the FOUNDATION for PERIPHERAL NEUROPATHY®

Welcome!

FPN Webinar:

New Horizons in CIDP Therapy: Exploring Current *and* Future Treatments

Wednesday, December 4, 2024

Today's webinar is generously sponsored by: Johnson&Johnson

We will begin our presentation shortly.

the FOUNDATION for PERIPHERAL NEUROPATHY®

Today's moderator:

Lindsay Colbert
Executive Director
the Foundation *for* Peripheral Neuropathy

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Before We Begin

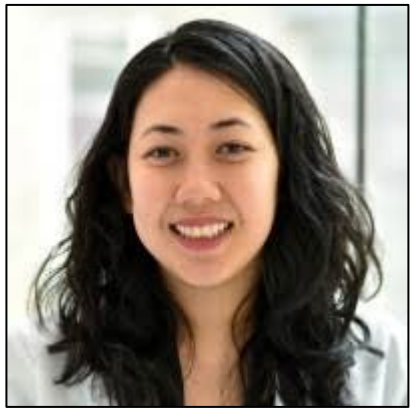
This presentation is being recorded. The recording link will be emailed to you so you can view it again later.

Submit your questions anytime via the Questions Box. We will try to answer them during this webinar.

If you are having trouble with the audio using your computer, you can dial in by phone (check your email for dial-in instructions).

the FOUNDATION for PERIPHERAL NEUROPATHY®

We welcome today's presenters:



Vanessa Tiongson, MD
Neuromuscular Specialist
Mount Sinai Hospital

Bob L.
CIDP Patient

the FOUNDATION for PERIPHERAL NEUROPATHY®

Bob's journey living with CIDP

Bob L.
CIDP Patient

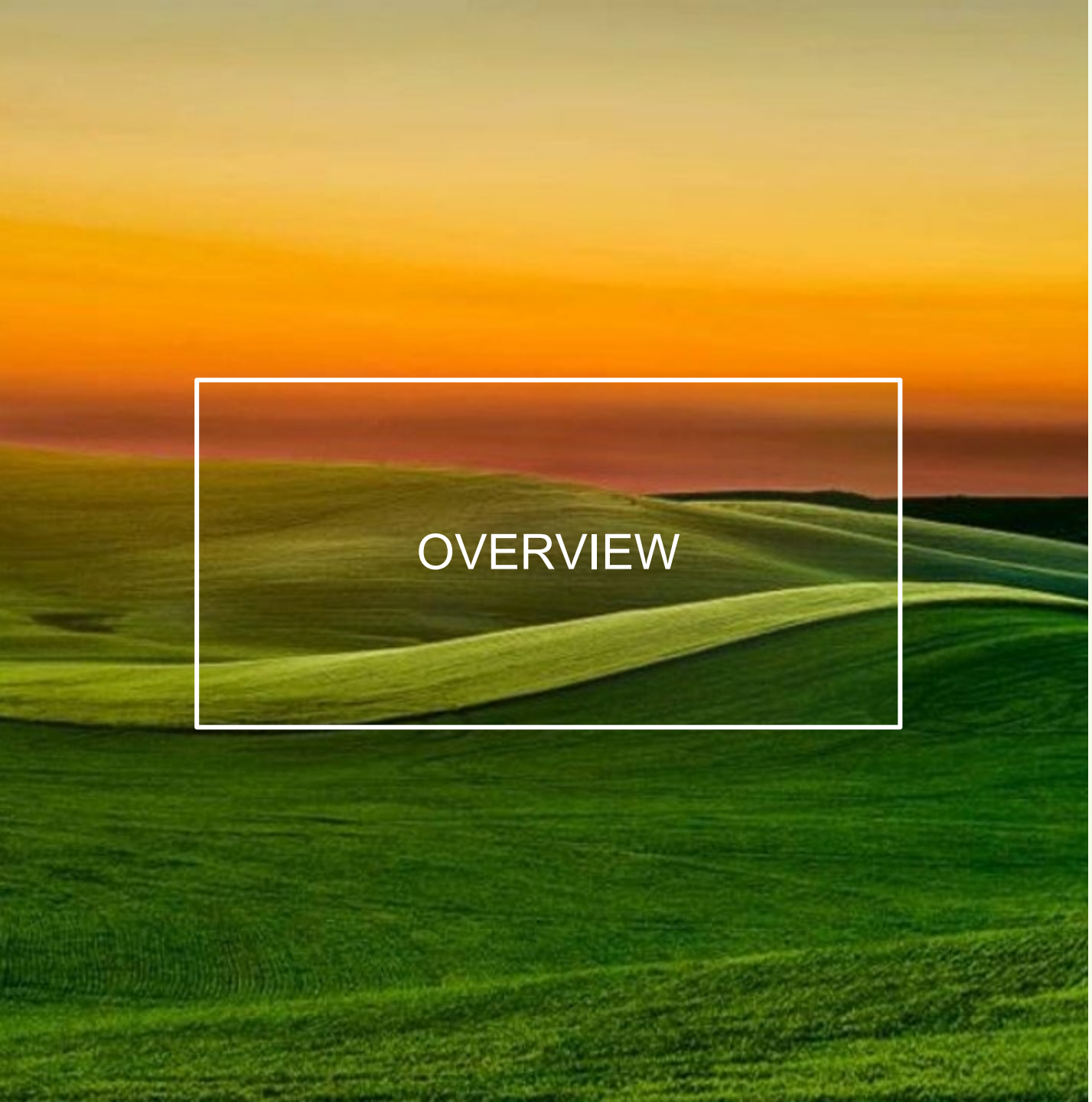
"Although I still have the effects of this disease, I go on living with the understanding that people have it a lot worse than me. I consider myself lucky."

NEW HORIZONS IN CIDP: EXPLORING CURRENT AND FUTURE TREATMENTS

VANESSA TIONGSON, MD
Neuromuscular Specialist
December 4, 2024

DISCLOSURES

I have participated in advisory panels for Argenx and Johnson and Johnson in the past regarding medications for myasthenia gravis



What is CIDP?

What are its signs and symptoms?

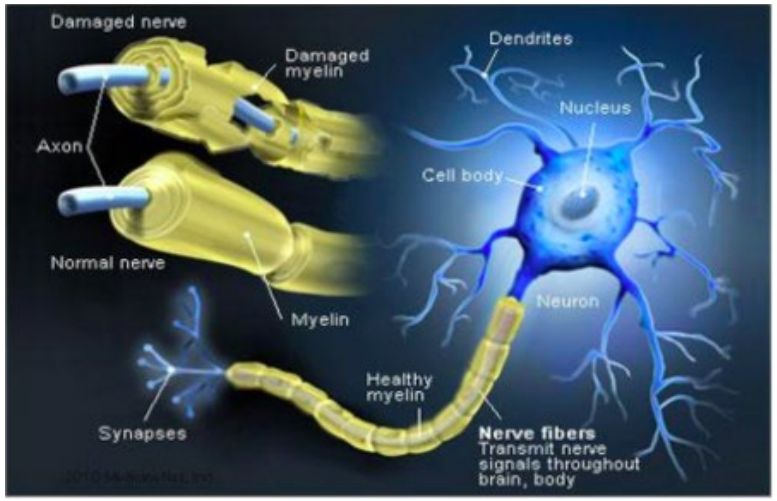
How is it diagnosed?

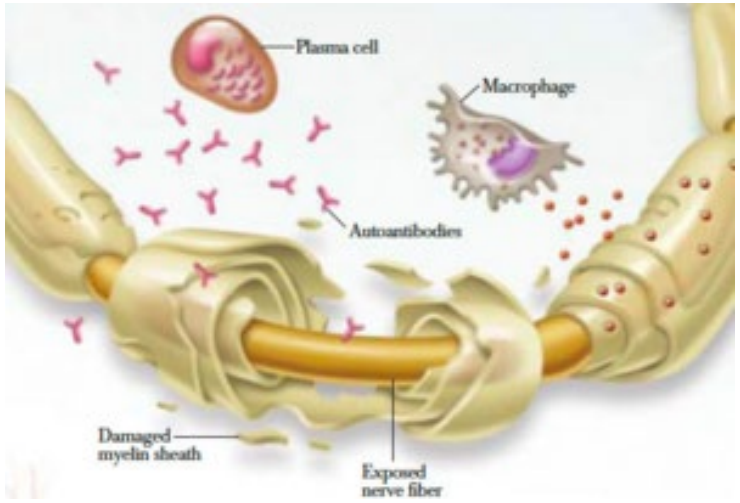
What therapies are available?

