Hedgies for the Cure—United Against WHS

Gioia Marie Kerlin

How many times have you wondered what you can do to help fight Wobbly Hedgehog Syndrome (WHS)? How many times have you asked yourself “What can I do to put an end to this horrible disease?” We all know that research is the key to understanding and someday finding a way to combat WHS, but isn’t that just for scientists? The resounding answer to this last question is an emphatic “No!” Recently, several concerned hedgehog caregivers formed with the goals of raising research funding for Wobbly Hedgehog Syndrome, as well as educating hedgehog caregivers, veterinarians and the general public about this devastating disease. This group is called Hedgies for the Cure—United Against WHS, and its members include representatives from the Hedgehog Welfare Society, the Hedgehog Breeders Alliance, the International Hedgehog Association, and the Twink Fund.

In order to achieve our goal of raising funds for WHS research, Hedgies for the Cure holds monthly eBay auctions and contributes the proceeds directly to The Hedgehog Welfare Society’s Campfire Fund, and designates them specifically for WHS research. Our members share their many artistic and organizational talents, and give freely of their time to help set up auctions, send out ads, man tables at hedgehog gatherings, make craft items for sale in Ruby’s Rescue Shop (the HWS store), brainstorm fundraisers, and communicate with hedgehog owners who are interested in our group. We hold special events, like the upcoming Ruby Tuesday sale during the summer of 2007 (via Ruby’s Rescue Shop), and we continue collecting recycled ink jet cartridges as a means to earn more research dollars.

But we can’t do all this alone—we need your help. There are many ways you can contribute to our common cause. If you have items you would like to donate for auction, if you have any fundraising ideas, or if you would simply like to get more involved in our mission to combat WHS, please contact us at hedgiesforthecure@yahoo.com. If you have any items to donate for sale in Ruby’s Shop, or if you would like to make a monetary donation, you can contact Donnasue Graesser at donnasue.graesser@aya.yale.edu. If you don’t have time to participate actively, that’s alright too. You can always help out by purchasing items ear-marked for WHS research in Ruby’s Shop (http://hedgehogwelfare.org). Just look for the little blue ribbon. Currently, you can find Pat Storm’s knitted hedgehogs (in a wide selection of colors from Salt and Pepper, Standard, Apricot and Cinnicot to more imaginative colorings) and Cyndy Bennett’s polymer clay hedgehog pins. Every dollar helps bring us closer to finding a way to end the suffering of our little friends afflicted with Wobbly Hedgehog Syndrome, so no contribution is too small.

Thank you for caring about the health and well being of our hedgehog friends, and we hope to see you at Ruby’s, in an auction, or helping Hedgies for the Cure in some other way!

Gioia Marie Kerlin
Health and Education Committee Co-Chair HWS
Health and Education Committee Chair HBA
Member Hedgies for the Cure—United Against WHS

Take a look at our past auctions.

Watch for up-coming auctions to benefit Wobbly Hedgehog Syndrome research! The more you bid, the more we find out about the cause and treatment of this dreaded disease.
When asked how they first became interested in hedgehogs, many people are likely to mention *The Tale of Mrs. Tiggy-Winkle* as the source of their initial exposure to these intriguing little creatures. Published in England in 1905, this lovely little book was written and illustrated by Beatrix Potter who is perhaps better known as the creator of *Peter Rabbit*.

*The Tale of Mrs. Tiggy-Winkle* is dedicated to Lucie Carr, “Little Lucie of Newlands,” whom Beatrix Potter met during a summer walk through the Lake District of northwest England. According to Potter’s biographer, Margaret Lane, Lucie played an important role in the creation of this particular book:

A new book was underway, inspired by an encounter between Lucie of Newlands and Miss Potter’s tame, affectionate, much traveled hedgehog, Mrs. Tiggy-Winkle. *Squirrel Nutkin* [Potter’s most recent book] had done well, and she felt that a story about a hedgehog—especially such a comfortable, clean, good-tempered and fastidious hedgehog—would be equally attractive to children.¹

Beatrix Potter outlined the story during the summer of 1904 while on an annual vacation with her parents to northwest England. She prepared sketches of the Cumbrian countryside to serve as backgrounds in the illustrations.

When she returned to her family’s Bolton Gardens home in London, Potter took some time off to study fossils at the museum before beginning the illustrations for her newest book. As usual, she wrote many letters keeping her publisher, Norman Warne, apprised of her progress. In one she described working with her pet hedgehog.

