Jefferson
Philadelphia University + Thomas Jefferson University

CDU PATHWAY 2.0

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Pathways Development

- EM Cardiology Intermediate risk Chest pain
- EM Ortho Post op infection
- EM Ortho Post op pain
- EM Ortho Post op DVT
- EM Hepatology Refractory Ascites - Paracentesis
- EM Hematology Sickle cell vaso-occlusive crisis
- EM GI Chronic abd pain
- EM GI Low risk GIB – AIMS 65 score 0-1
- EM Neurology TIA – ABCD2 score 0-3
- EM Neurology Headache
- EM Atrial fibrillation - CHA2DS2-VASC score 0-3
- EM Low Risk PE - sPESI score 0
- EM Bariatric Post-op dehydration
- EM Spine Back pain
- EM Opioid MAT
- EM Psychosis
- EM Trauma
- EM Low Risk PTX
- EM Low Risk TBI – BIG 1 Criteria

CDU Pathway 2.0 and EBM

- EM GI Low risk GIB – AIMS 65 score 0-1
- EM Neurology TIA – ABCD2 score 0-3
- EM Neurology Headache
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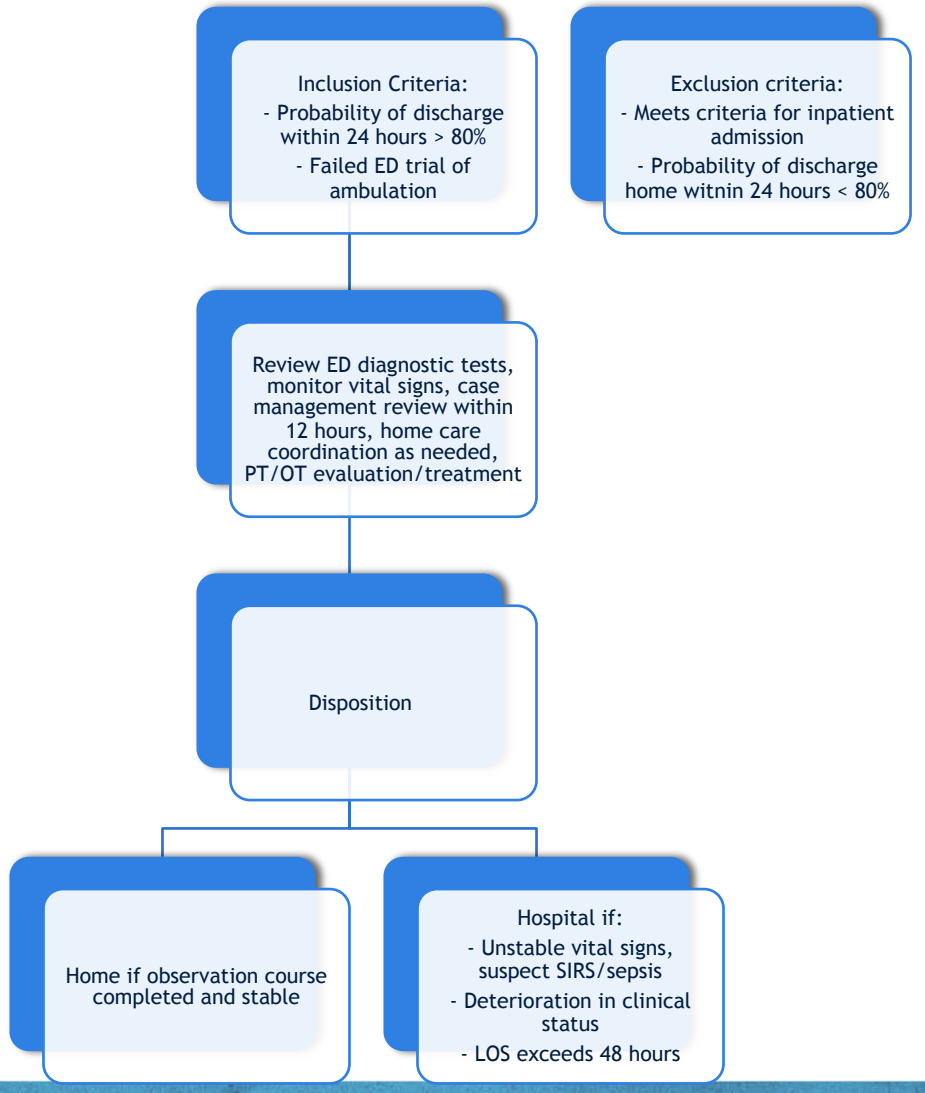
EM Primary Ambulatory Dysfunction Pathway



EM Ortho Post op infection/pain/DVT

INCLUSION CRITERIA
Probability of discharge within 24hrs >80%
Orthopedic consult in ED and Ortho Fellow/Attending evaluation within 12hours of arrival

EXCLUSION CRITERIA
2+ SIRS criteria
Complicated deep infection requiring OR washout

TYPICAL OBSERVATION INTERVENTION
Monitor VS
Laboratory tests
Elevation of extremity
Mark area of involvement
Antibiotics
Analgesia
Serial exams
Imaging as indicated
Discussion with ortho nurse and/or clinical navigator to ensure follow up
Case management review within 12hrs

DISPOSITION

Home
Observation course stable
Clinical improvement
Tolerating medications
Follow up arranged

Hospital
Change in clinical status
Progression to complex infection requiring OR
SIRS/Sepsis
Meets criteria for inpatient admission
Expected >23hrs

EM Hematology Sickle cell vaso-occlusive crisis

INCLUSION CRITERIA
Probability of discharge within 14hours >80%
Patient enrolled in TJUH Sickle Cell Program

