

Continuous Glucose Monitoring Facilitates Diazoxide Use in the Management of Glut1 Deficiency Syndrome

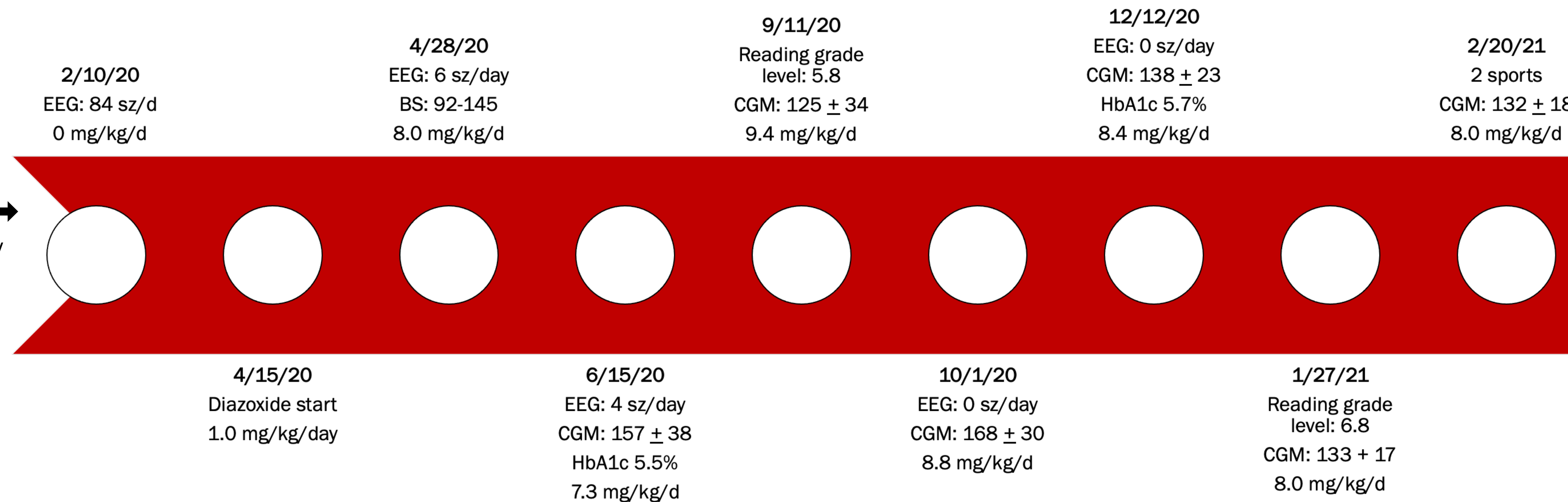
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Background