Mrs. Tiggy as a model is comical. So long as she can go to sleep on my knee she is delighted, but if she is propped up on end for half an hour, she first begins to yawn pathetically, and then she does bite! Nevertheless she is a dear person, just like a very fat, rather stupid little dog.²

She went on to describe her efforts to portray her lead character in an apron, cap and printed calico dress:

The hedgehog drawings are turning out very comical. I have dressed up a cotton-wool dummy figure for convenience of drawing the clothes. It is such a little figure of fun; it terrifies my rabbit, but Hunca Munca [Potter’s pet mouse] is always pulling out the stuffing.³

The narrative itself offers contemporary readers a lesson in Victorian costuming and laundry practices as well as telling an intriguing story. Lucie, who lives at Little-Town Farm, has lost three pocket handkerchiefs and a *pinny* (a sleeveless dress or apron). As she walks through the countryside searching for the missing items, she asks the animals she meets if they have seen them. Tabby Kitten, Henny-Penny, and Cock Robin have nothing helpful to offer Lucie.

Eventually Lucie thinks she sees her handkerchiefs spread out on a grassy hillside. She crosses the stile and, as she climbs the steep hill, she finds some very tiny footprints which lead to an improvised clothesline and a heap of tiny clothespins. Then Lucie finds a small door in the side of the hill. She knocks, and enters a miniature Victorian kitchen with a flagstone floor. There a small person with twinkling eyes and a black sniffly nose is ironing clothes. Lucie notices that what she first thought were hairpins protruding from this person’s cap are actually *prickles*!

Mrs. Tiggy-Winkle introduces herself, comments on her ability as a laundress, and shows Lucie each item of clothing as she removes it from the wicker basket, irons it on a table covered with an ironing-blanket, and hangs it on a clothes-horse.

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Occasionally Mrs. Tiggy-Winkle pauses to exchange her iron for another iron hot from the fire, or to dip some item of clothing into a basin of clear starch. Each piece of clothing belongs to a different animal including some of the creatures Lucie encountered earlier in the day.

When Lucie’s lost pinny finally emerges from the laundry basket, Mrs. Tiggy-Winkle takes great pains to iron it properly, even pressing the frills with a goffering iron.

Although Miss Potter did not need to define or illustrate goffering for her intended audience, contemporary readers may wonder what is happening. Goffering is the process of pressing frills, lace or tucks. A goffering iron is an unusual looking device especially designed for this process.

The goffering iron shown in this illustration consists of an iron pin which was heated and inserted into a hollow tube fixed on an iron stand. Moist, starched fabric was held with both hands and pressed over the tube to create a scalloped or fluted effect.

Lucie is quite impressed with Mrs. Tiggy-Winkle’s goffering technique and when the frills of her pinny are shaken out she declares, “Oh that is lovely!”

Once the laundry basket is empty, Mrs. Tiggy-Winkle shares tea with Lucie in front of the fire before proceeding down the hill delivering tiny bundles of laundry to the animals in the neighborhood.

At last they reach the stile near Little-Town Farm. As she turns to say good night, Lucie is astonished to see that Mrs. Tiggy-Winkle has not waited for thanks or payment of the laundry bill. Now free of her white-frilled cap, shawl, gown and petticoat, she is running up the hill as fast as she can. It is at this point that Lucie finally realizes that her friend Mrs. Tiggy-Winkle is actually a hedgehog!

Was Lucie’s strange encounter really a dream? As the story ends the narrator says it was not and claims not only to have seen the little door in the hillside herself but also to be “very well acquainted with dear Mrs. Tiggy-Winkle.”

The little book became one of the best known of the 22 children’s books that Beatrix Potter produced.

Mrs. Tiggy-Winkle, who was rather elderly when she modeled for the illustrations, died about a year after the book was published. Beatrix Potter mentioned her pet’s failing health in a letter to her publisher’s sister Millie Warne:

I am sorry to say I am upset about poor Tiggy. She hasn’t seemed well the last fortnight, and has begun to be sick, and she is so thin. I am going to try some physic, but I am afraid that the long course of unnatural diet and indoor life is beginning to tell on her. It is a wonder she has lasted so long. One gets very fond of a little animal. I hope she will either get well or go quickly. 4

Two weeks later another letter had this to say:

I might have come up this afternoon, but I have got a sad job trying to finish a drawing of poor little Tiggy. She has got so dirty and miserable I think it is better not to have her any longer, and I am going away for a few days so it is best to chloroform her first. She is not fit to be on anybody’s hearth-rug, and it is very nasty here. She has always been such a scrupulously clean little animal. 5

Mrs. Tiggy-Winkle was buried in the back garden of Beatrix Potter’s Bolton Gardens home.

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At about the same time that *Mrs. Tiggy-Winkle* was published, 39-year-old Beatrix Potter, who was still living at home with her parents, became engaged to her publisher Norman Warne. Her parents opposed the marriage, feeling that the publisher was socially inferior to them. Potter defied her parents' wishes but Norman Warne died of leukemia within a few weeks of their engagement.