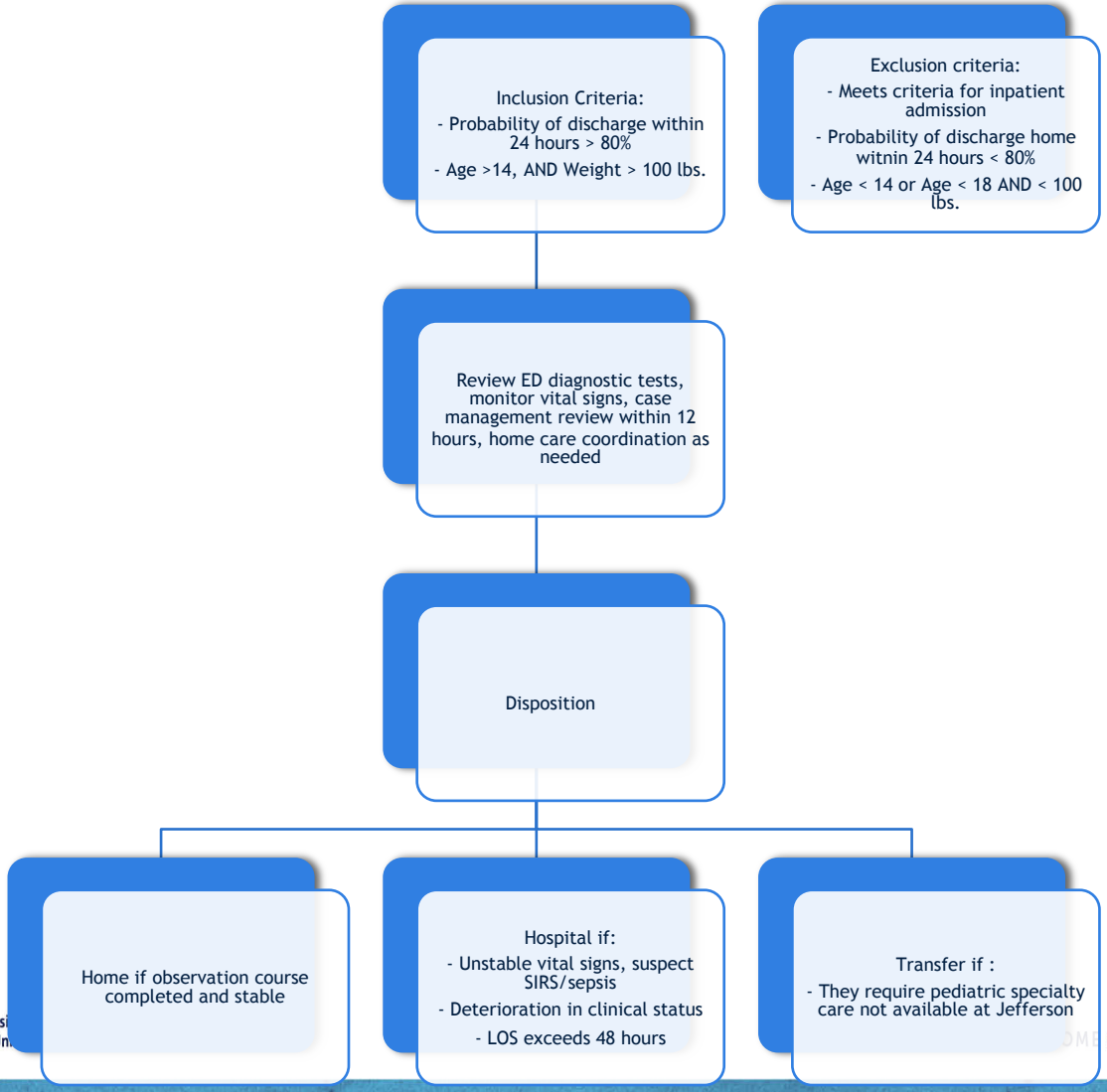
EXCLUSION CRITERIA
Meets criteria for inpatient admission
Fever, pregnancy, concern for Acute Chest Syndrome
Probability of discharge home within 24-48 hours < 80%

TYPICAL OBSERVATION MANAGEMENT
Initiate individualized pain pathway
Monitor vital signs
Case management review within 12 hours
Home care coordination as needed

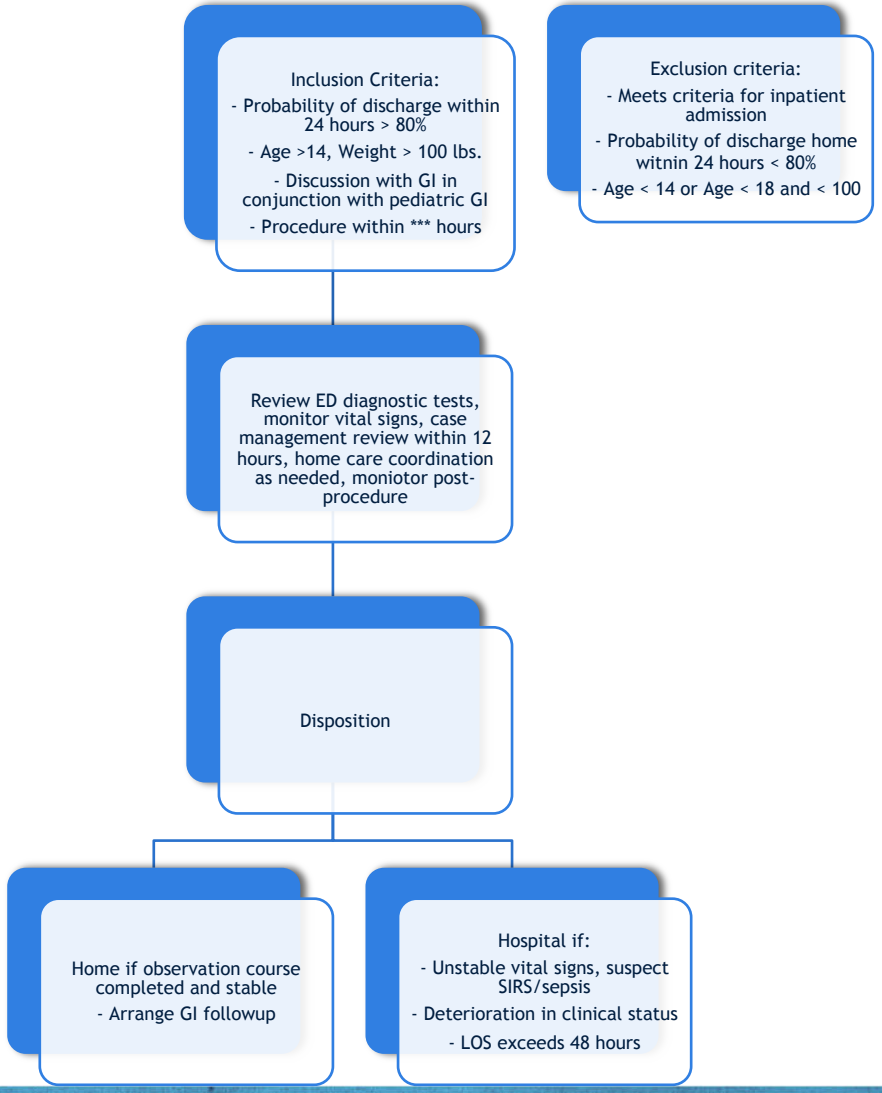
DISPOSTITION
Home
Observation course completed and stable

