What Advanced Practitioners Need to Know About the Diagnosis and Treatment of Patients With Pancreatic Cancer

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Johns Hopkins University
Learning Objectives

1. Summarize available treatments for patients beyond first-line chemotherapy agents for patients with relapsing or refractory pancreatic cancer
2. Describe the signs of serious toxicities associated with agents used to treat pancreatic cancer as they relate to mechanism of action and approaches to managing the toxicities
3. Identify candidates who are considered high-risk for pancreatic cancer and initial screening modalities
4. Discuss recent advances in the treatment of patients with pancreatic cancer that support an interdisciplinary approach to care
Financial Disclosures

• Dr. Herman has acted as a consultant for Oncosil and received royalties from Elekta.
• Ms. Hacker-Prietz has nothing to disclose.
Case

- A 87 y/o male presents with a 3-week history of obstructive jaundice, bilirubin is 9.6
- CT scan shows a pancreatic head mass compressing the bile duct, encases the SMA, tumor is FDG-avid
- He undergoes EUS and ERCP with successful placement of a metal bile duct stent and biopsy is positive for adenocarcinoma
CT Scan

Image courtesy of Dr. Joseph Herman.
Case

Patient presents to our pancreas cancer multidisciplinary clinic to discuss treatment options for his locally advanced, unresectable disease.
Why does pancreas cancer have a poor prognosis?

• Anatomy: proximity to critical vessels
• Biology: early metastatic spread
• Physiology: exocrine insufficiency, cachexia
  • Poor tolerance to treatment
• Treatment resistance
• Delay in diagnosis/treatment (need biomarkers)
• Lack of adherence to evidence based approaches
Pancreatic Adenocarcinoma

- 15-20% have potentially resectable disease
- 49,000 new cases and 41,000 deaths in 2015
- Margin negative resection (R0) remains the only potential cure
  - Patients with complete, incomplete or margin positive resection (R0 or R1 residual microscopic / R2 residual macroscopic disease respectively) have progressively decreasing survival rates

Accurate staging is crucial to avoid non beneficial surgery. Margin + surgery is associated with similar Px as metastatic.

Khorana AA. JCO 2016
Multidisciplinary Care for Patients with Cancer

- Multidisciplinary cancer clinics are increasingly more prevalent in management of patients with malignancies

- Potential benefits of multidisciplinary clinics
  - Specialists to work together / consensus recommendations
  - Patient ease / reduction of patient anxiety
  - Increased patient exposure to support services
  - Augment clinical trial enrollment
Pancreatic MDC: Case Review

- Present Cases using outline
- Review Pathology
- Review Images CT/PET/MRI/EUS
- Discuss Case and reach consensus
- See patients and discuss options
- Enroll in trials/studies
  Dictate note and cc to referring physicians
Traditional Clinic vs. PMDC

**Traditional Cancer Clinic (20th Century)**
- Surgery & Pathology (19th Century)
- Jaundice
- Surgeon
- PPCT
- Borderline Resectable
- Radiation Oncologist
- ??Liver Met
- Medical Oncologist
- Therapy Starts
- 1 week 1 week 1 week 2 weeks 1 week
- >6 weeks

**Multidisciplinary Cancer Clinic (MDC) (21st century)**
- PPCT/Expert Review
- Pathology Review
- Medical Oncology
- Radiation Oncology
- Surgeon
- Pain Medicine
- Nutrition
- Clinical Trial Assessment
- PMDC
- 1 week
- <1.5 week

**Consensus on Optimal Treatment**
MDC Impact: Change in Diagnosis

Change in Overall Diagnosis
149 out of 526 (28.3%)

Pathology
N = 27 (5.1%)

Cross-Sectional Imaging
N = 131 (24.9%)
Pancreatic Imaging

- High quality imaging and accurate [template] reporting is crucial
  - EUS
    - More detailed evaluation but limited for determining metastases and full local extent of disease
    - Added advantage of biopsy and fiducial placement
  - CT
    - MDCT, thin slice, biphasic, 3-D (reconstructions), CT angiogram (CTA)
  - MRI
    - Used in cases where CT doesn’t show a mass (problem solving)
    - Takes much longer (1 hr+ vs 10 minutes, more operator dependent, less accessible, higher cost)
    - MRCP—cholangiopancreatography

