An investigation into factors associated with survival and return to function of horses with synovial infections

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Introduction
Synovial infections (SI) are common in horses, and affected individuals can have high rates of morbidity and mortality. The aim of this study was to identify factors that influence survival and return to function for horses presented to the Veterinary Clinical Centre (VCC), Charles Sturt University with SI.

Materials and methods
Information on signalment, synovial structure(s) involved, history, results of diagnostic testing, treatment and outcome was collected retrospectively from medical records of all horses with SI that presented to the VCC between 1 April 2008 and 1 May 2017. Long term follow up was done using a combination of semi-structured telephone discussion on clinical outcomes and analysis of online race records (http://www.harness.org.au/index.cfm and http://www.racingaustralia.horse) to determine if horses that were discharged from hospital returned to previous or intended use. Charles Sturt University Animal Care and Ethics (A16065), and Human Research Ethics (H17143) approval were obtained for data collection and client follow-up, respectively. Descriptive data were generated. Univariate models were created using generalised linear and linear mixed models and multivariable logistic regression analysis was performed to determine significant factors associated with survival to discharge and return to function.

Results
Of 186 horses presented with SI, 161 were treated (86.6%) and 145 survived to discharge (90.1%). Of the 145 horses that survived, 17 (11.7%) were lost to follow up and 8 (5.5%) were excluded from return to function analysis as they were an insufficient age to function at their intended use at the time of follow up. Seventy-eight horses returned to function (65%). From univariate analyses, the number of involved synovial structures (P=0.029) the number of days a horse was treated with systemic antimicrobial drugs (P=0.007) and the use of regional antimicrobial treatment (P=0.043) were significantly associated with survival. Number of days treated with systemic antimicrobial drugs was retained in the final model for survival (OR 1.15, 95% CI 1.04-1.27, P=0.025). Animal age (P=0.043), number of days of hospitalisation (P=0.006), hospitalisation cost (P=0.022), number of days treated with systemic antimicrobial drugs (P=0.045), treatment with doxycycline (P=0.005), number of antimicrobial drugs used (P=0.04), complications associated with treatment for SI (P=0.023), how many times intra-thecal antimicrobial administration was done (P=0.002) and how many times intra-thecal and regional antimicrobial administration was done (P=0.027) were significantly associated with return to function in univariable analyses. In the final multivariable model, horses treated with doxycycline were 2.5 times less likely to return to previous function (OR 0.39, 95% CI 0.19-0.8, P = 0.031).

Relevance to Australian clinical equine practice
The rates of survival and return to function and factors associated with these outcomes will give practitioners and horse owners a guide when predicting the outcome for horses with SI and developing treatment plans. The greater number of days horses are treated with systemic antimicrobial drugs proportionally increases the likelihood of survival to discharge from hospital; however, the predicted return to function is decreased. While not significant
in the multivariable model in this study, the regional administration of antimicrobial drugs may contribute to increased odds of survival in horses with SI.