Wow. I am in aww. Although I went for an outdoor run this week, finished transplanting the rest of the Forsythia plants that I began last week, and participated in an outdoor activity pretty much every day, I am choosing to do this week's journal on a written response option: Tick Bourne Diseases. I am choosing to do this because it is our last normal journal week and I thought it would be cool to spice things up a bit, but also because I couldn't stop listening to the Outside/In podcast once I started it.

Ever since Week 12, upon learning the basics on ticks, I haven't been able to hold back my further interest. You see, I never was told to "check for ticks" when I was younger. (Not that I recall anyway, which is kind of bad because I grew up in a place I'd imagine a lot of ticks to exist.) A couple years ago, I got a tick remover in my Christmas stocking. With that said, I still remained rather ignorant on the matter. In hindsight (after listening to the three episodes of "Patient Zero" and reading up on "the others" article), I realize that I should probably go dig out that little metal gizmo, as there is a lot more to ticks than I once believed. They are quite remarkable little things/parasites.

In the article by Meghan McCarthy McPhaul, I learned about the lifecycle and transmission of ticks (specifically the black-legged/deer ticks), I learned about tick-borne diseases in the Northeast (other than Lyme), I learned how to best avoid tick-borne diseases (prevention), and I learned how to safely remove a tick (as well as what not to do, because the internet is unfortunately full of "abhorrently incorrect" information).

"Patient Zero." Where do I begin? I guess I should start off by saying I learned that the term "patient zero" essentially means the (index) case that started something. In the plight of Lyme Disease (what the three beginning episodes of this podcast focused on), Polly Murray was patient zero. The nonscientific name for this Borrelia Burgdorferi bacteria species all makes sense now, as Polly Murray was from Lyme, Connecticut. It was pretty cool to learn about the origin of this disease, in addition to all the complications that accompanied such. (I'm placing an order for Polly's book "The Widening Circle;" I figured it is perfect reading material for the quarantine.) Anyway, not to get too far into the details, here are a few things I learned by listening to the Outside/In podcast: One, the notion of medical complacency is more dangerous than the actual disease, or malpractice. Two, there is a lot that goes into discovering what something is, why it spreads, where it comes from, how to stop it, etc. (This particular lesson gave me a glimpse of insight into the extremes of the coronavirus outbreak and how grateful and patient we should all be for all the hard work that's being done.) Three, ticks are sneaky little things. Four, ticks don't have heads. Five, the bacteria of Lyme Disease (Borrelia Burgdorferi) takes time before it makes its way from this tick into the host (there's a guideline of 24-48 hours, as long as the tick is not pre-fed). Six, catching symptoms early is the key in being able to effectively treat Lyme Disease. Seven, you can get Lyme Disease more than once because there are different strains of the Borrelia Burgdorferi bacteria. Eight, Dr. Douglas Wine is a fraud. Nine, be careful because there are many other frauds out there in this world. Ten, I really enjoy listening to the Outside/In podcast, and I think I'm going to try and make a habit of it.

Notes from the podcast:

Outside/In: Patient Zero

- Learning about the natural world
- Pursuit of knowledge

Lyme disease

- Completely exhausted
- Red rash
- 2 weeks of symptoms before going to clinic
- one doctor said yes, lyme disease while the other doctor said no
- Doctors are pretty clueless on this matter. . .
- Lyme disease = confusing
- Patient Zero = index case that started it all → lady in Lyme, CT
    - Polly Murry
    - Q: "How do you know that the tick is feeding on you?" A: "Look for a coma that moves"

How disease moves through the world

- 1951 – man began the CDC
- Epidemiology = study of patterns in pathogens (How does disease move through society? Who gets it? How do we stop it?) investigators to figure out the cause of a disease
- Seems to me the biggest danger you face isn't disease or malpractice, it's complacency
- "You have to bear in mind that health professionals are notorious for downplaying the risks of an outbreak" Dr. Lawrence Altmin
    - Pennsylvania, July 1976: high fevers, pneumonia like symptoms (new variety of Swine Flu?!?!?)
        - SIMILAR TO RIGHT NOW-COVID19
        - Investigation about every little detail to get to the bottom of it: Who? What? When? Where? What?
        - All to find: Cause? Outcomes?
        - Nickel Poisoning?!?!? ← bogus theory for the CDC
        - Second Look → Answer: bacteria that formed in air conditioners of the hotel (Legionnaires Disease)
            - Scientists have to be humble
        - Epidemiologists see the puzzle pieces without the whole picture
        - Hosts see the big picture but not the individual puzzle pieces
- 1. Epidemiology Triangle
    - 1: Agent (bacteria, disease)
    - 2: Host
    - 3: Environment (landscapes, proximity to animals/insects, what we eat, what we drink, handshakes, kisses, sex, sewers, etc)
        - explain what pathogens connect which what people & how/why
    - Things aren't simple. . .
- Patient Zero: Polly Murray