What are their pros and cons?

What therapies are in pipeline?

WHAT IS CIDP?
CHRONIC INFLAMMATORY DEMYELINATING POLYRADICULONEUROPATHY





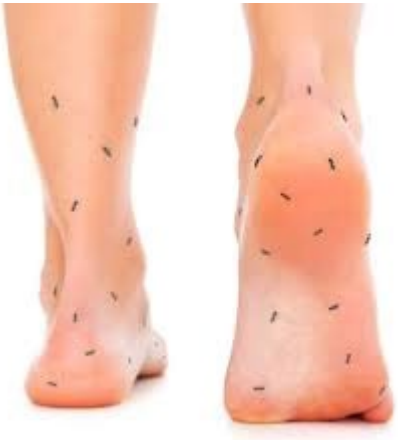
- Rare prevalence: 83.9 people for 100,000
- Occurs in males>females
- More commonly diagnosed between ages 40 and 60

- Condition in which the immune system is mounting an attack on the body's own nerves
- It is damaging the layer around the axon known as myelin, which is responsible for speeding up transmission of signals
- It is considered more of a syndrome than one unifying diagnosis. There is some variability in how it presents and which parts of the immune system are involved in the attack

SIGNS AND SYMPTOMS OF CIDP

Weakness of the limbs (proximal and distal)

Numbness and tingling



Balance impairment

Neuropathic Pain

VARIATIONS IN THE PRESENTATION OF CIDP

Classic CIDP

Weakness and numbness of upper/lower arms and legs, symmetric

CIDP Variants

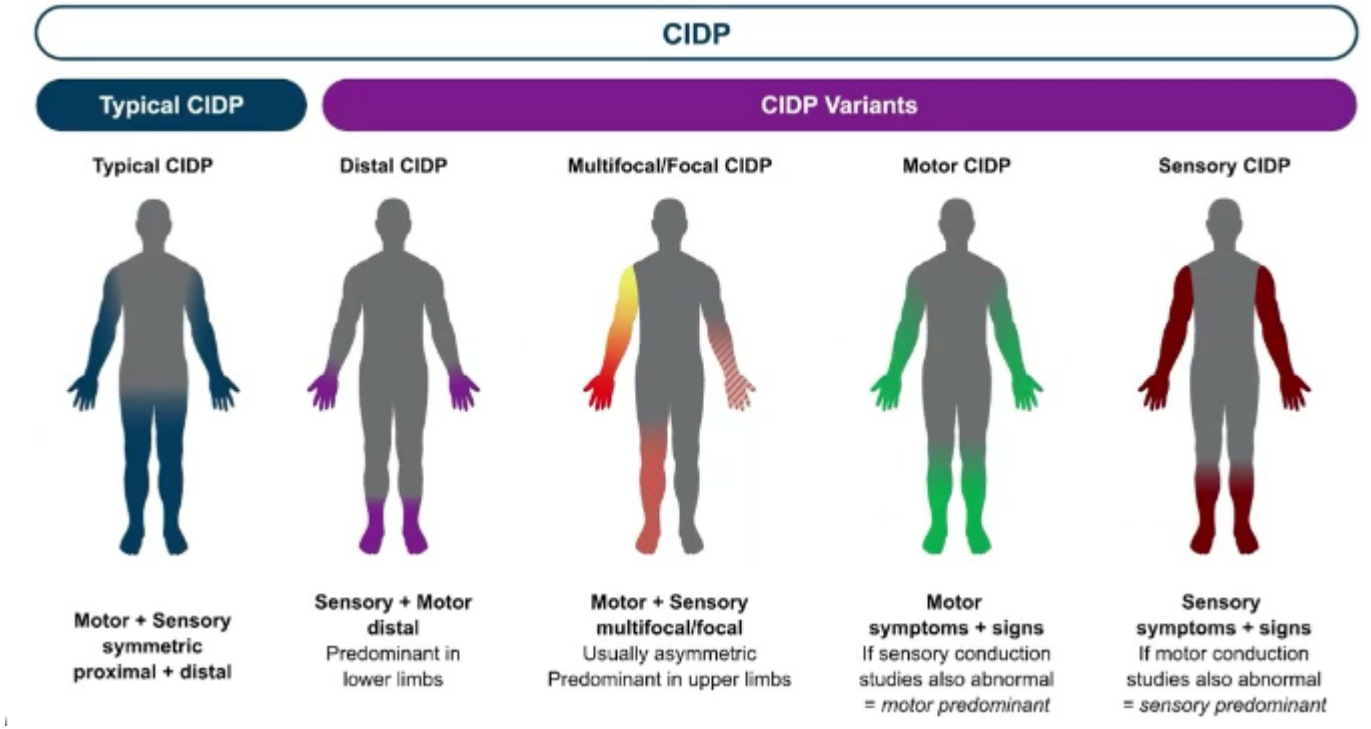
Multifocal

Pure motor

Pure sensory

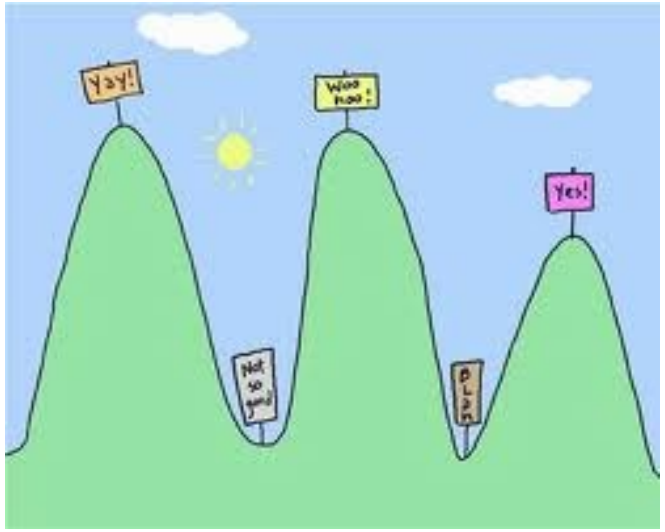
Distal predominance

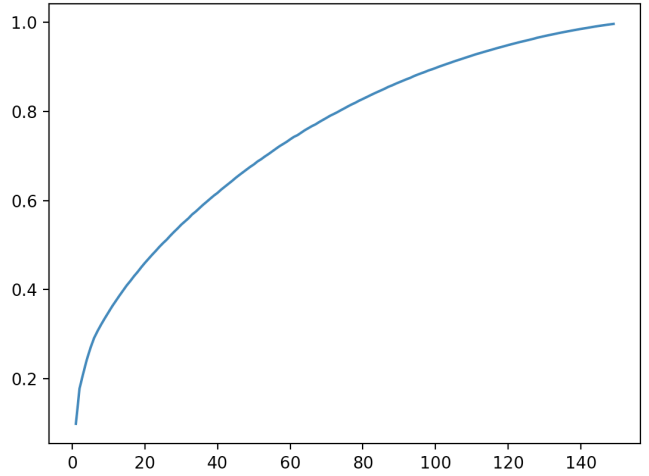
Focal distribution



VARIATIONS IN THE PRESENTATION OF CIDP

- Acute/Subacute
  - Need to be distinguished from AIDP (acute inflammatory demyelinating polyradiculoneuropathy)
  - Developing over at least 8 weeks
  - Lower rate of facial involvement
- Relapsing/Remitting
- Progressive





CIDP is a Challenging Diagnosis!

