From Data to Optimized Healthcare Outcomes: Using Prescriptive Analytics to Maximize Patient Access, Costs and Quality of Care

RIVERLOGIC
Optimizing Decisions through Advanced Analytics

80
Hôpital général juif
Jewish General Hospital

CGI
Experience the commitment®

Outline

- About Jewish General Hospital, Montreal & Their Opportunities
- Achieving Full Healthcare Value from Prescriptive Analytics
- Optimization Methodology & Model
- Project Results & JGH Potential Benefits
- Scaling to Integrated Care
- Questions

Many Thanks To:

- Dr. Lawrence Rosenberg, M.D., Ph.D., Executive Director, Jewish General Hospital, Montreal
- Clinical team at JGH
- Project Team
  - Aaron Berg - VP Consulting Services, River Logic, Inc.
  - Elizabeth Lepage Muir - Director Consulting Services, CGI
  - Gervais Pellerin – Senior Consultant, CGI
  - Julie Richards – Director, US Health, CGI
  - Philip Troy PhD – Quantitative Process Analyst, TroyWare

Jewish General Hospital – Opportunities & Challenges

About Jewish General Hospital

As one of the Quebec's largest and busiest acute-care hospitals, this 637-bed McGill University teaching hospital admits more than 23,000 patients a year, while handling at least 300,000 outpatient visits, 67,000 emergency visits and more than 4,000 births on an annual basis.

Business Opportunity

How can we improve

- access to care
- cost of care
- quality of care

With advanced prescriptive analytics?

