

# Diseases of Pionus

by Susan L. Clubb DVM

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Most species of Pionus parrots are very hardy, adapt readily to captive environments and very often thrive in captivity. In general, the diseases and disorders encountered in Pionus are essentially the same as those of other parrot species. The close phylogenetic relationship of Pionus to Amazons is reflected in their susceptibility to disease. In many aspects, they respond to disease similar to Amazons. The problems of special concern to Pionus will be covered along with a discussion of some general health requirements. Additional reading at the end of the chapter can be consulted for more detailed information on the diseases discussed.

Avian medicine has grown rapidly in recent years. Veterinarians worldwide are recognizing the popularity of parrots as pets and are responding to the challenges presented by this entirely new field of veterinary medicine. Both the aviculturist and the veterinarian can benefit from a close working relationship.

## First Aid

The aviculturist will be, on occasions, faced with emergencies that will require quick thinking and an understanding of simple first aid. The most common problems that will be seen include bleeding, traumatic events and concussion. The most important aspect of good first aid is knowing when to call for professional help.

Provision of a warm environment for sick birds is of primary importance when the bird is injured or ill. In the case of heat stroke or concussion, however, the bird should be kept cool. While an incubator or hospital cage is desirable, heat may also be provided by the use of a lamp, heating pad, space heater, or merely placing the bird in a warm room. A temperature of 80 to 85°F. is desirable. If a heat lamp or space heater is used, the bird should be allowed enough

room to retreat from the heat source if it becomes overheated.

Haemorrhagic episodes may occur following injury or as a result of disease or Vitamin K deficiency. The bleeding bird should be examined carefully to determine the source. If the bird is bleeding from the mouth or vent, it requires veterinary care. Broken nails, beaks and developing feathers are common sites for haemorrhage. Beaks and nails may be broken when the bird climbs on wires or falls. Bleeding may be extensive due to the rich blood supply to these areas. The bleeding tip of the beak or nails should be cauterized. Quick stop powder, silver nitrate, styptic pencils or a hot match stick may be helpful. A strip of tape wrapped around the tip of the beak or nail will prevent the clot from being dislodged. The tape is usually removed by the bird after a short period of time. Glues, such as 'super glue', may also be used to seal the surface of the defect and protect the wound. In the case of skin injuries, pressure should be applied directly to the site in order to control haemorrhage. A piece of cloth or paper towelling should be applied over the site and held firmly for several minutes. If bleeding on a limb is not controlled, pressure may be applied above the wound. If it is necessary to apply a tourniquet, the bird should be rushed to a veterinarian prior to removal of the tourniquet. Tourniquets may be made from a rubber band or a piece of bandage and should be applied only tight enough to stop the haemorrhage.

Fractures of the wing and leg also require veterinary attention. Birds with wing fractures should be carefully caught and restrained. The wing should be gently folded into a normal resting position and the entire bird should be firmly wrapped with a towel. In this way, it can be transported without further



damage to blood vessels, nerves and muscle. A bird with a broken leg should be placed in a small dark box for transport to a veterinarian.

Skin wounds in birds heal remarkably well and only large ones will require suturing. Minor wounds should be cleaned with a weak solution of hydrogen peroxide or iodine. Oily salves or lotions should not be applied to wounds due to the danger of matting the feathers resulting in a loss of heat retention. Powdered astringents or antibiotic preparations should be used if a wound dressing is necessary. Superficial injuries on the feet and legs should be bandaged. If comfortably applied, the bird will usually not chew the bandage.

Subcutaneous emphysema occurs when a bird suffers a blunt trauma such as flying into a window. An airsac is ruptured and air collects under the bird's skin. The bird will feel puffy or crackly. The air should be removed either by needle or syringe or by cutting a very small hole in the skin with a pair of small sharp scissors and squeezing the air out. The skin should be cleaned with a disinfectant before and after cutting. Subcutaneous emphysema should not be allowed to go untreated or it may become chronic.

