6	Dissemination and Implementation		
	Is a completed proposed implementation plan attached?	Yes	
7	Equality and Diversity		

Name

Signature

Dr NT Tarmey

signed electronically

Appendix A continued

	CONSULTATION AND PROPOSE	D IMPLEMENTAT	ION PL	AN
Date to rati	fication committee			
Groups /committees / individuals involved in the development and consultation process		Critical Care Governance Group Multidisciplinary staff working in DCCQ Trust Nutrition Nurse Specialist (Author of Trust NGT Guideline)		
Is training required to support implementation?		Yes		
If yes, outline plan to deliver training Outline any additional activities to support implementation		1. Distribution of revised guideline via email, and uploading to intranet site. 2. Inclusion in induction training for medical and nursing staff. 3. Coverage at identified Friday multidisciplinary teaching session. 4. Development of new training programme and record for chest x-ray confirmation of NGT position in Critical Care. As above		
Individual	Approval			
with this pap	nor, you are happy that the document complies with er, the Equality Impact Assessment and NHSLA c e ratified. To aid distribution all documentation shou	hecklist (if required) to the o	chair of the committee/group
Name	Dr P McQuillan		Date	14 June 2013
Signature	signed electronically			
Committee / Group Approval				
this documen	tee/group is happy to ratify this document, would the t, the Equality Impact Assessment, and NHSLA che colicies Officer. To aid distribution all documentation	cklist (if required) a	and the re	elevant section of the minutes

If answers to any of the above questions is 'no', then please do not send it for ratification.

Date

14 June 2013

Appendix B

Equality Impact Assessment

To be completed by the author of the document and attached when the document is submitted for ratification: a blank template can be found on the <u>Trust Intranet. Home page -> Policies -> Templates</u>

Title of document for assessment	Nasogastric Tubes in Critical Care
Date of assessment	14 June 2013
Job title of person responsible for assessment	Dr N Tarmey
Division/Service	DCCQ / CHAT CSC

	Yes/No	Comments		
Does the document affect one group less or more favorably than another on the basis of:				
Race	No			
Gender (including transgender)	No			
Religion or belief	No			
Sexual orientation, including lesbian, gay and bisexual people	No			
Age (for HR policies only)	No			
Disability – learning disabilities, physical disabilities, sensory impairment and mental health problems	No			
Does this document affect an individual's human rights?	No			
If you have identified potential discrimination, are the exceptions valid, legal and/or justified?				

If the answers to any of the above questions is 'yes' you will need to complete a full Equality Impact Assessment (available from the Equality and Diversity website) or amend the policy such that only an disadvantage than can be justified is included. If you require any general advice please contact staff in the Equality and Diversity Department on 02392 288511

APPENDIX C

Length Measurement Guide for Salem Sump Tubes

Salem Sump NGTs have 4 black lines printed on the tube:

- The line nearest the tip is at 45cm from the tip of the tube
- The line **second nearest the tip** is at **55cm** from the tip of the tube
- The line third nearest the tip is at 65cm from the tip of the tube
- The line furthest from the tip is at 75cm from the tip of the tube