Oncologic Emergencies for the Non-Oncologist

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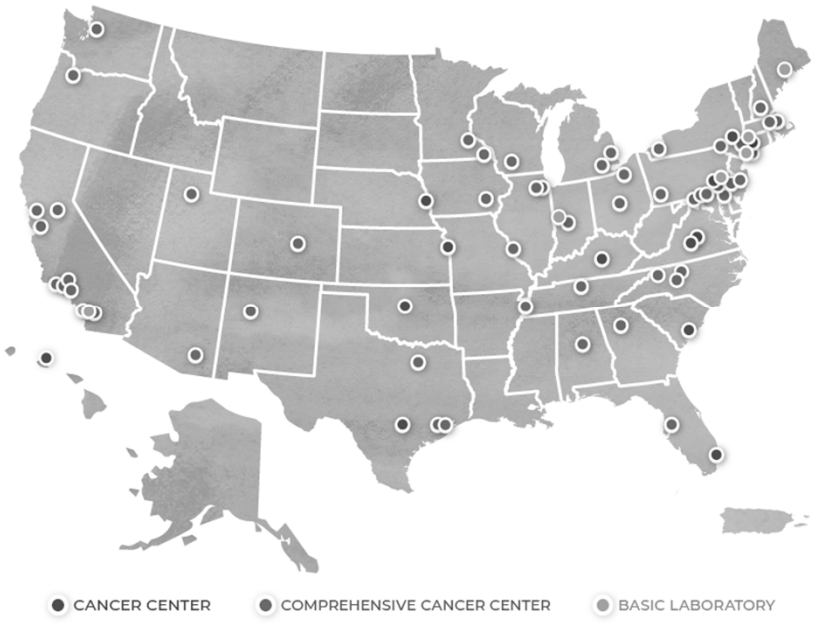
Disclosures

- I have no financial conflicts to report related to this presentation.

- Other research support for unrelated projects:
  - Beckman Coulter
  - PCORI
  - The Ohio Attorney General's Office

Objectives

1. Explain the state of acute oncology for the emergency medicine clinician.
2. Describe common acute complications experienced by oncology patients.
3. Discuss current deficits seen by emergency medicine clinicians in the acute care of oncology patients.
4. Describe the care coordination for oncology patients across medical specialties.



https://www.cancer.gov/sites/g/files/xnrzdm211/files/styles/cgov_enlarged/public/cgov_contextual_image/2021-02/Story_Specific_Visuals_CancerCenterMap_16x9__1.png?h=df3c6bf4&itok=sZ1b60f2

Current state of unscheduled acute care

JAMA Oncol. 2017 Oct 12;3(10):e172450. doi: 10.1001/jamaoncol.2017.2450. Epub 2017 Oct 12.

Trends in Adult Cancer-Related Emergency Department Utilization: An Analysis of Data From the Nationwide Emergency Department Sample.

Rivera DR[1], Gallicchio L[1], Brown J[2], Liu B[1], Kyriacou DN[3], Shelburne N[1].

Author information

Abstract

IMPORTANCE: The emergency department (ED) is used to manage cancer-related complications among the 15.5 million people living with cancer in the United States. However, ED utilization patterns by the population of US adults with cancer have not been previously evaluated or described in published literature.

OBJECTIVE: To estimate the proportion of US ED visits made by adults with a cancer diagnosis, understand the clinical presentation of adult patients with cancer in the ED, and examine factors related to inpatient admission within this population.

DESIGN, SETTING, AND PARTICIPANTS: Nationally representative data comprised of 7 survey cycles (January 2006-December 2012) from the Nationwide Emergency Department Sample were analyzed. Identification of adult (age ≥18 years) cancer-related visits was based on Clinical Classifications Software diagnoses documented during the ED visit. Weighted frequencies and proportions of ED visits among adult patients with cancer by demographic, geographic, and clinical characteristics were calculated. Weighted multivariable logistic regression was used to examine the associations between inpatient admission and key demographic and clinical variables for adult cancer-related ED visits.

MAIN OUTCOMES AND MEASURES: Adult cancer-related ED utilization patterns; identification of primary reason for ED visit; patient-related factors associated with inpatient admission from the ED.