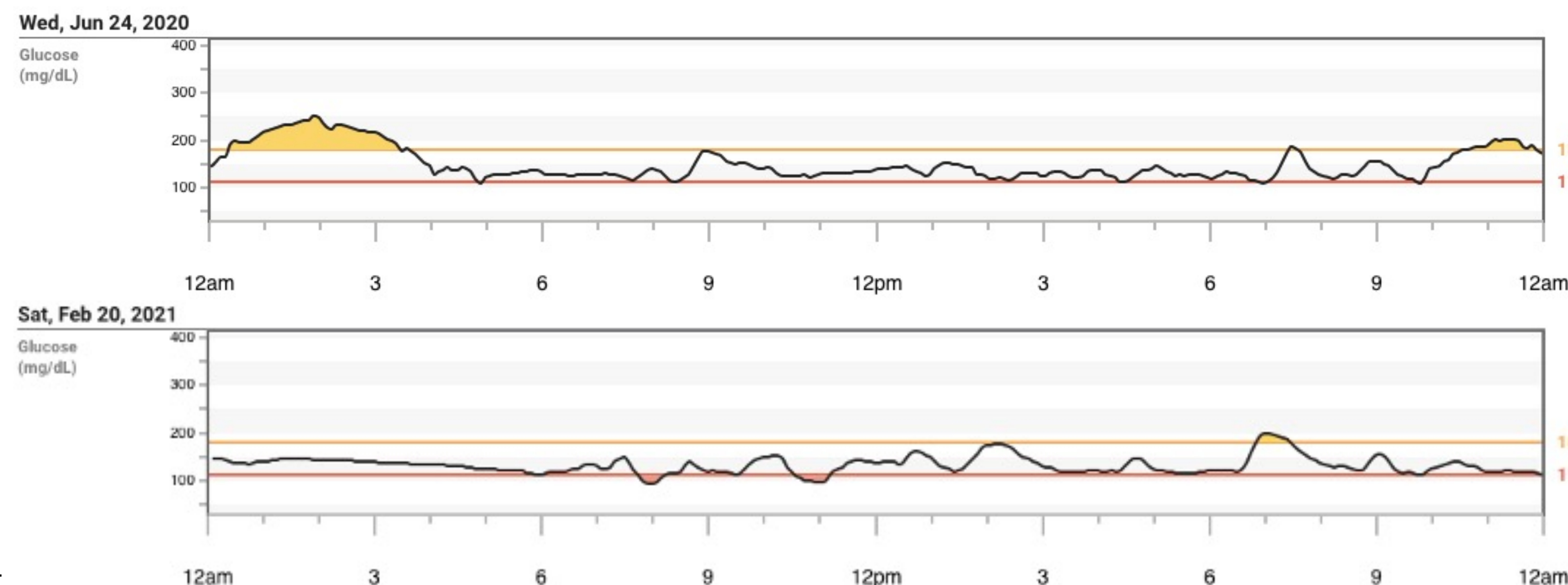
- Glut1: glucose type 1 transporter, located in blood-brain barrier
- Glut1DS caused by mutations *SLC2A1* (chromosome 1p34.2) that encodes Glut1
- Glut1 affected → impaired glucose transport across blood-brain barrier → ↓ CSF glucose → ↓ glucose for brain → drug-resistant metabolic epilepsy
- ~500 cases worldwide, 90% de novo
- Standard treatment: ketogenic diet (KD), alternative but not preferred energy source
- Diazoxide: ↓ insulin → ↑ blood glucose → ↑ intracerebral glucose → ↓ seizure frequency
- Previous use of diazoxide complicated by hyperglycemia
- CGM: demonstrated benefit in diabetes, congenital hyperinsulinism
- Can CGM enable diazoxide use in KD-resistant Glut1DS?



Timeline: CGM data is reported with average glucose ± SD and diazoxide dose is presented as total daily dose.

