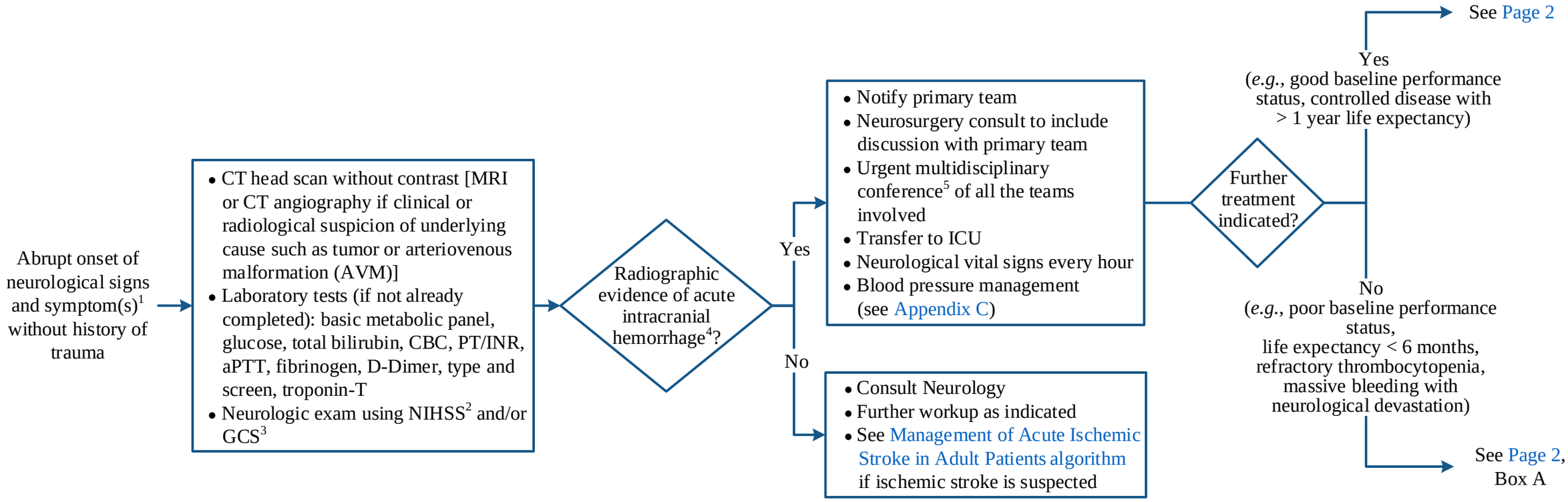
Acute Intracranial Hemorrhage in Adult Cancer Patients

PRESENTATION

ASSESSMENT



[1] Neurological signs and symptoms:
- Numbness, tingling, and/or paralysis to face, arm or leg (especially on one side)
- Severe headache
- Difficulty with swallowing or vision
- Loss of balance or coordination
- Difficulty speaking, understanding, reading or writing
- Change in level of consciousness or alertness

[2] See Appendix A: National Institutes of Health Stroke Scale (NIHSS)

[3] See Appendix B: Glasgow Coma Scale (GSC)

[4] Intracranial hemorrhage includes: subarachnoid hemorrhage, subdural hematoma, epidural hemorrhage, intraparenchymal hemorrhage, intraventricular hemorrhage

[5] The objective of this meeting/conference is to discuss the immediate plan of care, including whether surgery is indicated or not. If surgery is not indicated, discuss whether the patient is neurologically devastated and the chances of recovery are very poor justifying further discussion about end of life, do-not-resuscitate status, limitation of life supportive measures (*e.g.*, blood products, ventilation, vasopressors, cardiopulmonary resuscitation) and transition to comfort care.