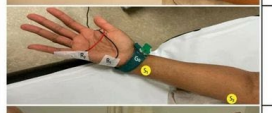
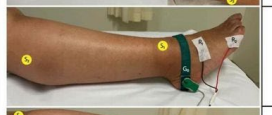
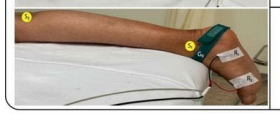
***History and Examination

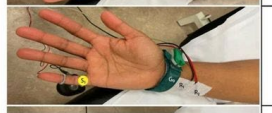
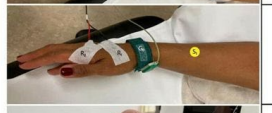
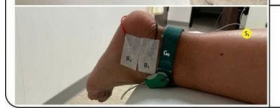
High arches, hammertoes

Weakness, numbness, absent reflexes

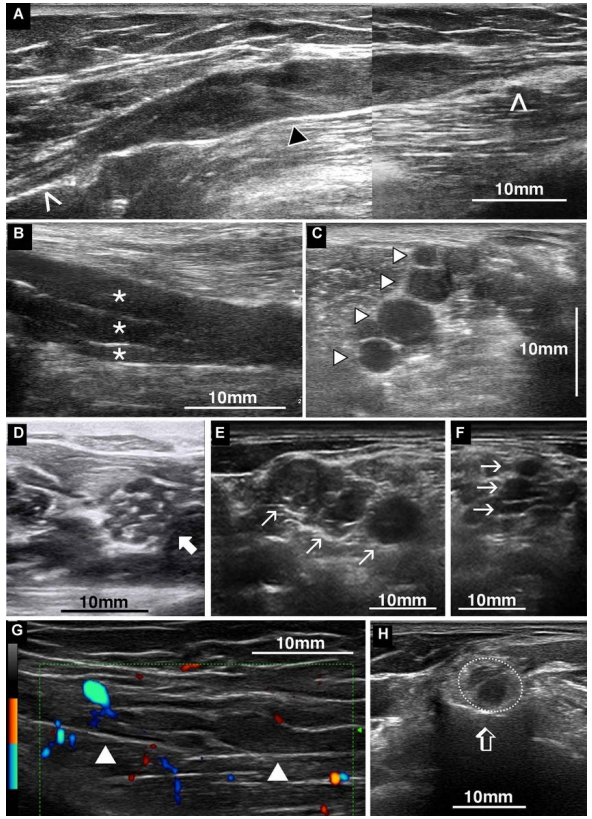
***Nerve Conduction Studies and EMG

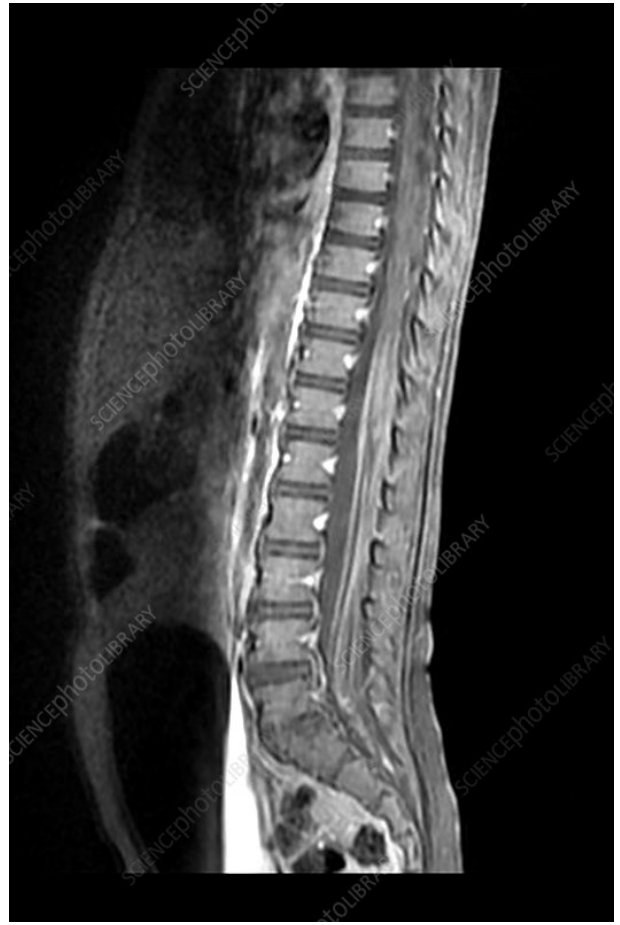
- Most important part - the EAN/PNS created specific guidelines updated 2021 depending on distribution
  - For example, for typical, at least 2 motor nerves must show certain features
  - Can sometimes be challenging in nerves with marked axonal damage
  - Can categorize CIDP and Possible CIDP

A Motor		Cut-offs for abnormal	Motor conduction criteria CIDP
	**Median:** • CMAP amplitude • DML • CMAP duration • MCV • F-wave latency	 <5.0 mV >4.0 ms <48 m/s >30 ms	CB >30% amplitude ↓, TD >30% duration ↑ >6.0 ms >8.4 ms <33.6 m/s >36.0 ms
	**Ulnar:** • CMAP amplitude • DML • CMAP duration • MCV • F-wave latency	 <4.0 mV >3.3 ms <48 m/s >31.0 ms	CB >30% amplitude ↓, TD >30% duration ↑ >4.4 ms >9.6 ms <33.6 m/s >37.2 ms
	**Peroneal:** • CMAP amplitude • DML • CMAP duration • MCV • F-wave latency	 <1.5 mV >6.5 ms <44 m/s >55 ms	CB >30% amplitude ↓, TD >100% duration ↑ >9.8 ms >8.8 ms <30.8 m/s >66 ms
	**Tibial:** • CMAP amplitude • DML • CMAP duration • MCV • F-wave latency	 <3.0 mV >6.1 ms <44 m/s >55 ms	TD >100% duration ↑ >9.2 ms >9.2 ms <30.8 m/s >66 ms

B Sensory		Cut-offs for abnormal	Sensory conduction criteria CIDP
	**Median:** • SNAP amplitude • SCV	 <10 µV <40 m/s	<32 m/s (SNAP >8µV) or <28 m/s (SNAP <8 µV)
	**Ulnar:** • SNAP amplitude • SCV	 <10 µV <40 m/s	<32 m/s (SNAP >8µV) or <28 m/s (SNAP <8 µV)
	**Radial:** • SNAP amplitude • SCV	 <15 µV (age<60), <12 (age>60) <40 m/s	<32 m/s (SNAP >80%) or <28 m/s (SNAP <80%)
	**Sural:** • SNAP amplitude • SCV	 <7 µV (age<40), <5 (age 40-60), <3µV (age>60) <38 m/s	<30.4 m/s (SNAP >80%) or <26.6m/s (SNAP <80%), or abnormal median/radial + sural sparing

CIDP is a Challenging Diagnosis!

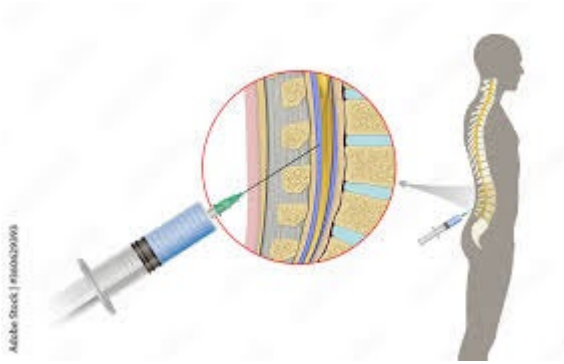


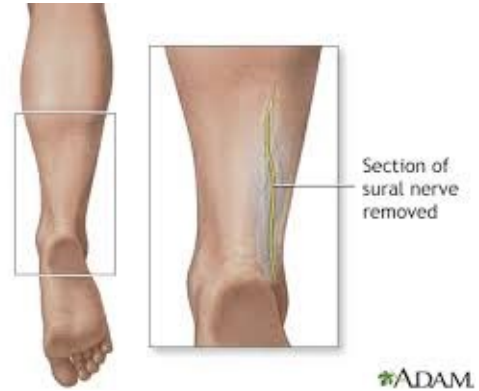


- Imaging - Recently has a larger role in diagnosis
  - Ultrasound
    - CIDP is a non-uniform neuropathy - variability in nerve involvement
    - Nerve disease often associated with increases in cross sectional area, vascularity. This is not specific, but it is unusual for proximal nerves to have these features
  - Spinal MRI with contrast
    - Nerve root enlargement and enhancement
    - Can be normal in CIDP

CIDP is a Challenging Diagnosis!

