

Wound healing and tissue repair is a complex, multi-phase process. Even in healthy individuals, it is difficult to quantify the different components involved in the successful healing of a wound. The inflammatory phase is particularly important to understand because dysfunction in this phase leads to undesirable patient outcomes. In order to understand the inflammatory phase in more detail, we developed an ordinary differential equation model that accounts for two systemic mediators that are known to modulate this phase, estrogen (a protective hormone during wound healing) and cortisol (a hormone elevated after trauma that slows healing). Including the effects of estrogen and cortisol is a necessary step to creating a patient specific model that accounts for gender and trauma. This inflammatory phase model will later become the inflammatory subsystem of our full wound healing model, which includes fibroblast activity, collagen accumulation and remodeling.