Department of Clinical Effectiveness V2
Approved by The Executive Committee of Medical Staff on 11/19/2019

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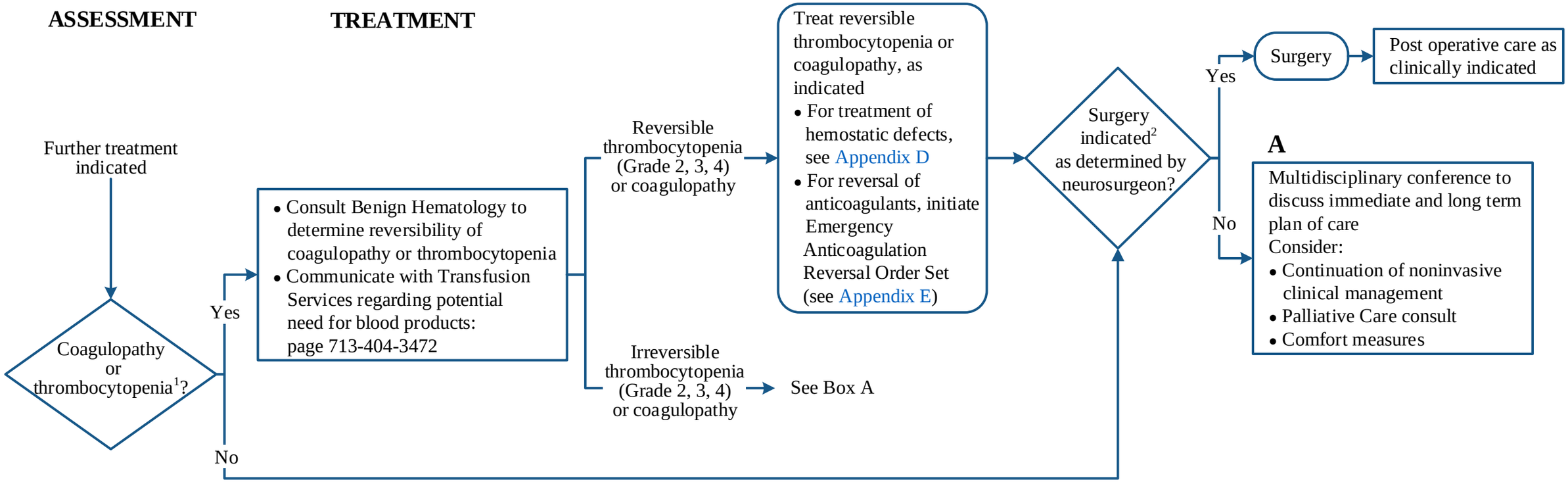

[1] World Health Organization (WHO)/National Cancer Institute (NCI) thrombocytopenia criteria:
- Grade 1: 75 to 150 K/microliter
- Grade 2: 50 to < 75 K/microliter
- Grade 3: 25 to < 50 K/microliter
- Grade 4: < 25 K/microliter

Non-reversible thrombocytopenia (platelet refractory) defined as a one hour post-transfusion platelet increment of < 3,000 K/microliter per unit transfused.

[2] Possible surgical indications:
- Intracerebellar hematoma > 30 mm in diameter, hydrocephalus, or brainstem compression
- Supratentorial hematoma 10-20 mL or herniation > 30 mL and within 1 cm of the surface
- Intraventricular hemorrhage with hydrocephalus

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APPENDIX A: National Institutes of Health Stroke Scale (NIHSS)

	Title	Responses	Score
1A	Level of consciousness	0 – Alert and responsive 1 – Arousable to minor stimulation 2 – Arousable to painful stimulation 3 – Reflex responses or unarousable	
1B	Orientation questions • Ask patient's age and month	0 – Both correct 1 – One correct (or dysarthria, intubated, foreign language) 2 – Neither correct	
1C	Response to commands • Open/close eyes and grip and release hand	0 – Both correct (ok if impaired by weakness) 1 – One correct 2 – Neither correct	
2	Gaze • Horizontal extraocular movement	0 – Normal 1 – Partial gaze palsy; abnormal gaze in 1 or both eyes 2 – Forced eye deviation or total paresis	
3	Visual field • Use visual threat if necessary	0 – No visual loss 1 – Partial hemianopia, quadrantanopia, extinction 2 – Complete hemianopia 3 – Bilateral hemianopia or blindness	
4	Facial movement	0 – Normal 1 – Minor facial weakness 2 – Partial facial weakness 3 – Complete unilateral palsy (upper and lower face)	
5	Motor function (arm) – arms outstretched for 10 seconds • Left • Right	0 – No drift before 5 seconds 1 – Drift but doesn't hit bed 2 – Some antigravity effort, but can't sustain 3 – No antigravity effort, but even minimal movement counts 4 – No movement at all X – Unable to assess due to amputation, fusion, fracture	Left: Right:

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APPENDIX A: National Institutes of Health Stroke Scale (NIHSS) - continued

	Title	Responses	Score
6	Motor function (leg) – raise leg 30 degrees supine for 5 seconds • Left • Right	0 – No drift before 5 seconds 1 – Drift but doesn't hit bed 2 – Some antigravity effort, but can't sustain 3 – No antigravity effort, but even minimal movement counts 4 – No movement at all X – Unable to assess due to amputation, fusion, fracture	Left: Right:
7	Limb ataxia • Check finger-nose-finger; heel-shin; and score if only out of proportion to paralysis	0 – No ataxia 1 – Ataxia in upper or lower extremity 2 – Ataxia in upper and lower extremity X – Unable to assess due to amputation, fusion, fracture	
8	Sensory • Use safety pin	0 – No sensory loss 1 – Mild-moderate unilateral loss but pt aware of touch 2 – Total loss, patient unaware of touch	
9	Language • Name objects; use repeating	0 – Normal 1 – Mild-moderate aphasia 2 – Severe aphasia 3 – Mute, global aphasia, coma	
10	Articulate • Read a list of words	0 – Normal 1 – Mild-moderate; slurred but intelligible 2 – Severe; unintelligible or mute X – Intubation or mechanical barrier	
11	Extinction/neglect • Simultaneously touch patient on both hands, show fingers in both visual fields, ask about deficit	0 – Normal, non detected 1 – Neglects 1 sensory modality 2 – Profound neglect in more than one modality	

Score ≥ 25	Very severe neurological impairment
Score 5-24	Mild to severe neurological impairment
Score < 5	Mild impairment

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APPENDIX B: Glasgow Coma Scale (GCS)[1]

Item	Description	Score
Eye Opening Response	Spontaneous	4
	To verbal stimuli, command, speech	3
	To pain only (not applied to face)	2
	No response	1
Verbal Response	Oriented	5
	Confused conversation, but able to answer questions	4
	Inappropriate words	3
	Incomprehensible speech	2
	No response	1
Motor Response	Obeys commands for movement	6
	Purposeful movement to painful stimulus	5
	Withdraws in response to pain	4
	Flexion in response to pain	3
	Extension in response to pain	2
	No response	1

[1] GCS is obtained by adding the score from each parameter

APPENDIX C: Blood Pressure Management [2]

Presenting Blood Pressure	Suggested Management
SBP > 200 mm Hg **or** MAP > 150 mm Hg	Consider aggressive reduction of blood pressure with confinuous IV infusion and frequent monitoring of blood pressure every 5 minutes or continuous intra-arterial pressure monitoring
SBP > 180 mm Hg **or** MAP > 130 mm Hg **and** Possibility of elevated intracranial pressure	Consider monitoring ICP and reducing blood pressure using intermittent or continuous intravenous medications while maintaining a cerebral perfusion pressure 60 mm Hg
SBP > 180 mm Hg **or** MAP > 130 mm Hg **and** No evidence of elevated intracranial pressure	Consider a modest reduction of blood pressure (*e.g.*, MAP of 110 mm Hg or target blood pressure of 160/90 mm Hg) using intermittent or continuous intravenous medications to control BP and clinically reexamine the patient every 15 minutes

SBP = systolic blood pressure
MAP = mean arterial pressure

[2] Consider target SBP < 180 mmHg for patients with prior history of hypertension or target SBP < 140 mmHg for patients with no history of hypertension

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APPENDIX D: Hemostatic Defect