- Blood Test
  - Monoclonal proteins
  - Antibody Testing
    - Ganglioside panels
- Spinal Fluid Testing
- Nerve biopsy
- Response to treatment
  - 80-90% of patients respond to steroids or IVIG





CIDP is a Challenging Diagnosis!
Other Differential Diagnoses - Just to Name a Few

- Diabetic Neuropathy
- Guillain Barre Syndrome
- HIV Neuropathy
- Vitamin B12 Deficiency
- Toxic Neuropathies
- Multifocal Motor Neuropathy
- Charcot Marie Tooth or other hereditary neuropathies
- Amyloidosis
- Autoimmune nodopathies

WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

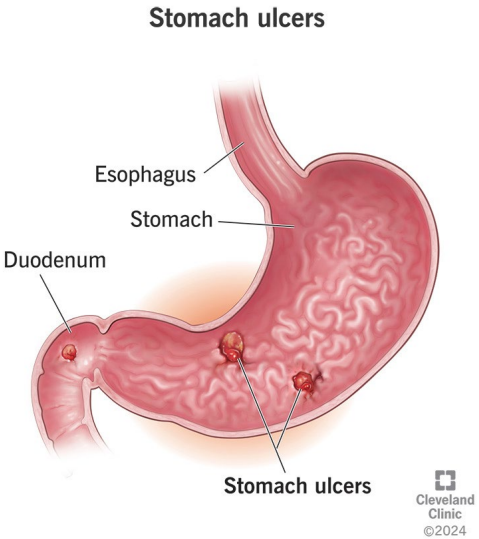
- Corticosteroids
  - Immunosuppressant
    - Improves symptoms in a majority of CIDP patients
    - Remission in 61% of patients reported in one study
    - Convenient to use
      - Daily oral prednisone
        - High dose then tapered slowly
      - Monthly IV methylprednisolone
        - 1 day monthly
      - Monthly dexamethasone
        - 4 days monthly
    - Can consider to reduction/discontinuation if in remission

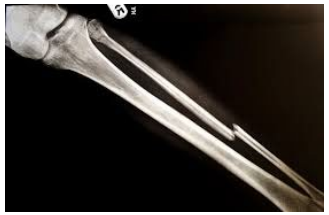
WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

- Corticosteroids
  - Not Effective for Pure Motor CIDP
  - Short term side effects
    - Mood disturbance
    - High blood pressure
    - Elevated glucose
    - Acid reflux/peptic ulcers
    - Leg swelling
  - Long term side effects
    - Diabetes
    - Weight gain
    - Buffalo hump/moon face
    - Bone loss
    - Vision impairment
    - Increased risk of infection



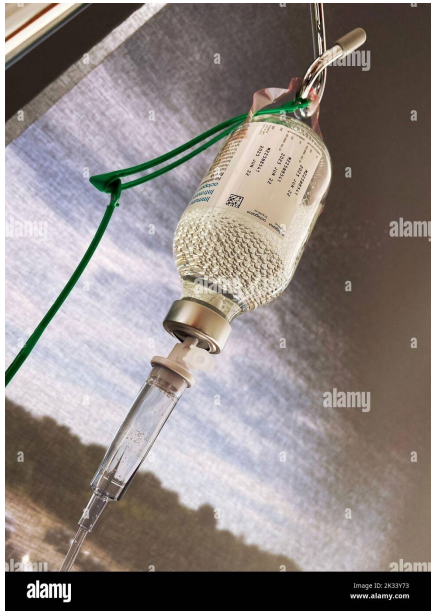


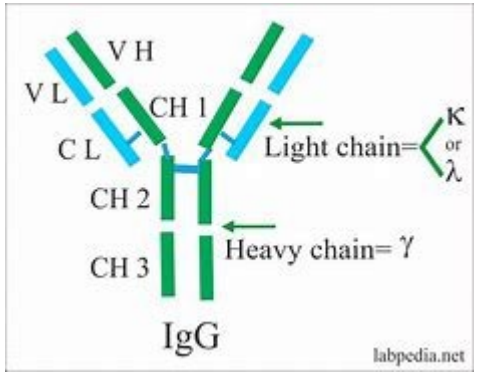
WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

- Intravenous Immunoglobulins
  - Plasma obtained from donations of many people
  - Immunomodulators - all of its mechanisms are not fully understood





WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

- Intravenous Immunoglobulins
  - 2-5 days of treatment (4 hour infusion often) every 2-6 weeks – initiation then maintenance
  - At Home or Infusion center
  - May be able to increase interval between dosing over time
  - Treatment failure - 3-5 cycles
  - High cost

WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

Intravenous Immunoglobulins

- Often well tolerated! Really!

- Side effects
  - Risk of allergic reactions
  - Increased risk of blood clots
  - Headaches
  - Flu like symptoms
  - Renal impairment

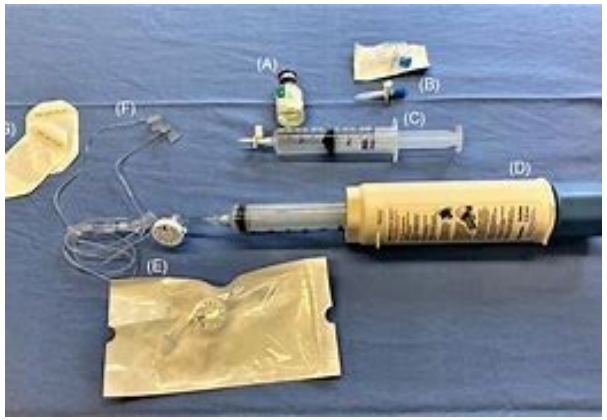
- Candidates not ideal for therapy
  - History of blood clots
  - Heart Failure
  - Kidney Disease

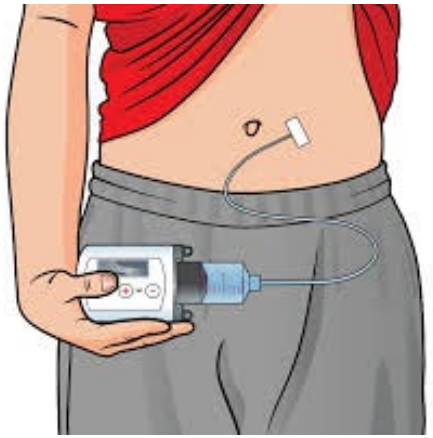
WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

- Subcutaneous Immunoglobulins
  - Not recommended for initiation
  - Can be used after IVIg for maintenance
  - Similar side effects compared with IVIg
    - Except Local side effects - swelling, pain
  - Self-administered at home with device, weekly, new every 4 weeks medication
  - More frequent dosing usually





WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

	Liquid SCIg								Lyophilized IVIg
	Cutaquig	Cuvitru	Gammagard Liquid	Gammaked	Gamunex-C	Hizentra	HyQvia	Xembify	Gammagard S/D
Manufacturer	Pfizer	Takeda	Takeda	Kedrion	Grifols	CSL Behring	Takeda	Grifols	Takeda
Clinical Contact	1-888-429-4535	1-877-825-3327	1-877-825-3327	1-855-353-7466	1-800-520-2807	1-800-504-5434	1-877-825-3327	1-800-520-2807	1-877-825-3327
Labeled Uses	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o, CIDP in adults	PIDD in adults	PIDD in pts ≥ 2 y/o	PIDD in pts ≥ 2 y/o and adults, ITP in adults, CLL, Kawasaki Syndrome in pediatric patients
Vial Sizes	1 g, 2 g, 4 g, 8 g	1 g, 2 g, 4 g, 8 g, 10 g	1 g, 2.5 g, 5 g, 10 g, 20 g, 30 g	1 g, 2.5 g, 5 g, 10 g, 20 g	1 g, 2.5 g, 5 g, 10 g, 20 g, 40 g	Prefilled syringes: 1 g, 2g, 4 g Vials: 1 g, 2 g, 4 g, 10 gm	2.5 g/200 U, 5 g/400 U, 10 g/800 U, 20 g/1,600 U, 30 g/2,400 U	1 g, 2 g, 4 g, 10 g	5 g, 10 g
Diluent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	• Sterile water • 96 mL for 5 gm 5% • 192 mL for 10 gm 5%
Concentration	16.5%	20%	10%	10%	10%	20%	10%	20%	• 5% • 10%: Use half diluent supplied
Dose Conversion Factor	1.3	1.3	1.37	1.37	1.37	PIDD: 1.37, CIDP: 0.2g/kg per week initial	None	1.37	
Infusion Rate (*Refer to package insert for newly-compromised or high-risk patients)	**Adults ≥17 years:** Infusions 1-2: ≤20 mL/hr/site. Subsequent infusions: Gradually increase as tolerated by approximately 10 mL/hr/site every 2-4 weeks up to a maximum of 52 mL/hr/site. **Age 2-16 years:** Infusions 1-2: ≤15 mL/hr/site. Subsequent infusions: Gradually increase as tolerated by approximately 10 mL/hr/site every 2-4 weeks up to a maximum of 25mL/hr/site.	May administer in up to 4 sites simultaneously. **First 2 infusions:** ≤40 kg administer ≤20 mL/site at rate of 10-20 mL/hr/site ≥40 kg administer ≤60 mL/site at rate of 10-20 mL/hr/site **Subsequent infusions (all weights):** Administer ≤60 mL/site at rate of ≤60 mL/hr/site	**40 kg BW and greater:** First infusion 30 mL/ site at a rate of 20 mL/hr/site. Subsequent doses may be increased to 30 mL/site at a rate of 20-30 mL/hr/site. Maximum flow rate not to exceed 240 mL/hr for all sites combined. **Under 40 kg BW:** First infusion 20 mL/site at a rate of 15 mL/hr/site. Subsequent doses may be increased to 20 mL/ site at a rate of 15-20 mL/hr/site. Maximum flow rate not to exceed 160 mL/hr for all sites combined.	**Adults:** 20 mL/hr/site (max of 8 infusion sites) **Pediatric:** Initial infusion rate: <25 kg 10 mL/hr/site, ≥25 kg 15 mL/hr/site. Maintenance infusion rate: <25 kg 10 mL/hr/ site, ≥25 kg 20 mL/hr/ site (max of 6 infusion sites)	**Adults:** 20 mL/hr/site (max of 8 infusion sites) **Pediatric:** Initial infusion rate: <25 kg 10mL/hr/site, ≥25 kg 15mL/hr/site. Maintenance infusion rate: <25 kg 10mL/hr/ site, ≥25 kg 20mL/hr/ site (max of 6 infusion sites)	**PIDD:** First infusion ≤15 mL/hr/site. Subsequent doses ≤25 mL/hr/site as tolerated. **CIDP:** First infusion ≤20 mL/hr/site. Subsequent doses ≤50 mL/hr/site as tolerated.	Refer to package insert; Initial and max rate is based on weight and number of infusions received. Infusion rates may be increased every 5–15 mins as tolerated. Initial rate range: 5–10 mL/hr/ site. Max rate: 300 mL/hr/site.	May administer up to 6 infusion sites simultaneously at a maximum rate of 25 mL/hr/site	• 5%: 0.5 mL/kg/hr and may increase gradually to a maximum of 4 mL/kg/hr if no adverse reaction[a] • High-risk patients: Maximum rate of 4 mL/kg/ hr at 5%[a] • May use 10% (if 5% tolerated)[a] at 0.5 mL/kg/hr and may increase gradually to 8 mL/kg/hr[a]
Sugar Content	79mg/mL maltose	Sugar free; stabilized with glycine	Sugar free; stabilized with glycine	Sugar free; stabilized with glycine	Sugar free; stabilized with glycine	Sugar free; stabilized with L-proline	Sugar free; stabilized with glycine	Sugar free; stabilized with glycine	2% glucose
Sodium Content	≤30mmol/L	N/A	N/A	Trace amounts	Trace amounts	Trace amounts	N/A	Trace amounts	0.85% with 5%
Osmolality/ Osmolarity	310–380 mOsm/kg	280–292 mOsm/kg	240–300 mOsm/kg	258 mOsm/kg	258 mOsm/kg	380 mOsm/kg	240–300 mOsm/kg	280–404 mOsm/kg	5%: 636 mOsm/kg
pH	5.0–5.5	4.6–5.1	4.6–5.1	4–4.5	4–4.5	4.6–5.2	4.6–5.1	4.1–4.8	6.8 ±0.4 (after reconstitution)
IgA Content	206 mcg/mL	80 mcg/mL	37 mcg/mL	46 mcg/mL	46 mcg/mL	<50 mcg/mL	37 mcg/mL	<70 mcg/mL	<1 mcg/mL
% IgG	≥96%	≥98%	>98%	>98%	>98%	≥98%	>98%	>98%	>90%
Latex Content	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Packaging contains latex
Method of Production and Viral Inactivation/ Removal Process	Cold ethanol, pH 4.0 incubation, SD	Cold ethanol fractionation, cation and anion exchange chromatography, solvent/detergent (S/D) treatment, 35 nm nanofiltration, low pH incubation at elevated temperature	Cold ethanol fractionation, 35 nm nanofiltration, chromatography, low pH incubation, solvent/ detergent treatment	Depth filtration, cold ethanol fractionation, chromatography, low pH treatment, caprylate precipitation	Depth filtration, cold ethanol fractionation, chromatography, low pH treatment, caprylate precipitation	Depth filtration, cold alcohol fractionation, octanoic acid fractionation, chromatography, pH44 incubation, 20 nm nanofiltration	Cold ethanol fractionation, S/D treatment, 35 nm nanofiltration, low pH incubation	Cold ethanol fractionation, caprylate precipitation and filtration, and anion-exchange chromatography	Cold ethanol fractionation, ultrafiltration, chromatography, solvent/detergent treatment
Filtration	No filter required	No filter required	In-line filter optional	No filter required	No filter required	No filter required	No filter required	No filter required	Filter required
Flushing Compatibility	N/A	N/A	Saline or dextrose	Saline or dextrose; Do not dilute with saline	Saline or dextrose; Do not dilute with saline	N/A	Saline	Dextrose if needed	Saline or dextrose
Storage Requirements	Store at +2°C to +8°C (36°F to 46°F) for up to 36 months from the date of manufacture. Do not use beyond the expiration date. Do not freeze. May be stored at room temp (≤25°C, 77°F) for up to 9 months without being refrigerated again during this period, and must be discarded if not used after this.	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• Room temperature • Do not freeze • Protect from light	• Refrigerate • Do not freeze	• Refrigerate • Do not freeze	• Room temperature • Do not freeze
Shelf Life		36 months refrigerated at 2°C–8°C (36°F–46°F), or up to 24 months at room temperature up to 25°C or 77°F. Do not return Cuvitru to refrigerator if you take it out to room temperature.	36 months refrigerated at 2°C–8°C (36°F–46°F), or 24 months at room temp (≤25°C, 77°F)	36 months refrigerated at 2°C–8°C (36°F–46°F), or 6 months at room temp (≤25°C, 77°F) any time during the 36 months	36 months refrigerated at 2°C–8°C (36°F–46°F), or 6 months at room temp (≤25°C, 77°F) any time during the 36 months	30 months when stored at room temperature as stable indicated by the expiration date on label. Preservative-free	36 months from date of manufacture refrigerated at 2°C–8°C (36°F–46°F). Room temperature for up to 3 months during the first 24 months from the date of manufacturing printed on the carton. Hyqvia must be used within 3 months after storing at room temperature but within the expiration date on the carton and vial label.	May be stored at temperatures not to exceed 25°C (77°F) for up to 24 months, preservative free	Store at a temperature not to exceed 25°C (77°F) for up to 24 months, preservative free