The royalties from her children’s books eventually gave her financial independence from her parents. She was able to buy *Hill Top Farm* and *Castle Farm* in Sawrey, England. For awhile both properties were rented to caretakers. Then at the age of forty-seven she married her solicitor William Heelis and moved to the country. She devoted the rest of her life to preserving the environment and farming, particularly breeding Herdwick sheep.

In 1943, at the age of 77, she became the first woman president of the Herdwick Sheep Breeder’s Association. She was thrilled with this honor but died on December 22nd before she was able to assume her presidency. She left part of her farm land to the National Trust to be preserved as a living landscape.

2. Ibid.
3. Ibid.
4. Lane, Margaret. Op cit. p.82.
5. Lane, Margaret. Op cit. p.83.

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**Lucy Laughs**

**Animal Code**

If AGMOLIE means LEOPARD in a certain code, what are the animals listed below?

- EMX
- QLN
- FLTZNGI
- XRLWWG
- WALTRSXM
- FGEXGFNM

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**Lucy says…**

Solve this puzzle for an important message.
The *Ramble Track*, aka Vern had an idea...

I knew what I wanted to do and how I wanted to do it... roughly. I’ve been mentally tweaking the details since then. I started out with a cardboard prototype:

![Cardboard prototype](image1)

What is needed is something lightweight, durable, reusable and maintainable. The *Ramble Track* affords a hedgehog in Stage I (the onset stage) of this horrible affliction the dignity of ‘self-propelled mobility’, of walking, for a few more months. Anyone who’s watched a hedgehog deteriorate, can appreciate this extra few months of an improved “quality of life.”

The *Ramble Track* is easy to construct. Erect the wall panels within a linear series of supporting arches (the 7” or 9” tall panels). I recommend 4 inch walls for petite hedgies or 5 inch walls for more hefty boys and girls.

Take your time, measure carefully, mark your cuts carefully and cut your marks carefully to get it right the first time. You may want to order an extra piece of coroplast for practice cutting before you begin your project.

According to my coroplast source, when you order the panels the second measurement provided will be the flute (the slots within the coroplast) axis. The flute axis is where the knitting needles insert so that the supporting arches will support the wall panels.

The supporting arches require a space cut at the bottom (with the flutes on the vertical axis) for the walls to fit into. You can cut to fit your hedgehog’s hips or you can cut and then adjust to fit the hedgehog. The walls are width adjustable by inserting the knitting needles through the flutes of the supporting arches into the flutes of the wall panels. The space you cut must be at least as high as the walls. The flags and parapets are a cosmetic touch and serve no function.

I decided this was going to be a donation to WHS. My gift to all the quilled children in America afflicted with WHS. I wanted to add it to [WHS.Org](http://WHS.Org) allowing anyone with a WHS hedgehog to download the plans and construct a *Ramble Track* at home for minimal cost.

I started out with a cardboard prototype: I ordered the following materials from the coroplast store:

- 4 ea 48” x 5” panels
- 6 ea 11” x 9” panels

Then I meandered over to the hobby & craft store and grabbed a fistful of #2 (US) knitting needles. Within a few days the coroplast was ready for pick up. I brought it home, looked at it for a couple days, then built this:

![Built structure](image2)

built it because hedgehogs who develop Wobbly Hedgehog Syndrome (WHS), or congenital degenerative myopathy, become weak and unstable in their hindquarters. They ‘flop’ as they walk. So why not give them some support at the hips? Hedgehog owners have brainstormed socks filled with rice and a dozen other very effective and capable ideas for supporting WHS hedgehogs as they walk but all have drawbacks for one reason or another.

I ordered the following materials from the coroplast store:

- 4 ea 48” x 5” panels
- 6 ea 11” x 9” panels

Then I meandered over to the hobby & craft store and grabbed a fistful of #2 (US) knitting needles. Within a few days the coroplast was ready for pick up. I brought it home, looked at it for a couple days, then built this:

Mark the space to be cut and, using a metal straight edge, slowly scribe along the mark with an exacto knife. Repeat the scribe using a light pressure on the blade until the panel is cut completely through. Trim any stringers and set the arch aside. Duplicate this step for each supporting arch. I recommend a minimum of one arch per each 2 feet of track.

Track section joiners are made by using the squares cut from the supporting arch. Cut a piece an inch and a half tall (flutes on the vertical axis) for each pair of wall panels to be joined. Join the track sections by aligning the wall panels end to join. Position a joiner over the abutted...
ends and insert knitting needles through the joiner plate into the wall panels. I recommend at least 2 knitting needles on each side of the joined wall panels as depicted here:

The size of Ramble Track you make for your pet is entirely up to you. The bigger and more varied you make it, the more likely it is that your hedgehog is going to enjoy romping in it. By flexing the coroplast sections you can create a weave, an oval, or whatever shape you wish.