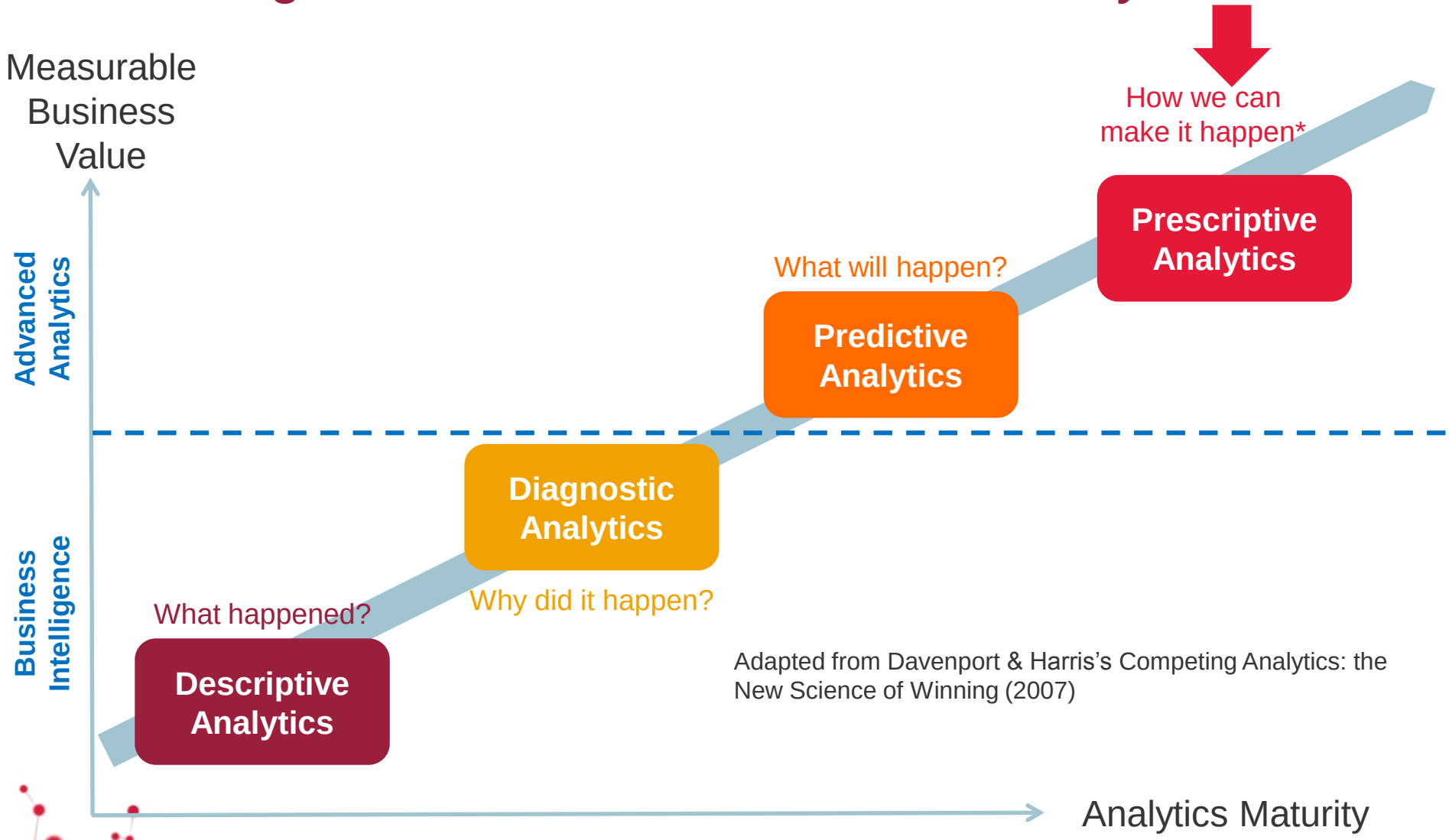
Key Challenges

- Fixed Funding
- Cannot Turn Patients Away
- Bed Blockages & Discharge Barriers

Defining Healthcare Access, Quality and Cost

Access to Care	• # of beds that become available per year • Increased access for clinical trial/study patients • Reduction in admission queue • Reduction in wait-list for procedures
Quality of Care	• Fewer days in the hospital • Fewer trips to the ED for geriatric patients • Fewer cancer patients vising the ED on the weekends • Less unnecessary procedures
Cost Savings	• # of beds that can be closed • Reduced LOS • Reduced costs in the ED • Net dollar savings across the system

Achieving Full Healthcare Value from Analytics



Adapted from Davenport & Harris's Competing Analytics: the New Science of Winning (2007)

*In the best feasible way?

How can Prescriptive Analytics help JGH?

General Overall Hospital Examples

- Understand the impact on the hospital as a whole of decisions made in one area given interactions and constraints through-out the system
- Prescribe alternate more cost effective decisions
- Optimize ED visits and hospital admissions to cut budget by 20%
- Optimize casemix volumes to improve access to care
- Ensure decisions will not negatively impact quality
- Prescribe the best way to plan for aging demographics, change in funding programs and new innovative treatments

JGH Specific Requests

What will happen to the hospital as a whole if:

- Discharge Improvement Programs
- Appropriate Oncology Orders in ED
- Directed Outreach for ED “Frequent Fliers”
- Oncology Partnership with Local Hospitals
- Bed Turnover Process Improvement
- Reducing Oncology Volumes
- Weekend Oncology Drop-in Clinic
- Geriatric Outreach to Nursing Facilities

Focuses on what is the best possible outcome for the hospital or society

Optimization Methodology & Model

Hospital Areas/Activities

- Emergency Department: (PODS, Fast-track, RAZ, Resus)
- In-Patient
- Segal Cancer Centre
- Operating Room
- Ancillaries

