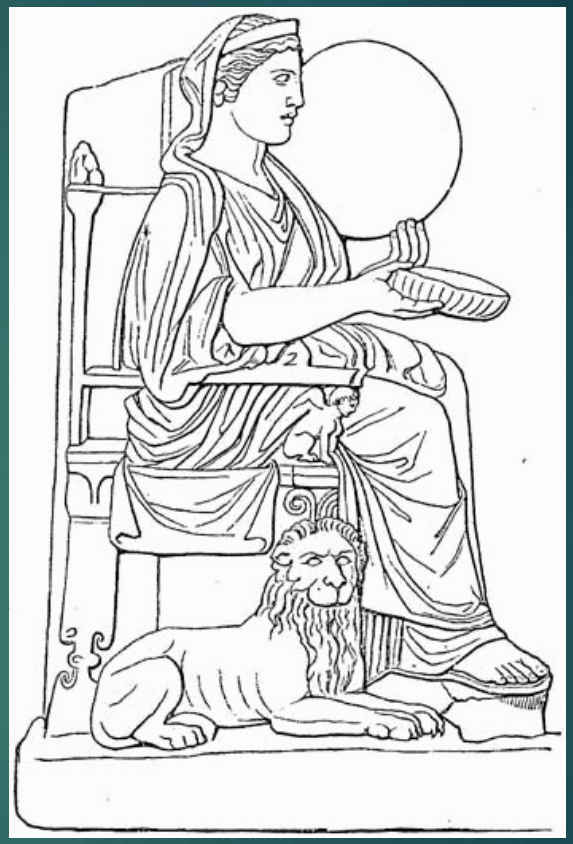
Patient L.L.

KRISTEN ARREDONDO, MD

CHILD NEUROLOGY PGY5, UT SOUTHWESTERN



Birth History

- LL was born to a healthy first time mother with an uncomplicated pregnancy
- Delivered at 38 weeks via C-section due to breech presentation
- No feeding or breathing difficulties at birth
- No NICU stay

Early Development

- Poor head control
- Able to crawl combat-style at a late age
- Walked at 18 months
- Clumsy walker with frequent falls
- Normal language and fine motor development

First Neurology Visit
Age 4

- CK normal (37 units/L)
- Muscle biopsy with type 1 fiber predominance, nonspecific
- Presumptive diagnosis of congenital myopathy
- Patient lived far from Children's and was lost to follow up for years

Scoliosis
Age 10

- Seen by a local orthopedic surgeon for scoliosis
- Placed in a TLSO brace
- She began losing weight, which was attributed to feeding difficulty secondary to the degree of spinal curvature limiting capacity

Back to Neurology
Age 11

- Failure to thrive
  - Eating in small portions by mouth
  - No difficulty with chewing or swallowing
- Restrictive lung disease
  - Using CPT vest regularly
  - Followed by Dr. Schochet of Pulmonology
- Sleeping propped on multiple pillows
- Hypothyroidism

