

Surveys of current practice

PICU

1.1 PICU Population studied

A list of PICUs responding to the survey is given in Table 1. A further 3 PICUs did not respond.

Table 1: List of PICUs responding to the survey

HQIP ¹ Key	HQIP Name (at December 2016)
A	Addenbrookes
C	Cardiff, Noah's Ark Children's Hospital for Wales
D	Manchester, Royal Children's Hospital
E1	London, Great Ormond Street Hospital – PICU/NICU
F	London, Evelina Children's Hospital
H	London, Kings College Hospital
I	Leeds General Infirmary
K2	Newcastle Freeman Hospital
K3	Newcastle, Great North Children's Hospital
M	Nottingham, Queen's Medical Centre
N	Oxford, John Radcliffe Hospital
O	London, Royal Brompton Hospital
P	Liverpool, Alder Hey
R	Southampton Children's Hospital
T	London, St George's Hospital
U	London, St Mary's Hospital
V	Birmingham Children's Hospital
W	Bristol, Royal Hospital for Children
X	Leicester Glenfield Hospital
X	Leicester Royal Infirmary
Y	Edinburgh Royal Hospital for Sick Children
ZA	Glasgow Royal Hospital for Children
ZB	Belfast, Royal Belfast Hospital for Sick Children
ZE	London, Harley Street Clinic

¹ Healthcare Quality Improvement Partnership

1.2 Quantitative results: PICU

This section summarises results of closed questions asked of PICU units in addition to those presented in tabular form within the text of the HTA report.

Table 2: Numbers and percentages of PICU respondents from different professions. Band for nurses and dietitians is summarised with median and IQR.

Types of professionals responding		
Senior Doctor (Consultant)		21 (87.5%)
Middle Grade Doctor (SpR)		1 (4.2%)
Nurse		23 (95.8%)
Band of Nurse:		
	5	1 (4.3%)
	6	6 (26.1%)
	7	14 (60.9%)
	8	1 (4.3%)
	8a	1 (4.3%)
Dietitian		23 (95.8%)
Band of Dietitian:		
	6	7 (30.4%)
	7	14 (60.9%)
	8a	2 (8.7%)

Table 3: PICU general nutritional practices within units

Section 1: Questions about general nutrition practices in your unit:		
Does your unit have written feeding guidelines/protocol?	Yes	23 (95.8%)
	No	1 (4.2%)
After respondents had given a text response to the question: "Which method is used to measure or estimate energy requirements in your PICU?", they were asked this follow-up question: If the child's condition or therapy changes do you use an alternative formula to predict energy requirements?		
	Yes	6 (25.0%)
	No	11 (45.8%)
	Sometimes	7 (29.2%)
When does your unit aim to meet full energy targets?	24 hours	2 (8.3%)
	48 hours	6 (25%)
	72 hours	5 (20.8%)
	Other	11 (45.8%)
Is there a target start time after the child's PICU admission?	Yes	14 (58.3%)
	No, there's no target time	8 (33.3%)
	Other	2 (8.3%)
What standard Naso-gastric tube used to feed in your unit	Standard rigid NG tubes	15 (62.5%)
	Soft long-term silicone tubes	8 (33.3%)
	Other	1 (4.2%)
Are your standard gastric enteral feeds given as intermittent or continuous?	Intermittent bolus feeds	9 (37.5%)
	Continuous	15 (62.5%)
If standard gastric enteral feeds are given continuously (n=15): What is the standard duration of feeding hours?	20 hours/day	5 (33.3%)

Section 1: Questions about general nutrition practices in your unit:		
	24 hours/day	9 (60%)
	Other	1 (6.7%)
If standard gastric enteral feeds are given intermittently (n=9): What is the standard regimen?		
	2-hourly	6 (66.7%)
	3-hourly	1 (11.1%)
	Other	2 (22.2%)
Do you use NJ (or post pyloric) feeding?		
	Yes	24 (100%)
	No	0
Is this your standard practice?		
	Yes	16 (66.7%)
	No	8 (33.3%)
Is there an agreed definition of feed tolerance in your unit?		
	Yes	18 (75.0%)
	No	6 (25.0%)
Does this include (n=18):		
	GRV	18 (100.0%)
	Abdominal appearance	8 (44.4%)
	Vomiting	12 (66.7%)
	Diarrhoea	9 (50.0%)
	Other	3 (16.7%)

