Pododermatitis is often defined as inflammation of the skin of the foot. However, several dictionaries actually use the term related to only inflammation of the dermal tissue underlying the horny layers of the hoof and generally are referring to diseases most often seen in cattle. If one uses the broader definition often applied to dogs then any foot (paw) epidermal or dermal tissue that is inflamed would be a form of pododermatitis. This would include interdigital spaces, footpads, nail folds (paronychia), and claws. The diseases that may affect any of these structures would include most of the diseases that affect dog skin, which results in an extremely long and not very helpful differential diagnosis. Therefore another approach is to separate the disorders based on more specific anatomic regions as well as to those diseases that may affect the paws along with other body areas from those diseases that are limited to the paws. Even in this context there are diseases that tend to affect only one paw or even one digit versus diseases that typically affect all or at least most paws and digits. When one narrows the presenting features based on this approach then the differential diagnosis is much more limited.

The author uses definitions based on these more specific anatomic sites and therefore different differentials. Paronychia is those diseases that are limited to the skin of the claw folds of the digits. Any involvements of the claw are superficial and from deposition of exudate or debris from the claw fold accumulating or contacting the adjacent claw. Pad diseases are those that affect the pads, which are located on the palmer/plantar surface of each digit, and under the metacarpal- and metatarsal-phalangeal joints, and the carpus of dogs and cats. The skin of the pad is non-haired, thickened, tough, and rough surfaced. It is most often hyperpigmented and the hypodermis contains large amounts of adipose tissue, as most pads are weight-bearing surfaces. Claw diseases are those that result in changes in the claws and can include the dermal or deep structures of P3. That leaves the rest of the digital and interdigital hair skin, as the last anatomic region of the paw which when inflamed is what this author defines as pododermatitis. We can then take this one more level and that is disorders that affect the hair follicles of the interdigital haired skin, podofolliculodermatitis.

Chronic interdigital pododermatitis has been described for years. Though it is often idiopathic it has been proposed that friction, scarring and trauma may predispose or cause follicular damage and lead to infection and inflammation. Podofolliculitis is one form of pododermatitis, which is defined as follicular disease (most often hyperkeratosis) with perifolliculitis and or folliculitis or furunculosis. These cases may involve one or multiple paws. Once there is follicular involvement in multi paw symmetrical disease then the most common differentials are secondary bacterial podofolliculitis, demodex and follicular hyperkeratosis and furuncular granulomatosis.

Pododemodicosis is most common in young dogs with generalized demodicetic mange. Occasionally cases are seen that following resolution of generalized demodex will have persistent pododemodicosis or podofolliculitis and sterile furuncular granulomatosis. These cases are generally very apparent with the history of generalized demodex prior to the pododemodicosis. Rarely a case of adult onset demodicosis or iatrogenic demodicosis from long term immune suppressive therapy will present with lesions confined to the paws. It is important to look close as perioral disease is often seen with the pododemodicosis in these cases. Pododemodicosis is tentatively ruled out with properly performed skin scrapings and hair plucks. In rare cases demodex pododemodicosis will only be diagnosed with a skin biopsy. Treatment of pododemodicosis is systemic ivermectin 450-600ug/kg q 48-24 hours. Some difficult cases may respond better to ivermectin twice weekly combined with weekly or twice weekly amitraz paw soaks.