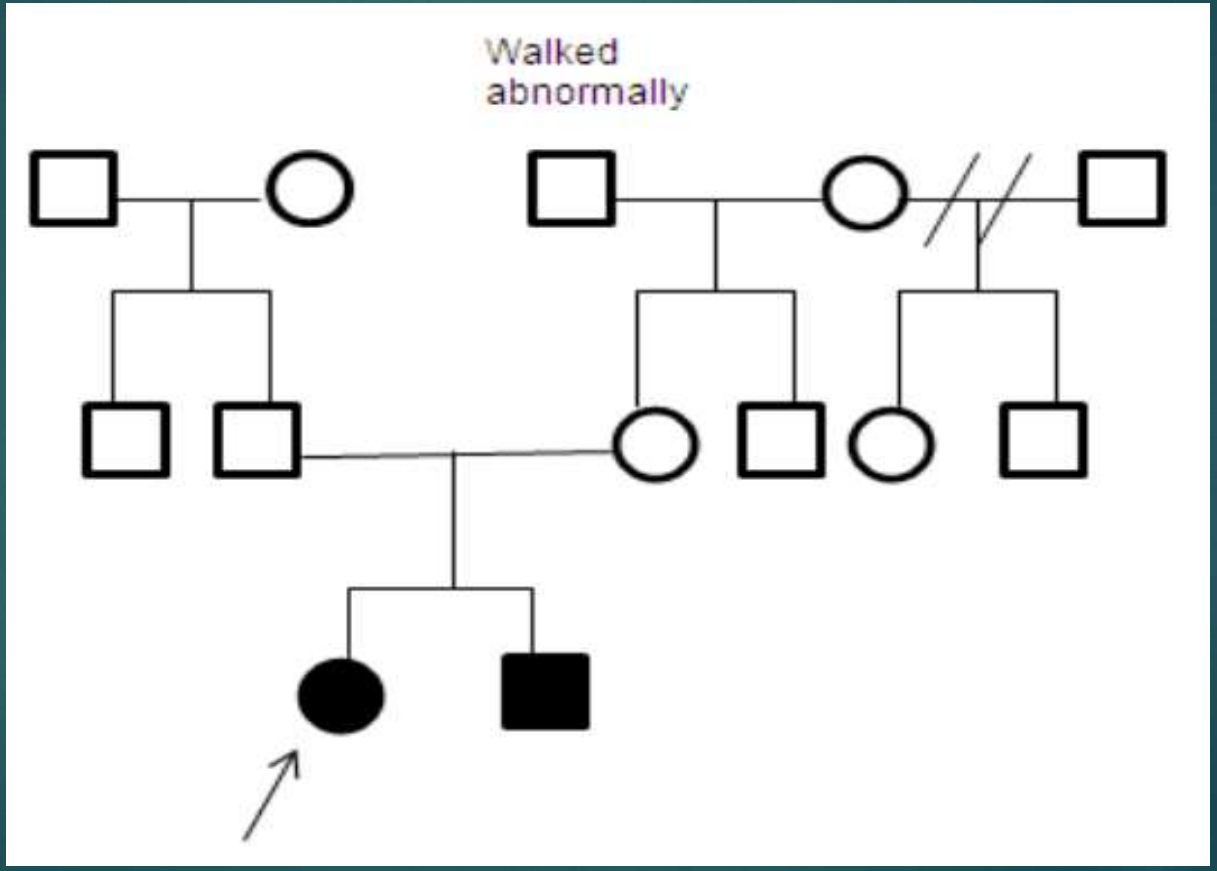
Musculoskeletal complaints
Age 11

- Shortness of breath when walking any significant distance
- Trouble climbing stairs
- Trouble turning head from side to side
- Frequent upper back pain
- About to start Physical Therapy