Optimization Variables

- DRG
- JGH catchment area
- Clinical trial/study
- Age: <75 or >= 75

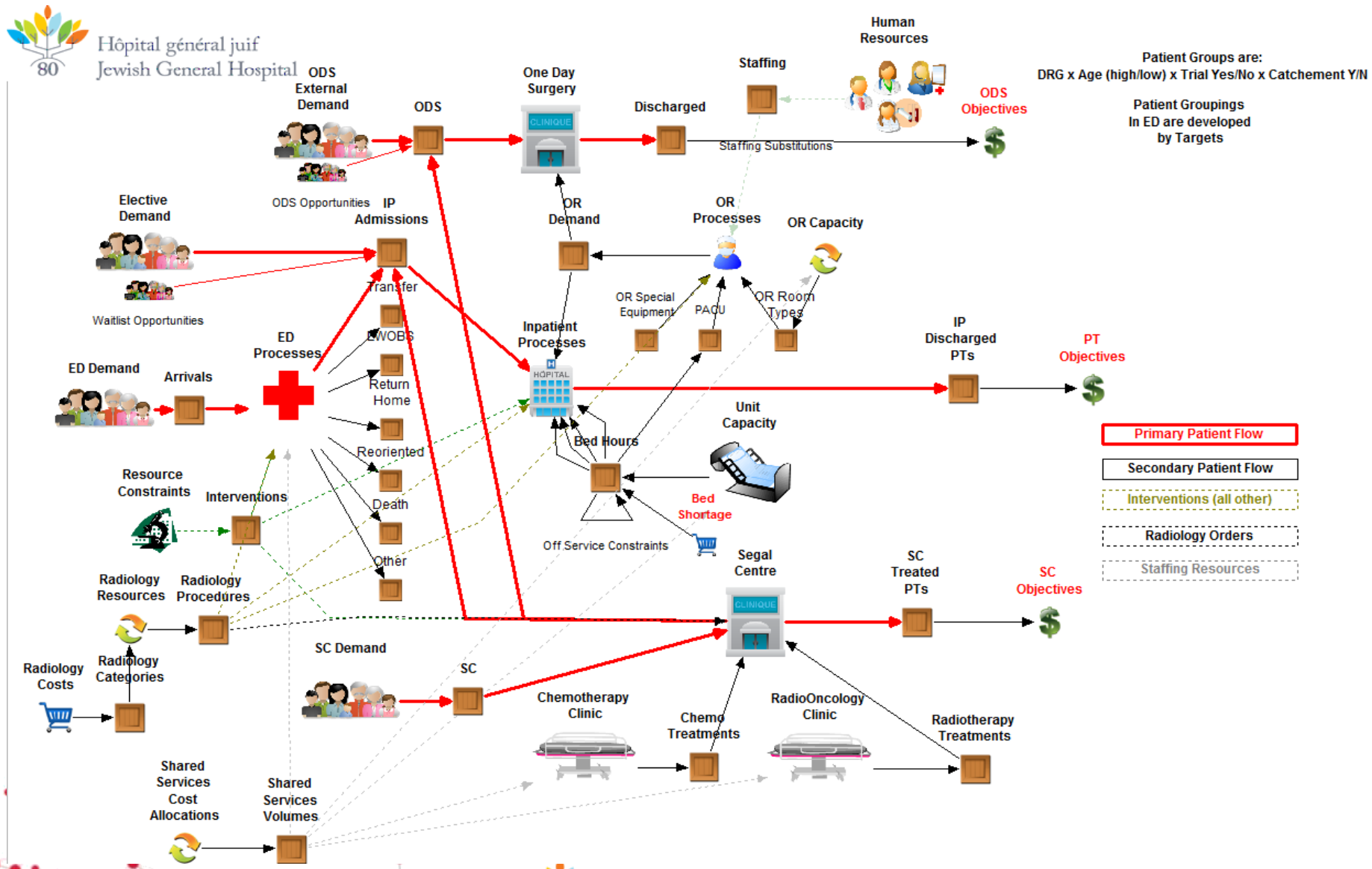
Types of Data Used for Patient Groups

Emergency Department
- Usage of each ED area
- Time in ED,
- Radiology, interventions, labs, pharmacy
- Admissions

Segal Cancer Centre
- Chemotherapy
- Radio-oncology
- Surgical procedures (both IP and ODS)
- Radiology, interventions, labs, pharmacy

