Rare Disease Clinical Trials

Module 4: Lysosomal Storage Diseases

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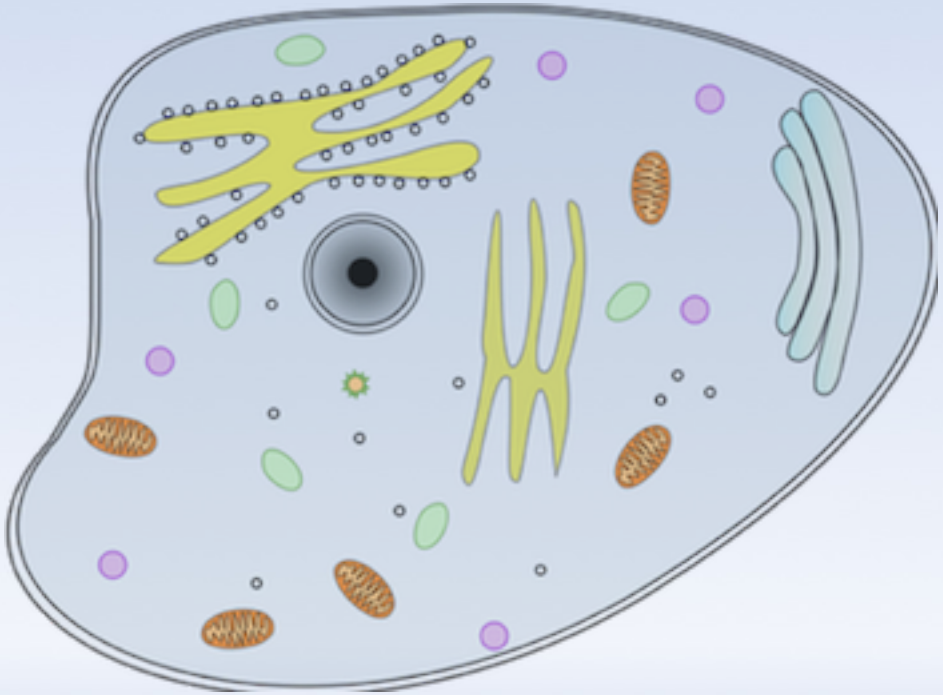
Lysosomal Storage Diseases

Lysosomal Storage Diseases (LSDs)

- Lysosomes collect byproducts in cells
- Filled with enzymes to help breakdown products
- LSD's are missing an enzyme that leads to an accumulation of substances in cells/tissues
- Severity often corelated to enzyme deficiency
- E.g., Pompe, Gaucher, Fabry, Sanfilippo, Hunter syndrome