Table 4: PICU GRV technique within units

Section 2: GRV technique in your unit		
Do you have a different GRV policy for ventilated and non-ventilated children?		
	No	24 (100%)
Do you have a different guidelines/policy for general surgical children (post gut/abdominal surgery)?		
	Yes	10 (41.7%)
	No	14 (58.3%)
If answered yes to the question: "Is there specific guidance about how GRV should be measured and interpreted - for example a protocol or guideline?" (n=8), units were asked: In your unit, do nurses measure GRV as per protocol?		
	Always	5 (62.5%)
	Usually	2 (25.0%)
	Often	1 (12.5%)
Is there a specific method to aspirate GRV?		
	Yes	4 (16.7%)
	No	20 (83.3%)
Is there any other guidance around GRV?		
	Positioning of patient when aspirating the tube	5 (20.8%)
	No other guidance	19 (79.2%)
Does the method of feeding (continuous vs intermittent) affect how often you measure GRV?		
	Yes	9 (37.5%)
	No	15 (62.5%)
Does patient age/weight or any other factors impact on GRV measurement		
	Yes	12 (50.0%)
	No	12 (50.0%)

Table 5: PICU GRV management within units

Section 3: GRV management in your unit		
Is the decision to stop or withhold feeds defined in your protocol or left to the nurse or doctor to make the decision?		
	Defined in attached protocol	8 (33.3%)
	Left up to nurses to decide	2 (8.3%)
	A decision made between nurses and medical staff / dietitian	11 (45.8%)
	Other	3 (12.5%)
Does this vary between infants (under 10Kg) and older bigger children e.g. 50Kg?		
	Yes	10 (41.7%)
	No	14 (58.3%)
What do you do with obtained GRV: return or discard?		
	Return	15 (62.5%)
	Discard	0
	Other	9 (37.5%)
What does your unit do in response to 'high GRVs'? Rank the following 5 options in the order they would be applied (rank of 1=least likely; rank of 6=most likely):		Median (IQR) Rank
Change feeding method (e.g. from bolus to continuous feeding)		5 (3,6)
Change to post-pyloric (small bowel) feeding		4 (3.5,5)
Add prokinetics and persist with gastric feeding		3 (1.5,5)
Change the type (formula) of the feed		4 (3.5,5)
Stop feeds and change to parental nutrition		2 (1,2)
Other		n=10, 2.5 (1,6)

1.3 Qualitative results: PICUs

Summary of PICU open ended question responses

p_s1q2) Which method is used to measure or estimate energy requirements in your PICU?

[24 responses]

N= 15 reported using the Schofield Calculation, n = 6 use EAR and n = 5 Scientific Advisory Committee on Nutrition Dietary reference values. Four responses highlighted that whether or not the child is intubated is taken into consideration *"EAR+ 20 % if not ventilated BMR + 20 % if ventilated"* (P115)

p_s3q1) What is your practice/ unit guidance on stopping or withholding feeds?

