



Metastatic Cancer: Progression, Complications, and CDI Opportunities

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Learning Objectives

- Review the pathophysiology of cancer spread
- Identify common metastatic sites
- Recognize complications of metastatic cancer
- Discuss common documentation gaps impacting risk adjustment

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Disclaimer

- Practical information about clinical documentation
- Seek counsel on individual legal and compliance questions

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Polling Question 1 (show of hands)

Cancer is the leading cause of death in the United States?

- a. True
- b. False



Polling Question 1

Cancer is the leading cause of death in the United States?

- a. True
- b. False

In 2016,

- Heart Disease caused 635,260 deaths (23%)
- Cancer was second at 598,038 deaths (22%)

<https://doi.org/10.3322/caac.21551>

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Estimated Cancer Deaths, 2019

- 606,880 (1,700 deaths/day)
Lung cancer (25%)

- Women (285,210)
 - Lung (23%)
 - Breast (15%)
 - Colorectal (8%)
- Men (321,670)
 - Lung (24%)
 - Prostate (10%)
 - Colorectal (9%)

5-year survival (all stages combined)

- Prostate (98%)
- Melanoma of the skin (92%)
- Female breast cancer (90%)
- Lung (19%)
- Esophagus (19%)
- Liver (18%)
- Pancreas (9%)

<https://doi.org/10.3322/caac.21551>

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Pathophysiology of cancer spread

Multistep process of metastasis



NIH - National Cancer Institute

1. Grows into nearby normal tissue
2. Moves through the walls of nearby lymph nodes or blood vessels
3. Travels through the lymphatic system and bloodstream to other parts of the body
4. Stops in small blood vessels at distant locations

<http://www.pathophys.org/metastasis/>

<https://www.cancer.gov/types/metastatic-cancer>

Multistep process of metastasis



5. Invades the blood vessel walls at distant sites and moves into surrounding tissue
6. Grows in this tissue until tiny tumor forms
7. Causes new blood vessels to grow, which creates a blood supply that allows the tumor to continue growing

<http://www.pathophys.org/metastasis/>

<https://www.cancer.gov/types/metastatic-cancer>

Determination of distant site for metastases

- Route of dissemination
 - Hematogenous
 - Lymphatic
- Seed and soil hypothesis

<http://www.pathophys.org/metastasis/>

<https://www.cancer.gov/types/metastatic-cancer>



Common sites of metastases

Primary

Common site of metastasis

• Lung	→ Brain	Bone	Lung	Liver	Adrenal
• Breast	→ Brain	Bone	Lung	Liver	
• Gastric	} →		Lung	Liver	Peritoneum
• Pancreatic					
• Colo-rectal					
• Ovarian					
• Kidney	→ Brain	Bone	Lung	Liver	Adrenal
• Bladder	→	Bone	Lung	Liver	
• Prostate	→	Bone	Lung	Liver	Adrenal
• Melanoma	→ Brain	Bone	Lung	Liver	Skin/Muscle

www.cancer.gov/types/metastatic-cancer



Brain: Signs and Symptoms of Metastasis

- Generalized (increased intracranial pressure)
- Focal (tumor burden)

Common Primary
Lung
Breast
Melanoma
Renal cell
Colorectal

Documentation Considerations

- ✓ Cerebral edema
- ✓ Delirium (+/- encephalopathy)
- ✓ Seizures
- ✓ Coma, brain herniation, brain death

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Bone: Signs and symptoms of metastasis

- Hypercalcemia
- Elevated alkaline phosphatase
- Fracture
- Pain

Common Primary
Breast
Lung
Prostate
Renal cell
Colorectal
Multiple Myeloma

Documentation Considerations

- ✓ Pathologic fractures
- ✓ Hypercalcemia
- ✓ Spinal cord compression
- ✓ Pancytopenia 2/2 to malignancy

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Lung: Signs and Symptoms of Metastasis