Al-Hawary MM. Radiology Jan 2014 AND Gastroenterology Jan 2014
The Spectrum of Pancreatic Cancer

Images courtesy of Dr. Joseph Herman.
Anatomy

- Complex anatomy
- Head/uncinate, body, tail
- Intimate vascular anatomy
GI Atlas
Anatomy (Axial)

- Tumor (T)
- Duodenum (D)
- Small bowel (SB)
- Stomach (S)
- Kidney (K)
- Liver (L)
- Cord (C)
3-D CT Reconstruction

Image courtesy of Dr. Joseph Herman.
CT Angiogram

Image courtesy of Dr. Joseph Herman.
Borderline Resectable

Images courtesy of Dr. Joseph Herman.
Resectability: Arterial contact

Assessment based on:
- degree of tumor contact with the vessel circumference
- whether vessel caliber narrowing or contour deformity is present
Resectability: Venous Contact

- Less than 180
- More than 180
- Tear drop deformation
- Deformation

Slide(s) courtesy of Dr. Mahmoud Al-Hawary
Case with SMV solid contact < 180%

- Tumor
- SMV
- SMA

Images courtesy of Dr. Joseph Herman.
## Familial Pancreatic Cancer Genes

<table>
<thead>
<tr>
<th>Individual</th>
<th>Increased Risk</th>
<th>Age 50</th>
<th>Age 70</th>
</tr>
</thead>
<tbody>
<tr>
<td>No History</td>
<td>1</td>
<td>0.05%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Hereditary Non-polyposis Colorectal Cancer</td>
<td>8</td>
<td>1%</td>
<td>3.7%</td>
</tr>
<tr>
<td><strong>BRCA2</strong> (Breast-Ovarian)</td>
<td>3.5-10</td>
<td>0.5-2%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Familial Atypical Multiple Mole Melanoma (p16)</strong></td>
<td>20-34</td>
<td>1%</td>
<td>10-17%</td>
</tr>
<tr>
<td><strong>Familial Pancreatitis (PRSS1)</strong></td>
<td>50-80</td>
<td>2.5%</td>
<td>25-40%</td>
</tr>
<tr>
<td>Peutz-Jeghers (STK11/LKB1)</td>
<td>132</td>
<td>6.6%</td>
<td>30-60%</td>
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Multidisciplinary Care: Especially Important for Pancreatic Cancer

Biopsy Proven or Suspected Pancreatic Cancer

Staging Work-up: Genetics, Family Hx, Functional Status
Imaging: 3-D CT scan, MRI, Functional Imaging
Labs: CBC, Liver function, Ca 19-9

Resectable
- Neoadj CRT
- Surgery ADJ Tx
- Metastatic or Unresectable

Borderline Resectable
- Chemotherapy
- CRT/ SBRT
- Metastatic or Unresectable

Unresectable
- CRT/ SBRT
- Chemo
- SBRT or 3X10
- Metastatic or Unresectable
Timing of Therapy

- **Adjuvant = Resected = Tumor Removed**
  - Given to patients after the tumor has been removed
- **Neoadjuvant = Preoperative = Before Surgery**
  - Given to patients where the plan is that they will go to surgery
- **Definitive = Locally advanced = Unresectable**
  - Tumor is unlikely to be removed (10-20%)
- **Palliative**
  - Often given to patients with metastatic disease to help with pain
Current Approach

**Appropriate Staging**

- **Borderline**
  - Maximize chemo (4-6 months)
  - Radiation therapy
- **Unresectable**
  - Maximize chemo (≥6 months)
  - Radiation therapy

**ULTIMATE GOAL**

- Surgery

**Maintenance chemotherapy ??**
What Is the Optimal Chemotherapy Regimen for Pancreatic Cancer?
Chemotherapy:
FOLFIRINOX VS. GEMCITABINE/ NAB-PACLITAXEL
Phase III Trials