[24 responses]

A minority (n=4) stated that there was limited unit guidance on withholding feeds and that decisions were dependent on the staff present: *"No unified guidance currently and therefore, led by the clinical team of the day"* (P03). However, the majority of respondents were able to give specific factors that influenced feeding practice:

"Feeds stopped if bilious vomiting/ aspirate Heavily / fresh blood stained aspirate Planned extubation Some children with physio input Surgery / transfers to MRI/CT/district general hospitals Poor absorption (NGT/NJT feeding) Sepsis / any abdominal distention or pathology" (P138)

Over half reported using GRV as a deterrent of whether to stop feeds (n = 15) with GRV volume being the main indicator (n = 14): *"If GRV > 5 mls/kg put it back and reassess in 3 hours"*. (P119) and to a lesser extent Bilious aspirate (n=3) and blood in aspirate (n = 2)

Symptoms that also influenced stopping feeding include: *"persistent vomiting"* (p104) (n =6), *"Abdominal distention"* (P071) (n =4) *"Increasing respiratory distress/compromise"* (n= 1, p118), *'diarrhoea'* (n=1, P59) and *'pain'* (n = 1, P153)

There was also a range of external medical/ logistical factors that were taken into consideration such as medical interventions (n=3) and hospital transfers (n=2): *'extubation, medical intervention and transfers P58'* *'Normally weight 4 hours between stopping feeds and an intervention (168)*

p_s3q2) If response is 'Other' to 'Is the decision to stop or withhold feeds defined in your protocol or left to the nurse or doctor to make the decision?': Please specify 'other':

[3 responses]

Two respondents felt that the decision to withhold feeds results from a combination of the protocol and clinical team: *"guided by protocol, but decision made by team"* (P60). The third reflected that decisions were: *"dependent on time and context"* (P116)

p_s3q3) If answered 'Yes' to question 'If you use Gastric Residual Volume as an indicator to stop feeding - do you have a maximum threshold, (volume) or formulae used to inform the decision to stop feeds?' they were asked: Please specify 'other':

[3 responses]

Two responses that give a similar formulae: *"5ml/kg or >200ml (if more than 40kg)"* (p111) and *"5ml/kg up to max of 250ml in patients >40kg"* (p118).

p_s3q4) Please describe the maximum amount you would consider acceptable before
Stopping feeds?

[24 responses]

Twelve stated that the maximum amount they would consider is *'5ml/kg'* (P08). This was expanded on by P60 who stated that *'Guided by 5ml/kg, but will often keep feeding if not vomiting but has GRV of >5ml/kg'* and P98 who noted that the maximum is *"5 ml/kg or 4 times the hourly rate, whichever is more"*. An additional four responses also looked at quantity in relation to feed volume, two over four hours *"4 hourly feeds worth of aspirates"* (p116) and two over six hours *"If gastric aspirate is greater than 6 hours their feed volume rested for 1 hours"* (P138)

Other respondents took a proportional approach (n =3) with the maximum amount equating to 50% of the last feed: *"When GRV>50% of last bolus feed, we stop for 2 hours and retest GRV to decide whether feeding can be restarted"* (P184).

Lastly P03 *"Maximum of 30 ml/kg/day"*

p_s3q5) If answered 'Yes' to the question 'Does this vary between infants (under 10Kg) and older bigger children e.g. 50Kg?' were asked: Please specify how this varies:

[10 responses]

Older/ bigger children were seen to be categorised as 40kg rather than 50Kg as suggested by the question (n = 3). Six respondents reported a variance that if under 10 KG the calculated 5 ml/kg, if over 40kg/ older then done by total volume, 200ml (n= 3) or 250ml (n= 3): *"< 10 kg: 5 ml/kg Older children: 200 ml"* (P08)

GVR volumes considered more important in younger than older children (n=2) *"Seems that nursing staff get inappropriately worried by large GRV in older/big patients - as most used to dealing with infants"* (P60)

"Smaller GR volumes may be proportionally more significant in smaller children. In larger children, if you are getting back all or most of the feed, even if this isn't >5ml/kg; or signs of feed intolerance, ie vomiting or retching" (P168)

p_s3q6) Qualifier to the question 'How much does the volume of Gastric Residual Volume affect your decision to stop feeds?' - Please specific specify how:

[23 responses]

The majority of responses described how volume is taken into consideration as part of the whole clinical picture (N = 9): *"Volume in conjunction with clinical indicators eg bilious / blood stained / coffee-ground, abdominal distension, bowel movements, absence of bowel sounds, discomfort and distress"* (P70) and/ or is treated as a indication that feeds might need to be stopped (n=3): *"Gives an indication of absorption rate"* (168)