RESULTS: Among an estimated 696 million weighted adult ED visits from January 2006 to December 2012, 29.5 million (4.2%) were made by a patient with a cancer diagnosis. The most common cancers associated with an ED visit were breast, prostate, and lung cancer, and most common primary reasons for visit were pneumonia (4.5%), nonspecific chest pain (3.7%), and urinary tract infection (3.2%). Adult cancer-related ED visits resulted in inpatient admissions more frequently (59.7%) than non-cancer-related visits (16.3%) ($P < .001$). Septicemia (odds ratio [OR], 91.2; 95% CI, 81.2-102.3) and intestinal obstruction (OR, 10.94; 95% CI, 10.6-11.4) were associated with the highest odds of inpatient admission.

CONCLUSIONS AND RELEVANCE: Consistent with national prevalence statistics among adults, breast, prostate, and lung cancer were the most common cancer diagnoses presenting to the ED. Pneumonia was the most common reason for adult cancer-related ED visits with an associated high inpatient admission rate. This analysis highlights cancer-specific ED clinical presentations and the opportunity to inform patient and system-directed prevention and management strategies.

Comprehensive Oncologic Emergencies Research Network (CONCERN)

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COMPREHENSIVE ONCOLOGIC EMERGENCIES RESEARCH NETWORK (CONCERN)

Overview

Membership

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- Objectives
- Organizational Structure
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Registration is now open for the Cancer-related Emergency and Urgent Care: Prevention, Management, and Care Coordination Workshop, which will be held virtually on December 1-3, 2021.

For more information on the agenda and related resources, visit the event website.

https://epi.grants.cancer.gov/concern/

Overview

Established in March 2015

Open scientific forum for oncology and emergency medicine researchers.

Goal: Accelerate knowledge generation, synthesis and translation of oncologic emergency medicine research through multi-center collaborations.

Table 2. Most Common ED Diagnoses Among 1075 Patients With Active Cancer

ICD-10-CM Code I	ICD-10-CM Category	Frequency, No. (%) [95% CI]
R10	Abdominal and pelvic pain	100 (9.3) [7.6-11.2]
R50	Fever of other and unknown origin	87 (8.1) [6.5-9.9]
R06	Abnormalities of breathing	77 (7.2) [5.7-8.9]
R11	Nausea and vomiting	60 (5.6) [4.3-7.1]
R07	Pain in throat and chest	51 (4.7) [3.6-6.2]
D64	Other anemias	47 (4.4) [3.2-5.8]
E87	Other disorders of fluid, electrolytes, and acid-base balance	47 (4.4) [3.2-5.8]
R53	Malaise and fatigue	45 (4.2) [3.1-5.6]
E86	Volume depletion	43 (4.0) [2.9-5.4]
I26	Pulmonary embolism	39 (3.6) [2.6-4.9]

Abbreviations: ED, emergency department; ICD-10-CM, International Statistical Classification of Diseases, Tenth Revision, Clinical Modification.

Caterino et al. JAMA Netw Open. 2019 Mar 1;2(3):e190979.

Table 2. Most Common ED Diagnoses Among 1075 Patients With Active Cancer

ICD-10-CM Code I	ICD-10-CM Category	Frequency, No. (%) [95% CI]
J18	Pneumonia, unspecified organism	39 (3.6) [2.6-4.9]
D70	Neutropenia	37 (3.4) [2.4-4.7]
C34	Malignant neoplasm of bronchus and lung	36 (3.3) [2.4-4.6]
N39	Other disorders of urinary system	36 (3.3) [2.4-4.6]
R19	Other symptoms and signs involving the digestive system and abdomen	36 (3.3) [2.4-4.6]
C79	Secondary malignant neoplasm of other and unspecified sites	35 (3.3) [2.3-4.5]
M54	Dorsalgia (eg, radiculopathy, sciatica)	33 (3.1) [2.1-4.3]
G89	Pain, not elsewhere classified	28 (2.6) [1.7-3.7]
M79	Other and unspecified soft tissue disorders, not elsewhere classified (ie, nonspecific pain)	26 (2.4) [1.6-3.5]
R55	Syncope and collapse	26 (2.4) [1.6-3.5]

Abbreviations: ED, emergency department; ICD-10-CM, International Statistical Classification of Diseases, Tenth Revision, Clinical Modification.

Caterino et al. JAMA Netw Open. 2019 Mar 1;2(3):e190979.

What do the rest of us know?