**Ramble Track enhanced:**

The wall joiner panels are an effective means of joining the sections. However, IF you have the skill to make a more detailed cut, the coroplast may be cut to a ‘dovetail’ and joined like a piano hinge. Use the knitting needle as a hinge pin, align the cuts and insert the knitting needle through the flutes in the wall ends.

Pictured are the marked dovetails to cut in the ends of the wall panel (fig. 1), the joined wall panels (fig. 2), a corner view of the piano hinge corner (fig. 3). This picture also shows the adjustable width feature of the Ramble Track. Figure 4 shows an overhead view of the enhanced Ramble Track:

Practice a few times with corrugated cardboard (available at any grocery store) to learn how to mark the cuts and cut the marks. Please take your time, mark your cuts carefully and cut your marks carefully.

If you would prefer, I am willing to build Ramble Tracks for you at a reasonable (as yet undetermined) cost. You may contact Vern at FoothillsHaven@yahoo.com.

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**JULY**

| Jul 4 | Pugsley Fleming |
| Jul 5 | Frogger Graesser |
| Jul 7 | Sonata Storm |
| Jul 9 | Leo Jackson-Dempsey |
| Jul 9 | Spooky Wallenda Fleming |
| Jul 12 | Eryika Storm |
| Jul 20 | Dulcinea Fleming |
| Jul 23 | Suzi Que Storm |
| Jul 23 | Steve's Spirit Storm |
| Jul 25 | Oliver Storm |
| Jul 26 | Molly Weaver |
| Jul 27 | Emmy Myhre |

**AUGUST**

| Aug 5 | Maxx Christopher |
| Aug 6 | Mini Mee Christopher |
| Aug 6 | Jadyn Lamb |
| Aug 15 | Pepsi Storm |
| Aug 16 | Portia Rake |
| Aug 23 | Baxter Woodring |
| Aug 23 | Princess Chloe Bennett |
| Aug 23 | Milani Brown |
| Aug 25 | Keilik Pozder |
Frequently Asked Quilly Questions
Advice for caretakers of hedgehogs with Wobbly Hedgehog Syndrome
Compiled by Donnasue Graesser

From the editor: The following tips and suggestions are due to the hard work of the following members of the hedgehog community: Cyndy Bennett, Cindy DeLaRosa, Nancy Denny, Jan Ernst, Donnasue Graesser, Laura Ledet, Vicki McLean and Vern Mills.

Many hedgehog guardians take on the daunting task of caring for hedgehogs with Wobbly Hedgehog Syndrome (WHS). Some are taken off-guard when they first experience the frightening reality that their beloved hedgehog is beginning to wobble. Others in the community are seasoned pros, having cared for several WHS hedgehogs. No matter where you fall on that spectrum, there is always something new to be learned about making life as pleasant as possible for these special hedgies.

In a recent poll, over 26% of hedgehog caretakers reported that they had had at least one hedgehog who was definitively diagnosed with WHS. Additionally, another 19% had cared for hedgehogs with progressive paralysis, although there was no confirmation of WHS for these hedgehogs. The results of this poll tell us that we have a ton of collective experience in helping our little ones to deal with the immobility and other symptoms associated with WHS.

An excellent starting point for advice on caring for a WHS hedgehog, is Laura Ledet’s WHS site (http://tinyurl.com/ptoe). This is one of the most comprehensive informational sites on the subject. Link to Laura’s main page and scroll down to find the WHS informational pages. You will find a wealth of information, thanks to Laura’s vast experience with WHS hedgehogs and her diligent documentation of their care.

Your WHS hedge will depend upon you for feeding, exercise, enrichment, and comfort. Of course we provide these necessities for all our hedgehogs but WHS hedgehogs require a higher level of attention and TLC. When I asked the hedgeie community to share some gems of wisdom for WHS care, many meticulous hedgeie caretakers were happy to share the following advice:

The first set of tips includes basic changes you can make in your hedgeie’s environment and habitat to support mobility and a sense of independence as long as possible:

Firmly attach cage liners so a hedgegie can get a grip on the liner without it bunching up. This is especially useful for hedgegies who are lying on their sides and “pawing.” Use liners made from fabrics such as corduroy or flannel rather than fleece, so nails won’t get caught when the hedgegie paddles around. Include “furniture” such as pigloos in the habitat, to give your WHS hedgegie something to lean against.

Be sure your WHS hedgegies get as much exercise as possible and that they are able to maintain the exercise they love as long as possible. Most of these tips involve wheel-adjustments, so that a hedgegie who is slowing down can still enjoy a hedgegie’s favorite past-time--wheeling!

