Equine Heaves/Equine COPD has many names for the same condition:

- Equine Recurrent Airway Obstruction (RAO)
- Equine Small Airway Inflammatory Disease (SAID)
- Equine Asthma
- Equine Allergic Airway
- Equine Chronic Obstructive Pulmonary Disease (COPD)
- Broken Wind

Equine Heaves/Equine COPD signs in horses become more and more evident as they age. The average age of a horse starting to show signs of Heaves is 8-10 years old. Horse COPD/Asthma and Human Asthma have the same signs - thick mucus in airway, labored breathing.

Equine Heaves/Equine COPD is worldwide with usual onset at 8-10 years old. It can affect any sex and breed equally.
Diagnosis of Equine Heaves/Equine COPD

First, there are two forms of Equine Heaves/Equine COPD:

1. **Year Round** - In winter and spring, signs seen more strongly, but struggles all year. Horses can get problems with 3 inches of snow on the ground.
   2. **Summer Heaves** (also known as pasture-associated Heaves) - horses begin showing signs when trees or grasses are blooming. Seen more strongly in early summer and early fall (leaves dying so allergens go up). In winter they are normal.

Stages of Equine Heaves/Equine COPD

**Early Stage:**

1. Exercise intolerance at end of race, or end of trail ride when there was no problem prior. No energy at the end of the ride and seems to get worse with time.
2. Coughing more.
3. No fever, blood work all normal, looks healthy. Cultures for bacteria are usually negative unless a secondary infection has occurred where there is a bacterial growth in the mucus created by Horse COPD
4. Mild nasal discharge but very watery, thin mucus - not yellow, green
5. Breathes about two times the normal rate at 24-30 times a minute
6. Has reactions to vaccines more often than other horses - probably due to hypersensitive immune system
7. Many horses with skin allergy conditions like hives from bites or Equine Summer Eczema appear to be more prone to Equine Heaves

**Chronic Stage (Often called Heaves or COPD)**

1. Exercise ability much less - can overheat and become exhausted due to so much energy being used to breath. Why? Less oxygen in the blood. Your horse can’t get oxygen to muscle properly, and other parts of the body. Low oxygen levels due to COPD is proven.
2. Coughs more and more.
3. No fever, blood work normal, but mucus is a good media for bacteria to grow in, so mild lung infections on top of mucus. Antibiotics help a little but never clear up cough or nasal discharge. Sometimes nasal discharge is colored but usually just large amounts of clear, thin mucus
4. Even at rest is “puffing” just like they ran in the Kentucky Derby
5. Weight loss
6. Grunt - an exaggerated exhale, trying to force air out of airway. You will see a double exhale. Finally, you will see a line along the rib cage of hypertrophied muscle, “Heave Line”, from this constant forceful exhaling
7. Condition worsens when exposed to allergens such as hay or bedding. Worse when indoors and round bales in the field due to higher counts of allergens. Horse
Heaves also worsens in humid/hot weather - above 80% humidity, cases will increase. Many horses are already too hot from strenuous exercise of breathing too hard and hot weather on top makes it worse.

8. Scoping - “Excess neutrophils seen in cytology and confirm presence of lower airway ROA” (Dr. House, AAEP). In most cases of allergic airway in other animals, mast cells and eosinophils are seen, but in horses it is neutrophils. (Dr. Lavole, University of Montreal Equine Professor, Geneva Conf. 2009).

9. Chest x-rays/ultrasound - May see lung changes but tests are not specific enough to diagnose Equine Heaves/Equine COPD

10. Heredity - “Incidences of ROA in horses with healthy parents is approximately 10% which increases to 44% if two parents are affected” (Dr. House, AAEP).

11. Age - Average horse, according to literature, is between 9-12 years old, but we have seen cases much earlier (5-7 years old)

12. “Skin tests do not predict allergens that will cause Heaves” (Dr. Robinson, Michigan State University College of Veterinary Medicine, July 2012).

**Aerosols (Inhalers)**

There are pieces of equipment that go over your horse’s nose or are placed against a nostril to apply inhalers. These are special order items that are an expense to you.

