# Pancreatic Adenocarcinoma





**Note:** Consider Clinical Trials as treatment options for eligible patients

## CLINICAL PRESENTATION

Clinical suspicion of pancreatic cancer (*e.g.*, jaundice) or evidence of dilated pancreatic duct and/or bile duct stricture

## DIAGNOSTIC WORK-UP AND TISSUE ACQUISITION

- Pancreatic CT scan protocol[1,2]
- Lifestyle risk assessment[3]

Mass in pancreas on imaging?

**Yes**

Metastases?

**Yes**

- CT scan or ultrasound-guided biopsy of metastatic disease if accessible. Core needle biopsy with FNA is preferred whenever technically feasible to facilitate next generation sequencing (NGS).
- Germline testing[4]
- Discuss Goal Concordant Care (GCC) with patient or if clinically indicated, with Patient Representative[5]

**No**

- Multidisciplinary planning presentation
- EUS with FNA
- Liver function tests, CA 19-9
- CT chest (preferred) or chest x-ray
- Germline testing[4]
- Discuss GCC with patient or if clinically indicated, with Patient Representative[5]

**No**

- Multidisciplinary planning presentation
- Liver function tests, CA 19-9
- CT chest (preferred) or chest x-ray
- EUS with FNA if mass visualized in pancreas
- ERCP with brushings as clinically indicated
- Discuss GCC with patient or if clinically indicated, with Patient Representative[5]

Biopsy or brushings positive?

**Yes**

**No** → Surgical consult

For treatment based on tissue confirmation and clinical staging, see Pages 2-5

EUS = endoscopic ultrasound
FNA = fine needle aspiration
ERCP = endoscopic retrograde cholangiopancreatography

[1] Pancreatic CT scan protocol: multiphasic cross sectional imaging and thin slices; consider MRI, PET and/or EUS if CT results are equivocal
[2] For patients who cannot undergo contrast enhanced CT (allergy, renal issues, *etc.*) consider MRI as an alternative
[3] See Physical Activity, Nutrition, and Tobacco Cessation Treatment algorithms; ongoing reassessment of lifestyle risks should be a part of routine clinical practice
[4] Consider referral to Genetic Counseling
[5] GCC should be initiated by the Primary Oncologist. If Primary Oncologist is unavailable, Primary Team/Attending Physician to initiate GCC discussion and notify Primary Oncologist. Patients, or if clinically indicated, the Patient Representative should be informed of therapeutic and/or palliative options. GCC discussion should be consistent, timely, and re-evaluated as clinically indicated. The Advance Care Planning (ACP) note should be used to document GCC discussion. Refer to GCC home page (for internal use only).



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# Pancreatic Adenocarcinoma





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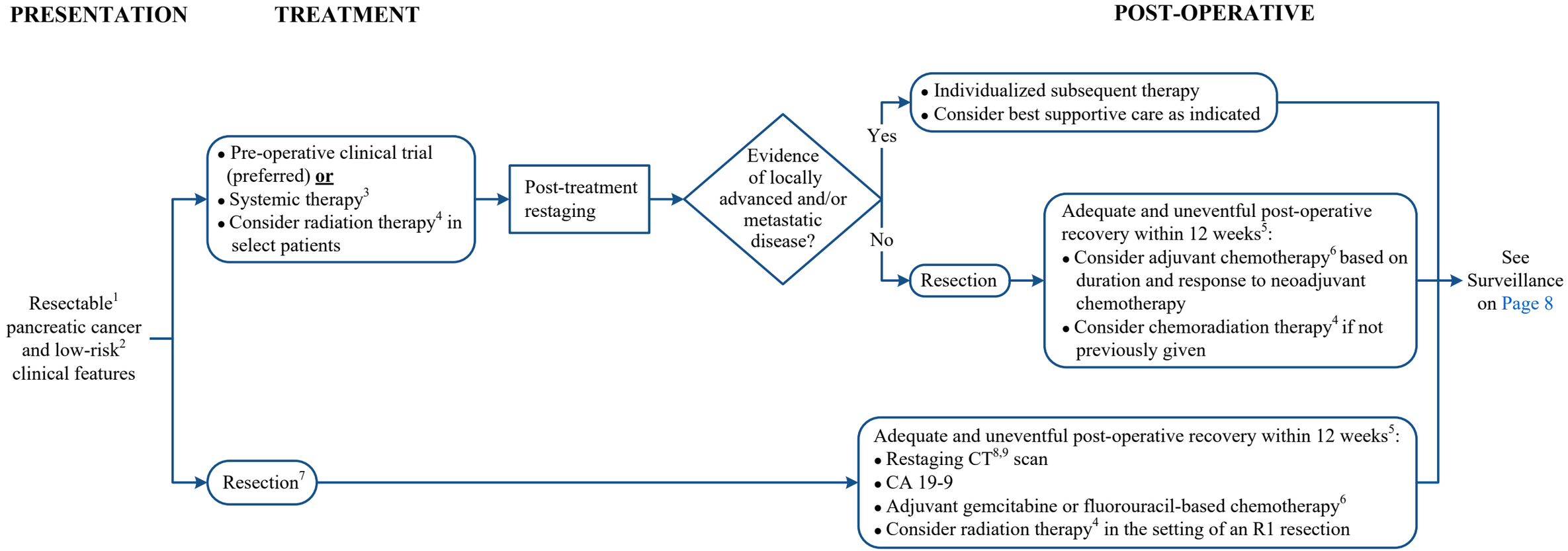


