Considerations for Medically Complex Patients

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#AccessToHealthCare

LEADERSHIP & INNOVATION
ORLANDO SUMMIT
NOVEMBER 16–19, 2022
WOMEN IN GOVERNMENT

CHLOE BARNES: A PATIENT AND PARENT PERSPECTIVE

- Chloe was born July 12, 2008 and appeared happy and healthy
- After noticing some developmental delays, and despite pediatrician assurances that Chloe was within normal limits despite her motor delays, a second opinion was sought and Chloe was diagnosed with Metachromatic Leukodystrophy (MLD) in 2010
- MLD is a very rare, neurodegenerative genetic disorder that causes children to lose the ability to walk, talk, and interact with the world around them
- Chloe received a stem cell transplant at the Mayo Clinic in Rochester, MN on October 1, 2010
- After a brave fight, Chloe lost her battle with MLD later that year

CHALLENGE: RECEIVING TIMELY DIAGNOSES

56%
of rare disease patients waited over **one year and upto ten years** to receive a diagnosis.

Source: 2020 Rare Diseases Health Care Access Study

- Early diagnoses are vital when dealing with rare diseases
- The time it takes for an accurate diagnosis for rare diseases ranges from one year to up to ten
- Many rare diseases, like MLD, progress rapidly and early intervention is key for treatment
- The cell and gene therapies that are expected to come to market over the next few years are only effective when used before the disease/condition progresses past a certain point

