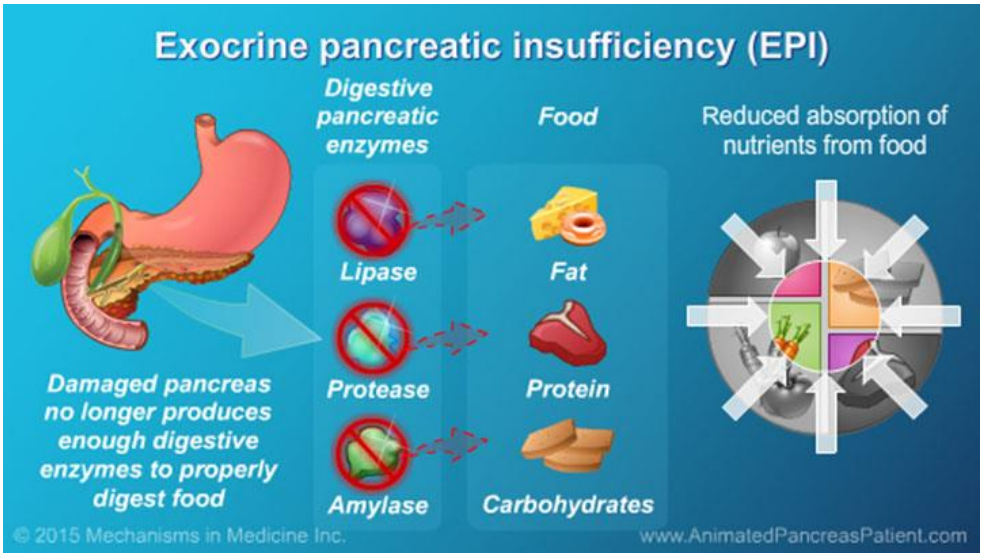

## EFFECTIVE EPI MANAGEMENT

(Updated Sept 15, 2020)

Successfully managing EPI, **Exocrine Pancreatic Insufficiency** is all about finding the right balance of:

- Enzymes
- Diet
- Prebiotics, Prebiotics & Probiotics, or Antibiotics (if needed for SID/SIBO)
- B12 (if needed for low or low-normal B12)




### ENZYMES

- The most effective enzymes are the porcine-based powdered enzymes called pancreatin. Enzyme pills are less effective and need to be crushed. Plant-based enzymes are not strong enough. The effective "average" USP Units for enzyme potency in powdered pancreatin used for EPI is:

  33,600 to 71,400 USP of **Lipase** (needed to digest fats and oils)
  280,000 to 495,000 USP of **Protease** (needed to digest proteins)
  280,000 to 495,000 USP of **Amylase (**needed to digest carbohydrates)

  - The best dose starting recommendation for standard (6x) powdered enzymes is **1 level teaspoon of powdered enzymes per 1 cup of dry kibble, ¾ level teaspoon of powdered enzymes per 1 cup of wet (or raw) food. Always measure powdered enzymes per volume of food actually given at each meal. Some enzymes companies label their enzyme products to be given per meal - -this is NOT correct!** Sometimes the dose may vary slightly from one dog to another. Adjust accordingly.
  - Always add enough room-temp liquid (water or broth) to moisten the food with enzymes. Let sit for 20 minutes (incubate):

- Always add enough room-temp liquid (water or broth) with food and enzymes and let sit for 20 minutes (incubate):
  To soften the food so the enzymes can be better distributed amongst more food particles.
  To help avoid possible mouth sores from the caustic attributes of the powdered enzymes.
- Although incubation is not necessary for all EPI dogs, many EPI dogs do much better once this extra step is taken.
- **Mix enzymes with room temperature ingredients.** Mixing the enzymes with cold food or liquid will temporarily inactivate the enzymes. Using hot (above 130 degrees F) food or liquid will destroy the enzymes. Do not Microwave or cook food with the enzymes in it or it will destroy the enzymes.
- In countries outside the USA, if powdered pancreatin is not readily available, CREON an enteric-coated capsule used for cystic fibrosis patients, may be used successfully after some trial and error. Start by either opening the capsule and sprinkling the CREON pellets on the food (do not mix) and serve immediately or give CREON 10 (or 12) approximately five minutes prior to a meal. Do not incubate. If poor digestion still occurs, start increasing the dose by increments of five. Dosage may vary greatly from one dog to another. Some EPI dogs do well on one CREON 10 (12) with each meal, some need two CREON 10 (12), or one CREON 25. With CREON it depends on the individual dog which dose and administration technique of CREON will work most effectively.
- Once an EPI dog is stable for a month or so, “try” reducing the amount of enzymes being used to the lowest dose possible but at a dose that will still allow the dog to properly digest food. This is determined by continued firm stools, minimal volume and elimination frequency equal to that of a normal dog.
- As some dogs age, enzymes supplementation may need to be increased, again, this depends on the individual dog.