[1] Resectable is defined as:
- Patent superior mesenteric vein-portal vein (SMV-PV) confluence
- No interface between tumor and superior mesenteric artery (SMA) or celiac
- No metastases

[2] Low-risk features:
- No suspicion of metastatic disease
- CA 19-9 ≤ 500 units/mL with normal bilirubin
- Manageable and optimized comorbidities

[3] Typically gemcitabine plus paclitaxel protein-bound or FOLFIRINOX (see Appendix A – Chemotherapy Regimens)

[4] See Appendix B – Radiation Therapy

[5] If post-operative recovery is > 12 weeks, adjuvant therapy will be at the discretion of the treating provider

[6] Typically FOLFIRINOX or GemCape or single agent gemcitabine (see Appendix A – Chemotherapy Regimens)

[7] If patient exhibits all low-risk features and all other factors are favorable, primary resection can be considered

[8] For patients who cannot undergo contrast enhanced CT (allergy, renal issues, etc.) consider MRI as an alternative

[9] Pancreatic CT scan protocol: multiphasic cross sectional imaging and thin slices; consider MRI, PET and/or EUS if CT results are equivocal



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# Pancreatic Adenocarcinoma

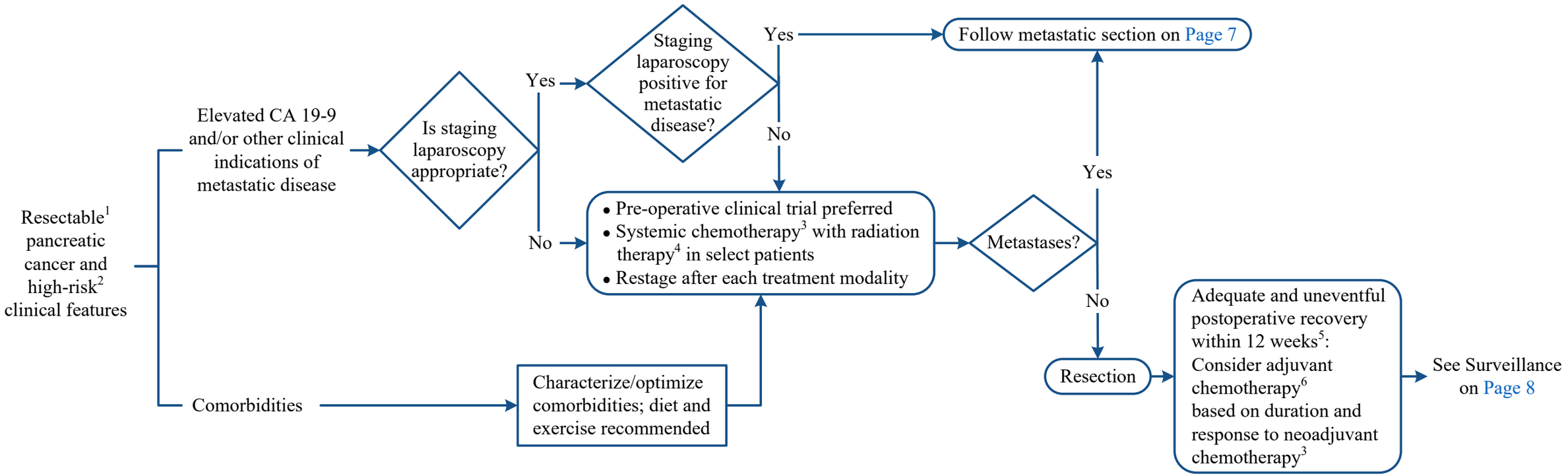




**Note:** Consider Clinical Trials as treatment options for eligible patients

**PRESENTATION**

**TREATMENT**




[1] Resectable is defined as:
- Patent superior mesenteric vein-portal vein (SMV-PV) confluence