Abscesses in birds form as hard solid masses of pus. Birds lack enzymes in their white blood cells which act to liquify pus. Abscesses under the skin are movable as opposed to a tumour which would not move easily under the skin. Abscesses will not come to a head and drain. In order to remove pus, an incision must be made and the material expressed. An antibiotic ointment is instilled into the resultant wound and it usually heals uneventfully.

### **Infectious Diseases**

Most of the important infectious diseases of Pionus are more likely to occur during or shortly after the importation period. In the absence of infectious disease, most Pionus species adapt quite easily to captive environments and diets. Quarantine of all new additions should be a routine practice followed by all aviculturists. A quarantine period of at least 30 days is recommended. During this time, the bird can be observed for any signs of illness. Additional diagnostic tests for bacterial infections, psittacosis and parasites can be performed at this time and any needed treatment can be carried out.

## **VIRAL DISEASES**

### **Exotic Newcastle Disease**

Quarantine of all birds for exotic newcastle disease is required by many countries prior to entry. Newcastle disease is a multistrain viral disease which ranges in virulence from a highly fatal disease to an

almost undetectable disease causing reduced reproduction in poultry. It is caused by a paramyxovirus. The most virulent form is Viscerotropic, Velogenic Newcastle Disease (VVND). Psittacine birds are often severely affected by VVND; however, birds who survive the disease have the potential for carrying the virus and infecting other birds while showing symptoms of disease. In many countries the disease is controlled by vaccination of poultry, but this is a costly procedure. In the United States, VVND has been eradicated at great cost and the United States Department of Agriculture vigorously protects poultry flocks from re-entry. In countries such as the United States, Britain, Canada, South Africa, and Germany, a quarantine period and testing for VVND is required.

VVND is common in Central America between the months of March and June. This is the time when White Capped Pionus are raising young which may be removed from the nest for the pet trade. While the practice and the resultant smuggling of diseased birds is not common (as it is with Amazon parrot) the possibility should be considered when a baby bird of questionable origin is offered for sale. The incubation period (time from exposure to virus until development of illness) in most psittacine species is 5 to 17 days. Clinical signs are highly variable depending on the strain of virus encountered and species of bird infected. Pionus are highly susceptible to VVND. Signs may include bright yellow-green diarrhoea, sneezing and nasal discharge, depression, paralysis and inability to control the limbs and head.

Vaccination of birds intended for importation in the United States is prohibited as it will mask the infection and allow infected birds to enter undetected.

### **Parrot Pox**

Avian pox virus infection is the most important viral disease of Pionus. All species are susceptible and the outcome can be devastating. In most cases Pionus exhibit the wet form of pox in which the mucous membranes of the eyes, mouth, oesophagus and crop, and upper and lower respiratory system may be involved. The disease can be spread by biting insects or direct contact with infected birds or contaminated surfaces. Pox in Pionus is highly contagious and spreads rapidly through a susceptible flock.

Treatment should include the use of high levels of Vitamin A (10,000 units per week given by injection) and supportive care. Antibiotics are necessary in severe cases to control secondary bacterial infection. Good nursing care should include forced feeding with a feeding tube into the crop. The eyes should be treated



h a solution of mercurochrome in eye wash solution. This is prepared by adding 1 ounce of 2% mercurochrome to 4 ounces of eye wash solution. An ophthalmic preparation of chloramphenicol should be instilled into the eye after washing, being careful not to get the feathers oily. Scabs should be left intact in order to prevent further damage to the eye, but could be lifted at one corner to allow medication of the eye.

The mortality rate of *Pionus* infected with parrot pox is usually high and birds which do survive will often be badly scarred. Scars may be evident as pigmented and distorted areas of the roof of the mouth and eyelids, scarred corneas, deformed nostrils and areas of distorted lamination on the beak. After recovery, however, *Pionus* do not apparently become carriers and could be used for breeders. The incubation period is 10 to 14 days and recovery usually requires 3 to 8 weeks. Recovered birds are immune to re-infection for a long period of time. Vaccination with fowl pox and pigeon pox vaccines which are currently available for poultry are not effective in psittacines.