Hospital
Unstable vital signs, suspect SIRS/sepsis
Deterioration in clinical status
LOS exceeds 14hours

EM Pediatric Pathway



EM Peds GI ERCP Pathway



EM GI Low risk GIB

INCLUSION CRITERIA
History of melena in 24-48hours
Bright red rectal bleeding requiring urgent GI eval
GI consultation for endoscopy/colonoscopy
Rectal exam performed and consistent with GIB
Probability of discharge within 24hours >80%

EXCLUSION CRITERIA
Meets criteria for inpatient admission
Probability of discharge home within 24 hours < 80%
Unstable vital signs
Related syncope
Active massive bleeding requiring IR consultation
Concern for ischemic bowel
Signs of cardiac ischemia
AIMS65 Score >2

TYPICAL OBSERVATION MANAGEMENT
Review ED diagnostic tests, labwork, imaging
Monitor vital signs - Q2 hours X2, then Q4hrs
Serial CBCs, T&S
IVFs
PPI bolus and drip
NPO
Hold antiplatelets, AC, and cardioactive medications
Endoscopy/colonoscopy prep
GI final recommendations
Case management review within 12 hours
Home care coordination as needed

DISPOSTITION
Home
Observation course completed and stable
CBC stable
If endoscopy - no active bleeding, and follow-up arranged on PPI

Hospital
Unstable vital signs, suspect SIRS/sepsis
Deterioration in clinical status
Continual decrease in CBC
Active bleeding by endoscopy
LOS exceeds 48hours

AIMS65 Score

Variable	Score
Albumin <3 g/dL	1
INR >1.5	1
Systolic BP <90 mmHg	1
Altered Mental Status	1
Age >65 yr	1

Scores >2 are considered high risk

EM Hepatology Refractory Ascites - Paracentesis

Inclusion Criteria:
Probability of discharge within 24 hours > 80%
History of cirrhosis and refractory ascites in need of large volume paracentesis
Time of ER assessment from Sunday evening through Friday morning (i.e. access to U/S guided paracentesis within 12 hours of being seen)
Hepatology fellow consult in ED with attending evaluation within 12 hours of arrival

Exclusion Criteria:
Presence of hepatic encephalopathy (Stage 2 or greater: presence of asterixis and disorientation)
New acute kidney injury (creatinine > 0.3mg/dL above baseline or > 1.5x above baseline)
Presence of fever (Temp > 38.5°C/101.3°F)
New/initial episode of ascites

Typical observation intervention:
Weigh patient
Monitor VS
Laboratory tests: CBC/diff, CMP, PT/PTT/INR, blood type and cross
Ultrasound-specials consult for large volume paracentesis
Pre-LVP transfusion with platelets (if count < 50,000) and FFP (if INR > 2): per radiology recommendations
Fluid analysis: cell count with diff, culture, albumin, total protein

Post-paracentesis: replace ascites volume removed:
- < 4L removed: no albumin replacement
- 4-5 L removed: 25g 25% albumin (two 50cc bottles)
- 5-7 L removed: 50g 25% albumin (four 50cc bottles)
- 7-9 L removed: 62.5g 25% albumin (five 50cc bottles)
- > 9L removed: 75g 25% albumin (six 50cc bottles)

Case management review within 12 hours

Disposition:
Home
Observation course stable
Paracentesis results show no evidence of SBP
Follow-up arranged in hepatology clinic

Hospital
SBP diagnosed (ascites absolute neutrophil count > 250)
> 100,000 RBC's in ascites or procedure-related complications
Post-procedure hypotension unresponsive to IV albumin resuscitation or new-onset encephalopathy
LOS exceeds 23 hours

EM Neurology TIA

INCLUSION CRITERIA
Probability of discharge within 24hours >80%
Neuro consultation notified in ED with Neuro Fellow/Attending evaluation within 12hours of arrival
$ABCD^2$ score 0-3

EXCLUSION CRITERIA
tPA given
Meets criteria for inpatient admission
Suspected acute CVA
$ABCD^2$ score greater than 3
Hypertensive crisis requiring IV antihypertensives
Concern for worsening neurological exam
Motor deficit or cortical symptoms
Newly depressed level of consciousness
Probability of discharge home within 24 hours < 80%

TYPICAL OBSERVATION MANAGEMENT
Review ED diagnostic tests, labwork, imaging
Monitor vital signs
Telemetry
Neuro checks every 4hours
CT/MRI/MRA as indicated
Echocardiogram + bubble (PFO)
Carotid dopplers as indicated
Antiplatelet therapy as indicated
Neuro consultation completion
Case management review within 12 hours
Home care coordination as needed

DISPOSITION
Home
Observation course completed and stable
Stable or improved neurologic exam