Gene Therapy for Neurologic Disease Access and Equity

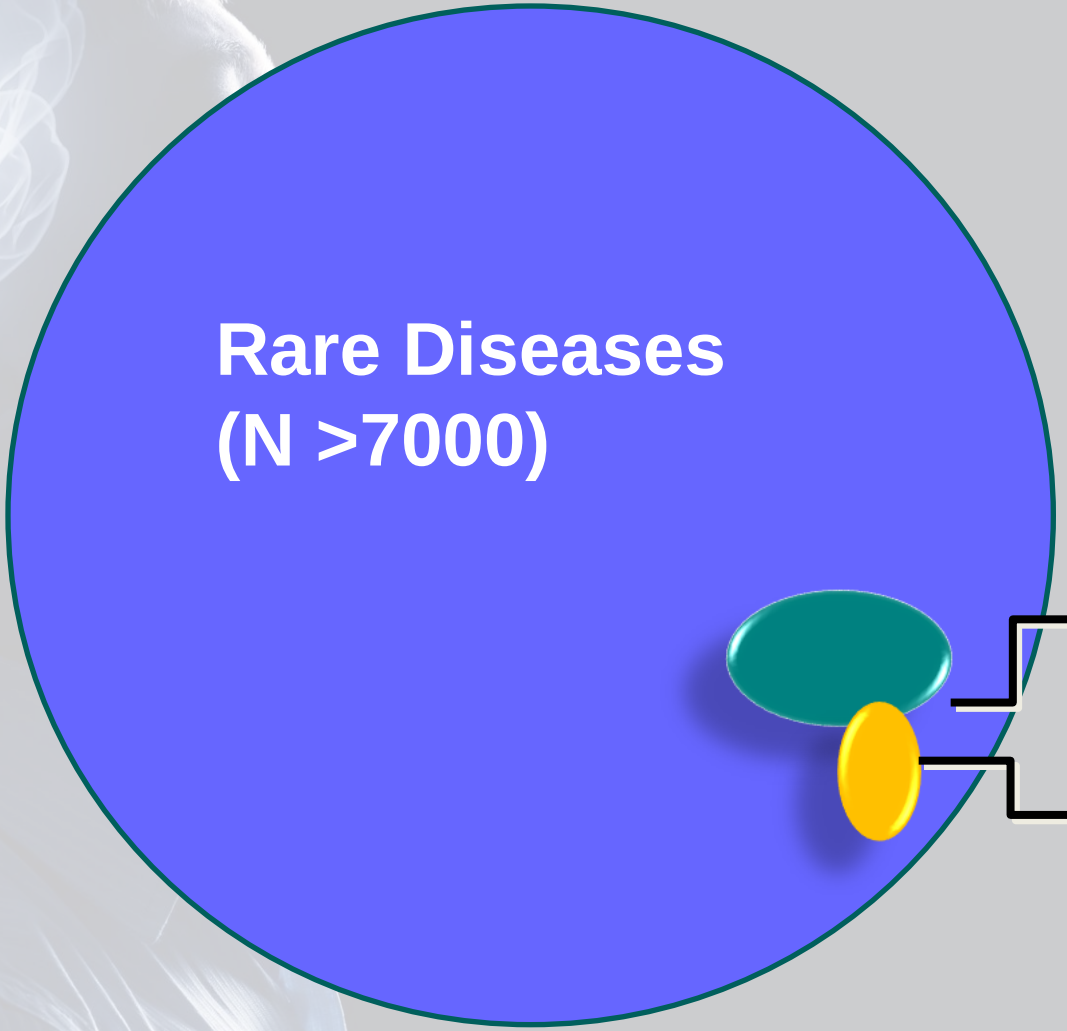
Paul Orchard, MD

November 17, 2022

Inherited Leukodystrophies are Rare Disorders

Rare Disease:
<200,000 affected in USA

Cost to Society ~1 trillion/year

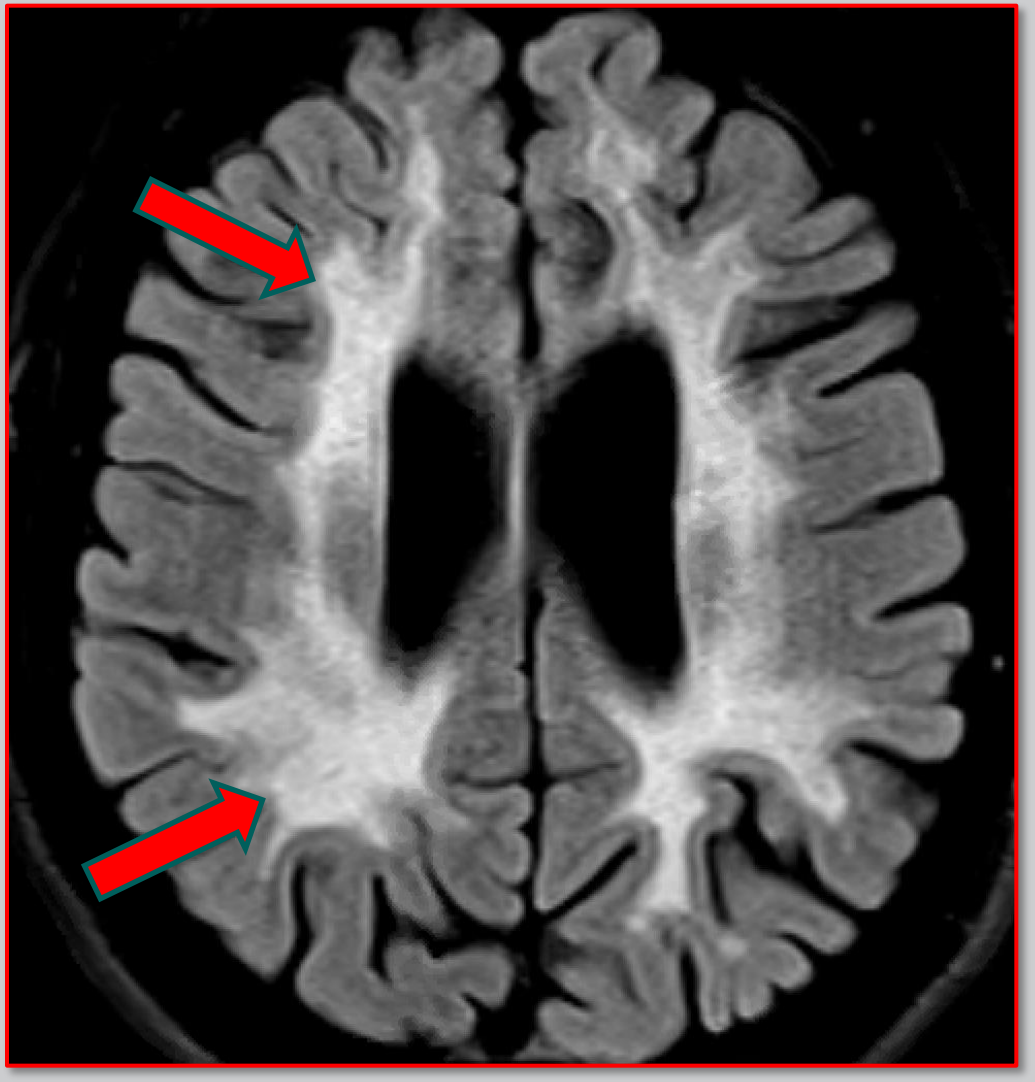


Inherited Leukodystrophies

