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- 4 days ago, went to UC due to new left face paralysis & new palpitations. Denied LOC, SOB, CP, dizziness.

- At baseline, he is active (swimming), but current symptoms limit activity.

- Traveled to Pennsylvania prior to onset of symptoms; Spent time outside (woods, creeks).

- Possibly had a rash around the right axilla (resolved).

- Does not recall any tick bites.

- Vaccinated for Covid-19 in Apr and May 2021.

PMH & FH:

- none / noncontributory

SH:

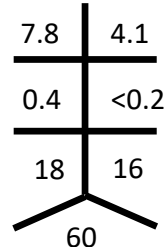
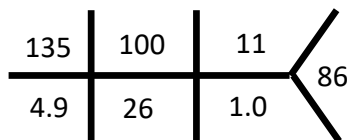
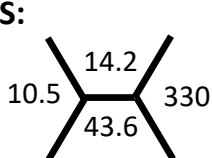
- Tobacco: denied
- EtOH: denied
- Drugs: denied

OUTPATIENT MEDS:

- none

PHYSICAL EXAM:**Tmax:** 36.4C, **BP:** 107/59, **HR:** 54, **RR:** 16, **SpO2:** 98% on RA**General:** NAD**HEENT:** Absence of left forehead wrinkle, flattening of left nasolabial fold, left mouth droop; drooling**CV:** Bradycardia, regular rhythm, no murmurs/rubs/gallops**Pulm:** CTAB, no wheezes/rhonchi/crackles**GI:** Non-distended, soft, non-tender to palpation, no masses or organomegaly**Neuro:** AOx3, moving all extremities spontaneously against gravity**Skin:** No rashes**PROBLEM REPRESENTATION:**

Young man with no significant PMH, presenting after recent travel to NE United States with subacute-chronic myalgias & headaches, acute left Bell's palsy, and acute palpitations, found to have sinus bradycardia + junctional rhythm + AV block due to...

LABS:

Troponin: <6 x2

Mono tests: negative
Covid-19: negative

Blood cultures x2: NGTD

Borrelia burgdorferi
ELISA: 4.21 (↑)
B. burgdorferi IgM:
positive
B. burgdorferi IgG:
positiveEKGSinus bradycardia with
competing junctional
rhythmTelemetrySinus bradycardia with
prolonged PR interval.
Episodes of 2:1 and 2nd
degree type 1 AV block



LYME DISEASE; ▼ LYME CARDITIS

STAGES

Stage	Onset after infection	Clinical findings
Early localized	≤ 4 weeks	EM, fever, myalgia, lymphadenopathy
Early disseminated	2 weeks – 6 months	Multiple sites of EM, flu-like symptoms, heart block, myocarditis, facial nerve palsy, meningitis, radiculopathy
Late disseminated	≥ 6 months	Recurrent large joint arthritis, neurologic symptoms (peripheral neuropathy, encephalopathy), dermatologic symptoms (acrodermatitis chronica atrophicans)
Post-Lyme disease syndrome	Years	Fatigue, arthralgia, myalgia, memory / cognition impairment