Start an exercise program and stick to it. Example day one: Have hedgegie out for walking/running time in a play area. In addition to whatever exercise it gets in its condos. Day two: Let the hedgegie rest so its body does not get too worn out from additional exercise. Then repeat the Day 1 activities. The reasoning behind this is to keep hedgegie’s body as strong as possible for as long as possible.

Build little steps up to the wheel so your hedgegie can use the wheel as long as possible. Pad the wheel so a hedgegie can get a grip and use it at night. Lower the wheel to just above floor level. You can remove the front frame pipe from a bucket wheel so it can go really close to the floor. Angle the wheel slightly back so the hedgegie falls in against the back of the wheel rather than out.

Photo courtesy of Cyndy Bennett

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Hedgehogs with mobility problems are sometimes able to walk with some support. This gives them a sense of independence, as well as delaying muscle atrophy. Several guardians have improvised using common items, or devised ingenious apparatus to keep their hedgies moving on their own.

If the hedgie needs Sub-Q fluids one should always warm the lactated ringers before administering. After filling the syringe with the fluid warm the syringe under hot water until it is lukewarm. Test it on the inside of your wrist. This is a great tip that Jeanne gave me when I had to start giving Cuddles Sub-Q fluids. It is best to use a winged infusion set 23G x ¾". That way the hedgie doesn’t feel pressure from the plunger.

This last bunch of tips pertains to comfort and TLC for your WHS hedgehog.

Avoid stressors with your WHS hedgehog. Use a fleece-lined basket for TV watching. For example: Cold drafts, frequent baths (especially if the hedgehog does not like baths), and anything you notice that causes them stress. Put disposable diapers to soak up any pee accidents under hedgies that can no longer move very well. Pearl doesn’t like lying on the diaper, so I cover it with a small piece of fleece that I change when replacing the diaper. I have found that Preparation H® works the best for sore bottoms. It protects hedgehog bottoms from moisture and promotes healing. It also makes people at the Milwaukee hedgehog show look at you strangely when you say, “I can’t find my hedgehog’s Preparation H.”

Hedgehog massage is a great way to improve well-being, alleviate stress and soreness, and ward off muscle atrophy. For a thorough review of massage techniques for WHS hedgies, refer to the excellent article by Vicki McLean in HWS newsletter issue #25, December 2006. This newsletter is available at http://www.hedgehogwelfare.org. In addition, Vicki will be providing a seminar on massage techniques for WHS hedgehogs at the Rocky Mountain Hedgehog Show in Denver Colorado on October 12-14 in Denver Colorado.

We hope to see a day when WHS will no longer exists, and this article will be obsolete, but until then, we hope that hedgehog guardians will continue to share their experiences so that we can all create the best environment and quality of life for our WHS hedgehogs. If you ever have any questions about hedgehog care in general, WHS care, or any quilly questions, there are 600+ hedgehog guardians just waiting to help at: http://pets.groups.yahoo.com/group/hedgehogwelfare/

If you have suggestions or ideas for items you would like to see in the newsletter, e-mail the editor at newsletter@hedgehogwelfare.org
Looking for an easy craft project to occupy restless or bored kids on a hot summer day? This simple, inexpensive art project may be just what you need!

Materials:
• A large sheet of drawing or construction paper for each participant
• Finger paint, or other washable paint that won’t irritate sensitive skin.
• Waterproof markers
• Aluminum foil pie plates or other washable containers large enough to encompass a hand print (hand held flat, fingers extended).
• Plenty of old newspapers
• Smocks, aprons or painting shirts

Directions:

Using the waterproof markers draw a large outline of a quill-less hedgehog on each sheet of paper.

Imagine a pear lying on its side; add legs and a perky, hedgie-esque nose, eyes, mouth and ears. Fill the pie plate with a shallow layer of paint. Use a separate plate for each color. The children can now decorate their hedgies with handprint quills.
WHS, Case Histories, and Necropsies

Laura C. Dunklee

(Note: This article may be upsetting for some readers. I’ve tried to find a balance between practical matters and empathy, but that isn’t always easy or possible. Like most folks, I don’t like to think about my hedgehogs dying and I don’t like the thought of their bodies being “investigated” after they die. But, to be blunt, if we’re going to put an end to WHS, we’re going to need to make decisions to have our WHS hedgies necropsied. We cannot stop WHS without the information that is gathered through necropsies. That’s just the way things are.

I look at the death of a WHS hedgie like this: it hurts and it’s upsetting. But the hedgehog is dead and no longer needs his or her body. If, by having that body necropsied, information can be gathered and answers can be found that will prevent other hedgehogs from suffering through WHS, then I have a duty to have a necropsy performed. Is it an emotionally difficult decision? Yes, without a doubt. But it is the right decision – we need to stop WHS, plain and simple – and so I have my WHS hedgies necropsied.)

