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Centre for Clinical Practice – Surveillance Programme

Clinical guideline

CG32: Nutrition support in adults - oral nutrition support, enteral tube feeding and parenteral nutrition

Publication date

February 2006

8-year surveillance report for GE (post consultation)

May 2014

Previous review dates

2-year review: 2008 (no update)
5-year review: 2011 (no update)

Key findings

			Potential impact on guidance	
			Yes	**No**
Evidence identified from literature search				✓
Feedback from Guideline Development Group				✓
Anti-discrimination and equalities considerations				✓
No update	Rapid update	Standard update	Transfer to static list	Change review cycle
✓				

Surveillance recommendation

GE is asked to consider the proposal to not update the Nutrition support in adults guideline at this time. The surveillance review proposal was consulted on for two weeks.

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8-year surveillance review of CG32: Nutrition support in adults - oral nutrition support, enteral tube feeding and parenteral nutrition

Background information

Guideline issue date: February 2006
2-year review: 2008 (no update)
5-year review: 2011 (no update)

NCC: Acute Care

Main conclusions of previous surveillance reviews

1. CG32 was previously reviewed for update in 2008 and 2011; at both review points no new evidence was identified that would change the direction of guideline recommendations.

2. In the 2011 review, the area of “immunonutrition” which is outside of the guideline scope was identified as an emerging topic and focussed searches were conducted to identify studies. However, it was felt that the available evidence was not sufficiently conclusive to merit inclusion of immunonutrition into the guideline at that time.

Eight-year surveillance review

3. An Evidence Update was produced for the guideline in 2013 and this was used as one source of evidence for the review proposal. The Evidence Update concluded that the new evidence identified since the review in 2011 did not have any impact on the guideline recommendations.

4. For the 8-year Surveillance Review, a search to identify randomised controlled trials and systematic reviews was carried out for articles published between 01 March 2013 (the end of the search period for the Evidence Update) and 30 September 2013 and relevant abstracts were assessed.

5. Clinical feedback on the guideline was obtained from members of the GDG through a questionnaire; six responses were received.

6. No new evidence was identified for any section of the guideline that may impact on current recommendations or necessitate expansion of the scope to include new topic areas.

Summary of stakeholder feedback

7. Stakeholders were consulted about the following proposal over a two week consultation period:

> Through the 8-year surveillance review of CG 32 no new evidence was identified which may potentially change the direction of current guideline recommendations or may necessitate an expansion of the scope. The proposal is not to update the guideline at this time.

8. Six stakeholders commented on the surveillance review proposal during the two-week consultation period (see Appendix 1).

9. Four stakeholders agreed with the review proposal to not update the guideline at this time, one stakeholder did not state a definitive decision and one stakeholders did not agree.

10. The stakeholder that disagreed with the surveillance review proposal suggested that the use of Cortrak, a bedside device that uses an electromagnetic sensor to track nasogastric and post pyloric tubes during placement should be recommended in the guideline. They also provided a draft journal paper (comprising a narrative review of observational studies) to support their case. However, as this paper is unpublished we are unable to consider it at this surveillance point.

11. No comments were provided by any stakeholder on equality issues or areas excluded from the original scope.

Ongoing trials

12. Two ongoing trials were identified. The PRoWL project in Australia, on the effectiveness of a composite nutritional intervention (a nutritional screening tool, the provision of food supplements at ward level, and a red tray system to identify those patients requiring help with eating and drinking) to reduce malnutrition in hospitalised adult patients; completion date is not known, the study protocol has been published

13. The other trial is the UK NIHR HTA-funded CALORIES trial comparing the clinical and cost-effectiveness of early nutritional support in critically ill patients via the parenteral versus the enteral route, is still ongoing and is due for completion in December 2015

Anti-discrimination and equalities considerations

14. None identified.

Implications for other NICE programmes

15. This guideline relates to a published quality standard on Nutrition support in adults (QS24)

16. A quality standard on Nutrition in hospital, including young people has been referred; a provisional start date is yet to be agreed.

17. The guideline will remain on the active surveillance list.

Conclusion

18. Through the 8-year surveillance review of CG 32 no new evidence was identified for any section of the guideline that may impact on current recommendations or necessitate expansion of the scope to include new topic areas.