- No interface between tumor and superior mesenteric artery (SMA) or celiac
- No metastases

[2] High-risk features:
- Suspicion of metastatic disease
- CA 19-9 > 500 units/mL with a normal bilirubin
- Reversible and optimizable comorbidities

[3] Typically gemcitabine plus paclitaxel protein-bound or FOLFIRINOX (see Appendix A – Chemotherapy Regimens)
[4] See Appendix B – Radiation Therapy
[5] If post-operative recovery is > 12 weeks, adjuvant therapy will be at the discretion of the treating provider
[6] Typically FOLFIRINOX or GemCape or single agent gemcitabine (see Appendix A – Chemotherapy Regimens)



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# Pancreatic Adenocarcinoma

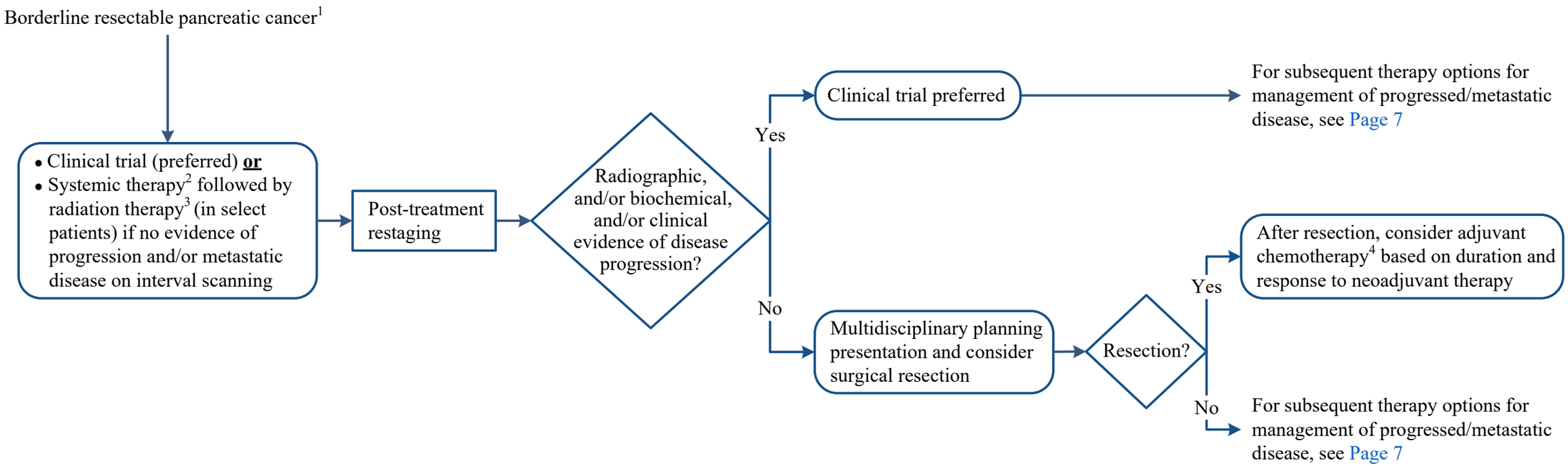




**Note:** Consider Clinical Trials as treatment options for eligible patients

## PRESENTATION

## TREATMENT




[1] MD Anderson Cancer Center's definition for **borderline resectable pancreatic cancer with or without high risk features:**
Based on anatomic considerations; a tumor abutment of ≤ 180° of circumference of superior mesenteric artery (SMA); short-segment encasement abutment of the common hepatic artery **or** gastroduodenal artery; short-segment occlusion of superior mesenteric vein (SMV) **or** superior mesenteric vein-portal vein (SMV-PV) and patent vessel above and below.
High-risk features:
- Suspicion of metastatic disease
- CA 19-9 > 500 units/mL with a normal bilirubin
- Reversible and optimizable comorbidities