Six gave statements that imply that volume has a substantial effect on stopping feeds: *"The progression after admission is totally dependent on GRV!"*(P07) *"Smaller and sicker children we are more guided by GRV than in those who otherwise seem to be tolerating feed in the abdomen. If aspirates are bilious then we also worry more about GRV"* (P71)

P119 had been advised that content of aspirate is more important to decision making than volume: *"a senior clinical nurse says that for her volume is less important than what the GRV looks like eg if partially digested milky she would be less worried about the volume even though the protocol says 5mls/kg volume."*

p_s3q7) How much does Gastric Residual Volume colour/consistency affect your decision to stop feeds?

[24 responses]

Colour appears to greatly affect the decision to stop feeds. With 18 respondents noting how incorrect colour such as blood (n=12), Bile (n=4), green (n=7), faecal matter (n =5) would result in feeds being stopped: *"If blood stained or bile stained may be more concerned that other major concerns regarding abdomen"* (p145)

Seven also raised that *"if bilious"* (P152) the feed would be stopped : *"If all mucuc, then may reurn it and continue feeding. If bilious, check NGT position. If correct, may be more likely to stop"* (P184)

p_s3q8) Please explain the factors that influence the decision to return or discard the Gastric Residual Volume. If 'other' selected, please also explain below:

[24 responses]

One response stated that there is no set *'unified approach to whether return or discard the aspirate.* (P03) The other responses heightened how the: *'decision to return or discard is influenced by content'* (P70) both in terms of volume (n=13): *'discard over 5 mls/kg and return the remainder'* (P152) and substance. *'If predominantly milk then like replace'* (P153) (n=4) the aspirate, but they would discarded it if contained blood and/ or other bodily fluids (n=8) *"blood or bile or faeces"* (P07) or generally *'If looks offensive, discard'* (P168) (n = 2). An additional three responses mentioned: *'If bilious then not returned'* (P58)

p_s3q9) If the feed is stopped, when is it started/re-assessed to be started? (24 responses)

Half of respondents (n=12) reassessed after 'One' (n=6) or 'two' (n= 6) hours.

'Not standardised. Usually 1-4 hours' (P06).

Three hours (n =1)

Few hours (n = 2)

Not based on time but rather Clinical condition (n =2) *"Looking at all the clinical indicators mentioned previously, and assess and decide according to clinical status. "* (P03) or when *'Next planned feed'* (P118)

NNU

1.4 Population studied

Table 6 shows the response rates split by region of the UK and unit type. This gives a measure of how representative the NNU survey is of the UK as a whole. A list of NNUs responding to the survey is given in Table 6. 5 units only responded to the first few questions – so for most questions, there are 90 respondents.

Table 6: NNU response rates by region of UK – for all NNUs, and split by type

Region	All		NICUs		LNUs		SCBUs	
	n	N(%)	n	N(%)	n	N(%)	n	N(%)
England								
East	16	7 (43.8%)	2	2 (100%)	10	3 (30%)	4	2 (50%)
London	27	16 (59.3%)	8	6 (75%)	15	8 (53.3%)	4	2 (50%)
South	30	15 (50%)	8	6 (75%)	14	7 (50%)	8	2 (25%)
South-West	17	11 (64.7%)	4	3 (75%)	9	5 (55.6%)	4	3 (75%)
Midlands	25	11 (44%)	9	6 (66.7%)	12	5 (41.7%)	4	0
North	48	23 (47.9%)	15	10 (66.7%)	22	13 (59.1%)	11	0
Scotland	12	7 (58.3%)	6	5 (83.3%)	4	0	2	2 (100%)
Wales	9	5 (55.6%)	4	2 (50%)	3	1 (33.3%)	2	2 (100%)
All	184	95 (51.6%)	56	40 (71.4%)	89	42 (47.2%)	39	13 (33.3%)