Surveillance recommendation

19. GE is asked to consider the proposal to not update the Nutrition support in adults guideline at this time.

Mark Baker – Centre Director
Sarah Willett – Associate Director
Khalid Ashfaq – Technical Analyst

Centre for Clinical Practice
May 2014

Appendix 1 - Consultation comments and response

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
Lancashire Care NHS Foundation Trust	Agree			Thank you.
NHS England	I am in agreement with the suggestion that there is no new evidence indicating that this guidance needs review at this time			Thank you for your comment.
Department of Health	No substantive comments to make, regarding this consultation			Thank you.
Royal College of Physicians	The RCP is grateful for the opportunity to comment and supports the NICE proposal not to update at this time.			Thank you for your comment.
The Royal College of Nursing	Agree Support the stance that there is no requirement for an update of this guidance at present	None		Thank you for your comment.
CORPAK MedSystems UK	Disagree - sections 1.7 of Clinical Guideline 32 (especially 1.7.17)	We believe that the exclusion of Cortrak from the guidance results in inequality between centres (some hospitals use Cortrak, others	PLEASE ALSO SEE ATTACHMENTS. PLEASE REGARD THE DRAFT	Thank you for your comment and for providing the draft of the paper on the Cortrak

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		rely on blind placement), resulting in 'postcode' differences in outcomes and risk. In addition, the exclusion of Cortrak incurs avoidable costs, undermines efficacy and places patients at avoidable risk. (It is worth noting that many patients requiring enteral feed are unable to give informed consent. Arguably, this places HCP under ethical and moral obligations to minimise risk.) Early initiation of enteral nutrition reduces, for example: gastrointestinal damage; infections; mortality among mechanically ventilated patients; and hospital stay. (We have attached an initial draft of a narrative review intended for publication in a peer-review journal, which gives full references. An updated version of this 'work in progress' will form part of any formal NICE submission.) Increasing evidence indicates that the misplacement of conventional nasoenteric tubes (NETs) is relatively common, associated with serious complications, and incurs avoidable costs and consequences. We believe that the weight of evidence (see attached files and the draft review attached) now shows that the Cortrak enteral access system improves clinical and economic outcomes in patients requiring NETs. As a result, we believe that the evidence supports	PAPER AS CONFIDENTIAL AS THIS IS A WORK IN PROGRESS AND WILL BE SUBMITTED TO A PEER REVIEW JOURNAL.	enteral access system. The harm caused by misplaced nasogastric feeding tubes is always a concern, however, as this paper is unpublished we are unable to consider it at this surveillance point.

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		reconsideration of sections 1.7 of Clinical Guideline 32 (especially 1.7.17) and NHS England guidance. Briefly, feeding through a misplaced NET can prove fatal and rigid or fine bore NETs can cause pneumothorax and other complications. Increasing evidence, including new analyses in the attached review, suggest that spontaneous reports and many healthcare professionals (HCP) underestimate these risks. HCPs should use one or more methods to assess the position of NETs. However, conventional techniques have limitations. Although widely used and advocated by NHS England, pH measurements may be misleading in some patients, such as those taking proton pump inhibitors and requiring continuous enteral feeds. In addition, difficulty in obtaining aspirate can delay feeding, hydration or the delivery of medications, which potentially compromises outcomes. When NET placement is in doubt based on pH, chest radiographs are performed. However, radiological misinterpretation is the most common cause of NETs-related incidents reported to the NPSA. Moreover, inadvertent bronchial intubation may cause pulmonary trauma between the NET insertion and x-ray confirmation of the inappropriate placement.		

