

Current postoperative nutritional practice after pancreatoduodenectomy in the UK

REBOUND Study Group

; Halle-Smith, James M; Pathak, Samir; Frampton, Adam; Pandanaboyana, Sanjay; Sutcliffe, Robert P; Davidson, Brian R; Smith, Andrew M; Roberts, Keith J

DOI:

[10.1093/bjsopen/zrae021](https://doi.org/10.1093/bjsopen/zrae021)

License:

Creative Commons: Attribution (CC BY)

Document Version

Publisher's PDF, also known as Version of record

Citation for published version (Harvard):

REBOUND Study Group, Halle-Smith, JM, Pathak, S, Frampton, A, Pandanaboyana, S, Sutcliffe, RP, Davidson, BR, Smith, AM & Roberts, KJ 2024, 'Current postoperative nutritional practice after pancreatoduodenectomy in the UK: national survey and snapshot audit', *BJS Open*, vol. 8, no. 2, zrae021. <https://doi.org/10.1093/bjsopen/zrae021>

[Link to publication on Research at Birmingham portal](#)

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.



When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

Current postoperative nutritional practice after pancreatoduodenectomy in the UK: national survey and snapshot audit

James M. Halle-Smith^{1,2,*} , Samir Pathak³, Adam Frampton⁴, Sanjay Pandanaboyana⁵, Robert P. Sutcliffe^{1,2}, Brian R. Davidson^{6,7}, Andrew M. Smith³ and Keith J. Roberts^{1,2} ; REBOUND Study Group

¹Hepatobiliary and Pancreatic Surgery Unit, Queen Elizabeth Hospital Birmingham, Birmingham, UK

²College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK

³Hepatobiliary and Pancreatic Surgery Unit, Leeds Teaching Hospitals NHS Foundation Trust, Leeds, UK

⁴Department of Hepato-Pancreato-Biliary Surgery, Royal Surrey County Hospital, Guildford, UK

⁵Hepatobiliary and Pancreatic Surgery Unit, Newcastle Upon Tyne Teaching Hospitals NHS Foundation Trust, Newcastle Upon Tyne, UK

⁶Hepatobiliary and Pancreatic Surgery Unit, Royal Free London NHS Foundation Trust, London, UK

⁷Department of Surgical Innovation, Organ Regeneration and Transplant, University College London, London, UK

*Correspondence to: James Halle-Smith, Hepatobiliary and Pancreatic Surgery Unit, Queen Elizabeth Hospital, 3rd Floor Nuffield House, Edgbaston, Birmingham B15 2TH, UK (e-mail: james.hallesmith@doctors.org.uk)

Presented to the Pancreatic Society of Great Britain and Ireland, November 2022; Biannual Meeting of the European and African Hepato-Pancreato-Biliary Association, Lyon, June 2023.

Despite advances in operative techniques and enhanced recovery programmes, morbidity after pancreatoduodenectomy (PD) remains high, with rates reported between 20% and 30%^{1,2}. Perioperative malnutrition plays a key role in this, being associated with reduced quality of life and survival after surgery³⁻⁵. This is especially pertinent for PD patients, for whom malnutrition is present in a fifth before surgery⁴ and increases during inpatient stay to greater than 75% following surgery³. Nutritional management of PD patients is extremely complex, in part due to cancer cachexia caused by an aggressive malignancy but also due to the relative frequency of postoperative complications, such as delayed gastric emptying (DGE) and postoperative pancreatic fistula (POPF), which can limit oral intake. Strategies to improve the perioperative nutritional status of PD patients are urgently required. Designing a clinical trial requires a robust understanding of current clinician practice.

The aims of this study were to collect current clinician opinion and practice regarding nutritional management of patients after PD in the UK. An electronic invitation to participate in the clinician survey and snapshot audit was sent simultaneously to all pancreatic surgery centres in the UK. Institutional audit approval was obtained at each participating centre.

Of the 26 centres contacted, 19 responded to the electronic survey (73%) and in some cases, more than one clinician from each centre responded (23 clinician responses in total). Less than half of the centres had a written institutional standard protocol for feeding patients after PD ($n = 8$; 42%). Just under half of clinicians felt that early oral feeding was entirely safe ($n = 11$; 48%). In terms of oral feeding in patients with POPF, most clinicians felt it would be safe for patients with biochemical POPF ($n = 17$; 74%) but only 38% ($n = 9$) felt it would be safe for patients with clinically relevant POPF (CR-POPF), with

the majority favouring nutrition with parenteral nutrition ($n = 14$; 61%). Most clinicians placed a nasogastric tube intraoperatively ($n = 20$; 87%), whereas just under half routinely used nasojejunal tubes ($n = 10$; 46%). Regarding immunonutrition, probiotics or synbiotics use, more than half of respondents were not aware of literature and felt more evidence was required ($n = 14$; 61%). Clinicians were broadly supportive of a potential RCT in which PD patients could be assigned to different perioperative nutritional interventions.

For the national snapshot audit, data from 12 centres were collected with 90 patients suitable for inclusion (Table 1). Most PD patients ($n = 88$; 98%) were allowed some form of oral intake on postoperative day 1 (POD1), with the most common modality being sips ($n = 37$; 45%). In terms of supplementary nutritional routes on POD1, 27% and 2% of patients received nutrition via nasojejunal tube and parenteral nutrition, respectively ($n = 22$ and $n = 2$, respectively). For those with biochemical POPF, 88% (15 of 17) continued to be fed orally with no change to their nutrition, whereas 76% (19 of 25) of those with CR-POPF were managed with parenteral nutrition and clear fluids orally. In terms of perioperative nutritional supplements, 15% of PD patients received immunonutrition whereas only 1% received probiotics ($n = 14$ and $n = 1$, respectively).