[2] Typically gemcitabine plus paclitaxel protein-bound or FOLFIRINOX (see Appendix A – Chemotherapy Regimens)
[3] See Appendix B – Radiation Therapy
[4] Typically FOLFIRINOX or GemCape or single agent gemcitabine (see Appendix A – Chemotherapy Regimens)

# Pancreatic Adenocarcinoma

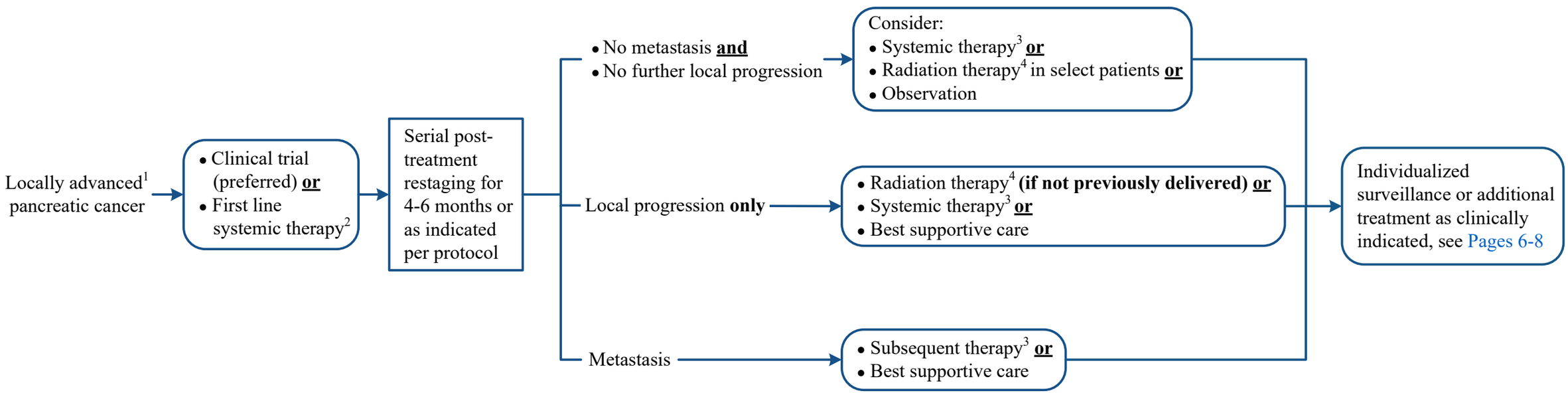




**Note:** Consider Clinical Trials as treatment options for eligible patients

**PRESENTATION**

**TREATMENT**




[1] Locally advanced defined as:
- Interface between tumor and SMA or celiac > 180°
- Interface with aorta
- Unresectable venous occlusion

[2] Typically gemcitabine plus paclitaxel protein-bound or FOLFIRINOX (see Appendix A – Chemotherapy Regimens)
[3] See Appendix A – Chemotherapy Regimens
[4] See Appendix B – Radiation Therapy