WORKUP

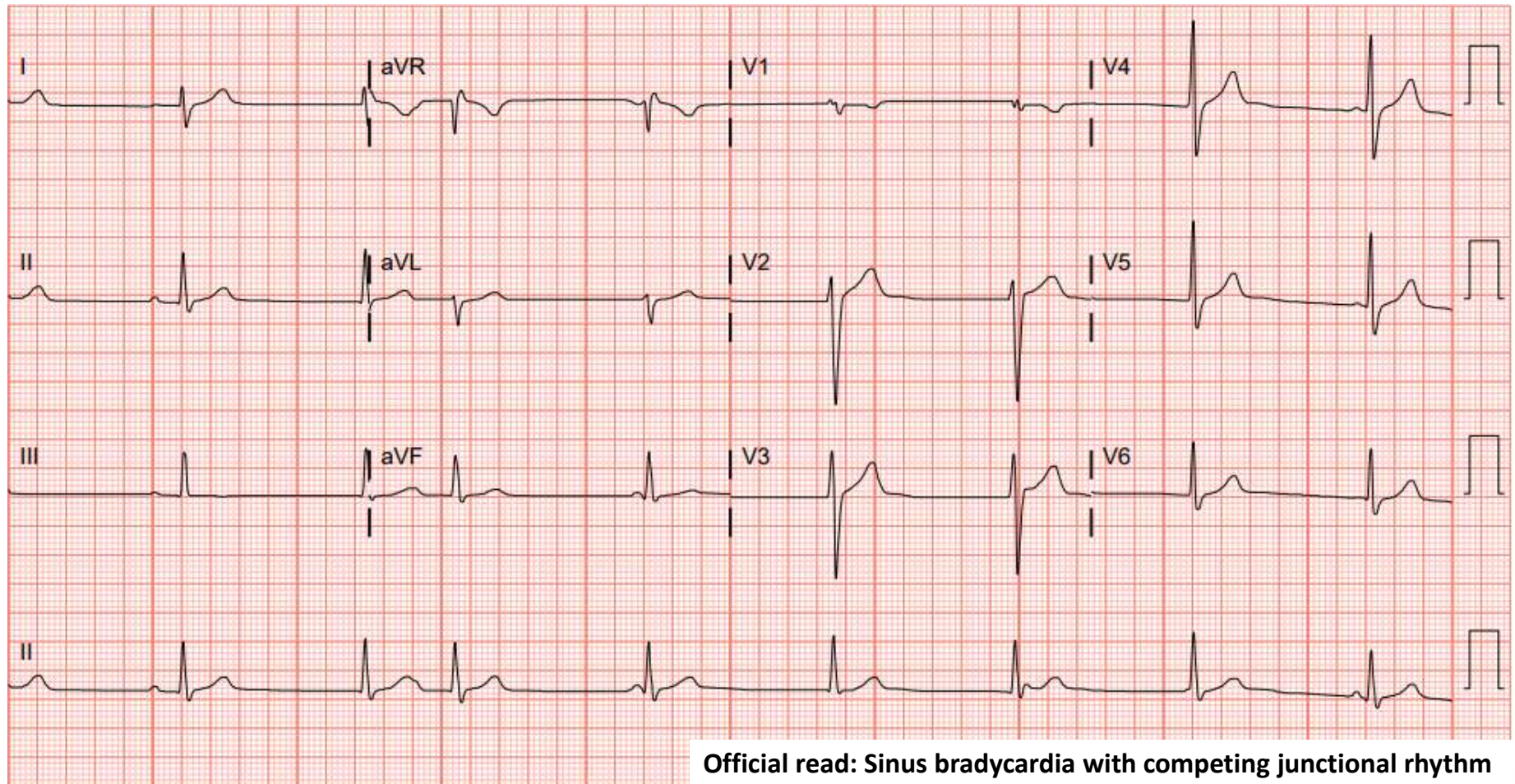
- Early localized disease
 - Ab testing has **low sensitivity**
 - Seroconversion may be delayed for several weeks after onset of EM
- Early disseminated disease
 - EM lesions present? Laboratory confirmation is **not necessary**
 - No EM lesions? **Two-tiered testing**
 1. ELISA
 2. Western blot IgM & IgG