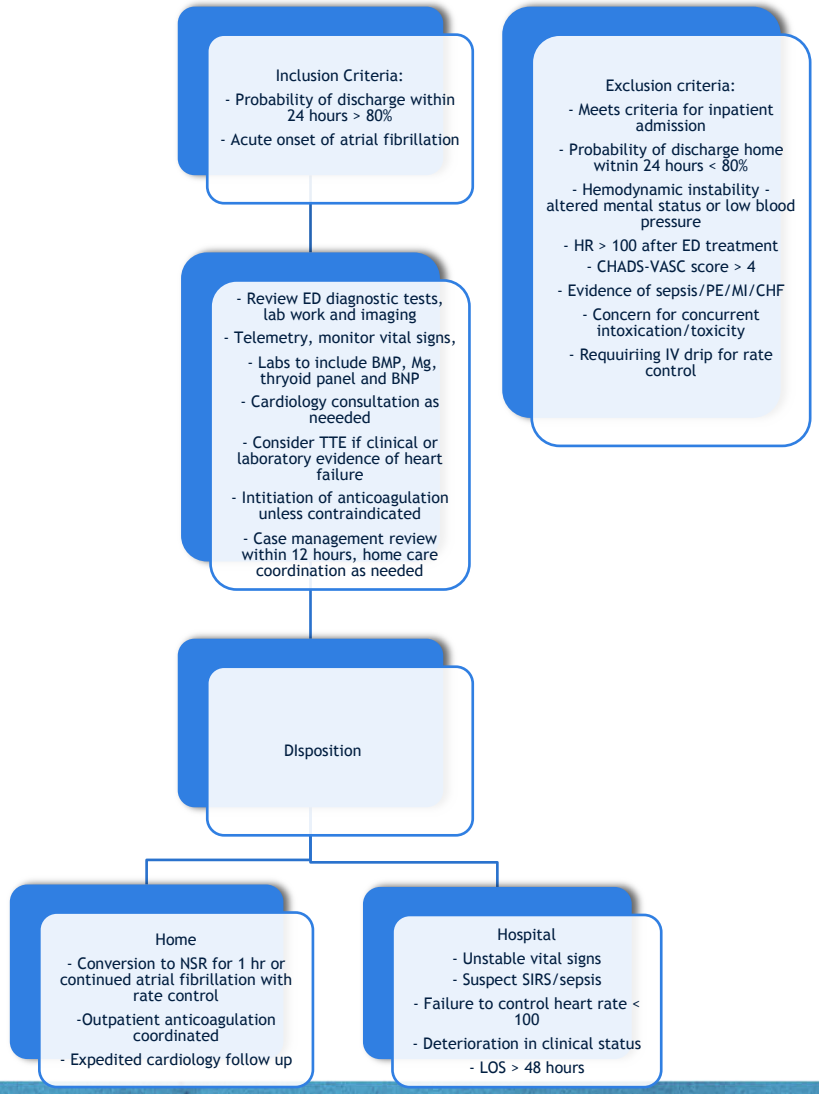
Hospital
Abnormal imaging requiring hospitalization
Unstable vital signs, suspect SIRS/sepsis
Deterioration in neurologic exam
$ABCD^2$ score greater than 3
LOS exceeds 48hours

$ABCD^2$ Tool [4]

A	AGE: ≥ 60 years (1 point)
B	BLOOD PRESSURE: systolic ≥140 mmHg or diastolic ≥90 mmHg (1 point)
C	CLINICAL FEATURES: any unilateral weakness (2 points), speech impairment without weakness (1 point)
D	DURATION: ≥60mins (2 points), 10-59 mins (1 point)
D	DIABETES (1 point)

$ABCD^2$ Tool interpretation[5]: >4 = HIGH risk; ≤4 = LOW risk (max = 7)

EM Atrial fibrillation



CHA_2DS_2-VASc for Atrial Fibrillation Stroke Risk	
Congestive heart failure or left ventricular systolic dysfunction	+1
Hypertension history	+1
Age ≥ 75 years	+2
Diabetes history	+1
S$_2$troke, TIA, Thromboembolism history	+2
Vascular disease history	+1
Age 65-74 years	+1
Sex **c**ategory (female)	+1

Score	Rate of Thromboembolic Event (per year)	
0	1.9%	Low
1	2.8%	Moderate
2	4%	Moderate
3	5.9%	High
4	8.5%	High
5	12.5%	High
6	18.2%	High

Score	Risk	Anticoagulation Therapy Considerations
0	Low	None recommended or clinical judgement
1	Low-moderate	Consider antiplatelet or anticoagulation
≥ 2	Moderate-high	Anticoagulation candidate

EM Low Risk PE

INCLUSION CRITERIA
Probability of discharge within 24hours >80%
Imaging consistent with non-central PE
sPESI score of zero
No other contraindications to outpatient anticoagulation.
JATS consultation notified in ED with JATS evaluation within 12hours of arrival

EXCLUSION CRITERIA
Meets criteria for inpatient admission
sPESI score greater than or equal to 1
Patient not a candidate for anticoagulation due to bleeding risk.
Elevated troponin
Right heart strain on imaging
Multiple co-morbidities
Renal insufficiency defined as CrCl < 30mL/min
Inability to care for self, noncompliance, or recent lost to follow up
Pregnancy
Dementia with no caregiver present for education
Necessity for heparin gtt
Probability of discharge home within 24 hours < 80%

