

*****NEW*** Treatment and Referral Guidelines for High-Risk and Intermediate-Risk Pulmonary Embolism in Adult Patients**

The provincially approved ***Provincial Clinical Practice Guideline: Treatment and Referral Guidelines for High-Risk and Intermediate-Risk Pulmonary Embolism in Adult Patients*** is being implemented to establish practice standards and guidance for identifying and managing patients and consulting the Pulmonary Embolism Response Team (PERT) across the province. **This clinical practice is taking effect immediately.**

Highlights of PERT

- ❖ **Inclusion Criteria:** patients with high-risk pulmonary embolism (PE) and intermediate risk PE with and without high-risk features, see page 2.
- Exclusion Criteria:** patients with low-risk PE that are hemodynamically stable and show no clinical evidence of cardiac dysfunction.
- ❖ Consult PERT for all high risk (massive) PE and intermediate risk PE (submassive) PE with high-risk features. **DO NOT DELAY alteplase (tissue plasminogen activator (tPA)) administration in high risk PE patients without contraindications while awaiting PERT consult.**
 - **For HSC, St. Boniface, Grace and Brandon Hospitals:** activate PERT by contacting the site ICU on-call attending physician.
 - **For Urgent Care Centres and all other sites (i.e. outside Winnipeg):** activate PERT by contacting the ICU Provincial On-Call Attending Physician (POAP) via Shared Health - HSC paging (204) 787-2071.
- ❖ Review guideline for classification of high risk and intermediate risk PE, as well as high risk features
- ❖ Review guideline for absolute contraindications and relative contraindications to thrombolytics.
- ❖ Review guideline for alteplase (tPA) dosing. If a patient is receiving unfractionated heparin (UFH) infusion, stop heparin infusion before the administration of systemic thrombolysis. A prior dose of low molecular weight heparin (LMWH) is not a contraindication to tPA.
- ❖ Review guideline for anticoagulation dosing. Take note of the following:
 - Twice a day (BID) dosing of low-molecular weight heparin for certain patients with intermediate risk PE;
 - Direct oral anticoagulants (DOAC) should generally be avoided in the acute treatment of high risk and intermediate risk PE until they have stabilized.
- ❖ Advanced therapy requires PERT consultation and is based on applied clinical judgement within individual circumstances: interventional radiology (mechanical thrombectomy), cardiac surgery, and half-dose thrombolytics.
- ❖ Review guideline for management of life-threatening hemorrhage post thrombolytics.

Please refer to ***Provincial Clinical Practice Guideline: Treatment and Referral Guidelines for High-Risk and Intermediate-Risk Pulmonary Embolism in Adult Patients*** for more detailed information, available here: <https://healthproviders.sharedhealthmb.ca/projects-standards-and-guidelines/>.

For any questions, please contact, Jodi Walker-Tweed, Emergency/Trauma & Critical Care Provincial Service Lead at jwalkertweed@sharedhealthmb.ca

Acute Pulmonary Embolism Algorithm*

Box 1. High Risk (massive) Pulmonary Embolism Criteria:

- CARDIAC ARREST;
- Systolic blood pressure (SBP) LESS than 90 mmHg for GREATER than 15 min;
- SBP drop GREATER than 40 mmHg from baseline;
- Vasopressors required;
- Cardiogenic shock;
- Persistent bradycardia heart rate (HR) LESS than 40.

