



# WBC Differential Counts in Little Brown Bats Treated for White-Nose Syndrome

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## Introduction

- White-nose syndrome is a deadly fungal disease, caused by *Pseudogymnoascus destructans*, that affects several bat species, especially those of the genus *Myotis*
- The little brown bat (*Myotis lucifugus*) was once common in Missouri, but is now considered a conservation concern due to deaths from white-nose syndrome
- Blood parameters have not been well characterized in bats, but may be useful in evaluating their health
- In many animals, white blood cell (WBC) differentials can indicate how the immune system is responding to an infection

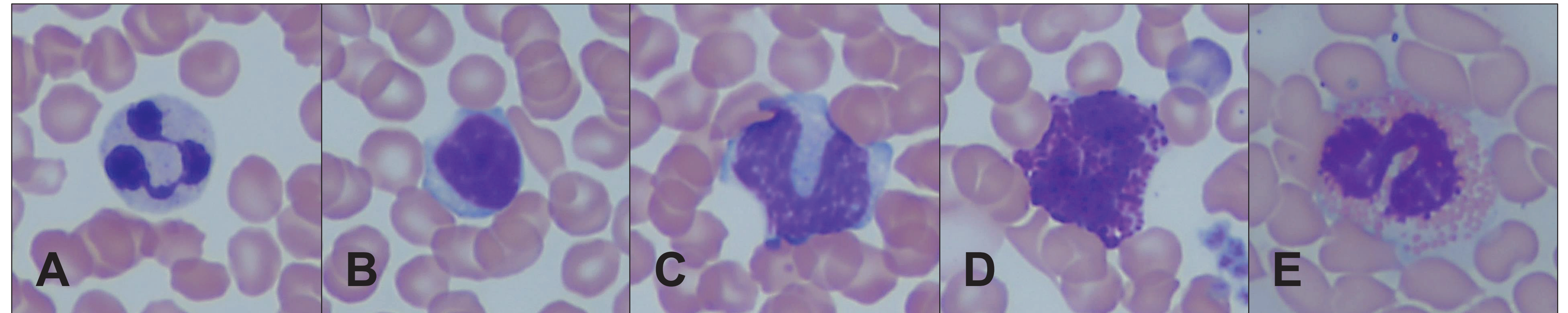


Figure 1. A little brown bat (*Myotis lucifugus*)

Figure 2. White blood cells of a little brown bat taken at 1000x magnification: (A) Neutrophil, (B) Lymphocyte, (C) Monocyte, (D) Basophil, (E) Eosinophil

## Questions

- Are there differences in the WBC differentials of little brown bats treated by different methods?
- What other factors might affect the WBC differentials found in little brown bats?
- Could this information be helpful in understanding and treating white-nose syndrome in the future?

## Methods

- WBC differential counts were performed on blood smears made from 40 little brown bats after being treated for white-nose syndrome
- Each bat had received one of three treatment types: volatile RRDAP, probiotic RRDAP, or euthermic conditions throughout winter
- Manual differential count was tested against IDEXX ProCyte Dx machine to confirm accuracy
- Each bat's sex, capture site, original infection level, type of treatment, weight, body condition, and wing score were also recorded
- Linear regression, ANOVA, and Spearman correlations were performed using Past 3.15 to determine which of the above variables may influence the WBC differentials found in each animal