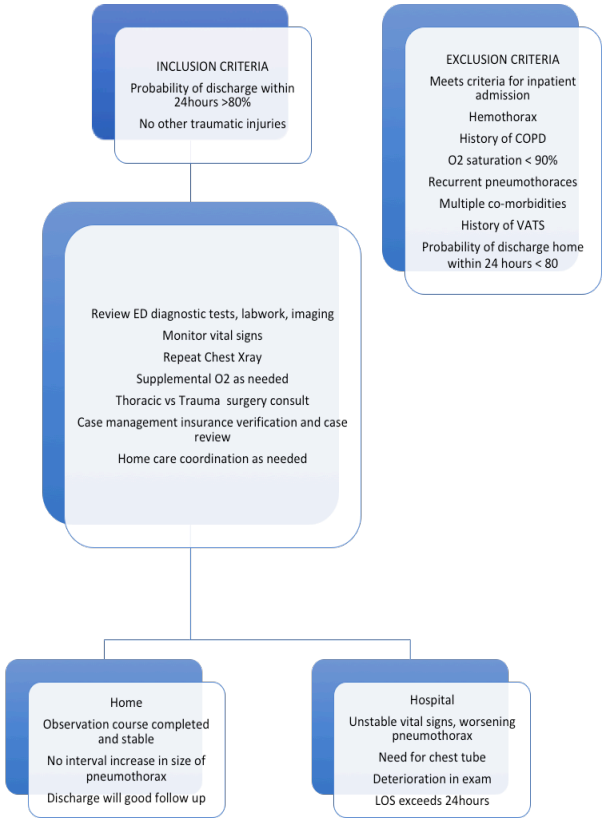
TYPICAL OBSERVATION MANAGEMENT
Review ED diagnostic tests, labwork, imaging
Monitor vital signs
Telemetry
Labs to include BMP, LFTs, Coags
TTE to evaluate for R heart strain if necessary
Initiation of outpatient DOAC regimen per JATS consultation
Anticoagulation teaching
Case management insurance verification and case review
Pharmacy verification
Home care coordination as needed

DISPOSITION
Home
Observation course completed and stable
Stable or improved exam
Anticoagulation initiated and teaching completed

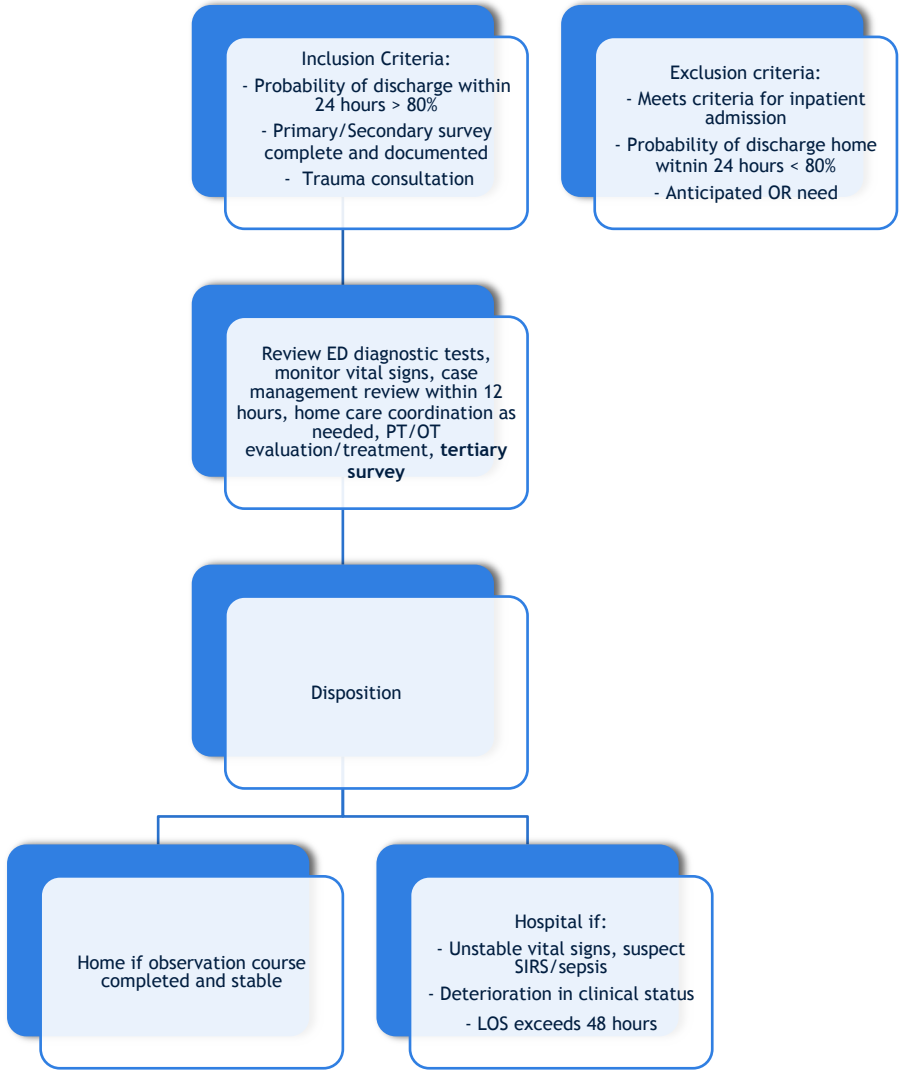
Parameter	Original version[1,14]	Simplified version[1,14]
Age	Age in years	1 point (if age >80 years)
Male sex	+10 points	–
Cancer	+30 points	1 point
Chronic heart failure	+10 points	1 point
Chronic pulmonary disease	+10 points	
Pulse rate ≥110 b.p.m.	+20 points	1 point
Systolic blood pressure <100 mm Hg	+30 points	1 point
Respiratory rate >30 breaths per minute	+20 points	–
Temperature <36 °C	+20 points	–
Altered mental status	+60 points	–
Arterial oxyhaemoglobin saturation <90%	+20 points	1 point
	Risk strata*	
	Class I: ≤65 points very low 30-day mortality risk (0–1.6%) **Class II: 66–85 points** low mortality risk (1.7–3.5%) **Class III: 86–105 points** moderate mortality risk (3.2–7.1%) **Class IV: 106–125 points** high mortality risk (4.0–11.4%) **Class V: >125 points** very high mortality risk (10.0–24.5%)	**0 points**= 30-day mortality risk 1.0% (95% CI 0.0%–2.1%) **≥1 point(s)**= 30-day mortality risk 10.9% (95% CI 8.5%–13.2%)

b.p.m. = beats per minute; PESI = Pulmonary embolism severity index.
*based on the sum of points.