# Pancreatic Adenocarcinoma

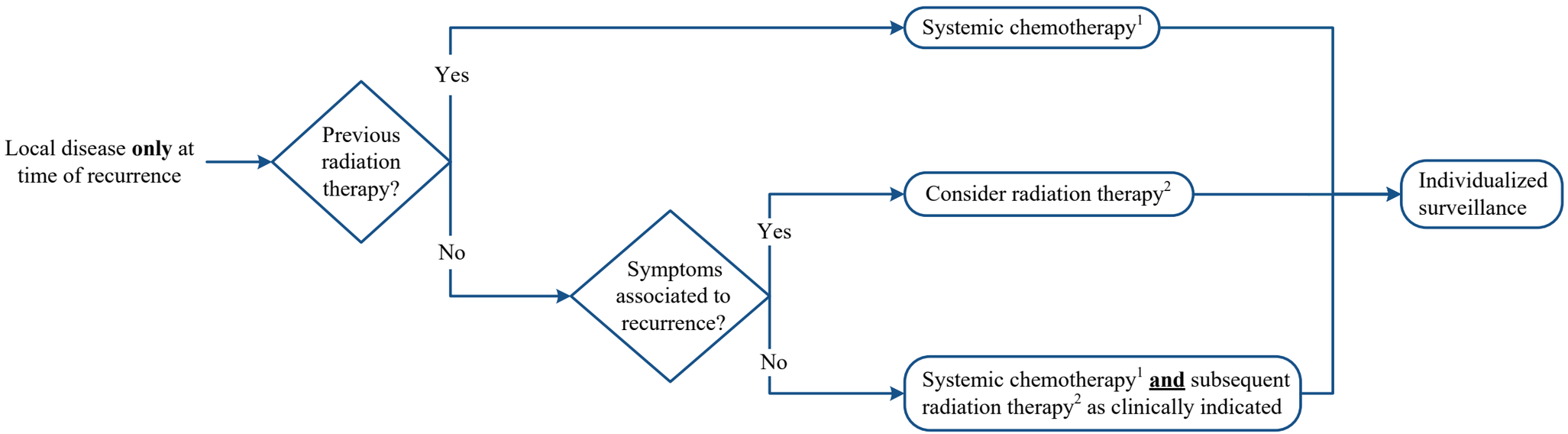




**Note:** Consider Clinical Trials as treatment options for eligible patients

## RECURRENCE

## TREATMENT



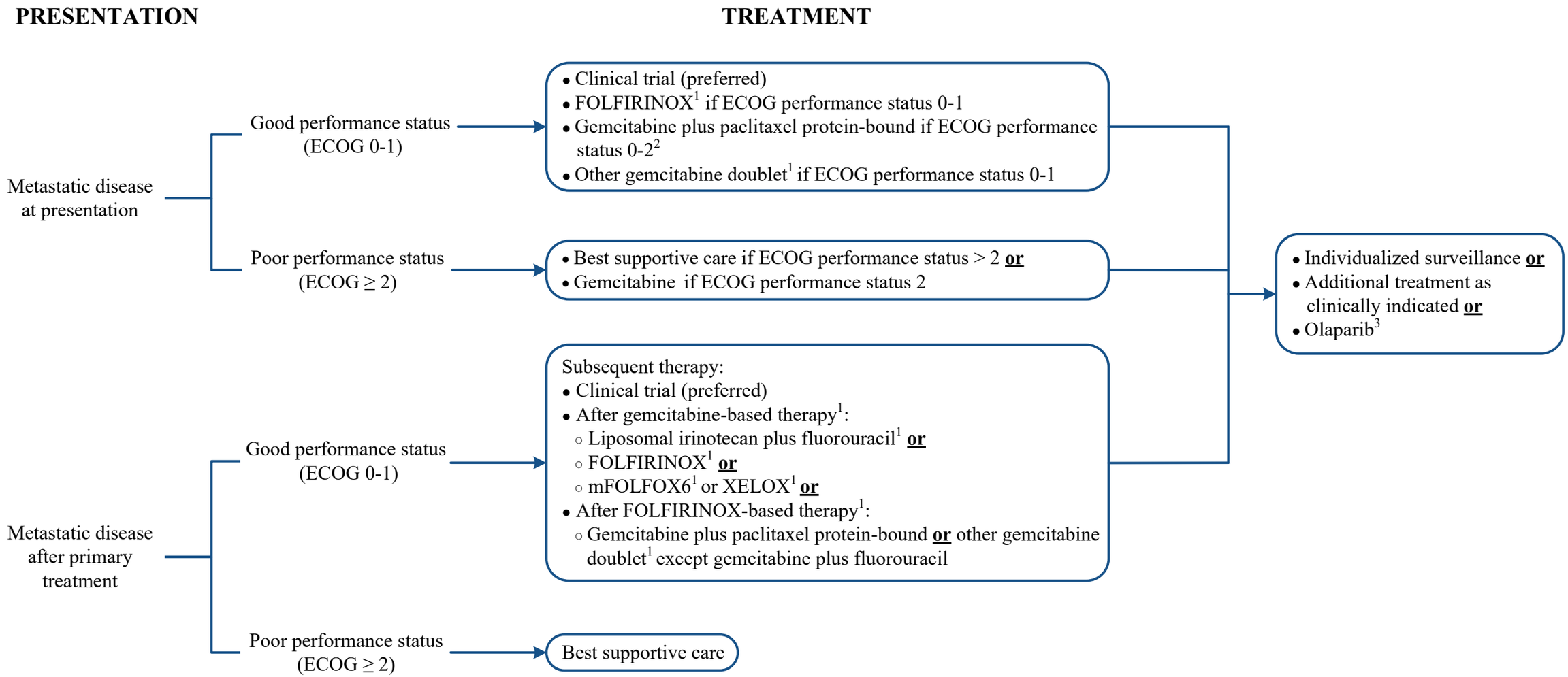

[1] See Appendix A – Chemotherapy Regimens
[2] See Appendix B – Radiation Therapy