- Soft-spoken, Serious, Perfectionist, Wrote EVERYTHING down (symptoms of doctor visits, etc) – medically minded, asks a lot of questions that the doctors had no answers to
- Gil (ex-husband): Alex ("Sandy" – soccer star), Todd (soft-spoken baby), Wendy, David
- Early 1970s
  - Had a chronical illness nobody could identify. . .labelled as a hypochondriac if nobody else developed symptoms. . .
    - Todd: excruciating headache out of the blue, bulls eye rash, severe muscle aches and fever, swollen knees → treated with crazy amounts of aspirin (treated with juvenile rheumatoid arthritis)
    - Then the rest of the family but Wendy and David started getting symptoms. . .and then other kids in the neighborhood with same symptoms. . .all treated with JRA (a rare disease) ← Polly questioned this
- Polly: The Widening Circle
- David Snider: 1975: working at CT state health department
  - Notes from 2 mothers: "Can arthritis be infectious?"

2. The Vector – Biology Episode: Borrelia Burgdorferi
- Coleen Evans: collections of dead parasites
- "There is a tick for any animals you can really think of" – birds, sea snakes (ears), hippos (anus), etc
- Ticks on every continent
  - Requirement: Ticks are hard to detect & hard to remove
- Ticks: One of the most efficient carriers for disease on the planet (pathogens within the body)
- Deer Tick (Black-legged tick): associated with lyme disease
- How do ticks get lyme disease themselves?
- Ticks don't have heads: made mostly of random body parts
- Ticks aren't actively feeding for the first 24 hours of being bit (they are working to disguise the fact that they are bound to the host)
  - When feeding, the tick secretes saliva into the host's blood (the lyme disease bacteria is dormant in mid gut of the tick until it passes into the host) ← takes time (24-48 hour rule = a guideline vs. a hard and fast rule. . . there are pre-fed ticks. . .especially with dogs)
- "You can't pull off a tick if you don't know it's there" – daily checks
- Once the pathogen that is lyme gets into the human body. . .
- Ticks swap fluids with the host
- Can get lyme disease more than once because there are different strains of Borrelia Burgdorferi – lyme disease vaccine for dogs
- Symptoms of Lyme Disease are from the inflammation itself vs the bacteria producing a poison/toxin
  - Center of bull's eye = least likely place you'll find the bacteria (because of the motors) --- most likely place to find the bacteria = edge of the bull's eye

- Quickly getting antiobiotics = way to cure the lyme disease (so it can go away) – 70 to 80% get a rash, but only 20% get that bull's eye rash. . .meaning the disease will manifest and people won't ask for help until symptoms are serious and treatment is much harder
    - CATCH SYMPTOMS EARLY

Worst Case Scenario: The Laser (a health tool)

- Symptoms: fatigue, severe headache, rash, fever (for 3 days)
    - thought it was the flu. . .until the rash was seen, then doctor definitely knew it was lyme
- colleague Hannah: caught in a feud between 2 doctors (one said she had lyme, one said she didn't)
- Medicine = constantly evolving
- Experimental Medicine vs. Pure Snake Oil (fraud: empty promises/not truly understanding things)
- Lyme Support Groups (run independently)
    - Frustration with health care = evident
    - Many = self-diagnosed
    - People go here when they feel like doctors close the door and give up on them → convincing others to seek other curing methods. . .malaria therapy (NO)/laser therapy. . .
    - Alternative (Ribotent?) therapies. . .where does laser therapy fall? A go or a no go?
        - Looking rough with all the bogus claims on the website & all the typos
        - RIDICULOUS . . . placebo and bogus (oscillator, meditation room, the laser room)
        - Low-level light therapy (approved by the FDA for treatment of aches and pains – sports medicine) --- studies show they have some minor effects
        - Subjective symptoms: worst nightmare for epidemiologists
        - Ridiculous questions in the cofactor test
        - Charming doctor. . .ridiculous process and WRONG information. . .EXPENSIVE
        - Humans are NOT carriers for lyme disease
        - So many crap info out there
        - Dr. Douglas Wine = a fraud
        - Line between health care and quackery = slim, even faded (hyperthermia as a treatment for depression)
        - Claims need to match the science (people need to TRULY understand before they broadcast it to consumers and the confused and desperate outside eye)
        - Why do people swear by treatments that have little to no scientific evidence: placebo effect (people don't like to admit they've been scammed)
        - 4 questions: Claims? Costs? Risks? Evidence?
- Taylor Quimby