

**Significance and Background:** Infection is responsible for mortality and adverse health outcomes in hundreds of thousands of US stroke patients annually. Hospital associated infections are one of the leading post-stroke complications [1], predicting prolonged hospital stay and significant post-stroke disability [2]. In the past, post-stroke infections were explained as a result of neurological deficits such as impaired protective reflexes, dysphagia, or as treatment associated complications related to mechanical ventilation or indwelling urinary catheters. However, brain injury itself might result in an immunological-depressive status with possible infections subsequently occurring. In both animals and humans, previous studies suggested that the left (prefrontal) brain may critically support immunological function [3-4].

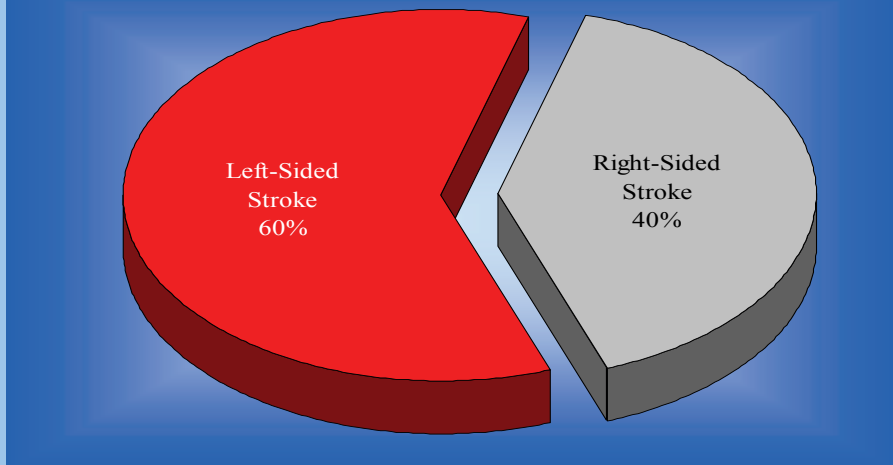
**Objective:** The present study expanded on prior research [5-6] by examining the relationship between stroke lateralization (right vs. left-sided stroke) and infection rates.

**Design/Methods:** A retrospective analysis was performed (January 2009 to July 2010) on electronic medical records from the Kessler Institute for Rehabilitation. All patients with a hospital associated infection (e.g., C-difficile, Vancomycin resistant enterococcus, Methicillin resistant staph aureus, Extended spectrum beta lactamase) that had a right or left-sided brain injury due to stroke were included. The prevalence of infection between right and left-sided stroke patients was compared with the chi-square statistic.

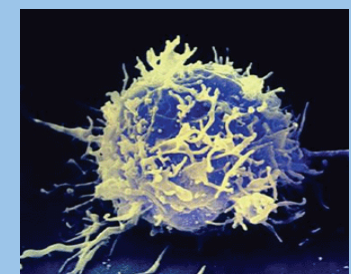
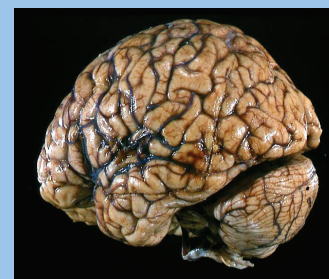
**Results:** Among the 103 stroke patients that were identified with infection during the study period, the prevalence of infection was significantly higher (see Figure 1) in stroke patients with left-sided (60%) relative to right-sided brain injury (40%),  $\chi^2(1) = 4.28, p < .05$ .

Differences in the prevalence of infection could not be attributed to age, gender, dysphagia, mechanical ventilation, indwelling urinary catheters, or stroke severity (FIM scores at admission) as these potential confounders were not statistically significant between the two groups (see Table 1).

Figure 1. Prevalence of Infection Among Stroke Patients with Left vs. Right-Sided Brain Injury



**Conclusion:** The findings from our study are consistent with the hypothesis that the brain may modulate the immune system through a left-dominant brain immune network (LD-BIN). Clinical implications relate to a greater identification of stroke patients that are at most risk for infection/illness—namely, those with left-sided brain lesions or left prefrontal hypofunction. Future research could examine whether the LD-BIN could be actively optimized to improve infection resistance and health outcomes in stroke patients via direct brain stimulation, or via cognitive techniques such as mental exercise [7].



## References

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Table 1: Demographic and Clinical Characteristics of Infected Stroke Patients

Variables	Left-Sided Brain Injury from Stroke	Right-Sided Brain Injury from Stroke	Significance (P) Value
# of Patients with Infection	62	41	.03*
% Male/Female	45%/55%	43%/57%	.86
% with Dysphagia	66%	54%	.20
% Infections Associated with Urinary Catheters and Mechanical Ventilation	11%	7%	.51
Age, years Mean (SD)	74.39	72.31	.43
Admission FIM Cognition, Mean (SD)	15.5	17.52	.23
Admission FIM Motor, Mean (SD)	21.95	21.59	.86
Length of Stay, days Mean (SD)	26.02	24.01	.54