Your doctor may ask you to have some for daily use or for possible emergency use. There are three main types:

1. Steroids - “Fluticasone inhaler after induction of severe Heaves resulted in complete resolution of clinical signs, normalization of pulmonary function tests and significant decrease in BAL neutrophils” (Dr. Giguere, Vet Immunopath, 2002).
2. Bronchodilators
3. Mast cell stabilizers

It is extremely important to get the right inhaler. There are two types and if you get the wrong type it will not go one inch up your horse’s nose and just cost a lot of money:

1. Aerosolized - for horses
2. Diskus powder - requires strong inhalation. Not for horses.

Inhaler steroids have the advantage of sending medications right to the problem area of the airway without having to treat the whole body as in oral or IV meds. This allows a lower dose of steroid to be used.

**WARNING:** Inhaled steroids, just like oral or injectable steroids, can create Insulin Resistance (IR). If your horse is already IR, you need to know these can make IR worse or trigger Laminitis.
Cost of inhalers is an important subject - you need to look at these prior to buying equipment. All pricing information is from CVS Pharmacy (Aug 2013)

- Advair (steroid/bronchodilator mix) - $348.99
- Albuterol - $54.99
- Flovent (steroid) - $158.99

Veterinarians have advocated 8-12 puffs a day of Fluticasone for 2 weeks then go to every other day. You can go through two of the Flovents in less than three weeks at the cost of over $300.00. Yearly use runs over $2,500 for just the Flovent Steroids.

For most owners, the cost and labor of doing this on a daily basis is too much. It is a great concept but difficult in the usual world of horse owners.

Management and Treatment - Why Thyroid Powder Can Help

The goal is to lower the amount of exposure to allergens (hay, bedding, mold, dust). Dust is not just powdered dirt, it contains many items such as bacteria, mold, organic plant allergens like hay, straw, endotoxins, and is called “organic dust”.

1. Eating hay outside/soaking hay if possible
   a. Horses, even on inhalers given daily, still had lung inflammation when fed hay indoors, but “once moved outside, the horse’s lung function continued to improve, and inflammation resolved” (Dr. LeClare, The Horse, 2013).
   b. Hay outside can further be managed to lower allergens
      • Soak hay 10 minutes prior to feeding in a Rubbermaid container. Do not use flakes of hay to soak. First tear up flakes into loose hay, then vigorously shake out hay to lower dust content, place in a hay net, and put in a tub to soak with a brick on top.
      • “No additional benefit from prolonged soaking. We found immersing hay until thoroughly wet had virtually the same effect as 16 hours soaking” on particle count (Dr. Pirie, Vet Sci Res, 2007).
      • Colder weather or boarding - may not have the ability to soak. Still take hay outside (do not do in the shed row) and tear up the flakes, shake out the dust, then bring back in if in the stall or leave outside in the field.
      • “Soaked hay reduced respiratory particle number by 60%” (Dr. Clements, University of Edinburgh).
      • Round bales have more allergens and can really be a problem in horses, even on full turn out. “Round bales are high in endotoxin and organic dust content and prevalence of round bales is potential cause of treatment failure in horses on pasture” (Dr. House, AAEP).
c. Hay steamers reduce allergens. This can help to avoid frozen hay.

2. Bedding (No. 2 cause of Horse Heaves)
   a. Fluffy pine shavings are the best bedding for horses with Heaves. No sawdust, wood pellets (too dusty), or straw (even clean straw). These are full of allergens and the worst bedding for COPD horses.
   b. 20 times less dust particles with shavings versus straws
   c. Another option is using shredded cardboard

3. Medicines
   a. Oral Bronchodilators - Ventipulmin Syrup is given to open airways and lower spasms. Often, riders will give it for 1-3 days on trail or unsanctioned shows - twice a day.

   Note: After 5 days of continual use, this medication down regulates (its action stops or slows), so giving Ventipulmin for weeks/months in a row is a waste of time and money
   - “Regular use of Beta-Agonists leads to tolerance to their bronchodilator effects” (Dr. Haney, Respiratory Medicine, 2004).
   - “It is inappropriate to treat heaves with bronchodilators as solo therapy. Bronchodilators do not address underlying inflammatory problem and tolerance develops rapidly to Beta-Agonists (5 days) when administered along to horses with heaves” (Dr. Rush, Equine Respiratory Diseases, 2004).