Table 7: List of NNUs responding to the survey

NNAP² Name (From 2017 report)	Type	NNAP Name (From 2017 report)	Type
NICUs		LNUs	
Ayrshire Maternity Unit	NICU	Barnet Hospital	LNU
Birmingham Women's Hospital	NICU	Barnsley District General Hospital	LNU
Bradford Royal Infirmary	NICU	Calderdale Royal Hospital	LNU
Chelsea & Westminster Hospital	NICU	Chesterfield & North Derbyshire Royal Hospital	LNU
Derriford Hospital	NICU	Colchester General Hospital	LNU
Guy's & St Thomas' Hospital	NICU	Croydon University Hospital	LNU
Homerton Hospital	NICU	Diana Princess Of Wales Hospital	LNU
Hull Royal Infirmary NICU	NICU	Gloucestershire Royal Hospital	LNU
James Cook University Hospital	NICU	Great Western Hospital	LNU
King's College Hospital	NICU	Kettering General Hospital	LNU
Lancashire Women & Newborn Centre	NICU	Kingston Hospital	LNU
Leeds Neonatal Service ¹	NICU	Leighton Hospital	LNU
Leicester Neonatal Service ²	NICU	Lincoln County Hospital	LNU
Liverpool Women's Hospital	NICU	Macclesfield District General Hospital	LNU
Luton & Dunstable Hospital	NICU	Milton Keynes Foundation Trust Hospital	LNU
New Cross Hospital	NICU	Newham General Hospital	LNU
Ninewells, Dundee	NICU	North Manchester General Hospital	LNU
Norfolk & Norwich University Hospital	NICU	Northampton General Hospital	LNU
North Bristol NHS Trust (Southmead)	NICU	Northwick Park Hospital	LNU
Nottingham University Hospital (QMC)	NICU	Peterborough City Hospital	LNU
Oxford University Hospitals, John Radcliffe Hospital	NICU	Pinderfields General Hospital	LNU
Princess Anne Hospital	NICU	Prince Charles Hospital	LNU
Princess Royal Maternity, Glasgow	NICU	Princess Royal Hospital**	LNU
Queen Alexandra Hospital	NICU	Queen's Hospital, Burton On Trent	LNU
Queen Charlotte's Hospital	NICU	Royal Albert Edward Infirmary	LNU
Royal Oldham Hospital	NICU	Royal Cornwall Hospital	LNU
Royal Preston Hospital	NICU	Royal Derby Hospital	LNU
Royal Victoria Infirmary	NICU	Royal Devon & Exeter Hospital	LNU
Singleton Hospital	NICU	Royal Glamorgan Hospital	LNU
St Michael's Hospital	NICU	Royal Hampshire County Hospital	LNU
St Peter's Hospital	NICU	Southend Hospital	LNU
The Jessop Wing, Sheffield	NICU	St Helier Hospital	LNU
The Rosie Maternity Hospital, Cambridge	NICU	Tameside General Hospital	LNU
University College Hospital	NICU	Taunton & Somerset Hospital	LNU
University Hospital Coventry	NICU	Tunbridge Wells Hospital	LNU
University Hospital Of North Tees	NICU	Victoria Hospital, Blackpool	LNU
University Hospital Of Wales	NICU	Warrington Hospital	LNU
Victoria Hospital, Fife	NICU	Wexham Park Hospital	LNU
William Harvey Hospital	NICU	Whiston Hospital	LNU
<i>Simspon Centre for Reproductive Health, Edinburgh*</i>	NICU	Whittington Hospital	LNU
		York District Hospital	LNU
		<i>Bath*</i>	LNU
SCBUs			
Conquest Hospital	SCBU	Whipps Cross University Hospital**	SCBU
Hereford County Hospital	SCBU	Worthing Hospital	SCBU
James Paget Hospital	SCBU	Wrexham Maelor Hospital**	SCBU
North Devon District Hospital	SCBU	Yeovil District Hospital	SCBU
Royal Alexandra, Paisley**	SCBU	Ysbyty Gwynedd	SCBU
The Royal Free Hospital	SCBU	<i>Dr Gray's Hospital SCBU, Elgin, Morayshire*</i>	SCBU
West Suffolk Hospital	SCBU		

