

**The following is an account of an owner's management of an Irish Wolfhound puppy, suffering from porto-systemic shunt (PSS) – otherwise known as liver shunt – who was successfully operated on. Please note that this is written from the personal perspective of a dog owner. Although all the information here is based on advice given and medication prescribed by vets, you should always consult a specialist veterinary surgeon when managing a hound with PSS**

### **When a diagnosis of PSS is suspected**

It is vitally important for the puppy's health and welfare, that a prescription diet (or suitable substitute) be commenced **as soon as a shunt is suspected** (i.e. – after the first positive bile acid test) Delaying the introduction of the diet (and any necessary supportive therapy) could lead to Hepatic Encephalopathy. This could prove fatal, if the initial signs are subtle and/or the onset is sudden. A further bile acid test (the double test) is usually performed as soon as possible after a positive first result. However, an ultrasound scan is the definitive way to diagnose the presence of a shunt and most modern vet surgeries have equipment capable of confirming that a shunt is present. An ultrasound scan is non-invasive and does not require sedation or general anaesthesia.

The bile acid test is a useful and reliable indicator of a problem, but the presence of a shunt **must** be definitively established prior to surgery. For the puppy's benefit, a diagnostic scan should be performed as soon as possible, followed by a referral to a specialist veterinary hospital to discuss surgical options.

### **When a diagnosis of PSS has been confirmed**

After consultation with the surgeon, it may be necessary to 'stabilise' the puppy on a low protein diet for at least 3 weeks prior to the operation to repair the shunt. This process is recommended whether or not Hepatic Encephalopathy has been diagnosed and is beneficial in preparing the puppy's system for surgery.

#### **PSS management diet**

#### **Pre and post op diet & medical management of porto-systemic shunt**

Feeding little & often helps to keep the system working at a steady rate, without overloading it

Amounts of food are **approximate** quantities for a puppy aged 8-14weeks

Approx 4.00 a.m.	One quarter tin Royal Canin Hepatic Diet One quarter tin Hills l/d
Approx 8.00 a.m.	One quarter tin Royal Canin Hepatic Diet One quarter tin Hills l/d Lactulose Synulox
Approx midday	One quarter tin Royal Canin Hepatic Diet One quarter tin Hills l/d Dessert spoon Cottage Cheese
Approx 4.00 p.m.	One quarter tin Royal Canin Hepatic Diet One quarter tin Hills l/d Lactulose Omeprazole
Approx 8.00 p.m.	One third tin Royal Canin Hepatic Diet One third tin Hills l/d Synulox
Approx midnight	One quarter tin Royal Canin Hepatic Diet One quarter tin Hills l/d Lactulose Dessert spoon Cottage Cheese
	1-2 raw carrots as 'chewy' treats

**Do not** feed hide chews, pigs' ears, tripe sticks, or any treats with a protein content greater than 12%

**NB** – The Lactulose dose is dependent upon an individual puppy's metabolism and intestinal function  
Synulox & Omeprazole doses are dependent upon the puppy's weight  
Recommended amounts of Cottage Cheese added to the diet varies – please ask your vet for guidance

## Other information

**Lactulose** is a synthetic non-digestible sugar, recommended to help reduce ammonia. It also improves the gut transit time and thus minimises the level of toxins in the system

**Synulox** is an antibiotic that kills ammonia-producing bacteria, it is important to lessen the amount of ammonia in the system of shunt-affected puppies

**Omeprazole** is given to protect the stomach lining. Shunt puppies can be prone to stomach ulcers

The addition of **Cottage Cheese** to the diet is aimed at improving blood protein levels – especially important for post op healing

## Observations

\* A combination of the Royal Canin hepatic diet and the Hills l/d (liver diet) helps to give a variety of flavour to your puppy. Tinned food is ideal for very young puppies, as it is easier for them to eat. However, if your puppy can cope with complete food, then this can be used instead, or in combination. Pouring a large amount of boiled water over the complete food and leaving it to soak for at least 30 minutes, helps to soften it. You may then wish to crush it with a potato masher, before feeding.

\* You should expect your puppy to ‘poo’ 3-4 times a day (at least!) Poo should be of a thick ‘porridge-like’ consistency

\* Constipation and feeding large quantities of food in one meal, **should be avoided** at all costs.