- Dyspnea, hemoptysis
- Cough
- Wheezes, stridor
- Loss of breath sounds

Common Primary
Breast
Colorectal
Melanoma
Sarcoma
Renal cell

Documentation Considerations

- ✓ Acute Hypoxic Respiratory Failure
- ✓ Pneumonia (+/- aspiration)
- ✓ Malignant Pleural effusion
- ✓ Superior vena cava syndrome
- ✓ Tracheoesophageal fistula

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Liver: Signs and symptoms of metastasis

- Albumen (low)
- Transaminases/LDH/ALP/bili (high)
- Nausea, RUQ pain
- Hepatomegaly, jaundice

Common Primary
Colorectal
Pancreatic
Breast
Lung

Documentation Considerations

- ✓ Cirrhosis
- ✓ Hepatic encephalopathy
- ✓ Metabolic encephalopathy
- ✓ Carcinomatosis
- ✓ Malignant ascites
- ✓ Bacterial peritonitis
- ✓ Coagulopathy
- ✓ Hyponatremia



Cancer morbidity and mortality

Cancer related admissions

Urgent/unplanned (nearly 75%)

Due to uncontrolled symptoms

- Dyspnea
- Pain
- Neurologic symptoms
- Fever
- Digestive tract – vomiting, jaundice, etc
- Intestinal obstruction

Healthcare utilization and outcomes

Unplanned admissions in patients with advanced cancer

- Average length of stay: **6.3 days**
- 90-day readmission rate: **43.1%**
- 90-day mortality rate: **41.6%**

<https://doi.org/10.1002/cncr.30912>

Polling Question 2 (show of hands)

When compared to other developed countries, the United States has the most cancer deaths occurring in hospitals.

- a. True
- b. False

Polling Question 2

When compared to other developed countries, the United States has the most cancer deaths occurring in hospitals.

- a. True
- b. False – The U.S. actually has the LEAST number of cancer deaths occurring in the hospital

JAMA. 2016;315(3):272-283. doi:10.1001/jama.2015.18603

Healthcare utilization for patients dying with cancer

Retrospective study of decedents with cancer over age 65
Administrative and registry data from 2010 (US, Canada, Belgium, Norway, England, Germany, Netherlands)

- U.S. deaths occurring in acute care hospitals → **22%** (range 22-52%)
- U.S. hospitalizations in the 6 months prior to death
 - Admission to acute care hospitals → **75%** (range 70-89%)
 - Admission to intensive care units → **40%** (range 8-18% . . . 40%)

JAMA. 2016;315(3):272-283. doi:10.1001/jama.2015.18603 22



New treatments for metastatic cancer



Targeted cancer therapy

- Specific genes
- Specific proteins
- Tissue environment
- Drugs can . . .
 - Block signals that tell cancer cells to grow and divide
 - Keep cells from living longer than normal
 - Destroy the cancer cells

Cancer.net <https://www.cancer.net/navigating-cancer-care/how-cancer-treated/personalized-and-targeted-therapies/understanding-targeted-therapy>



Impact on healthcare

- More treatment options for advanced cancer
 - Breast
 - Colon
 - Lung
 - Melanoma
- Expensive medications
- Patients with advanced cancer have less reserve
 - Higher risk for ED visits
 - Higher risk for hospitalization

Cancer.net <https://www.cancer.net/navigating-cancer-care/how-cancer-treated/personalized-and-targeted-therapies/understanding-targeted-therapy>

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Oncology Care Model (OCM)

- 5 Year Project (2016-2021)
- Led by the Centers for Medicare and Medicaid Innovation
- Requires practices to reduce the cost of care while improving quality and patient outcomes
- Payment impacted by comorbidities identified by hierarchical condition categories (HCCs)

<https://innovation.cms.gov/initiatives/oncology-care/>
<https://innovation.cms.gov/Files/slides/ocm-overview-slides.pdf>

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Oncology Care Model (OCM)

NQS (National Quality Strategy) Core Measure Set

- Practice reported measures
 - Person-and-caregiver experience and outcome
 - Clinical quality of care
- Claims-based measures
 - ▶ **Risk-adjusted** all-cause hospital admissions
 - ▶ **Risk-adjusted** all-cause ED visits or observations stays
 - Deaths in hospice for 3 days or more