<table>
<thead>
<tr>
<th></th>
<th>FOLFIRINOX</th>
<th>Gemcitabine/nab-paclitaxel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>342</td>
<td>861</td>
</tr>
<tr>
<td>Locations</td>
<td>France</td>
<td>N America, Eastern + Western Europe, Australia</td>
</tr>
<tr>
<td>Eligibility criteria, PS</td>
<td>ECOG 0-1</td>
<td>KPS 70-100</td>
</tr>
<tr>
<td>% head / non-head</td>
<td>39% / 61%</td>
<td>43% / 57%</td>
</tr>
<tr>
<td>Survival, median (mo)</td>
<td>11.1</td>
<td>8.5</td>
</tr>
<tr>
<td>Survival, % at one year</td>
<td>48</td>
<td>35</td>
</tr>
<tr>
<td>Toxicity (grade (\geq 3))</td>
<td>Fatigue 23.6% Neutropenia 45.7%</td>
<td>Fatigue 17% Neutropenia 38%</td>
</tr>
<tr>
<td>QoL data?</td>
<td>Yes</td>
<td>No</td>
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Conroy et al. NEJM 2011
Von Hoff et al. NEJM 2013
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Unique Challenges of Radiation for Pancreatic Cancer

- Proximity of Pancreas to small bowel:
  - RT to bowel can cause ulceration, bleeding, and perforation
  - Risk of late bowel complications increases with higher doses of RT

Courtesy N. Merchant
Evolution of Radiation Therapy Delivery
Pancreas Stereotactic Body Radiation Therapy (SBRT)

Prescribe 660 cGy per fraction to 82% of point dose at "Isocenter" for 5 fractions. Beam weights are proportional to monitor units. Actual point dose at "Isocenter" from all prescriptions/beans is 4024.8 cGy. 13 beams are assigned to this prescription.
SBRT Consultation and Patient Selection

- Multidisciplinary review: (3 P’s)
  - PPI (for 6 months after SBRT)
  - Pancreatic Enzymes
  - Pain Control

- Avoid SBRT if:
  - *Direct invasion* of duodenum or stomach by EUS
  - Tumor size >8 cm
  - Non-regional LNs

- EUS-fiducials (research biopsy), FNA/Stent
Fiducials

Gold Seeds (2)
4D Simulation
Simulation/Motion Management

Immobilization

Alpha-Cradle and wing board

Image courtesy of Dr. Joseph Herman.
Simulation

- 2 mm cuts
- IV contrast
- NPO 2 hr prior
- 240 cc oral contrast

- 4-D CT: ABC or gating if >3 mm motion (fiducial or stent)
  - No abdominal compression
SBRT Dose-Volume Histogram

Dose Volume Histogram

Prox Duodenum
ABC: Breath Hold ABC and KV Images for Fiducial Alignment

Images courtesy of Dr. Joseph Herman.
Case (cont)

- After gem (1 cycle) and SBRT he continued maintenance gem
- 3 months: PET/CT shows stable disease, but no PET avidity
- 6 months: CT shows 30% response, CA 19-9=36
  - He elects to discontinue gem
- 30 months: CT scan (below)
Patient Selection

Fine Needle Aspirate

Routine Processing

Cell Block or Core

Fresh Material for DNA

Diagnosis

Immunohistochemistry

Next Generation Sequencing

Sensitive and Specific Evaluation of Genetic Features in Pretreatment Specimens
Results: Surgical Implications

- LAPC (n=117)
  - Surgery (n=42)
    - Successful resection* (n=33)
      - R0 Resection (91%)
      - N0 Resection (82%)
    - Aborted (n=3)
    - IRE (n=6)
  - No Surgery (n=75)
    - Distant Mets (n=46)
    - Vessel Involvement (n=17)
    - Performance Status (n=10)
    - Other (n=2)