Numerous Lysosomal Storage Diseases

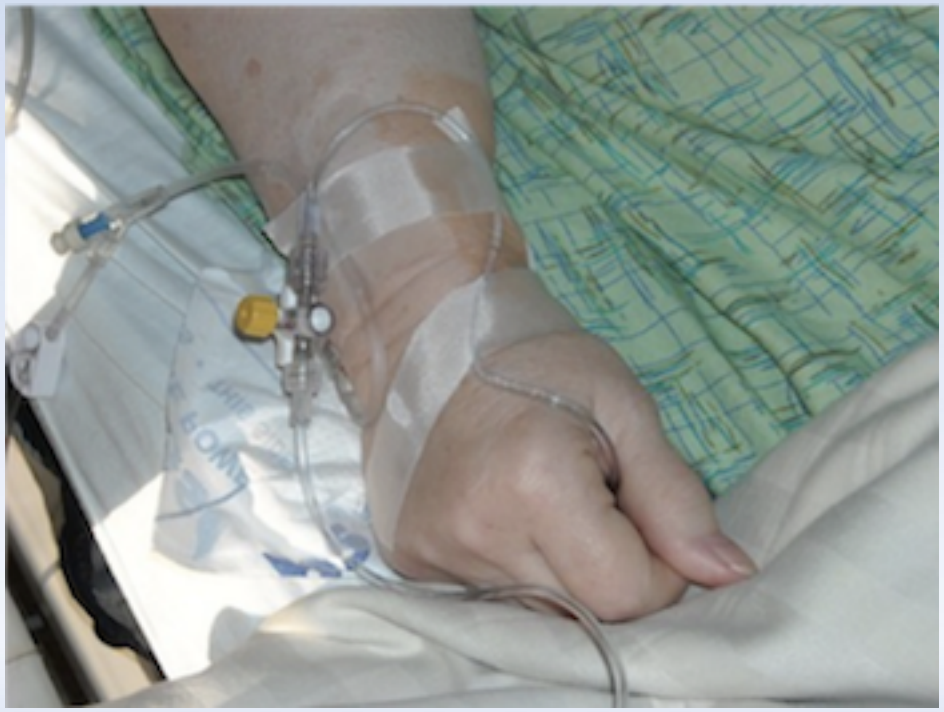
Aspartylglucosaminuria	Mucopolysaccharidoses (MPS) disorders	Mucolipidosis (I, II, III, IV)
Beta-mannosidosis	MPS I (Hurler, Hurler-Scheie, Scheie syndromes)	Multiple sulfatase deficiency
Christianson syndrome	MPS II (Hunter syndrome)	Niemann-Pick disease
Charcot-Marie-Tooth (type 4j	MPS IIIA (Sanfilippo syndrome Type A)	Neuronal ceroid lipofuscinoses
Chanarin-Dorfman syndrome	MPS IIIB (Sanfilippo syndrome Type B)	Pompe disease
Cystinosis	MPS IIIC (Sanfilippo syndrome Type C)	Pycnodysostonis
Danon disease	MPS IIID (Sanfilippo syndrome Type D)	Sandhoff disease
Fabry disease	MPS IVA (Morquio syndrome type A)	Kanzaki disease
Farber disease	MPS IVB (Morquio syndrome type B)	Salla disease
Galactosialidosis	MPS VI (Maroteaux-Lamy syndrome)	Infantile free sialic acid storage disease
Gaucher disease	MPS VII (Sly syndrome)	SMA with progressive myoclonic epilepsy
GM1-gangliosidosis	MPS IX (hyaluronindase deficiency)	Tay-Sachs disease
Krabbe disease		Yunis-Varon syndrome
Metachromatic leukodystrophy		Bilateral temporooccipital polymicrogyria
		X-linked hypercaciuric nephrolithiasis

Complete list courtesy of WORLDsymposia.Org
Image Gaucher disease baby courtesy of wikimedia commons.

Different Types of Clinical Studies

Not all studies are Phase 3 studies

- Prevention
- Screening
- Diagnostic
- Genetic
- Epidemiological
- Treatment (Phase I, II, III)
- Behavioral
- Quality of life
- Observational



Greenberg RG et al. *Contemp Clin Trials Commun. 2017;9:7-12.*

Location, Location, Location

Specialty centers

- Many LSDs have specialty centers where trials occur
- Most are in larger cities with teaching medical centers
- May require travel
  - Compensation
  - Time/travel commitment
- Team approach to care
  - Interact with multiple healthcare professionals with each visit

Obstacles

Treatment Concerns

- Side effects
- Invasive procedures, blood draws
- Untested drug
- Uncertain benefits
- Randomized to placebo
- Blinding/not knowing
- Multiple healthcare professionals with each visit

Greenberg RG et al. *Contemp Clin Trials Commun. 2017;9:7-12.*

Obstacles

Logistic Concerns

- Work schedule
- School schedule
- Transportation
- Compensation?
- Childcare concerns
- Length of study visits
- Frequency of study visits

Greenberg RG et al. *Contemp Clin Trials Commun. 2017;9:7-12.*

Talking to the Patient

During the conversation

- Start by reviewing the disease (if appropriate), current treatment options, and then present the option of the clinical trial or expanded access.
- Use the informed consent documents to steer the conversation (if appropriate)
- Explain that the clinical trial is voluntary (3x)
- Explain the right to withdraw at any time

Summary

- LSDs are genetic conditions that often impact multiple organs
- Treatment options are limited for many LSDs
- Most clinical studies are in specialty centers
- Not all studies are interventional studies
- While studies are essential to advance science, not all studies are appopriate for all individuals
- Role of the healthcare professional is to assist the individual in entering a clinical trial and help manage that person during the study