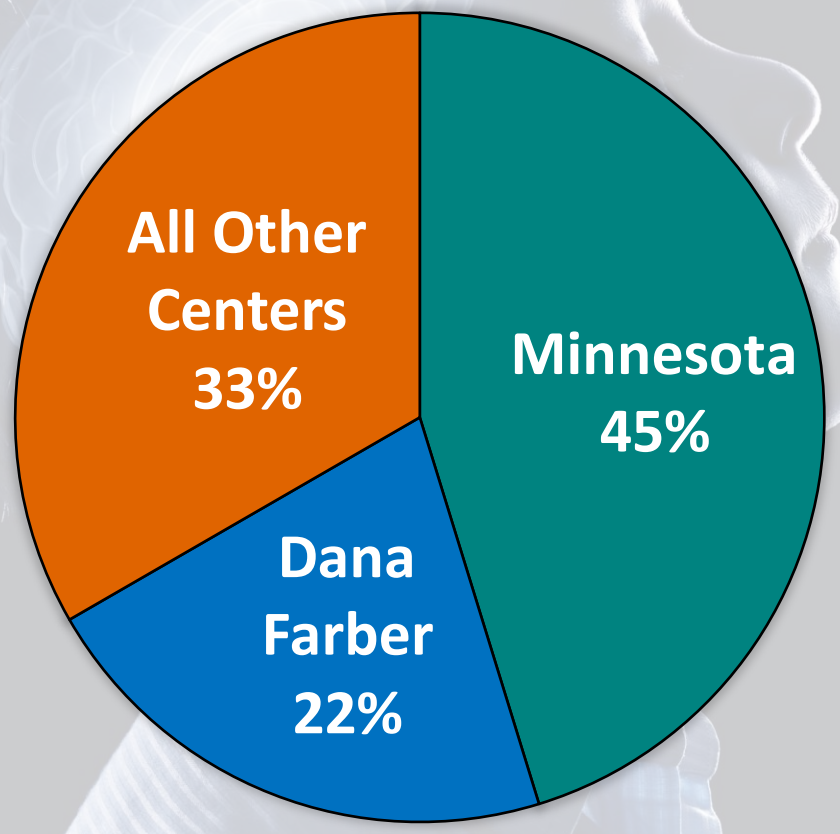
Metachromatic leukodystrophy (MLD)
1:40,000 births
~100 cases/year in USA

Metachromatic Leukodystrophy (MLD)

- MLD affects white matter of the brain
- Due to an enzyme deficiency (arylsulfatase A; ARSA)
- Accumulates sulfatides, which damages nerves
- Progressive, debilitating and lethal