## Results

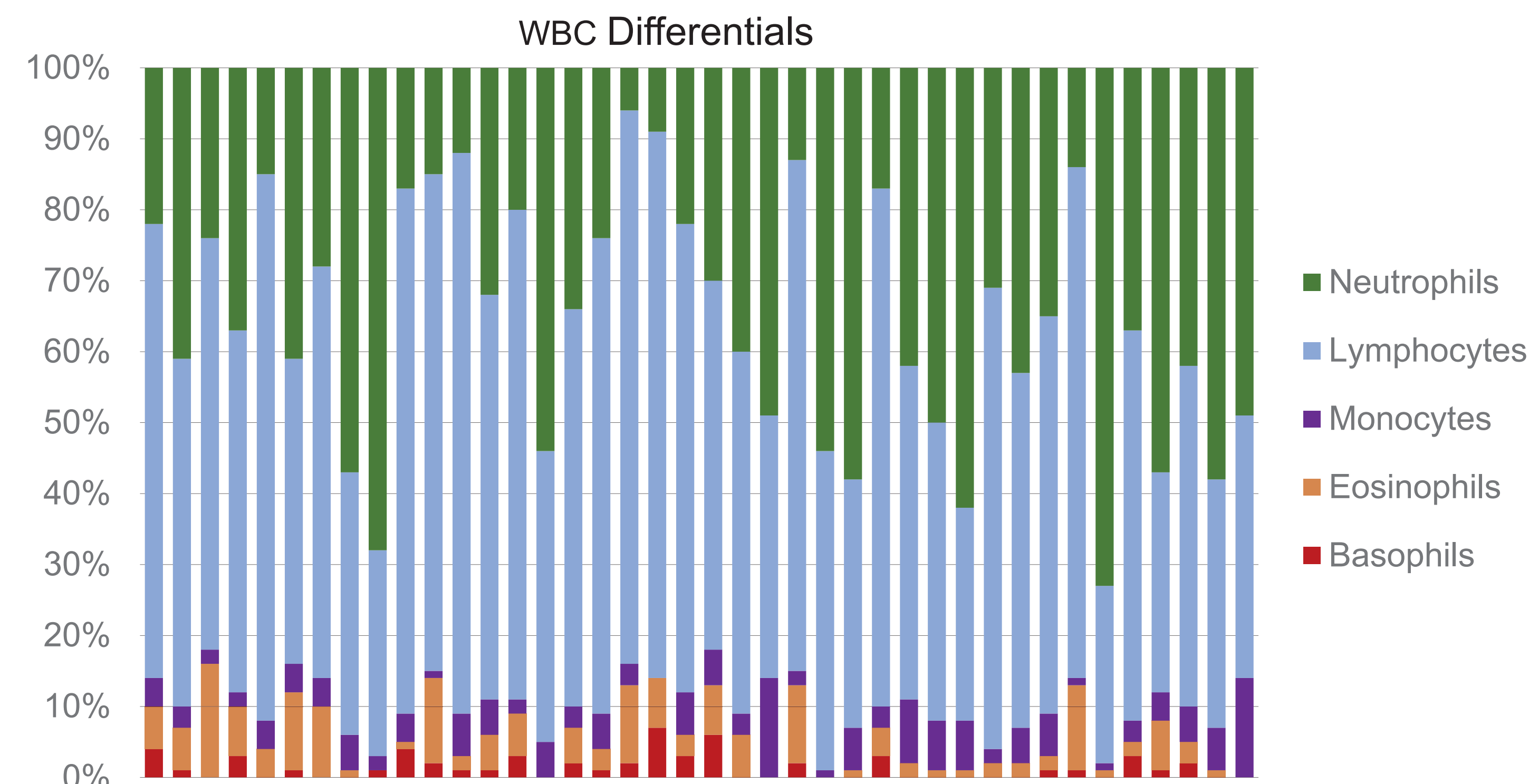


Figure 3. Bar chart of WBC differentials for 40 little brown bats

- Mean percentages for each cell:  
53.9% Lymphocytes  
35.8% Neutrophils  
4.5% Eosinophils  
4.3% Monocytes  
1.4% Basophils
- No significant differences in means found when bats were grouped by treatment type
- Increased body condition score showed significant correlation to decreased eosinophils, decreased lymphocytes, and increased neutrophils