\* It is said that typically, shunt puppies exhibit bizarre or unusual behaviour after feeding. This is often cited by breeders as a sign that a shunt may be present. However, unusual behaviour can sometimes be observed when the puppy is hungry, or needs to wee or poo.

\* Groaning (as a child would with a stomach ache) is a typical sign that the puppy has ‘hunger pains’ and/or that toxins are building up. This should not be ignored, as it can also be a sign of disorientation and precede an encephalopathic episode.

If the puppy is showing signs of discomfort, yet hunger and toilet needs have been attended to, then Hepatic Encephalopathy should be suspected – and you should contact your vet **immediately**.

\* Frequent urination (especially after the operation) should be expected – and is a good sign that ammonia and fluids are being properly expelled. Do not expect your puppy to be easy to house-train. The need for urination may be sudden and urgent. If the operation is a success, then this will resolve, along with any other shunt-related symptoms.

## Alternative diets

The diet for managing livershunt puppies should be low in purine (i.e. low in ammonia-producing protein – rather than low in protein per se). If your puppy is reluctant to eat the prescription diet, then a ‘homemade’ diet can be used, either in conjunction, or on its own, with the following guidelines:-

You must be careful not to reduce protein too much, as protein malnutrition can result, leading to ascites, growth retardation, muscle atrophy and other problems. It is important to get the balance right between providing enough nutrition for your puppy in a rapid growth phase and ensuring his/her system can cope with the diet you provide.

### **High-protein / low-purine foods include:-**

Dairy - such as low fat (low sodium) cottage cheese, ricotta cheese, skimmed milk and yogurt, as well as eggs (cooked & scrambled).

Vegetables & Fruit– especially carrots, sweet potatoes and tomatoes

Pasta, macaroni & rice

Bread – (no yeast, **low** fibre, white flour & refined grain types)

Cake and biscuits in very small amounts

Fats, oils, sugar, syrup, and other sweets in **very** small amounts

**Any of the above can be used in moderation, in addition to the diet, to encourage a reluctant feeder.**

### **Medium-purine foods which are still good to feed include:-**

White fish, chicken, and turkey

### **High-purine foods should be avoided, including:-**

Beef, Pork, Bacon & Lamb (red meats produce more ammonia)

Organ meats (liver, heart, kidneys, etc) seafood and soy

## Post-op management

Your puppy will likely remain in hospital for 3-4 days. A technique known as ‘cellophane banding’ is usually used as the surgical procedure for repairing shunts in Irish Wolfhound puppies. This allows partial closure of the shunt during the operation. As the puppy grows, the band slowly tightens and this enables the liver to adjust gradually to the change in blood flow. It is a more successful technique than total surgical ligation and helps to avoid portal hypertension.

The first 24hrs post-op are crucial and your puppy will be very carefully monitored to ensure that no complications develop. After the operation, the puppy should remain on the PSS diet until the post-op double bile acid test, one month later. Lactulose & Omeprazole should also be continued throughout this time. Synulox can usually be discontinued after 2 weeks.

It is important to keep the puppy quiet and for him/her to avoid stretching and/or jumping up for 2-3 weeks after the operation.

It is quite common for a moderate amount of ascites (fluid in the abdomen) to be present post op. This is not necessarily a bad sign and should gradually resolve within 2-3 weeks, or less. It is a good idea to measure your puppy’s ‘waist’ at the largest point, so that you can monitor the reduction in fluid.

If the bile acid test shows an encouraging result, your puppy can gradually be weaned off the lactulose and ‘normal’ food can slowly be introduced. A final double bile acid test is usually recommended to confirm the success of the operation 2 months later, by which time your puppy will hopefully be leading a normal life ☺

Providing your puppy has no other health conditions, then successful shunt surgery will have restored him or her to full health. From around 3 months post op, there should be no need for your puppy to be reared any differently to any other Wolfhound puppy and you should expect him/her to have a normal lifespan.

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You can read more about Whisper – the puppy whose experience is documented here – on the Practical Aid for Wolfhounds website [www.pawstrust.co.uk](http://www.pawstrust.co.uk) and Facebook page [www.facebook.com/pawstrust/](https://www.facebook.com/pawstrust/)

*Saving one Wolfhound won't change the world but it*

*WILL change the world for that one Wolfhound*



[www.pawstrust.co.uk](http://www.pawstrust.co.uk)