#### **Psittacine Parrot Disease**

Psittacine parrot disease (PPD) is a very contagious disease causing high mortality in *Pionus*. PPD is caused by a herpes virus which occurs naturally in Central America. The incubation period is 5 to 14 days and death usually occurs with little or no sign of illness observed. Death is due to rapid and severe liver damage. In some cases, a brilliant yellow to green diarrhoea and vomiting may be observed. Neurological signs may be observed terminally. Conures such as the Patagonian conure and Nanday conure are known to be carriers and other carrier species are suspected. *Pionus* have not been implicated as carrier species and they seldom survive exposure. Avoidance of carrier species and proper quarantine of new birds are the only practical control methods. Vaccines are currently available.

#### **Psittacosis-Ornithosis**

Psittacosis occurs commonly among psittacine birds but is not only a disease of parrots. Many species of birds, mammals and man can be infected. Psittacosis can be transmitted from bird to bird or from a bird to man, but transmission from man to bird or man to man is not likely. The causative agent is *Chlamydia psittaci*, an organism sharing the properties of both viruses and bacteria. While quarantine regulations in many countries require the treatment of all imported birds, control of psittacosis is still a problem. Treatment of birds for forty-five days with tetracycline may be effective in eliminating

most infections; however, the birds do not develop immunity to the organism and are immediately susceptible to re-infection after cessation of treatment. Despite a wealth of scientific research, the disease is still poorly understood. We do know that many healthy birds can be carriers of chlamydia. When these birds become stressed or ill, the infection may gain a foothold and cause disease.

The bird which is sick with psittacosis will show a variety of clinical signs. The most common, however, are a bright yellow-green diarrhoea, rapid weight loss, depression, nasal discharge, and red watery eyes. Psittacosis is particularly a problem in Central America and white-capped *Pionus* are most commonly affected; however, all species are susceptible.

Diagnostic methods for psittacosis are also confusing. Culture of the organism requires inoculation into eggs. Approximately 14 days are required for the completion of the test. While a positive test confirms infection, a negative test does not prove that the bird is not infected. It may only mean that the bird was not shedding the organism at the time that the specimen was collected or that the specimen may have been mishandled. A blood test is also advisable but also has some drawbacks. This test will often be negative in the early stages of the disease as several weeks are needed for the bird to mount an immune response that can be measured. Two tests, approximately two weeks apart, showing an increase in titre on the second test are required to confirm active infection. A measurable titre will remain for an extended time after the bird has been treated and cleared resulting in false positives.

Routine treatment of all birds entering a collection might be considered but it is not without detrimental effects and cannot be considered foolproof. Long-term feeding of tetracycline can disrupt normal bacterial flora of the gut and allow the pathogenic bacteria and fungi such as *Candida*. Pelleted foods containing the proper levels of chlortetracycline are available in the United States and are usually well accepted by *Pionus*.

The aviculturist should consider the possibility of psittacosis when dealing with a sick bird and be cautious of the public health significance. All sick birds should be isolated from both other birds and excessive contact with people. Old, young, or weak persons are at a higher risk.

#### **BACTERIAL DISEASES**

Hopefully in the closed breeding collection, or in pet birds, proper quarantine and management practices will prevent the entrance of serious viral diseases into captive *Pionus*. The danger of bacterial



infections, however, is always present. Bacterial diseases are generally less contagious and can be treated if the proper antibiotic is administered as required. Most bacterial infections, however, do not confer immunity and the organisms are present in the environment allowing repeated infections.

