Implementing Provider Scheduling Decision Support Tools in Clinical Practice

Amy Cohn
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CHEPS

INNOVATING HEALTHCARE DELIVERY

FOSTERING LEARNING

BUILDING COMMUNITY

POSITIVE IMPACT THROUGH...
Research
Education
Implementation
Outreach
Dissemination
CHEPS: OUR MISSION

FOSTER LEARNING
Providing experiential learning opportunities for students, faculty, and practitioners from across the campus and beyond

INNOVATE HEALTHCARE DELIVERY
Bringing together teams from across a wide spectrum of disciplines to make an impact by solving complex real-world healthcare problems

BUILD COMMUNITY
Nurturing a vibrant and diverse community of individuals working, learning, and having fun together
CHEPS: HOW WE DO IT

RESEARCH

IMPLEMENTATION

EDUCATION
CHEPS: HOW WE DO IT

OUTREACH

DISSEMINATION
WHAT IS MEDICAL RESIDENCY?

• Transition period between medical school and fully independent/unsupervised practice
  • Four years of med school
  • First year of residency – “Intern”
  • Two or more years of residency
  • Possibly one or two additional years as “Chief Resident”
  • Possibly more years as a “Fellow”

• During all of this time, providing patient care (albeit with the oversight of a more senior “attending” physician – supervision decreases over time)
WHAT IS MEDICAL RESIDENCY?

• A key issue: Dual role of residency
  • Learning experience: Residency (and Fellowship) are parts of the medical education training process
  • Patient care: Residents/Fellows provide a significant amount of the patient care in teaching hospitals and the associated clinical system

• A month in the life of a typical resident might include:
  • “Block assignment”
  • “Continuity clinics”
  • Seminars, formal educational activities
  • Research
INHERENT TIME CONFLICTS

• How to schedule residents’ time
  • Need adequate patient coverage with a limited pool of residents
  • Need adequate training opportunities
  • Need adequate rest – fatigue increases risk of error
  • Need to address resident satisfaction, personal life

• Not just quantity of hours but pattern
  • Continuity of care
  • Sleep issues (especially associated with overnight shifts)
  • Opportunities for different medical experiences
ED SHIFT SCHEDULING

• Assigning residents to shifts at a pediatric emergency department
• Monthly schedules
• Heterogeneous workforce (different levels, different programs)
• Resident-specific needs (education; personal)
• Program-specific needs (patient care)
SHIFT SCHEDULING

• Shift scheduling:
  • Given a time horizon
  • Given a set of shifts per day
  • Given a set of residents (heterogeneous set)
    • Residency program
    • Seniority
  • Assign residents to staff these shifts
WHY IS THIS HARD?

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- The more squares you fill in, the fewer choices you have left for what is valid
- Once you make a mistake, you might not know it for a long time
- Once you realize something is wrong, it can be very hard to back track and correct
HOW SHIFT SCHEDULES ARE TYPICALLY BUILT

• Schedules typically built by Chief Residents
• Limited decision support
• No formal training
• Hard to satisfy all rules
• Unlikely to make everyone happy
ED SHIFT SCHEDULING AT MICHIGAN MEDICINE

• What we’ve done:
  • Defined problem
  • Built software tool
  • Trained students
  • Work with chief resident to build monthly schedule for the past several years
  • Used as a platform to launch other related projects
KEY OBSERVATIONS

• Importance of collaboration
• Challenges in defining objective function
• Opportunity to engage and provide unique training for students
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