Little brother makes his debut…

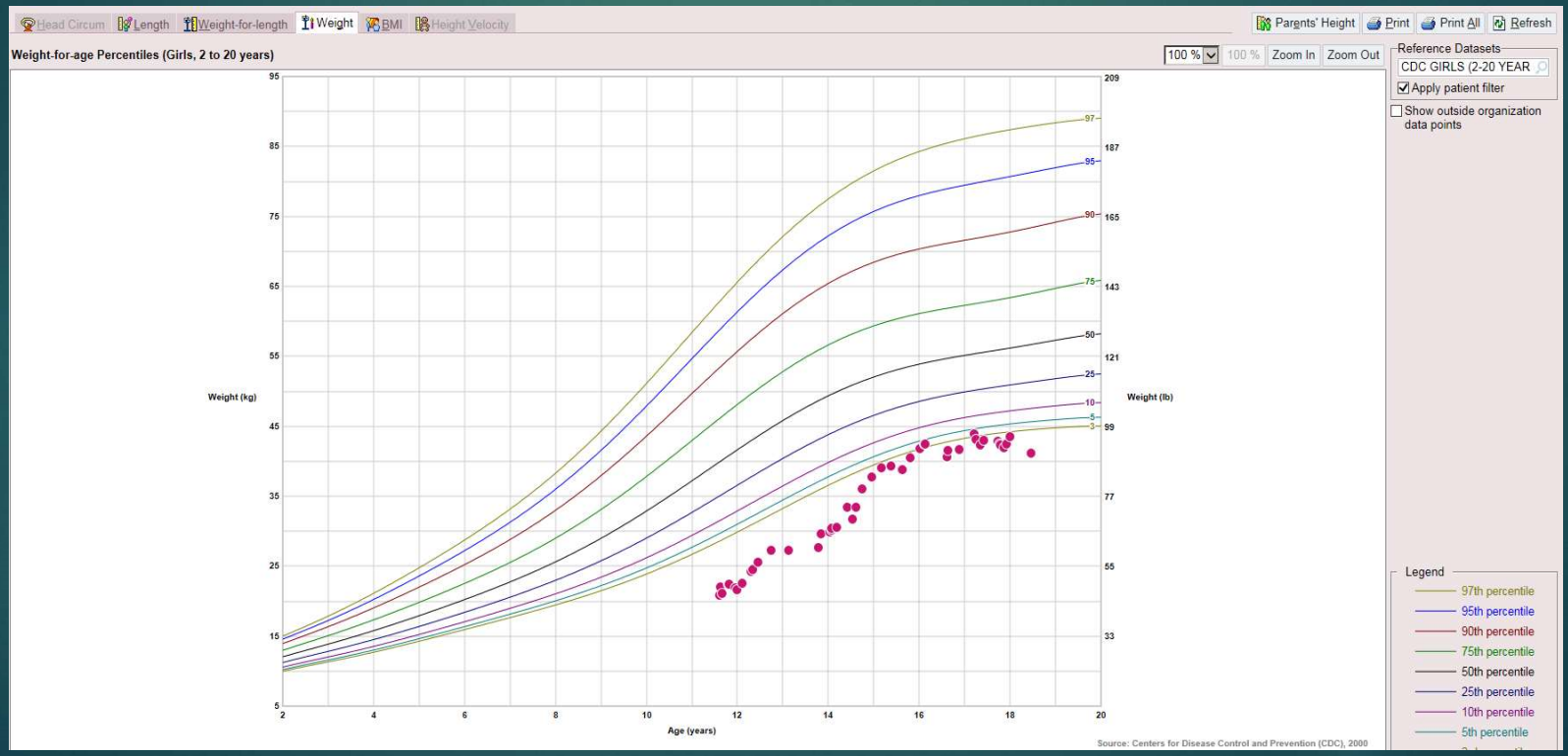
- Younger brother is born
- Multiple congenital findings
  - Hypoplastic left heart syndrome
  - Cryptorchidism
  - Muscle weakness