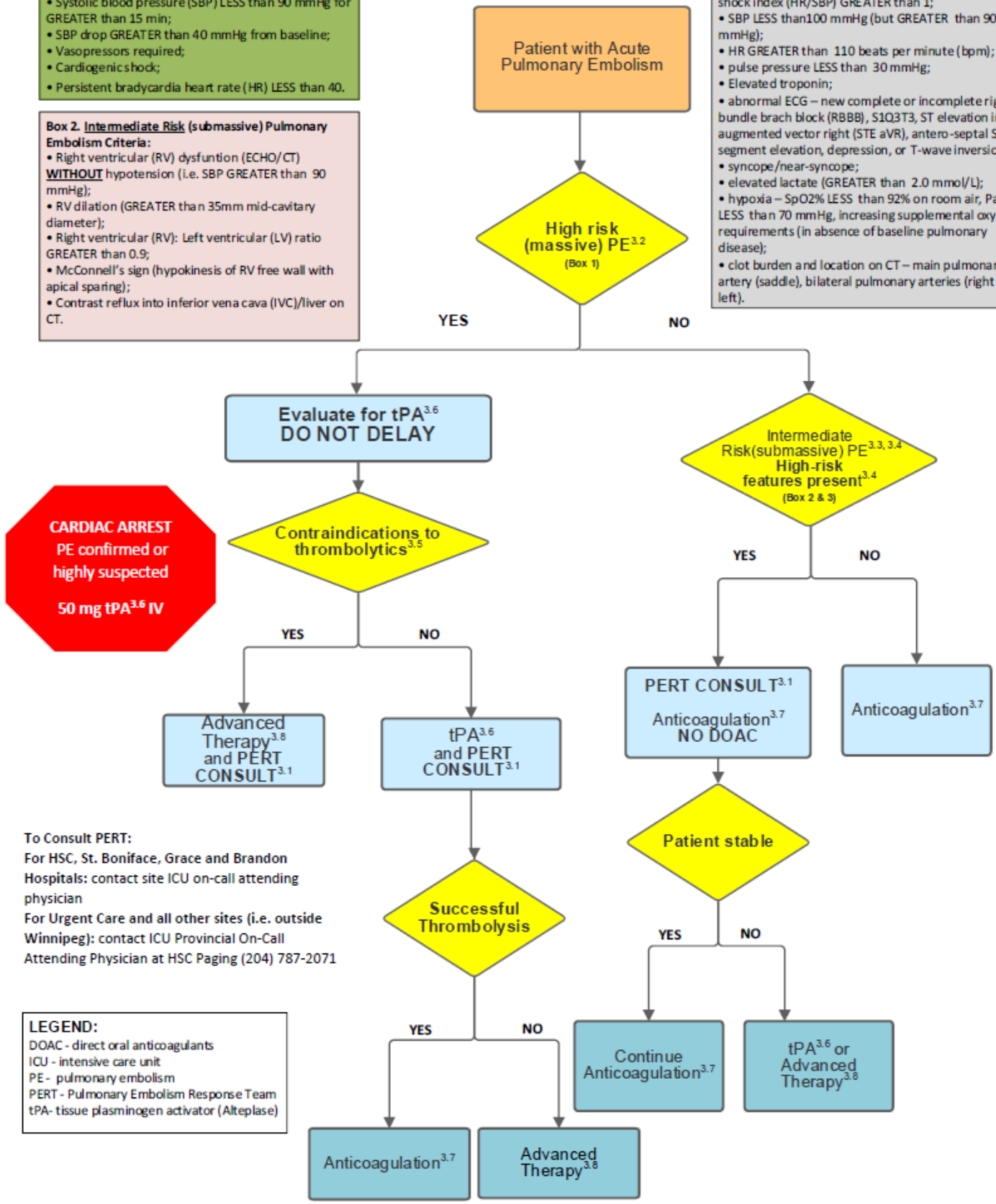
Box 2. Intermediate Risk (submassive) Pulmonary Embolism Criteria:

- Right ventricular (RV) dysfunction (ECHO/CT) **WITHOUT** hypotension (i.e. SBP GREATER than 90 mmHg);
- RV dilation (GREATER than 35mm mid-cavitary diameter);
- Right ventricular (RV): Left ventricular (LV) ratio GREATER than 0.9;
- McConnell's sign (hypokinesis of RV free wall with apical sparing);
- Contrast reflux into inferior vena cava (IVC)/liver on CT.

Box 3. Intermediate Risk (submassive) Pulmonary Embolism With High-Risk Features Criteria:

RV dysfunction as in Box 2 **PLUS ANY** of the following:

- shock index (HR/SBP) GREATER than 1;
- SBP LESS than 100 mmHg (but GREATER than 90 mmHg);
- HR GREATER than 110 beats per minute (bpm);
- pulse pressure LESS than 30 mmHg;
- Elevated troponin;
- abnormal ECG – new complete or incomplete right bundle branch block (RBBB), S1Q3T3, ST elevation in augmented vector right (STE aVR), antero-septal ST-segment elevation, depression, or T-wave inversion;
- syncope/near-syncope;
- elevated lactate (GREATER than 2.0 mmol/L);
- hypoxia – SpO2% LESS than 92% on room air, PaO2 LESS than 70 mmHg, increasing supplemental oxygen requirements (in absence of baseline pulmonary disease);
- clot burden and location on CT – main pulmonary artery (saddle), bilateral pulmonary arteries (right and left).



To Consult PERT:
 For HSC, St. Boniface, Grace and Brandon Hospitals: contact site ICU on-call attending physician
 For Urgent Care and all other sites (i.e. outside Winnipeg): contact ICU Provincial On-Call Attending Physician at HSC Paging (204) 787-2071

LEGEND:
 DOAC - direct oral anticoagulants
 ICU - intensive care unit
 PE - pulmonary embolism
 PERT - Pulmonary Embolism Response Team
 tPA - tissue plasminogen activator (Alteplase)

*From Provincial Clinical Practice Guideline: Treatment and Referral Guidelines for High-Risk and Intermediate-Risk Pulmonary Embolism in Adult Patients