Throughout this newsletter, you’ve learned about Wobbly Hedgehog Syndrome, read about the research, and gotten to know some of these special hedgehogs. Now we’re going to talk about some stuff that most of us don’t like to think or talk about. We’re going talk about WHS case histories and we’re going to talk about necropsies.

Following this article you will find information about how to ship an intact, deceased hedgehog to a laboratory and how to prepare tissue samples for examination at a laboratory. The latter is going to be detailed and likely not pleasant reading but it is being provided because we feel, strongly, that we need to get this information to veterinarians who are treating likely WHS cases and hedgehog caretakers who wish to participate in the WHS research.

Please, if you have a suspected-WHS hedgehog, share this article and the information about shipping the body and tissue samples with your veterinarian now, so that everyone is prepared when the hedgehog dies.

Why Are Case Histories and Necropsies Important to WHS Research?

Basically, the WHS case histories and the WHS necropsy data are two sides to the same coin: both are essential to research. The case histories collect data about hedgehogs when they were alive. The necropsies collect data about the physical changes caused to the hedgehog’s body systems and organs by WHS. Necropsy can only be performed once the hedgehog has died. One without the other is pretty much useless to researchers – a necropsy that confirms that a hedgehog had WHS just tells the researchers that very fact, it doesn’t help them understand how the disease progressed and how the hedgehog was cared for while alive, including possible environmental factors. At the same time, a case history tells all about a hedgehog who had neurological problems. But without the necropsy findings the researchers cannot say for sure if the hedgehog had WHS and so the information cannot be used in the research.

What is the WHS Case History?
The WHS Case History form has been put together by the researchers on the WHS Research Project. The Case History allows the researchers to look for patterns, similarities, and abnormalities in our WHS hedgehogs. The WHS Case History is filled-out by the hedgehog’s caretakers as soon as the caretakers have emotionally recovered from the loss of their companion hedge.

Some of the information collected about WHS hedgehogs through the WHS Case History includes: When the hedgehog was born, when it started showing WHS symptoms, how the symptoms changed over time, if the hedgehog had offspring, when the hedgehog died, what the cause of death was, and so forth. This information helps researchers to get a better grasp on WHS and to see patterns that will, hopefully, lead to answers about what causes WHS and how to treat and eventually eradicate the syndrome.

Do not worry if you cannot answer all of the questions on the Case History, or if you have only had the hedgehog for a short while. Any information helps the research.

If you’d like a copy of the WHS Case History form to fill out for a WHS hedgehog, please contact Dr. Donnasue Graesser at donnasue.graesser@aya.yale.edu or Laura Dunklee at Laura@Lauraslist.org. Please put “WHS Case Study” in the subject line.

Why are Necropsies Important to WHS Research?

At this time WHS cannot be diagnosed while a hedgehog is alive since we don’t have a blood or other test yet. The only way to say if a hedgehog had WHS is through an examination of the spinal cord and brain once the hedgehog has died.

Additionally, not only does a necropsy need to be performed to determine if the hedgehog had WHS, the necropsy also helps the researchers to see how the damage spreads through the hedgehog’s body and how fast it spreads. It is only by fully examining the damage at the microscopic level that the researchers can understand the changes caused by WHS.

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Most importantly, the pathological examination of tissues is the first step in understanding what causes a disease and how to treat the disease.

What is a Necropsy?
A necropsy is a post-mortem (after death) examination of an animal’s body (in our case, a hedgehog’s body) to determine the cause of death and to look for other health issues that might have been affecting the hedgehog. There are usually two parts to a necropsy: the gross necropsy and the histopathology.

The Gross Necropsy
The gross, meaning total or whole, necropsy procedure involves a trained person (a veterinarian or other specialist) examining a deceased hedgehog’s body. The person performing the necropsy first looks at the body and notes anything abnormal such as obvious tumors, bruising, missing or atrophied limbs, and any external injuries.

Then the veterinarian or pathologist opens the hedgehog’s body and examines the different systems and their related organs, such as the digestive system, the respiratory system, the cardiovascular system, and so forth. If abnormalities are found, tissue samples are taken from the area that is different and prepared for examination under the microscope.

The Histopathology
The histopathology portion of a necropsy is usually performed by a pathologist or a histopathologist. The tissue samples that were taken during the gross necropsy are “fixed” on a slide or several slides. These slides are then examined through a microscope and the abnormalities are identified.

If WHS is suspected, the pathologist will look at tissue samples from the brain and spinal column and possibly other systems. The pathologist will be looking for abnormalities. If the hedgehog had WHS, the slides will show that there has been damage to the fatty myelin sheath that insulates nerve fibers in the brain and spinal cord and a degeneration of the axons of nerve cells in the brain and spinal cord.