Family Pedigree



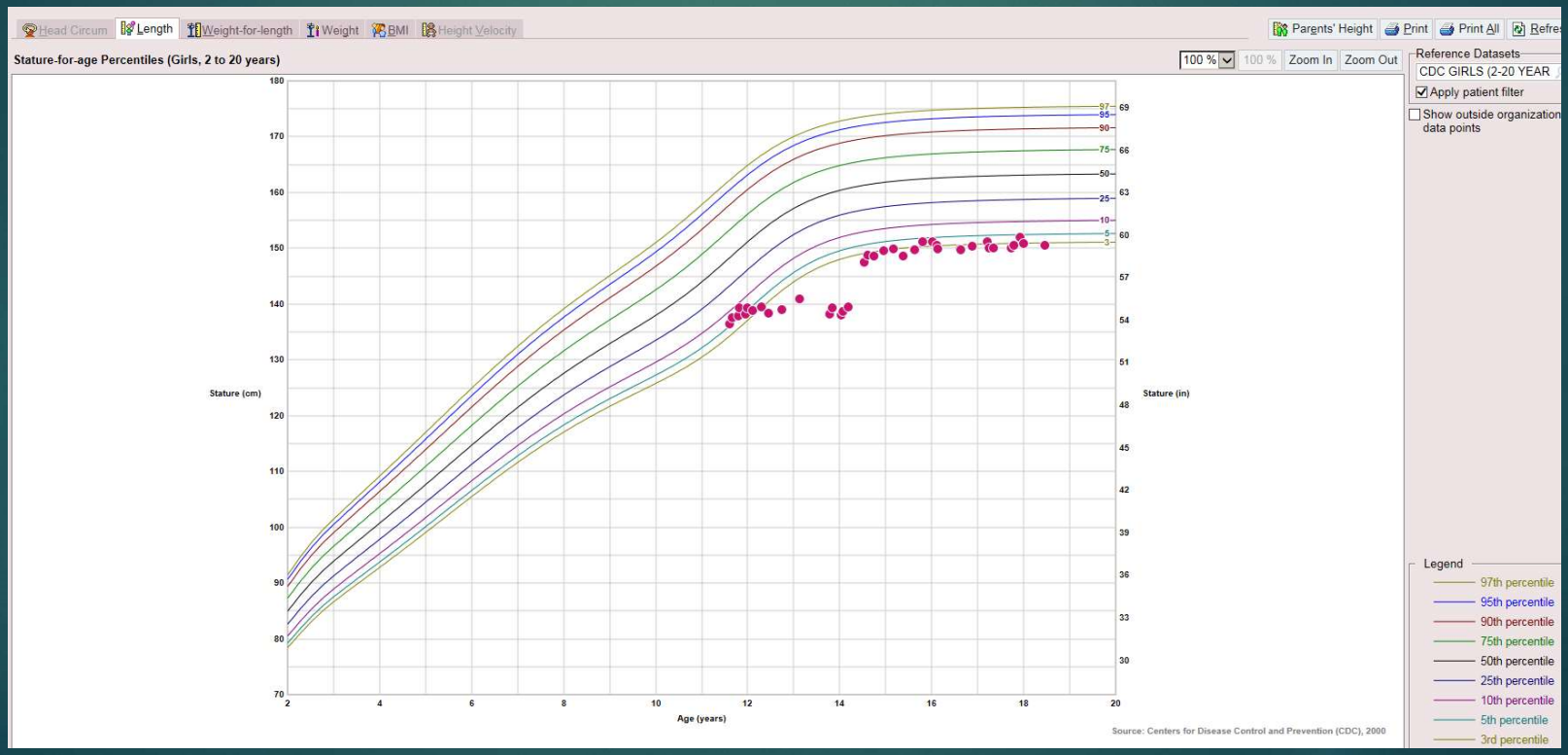
LL's Growth Parameters

Weight



Growth Parameters

Height



Physical Exam

Notable Exam Findings

- HEENT: Slight head tilt to right, high arched palate
- Normal cardiac exam
- Moderate thoracic scoliosis, bilateral scapular winging
- CN notable for diminished facial strength with eye closure (unable to bury eyelashes), otherwise unremarkable
- Motor:
  - Decreased tone in neck, trunk, and all extremities
  - Flexion contractures at elbows and knees bilaterally
  - Muscle atrophy throughout
  - No myotonia or fasciculations
  - Proximal weakness in all extremities, UE > LE
- Areflexia throughout
- Sensory exam and cerebellar testing unremarkable

Hospital Admission
2/2011

- LL was directly admitted from neuromuscular clinic on her first visit back in years due to increased work of breathing and hypercarbia concerning for impending respiratory failure
- During admission, she received a number of helpful consultations:
  - Pulmonology: sleep study completed, started on BiPAP with backup rate
  - Cardiology: S3 auscultated on exam, echocardiogram unremarkable
  - Nutrition: started on Boost supplementation
  - GI: Numerous metabolic and immunological labs unremarkable, started on vitamin D supplementation