ABFM In-Training Examination Content

Topic	Content %	Topic	Content %
Cardiovascular	12	Nonspecific	9
Endocrine	8	Psychogenic	7
Gastrointestinal	7	Reproductive – Female	4
Hematologic/Immune	3	Reproductive – Male	1
Integumentary	6	Respiratory	13
Musculoskeletal	12	Special Sensory	2
Nephrologic	3	Population-based Care	5
Neurologic	3	Patient-based Systems	5

https://www.theabfm.org/sites/default/files/2019-02/InTrainingExamination-Outline.pdf

The 2019 Model of the Clinical Practice of Emergency Medicine

The 2019 revision of the EM Model resulted in significant changes and clarifications, including the addition of an oncology section within Category 8, Hematologic and Oncologic Disorders

- Febrile Neutropenia
- Hypercalcemia of Malignancy
- Hyperviscosity Syndrome
- Malignant Pericardial Effusion
- Spinal Cord Compression
- Superior Vena Cava Syndrome
- Tumor Hemorrhage
- Tumor Lysis Syndrome

Beeson et al. J Emerge Med. 2020 May 28;S0736-4679(20)30154-2.

EM Education – How are we doing?

Rajha et al. surveyed EM program directions (The American Journal of Emergency Medicine, 2020)

- Oncology topics are critical in the preparation of EM trained physicians?

Disagree:	4%	
Neither Agree or Disagree:		6%
Agree:		**75%**
Strongly Agree:	**16%**	

- Our EM residency program's didactic curriculum fully prepares residents for the recognition and management of oncologic emergencies.

Disagree:	14%	
Neither Agree or Disagree:		22%
Agree:		**59%**
Strongly Agree:	**6%**	

Febrile Neutropenia

- Single oral temperature measurement of ≥38.3°C (101°F) or a temperature of ≥38.0°C (100.4°F) sustained over a 1 hour period

And

- Severe neutropenia that is defined as an absolute neutrophil count (ANC) of <500 cells/mm^3 or expected during the next 48 hours
- Multiple etiologies including myelosuppression secondary to chemotherapy
- Treatment: *Apply National Guidelines* (Taplitz et al. J Clin Oncol. 2018)

MASCC Risk Index for Febrile Neutropenia

Identifies patients at low risk for poor outcome with febrile neutropenia.

INSTRUCTIONS

Use in neutropenic patients (see ANC calculator) with fever at least 100.4°F (38°C). Do not use in patients with acute leukemia undergoing induction chemotherapy or allogeneic hematopoietic stem cell transplant conditioning, per IDSA guidelines.

When to Use | Pearls/Pitfalls | Why Use

Burden of illness (symptom severity) As determined by attending physician at presentation	None or mild	+5
	Moderate	+3
	Severe	0
Hypotension sBP <90 mmHg	No +5	Yes 0
Active COPD Active chronic bronchitis, emphysema, decreased FEV, or need for oxygen therapy, corticosteroids, and/or bronchodilators	No +4	Yes 0
Type of cancer	Solid tumor	+4
	Hematologic, no prior fungal infection	+4
	Hematologic, prior fungal infection	0
Dehydration requiring IV fluids	No +3	Yes 0
Status at onset of fever	Outpatient	+3
	Inpatient	0
Age (years)	<60 +2	≥60 0

FACTS & FIGURES

Interpretation:

MASCC Risk Index	Risk for febrile neutropenia	Recommendation*
≥21	Low risk	Consider oral and/or outpatient empirical antibiotic therapy.
<21	High risk	Admit for empiric antibiotics if not already inpatient.

*From the IDSA Clinical Practice Guideline for the Use of Antimicrobial Agents in Neutropenic Patients with Cancer, 2010.

Klastersky J et al. J Clin Oncol. 2000 Aug;18(16):3038-51.
https://www.mdcalc.com/mascc-risk-index-febrile-neutropenia#evidence

Clinical Index of Stable Febrile Neutropenia (CISNE)

Identifies febrile neutropenia patients at low risk of serious complications.

INSTRUCTIONS

Use in adult outpatients at least 18 years old with solid tumor, fever at least 38°C (100.4°F) over 1 hr, and neutropenia (500 cells/mm³ or fewer, or 1,000 cells/mm³ with expected decrease to 500). Do not use in patients with acute organ failure, severe infection, hypotension, or other reason for admission.