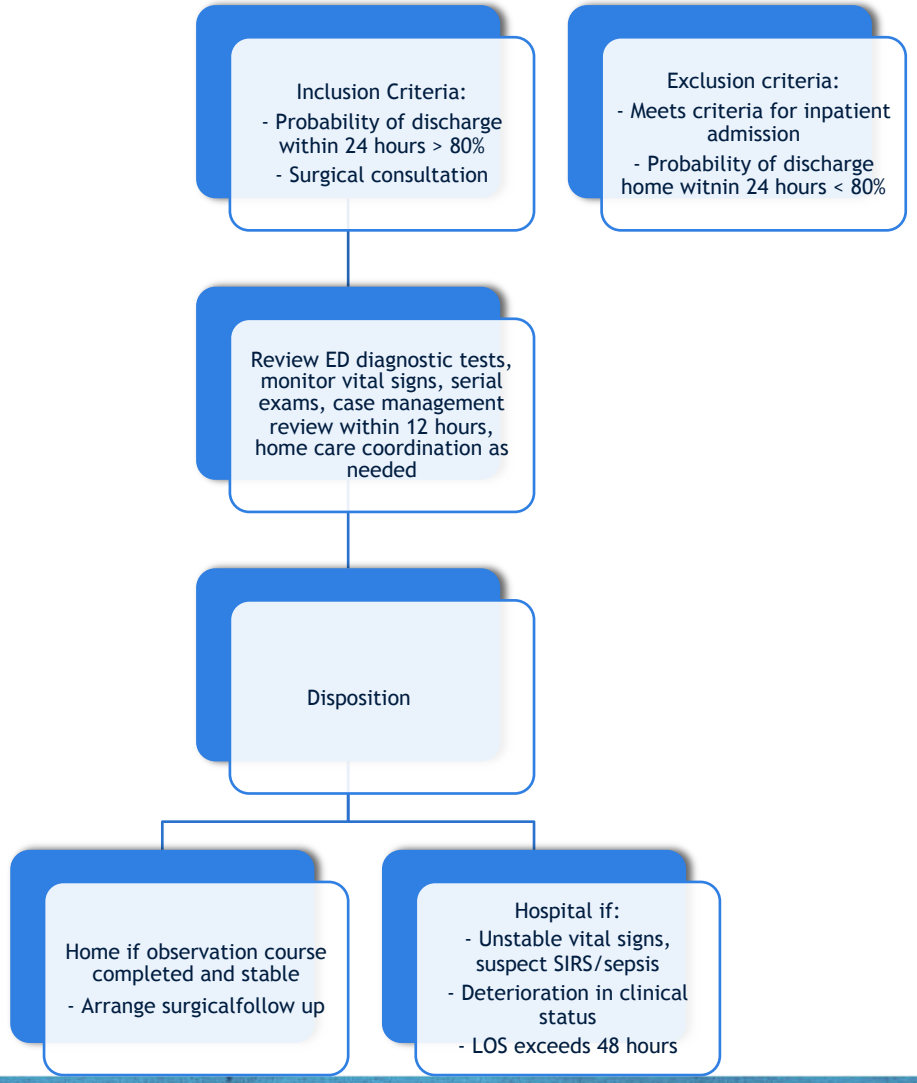
EM Low Risk PTX Pathway



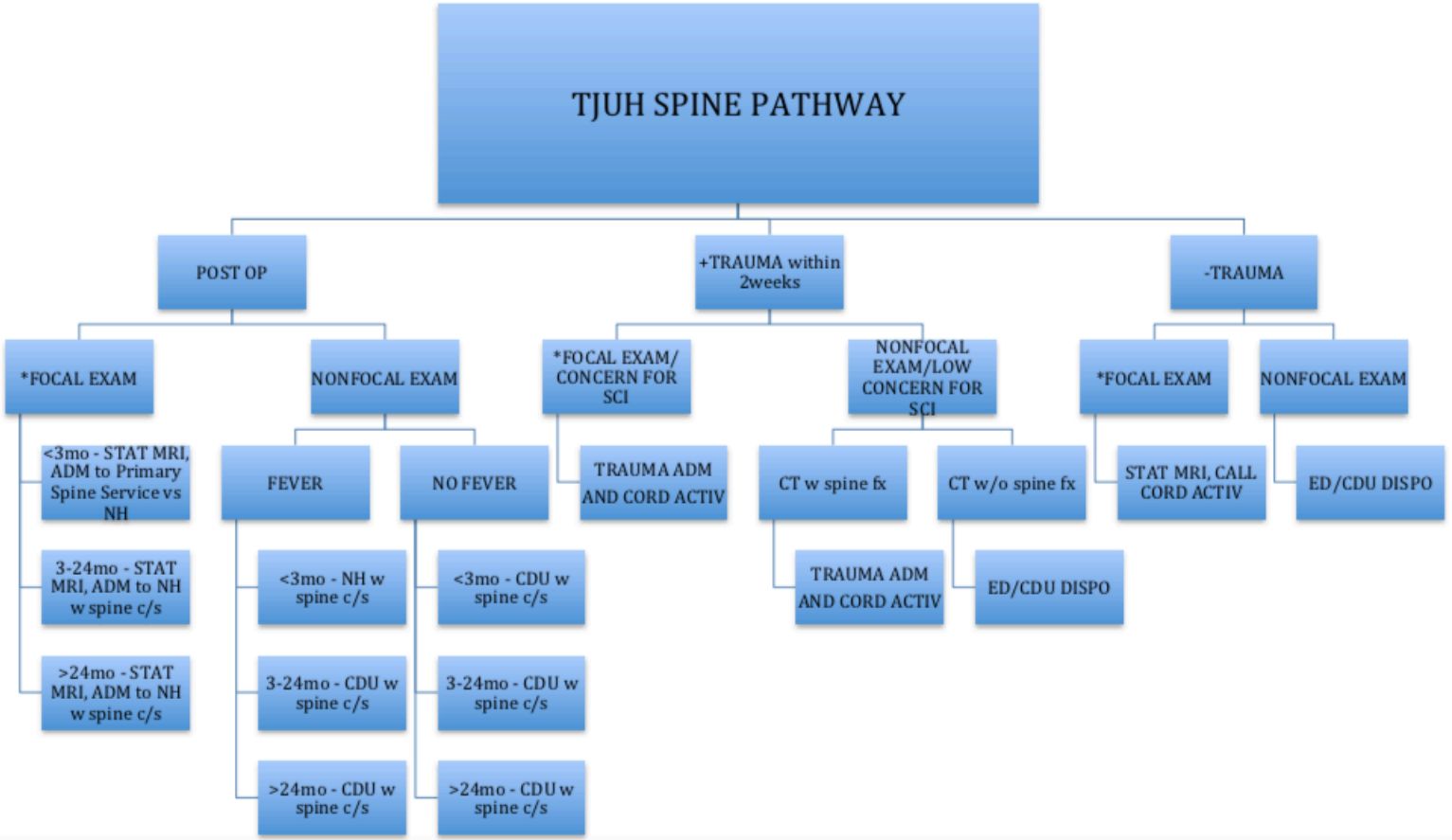
EM Trauma Pathway



EM Surgery Pre-op Pathway



EM Trauma Spine NH Spine Pathway



EM Trauma Spine NH Spine Pathway

***Focal Exam → paralysis, central focal motor weakness, spasticity, saddle anesthesia, loss of bowel/bladder function with PVR >100cc and/or decreased anal tone**

****Farber Hospitalist service -** Patients requiring a Farber neuro-hospitalist consult and/or co-management coverage (decision to be made collaboratively between orthopedic/neurosurgery attending and Farber-Hospitalist Medicine)

a. For patients placed under Farber-hospital medicine, the Farber-hospitalist will be the primary physician responsible for caring for the patient and will be listed as the attending of record in EPIC.
b. The Farber-hospitalist service is a non-teaching service.
c. Patients admitted to the Farber-Hospitalist Service within the unit include, but are not limited to:
    i. Lumbar abscess
    ii. Thoracic and cervical abscess
    iii. Osteomyelitis
    iv. Myelopathy
    v. Infection
    vi. Epidural hematoma
    vii. Stenosis

For ED transfers, PFMC to coordinate 3way call with OSH, primary spine service, NH for direct ADM vs ED transfer

The above algorithm can also be applied to ED transfers and decision-making should utilize out-side hospital advanced imaging studies when relevant