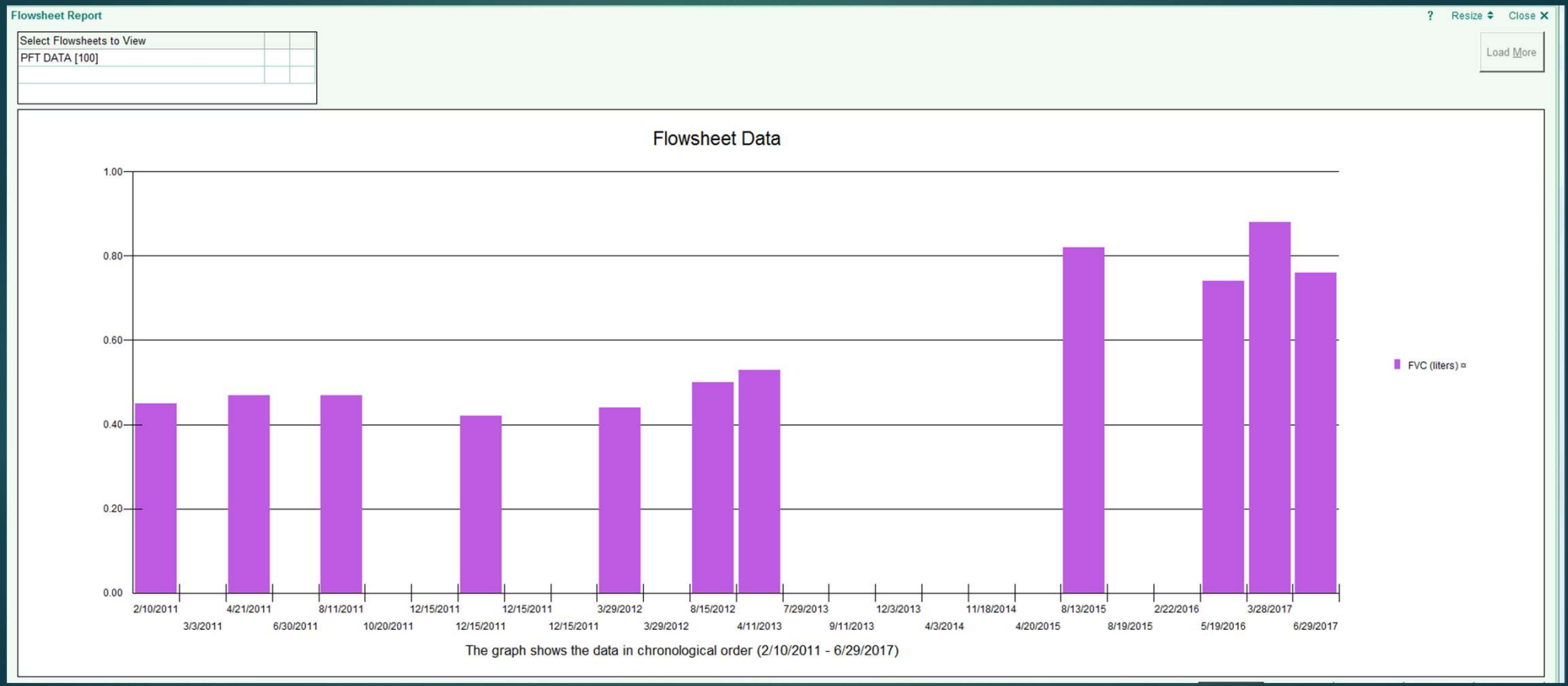
Subsequent Course
Gastrointestinal/FTT

- G tube placed 6/2011 and continuous overnight feeds started
- Reflux worsened for which multiple medications were started
- Significant weight gain noted during TSRH hospitalization in 2013 while in Halo traction for scoliosis repair

Subsequent Course
Pulmonary/Restrictive Lung Disease

- Sleep and energy much improved on nocturnal BiPAP
- CPT vest therapy continued twice daily
- Pneumonia several times
- PFTs:
  - 4/2011: FVC 0.47L (22% predicted), 6 minute walk test with desaturation from 95% to 87%, distance limited to 451 meters
  - 12/2011: FVC 0.42L (19% predicted), BiPAP increased to 22/5 with rate 18, 6 minute walk test with desaturation to 82% and only able to walk 350 meters; test repeated with oxygen supplementation with less marked desaturation noted → O2 for exercise
  - 5/2016: FVC 28% predicted, still using BiPAP at night

PFTs: FVC Trend



PFTs: MEP Trend

Subsequent Course
Scoliosis

- Surgical intervention initially deferred while awaiting appropriate weight gain to allow for proper healing
- Placed in Halo traction for 10 weeks starting in 9/2013
- Corrective surgery in 11/2013 at TSRH

Subsequent Course
Cardiology

- Multiple normal echocardiograms and EKGs
- Following with Cardiology every 2 years

Subsequent Course
Muscle weakness

- Worsening muscle cramping and fatigue
- Back and hip pain with prolonged standing
- Remains ambulatory, though using wheelchair for long distances
- One major fall at school in 2014 requiring ED visit for x-rays (no fractures)
- No dysphagia or tiring with chewing

Subsequent Course
Cognition

- Excellent student
- Started homebound schooling in late 2011 after hospitalization
- Graduated high school in 6/2017
- Currently in an undergraduate program

Evaluation of LL's brother

- COLVI testing (2011) negative
- Muscle biopsy:
  - Type 1 fiber predominance
  - Presence of multi-minicores
- Mutation analyses of RYR1, SEPN1, ACTA1, NEB, DNM2, MYH7 negative
- Whole exome sequencing sent in 2017

WES Results

- Compound heterozygous variants in TTN gene
  - 1 pathogenic variant
  - 1 possibly pathogenic VUS
- Targeted testing was sent on LL, who was found to have the same two variants as those previously identified in her brother