# Pancreatic Adenocarcinoma





**Note:** Consider Clinical Trials as treatment options for eligible patients




ECOG = Eastern Cooperative Oncology Group

[1] See Appendix A – Chemotherapy Regimens

[2] For patient with ECOG performance status 2, modify dose as appropriate (refer to dosing for average performance status in Appendix A)

[3] Olaparib may be used as maintenance treatment in the setting of platinum sensitive tumors with BRCA family mutations and no disease progression during at least 16 weeks of first-line, platinum-based chemotherapy

**Note:** Consider Clinical Trials as treatment options for eligible patients

## SURVEILLANCE
## (For patients who had surgery as primary treatment)

| | |
|---|---|
| Every 6 months for a total of 5 years, then annually for a total of 5 years | Physical Examination |
| First 3 years:<br>Perform every 6 months | • Surveillance (portal venous phase) CT[1,2] abdomen<br>• Chest x-ray<br>• CA 19-9 |
| ≥ Years 3: | For surveillance recommendations, see Survivorship – Pancreatic Cancer algorithm |

[1] Consider dedicated pancreatic CT protocol, MRI, PET and/or EUS if surveillance CT results are equivocal, *e.g.*, suspicion of recurrence within pancreatic remnant, extrapancreatic local recurrence, question of liver metastases, *etc*.
[2] For patients who cannot undergo contrast enhanced CT (allergy, renal issues, *etc*.) consider MRI as an alternative

