



Early Intervention: The Use of Nail Trimming to Treat Idiopathic Ulcerative Dermatitis Results in Improved Healing Rates of Mice

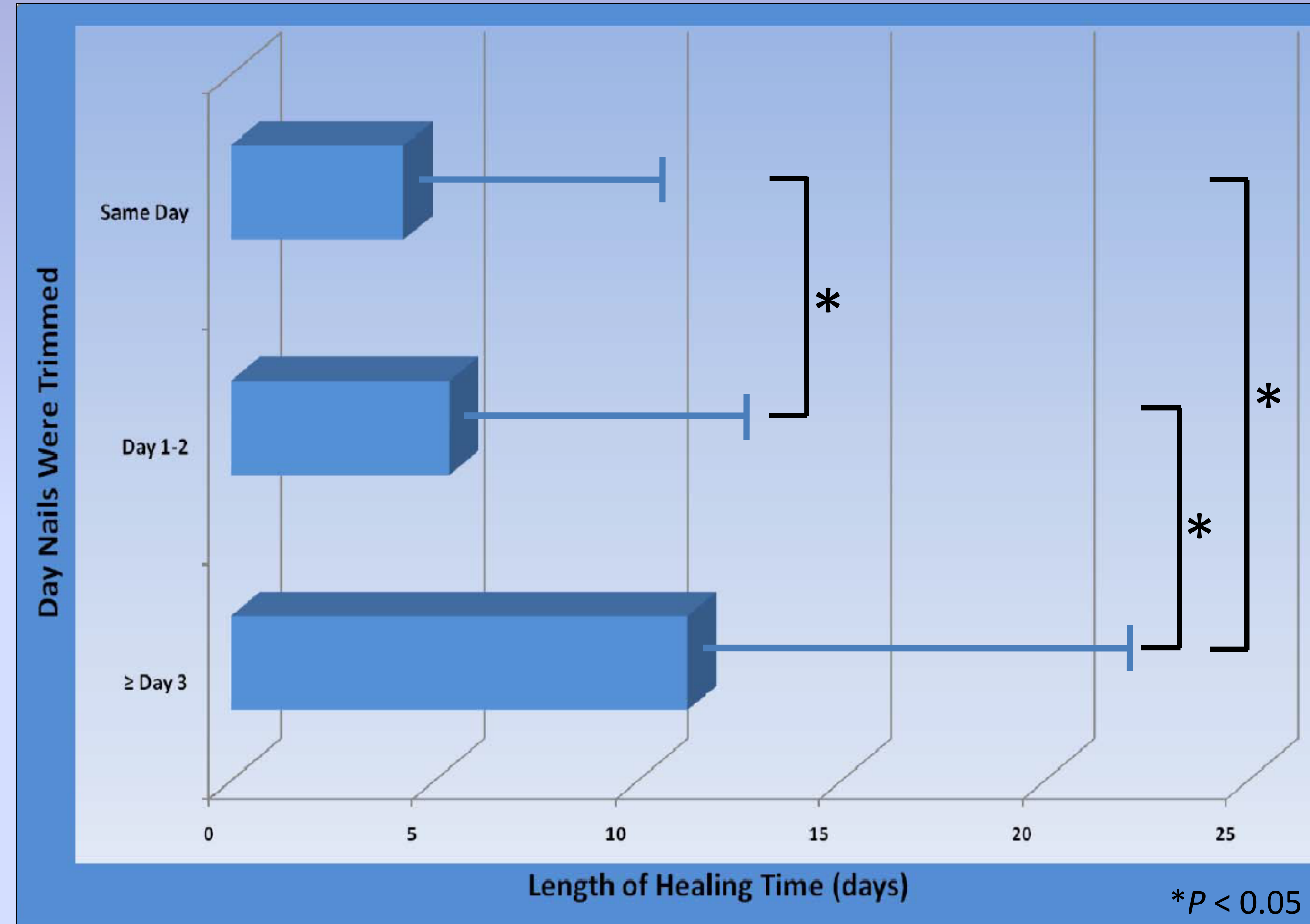
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BACKGROUND AND SIGNIFICANCE