#### **Salmonellosis**

**Salmonella** infections are the most serious bacterial infections of psittacines and result in high mortality and a high incidence of carriers. While the acute stage of the disease can be treated with antibiotics, this practice often results in asymptomatic carriers. These carriers will often become septicemic following a stressful event and die acutely. Screening of new birds by faecal culture may be helpful if the bird is shedding; however, shedding is intermittent and may occur only during times of illness. Any bird which is found to be infected should not be added to a breeding collection due to the danger of spread. If the bird in question is a valuable breeding bird, the pair should be held in permanent isolation and eggs should be artificially incubated and the babies hand raised. While transmission of **Salmonella** is well known in chickens, this has not been reported in psittacine birds.

**Salmonella** is not considered to be a common problem in Pionus. It is, however, a common problem in birds from Guyana and Surinam. Blue head Pionus from this area should be looked upon with suspicion. Three negative cultures during the quarantine period should relieve some apprehension.

#### **E.coli and Related Coliform Bacteria**

A point of much controversy is the normal flora of psittacine birds. It is commonly believed that the flora should consist only of Gram-positive bacteria such as **Bacillus**, **Lactobacillus**, **Staphylococcus** and **Streptococcus**. Gram-negative bacteria are considered to be abnormal in seed-eating birds; however, healthy birds are continually being found to carry various species of Gram-negative bacteria, especially in the group known as coliforms. These bacteria, **E. coli** most notably, are normal in the gut of mammals. They are, however, capable of causing death and disease when a carrier bird becomes stressed, or if the bacteria make their way into the blood stream, respiratory system, reproductive system, or are found in very large numbers in the gut.

Culture and antibiotic susceptibility testing are mandatory for the proper treatment of these infections. An experienced clinician's judgement is also necessary in order to determine if these bacteria are the cause of disease or merely a secondary infection. Coliforms are opportunistic and will take advantage

of a compromised bird. While they may not always be the primary cause of disease, they are very often the ultimate cause of the demise of a bird. In Pionus coliform infections are very common, especially in the gut and respiratory system.

#### **Pseudomonas and Proteus**

**Pseudomonas** and **Proteus** infections may occur in a variety of organ systems including the upper and lower respiratory system, eyes, and digestive system. In most cases, these are due to poor hygiene and environmental contamination. **Pseudomonas** is a common contaminant of sour foods. While large numbers can easily be fended off by the healthy bird, infections secondary to other illnesses are a threat. Culture and antibiotic susceptibility testing is imperative for proper therapy, especially in the case of **Pseudomonas** which is resistant to most of the commonly available antibiotics.

#### **Sinusitis**

Colds, sinusitis, or chronic respiratory disease, are common afflictions of Pionus. The underlying cause of this syndrome is unknown, but it is probably a complex of diseases. It can be highly infectious or can linger as a chronic infection without much spread to other birds. Several organisms have been suspected as the initial cause of sinusitis, most notably mycoplasmas. Confirmation of this infection, however, has been difficult. Respiratory viruses and **Haemophilus** may also be involved. Secondary infection with coliforms, **Proteus**, and **Pseudomonas** are common and complicate treatment. Some success may follow treatment for **Mycoplasma** in conjunction with treatment for secondary bacterial invaders as determined by culture and sensitivity testing. It is very important to initiate appropriate treatment early in the disease rather than trying several home remedies while the disease becomes chronic and refractory to treatment. Vitamin A should be supplemented at a rate of 10,000 units per bird per week. If no response is noted within a few days, then professional assistance should be obtained. Untreated cases may result in abscess formation in the sinuses, pneumonia and air sac infections.

### **FUNGAL DISEASES**

#### **Aspergillosis**

**Aspergillus** is a fungus which is highly prevalent in the environment, especially in moist dirty areas. The fruiting heads of **Aspergillus** colonies release large numbers of spores which become airborne. When inhaled in large enough numbers by a susceptible bird, they can grow in the lungs and airsacs. Pionus are particularly susceptible to **Aspergillosis**, espec



after they have recovered from pox. Plum crown fungus are especially susceptible to **Aspergillosis** and this disease appears to be the most common cause of death in plum crowns. Movement of plum crowns from their high mountain home to areas which are very warm and moist is probably an important factor in the disease. In addition, their desire to pick around old food on the floor of their cage may also be contributory. Plum crowns should be excluded from warm weather collections and housed in elevated cages which will allow food to fall through out of their reach.