FIRST LINE TREATMENTS

- Intravenous and Subcutaneous Immunoglobulins
  - Many, many brands - how to choose?
  - Variations in insurance coverage!
  - No differences in efficacy reported
  - Major dosage difference in subcutaneous HyQvia available as every 4 weeks
  - Possibly could be variations in side effects between patients
  - Variations in indications are mostly based on individual drug trials conducted

	Liquid IVIg								
	Asceniv	Bivigam	Gammagard Liquid	Gammaked	Gammaplex	Gamunex-C	Octagam	Panzyga	Privigen
Manufacturer	ADMA	ADMA	Takeda	Kedrion	Bio Products Laboratory	Grifols	Octapharma/Pfizer	Pfizer	CSL Behring
Clinical Contact	1-800-458-4344	1-800-458-4344	1-877-825-3327	1-855-353-7466	1-800-843-7477	1-800-520-2807	1-888-429-4535 (Octapharma)	1-888-429-4535	1-800-504-5434
Labeled Uses	PIDD in adults and adolescents 12–17 years of age	PIDD	PIDD in pts ≥2 y/o, MMN in adults	CIDP in adults, PIDD in pts ≥2 y/o, ITP in adults and children	PIDD in pts ≥2 y/o, ITP	CIDP in adults, PIDD in pts ≥2 y/o, ITP in adults and children	Is PIDD 10%: ITP in adults, DM in adults	PIDD in pts ≥2 y/o , ITP in adults, CIDP in adults	PIDD, ITP in patients ≥15 y/o, CIDP in adults
Dosing Sizes	5 g	5 g, 10 g	1 g, 2.5 g, 5 g, 10 g, 20 g, 30 g	1 g, 2.5 g, 5 g, 10 g, 20 g	• 5%: 1 g, 10 g, 20 g • 10%: 5 g, 10 g, 20 g	1 g, 2.5 g, 5 g, 10 g, 20 g	• 5%: 1 g, 2.5 g, 5 g, 10 g, 25 g • 10%: 2 g, 5 g, 10 g, 20 g, 30 g	1 g, 2.5 g, 5 g, 10 g, 20 g, 30 g	5 g, 10 g, 20 g, 40 g
Concentration	10%	10%	10%	10%	5%, 10%	10%	5%, 10%	10%	10%
Infusion Rate (*Refer to package insert for newly-compromised or high-risk patients	• Initial infusion Rate: 0.5 mg/kg/ min (0.005mL/kg/min) for the first 15 minutes • Maintenance Infusion Rate (if tolerated) Increase gradually every 15 minutes (if tolerated) up to 8 mg/kg/min (0.08mL/kg/min)	• Initial infusion Rate: 0.5 mg/kg/ min for the first 10 minutes • Maintenance Infusion Rate (if tolerated): Increase every 20 minutes (if tolerated) by 0.8 mg/ kg/min up to 6 mg/kg/min	• PIDD: 0.5 mL/kg/hr; rate can be increased every 30 min to a rate of 5 mL/kg/hr as tolerated* • MMN: 0.5mL/kg/hr, rate can be increased to 5.4mL/kg/hr as tolerated	• PIDD and ITP: 0.01 mL/kg/min for 30 min; can be gradually increased to a maximum of 0.08 mL/kg/min if no adverse reaction* • CIDP: 0.02mL/kg/min for 20 min; can be gradually increased to a maximum of 0.08mL/kg/min if no adverse reaction*	• 5%: 0.5 mg/kg/min (0.01mL/ kg/min) for the first 15 min; if tolerated, gradually increase to 4 mg/kg/min (0.08mL/kg/min)* • 10%: 0.5 mg/kg/min (0.01mL/ kg/min) for the first 15 min; if tolerated, gradually increase to 8 mg/kg/min (0.08mL/kg/min)*	• 5%: 0.5 mg/kg/min (0.01 mL/kg/ min) for 30 min, then increase to 1 mg/kg/min (0.02 mL/kg/min) for the remainder of the infusion.* • 10%: 0.5 mg/kg/min (0.01 mL/ kg/min) for 30 min, then increase to 2 mg/kg/min (0.04 mL/kg/min) for 30 min, then advance to 3 mg/kg/min (0.06 mL/kg/min) for the remainder of the infusion.*	• PIDD: Initial Infusion Rate: 1 mg/ kg/min (0.01 mL/kg/min); Maximum Infusion Rate: 4 mg/ kg/min (0.04 mL/kg/min) • ITP: Initial Infusion Rate: 1 mg/kg/ min (0.01 mL/kg/min); Maximum Infusion Rate: 8 mg/kg/min (0.08 mL/kg/min) • CIDP: Initial Infusion Rate: 1 mg/ kg/min (0.01 mL/kg/min); Maximum Infusion Rate: 12 mg/ kg/min (0.12 mL/kg/min)	• PIDD and CIDP: 0.5 mg/kg/ min (0.005 mL/kg/min); if well tolerated, may increase gradually to 8 mg/kg/min (0.08 mL/kg/ min)* • ITP: 0.5 mg/kg/min (0.005 mL/ kg/min); if well tolerated, may increase gradually to 4 mg/kg/ min (0.04 mL/kg/min)*
Sugar Content	Sugar free; stabilized with glycine	No added sugars	Sugar free; stabilized with glycine	Sugar free; stabilized with glycine	• 5%: 5 g D-Sorbitol in 100 mL of buffer solution • 10%: Sugar free, stabilized with glycine and polysorbate 80	Sugar free; stabilized with glycine	5%: 100 mg/mL maltose/ 10%: 99mg/mL maltose	Glycine	Sugar free; stabilized with L-proline
Sodium Content	100–140 mmol/L	100–140 mmol/L	N/A	Trace amounts	• 5%: 0.2 g sodium acetate and 0.3 g sodium chloride in 100 mL of buffer solution • 10%: ~30 mM sodium chloride in 100 mL of buffer solution	Trace amounts	<30 mmol/L	Trace amounts	<1 mmol/L (10% solution)
Osmolality/ Osmolarity	370–510 mOsm/kg	≥310 mOsm/kg	240–300 mOsm/kg	258 mOsm/kg	• 5%: Typically 420–500 mOsm/kg (not less than 240 mOsm/kg) • 10%: Typically 290 mOsm/kg (not less than 240 mOsm/kg)	258 mOsm/kg	310–380 mOsm/kg	240–310 mOsm/kg	320 mOsm/kg (range 240–440)
pH	4.0–4.6	4.0–4.6	4.6–5.1	4–4.5	• 5%: 4.8–5.1 • 10%: 4.9–5.2	4–4.5	5%: 5.1–6 10%: 4.5–5	4.5–5.0	4.8 (range 4.6–5)
IgA Content	≤200 mcg/mL	≤200 mcg/mL	37 mcg/mL	46 mcg/mL	• 5%: <15 mcg/mL • 10%: <20 mcg/mL	46 mcg/mL	5%: ≤200 mcg/mL 10%: 106 mcg/mL	Average 100 mcg/mL	≤35 mcg/mL
% IgG	≥96%	≥96%	>98%	>98%	• 5%: >95% • 10%: >98%	>98%	≥96%	≥96%	>98%
Latex Content	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free	Latex free
Method of Production and Viral Inactivation/ Removal Process	Precipitation and removal of fraction III during the cold ethanol process, SD, 35 nm nanofiltration, low pH	Cohn-Oncley fractionation, anion exchange chromatography; precipitation and removal of fraction III of the cold ethanol process; 35 nm nanofiltration, solvent/detergent treatment	Cold ethanol fractionation, 35 nm nanofiltration, chromatography, low pH incubation, solvent/detergent treatment	Depth filtration, cold ethanol fractionation, chromatography, low pH treatment, caprylate precipitation	S/D treatment, virus filtration, pH incubation	Depth filtration, cold ethanol fractionation, chromatography, low pH treatment, caprylate precipitation	Low pH treatment, Cold ethanol fractionation, ultrafiltration and chromatography as well as S/D treatment	Cold ethanol fractionation process followed by purification methodologies, as well as S/D treatment, ion-exchange chromatography, and nanofiltration (20 nm)	Depth filtration, cold-ethanol fractionation, octanoic acid fractionation, chromatography, pH4 incubation, 20 nm nanofiltration
Filtration	No filter required	No filter required	Filter optional	No filter required	No filter required	No filter required	0.2-200 micron filter optional	0.2-200 micron filter optional	No filter required
Flushing Compatibility	N/A	Saline	Saline or dextrose; Do not dilute with saline	Saline or dextrose; Do not dilute with saline	Saline or dextrose	Saline or dextrose	Saline or dextrose	Saline or dextrose	Saline or dextrose
Storage Requirements	• Refrigerate between 2°C–8°C (36°F to 46°F) • Do not freeze or heat. Do not use any solutions that have been frozen or heated. Do not use after expiration date.	• Refrigerate between 2°C–8°C (36°F to 46°F) • Do not freeze or heat. Do not use any solutions that have been frozen or heated. Do not use after expiration date.	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• Refrigerate or room temperature • Do not freeze	• 5%: Maintain temperature <2°C to > 25°C (36°F to 77°F). Do not freeze. • 10%: Store at refrigerated temperature 2°C–8°C (36°F to 46°F).	• Refrigerate 2°C to 8°C (36°F to 46°F). • Do not freeze	• Room temperature • Do not freeze • Protect from light
Shelf Life	Refer to package label	Refer to package label	36 months refrigerated at 2°C–8°C (36°–46°F), or 24 months at room temp (≤25°C, 77°F)	36 months refrigerated at 2°–8°C (36°F–46°F), or 6 months at room temp (≤25°C, 77°F) any time during the 36 months	36 months, when stored between 2°C (35.6°F) and 25°C (77°F)	36 months refrigerated at 2°C–8°C (36°F–46°F), or 6 months at room temp (≤25°C, 77°F) any time during the 36 months	• 5%: 24 months, at +2°C to + 25°C (36°F to 77°F) from the date of manufacture. Preservative free. • 10%: 36 months; within this shelf-life, the product may be stored at room temp (≤25°C (77°F). Preservative free.	36 months at 2°C to 8°C (36°F to 46°F) from the date of manufacture. Within its shelf-life, the product may be stored at ≤ 25°C (77°F) for up to 12 months. Preservative free.	36 months, preservative free