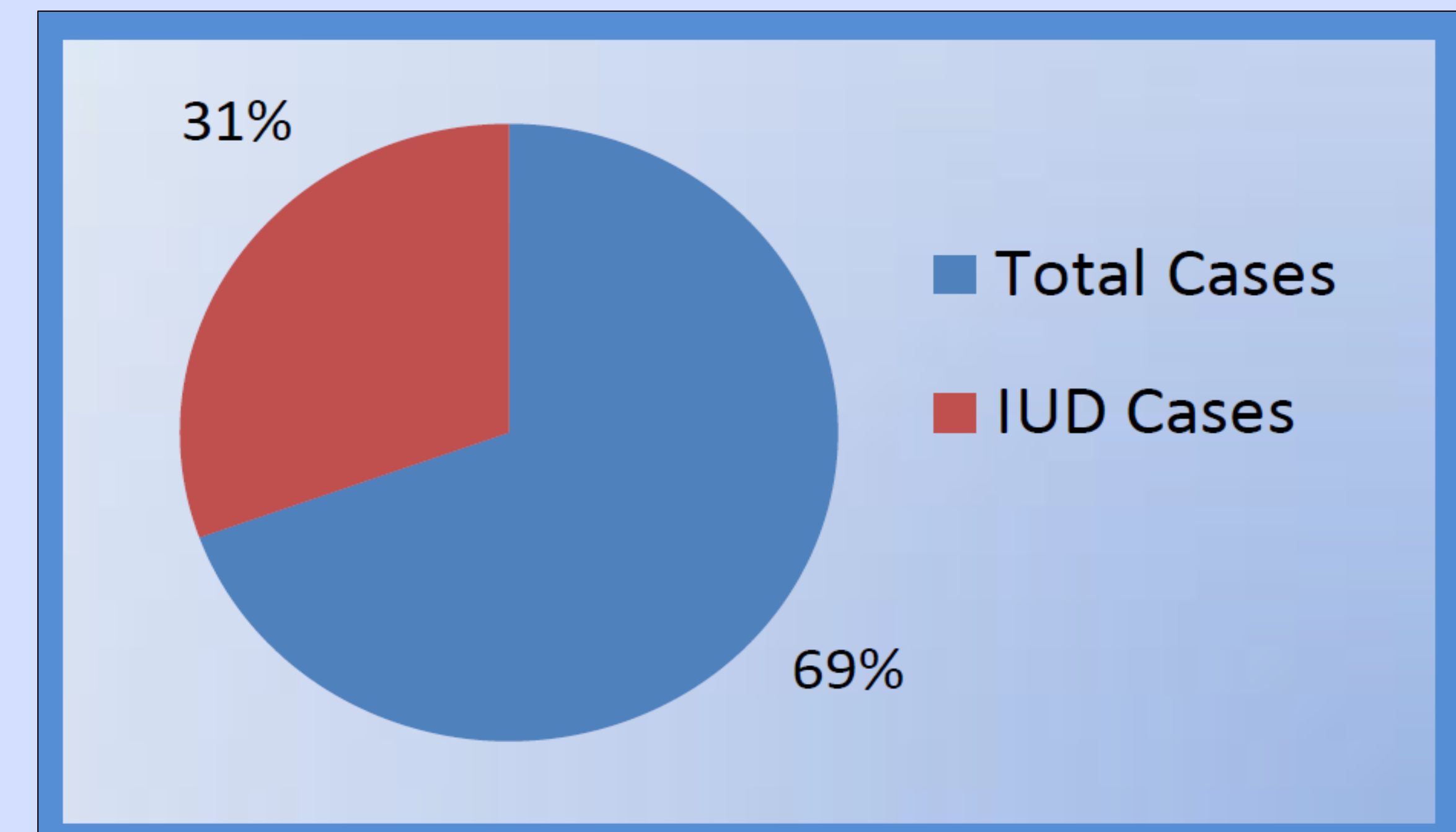
Idiopathic Ulcerative Dermatitis (IUD) is a common ailment affecting mice in the research setting. The most commonly affected strain is C57Bl/6 which is the most common background for transgenic mice. Due to its idiopathic nature, IUD treatment options are all palliative and have traditionally centered around topical treatments, anti-inflammatories, and antibiotics to prevent secondary infections. However, many of these treatments have the potential to confound research results and even when applied can still result in prolonged healing rates. Therefore, a non-pharmaceutical, easy to perform technique that can reduce healing time is necessary.

In 2007, the veterinary technicians at the University of Colorado Denver (UCD) began performing hind foot nail trims on mice with lesions due to IUD as the primary treatment option rather than the generally accepted standard of care for IUD. In 2009, a retrospective analysis was performed and found that trimming the nails decreases healing time and eliminated the need for other treatments for most cases of IUD.