*Units that are not listed in NNAP 2017, but that have taken part in the survey

**Units that are listed in NNAP 2017 as a different type to that reported in the survey

1.5 Quantitative results: NNUs

This section summarises the results of all closed questions asked of NNUs. A separate report will summarise the results of the open questions, and results from the two reports will be drawn upon in the final report to the HTA. 5 units only answered to the end of Section 1 – this accounts for a denominator of 90 for most questions in Section 2.

Table 8: Type of NNU [n=95]

Types of unit	
NICU surgical and medical	17 (17.9%)
NICU medical only	23 (24.2%)
LNU	42 (44.2%)
SCBU	13 (13.7%)

Table 9: Numbers and percentages of NNU respondents from different professions [n=95]

Types of professionals responding	
Senior Doctor (Consultant)	81 (85.3%)
Middle Grade Doctor (SpR)	1 (1.1%)
Junior Grade Doctor (SHO)	0
Nurse	51 (53.7%)
Band of Nurse	
5	1 (2%)
6	10 (19.6%)
7	31 (60.8%)
8a/8b	6 (11.8%)
ANNP	1 (2%)
Research nurse and senior ward sister	1 (2%)
Sister	1 (2%)
Dietitian	9 (9.5%)
Band of Dietitian	
6	1 (11.1%)
7	7 (77.8%)
8	1 (11.1%)

1.6 Qualitative results: Summary of NNU free text responses

(n_s1q7_yes) If Gastric Residual Volume measurement differs between the medical and surgical babies? ... Please describe how it differs?

N= 5 responses

Responses suggest varied approaches for GRV measurement in surgical babies, which differ from clinicians' approach to GRV measurement in medical babies. Two respondents referred to how GRV measurement is individualised post-surgery and dependent upon a number of factors including; *"type of condition and surgery, particular surgeon who operated and previous history of the baby concerned"* (P61, surgical and medical unit) as well as: *"if they have an ileus and aspirates need replaced; immediately following surgery for duodenal atresia etc"* (P50, surgical and medical unit).

In contrast, two participants stated they do have a general approach to measurement in surgical babies in their unit. This included one unit who used a '10ml rule', where *"aspirates up to 10ml are returned and baby is fed, anything over 10ml is discarded and feeds are held"* (P67, surgical and medical unit). In the other unit *"gastric aspirates are measured and replaced ml for ml"* (P24, surgical and medical unit).

(n_s2q2) Are Gastric Residual Volume measured for all babies, or just below a set gestational age/birth weight or for a specific condition?

N= 90 responses

Less than half (n=37) of participants stated that GRV is measure for all babies, or all babies with a NG tube (n=13). Eight described how the decision to measure GRV depends on the clinical situation, any clinical concerns, or who it was making the decision. For example: *"individual nurses make decision to measure or not"* (P158, surgical and medical unit). The size or weight of the baby was also a deciding factor described by four participants, although three gave general descriptions such a smaller or premature babies or below a *"certain gestation/weight and if not on full feeds"* (P74, LNU) without describing the threshold. One stated GRV was only measure in babies weighing less than 1500kg at birth. Two examples of GRV measurement under a set gestational age were: <32/40 weeks and then varied cut offs including: general <32 weeks; only sub 27 weeks, 32 weeks, and 34 weeks. Other less frequently reported criteria included: babies who were being fed more frequently (4 respondents); those with abnormal dopplers; high risk of NEC; or showing signs of not tolerating feeds.