Necropsy and Histopathology Report
Once the veterinarian, pathologist, and/or histopathologist have completed their examinations of the hedgehog’s body and systems, they write a report that details their findings. Any veterinary pathology laboratory can look for the physical damages to the brain and spinal cord caused by WHS, but the laboratory staff may not be aware of WHS and instead of saying “this hedgehog had abnormalities compatible with WHS” they may, instead, describe the changes and abnormalities that they observed during the gross necropsy and pathology. Some of the terms that the report might include, all of which are compatible with a WHS diagnosis, include: leukoencephalopathy, spongiform changes, demyelination, axonal degeneration, and neuronopathy. You should discuss the necropsy and histopathology report with your veterinarian. He or she will be able to answer your questions about the information it includes.

In Summation
The questions about WHS: What causes it, what affects it, how it progresses, and how we can stop it are all possible to answer. But it is going to take those of us in the hedgehog community: The breeders, the caretakers, and the rescuers, to find the answers. We will only find the answers through research and the research, at this point, involves caretakers filling out the WHS Case History form and sending our hedgehogs (or their tissues) to laboratories for necropsies and histopathologies.

The decision to have a necropsy done is not pleasant to contemplate but it is necessary. If you have had a hedgehog with what you suspected was WHS, or if you have interacted with a WHS-hedgie, then you know the heartbreak that Wobbly Hedgehog Syndrome brings. If we, as a community, band together and have the necropsies done and fill out the corresponding Case Histories, then we can end the suffering caused by WHS.
Arranging for a WHS-Symptom Hedgehog to Be Necropsied
Laura C. Dunklee

If you have a hedgehog that you suspect has Wobbly Hedgehog Syndrome (WHS), or if you have a hedgehog that is related to other hedgies with WHS or WHS-like symptoms, then we would really like to have your hedgehog included in the on-going WHS research. However, if you decide to participate you are going to need to make a couple of decisions and plans and also discuss all of this with your veterinarian.

Laboratory
You’re going to need to decide which laboratory you would prefer to send the hedgehog or tissue samples to. Any good veterinary diagnostics lab can perform the needed examination. You can ask your vet for suggestions. I prefer to send my WHS hedgehogs to Dr. Spraker, at Colorado State University Veterinary Diagnostic Laboratory, as he has examined lots of WHS hedgehogs and is researching the disease.

Here is his contact information:

Colorado State University
College of Veterinary Medicine and Biomedical Sciences
Veterinary Diagnostic Laboratories
300 West Drake Road
Fort Collins, Colorado 80523-1644
Attn: Dr. T. Spraker
Telephone: 970-297-1281  Fax: 970-297-0320

If you decide to send your hedgehog’s body to the CSU Veterinary Diagnostic Lab, you may want to also contact Precious Memories, a wonderful animal crematorium located in Fort Collins, Colorado. If you’d like to have your hedgehog’s body cremated, contact the crematory and they will arrange to pick-up the hedgehog from the laboratory, provide a private cremation, and place the ashes into a keepsake box which is then mailed back to you. I have had four of my hedgehogs cremated this way and have nothing but good things to say about the service. They have been professional, caring, and empathetic and I’ve felt reassured when my hedgehogs were cared for by them. You will need to call the crematory to get stuff set up as soon as the hedgehog is on the way to Colorado, so the crematory staff can make the arrangements on their end. They do charge for this service but are extremely affordable if it is important for you to receive your hedgehog’s remains.

Here is their contact information:

Precious Memories Pet Cemetery and Crematory
5819 E State Highway 14
Fort Collins, CO 80524
Telephone: 970-482-7557

Intact Body or Tissue Samples?

For research purposes, it is best for the whole hedgehog body to be sent for necropsy. However due to timing issues, sometimes this isn’t possible. Decomposition processes set in immediately following death and cause changes to the tissues. If the hedgehog’s body is not at the lab within 24-hours following death, there may be so much damage that it will be difficult to perform a good necropsy. If you cannot get the body to a lab within 24 hours, then you are going to need to make contingency plans to have a veterinarian perform the gross necropsy and secure the tissues needing to be examined. Talk about this with your vet, as he or she may or may not be willing to provide this service, especially if the hedgehog dies over a weekend. If the vet is not willing or able to do the gross necropsy and to get the tissue samples, hopefully a referral to another vet can be provided.

Shipping an Intact Body

If you decide to send your hedgehog’s intact body to the laboratory, you will have to make some arrangements so you’re prepared when the time comes. Under NO circumstances should you place your hedgehog’s body in a freezer. Ice crystals will form inside the cells and this will interfere with the histopathology results.

If your hedgehog dies at home during the week, you are going to need to act immediately to get the body to the lab. This means being prepared ahead of time.