When to Use | Pearls/Pitfalls | Why Use

ECOG Performance Status ECOG PS 2 = Capable of all self care, but no work activities, out of bed >50% of day	<2 0	≥2 +2
Stress-induced hyperglycemia Initial blood glucose ≥121 mg/dL (6.7 mmol/L), or ≥250 mg/dL (13.9 mmol/L) in diabetics or if on steroids	No 0	Yes +2
COPD COPD diagnosis on therapy with ≥1 of the following: steroids, supplemental O_2, bronchodilators	No 0	Yes +1
Cardiovascular disease history Chronic heart conditions (e.g., cor pulmonale, heart failure, cardiomyopathy, hypertensive heart disease, arrhythmias, valvular disease, other structural malformations), EXCLUDING history of single uncomplicated episode of AFib	No 0	Yes +1
NCI mucositis grade ≥2 Painful erythema, edema, or ulcers, but eating/swallowing possible	No 0	Yes +1
Monocytes	≥200/μL 0	<200/μL +1

FACTS & FIGURES

Interpretation:

CISNE	Risk category	Risk of complications*	Recommendation
0	I (Low)	1.1%	Consider discharge with oral antibio after discussion with oncology.
1-2	II (Intermediate)	6.2%	Use clinical judgment regarding admission. Consider oncology consultation.
≥3	III (High)	36%	Admit for further investigation, including blood cultures.

Carmona-Bayonas A et al. Br J Cancer. 2011 Aug 23;105(5):612-7.
https://www.mdcalc.com/clinical-index-stable-febrile-neutropenia-cisne#evidence

Hypercalcemia

- Presentation:
  - GI symptoms, Neurologic changes, renal failure
- Severity:
  - Degree and rate of onset
- Causes:
  - Humoral: parathyroid hormone-related protein (PTHrP) secretion (80%)
  - Osteolytic (20%)
  - Vitamin D secretion
  - Ectopic PTH
- Treatment: Fluids, bisphosphonates, calcitonin, monoclonal antibody (Denosumab), avoid loop diuretics (volume dependent)

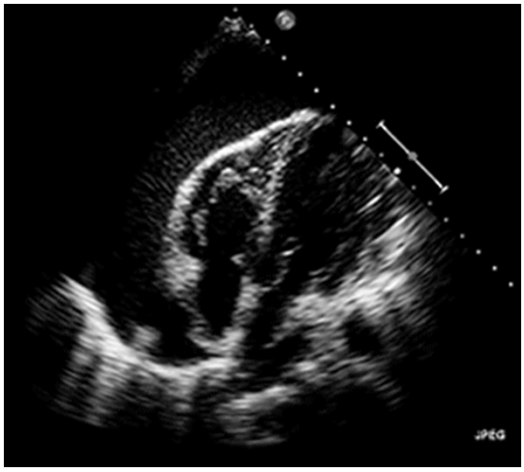
Sadiq NM, Naganathan S, Badireddy M. Hypercalcemia. [Updated 2021 Sep 11].
https://www.ncbi.nlm.nih.gov/books/NBK430714/

Hyperviscosity Syndrome

- Pathological increase in serum proteins, red blood cells (RBC), white blood cells (WBC), or platelets
- Triad: Neurologic deficits, bleeding, and visual changes (low flow state and platelet dysfunction)
- Waldenstrom Magroglobulinemia (10-30%), Myeloma (3-6%)
- Treatment: Plasmapheresis, Avoid dehydration (1-2L fluids), Treat etiology (Chemotherapy)

Weaver et al. Front Oncol. 2020 May 19;10:815
Perez Rogers at al. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan.

Malignant Pericardial Effusion



- Most often caused by lung cancer, breast cancer, melanoma, lymphoma, and leukemia.
- Chemotherapeutic agents (e.g., cyclophosphamide, cytarabine, dasatinib, doxorubicin, gemcitabine).
- Beck's triad (hypotension, jugular venous distention, and muffled heart sounds) less likely due to slow accumulation.
- Intervention dependent of clinical stability.