*Three patients went to surgery + IRE

- No surgery: 39%
- Aborted: 15%
- IRE: 9%
- Other: 2%
### Results: Surgical Implications

<table>
<thead>
<tr>
<th></th>
<th>Surgery</th>
<th>No Surgery</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥65, % (years)</td>
<td>30%</td>
<td>58%</td>
<td>0.006</td>
</tr>
<tr>
<td>Male gender, %</td>
<td>55%</td>
<td>51%</td>
<td>0.74</td>
</tr>
<tr>
<td>Caucasian race, %</td>
<td>88%</td>
<td>82%</td>
<td>0.45</td>
</tr>
<tr>
<td>ECOG ≥2</td>
<td>0%</td>
<td>6%</td>
<td>0.23</td>
</tr>
<tr>
<td>Head lesion</td>
<td>49%</td>
<td>62%</td>
<td>0.19</td>
</tr>
<tr>
<td>Induction chemo</td>
<td>100%</td>
<td>90%</td>
<td>0.05</td>
</tr>
<tr>
<td>Multi-agent chemo</td>
<td>85%</td>
<td>66%</td>
<td>0.04</td>
</tr>
<tr>
<td>FOLFIRINOX-based chemo</td>
<td>64%</td>
<td>30%</td>
<td>0.001</td>
</tr>
<tr>
<td>Chemo ≥4 months</td>
<td>58%</td>
<td>30%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>33 Gy SBRT dose</td>
<td>94%</td>
<td>76%</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Results: Surgical Resection and Overall Survival

<table>
<thead>
<tr>
<th></th>
<th>Median OS (mos)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery vs. no surgery</td>
<td>29.7 vs. 17.0</td>
<td>0.0001</td>
</tr>
<tr>
<td>R0 resection vs. R1/R2 resection</td>
<td>34.7 vs. 23.1</td>
<td>0.170</td>
</tr>
</tbody>
</table>
What are the pathologic outcomes when patients receive multi-agent chemotherapy +/- Radiation in patients with BRPC or LAPC?
Chemo ➔ SBRT ➔ Surgery

Images courtesy of Dr. Joseph Herman.
Chemo $\rightarrow$ ? $\rightarrow$ Surgery

Images courtesy of Dr. Joseph Herman.
**Hopkins: Neoadjuvant Chemo vs. Chemo + SBRT (N = 177)**

- 2008 – 2016: Median follow-up 17.0 mo

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Chemo group, n (%)</th>
<th>Chemo/SBRT group, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. patients</td>
<td>67</td>
<td>110</td>
</tr>
<tr>
<td>Age ≥65</td>
<td>29 (43%)</td>
<td>45 (41%)</td>
</tr>
<tr>
<td>Male gender</td>
<td>39 (58%)</td>
<td>56 (51%)</td>
</tr>
<tr>
<td>Caucasian race</td>
<td>60 (90%)</td>
<td>98 (89%)</td>
</tr>
<tr>
<td>Head of pancreas lesion</td>
<td>50 (75%)</td>
<td>77 (70%)</td>
</tr>
<tr>
<td>Locally advanced disease</td>
<td>16 (24%)</td>
<td>56 (51%)</td>
</tr>
<tr>
<td>FOLFIRINOX-based chemotherapy</td>
<td>34 (51%)</td>
<td>79 (72%)</td>
</tr>
<tr>
<td>Chemotherapy duration ≥4 months</td>
<td>20 (30%)</td>
<td>63 (57%)</td>
</tr>
</tbody>
</table>
Hopkins: Neoadjuvant Chemo vs. Chemo + SBRT (N=177)

**% Margin Negativity**

- **Borderline**
  - Chemo: 57%
  - SBRT: 83%

- **Locally Advanced**
  - Chemo: 62%
  - SBRT: 81%

**% Node Negativity**

- **Borderline**
  - Chemo: 40%
  - SBRT: 60%

- **Locally Advanced**
  - Chemo: 42%
  - SBRT: 52%

R0:
- Chemo: 62%
- SBRT: 81%

N0:
- Chemo: 42%
- SBRT: 52%
Pathologic Complete Response or Near Pathologic Complete Response

