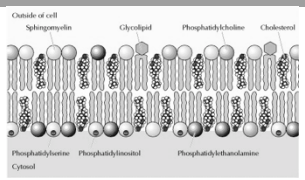
Phosphatidylcholine



Case 4

- 21 year old male with visual field disturbances, numbness and coordination issues. Diagnosed with multiple sclerosis treated with natalizumab minimal to no benefit.
- Treatment plan: PTC + Nutrients which demonstrated improvement
- Noticeable stabilization in symptoms when alternating Glutathione, LAMC, and PTC in the treatment plan

Case 3 From LAMC continued…

- 55 year old female with a history of uterine cancer in complete remission for 4 years.
- HX: standard conventional oncological treatments
- pretreated with glutathione before oxaliplatin.
- High cadmium and lead levels prior to cancer dx was tx with 30 rounds of chelation. Metals remained high and unchanged.
- Completed high dose vitamin C during chemotherapy and after.
- Fatigue improved with LAMC and IV IgG.
- IV IgG would generate multiple symptoms for 2 weeks after infusion
- Stabilized with IV 200 mg curcumin after IV IgG.
- Healing plateaued in gains after 5 months IVI gG and prior nutrients discussed.
- Switched from LAMC in the series to PTC.
- Dramatic impact/improvement on energy and stamina noted after 10 infusions PTC.
- Still slowly improving.

Cognitive improvement in mild to moderate Alzheimer's dementia after treatment with the acetylcholine precursor choline alfoscerate: A multicenter, double-blind, randomized, placebo-controlled trial

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Abstract
Background: Parallel with the development of hypotheses regarding cholinergic involvement in geriatric memory dysfunction, the first attempts to treat patients with Alzheimer's disease (AD) involved the cholinergic-precursor loading approach. Despite encouraging early results, well-controlled clinical trials did not confirm a clinical utility of cholinergic precursors such as choline and lecithin (phosphatidylcholine) in AD.
Objective: This study assessed the efficacy and tolerability of the cholinergic precursor choline alfoscerate (CA) in the treatment of cognitive impairment due to mild to moderate AD.
Methods: In this multicenter, double-blind, randomized, placebo-controlled trial, patients affected by mild to moderate dementia of the Alzheimer type were treated with CA (400-mg capsules) or placebo capsules, 3 times daily, for 180 days. Efficacy outcome measures that were assessed at the beginning of the investigation and after 90 and 180 days of treatment included scores of the Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Cog), the Mini-Mental State Examination™ (MMSE), the Global Deterioration Scale (GDS), the Alzheimer's Disease Assessment Scale-Behavioral Subscale (ADAS-Behav), all items of the Alzheimer's Disease Assessment Scale (ADAS-Total), and the Clinical Global Impression (CGI) scale. The Global Improvement Scale (GIS) score was assessed after 90 and 180 days of treatment.

Indications

- Liver
- Cardiovascular
- Post stroke recovery: Glycerophosphocholine
- Encephalopathy
- Memory, cognitive decline
- All cell membrane support

Phosphatidylcholine (PTC)

- Methyl donor
- Cell Membrane structural support and maintenance
- Highly metabolic tissues
  - Brain / Heart / Kidney / GI
  - High concentration in brain CM's
    - May help with concentration
    - Donates Choline for ACh synthesis
      - Used for cognitive support
- Liver damage (Drug / ETOH / Hep - B,C)
  - Also appropriate in NASH

Phosphatidylcholine (PTC)

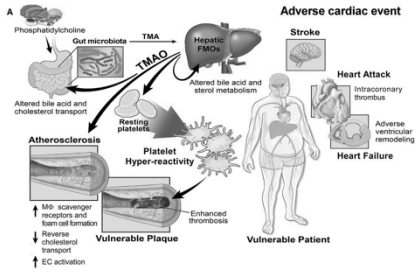
- Multiple IV protocols are published.
  - All appear to have their own merit based on clinical reports from physicians employing them in similar groups of patients.
  - The following is the protocol we think is best to begin with, and has the least phlebitis and other side effect potential

Phosphatidylcholine (PTC)

- Protocol:
  - Infuse slowly (higher concentrations and faster administration will cause phlebitis) over 1 hour if tolerated.
  - No other additives are mixed with this infusion
  - You can follow or lead with a different nutrient bag.
  - **MUST FLUSH OR CHANGE LINE** between bags
  - Sensitive patients (MCS, Elderly, Multiple comorbidities) may experience **GI distress** – RAMP Those patients doses up slowly from 10 mL starting dose.

