National Institute for Health and Care Excellence

Version 1.0

Pancreatic Cancer in adults:

diagnosis and management

Appendix K

Health economics evidence profiles

31 July 2017

Draft for Consultation

Developed by the National Guideline Alliance, hosted by the Royal College of Obstetricians and Gynaecologist

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The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

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Appendix K: Health economics evidence profiles

K.1 Staging

What is the most effective investigative pathway for staging adults with newly diagnosed pancreatic cancer or a non-definitive diagnostic result as resectable, borderline resectable, locally advanced and metastatic disease?

References to Included Studies:

Morris S, Gurusamy KS, Sheringham J et al. 'Cost-effectiveness of diagnostic laparoscopy for assessing resectability in pancreatic andperiampullary cancer'. BMC Gastroenterol. (2015)

Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER
Morris 2015 UK	People with pancreatic or periampullary cancer which has been identified as resectable	Direct Laparotomy with no further diagnostic work up.	£7480	0.337	Reference	Deterministic Sensitivity Analysis The preferred option is sensitive to the probability of non-resectable disease being identified and the post test probability of unresectable disease. The preferred option changes to direct laparotomy when laparoscopy is schedule prior to surgery.	Directly Applicable

	through CT scanning.	Diagnostic laparoscopy, to assess resectability of tumour, prior to laparotomy.	£7470	0.346	Diagnostic Laparoscopy dominant		
	Comments:						

K.2 Biliary Obstruction

What is the optimal treatment of biliary obstruction in adults with newly diagnosed or recurrent pancreatic cancer?

References to included studies:

Arguedas MR, Heudebert GH, Stinnett AA et al. 'Biliary stents in malignant obstructive jaundice due to pancreatic carcinoma: a cost-effectiveness analysis' AM J Gastroenterol 97(4) (2002) p898-904

Morris S, Gurusamy KS, Sheringham J et al. 'Cost-effectiveness of preoperative biliary drainage for obstructive jaundice in pancreatic and periampullary cancer. J Surg Res 193(1) (2014) p202-209

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Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER	Uncertainty	Applicability	Limitations
Arguedas 2002 US	Hypothetical cohort of people with pancreatic cancer and obstructive jaundice presenting for palliative biliary stenting.	Initial Plastic Stenting	$13,879	1.799 QALMs	Reference			Deterministic Sensitivity Analysis: The preferred intervention is sensitive to overall survival with shorter survival favouring plastic stenting. Metal stenting is dominant under the majority of assumptions	Partially Applicable	Very Serious Limitations.
		Initial Metal Stenting	$13,446	1.832 QALMs	-$433	0.033	Dominant			
	Comments:									

Morris 2014 UK	People with pancreatic or periampullary cancer and obstructive jaundice who are potential candidates for resection.	Preoperative Biliary Drainage	£10,775	0.337	Reference			Deterministic Sensitivity Analysis Deterministic sensitivity analyses were performed around all variables with Direct Surgery always dominant. Probabilistic Sensitivity Analysis At a willingness to pay per QALY of £20,000 and £30,0000 PBD only had a 9.5% and 8.9% probability of being cost effective.	Directly Applicable	Minor Limitations.
		Direct Surgery	£8,221	0.343	£2554	0.006	Direct Surgery Dominant			
	Comments:									

K.3 Neo-adjuvant treatment

Is neoadjuvant therapy for people with resectable and borderline resectable pancreatic adenocarcinoma an effective treatment?

References to included studies:

Abbott DE, Tzeng CW, Merkow RP et al. 'The cost-effectiveness of neoadjuvant chemoradiation is superior to a surgery-first approach in the treatment of pancreatic head adenocarcinoma.'Ann Surg Oncol 20 (2013): Suppl 3: s500-503

Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER	Uncertainty	Applicability	Limitations
Abbott et al. 2013 USA	People with resectable pancreatic head cancer.	Surgery First	$46,830	0.73 QALYs	Reference			One-way Sensitivity Analysis One-way sensitivity analyses were performed around a range of clinical variables impacting upon the surgery first approach. Neoadjuvant therapy remained dominant in all scenarios.	Partially Applicable	Potentially Serious Limitations.
		Neoadjuvant Therapy	$36,538	1.60 QALYs	-$10,292	0.87 QALYs	Dominant (Neoadjuvant therapy both more effective and less costly)			
	Comments:									

K.4 Follow up for people with resected pancreatic cancer.