You will need to have available:
Three to four “blue” ice packs or one ice blanket. These are available at grocery stores, drug stores, camping stores, gas stations, etc. Store them in your freezer as soon as you get them.

Paper towels. Alternatively, you may wish to use a favorite blanket, bag, cloth towel, etc.
A large ziplock or zippered plastic bag.
A large insulated lunch bag or small Styrofoam cooler. It must be large enough to hold your hedgehog, the ice packs, and some padding.
A cardboard shipping box large enough to contain the lunch bag or cooler.

Quick access to a Post Office (preferably), FedEx, or UPS office with guaranteed overnight delivery.
The shipping address and contact information for the laboratory where you are sending the hedgehog’s body.
A sheet of paper giving your name, address, and phone number and any specific tests or tissue examinations

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that you are requesting, or your contact information and that of your veterinarian. Also include the name of your hedgehog on this paper. If you have discussed billing the cost of the necropsy to the Hedgehog Welfare Society, be sure to include some indication that the bill should be sent to: Hedgehog Welfare Society, PO Box 242, Chaplin, CT 06235.

You will need to wrap the hedgehog’s body in the paper towels or other wrapping and then place the body into the ziplock bag. Squeeze out most of the air. Place the bag containing the body into the insulated bag or Styrofoam cooler and place the ice packs around the ziplock. You may wish to place some padding into the cooler first. Close the insulated bag or Styrofoam cooler and place it in the cardboard shipping box. On top of the cooler, inside the shipping box, affix the sheet of paper with your contact information and phone number. Get the box to your nearest shipping location immediately (if the hedgehog dies at night, do this first thing in the morning and send it to your lab with specifying next day/overnight delivery. Be sure, also, to call the laboratory to let them know the package is on its way and to give them your billing and payment information.

Alternately, if you’ve made the arrangements in advance, you may be able to take the hedgehog’s body to your veterinarian’s office and have them do the packing and shipping on your behalf. It’s likely they will charge for this service. In this case, you’ll need to cool down the hedgehog’s body by wrapping the body in absorbent material (paper towels, favorite blankets, etc.) and placing it into a ziplock bag. Place this bag in your refrigerator and then transport the hedgehog to your vet’s office as soon as you possibly can. Call the vet’s office to let them know that you’re on the way, so they can be ready.

Remember: Under NO circumstances should you place your hedgehog’s body in a freezer. Ice crystals will form inside the cells and interfere with the histopathology results.

Because most diagnostic laboratories are closed on the weekend and are not likely to have anyone to accept or sign for packages, never ship a hedgehog to a lab on a Friday. It will not be received until Monday and by then it may have decomposed to a point where the tissue is too damaged to be of any use. You can, however, ship a hedgehog’s body overnight on a Thursday, if your shipping provider can guarantee next-day delivery. Be sure to contact the laboratory to make sure someone will be available for receipt of the package on Friday afternoon, or whenever the delivery is scheduled.

Sending Tissue Samples for Pathology

If your WHS-likely hedgehog dies on a Friday or over a weekend, you will need to have a trained person perform a gross necropsy and prepare tissue samples to be sent for examination. Make arrangements for this now before the need arises. Otherwise you may find yourself calling around on a Friday night, trying to find someone who can prepare the samples.

Tissue Prep for a WHS Hedgehog

**Warning:** The following text may be upsetting reading to hedgehog caretakers – it is being provided for you to share with your veterinarian, as it details how to prepare the required tissue samples. You may wish to avoid reading this section and, instead, just print it out and give it to your vet.

At a bare minimum, the brain and spinal cord must be preserved to diagnose WHS. However, it is best to include all major organs for the histopathological examination.

The organs and tissue should be removed as soon as possible following the death of the hedgehog. The tissues will last for about 24 hours, if refrigerated. After that they will be too compromised to provide good histopathic results. _Do NOT freeze the body or tissues._

**Brain** – Remove the skull, leaving the brain intact in the skull. Cut off the top of the skull to expose the brain and place both the skull and brain in formalin. Leave the brain in the skull.

**Spinal Cord** – Remove the entire vertebral column _with the spinal cord intact_. Do NOT remove the spinal cord from the vertebral column. Instead, clear away as much muscle and connective tissue as possible. Then place the entire vertebral column in formalin (there are enough openings in the column that the fixative will infuse the spinal cord).

**Additional Organs** – Remove and place in formalin. Be sure to include any grossly pathological organs or tumors.

Editors Note: I would like to take this opportunity to thank everyone who contributed to the content of this newsletter, from those who researched the information, wrote the articles, edited the content, submitted photos and ideas, and especially all the hedgehog guardians out there who continue to support the HWS and its ongoing efforts to protect the well-being of pet hedgehogs through rescue, research and education of the people who care for them. ~editor