WHAT ARE THE TREATMENT OPTIONS FOR CIDP?

WHAT ARE THE PROS AND CONS OF EACH TREATMENT?

FIRST LINE TREATMENTS

- Immunoglobulins versus Corticosteroids

  - Some indications that pulsed steroids have longer duration of remission
  - IVIG potentially works at a faster rate
  - IVIG has better adherence
  - Worse side effect profile with steroids long term

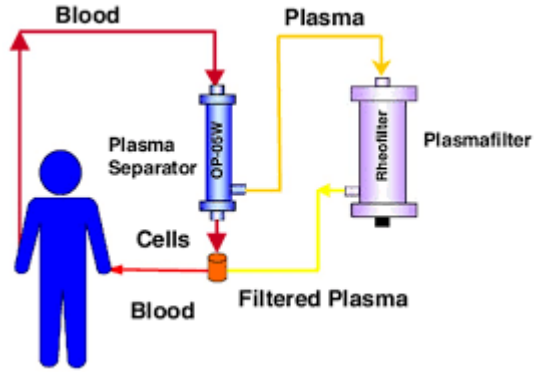
  - Steroids should be avoided in patients with diabetes, caution with osteoporosis
  - Immunoglobulins should be avoided in patients with heart failure, blood clots, kidney disease

OTHER KNOWN TREATMENT OPTIONS

PLASMAPHERESIS

Recommended if IVIg and corticosteroids are ineffective

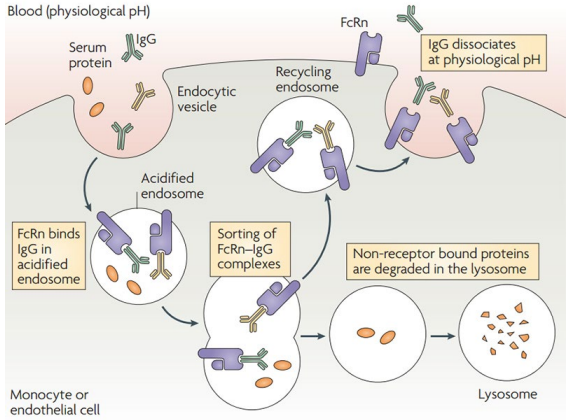
- Filtering of the plasma part of the blood and replacing it with saline/albumin
- Plasma contains antibodies of the immune system
- Frequent large bore intravenous access needed
  - Often, patients necessitate port access - risk of port infection
  - Need for specialized equipment - must be done in hospital or center
- 5 exchanges over 2 weeks - several hours per exchange
- Side effects
  - Drop in blood pressure - nausea, lightheadedness, feeling cold
  - Risk of blood infection
  - Changes in electrolytes
  - Low body temperature

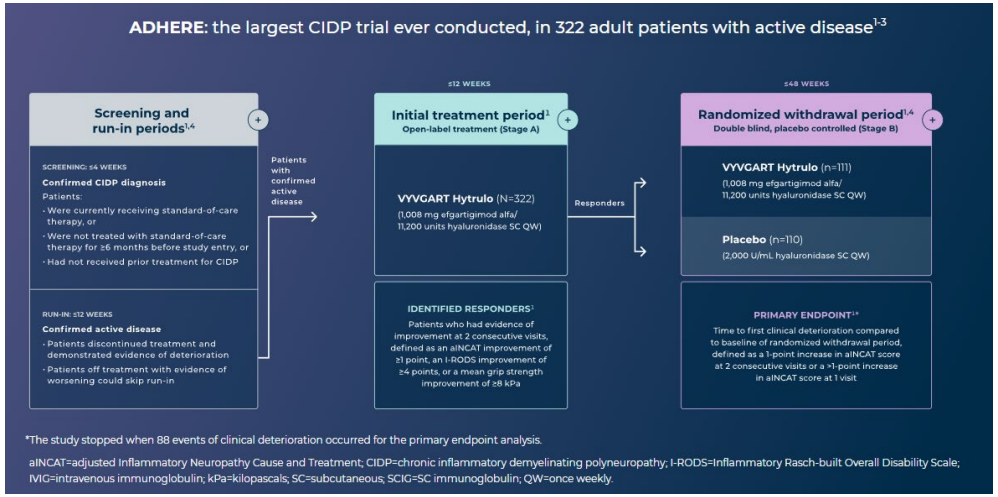


NEWLY FDA APPROVED MEDICATION FOR CIDP

VYVGART HYTRULO

- **Approved June 2024 for CIDP**
- Originally approved as vyvgart for myasthenia gravis in 2021, approved June 2023 as vyvgart hytrulo (subcut)
- Human IgG antibody Fc fragment that block FcRN - this decreases the recycling of IgG - overall reduces levels of IgG in body by >60%
- Complicated trial: CIDP stopped all therapies for 12 weeks, then started stage A. Trial showed treatment response in 66.5% in stage A. For stage B, divided into treatment and placebo groups for 48 weeks Patients on medication had longer relapse-free periods





