

Ward Layout Optimization

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GENERAL MEDICINE WARDS. FOUR PROGRAMS

- ▶ Acute Medicine
 - ▶ General Medicine
- ▶ Specialty Medicine
 - ▶ Dermatology,
Endocrinology,
Clinical Haematology,
Infectious Diseases,
Nephrology,
Neurology,
Neurosurgery,
Respiratory Medicine, and
Rheumatology.

PROBLEM DESCRIPTION

- ▶ Surgery and Interventional Service Program
 - ▶ Cardiology,
Cardiothoracic Surgery,
Endocrine Surgery,
ENT Surgery,
Gastroenterology,
General Surgery,
Oral and Maxillofacial Surgery,
Urology, and
Vascular Surgery.
- ▶ Womens and Newborn Program
 - ▶ Gynaecological Oncology,
Gynaecology, and
Obstetrics.

PROBLEM DESCRIPTION

- ▶ Each day accommodates around 250-300 patients in its 8 wards: W32, W33, W34, W41, W42, W43, W51, W52
- ▶ Ward capacities: soft constraint 36 beds for all wards, except W52 44 beds
- ▶ A patient is considered an “outlier” if
 - ▶ an additional bed is needed for a ward
 - ▶ has to stay in emergency room
 - ▶ is located in a ward that does not hold the specialty

ESSENTIAL REQUIREMENTS

- ▶ Gastroenterology and General Surgery patients must be in wards W32 or W33
- ▶ Neurology and Neurosurgery patients must be in W54N
- ▶ All surgeries except for Neurosurgery must be in Level 3
- ▶ General medicine must be in Wards W42 and W43
- ▶ Ward W52 is for Obstetrics only

DESIRED REQUIREMENTS

- ▶ No more than 5 (or 6) specialties in a ward
- ▶ No more than one specialty in Specialty Medicine
- ▶ All specialties in a program must be close to each other
- ▶ Ward W52 is for Obstetrics only
- ▶ Gastro and Cardiology cannot be in the same ward
- ▶ Infectious Disease and Nephrology cannot be in the same ward
- ▶ Infectious Disease and Dermatology cannot be in the same ward

DESIRED CONSTRAINTS

- ▶ Gastroenterology and General Surgery must be in W32 or W33
- ▶ WOMEN must be in W52.
- ▶ No other specialties can be in W52.
- ▶ Neurology and Neurosurgery must be W54N
- ▶ Cardiology and Cardiothoracic Surgery must be in W32
- ▶ Nephrology must be in W34.
- ▶ General Medicine must be in Wards W41, W42, and W33 if needed

OBJECTIVES

- ▶ Minimize “outliers”, patients allocated to beds in the “wrong” ward (either a virtual ward or a ward not for that specialty).