**DIET**

This is the trickiest part of managing EPI.

- **Most EPI dogs respond best to low-fiber** (grain-free) With most dogs, **but not all,** commercial (over the counter) brand name grain-free foods with less than 4% fiber work as well or better than some of the prescription diets… unless there is EPI + a concurrent condition such as a food allergy/sensitivity, IBD, etc. However, not all EPI dogs respond equally well to all low fiber dog foods. Finding the right food is trial and error. Some do better on very high-protein/low carb food, others do better with foods with a little grain. Some do best on home-made or raw. It all depends on the individual dog.

  **In the beginning, Feed 150%** of what the dog normally would require until the body replenishes the weight that was lost.

- **Do not restrict fat intake**, unless, once again, there is a possible concurrent condition that requires fat restriction. Dogs appear to resume their health quicker when fat % is not restricted as long as they are receiving the proper type and dose of enzymes, and, if needed, B12 and if SID is kept under good control.
- **Feed smaller portions but more often** when first trying to stabilize the dog. Feeding 3 to 4 small meals a day- -at least 2 hours apart to allow for digestion- -is suggested.
- If acid reflux/regurgitation is a problem, try adding 1 teaspoon of canned pure pumpkin to meals, or slippery elm loose powder, psyllium, or (omeprazole) Prilosec. Worst case scenario, use short-term steroids. However, also check to see if a declining B12 level is the culprit. Always work with your vet when administering meds.
- For itchy skin or a dry coat, if tolerable, may add EFS (Essential Fatty Acids) suggested at 180mg per 10lbs per day, or on alternate days give ½ to 1 teaspoon of cold pressed (virgin) coconut oil.

**SID** (small intestinal dysbiosis) / **SIBO & TREATMENT**

Because of the very nature of EPI (pre-diagnosis/treatment) undigested food/ bacterial imbalance/not enough different bacterial strains/ excessive fermentation … all this combined triggers SID/SIBO in all EPI dogs. Goal is to get SID under good management.

- **The best way to assess SID/SIBO is by (1) symptoms and (2) accompanying medical ailment, in this case EPI, and treat early on for best results.** Years ago, it was thought that only high folate test results indicated SID. This has since been proven wrong. Folate test results such as Culturing, Counting bacterial numbers, and Duodenal juice collection all have majors flaws in their technique rendering them inaccurate indications of SID/SIBO, but rather "the type of flora and/or how the host and flora interact is most important." Recent studies have revealed that all dogs with EPI have SID. The goal now is to keep SID under good control. Unfortunately, with EPI dogs, research has also recently proven that EPI dogs do not have enough of a variety of bacterial strains nor enough bacteria overall.
- **SID is not under good control if the dog displays any repeated signs such as yellowish or pale colored stools, loose stools, gelatinous stool coating, flatulence, lack of appetite, stomach noises, vomiting, acid reflux, low or low normal B12 then treat for existing secondary SID/SIBO.** In trying to keep SID under good control, much success is seen with prebiotics (FOS/Fructooligosaccharide). FOS is a soluble dietary fiber, a non-digestible food components that is fermented by intestinal bacteria. FOS is most abundant in Inulin (Chicory Root), Jerusalem Artichokes, and Slippery Elm powder which has prebiotic and mucilage properties. This may lead to more normalization of the intestinal microbiota. Many EPI folks use Slippery Elm powder given with breakfast and dinner.

The following are suggested doses for Slippery Elm: 1/8 tsp for dogs under 10lbs, ¼ tsp for dogs 10lbs to 30lbs, ½ tsp for dogs 30lbs to 80lbs, 3/4 tsp for dogs 80lbs to 100lbs, and 1 tsp for dog 100/+lbs. Mix in meal, add 1 to 2 tablespoons of water, mix and serve meal as you normally would. Incubating not necessary. HOWEVER please know that too much of any prebiotic can cause loose stools and an upset stomach. So always give just a little. Do not give if the pet has an allergy to the American Elm Tree.