Xiong W, Shi C. N Engl J Med 2011;364:e18.
https://www.cancer.gov/publications/dictionaries/cancer-terms/def/malignant-pericardial-effusion
https://www.cancer.gov/about-cancer/treatment/side-effects/cardiopulmonary-pdq#_132

Malignant Spinal Cord Compression

- Etiology: Primary invasion, Metastatic lesions, Pathologic fracture
- Back pain, focal neurologic deficits
- Associated with breast, lung, prostate, and kidney cancer, lymphoma and multiple myeloma
- Acute neurologic findings requires urgent MRI evaluation
- Multiple grading systems, symptom (Frankel) and imaging based (ESCC)
- Treatment: Dexamethasone 10-16mg IV, Chemotherapy/Radiation/Surgery depending on tumor type

Ropper AE, Ropper AH. N Engl J Med ;376:1358-1369
https://www.nice.org.uk/guidance/cg75/chapter/1-Guidance#the-patients-experience-of-mscc
https://www.mdanderson.org/content/dam/mdanderson/documents/for-physicians/algorithms/clinical-management/clin-management-spinal-cord-compression-web-algorithm.pdf

Superior Vena Cava (SVC) Syndrome

- Blockage of thin walled SVC
  - Generally malignancy: Lung Cancer, Non-Hodgkin's Lymphoma
  - Other causes: Catheter associated thrombosis, infection, thymoma, autoimmune disorders
- Swelling of the face, neck, arms, neck (edema including pleural and cerebral)
- Grading based on symptoms/involvement of azygous vein.
- Treatment dependent on etiology: Head of bed elevated, Airway management, Steroids, Chemotherapy, Radiation therapy, Stenting, bypass, Thrombolysis

https://www.cancer.gov/about-cancer/treatment/side-effects/cardiopulmonary-pdq#_132

Tumor Hemorrhage

- Management dependent on location and severity
- Due to malignancy or treatment adverse effects
- Assess for anticoagulation and reverse as appropriate
- Co-management with appropriate consulting service

- In a sample of 555 patients on Immune Checkpoint Inhibitors: Clinically significant bleeding and thrombocytopenia at 3 months of treatment were identified in 21% and 7%.

Kondziolka D et al. J Neurosurg. 1987 Dec;67(6):852-7.
Kewan TZ et al. Journal of Clinical Oncology. 2020 38, no. 15_suppl

Tumor Lysis Syndrome

- Tends to occur in rapidly dividing tumors.
- Rapid release of potassium, phosphorous, nucleic acids, and cytokines.
- Laboratory definition: ≥2 abnormal serum values or a 25% change in value of uric acid, potassium, phosphorous, and calcium.

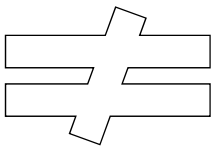
- Treatment: fluids, allopurinol, rasburicase, serial electrolyte monitoring, dialysis
  - no role for urine alkalinization

Cairo et al. Br J Haematol. 2010 May;149(4):578-86.
Coiffier et al. J Clin Oncol . 2008 Jun 1;26(16):2767-78.

Current Deficits

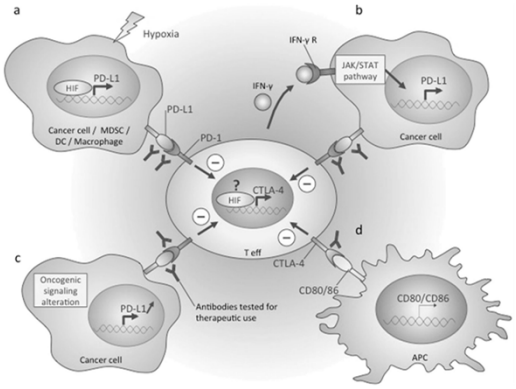
Gaps in Current Curriculum
Immunotherapy Treatments and Associated Side Effects
Symptom and side effect management in Cancer Patients
Surgical Procedures and Complications in Patients with Cancer
Effects of Oncology Treatment on Common Emergency Presentations
Need for Emergent Oncological Treatment for the Newly Diagnosed Cancer Patient with Cancer
Gaps in Research Efforts
Care Utilization Across the Age Continuum and Rural/Urban Divide
Risk Stratification
Diagnostic Pathways
Implementation Science Barriers to Oncology Evidence-Based Medicine
Social Determinant of Health Affecting Acute Presentation

Immunotherapy



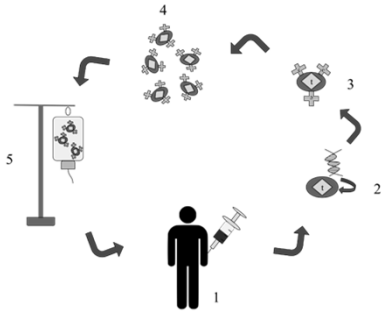
Chemotherapy

Immune Checkpoint Inhibitors (ICI)