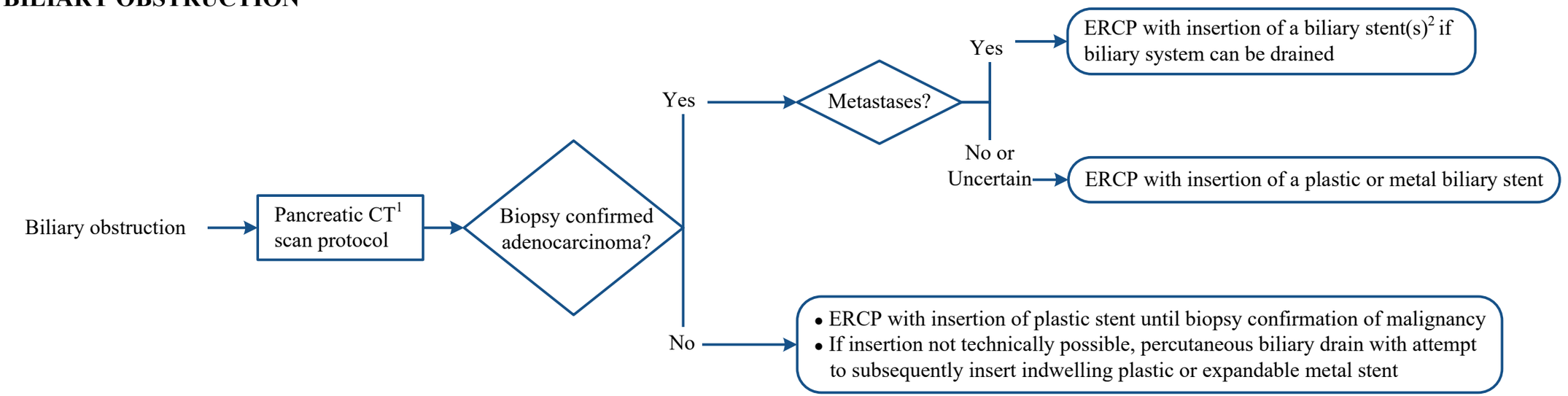
# Pancreatic Adenocarcinoma



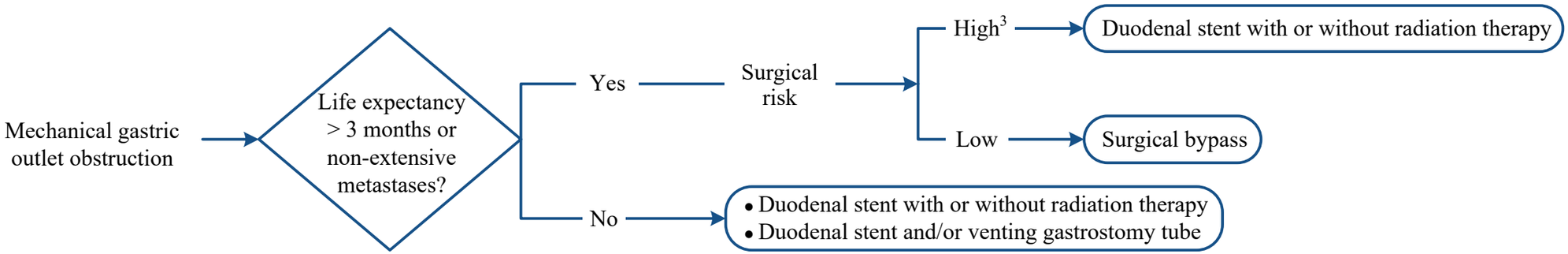


**Note:** Consider Clinical Trials as treatment options for eligible patients

## BILIARY OBSTRUCTION




## MECHANICAL GASTRIC OUTLET OBSTRUCTION




ERCP = endoscopic retrograde cholangiopancreatography

[1] For patients who cannot undergo contrast enhanced CT (allergy, renal issues, *etc.*) consider MRI as an alternative

[2] Biliary stent(s) may be metal or plastic

[3] Presence of comorbidities and malnutrition

# Pancreatic Adenocarcinoma





## APPENDIX A: Chemotherapy Regimens

### Gemcitabine-based regimens[1,2,3]:

**Gemcitabine**[4]
- Gemcitabine 600-750 mg/m$^2$ IV on Days 1, 8, 15 (fixed dose infusion rate of 10 mg/m$^2$/minute preferred)
- Repeat every 28 days

**GemCis - gemcitabine and cisplatin**[5]
- Gemcitabine 600-750 mg/m$^2$ IV on Day 1 (fixed dose infusion rate of 10 mg/m$^2$/min preferred)
- Cisplatin 30 mg/m$^2$ IV over 60 minutes on Day 1
- Repeat every 14 days

**GemCape - gemcitabine and capecitabine**[4]
- Gemcitabine 600-750 mg/m$^2$ IV on Days 1 and 8 (fixed dose infusion rate of 10 mg/m$^2$/minute preferred)
- Capecitabine 1,500-1,800 mg/m$^2$/day PO divided twice daily on Days 1-14
- Repeat every 21 days

**GemCape - gemcitabine and capecitabine**[4]
(dosing from ESPAC-4 in the adjuvant setting)
- Gemcitabine 1,000 mg/m$^2$ IV over 30 minutes weekly on Days 1, 8, and 15[6]
- Capecitabine 1,660 mg/m$^2$/day PO divided twice daily on Days 1-21[6]
- Repeat every 28 days

**Gemcitabine plus paclitaxel protein-bound (Abraxane®)**[7]
Good performance status:
- Paclitaxel protein-bound 100-125 mg/m$^2$ IV on Days 1, 8, 15
- Gemcitabine 600-750 mg/m$^2$ IV on Days 1, 8, 15 (fixed dose infusion rate of 10 mg/m$^2$/min preferred)
- Repeat every 28 days

Average performance status:
- Paclitaxel protein-bound 125-175 mg/m$^2$ IV on Day 1
- Gemcitabine 600-750 mg/m$^2$ IV on Day 1 (fixed dose infusion rate of 10 mg/m$^2$/min preferred)
- Repeat every 14 days

**GTX**
- Gemcitabine 300-400 mg/m$^2$ IV on Days 4 and 11 (fixed dose infusion rate of 10 mg/m$^2$/minute preferred)
- Docetaxel 30-40 mg/m$^2$ IV on Days 4 and 11
- Capecitabine 1,000 mg/m$^2$/day PO divided twice daily on Days 1-14
- Repeat every 21 days

**GemOx - gemcitabine and oxaliplatin**
- Gemcitabine 600-750 mg/m$^2$ IV on Day 1 (fixed dose infusion rate of 10 mg/m$^2$/minute preferred)
- Oxaliplatin 85 mg/m$^2$ IV over 2 hours on Day 1
- Repeat every 14 days