- If just a Prebiotic doesn't work or doesn't work well enough, try a prebiotic + probiotic. If this 2nd option still doesn't work well, then you will need to resort to an antibiotic regimen to get SID/SIBO under good management. A 45 day regimen/twice daily with breakfast and dinner of Tylosin Tartrate antibiotic is recommended. Metronidazole is no longer recommended for any dog with chronic gastrointestinal issues.
- In some cases, if the Tylosin is not working, then try Amoxycillin (which may or may not work) or try Oxytetracycline which often does work. Tylosin appears to work best for the majority of EPI dogs with SID/SIBO.
- The current recommended Tylosin dosage has recently been changed to "25mg/kg BID with food for 6 weeks", but some still prefer to administer twice daily [every 12 hours] with food:

  30 lbs – 1/8 tsp  60lb – 1/4 tsp

  90 lb – 3/8 tsp  120 lb – 1/2 tsp

  **Be sure to add a pre+probiotic product about halfway through the Tylosin regimen to increase population and bacterial variety.**
- Also, although not clinical proven, what has been observed by diligent pet owners is that some are able to completely remove a SID/SIBO-prone dog from antibiotics through a methodical process at the end of 45 days of Tylosin, then instead of stopping completely, slowly reduce the antibiotic dose before stopping completely.
- In a recent study the use of fructooligosaccharides (FOS) in the diet showed a lasting advantageous effect. This syndrome is also a potential target for probiotic therapy but one must be careful when administering prebiotics. However, please know that too much FOS can cause the opposite effect! Per Dr. Jorg Steiner of Texas A&M University *"…unrealistic expectations have been replaced with well-defined requirements for probiotics and controlled studies of their beneficial effects. A probiotic must be efficacious. In order to be efficacious, the bacteria must reach the intestinal lumen. This requires that the bacterial species being used in the formulation are both acid- and bile-acid resistant. Also, the bacterial species of the probiotic preparation should adhere to the intestinal mucosa to prolong the time of interaction.*
- When possible use a 3rd party laboratory such as http://www.consumerlab.com/ to verify product "claims"


## B12 (Cobalamin Deficiency)

**Cobalamin deficiency occurs in approximately 82% of all EPI dogs.**

- **Treatment is required for low and low-normal B12 levels** with either serum vitamin B12 weekly, bi-weekly, monthly), or oral B12 (daily, couple days weekly). Both applications use the same dose amount. Either Generic cobalamin injection preparations or high dose B12 pills (Wonderlabs B12 Pet Factor or Trinfac B12 pills are widely used and successful) are recommended at 1mg/ml, i.e. 1000µg/ml. Do not use B12 multivitamin pills or serum or B12 complex serum as these are not sufficient and will also sting the dog. The conservative serum dose regimen is one dose weekly for six weeks, then one dose every two weeks for six weeks, then dose monthly. Re-measure serum cobalamin concentrations one month after last administration is using B12 injections. If using B12 pills, stop pills for 1 week prior to re-testing(re-measuring). The newer, less conservative serum regimen is either injectable or pill dose weekly for 6 weeks, then one injectable dose after 30 days (or pills for 3 more weeks) and re-test 30 days after the last injectable dose or re-test after 1 week of stopping the pills. In either case, if the cobalamin test results are normal…**CONTINUE dosing until levels are above mid- range**, then determine how often B12 needs to be administered on-going for the life of the dog to maintain above mid-range levels.

  B12 (serum or pill) dosage for EPI dogs:

  dogs up to 5 kg (10 lb) = 250 µg

  dogs, 5-15kg (10-30 lb) = 400 µg

  dogs, 15-30 kg (30-65 lb) = 800 µg

  dogs, 30-45 kg (65-100 lb) = 1200 µg

  dogs above 45 kg (100 lb) = 1500 µg

- With some dogs, especially the smaller breeds, there sometimes appears to be some difficulty maintaining B12 levels even with weekly injections. In these cases, although no controlled study has been done yet, when re-tested these dogs manage to “improve & hold” their B12 levels if supplemented (in-between weekly injections) with **B12 pills that contain the intrinsic factor**. The favored product nowadays is *Wonder Laboratories* Pet Factor B12 or Trinfac-B Intrinsic Factor. Both are the same and uses Methylcobalamin B12. Or some will use *Metagenics* Intrinsi B12/Folate (more expensive). Supposedly Intrinsic Factor was suspected to be species specific, however, many dogs do not do well until they use oral B12 with non-species specific Instrinsic Factor included or another possibility why the Wonderlabs products work so well may be because they use Methylcobalamin B12 vs. Cyanocobalamin. We really don’t know why the Wonderlabs products work so well most of the time, just that it does. If using B12 injections, and having difficulty maintaining upper mid-range B12 levels with the cyanocobalamin B12, Another

possibility with some difficult cases is to try hydroxocobalamin B12 serum (human product) vs. cyanocobalamin B12.

- Since cobalamin is a water-soluble vitamin, excess cobalamin is excreted through the kidneys. Over-supplementation has never been reported to date. However, if there is a concurrent kidney health concern, please work with your vet before administering excessive B12.

Effectively managing an EPI dog (or cat) is all about finding the right balance of the recommended EPI protocol. We at Epi4Dogs will do our best to help you find your EPI pet's balance in managing this condition…..