(n_s2q1_other) Please provide further details regarding how staff measure Gastric Residual Volume below; if 'other' has been selected, please also describe below:

N= 88 responses

Participants interpreted this question differently. Nine described how they measured GRV by stating 'syringe', others interpreted the question to mean *how often* GRV was measured. Of those, the majority stated every 4 hours (n=16), 4-16 hours (n=16) or 6 hours (n=15) or with every feed (n=9). Some also stated that this would be a decision made by a

clinician depending up any clinical concerns (n= 13), which may be *“very variable depending on the nurse looking after the baby”* (P61, surgical and medical unit).

(n_s2q3_not_always) Why is the guidance not always followed?

N= 26 responses

An individual clinician decision was the most commonly (n=12) reason cited for staff not following guidance. Some clarified that this decision could be related to a large volume or aspirate colour e.g. *“green NGA”* (P206, surgical and medical unit). Other participants (n=7) also described how staff were unaware of guidance, or there was lack of related guidance on their unit.

(n_s2q4_nurse2) What would make a nurse seek advice from the medical team?

N= 72 responses

Increased or large volume aspirates (n=55), as well as bilious, or a change in colour of aspirates (e.g. dark colour) (n=52), were the most common reasons given for a nurse seeking advice from the medical team. Other reasons included a blood stained aspirate (n=16), concerns about the condition of the baby (e.g. desaturations) (n=16), abdominal distention (n=11) and vomiting (n=5). No aspirates, particulate or ‘coffee ground’ aspirates, bile in feeds, not tolerating feeds and PH not obtainable were also mentioned by a few participants.

(n_s2q4_multiple) If you indicated that more than one person is involved in decision-making, please explain which factors may influence who makes the decision below:

N= 58 responses

Less than half (n= 24) of participants described how a nurse would raise any concerns with a doctor, who would then make the decision. Fourteen stated that senior nursing staff could also make the decision. Others (n=4) described how it was an experienced member of staff who made the decision without stating a medical or nursing role. Only one participant described joint decision making: *“nurse and doctor will discuss, review baby and come to a decision”* (P172, NICU medical only unit). Fifteen participants described how clinical signs, or the condition of the baby, were factors that may influence who makes the decision. These participants did not provide detail of *who* made the decision.

(nn_s2q6_specify) How much does colour of the aspirate affect your decision around Gastric Residual Volume?...Please specify how:

N= 80 responses

Most commonly, participants stated that a dark or bilious colour would cause concern (n=25), or lead a clinical review (n=22) e.g. *“trigger medical review-ANNP, Middle Grade or Consultant”* (P20, NICU medical only). Six participants described how they would not be concerned about milky, blood stained or coffee ground aspirates. Others (n=7) stated that feeds would be stopped if the aspirate was a dark or bilious colour: *“Green aspirate - assess baby and feeds withheld”* (P127, LNU). One participant noted that feeds would not be increased, but they would not be stopped. Whilst another stated that an x-ray

would be conducted to look for a possible obstruction. Only three participants described how dark or bilious aspirates would be discarded. Although inconsistent responses may have been related to how this question was interpreted, a few participants commented that there were inconsistent decisions made, which were influenced by the colour of an aspirate and which nurse was looking after the baby.

(n_s2q5_specify) How much does volume of the aspirate affect your decision around Gastric Residual Volume?...Please specify how:

N= 74 responses

A large volume of aspirate was described as a concern (n=27), which would often lead to a clinical review of a baby's condition (n=22) and subsequent consideration of the how much milk the baby is receiving (n=31). The threshold for prompting a feeding review appeared to vary. Eight of the 17 participants stated that aspirates over 50% of the feed would "*prompt a review*" (P161 NICU surgical and medical), whilst others stated ">25% of feed given in previous 6 hours" (P90, NICU medical only), if exceeds "25% of the previous 4 hours' feed volume" (P20, NICU medical only) or "If >25% of the feed volume given since the last assessment was made" (P88, NICU medical only).

