

Cost-effectiveness of biodegradable pancreatic stents in post ERCP pancreatitis prophylaxis.  
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## Background

Biodegradable biliopancreatic stents (BDS) are commercially available alternatives to conventional stents. Whilst these offer potential economic benefits, such as no need for follow up imaging or endoscopic procedures to retrieve retained stents, they have not been evaluated in a Health Economic model. We sought to develop a Health Economic model comparing conventional pancreatic stents (PS) to BDS for post ERCP pancreatitis prophylaxis (PEP).

## Methods

Information on pancreatic stents used for PEP and follow up data were extracted from the endoscopy database at The Royal Wolverhampton NHS Trust (RWT) to develop a cost-benefit decision analysis model. Healthcare associated quality of life data were extracted from the literature to develop healthcare effectiveness utilities used in the model. Complications due to retained stents were included in the model. Monte Carlo microsimulation using 1000 patient runs and sensitivity analyses were performed. Incremental cost effectiveness ratios (ICER) were calculated for a willingness to pay (WTP) threshold of £30,000.

## Results

Between 2021-23, 60 patients (39/60 (65%) females and 21/60 (35%) males) underwent prophylactic pancreatic stenting. Of these, only 34 (57%) had a follow up abdominal Xray requested, and the stent had fallen out in 20 (59%) of patients. In 14 patients who underwent gastroscopy for stent retrieval, the stent was present in 12 (86%) patients. In 26 patients who did not have an abdominal Xray, 15 (58%) already had a repeat endoscopy arranged as part of a follow up procedure. Nine patients did not have any follow up imaging and in this group, 3 died due to worsening malignancy (2 cholangiocarcinoma and 1 pancreatic cancer), 1 had scheduled pancreatic surgery and 5 patients were referred back to their referring centres with follow up data unavailable.

Base-case cost benefit analysis demonstrated that a strategy of using BDS for PEP was cost-effective compared to conventional PS (£656.44 / 0.98 effectiveness for BDS vs £296.75 / 0.95 for PS). On microsimulation, BDS remained cost-effective (£651.51/0.98 vs £290.94/0.95) with an ICER of 10969 and a net monetary benefit (NMB) of £28,712 for BDS compared to £28,164 for PS. Threshold analysis demonstrated a cost-threshold of £275 for BDS.

## Conclusions

BDS for PEP prophylaxis is cost effective compared to conventional PS, in addition to avoiding the need for follow up imaging and procedures.