} **Based on HCCs**
Hierarchical Condition Categories

<https://innovation.cms.gov/Files/ocm-otherpayercoremeasure.pdf>

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Partnering with Oncology to improve documentation

Risk-adjustment

Hierarchical Condition Categories (HCCs)



Risk adjustment examples: 68yof living in the community with Medicare (2018)

Code	Description	Score

Low
↓
High

Hierarchical Condition Categories (HCCs)



Risk adjustment examples: 68yof living in the community with Medicare (2018)

Code	Description	Score
N18.4	Chronic kidney disease, stage IV (HCC 137) - CC	0.237
E66.01	Morbid obesity (HCC 22)	0.273
J96.01	Acute hypoxic respiratory failure (HCC 84) - MCC	0.302
I50.31	Acute diastolic heart failure (HCC 85) - MCC	0.323
J44.9	Chronic Obstructive Pulmonary Disease (HCC 111)	0.328
I27.82	Chronic pulmonary embolism (HCC 107) - CC	0.400
N17.9	Acute kidney failure (HCC 135) - CC	0.422
E44.1	Mild malnutrition (HCC 21) - CC	0.545
J69.0	Aspiration pneumonia (HCC 114) - MCC	0.599
C34.11	Lung cancer (HCC 9) - CC	0.970
C79.31	Brain metastasis (HCC 8) - CC	2.625

Low
↓
High

Hierarchical Condition Impact: lung cancer patient



Diagnoses	Risk score	Risk score
C34.11 Malignancy of upper lobe, right bronchus or lung (HCC 9) - CC	-0.970	
C79.51 Secondary malignant neoplasm of bone (HCC 8) - CC	2.625	2.625
C79.31 Secondary malignant neoplasm of brain (HCC 8) - CC	-2.625	
G83.21 Monoplegia of upper limb affecting right dominant side (HCC 104)	0.395	0.395
G93.5 Compression of brain (HCC 80) - MCC		0.584
D63.8 Anemia in other chronic diseases	no HCC	no HCC
D70.8 Other neutropenia (HCC 47)	0.625	0.625
D69.6 Thrombocytopenia, unspecified (HCC 48)	0.221	-0.221
D61.810 Pancytopenia due to chemo (HCC 47) - MCC		-0.625
D61.82 Pancytopenia due to cancer in bone marrow (HCC 46) - CC		1.388
→ Interaction: Immune Disorders* Cancer Group	0.893	0.893
→ 2018 Demographic Risk Factor	0.312	0.312
2018 TOTAL RISK ADJUSTMENT FACTOR (RAF) SCORE	5.071	6.822

Translating SEVERITY and RISK

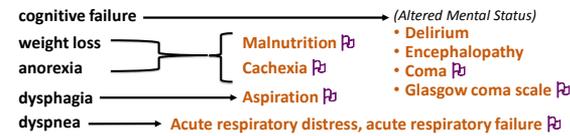


Advanced Cancer Symptoms

Best Predictor of Prognosis

PERFORMANCE STATUS →

Symptoms with independent predictive value

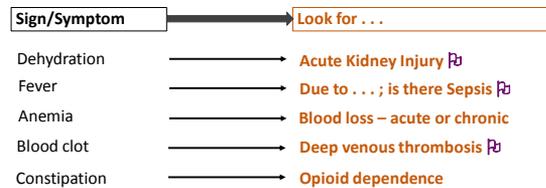


= HCC (Hierarchical Condition Category) <https://journals.sagepub.com/doi/abs/10.1191/026921600701536192>

Translating SEVERITY and RISK



Other Common Symptoms



= HCC (Hierarchical Condition Category) 33

Summary

- Get comfortable discussing metastatic cancer and recognizing the manifestations
- Identify what motivates your Oncologists
- Use your knowledge to close the gap between implied risk and documented (codable) risk

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Thank you. Questions?

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