Center Experience: Leukodystrophies



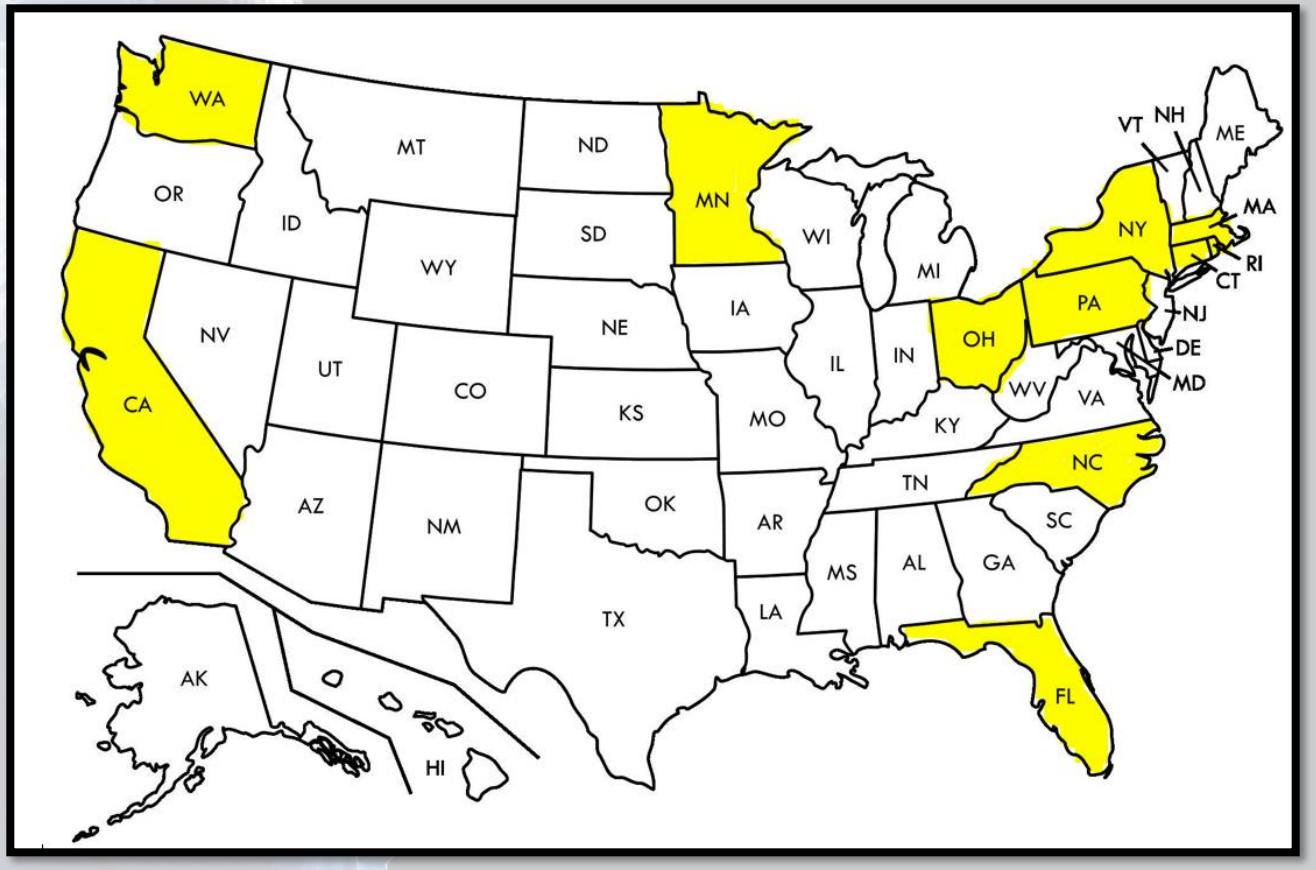
Listed Numbers of Transplants for Adrenoleukodystrophy

(2019-2020: Be the Match)

- 42 transplants overall (32 centers)
- 19 (45%) Univ. of Minnesota