This study reported the results of a national survey and snapshot audit of current perioperative nutritional practice after PD at UK pancreatic centres. The main findings were that there is widespread variation in perioperative nutritional practice and in opinion regarding nutritional management among this challenging patient group. The pancreatic surgery community in the UK seemed willing to investigate nutritional interventions in suitable clinical trials to generate further evidence in this area. Further understanding of whether the implementation of

Received: July 17, 2023. Revised: November 10, 2023. Accepted: November 18, 2023

© The Author(s) 2024. Published by Oxford University Press on behalf of BJS Foundation Ltd.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1 Postoperative feeding practice reported in national snapshot audit

Nominal variables	Total (n = 90)
Oral diet permitted on POD1	
Sips	37 (45)
Clear fluids	26 (31)
Free fluids	16 (19)
Nil by mouth	2 (2)
Alternative nutrition route POD1	
Nasojejunal feeding	22 (27)
Parenteral nutrition	2 (2)
None	59 (71)
NGT placed intraoperatively	
Yes	83 (98)
No	1 (2)
NGT removal day; n = 59	
POD1	8 (14)
POD2	0 (0)
POD3	18 (31)
POD4	7 (12)
POD5	6 (10)
POD6	6 (10)
POD7–10	5 (9)
POD11+	9 (15)
Biochemical POPF nutritional management; n = 17	
Start nasojejunal feed and step down diet to free fluids orally	2 (12)
No change—continue oral diet	15 (88)
CR-POPF nutritional management; n = 25	
PN and step down diet to clear fluids orally	19 (76)
No change—continue oral diet	6 (24)
Nutritional supplementation; n = 15	
Immunonutrition	14 (15)
Probiotics	1 (1)
Synbiotics	0 (0)

Values are n (%). CR-POPF, clinically relevant postoperative pancreatic fistula; NGT, nasogastric tube; PN, parenteral nutrition; POD, postoperative day; POPF, postoperative pancreatic fistula.

different interventions to address malnutrition is feasible among PD patients is required before a larger clinical trial can begin.

Collaborators

Colin Wilson and Viswakumar Prabakaran (Freeman Hospital, Newcastle, UK); Asma Sultana, Ayesha Khan and Muhammad Butt (East Lancashire Hospitals, UK); Declan Dunne (Liverpool University Hospitals, UK); Melissa Bautista (Leeds University Hospitals, UK); Richard Laing (University Hospitals of North Midlands, UK); Dhanny Gomez (Nottingham University Hospitals, UK); Raaj Praseedom (Addenbrookes Hospital Cambridge, UK); Michael Feretis (Queen Elizabeth Hospital Birmingham, UK); Giuseppe Kito Fusai, Gulbahar Syeda and Murali Somasundaram

(Royal Free Hospital, London UK); Omar Mownah (Kings Hospital, London, UK); Srikanth Reddy (Churchill Hospital, Oxford, UK); Ali Arshad and Tayseer Al-Tawarah (Southampton University Hospital, UK); James Skipworth and Jonathon Rees (University Hospital Bristol, UK); Somaiah Aroori and Deborah Cipriani (University Hospital Plymouth, UK); James Milburn (Aberdeen Royal Infirmary, UK); Anya Adair (Edinburgh Royal Infirmary, UK); Maria Coats (Glasgow Royal Infirmary, UK); Bilal Al-Sarireh (Morriston Hospital, Swansea, UK); Oonagh Griffin (St Vincents Hospital, Dublin, Ireland); Nabeel Merali, Isabel Miglior, Rajiv Lahiri and Mary Phillips (Royal Surrey Hospital, UK); Sarah Powell-Brett, Lewis Hall and Rupaly Pande (University Hospitals Birmingham, UK).

Funding

The authors have no funding to declare.

Disclosure

The authors declare no conflict of interest.

Supplementary material

[Supplementary material](#) is available at *BJS Open* online.

Data availability

Anonymized data can be made available upon reasonable request.

References

1. Cameron JL, He J. Two thousand consecutive pancreaticoduodenectomies. *J Am Coll Surg* 2015;**220**:530–536
2. Sánchez-Velázquez P, Muller X, Malleo G, Park J-S, Hwang H-K, Napoli N *et al*. Benchmarks in pancreatic surgery: a novel tool for unbiased outcome comparisons. *Ann Surg* 2019;**270**:211–218
3. Kang J, Park JS, Yoon DS, Kim WJ, Chung H-Y, Lee SM *et al*. A study on the dietary intake and the nutritional status among the pancreatic cancer surgical patients. *Clin Nutr Res* 2016;**5**:279–289
4. Kim E, Kang JS, Han Y, Kim H, Kwon W, Kim JR *et al*. Influence of preoperative nutritional status on clinical outcomes after pancreatoduodenectomy. *HPB (Oxford)* 2018;**20**:1051–1061
5. Jin J, Xiong G, Wang X, Peng F, Zhu F, Wang M *et al*. The impact of preoperative and postoperative malnutrition on outcomes for ampullary carcinoma after pancreatoduodenectomy. *Front Oncol* 2021;**11**:748341