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		Further x-rays may be required as NETs can migrate by coughing, retching, vomiting or movement. Radiographs can delay the start of enteral feeding, hydration and medication. Currently, approximately 50% of critically ill patients do not reach caloric targets with nasogastric feeding. Eliminating delays, such as those associated with x-ray, helps patients start tube feeding more rapidly and potentially increases the proportion that attain targets. Cortrak is a bedside system that uses an electromagnetic sensor to track the NET during placement. Cortrak can be used in diverse settings (eg acute ward, intensive care and out-patient clinics) for a wide range of indications (corpakmedsystemsuk.com/Learning_Center/learning-center.html). Several studies compared NET placement using Cortrak with chest x-ray (table 1 [table numbers refer to the accompanying paper]). The median proportion of correct placements using Cortrak was 100%. Indeed, in clinical studies, Cortrak virtually eliminates misplacement (table 2). Cortrak detects when the NET enters the lung allowing immediate repositioning and avoids additional radiogram if a HCP suspects NET migration. Our analysis		

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		suggests that 2.2% of NETs positioned with blind placements enter the pulmonary system, suggesting an estimated 5962 potential never events annually. Avoiding x-rays saves resources (table 4), even when an initial radiograph is mandated. Cortrak reduces the time to the start of enteral nutrition by 60% (15.2 hours), compared to blind placement (p=0.05-0.01; table 3). Furthermore, HCPs can insert NETs more rapidly with Cortrak than blind placement. As Cortrak virtually eliminates NET misplacement, iatrogenic pneumothorax was not seen in the clinical studies (p=0.005 versus blind placement). We estimate that a trust performing 1500 NET insertions a year using blind placements would manage about seven iatrogenic pneumothoraces (table 6). As a first approximation, a pneumothorax costs an estimated £3300 in 'hotel' expenses, excluding management. As this excludes treatment costs, it is likely to underestimate the resource implications. A cost-minimisation analysis suggests that, ceteris paribus, and excluding pneumothorax, using Cortrak instead of blind NET placement could save the NHS money while almost eliminating the risk of never events, pneumothorax and, presumably, other		

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		complications associated with NET misplacement. In addition, cost savings using conservative assumptions on a few domains seem to offset Cortrak's acquisition price. While the assumptions are subject to uncertainty, the size of the difference and the consistency with a variety of studies from diverse settings (all of which report Cortrak is cost-effective), suggests that our conclusions are robust. A cost-consequence analysis is underway for a planned MTEP submission. Because of the uncertainties surrounding many assumptions, our results are preliminary and will be revised for any formal submission for the CG32 review and the MTEP. On the other hand, the current estimate does not include costs and consequences associated with: treating cancers caused by x-rays; delayed nutritional support, hydration and medication; adverse events other than pneumothorax; reducing inappropriate total parental nutrition starts; and other lost opportunity costs for patient contract. (For instance, HCPs accompany some patients for x-rays.) Therefore, our preliminary figures are likely to underestimate the costs. While formal cost-consequence analyses need to quantify economic outcomes, the differences seem sufficiently large to indicate that Cortrak offers improved safety and efficiently without		

Stakeholder	Do you agree that the guidance should not be updated?	Comments on equality issues or areas excluded from the original scope	Comments If you disagree please explain why	Response
		incurring additional costs and, probably, reducing pressure on resources. This combination of clinical efficacy, improved safety and reduced costs justifies, we believe, review and revision of section 1.7. Inclusion of Cortrak offers the opportunity to reduce the risk to patients, help control costs, improve effectiveness and minimise 'postcode' differences in outcomes and patient risk.		