- 9 (22%) Dana Farber
- 14 (33%) all other centers
  - Of these in all but one case one transplant/center

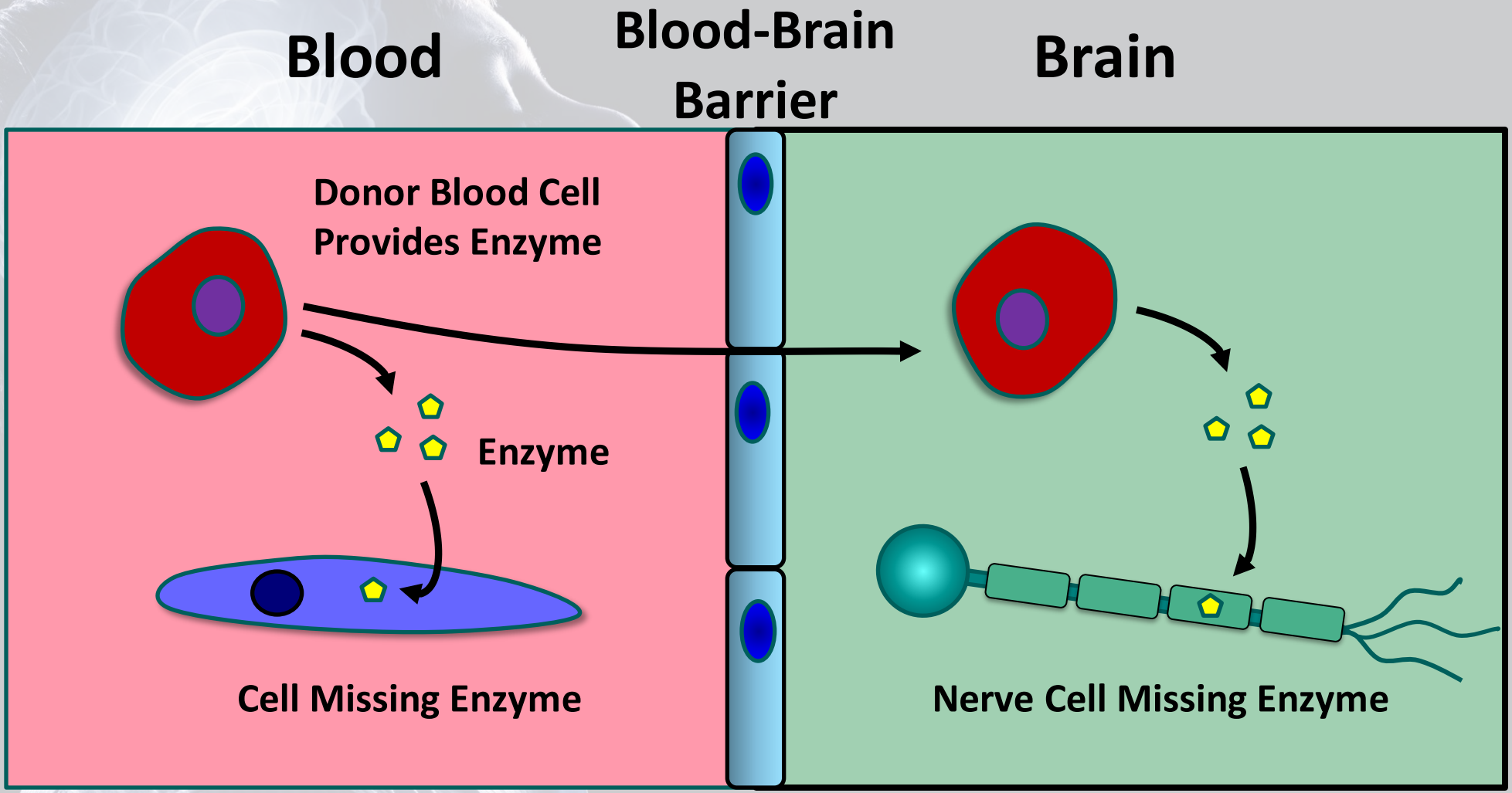
https://bethematch.org/tcdirectory/search/advanced/?d=12_36&sp=false