**Aspergillosis** is a difficult disease to diagnose and treat. Cultures and X-rays are helpful in confirming a suspected case. A positive culture does not always mean the bird is sick with **Aspergillosis**. In many pittacine species, 5-fluorocytosine in combination with amphotericin-B has proved to be helpful in treatment. In Pionus, however, treatment has not proven to be highly successful. In order to respond to treatment, the bird has to be able to mount an immune response and this appears to be difficult for any of the compromised Pionus. The disease is not contagious and is unlikely to spread through a flock.

#### **Candidiasis**

**Candida**, a yeast, commonly infects the mucous membranes of the mouth, crop and intestinal tract of Pionus. It occurs commonly in hand-fed babies in which lesions may be absent in the mouth but cause gut infections with no obvious lesions. It may be easily diagnosed by examination of a stained smear of the faeces of the bird. In adult Pionus, it is a common secondary invader following antibiotic therapy or may be associated with sour food or Vitamin A deficiency. Most cases respond to oral nystatin preparations which are commonly used to treat thrush in human babies. More severe infections may require treatment with more powerful antifungal drugs or chemicals.

The possibilities of **Candidiasis**, in conjunction with bacterial infections, should always be considered in any digestive disorder of baby Pionus. Slow clearing of the crop may be the first sign and if the condition is not promptly treated, it could result in sour crop, crop binding and death. While low numbers of **Candida** are a normal finding in the gut, they can proliferate in the face of antibiotics, stress, or other diseases. Any baby bird which is treated with antibiotics should have received nystatin for the duration of antibiotic therapy and for several days after cessation of therapy. In a very small bird, a few drops are placed in the beak following each feeding for 1 to 2 weeks. Nystatin is very safe, acts on

contact with the yeast and is not absorbed from the gut.

## **MISCELLANEOUS DISEASES**

### **Punctate Keratitis**

This eye disease, of unknown aetiology, is found in white capped Pionus which are imported from Central America with Amazons. It causes a temporary disruption of the surface of the cornea of the eye resulting in blinking and watering. In most cases it will subside without treatment; however, a low percentage of the birds will develop a sinusitis in conjunction with the eye lesions. For complete recovery, these birds require antibiotic treatment to minimize the invasion of secondary bacteria. The disease is probably caused by a virus.

### **Tracheitis**

A severe tracheitis of suspected viral origin has been observed in white capped Pionus imported from Central America with Amazons. It is suspected that it is caused by a herpes virus. The disease is associated with high mortality and a prolonged course. Death is usually due to pneumonia and caseous plugs which form in the primary bronchi. No treatment is available and the prognosis is very poor.

## **PARASITIC DISEASES**

### **External Parasites**

Lice and mites may occur on newly imported or captive Pionus. In most cases, dusting with a mild carbamate dust (5% sevin dust), as used in gardens, is effective in eliminating these parasites. In some cases, especially with lice, pyrethrum sprays may be required. Care must be taken to spray the bird thoroughly under the wing, in the armpit area, as this is a favourite hiding place for lice. Red mites may be particularly troublesome and live off the host in cracks and crevices in the cage or aviary. They only come out at night to feed on the bird. In this case, the entire aviary must be cleaned and painted with a mild insecticide. Hanging pest strips are also effective in eliminating the mites from the environment. **Cnemidocoptes**, the scaly leg mite of budgerigars, is very rare in Pionus.