   Clenbuterol (Ventipulmin): Use with caution in Insulin Resistant and past Laminitis cases

   “It is good for short-term use of no more than 5 days in a row. I have seen an Insulin Resistant pony being controlled on Insulin for years, flip into Laminitis after being on Clenbuterol for 30+ days in a row.”
   -Dr. Reilly

   b. Oral Antihistamines, NSAIDS (Bute, Banamine)

   ‘NSAIDS/Antihistamines have failed to demonstrate therapeutic benefit in horses with Heaves” (Dr. Rush, Kansas Veterinary School).

   Many owners try them and most report little help. Even IV antihistamines in our practice do little.

   c. Antibiotics - the mucus accumulating in the airway is ripe to grow bacteria, so the horse can get a mild lung infection and horse Heaves together.
Naxcel is recommended in these cases (Dr. Orsini, Manual of Equine Emergency, 1998).

d. Oral Steroids - Prednisolone used in Equine Heaves/Equine COPD can be effective short term (1-3 weeks). WARNING: Long term (just 32 days in a row) use of steroids can lead to a greater change of EPM Neurological Disease

e. Omegas for Horses with Heaves/COPD Airway Problems - proven to help your horse. There are many sources of Omega's for your horse.

Ground Flax Seed - need to grind. The No. 1 source of Omega 3’s in plants. Great 4:1 ratio of Omega 3 to Omega 6. Good for Insulin Resistant and COPD horses.

Whole Chia Seed - No. 2 source of Omega 3’s in plants. Good for Insulin Resistant and COPD horses. Great 3:1 ratio of Omega 3 to Omega 6. Give 2 tablespoons a day. “Clinical improvement was noted in all horses involved in group receiving Omega 3's. Cough score improved 60%. Respiratory effort decreased 48%” (Dr. Nogradi, J of Vet Medicine, 2015).

f. Need Thyroid Powder with COPD Horses to Overcome Effects on Thyroid Gland

Cytokines actions on the Thyroid Gland
- High IL-1 and TNF inhibited thyroid function. So, the inflammation from COPD decreases thyroid function

Mechanisms of the non-thyroidal illness syndrome
- Changes in T4 and T3 thyroid hormones occur in sickness - they drop
- In the brain, the TSH hormone that goes to the thyroid gland decreased
- Malnutrition can also cause a drop in thyroid hormones

Endocrinological derangements in COPD
- Patients with non-thyroidal illness have decreased biologically active T3 and T4
- Patients with severe COPD have reductions in T3 and T4
- Hypoemia (less than normal oxygen in blood) seen in COPD can further cause problems by not allowing T4 to go to T3
- Many inflammatory Cytokines are in COPD and they inhibit synthesis of TSH in the brain which leads to less thyroid gland stimulation
- Glucocorticoids will lower thyroid hormones. So, if on steroids, you are affecting the thyroid gland
- Low thyroid directly damages breathing muscles, so it is not just mucus in the lungs, it is the muscles themselves that are damaged. Called Hypothyroid Myopathy - damaged respiratory muscles

COPD and Thyroid Dysfunction
• Low thyroid function patients had lower oxygen levels in blood. So, terrible circuit of Hypoxia leading to inflammation, leading to brain changes, leading to thyroid lowering, leading to Hypoxia

Effect of Thyroid Function on COPD
• Low thyroid function effects exacerbation frequency of COPD
• Low thyroid decreases lung volume and increases upper airway obstruction
• Low thyroid damages the muscles needed to breathe

Assessment of thyroid functions in patients with COPD
• COPD affects not only the lungs, but pituitary in the brain and thyroid gland
• Severity of COPD air obstruction is associated with the impairment of thyroid gland

Immune function modulation by Thyroid hormones
• When thyroid hormones are low, white blood cell immunity is damaged

Thyroid hormones as modulators of immune activities
• Proinflammatory mediators found in hypothyroidism (low thyroid function)

g. Thyroid Powder to help Breathing

• 1,000+ pound horse - 2 scoops a day = 24 mg
• 500-1,000-pound horse - 1 scoop a day = 12 mg
• 500-pounds and below horse - ¾ scoop a day = 9 mg
• After being on these doses for 14+ days, you can test Total T4 in blood if you want to monitor. These amounts will keep your horse in the normal range - it will not cause Hyperthyroidism. Your horses can show and race on these amounts.