LYME CARDITIS

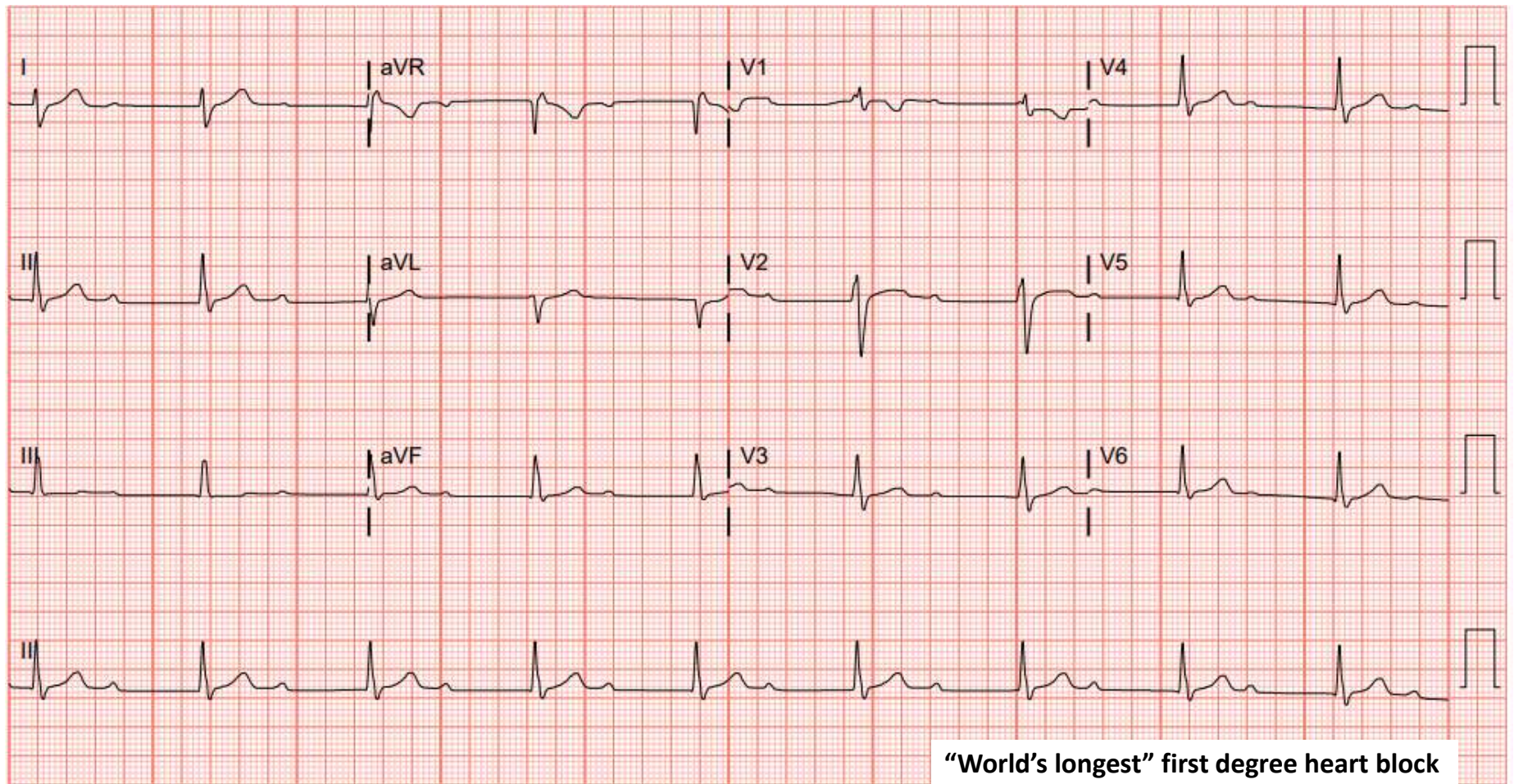
- Can present **<1 to 28 weeks** after onset of infection
- **AV conduction block of varying severity** > Sinus node & distal conduction system involvement
- ↑ risk to progress to complete AV block if **PR interval > 300 ms**
- Treatment
 - PR > 300 ms: **IV penicillin or ceftriaxone x28 days**
 - PR < 300 ms: **PO antibiotics (e.g. doxycycline x14-28 days)**



BACK TO THE CASE



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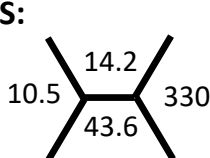
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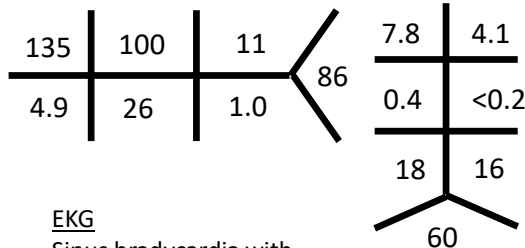
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**EKG**

Sinus bradycardia with
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rhythm

Telemetry

Sinus bradycardia with
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DIAGNOSIS: LYME DISEASE & LYME CARDITIS**LEARNING POINTS:**

- Stages of Lyme disease
 - Early localized (≤ 4 weeks): Fever, EM, myalgia, lymphadenopathy
 - Early disseminated (2 weeks – 6 months): Multiple sites of EM, flu-like symptoms, heart block, myocarditis, facial nerve palsy, meningitis, radiculopathy
 - Late disseminated (≥ 6 months): Recurrent large joint arthritis, neuropathy, encephalopathy, acrodermatitis chronica atrophicans (rare)
 - Post-Lyme disease syndrome (years): Fatigue, arthralgias, myalgias, memory impairment
- Lyme carditis
 - Presents <1 – 28 weeks after infection onset
 - AV conduction block of varying severity > sinus node & distal conduction system disease
 - ↑ risk of complete AV block if PR > 300 ms
 - Treatment:
 - PR > 300 ms: IV penicillin or ceftriaxone x28 days
 - PR < 300 ms: PO antibiotics (e.g. doxycycline x14-28 days)