As a result, animal husbandry staff were trained on performing initial nail trims immediately upon finding mice with IUD lesions, rather than waiting for a member of the veterinary staff to perform the task (average of 24 hours later). An Analysis comparing cases from 2012 to those in 2009 showed that the earlier that the nails were trimmed after discovery, the shorter the healing time.



Demonstration of trimming mouse nails



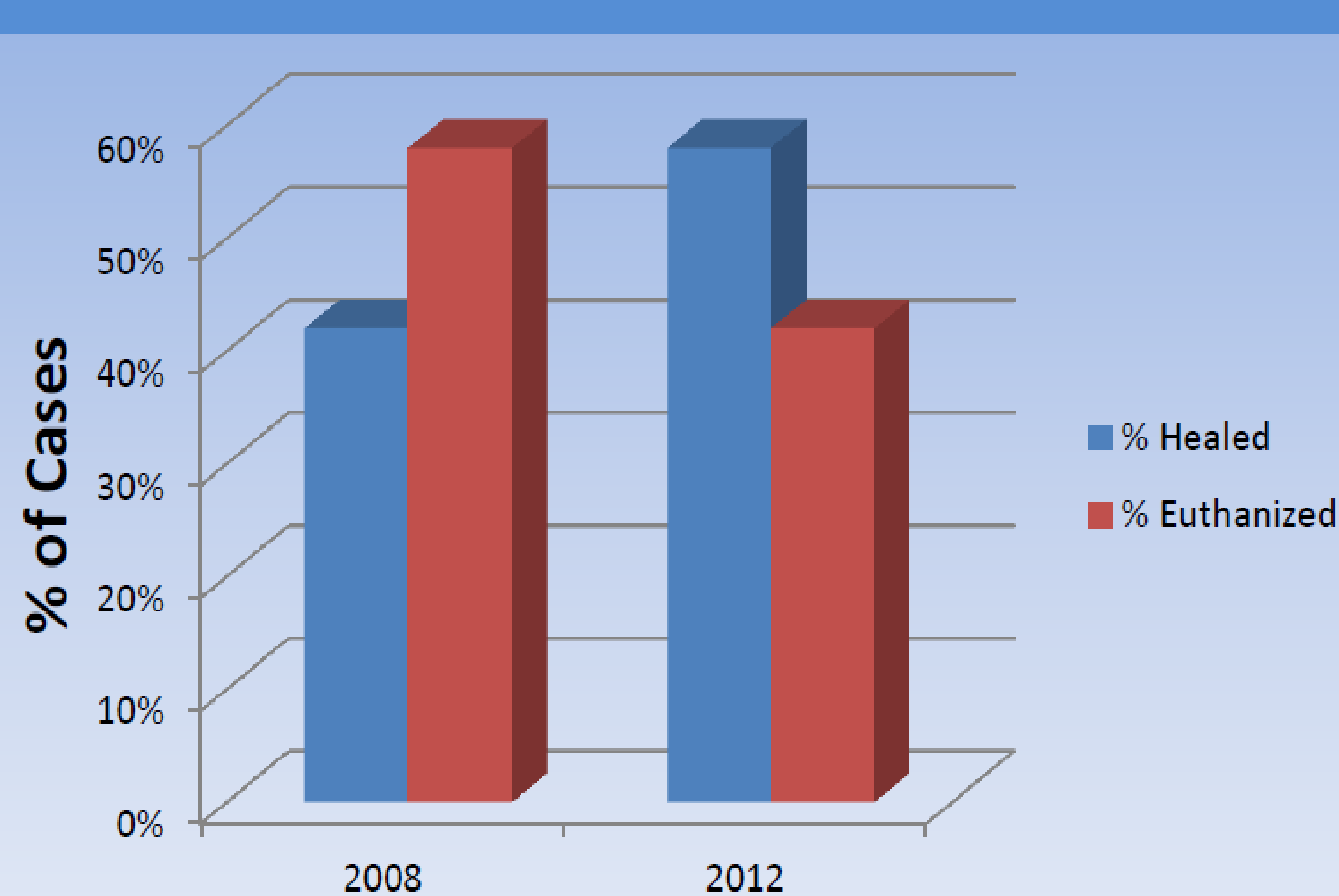
METHODS

- Train animal husbandry staff to clip the hind limb nails
- All instances of IUD are reported to the veterinary staff
- Analyze all instances of IUD for date found, date of first nail trim, and date indicated for healing
- Statistical Evaluation : A One Way Analysis of Variance (ANOVA) on Ranks was performed on the length of healing time of each group [nail trim same day, nail trim day 1-2, and nail trim ≥3 days]. A post-hoc pairwise multiple comparison procedure (Dunn's Method) was then performed to determine significance between groups.

