Every month, the three Operating Room Clinical Supervisors at the University of Michigan Health System each spend one week scheduling approximately 200 nurses and surgical technicians by hand to staff the operating rooms. The schedules must consider hospital policies, nursing contract language and staff preferences. Given the conflicting constraints, a feasible solution may not exist. To address this, we present a mixed-integer linear programming optimization model that minimizes a measure of infeasibility and produces an initial schedule in only minutes of computing time. The significant reduction in effort allows the Clinical Supervisors to spend more time on their other duties, including hiring, patient safety reviews, policy updates and nurse mentoring. We discuss the importance of allowing for infeasibility in preference-based optimization and present examples of how to model it appropriately.

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