### **Internal Parasites**

The most common parasite of Pionus is the ascarid or roundworm. They are most prevalent when Pionus are housed so that they have access to the floor, such as in aviaries. The life cycle is simple and direct and requires ingestion of the infective eggs. These eggs mature in the gut to adult, egg-laying worms in about two weeks. The eggs are quite resistant to environmental conditions and steam or flame is required in most instances to remove them from environmental surfaces such as concrete. Wooden



surfaces cannot be cleaned sufficiently to eliminate roundworm eggs. If birds are housed in elevated cages so that foods and faeces can fall through, there is much less chance of reinfestation. Diagnosis of infection by faecal flotation test is simple. Ascarids in psittacines are usually resistant to piperazine parasiticides commonly used in poultry but respond nicely to levamisole. Heavy infections can cause a bird to be unthrifty. In very heavy infections, the bird can die as a result of intestinal obstruction.

Tapeworms are infrequent in Pionus and in most cases are not detrimental. Rather than passing eggs as ascarids do, tapeworm eggs are shed in packets called proglotids. As the tapeworm matures, the proglotids on the end of the worm break off and are passed in the faeces. They are seldom seen in faecal flotation or direct faecal examination tests. The life cycle is indirect and usually requires ingestion of the packet by an insect, which is in turn ingested by the Pionus. Diagnosis is usually made by observation of the proglotids, which will appear as grains of rice, in the faeces. They are easily treated with niclosamide.

Capillary worms (*Capillaria* sp.) are not common in Pionus but they may easily pick up the infection if placed in an infected aviary. The life cycle is direct as in the ascarid and the eggs are very resistant to environmental conditions. In an infected aviary, the only control measure is often to put the bird on wire floors to restrict access to the floor. Heavy infestations can result in death. *Capillaria* usually respond to treatment with levamisole.

Blood parasites are uncommon in Pionus; however, they are sometimes infected with filarial worms and will have microfilaria in the blood. These parasites are considered to be non-pathogenic and don't warrant treatment.

#### **VITAMIN A DEFICIENCY**

Pionus require relatively high levels of Vitamin A. Signs of Vitamin A deficiency include white lesions in the mouth, clear nasal discharge, watery eyes and in severe cases abscesses in the mouth. Vitamin A deficiency may contribute to the development of respiratory, digestive and ocular diseases. Initial therapy should be by injection as absorption from the gut may be poor in deficient birds. Long-term supplementation may be required to replace stores in the liver. A source of Vitamin A should be available daily, especially in breeding birds. Fresh yellow and green vegetables are a rich source of Vitamin A.

#### **EGG BINDING**

Egg binding is a complex physiological process involving calcium metabolism and muscle tone in the oviduct. During the time that the shell is being

applied to the developing egg, the blood calcium levels are greatly increased and calcium is drawn from the bones. If adequate calcium is not available the eggs will often be misshapen or rough. The combination of these factors may result in an egg which is incapable of passing easily through the oviduct and cloaca. This most commonly occurs at the end of a heavy laying season, or in times of cold weather.

Eggs which are bound in the oviduct may be difficult to observe and may go undetected for quite a period of time. These eggs are not life-threatening but may cause irreparable damage to the oviduct rendering the bird infertile. Eggs which are bound in the cloaca are life-threatening due to the blockage of excretory function of both the colon and the ureters. In most cases of early egg binding, an injection of calcium and Vitamin D3 along with placing the bird in a hot moist brooder will be effective in relieving the binding. The brooder should be approximately 85°F and the floor should be covered with moist towelling. If the egg is not expelled within 24 hours, lubrication should be placed around the egg in the cloaca and the egg can be removed by gentle manipulation. In many cases more than one egg is present and the bird should be X-rayed. If this is unsuccessful, the surgical intervention will be required. Handling should be minimized in order to prevent exhaustion. Adequate provision for calcium in the diet and the prevention of nesting in very cold weather will minimize the incidence of egg binding.

#### **BEHAVIOURAL PROBLEMS**

Egg eating by adults may also be related to inadequate calcium intake initially, but eventually becomes a vice which is very difficult to deal with. Removal of the eggs and replacement with plastic eggs may be helpful in discouraging egg eating.