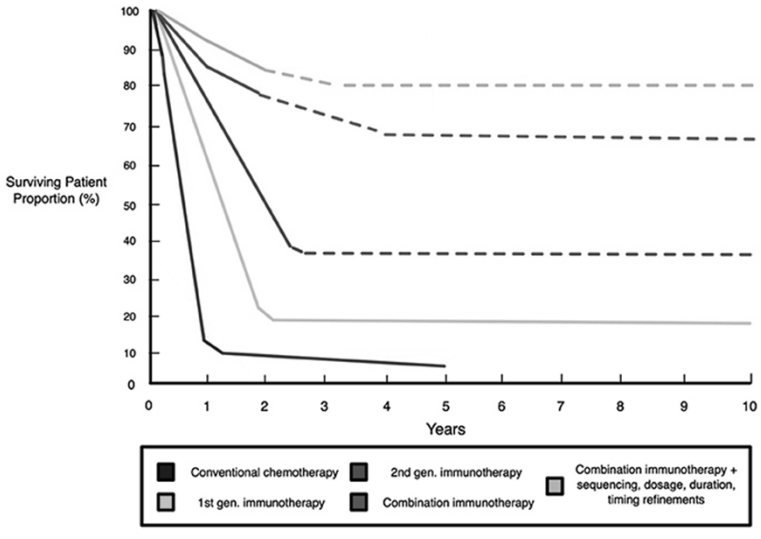


Other Major Classes of Immunotherapy:
-Oncologic Vaccines
-Cytokines
-Viral Therapy

Chimeric Antigen Receptor T-cell Therapy (CAR-T)



https://upload.wikimedia.org/wikipedia/commons/archive/b/b6/20180611203918%21CAR_T-cell_Therapy.svg



Marshall HT and Djamgoz MBA (2018) Immuno-Oncology: Emerging Targets and Combination Therapies. Front. Oncol. 8:315. doi: 10.3389/fonc.2018.00315

Research Letter | Oncology

March 9, 2020

Estimation of the Percentage of US Patients With Cancer Who Are Eligible for Immune Checkpoint Inhibitor Drugs

Alyson Haslam, PhD[1,2]; Jennifer Gill, MS[1]; Vinay Prasad, MD, MPH[1,3,4]

Proportion of US patients with cancer were eligible for immune checkpoint inhibitor therapy
1.5% (2011) --> 36% (2019)

Immune Related Adverse Events (irAEs)

- All organ systems are potentially affected.
- Presentation is often delayed weeks, months and even years later.

- Eyes: Uveitis, Conjunctivitis
- Endocrine: Hypo/hyperthyroidism, hypopituitarism, hypophysitis, adrenal insufficiency
- Cardiovascular: Myocarditis, Pericarditis, Vasculitis
- Gastrointestinal: Colitis
- Musculoskeletal: Arthritis, Dermatomyositis
- Neurologic: Neuropathy, Myelopathy, Encephalitis, Myasthenia
- Respiratory: Pneumonitis, Pleuritis
- Liver: Hepatitis
- Renal: Nephritis
- Dermatologic: Rash, Vitiligo, Rash

Patil et al. Expert Rev Mol Diagn. 2018 Mar;18(3):297-305.
Haanen et al. Annals of Oncology 28 (Supplement 4): i119–i142, 2017

Common Terminology for Adverse Events (CTCAE)

Introduction
The NCI Common Terminology Criteria for Adverse Events is a descriptive terminology which can be utilized for Adverse Event (AE) reporting. A grading (severity) scale is provided for each AE term.

SOC
System Organ Class (SOC), the highest level of the MedDRA[1] hierarchy, is identified by anatomical or physiological system, etiology, or purpose (e.g., SOC Investigations for laboratory test results). CTCAE terms are grouped by MedDRA Primary SOCs. Within each SOC, AEs are listed and accompanied by descriptions of severity (Grade).

CTCAE Terms
An Adverse Event (AE) is any unfavorable and unintended sign (including an abnormal laboratory finding), symptom, or disease temporally associated with the use of a medical treatment or procedure that may or may not be considered related to the medical treatment or procedure. An AE is a term that is a unique representation of a specific event used for medical documentation and scientific analyses. Each CTCAE v4.0 term is a MedDRA LLT (Lowest Level Term).