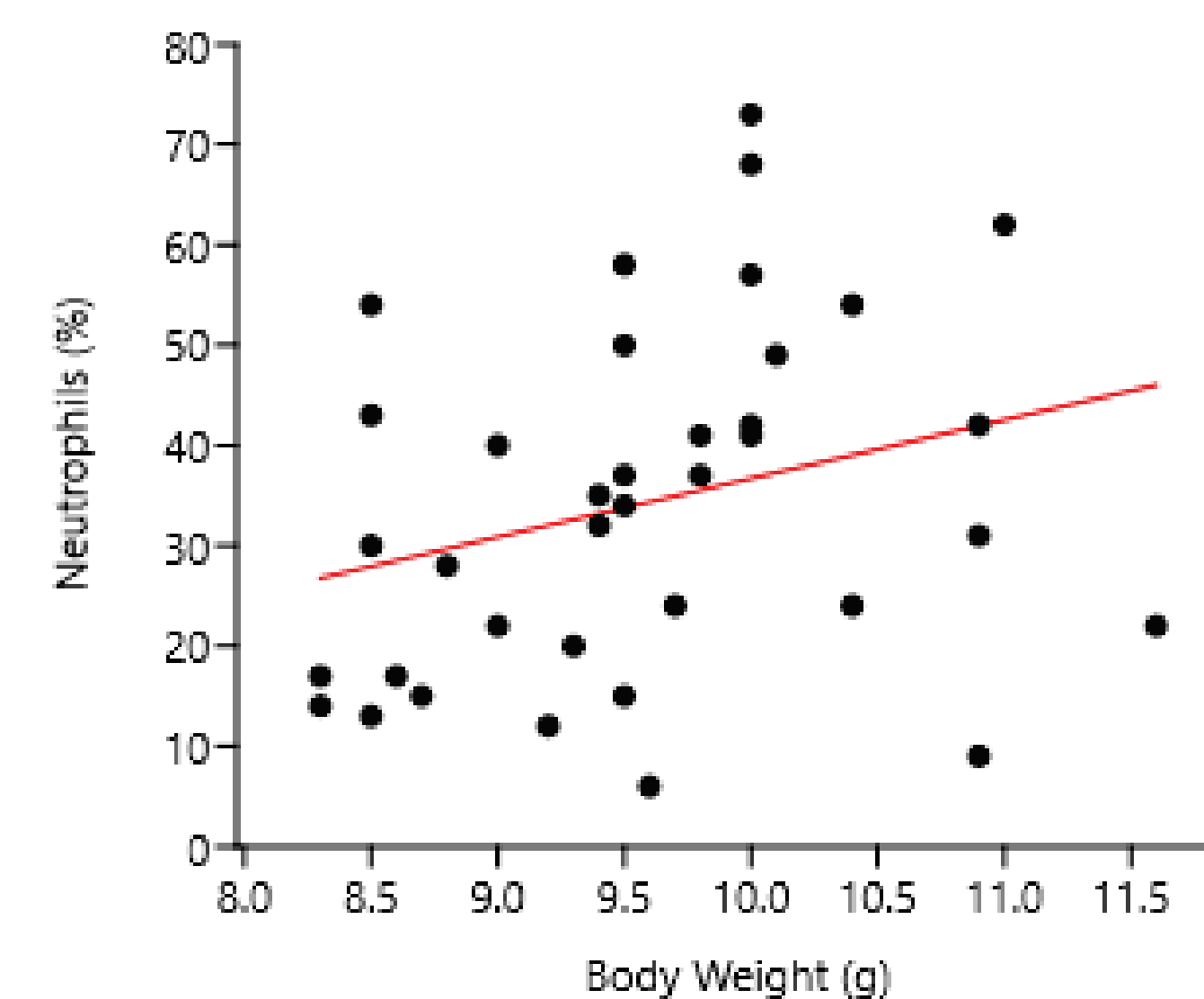


Figure 4. Linear regression for Neutrophil % based on body weight was not statistically significant

## Conclusions

- There was no difference in WBC differentials between treatment groups after recovery from white-nose syndrome
- Since treatment was successful on these bats, they are likely exhibiting normal WBC ratios
- Body condition may have an affect on WBC differentials in little brown bats
- These WBC differentials can be used as a baseline for little brown bats in future studies

## Future Directions

- Collect blood samples from bats that are currently showing signs of infection to compare to healthy bats
- Analyze other blood parameters using the IDEXX ProCyte Dx
- Explore the activation of WBCs as a treatment method for white-nose syndrome

## Acknowledgements

- We thank Charles Wiedmeyer for the use of his lab equipment and the C-Path lab technicians for their assistance in the lab