What is the optimal follow-up protocol for people with resected pancreatic adenocarcinoma?

References to included studies:

1 Tzeng CW, Abbott DE, Cantor SB et al. 'Frequency and intensity of postoperative surveillance after curative treatment of pancreatic cancer: a cost-
2 effectiveness analysis.' Ann Surg Oncol 20 (2013): Suppl 3: 2197-203

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Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER	Uncertainty	Applicability	Limitations
Tzeng et al. 2013 USA	People who completed neoadjuvant therapy and pancreaticoduodenectomy for pancreatic ductal adenocarcinoma (PDAC).	1. No scheduled surveillance, patient-initiated clinical evaluation for symptoms with computed tomography (CT) of the abdomen/pelvis and posterior-anterior/lateral chest X-ray (CXR).	$3,837	24.6 Life Months (LM)	Reference			Deterministic Sensitivity Analysis Deterministic sensitivity analyses were performed around the proportion of patients receiving chemotherapy and the effectiveness of chemotherapy following recurrence. Whilst the sensitivity analyses changed the absolute life time costs it did not impact upon the ranking of the interventions in terms of cost effectiveness.	Partially Applicable	Potentially Serious Limitations.
		2. Scheduled clinical evaluation every 6 months with carbohydrate antigen (CA) 19-9 assay	$7,496	32.8LM	$3,659	8.2LM	$5,364 per Life Year (LY) gained			
		3. Scheduled clinical evaluation every 6 months with CA 19-9 and routine	$10,961	32.8LM	$3,465	0.0LM	Dominated			

		CT/CXR								
		4. Scheduled clinical evaluation every 3 months with CA 19-9	$18,523	33.8LM	$11,027	1.0LM	$127,680 per LY Gained			
		5. Scheduled clinical evaluation every 3 months with CA 19-9 and routine CT/CXR	$24,775	34.1LM	$17,279	1.3LM	$294,696 per LY Gained			
	Comments:									

K.5 Management of metastatic pancreatic cancer.

What are the most effective interventions (excluding relevant NICE TAs) for adults with newly diagnosed or recurrent metastatic pancreatic cancer (chemotherapy, surgery, biological therapy, immunotherapy, radiotherapy, ablative techniques, low molecular weight heparin)?

References to included studies:

Tam VC, Ko YJ, Mittmann N, Cheung MC, Kumar K, Hassan S, Chan KK. 'Cost-effectiveness of systemic therapies for metastatic pancreatic cancer' Curr Oncol 20 (2013) e90-e106

Attard CL, Brown S, Alloul K et al. 'Cost-effectiveness of folfirinox for first-line treatment of metastatic pancreatic cancer' Curr Oncol 21 (2014) e41-51

Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER	Uncertainty	Applicability	Limitations
Tam 2013 Canada	People with metastatic pancreatic cancer undergoing chemotherapy	Gemcitabine	CA$29,423	0.487	Reference			Deterministic Sensitivity Analysis Deterministic sensitivity analyses were performed around the majority of variables. The decision appeared most sensitive to chemotherapy drug costs. Probabilistic sensitivity analysis estimated that there was less than a 5% probability of FOLFIRINOX being cost effective at a WTP threshold of CA$100,000.	Partially Applicable	Potentially Serious Limitations.
		Gemcitabine and Capecitabine	CA$33,572	0.536	CA$4,329	0.049	CA$84,299			
		Gemcitabine and Erlotinib	CA$41,239	0.564	CA$11,816	0.077	CA$153,631			
		FOLFIRINOX	CA$58,243	0.703	CA$28,820	0.216	CA$133,184			
	Comments:									

Study	Population	Comparators	Costs	Effects	Incr costs	Incr effects	ICER	Uncertainty	Applicability	Limitations
Attard 2014 Canada	People with metastatic pancreatic cancer undergoing chemotherapy with an ECOG performance score of 0 or 1	Gemcitabine	CA$7,207	0.670	Reference			Deterministic Sensitivity Analysis Deterministic sensitivity analyses were performed around the majority of variables with the results of the analysis being robust to all changes. Probabilistic sensitivity analysis estimated that there was a greater than 85% probability of FOLFIRINOX being cost effective at a WTP threshold of CA$100,000.	Partially Applicable	Potentially Serious Limitations.
		FOLFIRINOX	CA$21,103	0.974	CA$13,896	0.324	CA$57,858			
	Comments:									

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