Appendix 2 - Decision matrix

Surveillance and identification of triggers for updating CG32. The table below provides summaries of the evidence/intelligence that were identified.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Organisation of nutrition support in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) Five studies relating to nutrition support teams were identified. Two studies identified were related to nutrition support[1,2]. One study compared individualised nutrition to routine care in patients who had had stroke and found increased quality of life and better maintenance of weight in the intervention group, but no difference in length of hospital stay.[1] The other study assessed the timing of nutritional support in patients undergoing treatment for cancer; it was found that individuals undergoing nutritional support before treatment had worse outcomes overall.[2] These	No. 8-year Evidence Update (2013) Five studies[6-10] relating to continuity of nutrition support between the hospital and the community were identified. The Evidence Update concluded that the findings were consistent with the need to coordinate care between hospital and community as recommended by NICE CG32 and reiterated in NICE QS24, and there would therefore be no potential impact of evidence on current guideline recommendations. 8-year surveillance review (2013/2014) No. Three studies[11-13] on organisation of nutrition support in the hospital and the community were identified; findings of studies were in line with guideline recommendations.	One GDG member commented that there are inequalities in the provision of nutrition support in non-hospital settings and that these are not well addressed in the current guideline.	No new evidence was found that would warrant a change in current guideline recommendations. Feedback from the GDG is unlikely to impact on the guideline recommendations at this time.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
studies support current recommendations on general standards of nutritional care. Three studies analysed nutritional counselling vs standard care and found that energy intake, protein intake and quality of life were generally improved in the groups that received nutritional counselling.[3-5] One study also reported decreased mortality in the group receiving nutritional counselling.[3]			
Screening for malnutrition and the risk of malnutrition in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) No studies relevant to the clinical area were identified	No. 8-year Evidence Update (2013) One study on malnutrition screening in hospital admissions among older people was identified;[14] the study findings buttress the recommendation in the guideline to screen all patients admitted to hospital for malnutrition. 8-year surveillance review (2013/2014) Eight studies on screening for malnutrition and the risk of malnutrition in hospital and the community were	No clinical feedback was provided for this section of the guideline.	New evidence is consistent with guideline recommendations

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
	identified;[15-22] findings of studies were broadly in line with guideline recommendations		
Indications for nutrition support in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) No studies relevant to the clinical area were identified	8-year Evidence Update (2013) No studies relevant to the clinical area were identified 8-year surveillance review (2013/2014) No studies relevant to the clinical area were identified	No clinical feedback was provided for this section of the guideline.	No relevant evidence identified
What to give in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) No studies relevant to the clinical area were identified	No. 8-year Evidence Update (2013) Two observational UK studies[23,24] on the incidence of and risk factors for refeeding syndrome were identified. In both studies, the risk of refeeding syndrome was determined using the criteria set out in this guideline. One study[23] concluded that starvation and baseline low-serum magnesium concentration were independent predictors for refeeding syndrome.	One GDG member highlighted that there has been considerable debate about the safety of the refeeding recommendations in the guideline and that this needs to be revisited and rewritten to prevent overly cautious approaches to feeding which in itself can hold risks.	No new evidence was found that would change the direction of current guideline recommendations; feedback from the GDG is also unlikely to impact on the guideline recommendations at this time.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
	The other study[24], using hypophosphataemia as the 'reference standard', found that the NICE criteria for defining risk of refeeding syndrome had a sensitivity and specificity of 0.76 and 0.50 respectively for nasogastric feeding, and 0.73 and 0.38 respectively for parenteral feeding. The Evidence Update concluded that taken together, the evidence is broadly consistent with the guideline, and although the findings of the studies question the validity or lack of specificity of some risk markers set out by NICE, the lack of universally accepted criteria for a diagnosis of refeeding syndrome prevents a definitive assessment. Hence this evidence is unlikely to have an impact on NICE CG32; further research is therefore needed. 8-year surveillance review (2013/2014) No studies relevant to the clinical area were identified.		
Monitoring of nutrition support in hospital and the community			
2-year review (2008)	No.	No clinical feedback was provided	No relevant evidence identified

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Update not required after review of evidence 5-year review (2011) No studies relevant to the clinical area were identified	8-year Evidence Update (2013) No studies relevant to the clinical area were identified 8-year surveillance review (2013/2014) No studies relevant to the clinical area were identified	for this section of the guideline.	
Oral nutrition support in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) Thirteen studies[25-37] relevant to the clinical area were identified. Several studies, comparing oral nutritional supplements with either standard care or dietary counselling generally showed that giving oral nutritional supplements improves various outcomes such as weight gain, quality of life and decreased postoperative complications[25-28,30,33,35-37] One of these studies includes a trial based economic evaluation[35]. These	No. 8-year Evidence Update (2013) Eight studies[38-45] relating to oral nutrition support in hospital and the community were identified. The key point from one of the studies[45] was that immune enhancing nutrition (which were outside the scope of CG32) may reduce postoperative complications in patients undergoing non-emergency gastrointestinal surgery. However, the Evidence Update contended that limitations of the evidence, combined with some potential issues of adverse reactions to immune enhancing supplements in critical care populations noted by the authors of the Cochrane	One GDG member commented that that new recommendations on the use of oral nutrition supplements in the community where practice is highly variable could be made	No new evidence was identified which would change the direction of current guideline recommendations. Feedback from the GDG is unlikely to impact on the guideline recommendations at this time. Further evidence relating to immune enhancing nutrition, identified in the Evidence Update in the study by Burden et al. 2012[45] is discussed below under the heading: Area not currently covered in the guideline - Immunonutrition]

