

Appendix 1

Proof of Solution to stochastic Marmarou Model with Constant Infusion: The stochastic Marmarou model with a constant infusion rate is

$$dp = \left\{ Ep - \frac{Ep(p - p_b)}{R} \right\} dt + \sigma Ep dW$$

This may be rewritten in the form of the stochastic logistic model

$$dp = \left(\frac{E}{R} \right) p (RI + p_b - p) dt + \sigma Ep dW$$

It is shown in [28, p.78] that the solution to the stochastic logistic model

$$dX = rX(K - X)dt + \sigma X dW$$

is

$$X(t) = \frac{\exp \left[\left\{ rK - \frac{\sigma^2}{2} \right\} t + \sigma W(t) \right]}{\frac{1}{x_0} + r \int_0^t \exp \left[\left\{ rK - \frac{\sigma^2}{2} \right\} s + \sigma W(s) \right] ds}$$

Identification of the parameters “r” with (E/R), ‘K’ with (RI + p_b) and σ with σE produces the claimed solution.