4. Stall Management

“What we know for certain about Heaves is that in many horses it is precipitated by stabling” (Dr. Robinson, *DVM Magazine*, 2012).

Ammonia from urine is an airway irritant which can lead to more mucus accumulating leading to less air flow. Sweet PDZ powder put on the stall floor after mucking is helpful.

a. Study shows partial mucking still creates the least amount of ammonia production over a complete mucking or no mucking (Dr. Fleming, *J Am. Sci.*, 2012). The more you churn the stall up, the more ammonia, so light picking out of manure and wet spots is best. The worst choice is no mucking.

b. Studies show to reduce ammonia by 25-60% using Sweet PDZ in stalls
Shavings/shredded newspaper/cardboard has less allergens than straw. Straw is a problem.

Increase ventilation to reduce particle exposure

a. Attic fan in Barn
b. Turnout more
c. Stall with window for air flow
d. Stall with fan for fresh air
e. Stall at the end of barn - more air flow
f. Higher ceiling in barn - more flow
g. No hay/straw in loft - showers all the allergens down

h. No tossing hay down from loft into stall aisle
i. Cobweb Barn - spiderwebs full of dust
j. If stacks of hay in the aisle or a stall, move Heave horse to the other end
k. Keep horses in barn or turnout away from dusty road
l. Use fly spray - horses inside or outside create dust from stomping

Clean stall when the horse is not in the barn - you kick up lots of dust picking out stalls. You are kicking up dust when sweeping the aisle. You kick up lots of dust even cleaning the stall next to a Heave horse. Mold grows in the bedding.

There are 19 times more respiratory particles when stall is being mucked out (Dr. Clements, University of Edinburgh).

Outdoor sheds need to be free of allergens

- Use shavings, pea gravel, or mats to keep dirt down. Avoid stone dust
- Clean out sheds regularly. Old, dry manure being kicked around is no good.
- Broom out cobwebs that hold dust

Hay Management

Tear flakes apart outside the barn, shake out well to reduce dust, put in hay bag, soak for 15 minutes. If winter or not able to soak, still tear up and shake flakes.

Baled hay density is 8 pounds/cubic foot versus loose hay which is 4 pounds/cubic foot - let air get into it (Pennsylvania State Dept. of Agriculture, 2009)

“Inflammation occurs in lungs within 6-8 hours when brought into the barn from the pasture” (University of Kentucky, College of Agriculture).

Pelleted feed has less dust, so use these.
Most horses do not do well on just hay cubes and pellets. They need hay, but you can reduce the hay amount from 20 pounds a day (2% body weight in hay in a 1,000-pound horse) to 15 pounds of hay and 5 pounds of cubes/pellets, to help reduce allergen load.

Ponies are lower to the ground, so they are going to inhale a larger number of allergens if bedding/management is not good. Open stall doors, apply webbings so air flow is better.

5. Keep these Heave horses away from dusty roads
6. In trail riding, keep up front - don’t eat the dust of 10 horses ahead of you
7. Keep blankets clean - if full of dust and/or dirt, it is following the horse around all day
8. Traveling - bring your own shavings so you’re not at the mercy of the barn you’re at. Get a windowed stall at the end of the barn. Be sure to bring your fan
9. Use fly spray when turned out or in the stall - stomping feet kicks up a lot of dust

**Sudden/Dramatic Equine Heave/Equine COPD Attack Crisis**

**Heave Crisis:** At times, a large antigenic load may severely compromise your horse’s ability to breathe. I have been called out on cases to see a horse for the first time on an emergency that was staggering around from not getting enough air and with mucus membranes on his gums the color of mud.

Hank was in crisis but in five minutes was a lot more comfortable and his breathing was reduced significantly after IV medications.