Center Experience: Leukodystrophies



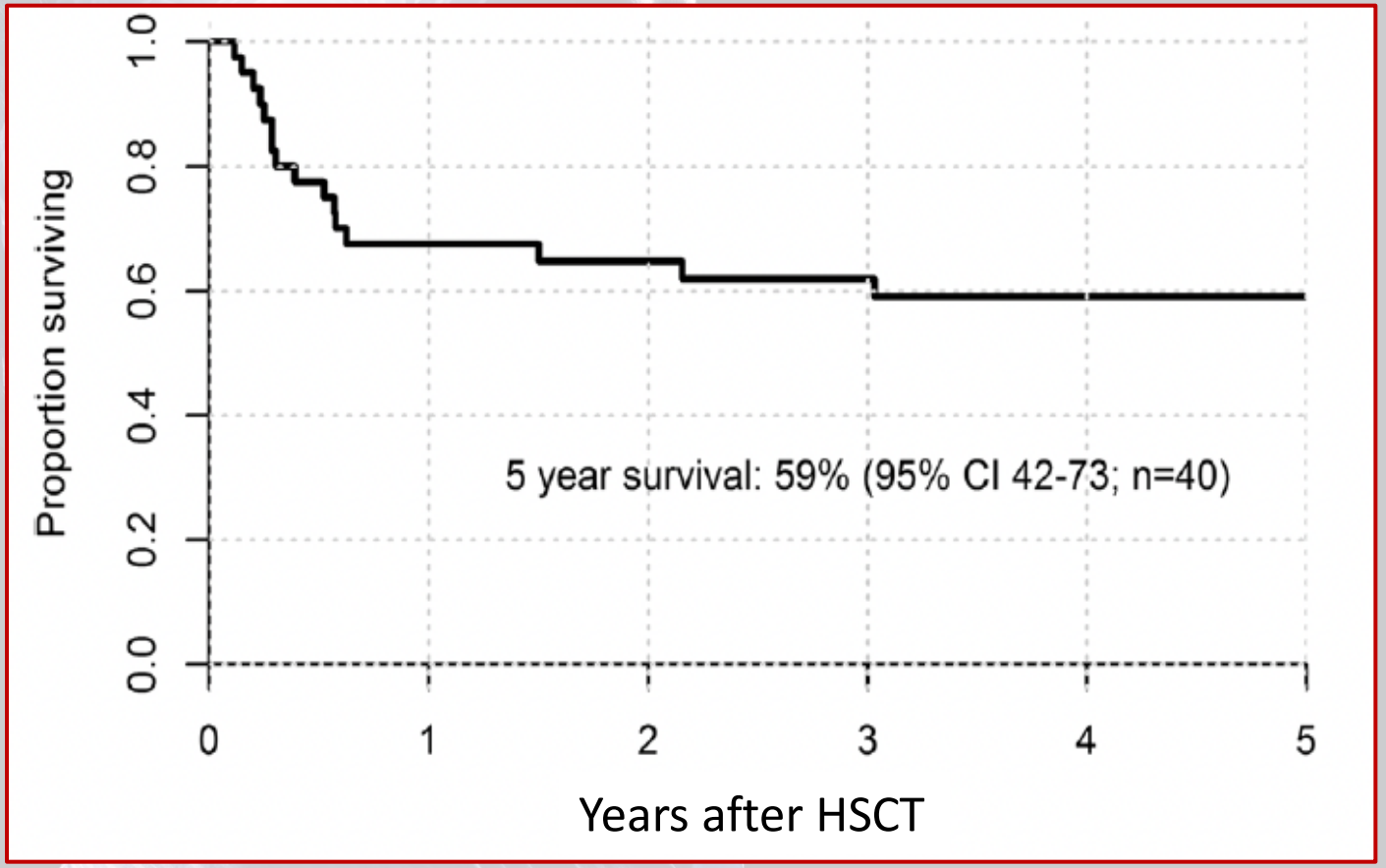
Geographically disbursed patients, limited treatment centers