Bacterial podofolliculitis may be seen secondarily to most diseases that affect the paws, including demodex pododemodicosis. It also has been described as occurring as an idiopathic disease. Many cases likely described as idiopathic likely occur secondary to conformational disease. Two syndromes have been described that likely reflect the same or similar syndrome. Canine interdigital palmar and plantar comedones and follicular cysts (IPPCFe) was described as generally localized form of chronic pododermatitis.[1] This syndrome most often affected the 4th/5th interdigital space (26/36 lesions) or the 3rd/4th space (7/36 lesions) and mostly on the palmar and plantar comedones and follicular cysts (IPPCFc) was described as generally localized form of chronic pododermatitis.[1]

Conformational disease. Two syndromes have been described that likely reflect the same or similar syndrome. Canine interdigital demodicosis or iatrogenic demodicosis from long term immune suppressive therapy will present with lesions confined to the paws. It is important to look close as perioral disease is often seen with the pododemodicosis in these cases. Pododemodicosis is tentatively ruled out with properly performed skin scrapings and hair plucks. In rare cases demodex pododemodicosis will only be diagnosed with a skin biopsy. Treatment of pododemodicosis is systemic ivermectin 450-600ug/kg q 48-24 hours. Some difficult cases may respond better to ivermectin twice weekly combined with weekly or twice weekly amitraz paw soaks.

Another syndrome called immunomodulatory-responsive lymphocytic-plasmacytic pododermatitis (ImR-LPP) shares similar features though often is not localized to one or two interdigital spaces.[4-6] This syndrome has been associated with purebred dogs and the presence of *Staph pseudintermedius.*[6] Multiple authors have theorized that the lesions may be induced, at least in some cases or partially, by trauma from friction or haired skin being becoming weight bearing.[1, 7] There are some similarities between these lesions and callus formation in other regions where haired skin is exposed to chronic weight bearing trauma. This theory is certainly supported for the interdigital palmer planter comedones, which occur in the spaces that are most weight bearing in dogs.[1, 8] Cases are also seen that the onset of disease is associated with increases in weight, which is also supported by the average age of onset being middle-aged dogs. In some cases conformational abnormalities are obvious and may also be associated with the development of joint laxity and
“flat footedness”. In others it is possible to see the digital pads projecting anterior. What is also interesting some dogs and even affected dogs with some lesions may develop effective calluses or even modified pad tissue that does not result in perifolliculitis and granulomatous furunculosis. What determines the development of that response is unknown.

What complicates the diagnosis of these disorders is that they can occur secondary to other diseases that result in pododermatitis, pain and altered weight bearing. Even chronic infections lead to follicular hyperkeratosis therefore these syndromes can be associated with other diseases or occur with no predisposing condition other than conformational changes or apparently be truly idiopathic though this is very infrequent in the author experience. Another complicating factor is some dogs with deeply recessed folds in the palmar plantar skin will develop infections related to the fold dermatitis, often aggravated by concurrent allergic dermatitis. Diagnosis thus may be limited to the presence of interdigital palmar plantar comedone and follicular cysts and IrR-LPP or they may be associated with another disease in which case maybe the diagnosis of that name is not appropriate. However once present treating the primary disease will not resolve the pododermatitis. The primary causes that need to be ruled out are the potential causes for bacterial podofolliculitis, such as allergy, hormonal, parasitic, keratinization, metabolic and immune mediated disorders. Once all those are ruled out then it may be appropriate to diagnose IPPCFc or IrR-LPP if there is follicular disease and appropriate histopathology. Certainly a conformational component needs to be addressed as an underlying cause because when present medical therapy is rarely successful without long term anti-inflammatory therapy.[4, 9] Once conformational disease is diagnosed then the treatment of choice is surgical removal of the diseased tissue and creating non-haired weight bearing surfaces. Both syndromes may present with secondary infection but eliminating the infection does not result in complete resolution of the lesions. All drainage, fistulous tracts and pain may resolve with antibiotics leading some owners and even veterinarians to believe the lesions are healed, only to recur following the discontinuation of antibiotic therapy. Even successful removal of the diseased tissue has had recurrence if the dog ends up weight bearing on haired skin that is sutured into the defect. For localized lesions focal surgical excision or laser therapy may be successful. The key is to remove all foreign hair and epithelial debris and then allow the lesion to granulate in so there is no haired skin brought back into the weight bearing area. Cases with generalized pododermatitis may respond best to a complete podoplasty.[10, 11]

References