**As an owner you need to know:**

1. Prednisolone Tablets and Clenbuterol (Ventipulmin Syrup) will not help these horses in severe crisis - do not try to ride out the storm with these medications.
2. Get them in the shade, hose off with cold water, and then scrape off excess water. Many are half in heat exhaustion from labored breathing. Repeat this every 15 minutes until the vet comes.
3. Get horse out of the barn. If it falls, it is easier to work with them in the field near the barn, and the barn is full of possible allergen triggers.
4. Do not feed any hay/grain - we need the airway clear. Wash out mouth with water. If they want water, it is okay to drink.
5. If there is a lot of mucus in nostrils, wipe it out with paper towels. This will help airflow.
6. Stand still - do not keep walking around. We want them quiet and calm. Keep in an area by themselves. Do not want other horses poking at them.
7. If they go down, do not panic. All our cases of Heave attacks that were down recovered well because we got there within 30-45 minutes of being called.
8. Your doctor may direct you to use aerosol inhalers for your horse prior to their arrival. Often people do not have these, or the inhalers are all used up with no puffs left.

9. Your doctor may need to give oral or IV fluids if your horse is exhausted. Just because their breathing is better doesn’t mean all is okay. Often these horses get impaction colic 1-2 days later due to lack of water intake prior to Heave attack. We may give Banamine the day of a Heave attack but no more after that due to the slowing of gut motility [from Banamine] when given many days in a row. We need to see normal manure production within a day of a Heave attack otherwise you may need another tubing of fluids.

10. Look around - what triggered the attack? It is probably hay or bedding. Bring in new hay and strip out stall bedding if the horse was in the stall in the past 24 hours.

11. Steroids IV in Equine Cushings or Equine Insulin Resistant horses - we had several horses with these conditions get Heave attacks and, in a crisis, these medications are needed. Low dose Dexamethasone or Solu-delta Cortef did not trigger any Laminitis events in these horses.

12. Start the Heave Ho program

Weight Loss

1. Extreme/moderate labored breathing overcomes horses need for food and water. They are too busy trying to catch their breath.

2. The labor of breathing more times a minute and trying to exhale stronger burns tremendous calories.

3. Exhaustion - your horse is so tired, they just lay down more and skip food and water.

4. Coughing is exhausting - it also burns tremendous amounts of calories.

5. Coughing can irritate the upper airways making swallowing painful.

6. Some drugs knock down their appetite.

7. They are stressed, so higher cortisol which leads to tissues being broken down.

8. Helpful hint in older horses or horses with teeth problems:
   - Total immersion of hay for 10 minutes can increase water content of hay from 10% to 50%. This water increase can provide 10-20% of water needs and cut down on impactions. In older people, saliva can drop 50%, so in older horses, soaked hay helps in chewing, swallowing, and nutritional access.

9. Older Cushings horses have higher ACTH, Cortisol hormones, and on Pergolide that all leads to some weight loss that layers on top of Equine Heaves/Equine COPD.

10. How to safely gain weight in your COPD/Asthma horse:
   - You will combine a ration balancer and a senior feed to bring back muscle, topline, and to help breathing muscles that are damaged in COPD.
   - Ration balancers have higher protein to help add muscle.
Both ration balancers and commercial senior feeds are low carb. We need that due to many that have COPD are also Insulin Resistant

What Happens to Your Horses Airway in Equine Heaves/Equine COPD?

Your horse reacts to a level of stimuli from allergens that do not affect normal horses

- “Hyper-responsiveness to allergens for even a brief time and its effects can last for days” (University of Kentucky, College of Ag.)
- Even if you remove the offending cause, your horse may still be affected in their airway days later
- Hay and straw bedding are the usual allergens leading to Equine Heaves/Equine COPD. “Most common environmental entity precipitating an episode of airway obstruction in Heaves affected horses is organic dust of hay and straw” (Dr. Rush, Kansas State University, *Equine Respiratory Disease*, 2004)

Three things occur after exposure:

1. Constriction of airways - walls of airway become smaller so imagine breathing through a garden hose and then breathing through a straw
2. Mucus accumulates in airway paths - these further block air flow. Imagine your horse sipping water through a straw and then having to sip pudding - extra effort
3. Airway spasms - an already narrowed airway becomes narrower as spasms further reduce airflow

Horse COPD/Asthma is proven to create abnormal heart changes - thickened walls, inflammatory cells going right into heart muscle. It is not just a lung thing.