Blood Stem Cell Transplantation



Outcomes: Blood Stem Cell Transplant for MLD

Minnesota Data: Largest experience in MLD



40% death rate 5 years after transplant

1. Transplant insufficient
2. Diagnosis too late

Boucher et al. Orphanet Journal of Rare Diseases (2015) 10:94

MLD: Treatment with bone marrow transplant

Matched donor availability for transplant: varies by race/ethnicity

29%

Black or African American

47%

Asian or Pacific Islander

48%

Hispanic or Latino

60%

American Indian and Alaska Native

79%

White

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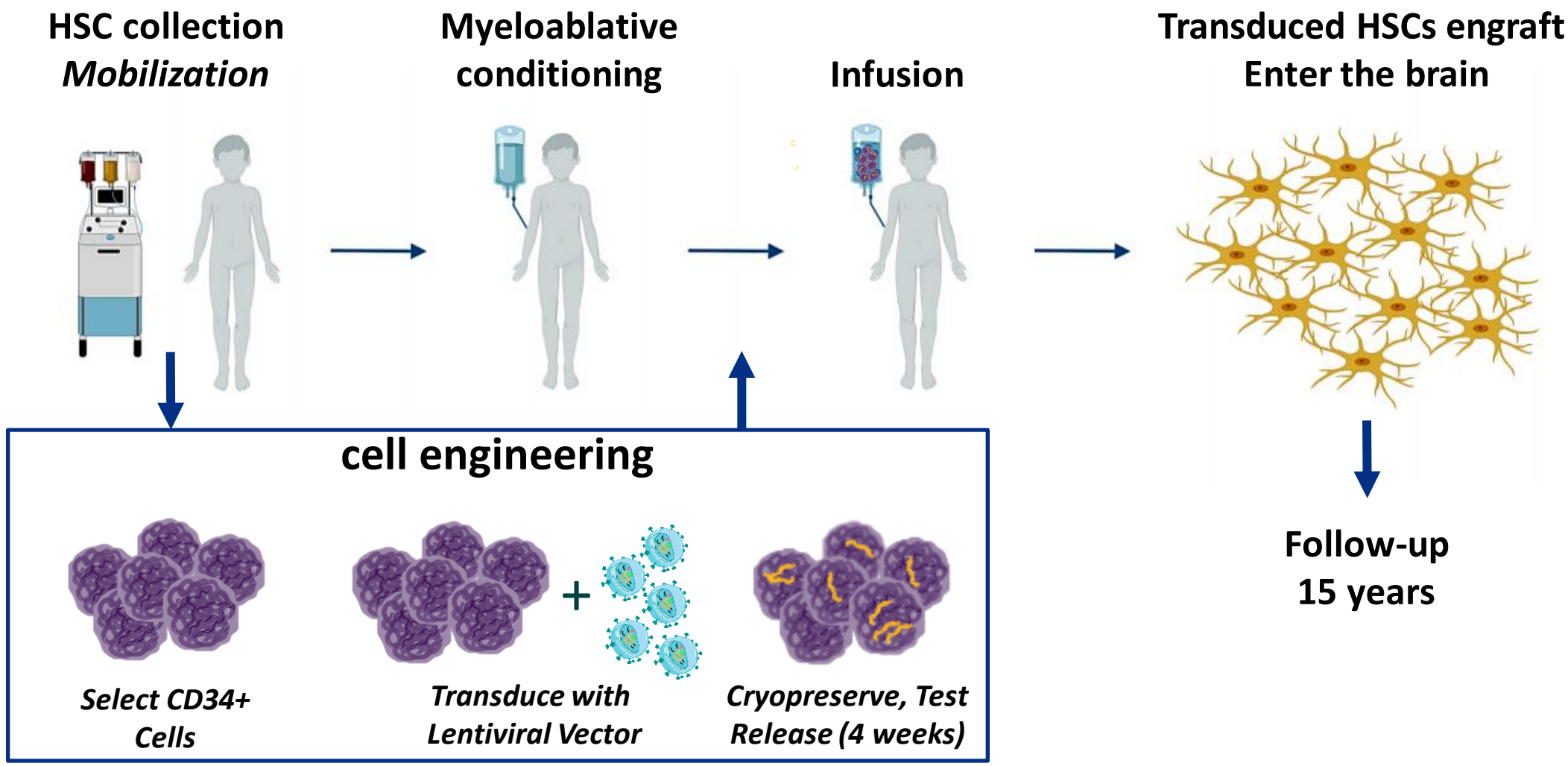
CENTER FOR INTERNATIONAL BLOOD & MARROW TRANSPLANT RESEARCH