### Fluoropyrimidine-based regimens[1,2]:

**mFOLFOX 6**
- Oxaliplatin 85 mg/m$^2$ IV over 2 hours on Day 1
- Leucovorin 400 mg/m$^2$ IV over 2 hours on Day 1[8]
- Fluorouracil 400 mg/m$^2$ IV bolus on Day 1[8], then fluorouracil 2,400 mg/m$^2$ IV continuous infusion over 46 hours
- Repeat every 14 days

**XELOX or CapeOx**
- Capecitabine 1,500-1,800 mg/m$^2$ PO divided twice daily on Days 1-14, then
- Oxaliplatin 85-100 mg/m$^2$ IV over 2 hours on Day 1
- Repeat every 21 days

**FOLFIRINOX**[4,7]
- Oxaliplatin 75-85 mg/m$^2$ IV over 2 hours on Day 1
- Irinotecan 125-180 mg/m$^2$ IV over 90 minutes on Day 1
- Leucovorin 400 mg/m$^2$ IV over 2 hours on Day 1[7] Fluorouracil 400 mg/m$^2$ IV bolus on Day 1[7], then fluorouracil 2,400 mg/m$^2$ IV continuous infusion over 46 hours
- Repeat every 14 days

**Liposomal irinotecan (Onivyde®) plus 5-fluorouracil**[9]
- Liposomal irinotecan 70 mg/m$^2$ IV over 90 minutes on Day 1[10]
- Leucovorin 400 mg/m$^2$ IV over 2 hours on Day 1[7,8]
- Fluorouracil 400 mg/m$^2$ IV bolus on Day 1[7,8], then
- Fluorouracil 2,400 mg/m$^2$ IV continuous infusion over 46 hours
- Repeat every 14 days

[1] For gemcitabine-based and fluorouracil-based regimen, combination chemotherapy is preferred over monotherapy in the preoperative setting
[2] Dosing should be started at the lower level and modified as patient tolerates
[3] If fixed dose infusion rate not utilized, administer gemcitabine 1,000 mg/m$^2$ over 30 minutes
[4] Typical post-operative adjuvant regimens: FOLFIRINOX or GemCape or single-agent gemcitabine (depending on response and recovery)
[5] The preferred doublet for tumors with germline BRCA mutations
[6] Many MD Anderson GI Oncologists omit Day 15 of gemcitabine and week three of capecitabine
[7] Typical pre-operative neoadjuvant regimens: gemcitabine plus paclitaxel protein-bound or FOLFIRINOX
[8] Many MD Anderson GI Oncologists omit the bolus of fluorouracil/leucovorin
[9] FDA approved for the treatment of metastatic adenocarcinoma of the pancreas in combination with fluorouracil and leucovorin
[10] For patients with known homozygous *UGT1A1*28* allele reduce the initial starting dose to 50 mg/m$^2$



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## APPENDIX B: Radiation Therapy

| Chemoradiation Regimens |
|---|
| **Long course chemoradiation**<br>• Total dose 50 Gy in 25 fractions **or** 50.4 Gy in 28 fractions<br>• Concurrent capecitabine[1] 1,650 mg/m$^2$ PO in two divided doses on each day of radiation **or**<br>• Concurrent gemcitabine 300-400 mg/m$^2$ IV given at fixed dose infusion once weekly[2] |
| **Short course chemoradiation**<br>• Total dose 30 Gy in 10 fractions<br>• Concurrent capecitabine[1] 1,650 mg/m$^2$ PO in two divided doses on each day of radiation **or**<br>• Concurrent gemcitabine 300-400 mg/m$^2$ IV given at fixed rate dose infusion once weekly[2] |
| **Hypofractionated chemoradiation**<br>• Total dose 60-67.5 Gy in 15 fractions<br>• Concurrent capecitabine[1] 1,650 mg/m$^2$ PO in two divided doses on each day of radiation<br>• Requires image guidance |
| **Stereotactic Body Radiation Therapy** |
| • Total dose 33-40 Gy in 5 fractions<br>• Usually requires fiducials<br>• Requires daily image guidance |

[1] Infusional fluorouracil may be used instead
[2] If fixed dose infusion rate of 10 mg/m$^2$/minute not utilized, administer gemcitabine over 30 minutes

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## DEVELOPMENT CREDITS

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