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
studies strengthen the recommendation for oral nutritional supplementation with various care settings, especially within the community. One study looked at oral nutritional supplements (ONS) vs standard care and identified that for ONS to be effective, more than one meal should be enhanced [29] One study found that early oral nutrition compared to traditional oral feeding resulted in a shorter length of hospital stay [31], however the evidence was not deemed sufficient to merit a change in the guidance. One study was identified that provided evidence for nutritional care in dementia[32]	review, mean that this finding is unlikely to affect CG32. However, further research into the effects of perioperative nutrition support across the spectrum of nutritional status, not just malnourished patients, may be useful. <u>8-year surveillance review (2013/2014)</u> Twelve studies[40,46-57] on oral nutrition support in hospital and the community were identified; findings of studies were broadly consistent with guideline recommendations.		
Enteral tube feeding in hospital and the community			
<u>2-year review (2008)</u> Update not required after review of evidence <u>5-year review (2011)</u>	No. <u>8-year Evidence Update (2013)</u> Five studies[70-74] relating to enteral tube feeding in hospital and the community were identified.	One GDG member pointed out that there has been further NPSA guidance around nasogastric feeding tube safety.	No new evidence was identified which would change the direction of current guideline recommendations. The point around safety of nasogastric tube feeding raised by a

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Twelve studies[58-69] relevant to the clinical area were identified. One study addressed immediate optimum flow rate vs incremental optimum flow rate for enteral feeding, and found that the immediate flow-rate group had significantly more calories and higher residual gastric volums than the incremental flow rate[58] Three studies were identified that are of note for nutrition in intensive care units. One study looked at the timing of enteral nutrition (early vs late enteral nutrition) and found that delayed feeding resulted in a longer stay in ICU [66],another study found that early enteral feeding after Gastrointestinal surgery resulted in higher transferring levels and a quicker return of bowel sounds, but resulted in more episodes of diarhhoea and stomach cramps [68]. One study assessed the effect of tube placement on ICU patients (post pyloric vs nasogastric)[67] and found that there was no difference between groups with respect to length of	The key point from one of the studies[74] was that acupuncture may have benefits over standard motility drugs in treating delayed gastric emptying in critical care. However, this was a very small (30 participants), single-blinded trial, and the Evidence Update contended that limitations of the evidence mean that it is unlikely to have an impact on CG32 and further research is needed. <u>8-year surveillance review (2013/2014)</u> Three studies[75-77] on enteral tube feeding were identified; findings of studies were broadly consistent with guideline recommendations.		GDG member was also raised at the last review in 2011; it was addressed as follows: “One GDG member was concerned about the harm caused by misplaced nasogastric feeding tubes in adults, which has also been a subject of a recent NPSA safety warning. The main causal factor leading to harm was misinterpretation of x-rays, therefore the safety alert incorporated specific steps for healthcare professionals to follow during nasogastric tube insertion. However, no evidence was found during the high level RCT search and no other member raised this issue”.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
hospital stay and number of ventilator days, but the nasogastric group had better outcomes with regards to nutritional status (increased calorie intake and reached target feed in a shorter time). A UK cost utility analysis[69] was identified that looked at the setting of enteral nutrition in patients with cerebrovascular accident, and found in favour of enteral nutrition being undertaken in the home rather than in nursing homes. This evidence is not sufficient to alter the current guideline. Five studies were identified that may affect guidance with regards to enteral vs parenteral nutrition in various clinical settings including patients who had undergone GI surgery and patients with severe acute panceratitis[59,61-64] ; one found that enteral nutrition resulted in a bigger decline in quality of life than parenteral nutrition, yet parenteral nutrition resulted in more complications[61], another study found greater patient satisfaction with enteral nutrition[62] and			

