"The clot thickens..."

A Case for RV Assessment

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### 32 y female G4P1A2

- Transferred to ICU post cardiac arrest
- PMH:
  - Turner's Syndrome (mosaic)
  - ASD/VSD repair



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## Case Cont'd

- Admitted 10 days previously for pregnancy termination at 24 +3
- Feticide procedure using digoxin
- Misoprostol + Ancef post procedure
- Pain throughout night...



### The Next Morning

- 0415 palpatation and dyspnea
- 0420 convulsing, unresponsive and pulseless
- First rhythm PEA
- 7 min CPR ROSC sinus tachycardia
- I+V, sedated, epi and levo both < 10 mcg/min
- HS normal, clear lungs, easy to ventilate, no signs of bleeding
- pH 7.22, CO2 38, HCO3 16, O2 358, Lactate 7.2
- HGB 129, WBC 12, plts 19, INR 5.6, APTT 60s
- Fibrinogen < 0.6





















# Utility of echo in suspected PE

#### Advantages

- Provides rapid differential diagnosis
  - PE vs other life threatening CV diseases
- May suggest diagnosis
  - Identifies indirect signs
- Risk stratification
- Guides treatment

#### Disadvantages

- High false positive rate of indirect signs in patients with underlying CPD
- Rarely detects direct signs of PE
- Operator dependent
- Patient factor dependent
- Environment dependent



# Echo signs of (Hemodynamically significant) PE



- Decreased LV size



Combination Signs \_\_\_\_60/60 sign





## McConnell's Sign

- Proposed mechanisms
  - 1. Tethering of RV apex to hyperdynamic LV
  - 2. RV may assume more spherical shape to equalize regional wall stress when subjected to increased afterload
  - 3. Localized ischemia to RV free wall due to increased wall stress





			PULMO	NARY EMI	BOLISM			TACI
I ransthoracic Echocardiography for Diagnosing								
Pulmonary Embolism: A Systematic Review and								
Meta-Analysis								JOURNAL OF THE AMERICAN
Table 2 Pooled estimates of sensitivity and specificity for transthoracic echocardiographic signs for diagnosis								ASE SOCIETY OF ECHOCARDIOGRA
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Sign	Studies	True negative	False negative	True positive	False positive	n	Sensitivity (95% CI)	Specificity (95% CI)
60/60 <sup>35,37</sup>	2	49	82	26	10	167	0.24 (0.16, 0.33)	0.84 (0.45, 0.97)
Hypokinesis <sup>24,26,28,39,44,45</sup>	6	348	153	92	34	627	0.38 (0.31, 0.44)	0.91 (0.88, 0.94)
McConnell <sup>27,28,32,35,37,39</sup>	6	372	147	42	10	571	0.22 (0.16, 0.29)	0.97 (0.95, 0.99)
PAH <sup>24,26,29-31</sup>	5	259	134	129	43	565	0.44 (0.19, 0.72)	0.84 (0.70, 0.92)
RH strain <sup>23,24,26,29-31,</sup> 33,35,37,41,43,44,46	16	886	456	487	157	1986	0.53 (0.45, 0.61)	0.83 (0.74, 0.90)
RHT <sup>26,31,34,46</sup>	4	252	157	5	0	414	0.05 (0.02, 0.09)	0.99 (0.96, 1.00)
RV:LV <sup>23,27,28,36,37,45</sup>	8	501	133	162	83	879	0.55 (0.49, 0.60)	0.86 (0.83, 0.89)
RVEDD <sup>26,37,40</sup>	4	228	40	156	49	473	0.80 (0.61, 0.92)	0.80 (0.67, 0.89)
Septal <sup>24,26,28,30,31,34,37</sup>	8	530	269	97	29	925	0.26 (0.22, 0.31)	0.95 (0.93, 0.97)
TR <sup>23,24,26,27,31,37,40</sup>	7	438	188	125	92	843	0.40 (0.35, 0.46)	0.83 (0.79, 0.86)
TAPSE <sup>27,45</sup>	2	190	35	95	62	382	0.64 (0.54, 0.73)	0.61 (0.56, 0.67)
RVSP <sup>31,45</sup>	3	110	28	48	29	215	0.47 (0.34, 0.61)	0.73 (0.65, .80)
All signs	71	4,163	1,822	1,464	598	8,047		
J Am Soc Echocardiogr 2017;30:714-23.)								

### Echocardiographic Pattern of Acute Pulmonary Embolism: Analysis of 511 Consecutive Patients

Katarzyna Kurnicka, MD, PhD, Barbara Lichodziejewska, MD, PhD, Sylwia Goliszek, MD, Olga Dzikowska-Diduch, MD, Olga Zdończyk, MD, Marta Kozłowska, MD, Maciej Kostrubiec, MD, PhD Michał Ciurzyński, MD, PhD, Piotr Palczewski, MD, PhD, Katarzyna Grudzka, MD, Marcin Krupa, MD, Marcin Koć, MD, and Piotr Pruszczyk, MD, PhD, *Warsaw, Poland* 

(J Am Soc Echocardiogr 2016;29:907-13.)

- 100% of hemodynamically unstable PE's had RV enlargement
  RV:LV > 0.9 in end diastole in the A4C view
- 100% of hemodynamically unstable PE's had at least one:
  McConnell, "60/60", and right heart thrombus