If patient is primarily known to ortho or neurosurg, call primary service. If unknown, call spine on-call provider

Unassigned post-op and/or transfer patients can also be applied to above algorithm with consultation to on-call spine instead to primary spine surgery service

EM Opioid MAT

INCLUSION CRITERIA
Probability of discharge within 24hours >80%
Age >18
History of active OUD with symptoms of intractable, acute withdrawal requiring further observation
Desire for MAT with Buprenorphine (BUP)
Opioid Counsellor contacted in the ED to facilitate warm handoff (phone number: 215-219-9661)

EXCLUSION CRITERIA
Meets criteria for inpatient admission
Patient not eligible for BUP due to allergy or severe liver disease
Concomitant alcohol or benzodiazepine dependence/abuse requiring monitored detoxification
Pregnant Patients
Use of pathway system within the last 30 days or otherwise ineligible for acute detox therapy
Concomitant, acute psychiatric emergency

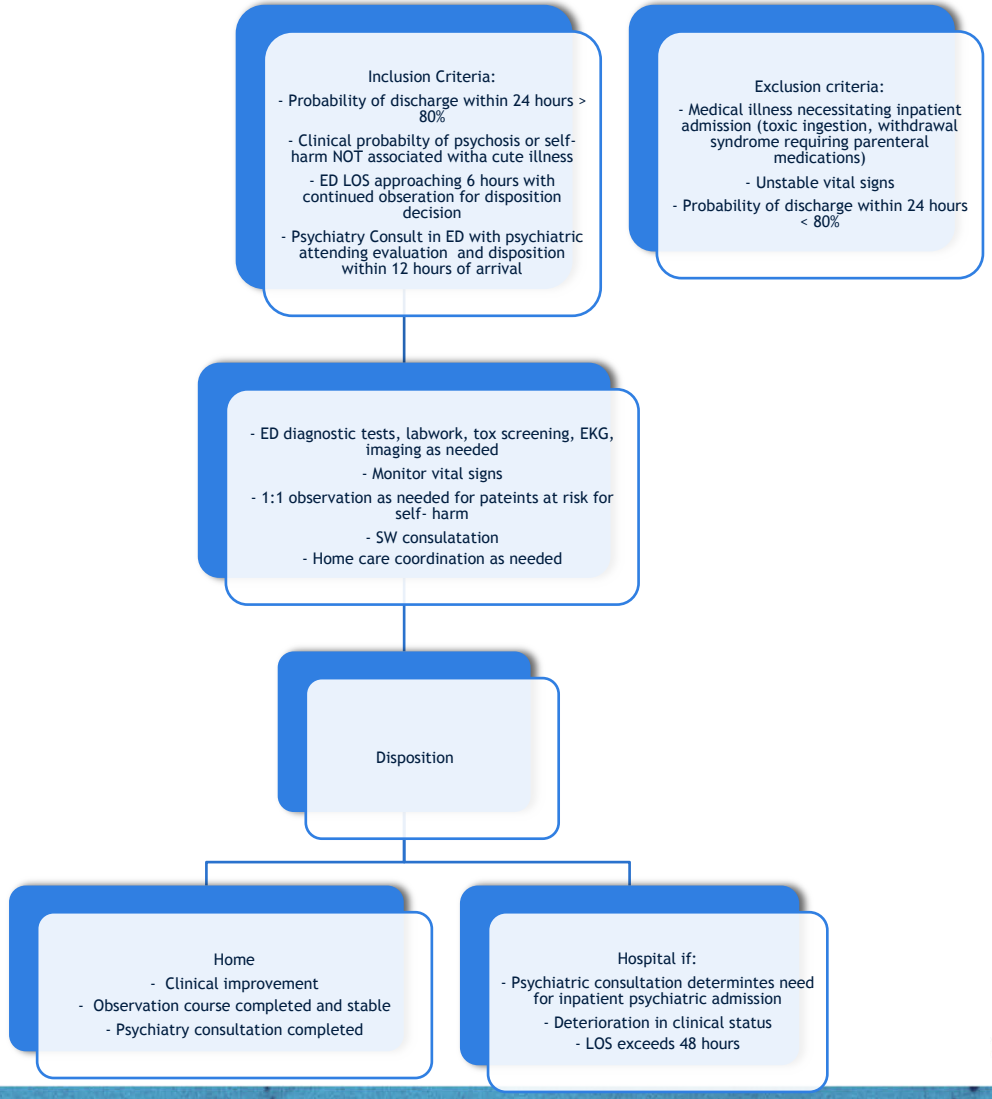
TYPICAL OBSERVATION MANAGEMENT
Review ED diagnostic tests, labwork, imaging
Progression of diet as tolerated
IV hydration as needed
Alternative symptomatic control PRN (antiemetics, antihistamines, clonidine)
Buprenorphine Initial Dosing:
- Low Tolerance/Withdrawal (COWS ≥5-12): 4mg PO Daily or 2mg PO BID
- Moderate Tolerance/Withdrawal (COWS ≥13-23): 4mg PO BID or 8mg PO Daily