Grades
Grade refers to the severity of the AE. The CTCAE displays Grades 1 through 5 with unique clinical descriptions of severity for each AE based on this general guideline:

- **Grade 1** Mild; asymptomatic or mild symptoms; clinical or diagnostic observations only; intervention not indicated.
- **Grade 2** Moderate; minimal, local or noninvasive intervention indicated; limiting age-appropriate instrumental ADL*.
- **Grade 3** Severe or medically significant but not immediately life-threatening; hospitalization or prolongation of hospitalization indicated; disabling; limiting self care ADL**.
- **Grade 4** Life-threatening consequences; urgent intervention indicated.
- **Grade 5** Death related to AE.

A Semi-colon indicates 'or' within the description of the grade.

A single dash (-) indicates a Grade is not available. Not all Grades are appropriate for all AEs. Therefore, some AEs are listed with fewer than five options for Grade selection.

Grade 5
Grade 5 (Death) is not appropriate for some AEs and therefore is not an option.

Definitions
A brief Definition is provided to clarify the meaning of each AE term. A single dash (-) indicates a Definition is not available.

Navigational Notes
A Navigational Note is used to assist the reporter in choosing a correct AE. It may list other AEs that should be considered in addition to or in place of the AE in question. A single dash (-) indicates a Navigational Note has not been defined for the AE term.

Activities of Daily Living (ADL)
*Instrumental ADL refer to preparing meals, shopping for groceries or clothes, using the telephone, managing money, etc.
**Self care ADL refer to bathing, dressing and undressing, feeding self, using the toilet, taking medications, and not bedridden.

[1] CTCAE v5.0 incorporates certain elements of the MedDRA terminology. For further details on MedDRA refer to the MedDRA MSSO Web site (https://www.meddra.org/).

https://ctep.cancer.gov/protocoldevelopment/electronic_applications/docs/CTCAE_v5_Quick_Reference_5x7.pdf

VOLUME 36 · NUMBER 17 · JUNE 10, 2018
JOURNAL OF CLINICAL ONCOLOGY ASCO SPECIAL ARTICLE

Management of Immune-Related Adverse Events in Patients Treated With Immune Checkpoint Inhibitor Therapy: American Society of Clinical Oncology Clinical Practice Guideline

Julie R. Brahmer, Christina Lacchetti, Bryan J. Schneider, Michael B. Atkins, Kelly J. Brassil, Jeffrey M. Caterino, Ian Chau, Marc S. Ernstoff, Jennifer M. Gardner, Pamela Ginex, Sigrun Hallmeyer, Jennifer Holter Chakrabarty, Natasha B. Leighl, Jennifer S. Mammen, David F. McDermott, Aung Naing, Loretta J. Nastoupil, Tanyanika Phillips, Laura D. Porter, Igor Puzanov, Cristina A. Reichmer, Bianca D. Santomasso, Carole Seigel, Alexander Spira, Maria E. Suarez-Almazor, Yinghong Wang, Jeffrey S. Weber, Jedd D. Wolchok, and John A. Thompson in collaboration with the National Comprehensive Cancer Network

Puzanov *et al. Journal for ImmunoTherapy of Cancer* (2017) 5:95
DOI 10.1186/s40425-017-0300-z
Journal for ImmunoTherapy of Cancer
POSITION ARTICLE AND GUIDELINES Open Access

Managing toxicities associated with immune checkpoint inhibitors: consensus recommendations from the Society for Immunotherapy of Cancer (SITC) Toxicity Management Working Group

I. Puzanov[1†], A. Diab[2†], K. Abdallah[3], C. O. Bingham III[4], C. Brogdon[5], R. Dadu[2], L. Hamad[1], S. Kim[2], M. E. Lacouture[6], N. R. LeBoeuf[7], D. Lenihan[8], C. Onofrei[9], V. Shannon[2], R. Sharma[1], A. W. Silk[12], D. Skondra[10], M. E. Suarez-Almazor[2], Y. Wang[2], K. Wiley[11], H. L. Kaufman[12†], M. S. Ernstoff[1*†] and on behalf of the Society for Immunotherapy of Cancer Toxicity Management Working Group

ESMO
Annals of Oncology 28 (Supplement 4): iv119–iv142, 2017
doi:10.1093/annonc/mdx225
CLINICAL PRACTICE GUIDELINES

Management of toxicities from immunotherapy: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

J. B. A. G. Haanen[1], F. Carbonnel[2], C. Robert[3], K. M. Kerr[4], S. Peters[5], J. Larkin[6] & K. Jordan[7], on behalf of the ESMO Guidelines Committee*