Colour of the aspirate (e.g. green) (n=10), vomiting (n=5) or abdominal distention (n=4), age/gestation (n=3) and type of feed e.g. formula or breast milk (n=3) are all factors taken into consideration when a large volume was observed. Decisions about how feeding should be changed also appeared to vary. Whilst seven stated that volume (and other factors) would influence decisions to withhold or "*omit that feed*" (P143, LNU), five described how they would alter the "*speed of feed increment*" (P23, LNU). Others stated that feeds may be delayed or the feed volume would be reduced (n=4).

Eight participants acknowledged that there is a "*very variable response*" (P158, NICU surgical and medical) to decision making in this situation due to a lack of guidance and an overall assessment of each baby's clinical wellbeing. One participant stated that "*some nursing staff will not have had any education about GRV, and will base their assessment on hearsay from other staff*" (P99, LNU).

(n_s2q7_explain) Please explain the factors that influence the decision to return or discard the Gastric Residual Volume. If 'other' selected, please also explain below:

N=90 responses

Colour (n=53), volume (n=43), clinical condition of the baby (n=17), and individual nurse or doctor decision (n=14) were all factors described as influencing the decision to return or discard the GRV. Many described how large (n=17), bilious, or blood stained (n=35) aspirates are discarded, whilst milky (n=20) or low volume aspirates (n=9) are returned. There were a few exceptions, with one participant stating they would discard a low volume aspirate, and three who would return a large volume; two of whom stated this aspirate would be included in the next feed. Finally, two participants described how they discard all aspirates, or discard them "*on most occasions*" (P51, LNU).

Additional comments included (not coded)

<p>Feeding guideline (which also contains guidance on gastric residuals will be forwarded by email separately) this is the East of England feed guideline which is currently being updated and new policy will be rolled out in the next few months. Guidance on management of gastric residuals has changed in the updated guidance.</p>
<p>Our ODN has recently adopted a new GL for enteral feeding which is only just becoming embedded in clinical practice Some of these questions require a specific answer but in reality there are so many clinical factors which influence decisions [including GRV] so these responses may be an over simplification of the real life situation</p>
<p>Please include the references on your website section for healthcare professionals. Only the ref numbers are given</p>
<p>Please note filled in by others but Dr xx is contact person in the future!</p>
<p>Shall e-mail link to West of Scotland feeding guideline</p>
<p>Thanks for inviting us to participate</p>
<p>The guideline is in the process of updating.</p>
<p>The guideline we are sending is a modification of existing local (Lancashire Teaching Hospitals guideline, and is yet to be ratified - we will update you of outcome after discussion at our CEG next week.</p>
<p>We are a unit with quite a strong belief in feed introduction and advancement. We err on the side of continuation with feeds whilst still remaining vigilant for early signs of NEC. We tend to try to continue feeds even in the light of mild/moderate bile staining of the aspirates. It would be useful to survey the average time to full enteral feeding in the units you wish to participate in the study as I think it may prove challenging to shorten the time to full feeds in our unit with such a measure alone. It is not looking at the aspirates which is as important as the response to them</p>
<p>We are in the process of updating our feeding policy so I have not uploaded our present one as written as it is out of date (2012)</p>
<p>We do have updated guidelines that we are waiting to be ratified with more specific guidance</p>
<p>We do routinely aspirate NGTs prior to feeds, though we find this often results in otherwise well babies having their feeds held or made NBM, only to recommence feeds within a 24 hour period. We may move toward not monitoring NG aspirates unless there are other concerns - eg distended abdomen.</p>
<p>We have not submitted our guideline as it is under review. We are happy to be contacted at a later stage to obtain it.</p>
<p>We use network guideline which will be emailed to you later.</p>
<p>We would appreciate if you let us know of the outcome of the survey</p>
<p>consistent evidence-based approach would be useful</p>
<p>enjoy! it wouldn't be possible to precisely define how we behave happy to help more if you want good luck!</p>

part of Lancashire and South Cumbria neonatal Network - plans are to adopt a network wide feeding policy which includes gastric aspirates.

we 'think' we are more cautious if baby is on formula rather than on mothers own milk