Pionus are placid creatures by nature and rarely fight; however, some individuals develop the annoying habit of chewing the toes and tail of cage mates. This is especially a problem when adult birds are housed with immature birds. Aggressive birds must be separated from the flock. In most cases, the behaviour will not be continued when these birds are placed in breeding pairs.

#### **SEXING**

Since no Pionus are dimorphic, accurate sexing techniques are essential to a successful breeding programme. Surgical sexing by laparoscopy is very safe and accurate in the hands of an experienced avian veterinarian. For maximum safety and minimum stress, the bird should be anaesthetized. A small incision in the left flank behind the last rib





*Insertion of the laparoscope*

allows insertion of the laparoscope into the airsacs.

The gonad, as well as many other abdominal and thoracic organs, can be directly viewed, allowing not only an accurate determination of sex, but also an assessment of health. The gonads are sufficiently differentiated at a young age to allow safe sexing just prior to or following weaning. In some birds, the testis is larger at weaning than at 5 to 8 months of age.

### **OBESITY**

Due to the sedentary nature of some Pionus species, they have a tendency to become overweight. This condition is not only unhealthy but is also detrimental to breeding. A diet high in vegetables and low in sunflower, or without sunflower, may be required in very fat birds.

### **HOME CARE OF ILL BIRDS**

Due to the rising costs of veterinary care, many bird owners may elect to treat their birds at home in lieu of prolonged hospitalization. Many veterinarians are happy to instruct their clients in home care. In this way, the client will also be more willing to invest his money in diagnostic procedures. This does not negate the need for veterinary care to diagnose the

disease, initiate treatment, and hospitalize the patient until stabilized. Owners can be instructed in proper methods of drug administration, whether by injection or orally and in gavage or forced feeding by placing a tube into the crop. The aviculturist should ask his vet about the possibility of home treatment and for a demonstration of these techniques.

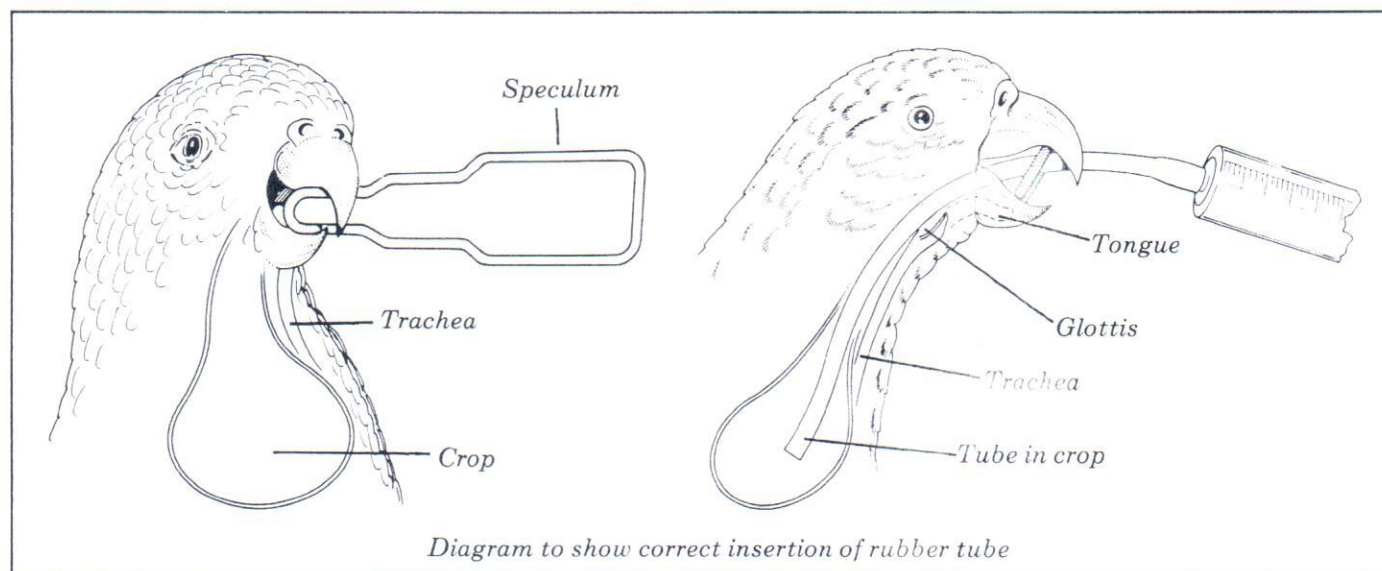
Gavage or tube feeding is a very safe practice, but care must always be taken. Pionus tend to eat poorly when ill and energy requirements of ill birds are increased. Tube feeding is a very necessary adjunct to therapy in any serious illness. A large tube should be used to allow quick delivery of food or medications. A 16 French gauge soft rubber feeding tube is suitable for Pionus and is very difficult to accidentally place into the trachea. The tube should be passed into the left corner of the bird's mouth and over the tongue directing it slightly to the bird's right as the oesophagus passes down the bird's right side. The mouth can be held open by use of a metal speculum or similar device. A metal feeding tube can be substituted for the rubber tube. A bird's neck may be stretched to straighten the oesophagus in order to pass the tube. Most Pionus can easily hold 10 to 15ml of food and babies can hold even more. Dietary requirements may vary with different diseases, but in most cases any formula which is suitable for hand feeding young Pionus will be well suited to feeding ill birds.