- Pathologic complete response (pCR)
  - No residual tumor can be identified or measured
- Near pCR
  - Scattered microscopic foci of single cells or groups of single cells
  - Typically within a dense area of fibrosis
  - Demonstrating marked treatment effect
Hopkins: Neoadjuvant Chemo vs. Chemo + SBRT (N=177)

<table>
<thead>
<tr>
<th></th>
<th>Borderline</th>
<th>Locally Advanced</th>
<th>Borderline</th>
<th>Locally Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemo</td>
<td>SBRT</td>
<td>Chemo</td>
<td>SBRT</td>
</tr>
<tr>
<td>pCR</td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>npCR</td>
<td>21%</td>
<td>20%</td>
<td>13%</td>
<td>39%</td>
</tr>
</tbody>
</table>

% pCR

% Near pCR

= BRPC

= LAPC
Proposed Alliance A021501: Preoperative Extended Chemotherapy vs. Chemotherapy Plus Hypofractionated Radiation Therapy for BRPC of the Head of the Pancreas

Arm A
- mFFX x 4 cycles
- mFFX x 4 cycles
- Surgery
- FOLFOX x 4 cycles

Arm B
- mFFX x 4 cycles
- mFFX x 3 cycles
- SBRT
- Surgery
- FOLFOX x 4 cycles

= Re-staging
Conclusion

- Pancreas cancer has a poor survival and is the 3rd leading cause of cancer death
- CT staging is important to determine resectability
- Multiagent chemotherapy improves survival
- SBRT improves surgical outcomes, Alliance trial will formally test role
2015 Census

- 333,000
  - Advanced practitioners
- 2.3%
  - Oncology
- 1189
  - Physician assistants in oncology
- 217
  - Physician assistants in radiation oncology

NCCPA, 2015; AANP, 2015.
Need for Advanced Practitioners (APs)

- Increasing patient population in oncology and advancing technologies in radiation oncology and systemic treatment
  - Acute symptom management
  - Perform procedures
  - Reimbursable, 85-100%
  - Independent
  - Prescriptive authority
- 1997 ASTRO Joint Committee on Advanced Practice Nursing Roles
  - Educational information on implementing APs

Job Description

- History, physical exams, assessment/plans of new patient consults and follow ups, coordination of care, clinical documentation;
- Independent follow-up clinic
- Consults by direct referral/non-urgent inpt consults-split w/resident
- Review of radiology imaging, labs, and other diagnostic procedures;
- Consenting patients for treatments;
- Signing of EPIC orders/medications
- Coordinating SBRT patient setup & orders
- Attendance/H&Ps/presentation/coordination of care of PMDC patients
- Assisting with OTVs and acute clinic issues;
- Assisting with IORT cases-assessment & setup of equipment, documentation; consent
- Assisting with brachytherapy, including simulation, planning and setup of devices/equipment, plans, and patient setup, also includes resident teaching; skin, endorectal, IORT, bile duct brachy
- Managing protocol patients, pre/during/post therapy, maintaining clinic notes per protocol, data collection, attribution of toxicities, resident teaching, collecting/processing specimens;
- Protocol AE log updates/attributes
- Preceptor to PA students, medical students, and resident teaching
- Clinical research, including abstract submission, poster/oral presentations, conference attendance
- Tumor board attendance and discussion of patient cases;
- Initiates or modifies routine, complex, and emergent medication regimens and therapies.
- EPIC clinic note documentation & POE documentation,
- Simulation setup notes,
- Billing of encounters within mosaic & MDC/EPIC
- Obtains treatment and diagnostic approvals including peer to peer review discussions and submission of letters of medical necessity, prior authorizations.
- EPIC efficient with documentation, orders, Meaningful Use criteria, and in-basket.
- Coordinates care in a multi-disciplinary setting to include appointments with other specialties, procedures, diagnostic studies, labs.
- Communicates with outside providers/discussion of results & care plan
- Y90-consults & consents
Role in GI Services