Clinical Case

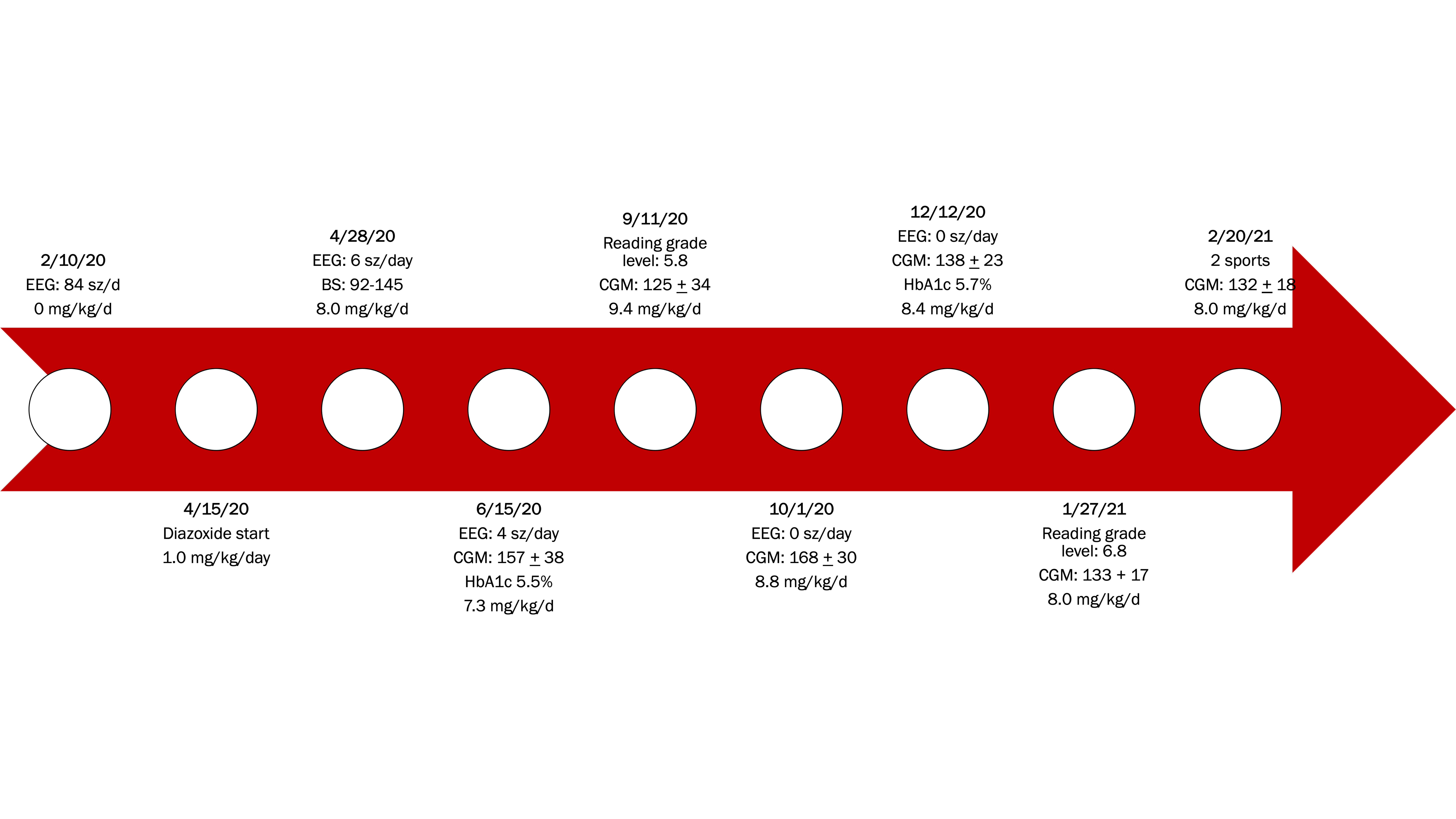
- 14 yo F w/ first sz at age 2
- Refractory to antiepileptics
- Developed lower extremity weakness at age 5
- CSF glucose 36 (usually < 60 in Glut1DS) when blood glucose 93
- CSF/blood glucose ratio 0.39 (usually < 0.40 in Glut1DS)
- Genetic testing: c.398_399delGCinsTT;p.Lys133Phe
- Unable to tolerate KD due to severe nausea, vomiting, abdominal pain, and hypertriglyceridemia
- Glucose tolerance test during EEG demonstrating seizures: insulin 104 when blood glucose 109



Daily CGM reports: First day with CGM vs recent day with CGM.

Conclusions

1. CGM: safe initiation and precise titration of diazoxide
2. Diazoxide addresses neuroglycopenia unlike KD → a new standard of care for Glut1DS?
3. CGM valuable tool for other inborn errors of glucose transport and carb metabolism



2/10/20

EEG: 84 sz/d
0 mg/kg/d

4/28/20

EEG: 6 sz/day
BS: 92-145
8.0 mg/kg/d

9/11/20

Reading grade level: 5.8
CGM: 125 ± 34
9.4 mg/kg/d

12/12/20

EEG: 0 sz/day
CGM: 138 ± 23
HbA1c 5.7%
8.4 mg/kg/d

2/20/21

2 sports
CGM: 132 ± 18
8.0 mg/kg/d

4/15/20

Diazoxide start
1.0 mg/kg/day

6/15/20

EEG: 4 sz/day
CGM: 157 ± 38
HbA1c 5.5%
7.3 mg/kg/d

10/1/20

EEG: 0 sz/day
CGM: 168 ± 30
8.8 mg/kg/d

1/27/21

Reading grade level: 6.8
CGM: 133 + 17
8.0 mg/kg/d