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
another study found decreased mortality in enteral nutrition.[64] One study found that motilin and cholecystokinin were increased in the enteral nutrition group, and that they had improve electrogastrography post-operatively.[63] One study looked at enteral nutiriton vs parenteral+enteral nutrition in patients undergoing pancreoduodectomy and found that there was no difference between groups with regards to mortality, but enteral group had a higher discontinuation of feeding, and the enteral+parenteral group had a longer duration of feed and had their line maintained for longer.[65] One study looked at early enteral nutrition vs early natural nutrition [60] in pancreoduodectomy patients, and found that early enteral nutrition received more energy in the first 5 days post-operatively than the early natural nutrition group, there were also more complications in the early natural nutrition group			

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Parenteral nutrition in hospital and the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) Five studies[62,78-81] relevant to the clinical area were identified. One study in trauma patients looked at partial parenteral vs enteral nutrition and found that the parenteral nutrition group received more protein and calories and had higher albumin and transferrin concentrations[78,80,81] There are two trial based economic evaluations[62,79] which favoured enteral over parenteral nutrition in terms of cost, without finding differences in clinical outcomes. This evidence supports the existing recommendation.	No. 8-year Evidence Update (2013) No studies relevant to the clinical area were identified 8-year surveillance review (2013/2014) Two studies[82,83] on parenteral nutrition were identified. The study by Casaer et al. 2011[82] is the report of the EPaNIC trial that was identified at the 5-year review in 2011. The study compared early (within 24-48 hours, European guideline) versus late (after 7 days, American/Canadian guideline) initiation of PN when EN fails to reach a caloric target and concluded that late initiation of parenteral nutrition was associated with faster recovery and fewer complications, as compared with early initiation. The other study[83] aimed to assess outcomes of parenteral nutrition when the NICE guidance was adhered to. It concluded that implementing the guidelines may not be enough to reduce	No clinical feedback was provided for this section of the guideline.	The identified new evidence would not change the direction of current guideline recommendations. It would be appropriate to await the results of a large ongoing UK multi-centre study (the CALORIE trial) that is due for completion in December 2015.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
	mortality and other outcomes. The authors also posited that in view of the fact that the guideline recommendations were mostly based on Grade D evidence due to absence of randomised controlled trials, new interventions or changes in clinical practice should be considered to optimise the impact of parenteral nutrition on mortality. However, there is a large ongoing multicentre UK RCT (the NIHR HTA-sponsored CALORIE trial) that is expected to report in December 2015, and it would be appropriate to wait for the publication of the results of the trial to look at this again.		
Supporting patients in the community			
2-year review (2008) Update not required after review of evidence 5-year review (2011) No studies relevant to the clinical area were identified	No. 8-year Evidence Update (2013) No studies relevant to the clinical area were identified 8-year surveillance review (2013/2014) No studies relevant to the clinical area were identified	No clinical feedback was provided for this section of the guideline.	No relevant evidence identified

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Area not currently covered in the guideline - Nutrition support in stroke, liver disease			
5-year review (2011) Nutrition in people requiring specific long-term therapeutic regimens for the treatment of diseases was excluded from the original scope. Thus no study was identified from the high level searches on this area. However, during consultation, one stakeholder suggested that this was an important area that warranted inclusion in the guideline and provided information on publications relating to nutrition in chronic liver disease.	No. 8-year Evidence Update (2013) Two Cochrane reviews, one each on a range of interventions for nutrition support in people with stroke[84] and liver disease[85] were identified - these two studies examined a wider range of interventions within specific conditions, and were therefore deemed not to be aligned to any particular section of the guideline. Alongside general recommendations for nutrition support in CG32, guidance specific to nutrition support in stroke is covered by the NICE 'Stroke' guideline CG68. On the basis of the findings of the Cochrane review on nutrition interventions in stroke[84], the Evidence Update concluded that the evidence is unlikely to have an impact on the stroke guideline recommendations and the evidence for reduced pressure sores is broadly consistent with recommendations for general nutrition support in CG32.	No clinical feedback was provided on this topic	Alongside general recommendations for nutrition support in CG32, guidance specific to nutrition support in stroke is covered by the NICE 'Stroke' guideline CG68; the identified new evidence is unlikely to have an impact on the stroke guideline recommendations and is broadly consistent with recommendations for general nutrition support in CG32. The identified new evidence on nutrition support in liver disease is insufficient to warrant an update of the guideline.