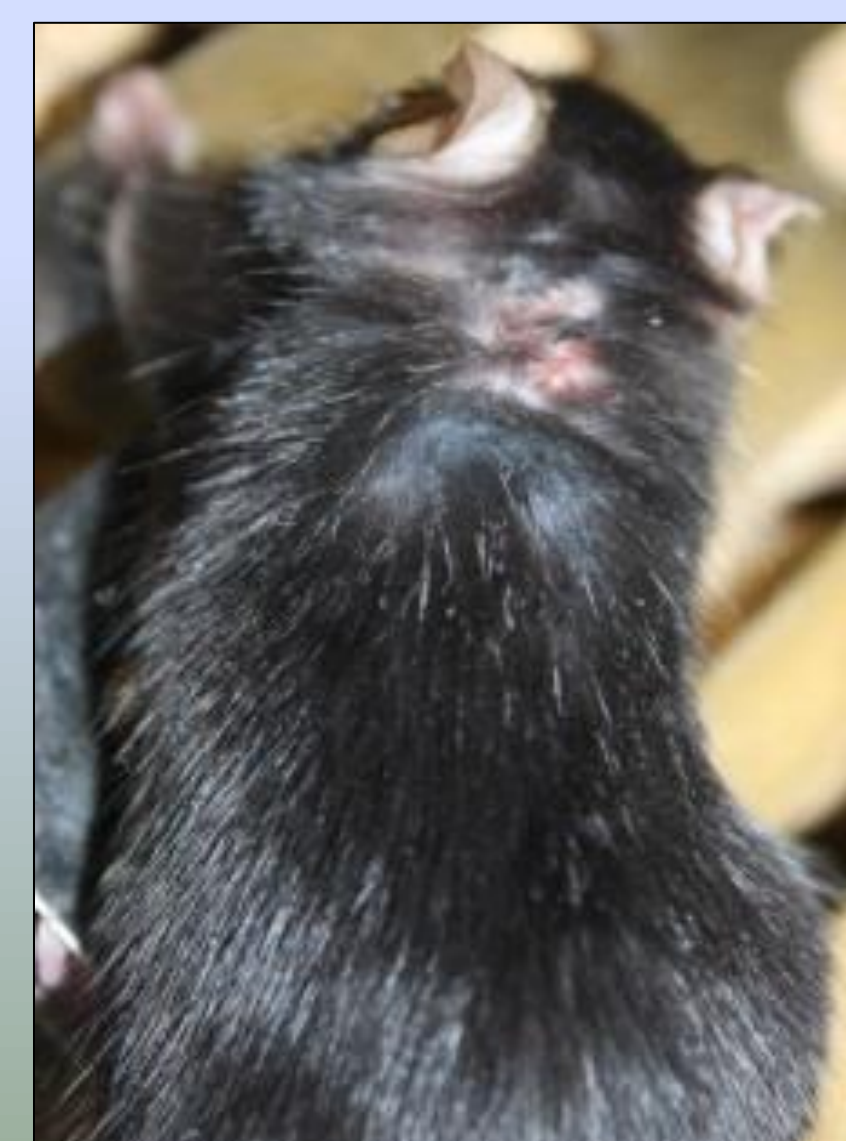
RESULTS AND CONCLUSIONS

In 2012, out of 2179 cases of sickness or injury reports in rats and mice, 31% of cases were IUD in mice. Out of 957 cases of lesions due to IUD in 2012, all mice got back-foot nail trims. 58% of those cases healed and the other 42% were euthanized. Trimming the nails of all mice with IUD has improved the percentage of cases that healed from 42% in 2008, to 58% in 2012. Trimming toe nails at the time of initial identification of skin lesions results in a significant reduction in healing time ($P < 0.05$) as compared to nails trimmed even 1-2 days after initial lesion identification.