Hemostatic Finding	Recommended Treatment	
• Disseminated Intravascular Coagulation (DIC) • Hepatic dysfunction	Fresh frozen plasma (10-15 mL/kg) with ideal recovery would raise factor levels 15-20%	Target INR ≤ 1.3
Vitamin K deficiency	Vitamin K 10 mg IV at 1 mg/minute daily	
Fibrinogen < 150 mg/dL	Cryoprecipitate 1 unit/5 kg up to a total dose of 10 units (target fibrinogen: ≥ 150 mg/dL)	
Congenital Factor VII deficiency	Recombinant Factor VII activated 15-30 mcg/kg every 4-6 hours (not recommended for spontaneous ICH without Factor VII deficiency or oral anticoagulant reversal). Dose ranges from 10-90 mcg/kg based on indication and severity of bleeding.	
Factor VIII deficiency (Hemophilia A)	• Each Factor VIII unit raises plasma Factor VIII levels by 2% [50 units/kg used to raise levels to 100% (80-100 international units/dL)] • Target Factor VIII activity level of 100 international units/dL and maintain level of 50% for 7-10 days (a variety of Factor VIII products are available)	
Factor IX deficiency (Hemophilia B)	• Each Factor IX unit raises plasma Factor IX levels by 1% [100 units/kg used to raise levels to 100% (60-80 international units/dL)] • Target Factor IX activity level of 100 international units/dL and maintain level of 50% for 7-10 days (a variety of Factor VIII products are available)	
Von Willebrand Disease	Target von Willebrand Ristocetin Cofactor (VWF:RCo) and Factor VIII activity levels of 100 international units/dL and maintain levels of 50% for 7-10 days. Use Humate-P® or Alphanate®, begin 40-60 international units/kg.	
Thrombocytopenia	Ideal target platelet count of 100 K/microliter in patients who are not refractory to platelets. Each unit transfused should increase platelet count by 5-10 K/microliter.	

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APPENDIX E: Reversal of Anticoagulants

Anticoagulant	Recommended Treatment	
Warfarin	• Administer prothrombin complex concentrate IVPB for severe or life threatening bleeding based on INR and actual body weight: **INR** / **Dosage** / **Maximum Dose** 2-3.9 / 25 units/kg / 2500 units 4-6 / 35 units/kg / 3500 units > 6 / 50 units/kg / 5000 units • Add vitamin K 10 mg IV at 1 mg/minute	Target INR ≤ 1.3
Low molecular weight heparins	• Administer 1 mg of protamine IV for every 100 units of dalteparin or 1 mg of enoxaparin given within the previous 8 hours • Administer 0.5 mg of protamine IV for every 100 units of dalteparin or 1 mg of enoxaparin given within the previous 8 to 12 hours • Single dose should not exceed 50 mg • Consider coagulation factor VIIa recombinant 20 mcg/kg IV times one	
Heparin	• Administer 1 mg of protamine IV for every 100 units of IV heparin given over the previous 2.5 hours • Consider repeat dosing if continued bleeding or a prolonged aPTT	
Dabigatran	• Administer activated charcoal 25-50 grams oral or nasogastric tube times one dose if ingested within the previous 2 hours • For life-threatening bleed or need for emergency surgery, administer idarucizumab 2.5 grams IV times two doses • Consider repeated dose of idarucizumab if after several hours the patient re-bleeds or has worsening coagulopathy • Consider hemodialysis for life-threatening bleeds	
Apixapan or rivaroxaban	• Administer activated charcoal 25-50 grams oral or per nasogastric tube times one dose if ingested within the previous 2 hours • Administer low dose andexanet alfa with 400 mg IV bolus followed by continuous infusion of 4 mg/minute up to 2 hours for the following indications: ◦ Last dose of rivarobaxan ≤ 10 mg regardless of timing ◦ Last dose of rivarobaxin > 10 mg taken 8 hours or longer prior to presentation ◦ Last dose of apixaban ≤ 5 mg regardless of timing ◦ Last dose of apixaban > 5 mg taken 8 hours or longer prior to presentation • Administer high dose andexanet alfa with 800 mg IV bolus followed by continuous infusion of 8 mg/minute up to 2 hours for the following indications: ◦ Last dose of rivarobaxan > 10 mg or unknown taken within the previous 8 hours or unknown ◦ Last dose of apixaban ≤ 5 mg or unknown taken within the previous 8 hours or unknown	

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APPENDIX E: Reversal of Anticoagulants - continued

Anticoagulant	RECOMMENDED TREATMENT
Edoxapan or betrixaban	• Administer activated charcoal 25-50 grams oral or nasogastric tube times one dose if ingested within the previous 2 hours • For life severe or life-threatening bleeding, administer prothrombin complex concentrate 25-50 units/kg IVPB (maximum dose 5000 units) based on actual body weight up to 100 kg • Consider using ideal weight for obese patients
Fondaparinux	• Administer prothrombin complex concentrate 25-50 units/kg IVPB (maximum dose 5000 units) based on actual body weight up to 100 kg • Consider coagulation factor VIIa recombinant 20 mcg/kg IV times one

SUGGESTED READINGS

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