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Development of a Model of Erythropoiesis in Patients with Chronic Kidney Disease.

Red blood cell production (erythropoiesis) is normally regulated by the hormone erythropoietin (EPO) via a negative feedback control in the kidney. Patients with chronic kidney disease (CKD) must receive EPO and iron intravenously concurrent with hemodialysis to avoid anemia. We develop an age-structured model to describe erythropoiesis in patients with CKD and compare the model output to data. We also model overall inflammation level in the body, which affects both iron availability and survival of erythroid progenitor cells. (Received September 22, 2009)