• Consultations/Follow-ups/MDC
• Symptom management/acute care
• Treatment Consent
• Clinical Trials
  • Enrollment/Consent Process, Protocol requirements/Documentation,
  • Appropriate timing/schema of events, protocol toxicity assessments/Data Collection
• Ordering/Review of Diagnostics studies
• Resident training
• Tumor board discussion
Team Effort

- JHU GI Rad/onc model
  - Attending physician, physician assistant, nurse, resident, clinical coordinator, admin assistant, & research staff
- Continuity of care
  - Residents change
  - Need for direct patient care
  - Physicians have numerous responsibilities
Pancreas Cancer Patients

- 7.7% 5 yr OS
- Most have active disease/treatments
- Symptom management
  - Disease related
  - Treatment related

SEER 18 2006-2012
Pancreas Cancer Patients
Things to Consider

• Goals
• Where they live
• Support system
• Family planning/fertility
• Symptom management
• Physical Therapy
• Work/Hobbies
Patient Education

• Symptom management
• On call numbers
• Expectations
• Treatment flow
• Facility services
  • Social work, nutrition, PT, pain, palliative care, housing, financial, support groups
Pancreas Cancer Symptoms

Disease

- Biliary obstruction
- GI obstruction
- Pain
- Nausea/Vomiting
- Diarrhea
- Constipation
- anorexia
- EPI
- Weight loss
- FTT
- LEE
- steatorrhea
- DM
- Ascites

Treatment

- Mental health
- Constipation
- Reflux
- Fatigue/weak
- Neuropathy
- Neutropenia
- DM
- Nausea/Vomiting
- Gastroparesis
- GI obstruction
Pain

• Affects >70% of cancer patients
  • 75-80% initial presentation
• 40% survivors have chronic pain
• 75% multiple sites
• 75% require opioids
• 33% have functional deficits
• 60% QoL deficits

Grossman and Nesbit, Cancer Related Pain; M. Abeloff; Palace et al. JCO 2016, V34 epub;
Defining Pain

- Good H&P
  - Define pain experience
- Review data
- Pain log
- Special populations
  - Elderly, comorbidities, hepatic/renal dysfxn, OSA, CAD, past abuse

Pancreas Cancer Pain

- Generalized abdominal pain
- Epigastric pain
- Post prandial pain
- Back pain
- RUQ pain
- Peripheral pain
Pain Treatment

- Opioid vs non-opioid
- Interventional procedures
  - RT
  - Vertebroplasty
  - Pain blocks
  - Drains
- Non-pharmacologic therapies
  - Exercise, PT/OT
  - Acupuncture, massage, meditation
- Psychosocial
Adult Cancer Pain

Universal Screening

If pain present

Screen for pain

If no pain

Anticipated painful events and procedures

Rescreen at each subsequent contact

Assessment

- Quantify pain intensity and characterize quality
  - See Pain Intensity Rating (PAIN-A)
- Severe uncontrolled pain is a medical emergency and should be addressed promptly

Management of Pain

- Opioid-naive patients

See Management of Pain in Opioid-Naive Patients (PAIN-3)

See Management of Pain in Opioid-Tolerant Patients

Pain Rating ≥ 4 (PAIN-4)

or

Pain Rating 0–3 (PAIN-3)

See Procedure-Related Pain and Anxiety (PAIN-B)

- Pain not related to an oncologic emergency

Opioid-tolerant patients

- Painful events and procedures

Pain related to an oncologic emergency:
  - Bone fracture or impending fracture of weight-bearing bone
  - Neuroaxial metastases with threatened neural injury
  - Infection
  - Obstructed or perforated viscus (acute abdomen)

Analgesics as specified by above pathway in addition to specific treatment for oncologic emergency (eg, surgery, steroids, radiation therapy [RT], antibiotics) as consistent with patient goals

Notes:

- For chronic pain in cancer survivors, see NCCN Guidelines for Survivorship.
- Opioid-naive includes patients who are not chronically receiving opioid analgesic on a daily basis and therefore have not developed significant tolerance. The FDA identifies tolerance as receiving at least 60 mg of morphine daily, at least 30 mg of oral oxycodone daily, or at least 8 mg of oral hydromorphone daily or an equianalgesic dose of another opioid for a week or longer.
- Opioid tolerant includes patients who are chronically receiving opioid analgesic on a daily basis. The FDA identifies tolerance as receiving at least 60 mg of morphine daily, at least 30 mg of oral oxycodone daily, or at least 8 mg of oral hydromorphone daily or an equianalgesic dose of another opioid for a week or longer.
Exocrine Pancreatic Insufficiency (EPI)

- Loss of parenchyma
  - Pancreatitis, treatments
- Obstruction of the duct
  - Tumor location, fibrosis
- Surgery-injury/removal
  - Pancreatectomy, small bowel, bypass
Exocrine
The pancreas produces enzymes that help digest our food.

- Amylase
- Protease
- Lipase
- Starch
- Protein
- Fat

National Pancreas Foundation, 2014
Overview of Exocrine Pancreatic Insufficiency Symptoms

- Diarrhea
- Malabsorption of lipid-soluble vitamins
- Deficiency of vitamin B12
- Exacerbate motility disorders

- Steatorrhea
- Abdominal Distension
- Weight loss

Exocrine Pancreatic Insufficiency
Enzyme Replacement Therapy

• Ask questions
• Intervene early
• Use appropriate dosing
• Easy to try
• Keep in mind cost/programs
Per-meal Lipase Unit Range

Minimum: 34,000

Maximum: 170,000
JHU Pancreas Multidisciplinary Clinic

- Surgery, Medical Oncology, Radiation Oncology, GI/Endo, Pathology, Radiology, Pain & Palliative Care, Clinical trials/Research
  - Physicians, advanced practitioners, fellows, residents, students, coordinators
- Started in 2008 with 4-6 patients, currently up to 14 patients
- 1-2 day process
- Comprehensive review of case, images, pathology
Advanced Practitioner Role
JHU PMDC

- H&P
- Review imaging, pathology, treatments
- MDC conference presentation
- Discussion of recommendations/results
  - Patient, family, outside providers
- Clinical trial discussions
- Coordination of care w/ outside providers
- Follow-up
Disciplines

- Surgery
  - Pancreaticoduodenectomy, distal, bypass
- Medical Oncology
  - Standard therapy, protocols
- Radiation Oncology
  - Neoadjuvant, adjuvant, palliative
- GI
  - EUS/FNA, ERCP/stent, blocks
Disciplines (cont)

- Pathology/Genetics
- Radiology
- Pain & Palliative Care
  - Medications, interventional procedures
- Research
  - Not just therapeutic agents/tx, QoL
Other Disciplines to Consider

- Interventional Radiology
  - Tubes, drains, biopsies, pleurex
- Integrative Medicine
  - Acupuncture, meditation, PT
- US
  - Centesis, lines
- Psych
- Nutrition
- Survivorship
- Social Work
What Else Can APs Do?

• Community engagement
  • Couples retreats

• Clinical trials
  • Create, support

• Research
  • Publications, national & international meetings

• Education/Mentorship
  • Other APs, residents, students
This is the Johns Hopkins Pancreatic Cancer Couples Retreat.

A place of Trust, Care and Respect...
Conclusions

- Pancreas cancer patients
  - Sick/symptoms are multifactorial
  - Time/direct patient care
- Emergent role of APs have been increasing in awareness and utilization in specialty clinics-oncology
- Can assist in improving patient treatment flow, provider workflow, and overall patient care and patient experience
- Can be cost effective and time efficient in symptom management
- Can help fill the deficit of increasing demand
- Academic setting-teaching, publication, clinical trials
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- JADPRO
This has been a SMARTIE presentation. SMARTIE participants, you can now visit the SMARTIE website to answer the post-session questions for this presentation.

If you would like more information about this program, please ask a conference staff member or visit the SMARTIE booth.