High Tolerance/Withdrawal (COWS ≥24): 8mg PO BID
Buprenorphine Repeat Dosing:
If no response to initial dose, a 4mg repeat dose may be provided after 1 hour and repeat dose after 4 hours is appropriate depending on COWS/symptoms.
Maintenance dosing is typically 8-16mg/day (Daily or divided BID) in most patients, no more than 24mg/day
Serial exams to assess response to Buprenorphine
Vital signs q 4hours
Opioid Counsellor through Mary Howard Clinic or (if patient prefers due to location, CleanSlate)

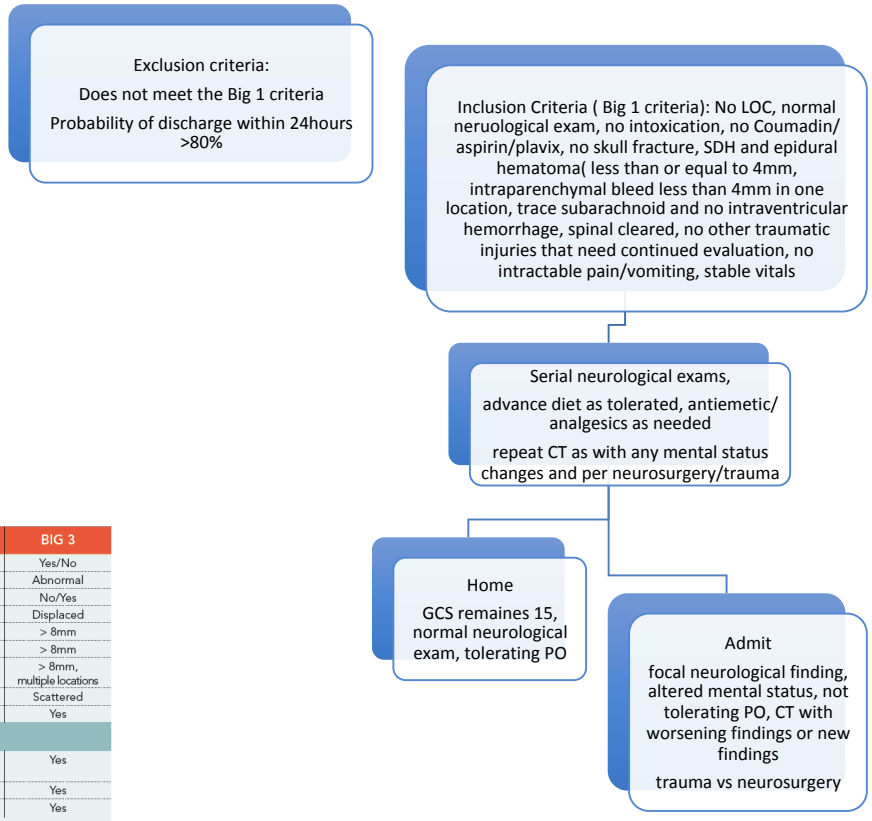
DISPOSITION
To Mary Howard/CleanSlate for warm handoff:
Observation course stable
Clinical improvement
Tolerating medications
Follow up arranged

Inpatient:
Incomplete response to Buprenorphine with persistent/severe withdrawal symptoms
Unstable vital signs, suspect sepsis or other underlying acute medical issue
Persistent PO Intolerance
LOS exceeds 48hours

EM Psychosis Pathway – ED only



EM Low Risk TBI



Variables	BIG 1	BIG 2	BIG 3
LOC	Yes/No	Yes/No	Yes/No
Neurologic examination	Normal	Normal	Abnormal
Intoxication	No	No/Yes	No/Yes
Skull Fracture	No	Non-displaced	Displaced
SDH	< 4mm	5 – 7 mm	> 8mm
EDH	< 4mm	5 – 7 mm	> 8mm
IPH	< 4mm 1 location	5 – 7 mm, 2 locations	> 8mm, multiple locations
SAH	Trace	Localized	Scattered
IVH	No	No	Yes
Therapeutic Plan			
Hospitalization	Observation (6 hours)	Yes	Yes
RHCT	No	No	Yes
NSC	No	No	Yes

BIG: brain injury guidelines: CAMP: Coumadin, Aspirin, Plavix; EDH: epidural hemorrhage; IVH: intra-ventricular hemorrhage; IPH: intra-parenchymal hemorrhage; LOC: loss of consciousness; NSC: neurosurgical consultation; RHCT: repeat head computed tomography; SAH: subarachnoid hemorrhage; SDH: subdural hemorrhage.

EM General Pathway

INCLUSION CRITERIA
Probability of discharge within 24hours >80%

EXCLUSION CRITERIA
Meets criteria for inpatient admission
Probability of discharge home within 24-48 hours < 80%

TYPICAL OBSERVATION MANAGEMENT
Review ED diagnostic tests, labwork, imaging
Monitor vital signs
Case management review within 12 hours
Home care coordination as needed

DISPOSTITION
Home
Observation course completed and stable

Hospital
Unstable vital signs, suspect SIRS/sepsis
Deterioration in clinical status
LOS exceeds 48hours