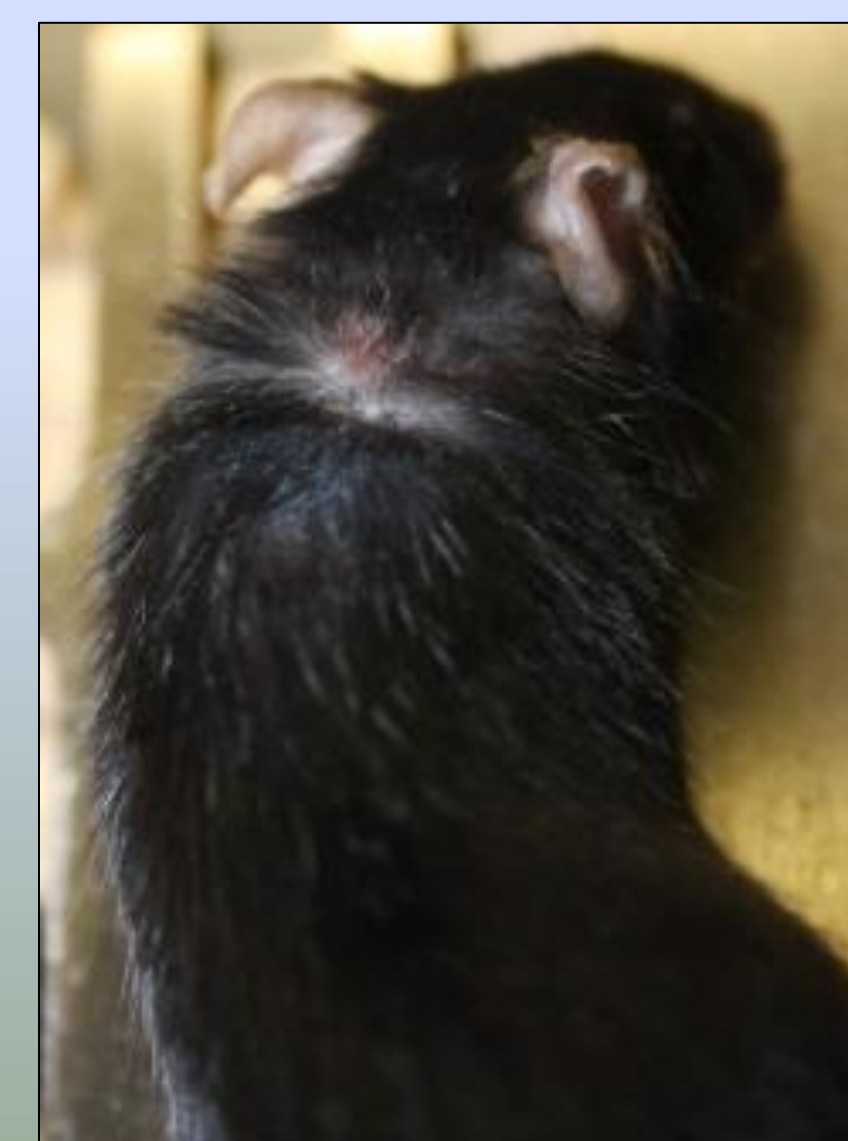
Based on these results, the veterinary staff at UCD recommends that all animal husbandry staff working with mice be trained in this simple, fast, and cost effective technique to significantly decrease the amount of time to healing. In addition, this method may decrease the need to use alternative drug therapy which could confound experimental results.



Day 0: Lesion Found & Nails Trimmed



Day 1: Lesion healing with no other treatment



Day 2: Lesion nearly healed



Early Intervention Using Nail Trimming to Treat Idiopathic Ulcerative Dermatitis Results in Improved Healing Rates of Mice Compared to Other Standard Practices

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In November of 2007, the veterinary technicians at the University of Colorado Denver began routinely performing hind foot nail trims on mice with lesions due to idiopathic ulcerative dermatitis (IUD). The previous standard of care at the University was similar to what is generally accepted in the Laboratory Animal Medicine field and included topical or injectable steroids, other ointments such as triple antibiotic or panalog, and/or washing of the skin with dilute betadine. Water with acepromazine and/or Clavamox were used as a last resort in order to provide a tranquilizing effect and also decrease secondary infections in an attempt to lower the impact of inflammation and the pruritus associated with such lesions.

In 2009, a retrospective analysis was performed and found that trimming the nails decreases healing time and eliminated the need for steroids, tranquilizers, and systemic antibiotics in most cases of IUD. Since the original presentation of this technique in 2009, animal husbandry staff have been trained on performing initial nail trims immediately upon finding mice with IUD lesions. Analysis done on cases in 2012 compared to those in 2009 shows that trimming the nails earlier in the disease process decreases healing time and the need for drug therapy compared to the practice in 2009 of waiting approximately 24 hours for a member of the veterinary staff to perform the task. Therefore, it is recommended that all husbandry staff are trained to perform hind limb nail trims upon discovery of IUD lesions in order to decrease duration and severity of lesions.