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
	The results of the Cochrane review on nutritional support for liver disease[85] revealed no significant differences for most analyses and the Evidence Update concluded that although the evidence suggests that the benefits of nutrition support in patients with liver disease appear to be restricted, limitations of current data prevent firm conclusions and more robust evidence is needed to confirm findings. <u>8-year surveillance review (2013/2014)</u> One systematic review and meta-analysis[86] of RCTs of oral or enteral nutritional supplementation in adult patients with cirrhosis was found. Results showed that there was no reduction in mortality when all studies were combined. The authors concluded that there is insufficient evidence to definitively state that the intervention impacts clinical outcomes in liver cirrhosis.		

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
Area not currently covered in the guideline – Immunonutrition (including the use of novel substrates such as glutamine or arginine)			
5-year review (2011) Although the use of novel substrates such as glutamine or arginine was excluded from the scope of the guideline, at the 5-year review, immunonutrition was considered an emerging topic that might warrant inclusion in the scope of a future update of the guideline. A focused search on immunonutrition was therefore undertaken and 35 studies[87-121] were identified for inclusion in the review. Six studies were related to the area of parenteral immunonutrition in a varied patient population (GI cancer, severe acute pancreatitis and critically ill patients): Three studies analysed the effect of varying quantities of omega 3 and fish oils in TPN [87-89], two studies addressed the effect of varying lipid composition of TPN[91,92], and one study looked at the effects of varying the amino acid content of TPN[93]. The largest study (166 patients in an intensive care setting) found no	No. 8-year Evidence Update (2013) The key point from one of the Cochrane reviews[45] included in the oral nutrition section of the Evidence Update was that immune enhancing nutrition may reduce postoperative complications in patients undergoing non-emergency gastrointestinal surgery. However, the Evidence Update contended that limitations of the evidence, combined with some potential issues of adverse reactions to immune enhancing supplements in critical care populations noted by the authors of the review, mean that this finding is unlikely to affect CG32, and that further research into the effects of perioperative nutrition support across the spectrum of nutritional status, not just malnourished patients, may be useful. 8-year surveillance review (2013/2014) Nine studies[125-133] were identified through a high level search.	One GDG member commented that the field of immunutrition was not included in the original guidance but since then a lot of research has been published which has led to massive variation in practice related to the prescription or otherwise of these more expensive nutritional support interventions.	The evidence relating to immunonutrition is promising - benefits were found in subgroups of high-risk and malnourished patients. However, conflicting results on the benefit of immunonutrition from several studies do not allow for any firm conclusions. The current evidence is therefore insufficient to merit inclusion of immunonutrition into the guideline at this stage

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
difference between groups with respect to inflammatory markers[87.] Other, smaller studies found that the intervention reduced the concentration of inflammatory markers[89], and had beneficial effects on serum lipid profiles[92] and reduced postoperative morbidity[93]. Two studies could potentially inform health economic considerations of this new topic once conclusive clinical evidence is available [90,122]. Ten studies were found that specifically looked at parenteral nutrition with glutamine vs standard parenteral nutrition [111,113-121.] These studies were relatively small (all less than 75 patients) and undertaken on a variety of patient populations, including surgical and trauma patients and patients undergoing stem cell transplantation. Studies involving patients undergoing stem cell transplants found a higher C- reactive protein[111] and increased survival [114] in the intervention group. One study assessing immunonutrition	One systematic review and meta-analysis[125] of RCTs published between 1985 and 2009 that assessed the clinical impact of perioperative enteral immunonutrition in major gastrointestinal elective surgery was found. The authors concluded that perioperative enteral immunonutrition decreases morbidity and hospital stay but not mortality after major gastrointestinal surgery. One large RCT[126] conducted in Scotland showed no effect on new infections or on mortality when parenteral nutrition was supplemented with glutamine or selenium. One large multi-centre RCT[127] conducted in Europe and North America concluded that early provision of glutamine or antioxidants did not improve clinical outcomes, and that glutamine was associated with an increase in mortality among critically ill patients with multiorgan failure. Preliminary data from one small French RCT[128] showed that immunonutrition improves functional capacities in head, neck and oesophageal cancer patients		

