Grady, EUH, EUHM, ESJH, EJCH
hs-troponin I clinical protocol
EMERGENCY DEPARTMENT ONLY
(Beckman Coulter UniCel DxI analyzer) [1]

Version 9/2/21

SCAN ME

Acute CP / ischemic equivalent

Presenting ECG

ECG meets STEMI criteria → **Follow STEMI protocol**

New acute signs of ischemia [2] → **HIGH RISK**

No significant ST deviation

Draw 0h hs-TnI

SXS ≥ 3 hrs **&**
HEART score 0-3 **&**
0h Trop < 5 ng/L → **LOW RISK**

0h Trop ≥ 100 ng/L → **HIGH RISK**

SXS < 3 hrs; **OR**
HEART score ≥ 4; **OR**
0h Trop ≥ 5 and < 100 ng/L

Draw 1h hs-TnI

HEART score 0-6 **&**
0h Trop < 5 ng/L **&**
1h delta < 5 ng/L → **LOW RISK**

Any Trop ≥ 100; **OR**
1h delta ≥ 15 ng/L → **HIGH RISK**

HEART score ≥ 7; **OR**
0h Trop ≥ 5 ng/L and < 100 ng/L; **OR**
1h delta ≥ 5 and < 15; **OR**

Draw 3h hs-TnI

HEART score 0-6 **&**
All Trops < 15(F)/20(M) **&**
No delta[3] > 5 ng/L → **LOW RISK**

Any Trop ≥ 100; **OR**
Any delta[3] ≥ 25 ng/L → **HIGH RISK**

HEART score ≥ 7; **OR**
Any Trop ≥ 15(F)/20(M) **&**
All trops < 100 **&**
All deltas[3] < 25 ng/L

INTERMEDIATE RISK
Consider:
- Shared decision making
- OP follow-up for HEART score 0-3
- Observation and stress testing / CTA
- If hs-TnI 50-100 and high suspicion for NSTEMI, may manage as high-risk

LOW RISK
- Consider discharge and OP follow-up

HIGH RISK
Consider:
- Cardiology consult
- Admission
- Follow treatment guidelines for most likely diagnosis (Type 1 NSTEMI, Type 2 MI, or nonischemic myocardial injury)

Footnotes:
1. Beckman UniCel DxI Access analyzer "abnormal" (>99th percentile) cut points: >14.9 mg/L (women); >19.8 ng/L (men)
2. Refers to acute findings not seen on prior ECGs, and not associated with LVH, LBBB, RBBB, or early repolarization
3. "No delta", "All deltas", or "Any delta" includes 0➔1h, 1➔3h, and 0➔3h changes in hsTnI

CP chest pain; Dx diagnosis; OP outpatient; SXS symptoms

Summary of dispositions:

Discharge:

- Symptoms >3hr, initial hsTn <5, HEART score <4
- Initial hsTn <5, 1hr delta <5, HEART score 0-6
- 0, 1, 3hr hsTn normal*, all deltas <5, HEART score <7
- Intermediate risk and shared decision making chooses home with outpatient follow-up

Admit / consult:

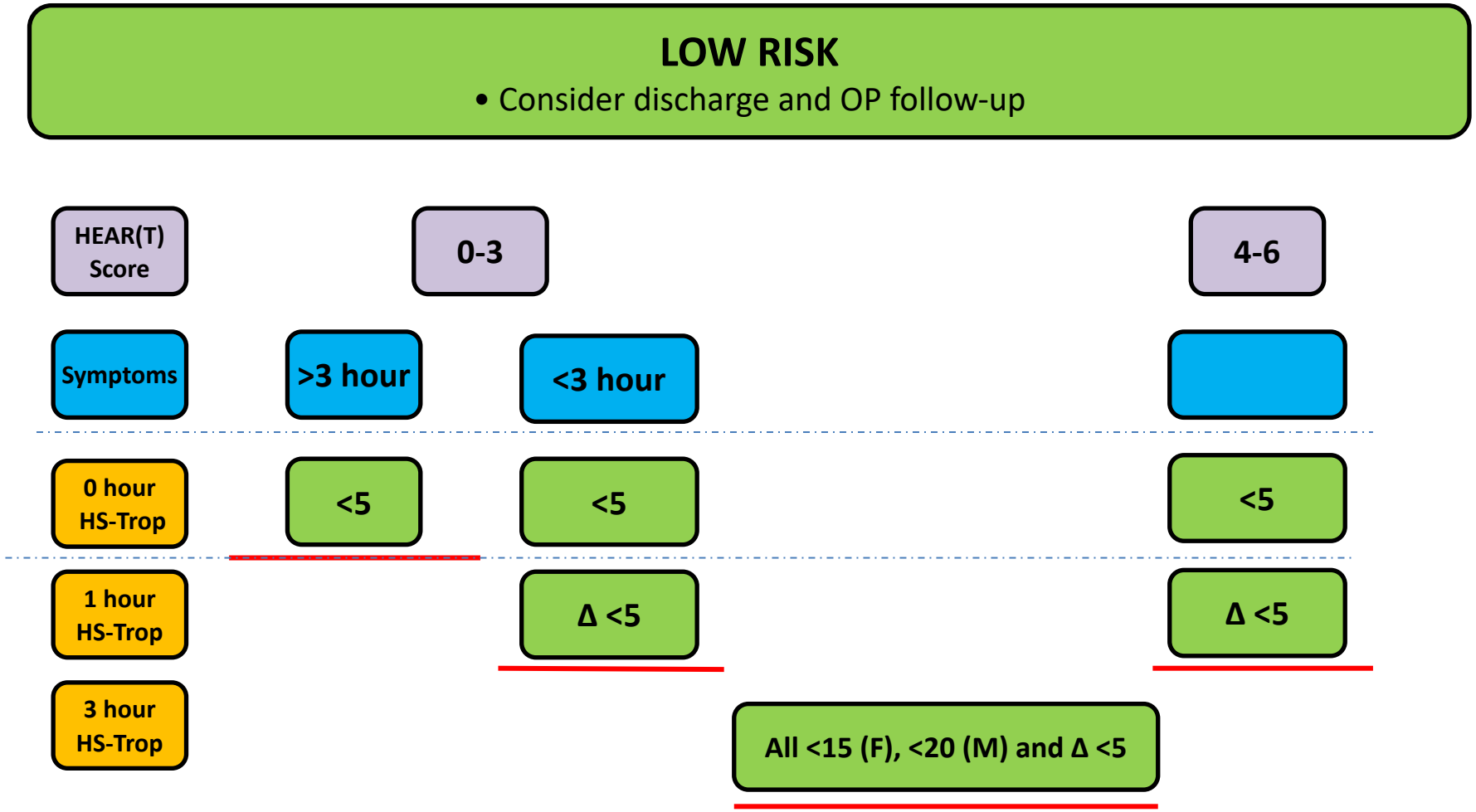
- Usual indications (STEMI, etc.)
- Any hsTn delta >25
- Any hsTn >100 (T0hr, T1hr, or T3hr)
- hsTn of 50 – 100 (indeterminate range) with high suspicion for ACS

Intermediate risk

(CDU or Shared Decision Making):

- hsTn between normal* and 50
- hsTn between normal* and 100 and low suspicion of ACS
- hsTn delta between 5 – 25 (5-15 at 1hr)
- HEART score >3 with clinical concern