Vitamin E Can Help with Equine Heaves/Equine COPD

Heave Ho has high dose Vitamin E - 5,784 IU in each scoop - rated #1 in highest levels. Vitamin E in horses is proven to increase immunity to help decrease chronic and constant lung infections. This can cut back on snotty noses, constant antibiotics of secondary bacterial infections. The Vitamin E has also been proven in horses to increase immunity via immunoglobulin protection increased.

In studies:

- Blood Vitamin E levels lower in COPD
- Supplementing with Vitamin E improved breathing components. “Positive association with dietary Vitamin E intake and lung function” (C. Hanson, *Tocopherol Levels in Lung Function*).
- “Vitamin E may be beneficial in the prevention and treatment of harmful effects of COPD” (T. Tug, *Oxidative Stress of COPD Lowers Vitamin E*).
- “Vitamin E supplements decreased DNA damage to white blood cells” (Y. Kelly, *Long-Term Vitamin E Supplementation Helps COPD*)
- Patients on Vitamin E had greater lung capacity and produced less phlegm (Y. Kelly, *Vitamin E Helps Reduce Phlegm of COPD*)
• Long-term regular use of Vitamin E may help decrease risk of COPD (American Thoracic Society, *Increased Vitamin E Prevents COPD*)

Protocol:
1. Heave Ho Powder: 1 Scoop AM and 1 Scoop PM for 7 days, then 1 Scoop a day.
2. Some horses are “finicky” about supplements in their feed. Heave Ho tastes good, but here is what to do to help them eat easier. You need to add volume and flavorings.
   a. Need to add volume to your feed
      i. Add 2 cups of Senior Feed (low carb, tasty) or 2 cups Alfalfa or Timothy Pellets (low carb, tasty)
      ii. In addition to either Senior, Alfalfa, or Timothy Pellets, add 2 cups of soaked Beet Pulp - moisture helps with Heave Ho sticking to the feed
   b. Flavoring - add to the volume
      i. Sugar-Free Applesauce - helps Heave Ho stick
      ii. Sugar-Free Pancake Syrup - helps Heave Ho stick

Prognosis
“Depending on the clinical signs and severity of ROA, horses with this condition can be managed successfully for much if not most of their lives. Many of these horses are able to be excellent pleasure, trail riding, and even competition horses with dedicated owners that understand it is a chronic condition that will require life-long management” (A. House, AAEP).

Combining management with Equine Heave Ho Oral Therapy helps you continue to enjoy your horse in many activities.

Many people have airway allergy issues and know that with daily, diligent care, can do very well.

Medicines and supplements are not going to work unless changes to the environment are done at the same time.

The four easy steps of the Heave Ho program:
1. Hay - all hay has organic dust from normal production, but it can transfer asthma/COPD in many, so need to reduce the load via flash soaking. Tear up hay, place in hay net, place in bucket of water and fully submerge for only 10 minutes, pull out and hang up. Never use round bales, the contain a large amount of dust
2. Omegas - see an article on our site showing how omegas can reduce coughing by 50% - add chia or flax seed that is high in ALA Omega 3 and has a great Omega 3 to 6 ratio
3. Thyroid Function - low in all COPD/asthma horses - it directly lowers thyroid gland output. Add Thyro-L to their diet and test T4 levels in 30 days to see if you need to add more.
These horses run at the low end of normal range, this is sub-optimal. Your horse needs to be on the high end of normal to reduce lung infections and help breathing muscle.

4. Heave Ho - 2x a day for 7 days, then 1x a day

Visit [www.equinemed surg.com](http://www.equinemed surg.com) for additional information and helpful links.

*Proper diet and exercise are essential for horse health. This product is a supplement to help maintain horse health. This product is not intended to diagnose, treat, cure, or prevent disease.*