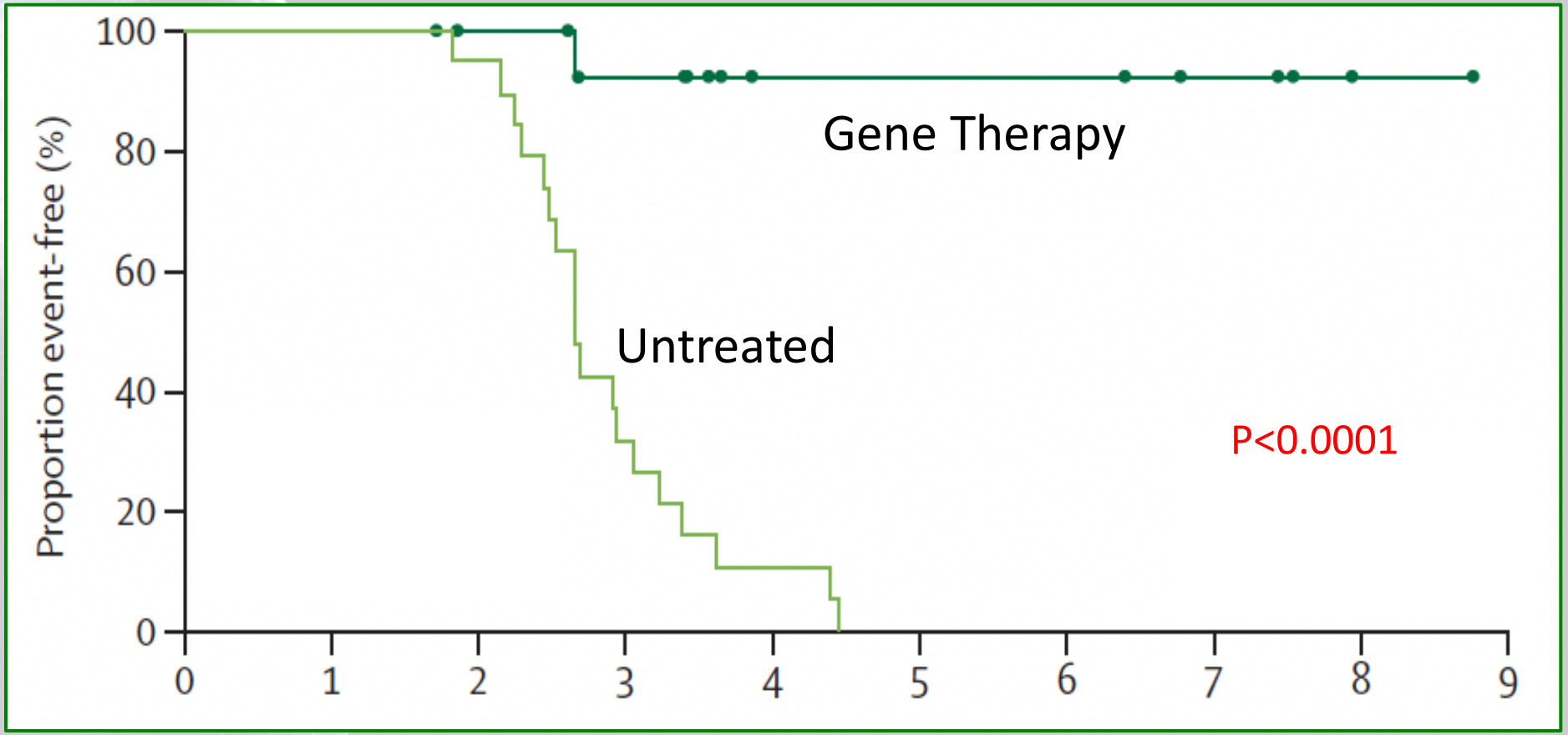
Equal Outcomes for ALL

Lentiviral ex-vivo genetic engineering



Survival Outcomes in MLD +/- Gene Tx

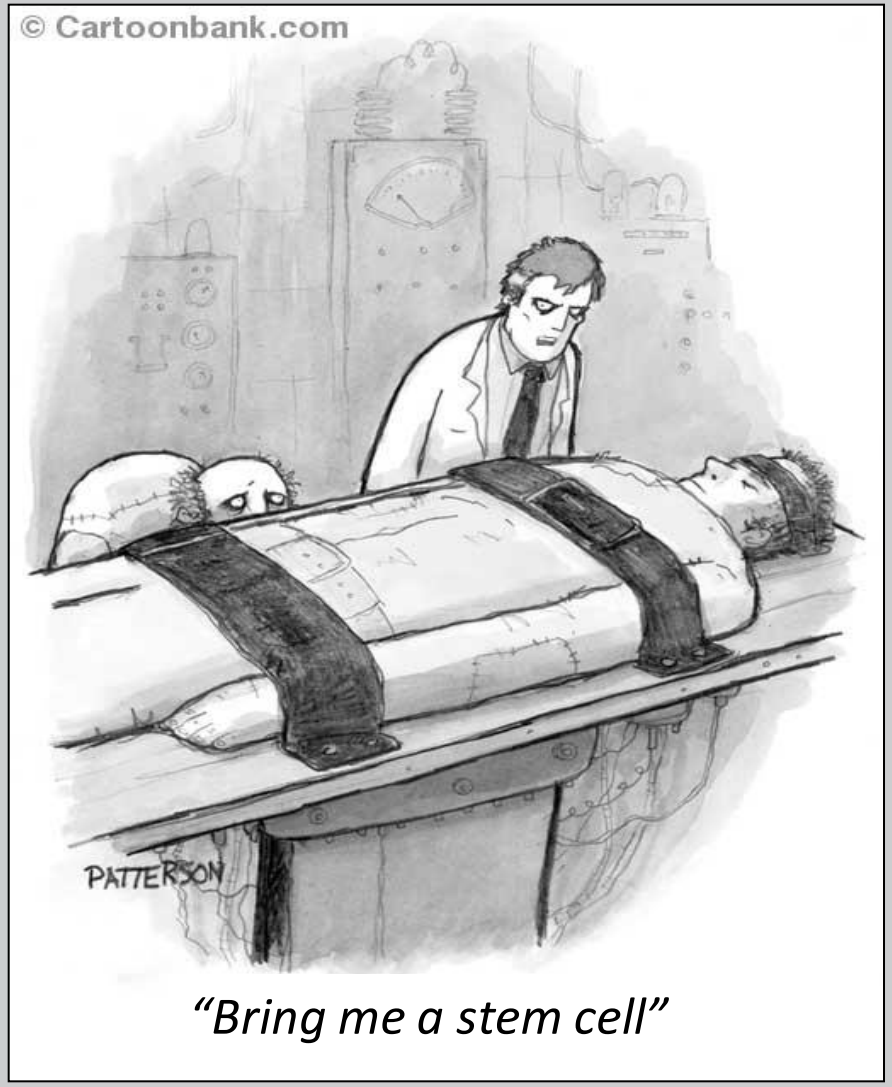
Survival/Lack of Severe Motor Impairment



Fumagalli; Lancet 2022; 399: 372–83

Gene Therapy vs. Bone Marrow Transplant

1. **Current Therapy:**
   - The risks of BMT are high
   - Availability of donors affects risk
   - Race, ethnicity important in finding donors
2. **Effectiveness:**
   - May deliver more enzyme than BMT
   - If so, may be more effective, and safer
3. **Cost:**
   - $2.5 – 3M for gene therapy product
   - These are complex diseases, and to start there will be limited sites (3-4 in the USA)
   - Can we make access equitable?



"Bring me a stem cell"