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
in chronic obstructive pulmonary disease found the intervention group had a significantly higher CD3 concentration and a decreased TNFα [119]. One study assessing immunonutrition in gastrointestinal surgery found that there was not a significant difference between the control and intervention groups - both groups showed decreases in albumin, CRP, lymphocyte count, T cell and CD8 count after surgery[121]. Studies also showed improved survival [114], incidence of specific infections [115,] and decreased intolerance to feeding [123.] Eleven studies pertaining to the area of enteral immunonutrition were Identified. Studies involved looking at imunonutrition vs standard enteral nutrition [94,94,94,96-103,112,124.] One study looked at immunoenhanced enteral nutrition vs standard parenteral nutrition. Immunonutrition refers to the addition of substances such as arginine, eicosapentoic acid (EPA) and gammalinoleic acid (GLA) to the nutrition. In the majority of studies patients receiving immunonutrition	undergoing radiochemotherapy. One small RCT[129] conducted in China concluded that arginine-supplemented enteral nutrition significantly improves long-term survival and restores immunity in malnourished gastric cancer patients. A systematic review and meta-analysis[130] of RCTs found that fish oil-containing lipid emulsions may be able to decrease mortality and ventilation days in the critically ill. However, the authors concluded that because of the paucity of clinical data, there is inadequate evidence to recommend the routine use of parenteral fish oil and that large, rigorously designed RCTs are required to elucidate the efficacy of parenteral fish oil in the critically ill. Another systematic review and meta-analysis[131] concluded that omega-3 fatty acid supplementation of parenteral nutrition does not improve mortality, infectious complications, and intensive therapy unit length of stay in comparison with standard parenteral nutrition in critically ill adult patients.		

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
tend to have better outcomes with regards to inflammatory markers, mortality, ventilator and ICU free days[59,94-101,102,103,112]. There were seven studies pertaining to the area of oral immunonutrition[107,124 105-110,124]. These included studies comparing oral nutritional supplements with substances such as arginine, zinc, testosterone, polyunsaturated omega-3 and oligosaccharides with standard oral nutrition. The majority of studies looked at an elderly population in the community or nursing home facilities[108,109,124], one study looked at stroke patients[106], and one looked at patients with gastrointestinal tumours[107]. Some studies showed a trend towards decrease in hospital admissions, decreased length of stay, and decreased mortality[105,106,124]. One study specifically looked at antibody titres with respect to a population at risk from influenza; the usefulness of this study is restricted as it addresses a very specific and indirect population [108]. Two studies looked at biochemical	One small RCT[132] conducted in Brazil found that fish oil decreases c-reactive protein/albumin ratio and plasma fatty acid profile and potentially prevents weight loss in people with colorectal cancer. One small RCT[133] conducted in Taiwan found that Omega-3 fatty acid-, micronutrient-, and probiotic-enriched nutrition helps body weight stabilization in head and neck cancer cachexia. Put together, the evidence relating to immunonutrition is promising - benefits were found in subgroups of high-risk and malnourished patients. However, conflicting results of effectiveness of immunonutrition products from several studies and even of harm in at least one study[127], do not allow for a firm conclusion.		

Conclusions from previous surveillance reviews	Is there any new evidence/intelligence identified during this 8-year Evidence Update (2013) and surveillance review (2013/2014) that may change this conclusion?	Clinical feedback from the GDG	Conclusion of this 8-year surveillance review (2013/2014)
indices, one study found a beneficial reduction in TNFα mRNA and IL6 mRNA in the intervention group,[109] and another study found that biochemical markers indicated a decrease in immune suppression in patients receiving immunonutrition intervention.[110] All of the studies listed here are of limited relevance as they were all carried out on relatively small populations (all less than 100 patients) and the results are inconclusive. The 5-year review concluded that no sufficient conclusive evidence was identified that would merit inclusion of immunonutrition into the guideline at that stage.			

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