NEWLY FDA APPROVED MEDICATION FOR CIDP

VYVGART HYTRULO

- **Approved June 2024 for CIDP**
- Dosing: weekly subcutaneous injections administered by health care professional - reportedly takes 90 seconds
- Side effects
  - Headaches
  - Increased risk of upper respiratory infections and urinary tract infections
  - Allergic reactions
- Well tolerated - 99% of patients stayed on open label study

OTHER KNOWN TREATMENT OPTIONS - Immunosuppressants

Very low level evidence for use of these drugs

- Azathioprine
- Cellcept
- Cyclosporine

The below are considered if patient is refractory to the above. For the below, although there is less evidence, it is widely accepted that these drugs are effective. However, they come with increased risk of infection, other toxic side effects

- Cytoxan
- Rituxan

MS Medications Repurposed

- Kesimpta
- Gazya
- Ocrevus

OTHER KNOWN TREATMENT OPTIONS

Neuropathic Pain Medications

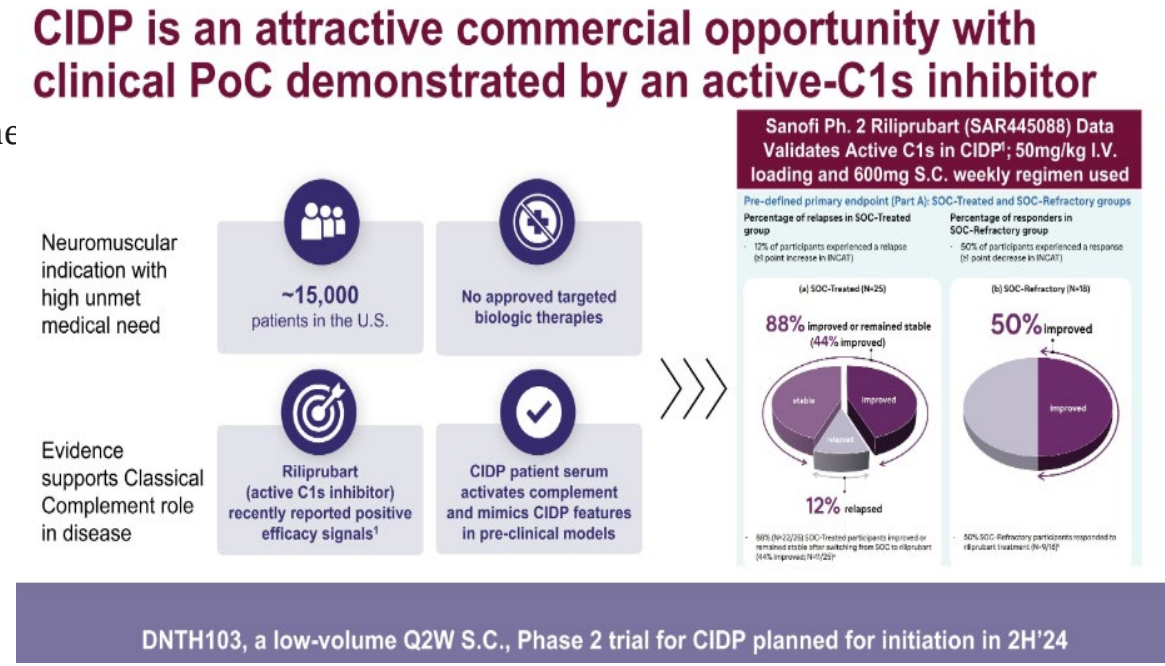
These have not been shown to improve nerve function. They help with nerve pain. Majority can be associated with sleepiness.

- Gabapentinoids
  - Gabapentin - sometimes, very high doses needed
  - Pregabalin
- Serotonin Norepinephrine Reuptake Inhibitors
  - Duloxetine
  - Venlafaxine
- Tricyclic antidepressants
  - Amitriptyline
  - Nortriptyline

MEDICATIONS FOR CIDP IN PIPELINE

Riliprubart

- **Phase 2 Trial from Sanofi**
- Classical complement inhibitor, is a humanized monoclonal antibody that selectively inhibits only the activated form of C1s (part of immune system thought to play a role in CIDP
- Planned to be a self administered low volume subcutaneous injection q2w
- Three separate participant cohorts
  - failed standard of care
  - inadequate response to standard-of-care
  - treatment naive
- Riliprubart showed efficacy and safety across all enrolled cohorts
- Two global CIDP phase 3 studies started recruiting



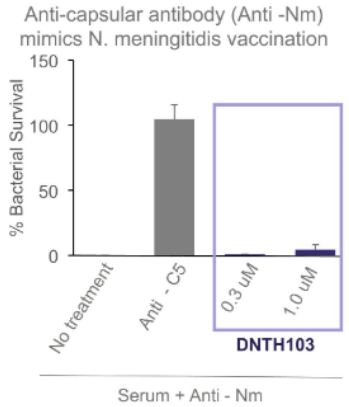
MEDICATIONS FOR CIDP IN PIPELINE

Riliprubart

- There are several other complement inhibitors on the market acting on C5
- In the past, biggest concerns with complement medications is risk of meningitis

DNTH103 *in vitro* study demonstrates lower risk of *Neisseria meningitidis* infections

- Protection against infection is a critical function of the complement pathway
- **DNTH103 selectively inhibits** the **classical pathway**, leaving the alternative and lectin-activated defense pathways intact
- An *in vitro* assay measured **antibody-dependent complement-mediated killing of *N. meningitidis*** in the presence of **DNTH103** and **anti-C5 (ravulizumab*)**
- In this assay, **DNTH103 maintained bacterial killing**, potentially leading to a decreased risk of infection vs. C5 inhibitors



Results further validate the differentiated safety profile of DNTH103 as a selective classical pathway inhibitor consistent with ENJAYMO, an approved C1S inhibitor without an FDA Boxed Warning or REMS

MEDICATIONS FOR CIDP IN PIPELINE

Medications in pipeline

- Othre FcRn targeting medications
  - **Nipocalimab** - CIDP phase 3, maybe be considered for approval myasthenia gravis, phase 3 trial hemolytic anemia in the newborn, IV
  - **Rozanolixizumab** - CIDP Phase 2 - FDA approved for use in myasthenia gravis, subcutaneous
  - **Batoclimab** - CIDP phase 2b, myasthenia gravis phase 3, weekly injection
- **Temelimab** - no trials yet, but possibly in future
  - Immunoglobulin (Ig) G4 monoclonal antibody that targets the human endogenous retroviral envelope protein HERV-W-Env
  - Being studied for MS, ALS, post covid patients
  - Several studies have confirmed that pHERV-W-Env is found in half of CIDP patients and that this protein is expressed in Schwann cells in CIDP lesions.

SUMMARY

- CIDP is autoimmune condition in which the body attacks the myelin of the nerves
- The pathogenesis of the disease is something we are continuing to learn about
- Symptoms include weakness, numbness, nerve pain, and balance disturbance
- It is a challenging diagnosis and many potential modalities can be using including EMG, imaging, blood tests, cerebrospinal fluid analysis, nerve biopsy, and treatment response

SUMMARY

- The first line treatments are steroids and IVIG, both frequently effective
- Steroids can cause many side effects including anxiety, weight gain, diabetes, and bone loss
- IVIg/SIg are immunoglobulins but carry a risk of allergic reactions, blood clots, and kidney dysfunction
- Plasmapheresis is another potential option that filters plasma from the blood and often long term placement of an intravenous line and must be administered at a location with the machine

- Vyvgart Hytrulo is the newest drug approved for CIDP – it causes immunoglobulins to be degraded

- Pipeline drugs
  - Riliprubart – classical complement inhibitor
  - Other FcRns targeting meds: Nipocalimab, Rozanolixizumab, Batoclimab
  - Temelimab

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THANK YOU

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Questions?

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