



Supplementary Figure 1. Flowchart of Patient Cohort. *HMO*, Health maintenance organization; *HOP*, head of pancreas; *PTBD*, percutaneous transhepatic biliary drainage; *SEER*, Surveillance, Epidemiology, and End Results.

SUPPLEMENTARY TABLE 1. Medicare and Surveillance, Epidemiology, and End Results Billing Codes

Variables	Codes
Pancreatic adenocarcinoma (ICD-0-3 codes for histology of pancreatic cancer)	8000-5, 8010-15, 8020-22, 8050-55, 8140, 8211, 8230, 8260-63, 8440, 8450-53, 8470-71, 8480-81, 8500, 8503, 8521, 8570
ERCP (HCPCS and ICD-9 procedure codes)	43260-65, 43271-72, 74328, 74329, 74330, 43267-69, 43274, 43276, 5110, 5111, 5184- 87, 5199, 5213, 5293
PTBD (HCPCS and ICD-9 procedure codes)	47505, 47510, 47511, 47525, 75980, 74320, 47533, 47534, 47535, 47536, 47538, 47539, 47540, 8751, 5198
Jaundice (ICD-9)	7824
Obstructive faundice (ICD-9)	5768
Obstruction of the bile duct (ICD-9)	5762
Abnormal liver function tests (ICD-9)	7948
Cholangitis (ICD-9)	5761
Gastric outlet obstruction (ICD-9)	5370
Whipple (HCPCS and ICD-9 procedure code)	48150, 48152, 48153, 48154, 48155, 527, 5251
Biliary obstruction (ICD-9)	5768, 7824, 5761, 5762, 7948, 6989
Pruritus (ICD-9)	6989
Chemotherapy (ICD-9 procedure, ICD-9 diagnosis, and HCPCS codes)	C1086, C1166, C1167, C1178, C9012, C9110, C9127, C9205, C9207, C9213, C9214, C9215, C9217, C9218, C9235, C9257, C9262, C9414, C9415, C9417, C9418, C9419, C9420, C9421, C9422, C9423, C9424, C9425, C9426, C9427, C9429, C9431, C9432, C9433, C9437, C9440, J0594, J0894, J8510, J8520, J8521, J8530, J8560, J8565, J8600, J8610, J8700, J8705, J9000, J9001, J9010, J9017, J9020, J9025, J9027, J9033, J9035, J9040, J9041, J9045, J9050, J9055, J9060, J9062, J9065, J9070, J9080, J9090, J9091, J9092, J9065, J9070, J9080, J9090, J9091, J9092, J9093, J9094, J9095, J9096, J9097, J9098, J9100, J9110, J9120, J9130, J9140, J9150, J9151, J9170, J9171, J9178, J9180, J9181, J9182, J9185, J9190, J9200, J9201, J9206, J9207, J9208, J9211, J9230, J9245, J9250, J9260, J9261, J9263, J9264, J9265, J9266, J9268, J9270, J9280, J9290, J9291, J9293, J9300, J9305, J9307, J9310, J9315, J9320, J9328, J9330, J9340, J9350, J9351, J9355, J9357, J9360, J9370, J9375, J9380, J9390, J9399, Q2017, Q2024, S0087, S0088, S0115, S0116, S0172, SS0176, SS0178, S0182, C8954, C8955, G0355, G0357, G0359, G0360, G0361, G0362, G0370, J7150, Q0083, Q0084, Q0085, S5019, S5020, S9329, S9330, S9331, S9425, C9419, C9420, C9421, C9422, C9423, C9424, C9425, C9426, C9427, C9429, C9431, C9432, C9433, C9437, C9440, J0594, J0894, 0010, 1770, 0519F, 36823, 51720, 61517, 95990, 95991, 96500, 96549, 9925, 9928, V581
Radiation (ICD-9 and HCPCS)	77520, 77523, 76370, 76950, C1325, C1348, C1350, C1728, C2616, C2632, C2633, C9714, C9715, G0174, G0178, G0179, G0261, G0256, G0273, G0274, 77621, 77299, 77750, 77799, C1700, C1712, C1715, C1720, C1790, C1806, G0338, G0340, V581, V671, 9221-9229

ICD, International Classification of Diseases; HCPCS, health care common procedure codes; PTBD, percutaneous transhepatic biliary drainage.

SUPPLEMENTARY TABLE 2. Subgroup analysis among unresectable pancreatic cancer patients receiving ERCP compared with PTBD

Subgroup analysis	Adjusted hazard ratio (95% confidence interval)*
Stage IV disease only (n = 2871)	.75 (.63-.91)
Stage III and Stage IV disease only (n = 3626)	.77 (.65-.91)
Treated with chemotherapy and/or radiation (n = 4145)	.81 (.66-.99)
Biliary obstruction without abnormal liver function tests† (n = 7933)	.62 (.55-.70)
Biliary obstruction treated with chemotherapy and/or radiation (n = 3460)	.73 (.58-.93)
Multiple ERCP or PTBD without switching to alternative biliary modality (n = 2767)	.51 (.41-.66)
Survival >30 days (n = 8232)	.68 (.60-.76)
Head of pancreas mass‡ (n = 7010)	.70 (.61-.79)
No biliary obstruction (n = 855)	.97 (.69-1.4)

PTBD, Percutaneous transhepatic biliary drainage.

*Hazard ratio for ERCP compared with PTBD.

†Biliary obstruction without abnormal liver function tests, defined as jaundice, obstructive jaundice, obstruction bile duct, pruritus, and cholangitis.

‡Patients with head of pancreas mass with or without evidence of biliary obstruction.

SUPPLEMENTARY TABLE 3. Subgroup analysis among unresectable pancreatic cancer patients receiving either ERCP or PTBD compared with no biliary intervention

Subgroup analysis (treatment = ERCP or PTBD)	Adjusted hazard ratio* (95% confidence interval)
Stage IV disease only (n = 6031)	
ERCP	.50 (.46-.55)
PTBD	.43 (.36-.52)
Stages III and IV disease only (n = 7135)	
ERCP	.48 (.44-.52)
PTBD	.43 (.37-.50)
Treated with chemotherapy and/or radiation (n = 5987)	
ERCP	.67 (.61-.73)
PTBD	.56 (.47-.68)
Biliary obstruction without abnormal liver function tests† (n = 10,073)	
ERCP	.44 (.41-.47)
PTBD	.44 (.39-.49)
Biliary obstruction treated with chemotherapy and/or radiation (n = 3803)	
ERCP	.68 (.59-.80)
PTBD	.65 (.50-.86)
Multiple ERCP or PTBD without switching to alternative biliary modality (n = 8663)	
ERCP	.32 (.29-.34)
PTBD	.26 (.22-.32)
Survival >30 days (n = 12,871)	
ERCP	.59 (.56-.63)
PTBD	.61 (.54-.68)
Head of pancreas mass‡ (n = 11,073)	
ERCP	.54 (.51-.58)
PTBD	.53 (.47-.60)
No biliary obstruction (n = 3850)	
ERCP	.52 (.47-.57)
PTBD	.40 (.31-.51)

PTBD, Percutaneous transhepatic biliary drainage.

*Hazard ratio comparing ERCP and PTBD with no biliary intervention.

†Group includes those with biliary obstruction, defined as jaundice, obstructive jaundice, obstruction bile duct, pruritus, and cholangitis.

‡Patients with head of pancreas mass with or without evidence of biliary obstruction.