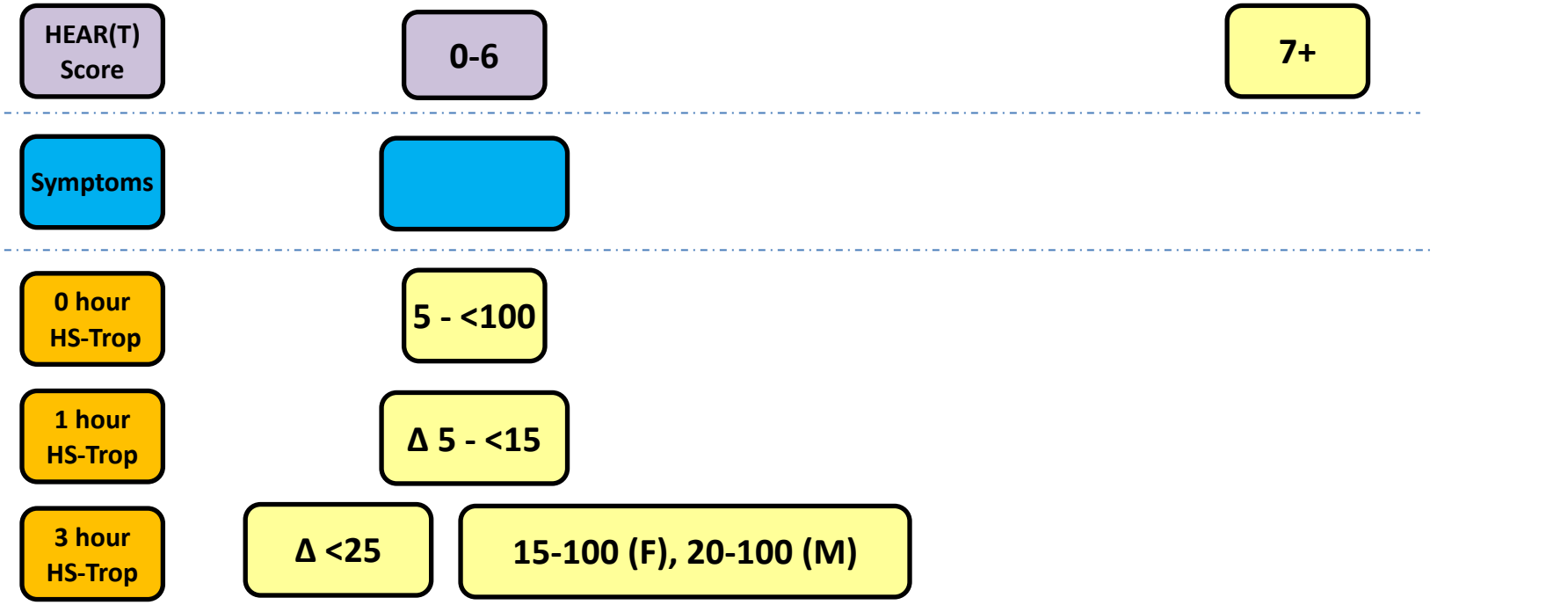
* Normal = 99%ile, sex based = <15(F) / <20(M) ng/L
hsTn levels above are in ng/L


LOW RISK
• Consider discharge and OP follow-up
HEAR(T) Score
0-3
4-6
Symptoms
>3 hour
<3 hour
0 hour HS-Trop
<5
<5
<5
1 hour HS-Trop
Δ <5
Δ <5
3 hour HS-Trop
All <15 (F), <20 (M) and Δ <5

INTERMEDIATE RISK

Consider:

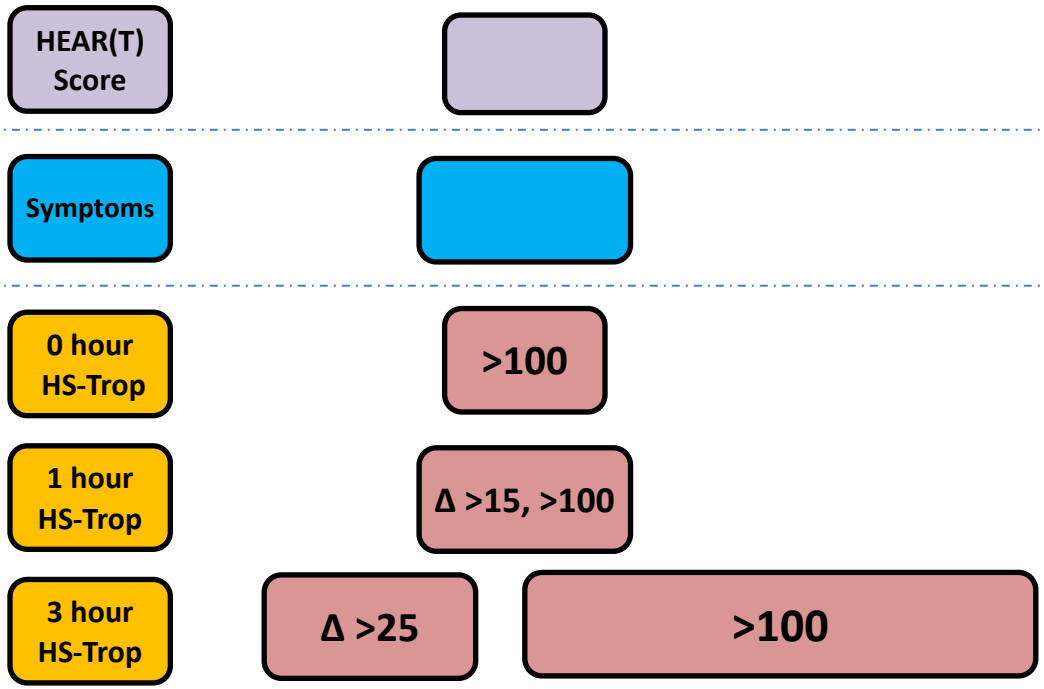
- Shared decision making
- OP follow-up for HEART score 0-3
- Observation and stress testing / CTA
- If hs-TnI 50-100 and high suspicion for NSTEMI, may manage as high-risk



HIGH RISK

Consider:

- Cardiology consult
- Admission
- Follow treatment guidelines for most likely diagnosis (Type 1 NSTEMI, Type 2 MI, or nonischemic myocardial injury



Equivalency of values: TnI vs. hs-TnI (EUH, EUHM, ESJH, EJCH, Grady) *

Note the following differences between standard troponin I and high-sensitivity troponin I (hs-TnI):

1. Units of measurement are different. hs-TnI is reported **as integers in ng/L** (whereas TnI was in ng/mL)
2. To convert from hs-TnI to standard TnI (for clinical context), **divide by 1000**. Example: hs-TnI value of 100 ng/L corresponds to a standard TnI value of 0.1 ng/mL. See table below.
3. hs-TnI has different "abnormal" cut point, (or 99th percentile value) in women and men.

standard TnI (ng/mL)	**hs-TnI** (ng/L)	**Notes**
0.0023	< 2.3	LOQ** for hs-TnI
0.015	15	99 percentile (abnormal) hs-TnI value for women
0.02	20	99 percentile (abnormal) hs-TnI value for men
0.03	30	
0.04	40	99 percentile (abnormal) standard TnI value
0.05	50	
0.1	100	
0.5	500	
1	1000	
10	10000	
25	> 25000	Highest reportable value of analytic range for hs-TnI
>70		Highest reportable value of analytic range for TnI

These TnI values are reported as < 0.03 ng/mL

* Grady, EUH, EUHM, ESJH, and EJCH use a Beckman Coulter UniCel DxI analyzer with the following "abnormal" (>99th percentile) cut points: >14.9 mg/L in women; >19.8 ng/L in men. These cut points do NOT apply for EUOSH, EDH, EHH, or ELTAC (see separate protocols for these operating units).

** LOQ: Lowest hs-TnI concentration that is reportable as a number with specified certainty

hs-TnI: high-sensitivity troponin I