NCCN CLINICAL PRACTICE GUIDELINES IN ONCOLOGY

Management of Immunotherapy-Related Toxicities, Version 1.2019

John A. Thompson, MD[1,*†]; Bryan J. Schneider, MD[2,*†]; Julie Brahmer, MD, MSc[3,*†]; Stephanie Andrews, MS, RN, ANP-BC[4]; Philippe Armand, MD, PhD[5]; Shailender Bhatia, MD[1]; Lihua E. Budde, MD, PhD[6]; Luciano Costa, MD, PhD[7]; Marianne Davies, MSN, DNP[8]; David Dunnington, MA[9]; Marc S. Ernstoff, MD[10,†]; Matthew Frigault, MD[11]; Brianna Hoffner, MSN[12]; Christopher J. Hoimes, MD[13]; Mario Lacouture, MD[14]; Frederick Locke, MD[4]; Matthew Lunning, DO[15]; Nisha A. Mohindra, MD[16]; Jarushka Naidoo, MD[3]; Anthony J. Olszanski, MD, RPh[17]; Olalekan Oluwole, MD[18]; Sandip P. Patel, MD[19]; Sunil Reddy, MD[20]; Mabel Ryder, MD[21]; Bianca Santomasso, MD, PhD[14]; Scott Shofer, MD, PhD[22]; Jeffrey A. Sosman, MD[16]; Momen Wahidi, MD[22]; Yinghong Wang, MD, PhD[23,†]; Alyse Johnson-Chilla, MS[24]; and Jillian L. Scavone, PhD[24]

Cytokine Release Syndrome (CRS)

- Presents from mild to severe symptoms
  - fatigue → hypotensive shock and respiratory failure.
- Treatment: Supportive care as necessary
- Grading based on need for supportive measures

Lee et al. Biol Blood Marrow Transplant. 2019 Apr;25(4):625-638.
https://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy/car-t-cell1.htm

Immune Effector Cell-Associated Neurotoxicity syndrome (ICANS)

- Symptoms range from non specific neurologic symptoms (Fatigue) to Seizures, Coma and Death 2/2 cerebral edema
- Graded by alterations to mental status
- Onset typically 3-10 days after treatment
- Evaluation: Altered Mental Status evaluation + LP + MRI
- Treatment: Supportive care seizure prophylaxis ± tocilizumab ± steroids

Lee et al. Biol Blood Marrow Transplant. 2019 Apr;25(4):625-638.
https://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy/car-t-cell1.html

Care Coordination – Wrap Around Care

- irAE diagnosis is a diagnosis of exclusion dependent on obtaining an accurate history (integration of medical record)
- Clear communication/coordination with the primary oncologist
- Immunotherapy Wallet Cards
- Emergency Physician is part of the Oncology Team
- Need for adoption/endorsement of Oncology Guidelines by Non-Oncology Organizations

Bischof et al. Ann Emerg Med. 2019 Jan;73(1):88-90.

Joint Models of Acute Care

- Nurse Navigation extending from the Oncology Clinic/Ward to the ED
  - When surveyed, 91% of participants at an oncology navigation conference reported that navigation services in the ED would be either moderately or very helpful.
- Hybrid Care Sites
  - Nurse Triage Line for acute care in Cancer Hospital Infusion Center versus Emergency Department
  - The James Immediate Care Center
  - Integrated Oncology Pods
  - Clear Referral Patterns – Diagnostic Center

Bischof et al. Support Care Cancer. 2019 Nov;27(11):4359-4362
Bischof et al. Support Care Cancer. 2021 Jun 5;1-7; Delatore et al. Emerg Med Clin North Am. 2018 Aug;36(3):631-636.
https://cancer.osu.edu/blog/patients-finding-fast-relief-at-the-james-immediate-care-center
https://cancer.osu.edu/for-patients-and-caregivers/learn-about-cancers-and-treatments/specialized-treatment-clinics-and-centers/cancer-diagnostic-center

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Ann Emerg Med. 1984 Sep;13(9 Pt 1):723-30.

Emergency evaluation of the cancer patient.

Kalia S, Tintinalli JE.

Abstract

The oncology patient can experience medical or surgical emergencies as a result of effects of the primary tumor, metastases, or systemic

"Emergencies unrelated to the primary oncologic diagnosis,..., may occur. For this reason routine emergency protocols and diagnostic procedures should be followed in the treatment of oncology patients."

[Indexed for MEDLINE]