Baby Pionus often refuse to be fed around the age of weaning. Feeding by tube may be required until they are eating adequately. They can often be taught to gulp the tube voluntarily and may readily accept formula in this way.

### **NECROPSY**

In the case of death, prompt action should be taken to ensure the most meaningful necropsy (autopsy) results. The veterinarian should be consulted as to how the body should be stored and transported. In case the veterinarian cannot be reached, the birds should be moistened, put in double plastic bags, and placed in the refrigerator. The object is to cool the body as quickly as possible to prevent breakdown of tissues and migration of bacteria from one organ to another. The bird should be frozen only in the event that it will be more than two days before the bird can be examined. Freezing will make culture of bacteria and examination of microscopic tissue samples difficult and in most cases unrewarding. While in many cases expensive, a thorough necropsy with cultures and microscopic examination of tissues may reveal a problem before it is able to spread through a valuable collection.





#### ADDITIONAL INFORMATION

##### Diseases of Cage and Aviary Birds,

Margaret L. Petrak,  
Second Edition, Lea & Febiger, Philadelphia, PA,  
U.S.A. 1982

##### Bird Diseases,

L. Arnall and I.F. Keymar,  
TFH Publications,  
Neptune City, NJ, U.S.A.;  
Bailliere Tindall, London, England. 1975

##### Association of Avian Veterinarians,

P.O. Box 229  
East Northport,  
NY 11731, U.S.A.

#### GUIDE TO RING SIZES

	size	mm
Plum-crowned	R	7.04
Bronze-winged	S	7.52
Blue-headed	S	7.52
Scaly-headed	S	7.52
Dusky	R	7.04
White-capped	S	7.52
Coral-billed	S	7.52
White-headed	R	7.04

#### Note

When numbers or letters are inscribed on the rings it slightly increases their diameter.

#### Supplier of rings

A.C. Hughes  
1 High Street  
Hampton Hill  
Middlesex TW12 1NA  
England

	Wet Bulb readings		Relative humidity
	°C	°F	%
Incubator Temperature 98.5°F 36.9°C	25.5	78	39
	26.6	80	44
	27.7	82	48
	28.8	84	53
	30.0	86	59
	31.1	88	65
	32.2	90	72
	33.3	92	78
	34.4	94	84

The above relative humidity figures were obtained with the aid of a Psychrometric chart.

A whirling Hygrometer and relevant tables can also be used.