IV PTC benefit to Oral

- **IV is best until you know your patient!**
- Cleveland clinic has found that choline can contact certain bacteria in the intestines which converts choline to TMA. In the liver there is an enzyme that makes TMAO (Trimethylamine-N-oxide)
- TMAO forms vascular inflammation and unstable plaques in the arterial walls.



http://dx.dol.org/10.1016/j.cell.2016.02.01101

PTC (Intravenous Protocol)

- PC 35mg/mL OR 50mg/ml, Sodium Deoxycholate 24mg/mL, Benzyl Alcohol 0.9% and Ethanol 0.2%.
- Basic protocol:
  - Increment dose and infuse over 90 minutes
  - 25 ml PTC (maximum 50 ml of 50 mg/ml) in 250-500 mL D5W **(MUST BE IN NON-IONIC carrier). Some forms are now stable in Normal Saline.**
  - Optional: Follow with glutathione push
- Caution is can cause GI upset and diarrhea. Work up slow and consider fiber.
- Caution: phlebitis is common if given to rapidly.
  - More phlebitis noticed with injectable compound in the USA due to stabilizers.

Rx: Phosphatidylcholine

	PTC (35-50 mg) (3-50 mls) D5W (250-500 ml)			

Additions /Subtractions:

Glutathione + 0.9% Normal Saline

Total Volume: mL Osmolarity: mOsm/L

*****Some forms of PTC are now stable in Normal Saline. Talk to your compounding pharmacy.

NEVER MIX ANYTHING IN THE SAME BAG WITH PTC!!

•Precipitates with other minerals and can also cause thrombus when mixed in the same bag.

•You may run other nutrients in the same day or a series of infusions. Make sure to change and/or flush the line between PTC and the nutrients.

(The "Push Protocol")

- Draw 5 to 10 ml into a syringe at least twice the volume, leave 5 ml air in syringe
  - Some add 0.5 mL heparin, 1000 IU/mL
- Establish the IV using a 21 or 23 gauge butterfly set & draw an equal volume blood into syringe
- Mix the blood and Essentiale-N during and after drawing sufficient blood into the syringe
- Immediately inject the mixture over 2-3 minutes, keeping the air bubble uppermost in syringe to avoid injecting air
- Remove empty syringe and attach syringe for glutathione push, 600-2500 mg
- Injections are given 3-5 times weekly until liver tests normalize
- It may be more prudent to add the Essentiale-N to 250 mL D5W and infuse over 90 minutes
- Flush butterfly – administer glutathione IV push

Parenteral PC Caution

- Phosphatidylcholine is compounded by a number of pharmacies in the U.S. for use in Mesotherapy. This is commonly 100 mg/ mL concentration. This formulation can not be used for intravenous applications.

More Research

- Hepatic disease – Vnitr Lek 2000 apr;46(4):199-204. 2 g daily for 2 weeks resulted in 50% decrease in ammonia levels in patients with cirrhosis and hepatic encephalopathy
- Hepatic disease – Med Monatsschrift 27:131-137, 1973. Essential phospholipids in the treatment of hepatic disease. 650 subjects with varying liver damage followed 5 years. Patients received 950 mg IV PC with 450-700 mg oral PC, when labs normalized received oral PC only. All groups benefited: reversal of fatty degeneration, acute inflammation recovery accelerated.
- Protects liver against damage from alcohol, pharmaceuticals, environmental toxins and xenobiotics as well as infection (viral, bacterial, fungal). Alcoholism Clin Exp Res 18:592-595, 1994.; Gastroent 106:152-159, 1994.; Clin Exp Res 23:5:944-949, May 1999.; Pathol Biol (Paris) 49(9):738-752, Nov 2001.; Am J Addict 10 Suppl: 29-50, 2001.
- Cirrhosis: Marked improvement of liver function following PC administration in terms of an increase in metabolic and detoxifying capacity of liver was noted. Pogromov, AP et al. Klin. Med. (Moscow)10(1978)97.