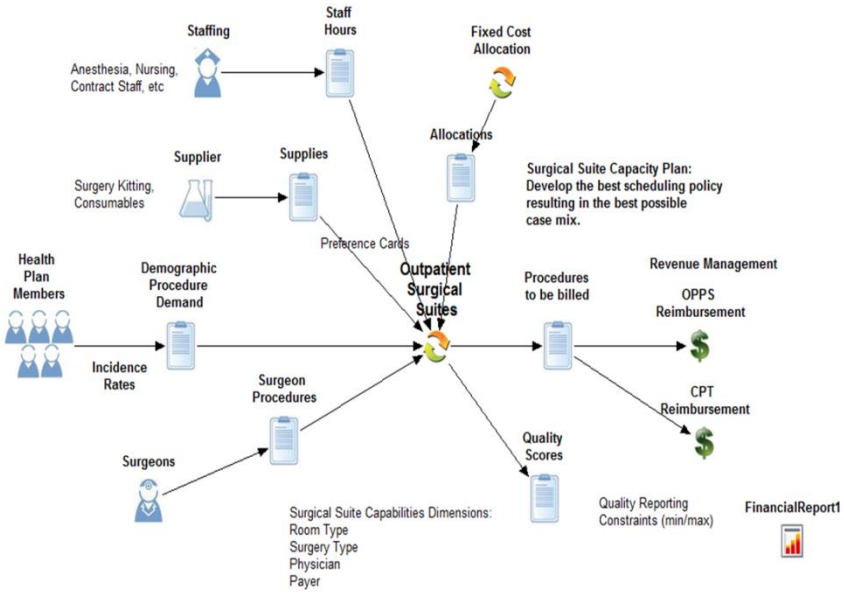
Inpatient Units
- Beds, LOS and units
- Surgical procedures
- Radiology, interventions, labs, pharmacy

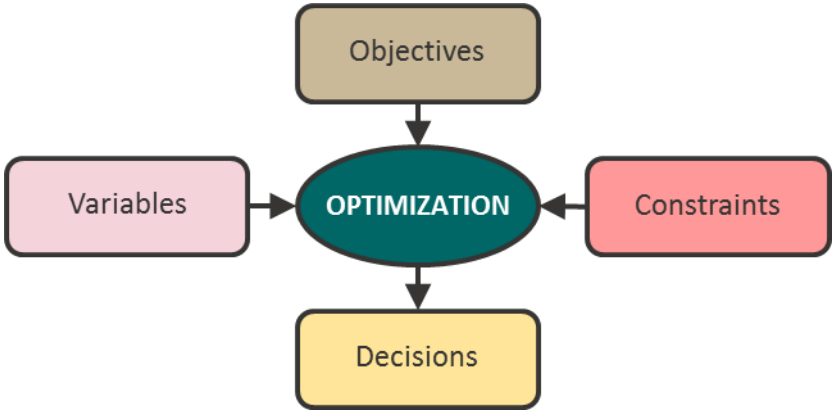
Jewish General Hospital Model



Optimization Methodology

1. Build a **process flow model** of a service
2. The process flow model and underlying data together **define a set of decision possibilities**
3. **All decision possibilities are evaluated** and the best option is returned as the solution
4. Upper and lower limits on decision are defined to evaluate all possible scenarios ensuring the **best possible mathematical solution**
5. In addition, EO provides information that is helpful in **identifying further improvements** to the recommended solution





Project Results & JGH Potential Benefits

Program Scenario	Access to Care	Quality of Care	Estimate Savings	Program Impact if implemented
Rehab patient discharge improvement	7 Beds	-40% inappropriate rehab patient bed days	$1M	
Discharge planning system	84 Beds	-16% Bed Days	$13M	
Appropriate ED oncology orders	0 Beds	-200 CT Scans	$10K	
Directed outreach for ED “Frequent Fliers”	14 Beds	-2000 ED Visits	$3M	
Extend oncology to other hospitals	20 Beds	Treatment nearer home	$18M	
Increase number of clinical trial cancer patients	4 Beds	Increased study patients	($0.4M)	
Weekend oncology drop-in clinic	0 Beds	-100 ED Visits	$0.2M	
Geriatric Outreach to Nursing Facilities	26 Beds	-500 admissions -1800 ED visits	$5M	
Rehab program & optimizing elective procedures	1000 Procedures	Earlier Surgery	$0	

“The findings of the proof-of-concept are not exact results but are derived from real data and scenarios and do show direction and comparability of the impact of the scenarios.”

Perceived High Value

CGI

What Could be Next for Montreal?

"Several clinical programs, including those that target clienteles in geriatric nursing homes and to prevent hospitalization, have already been analyzed and suggest significant potential gains."

"Bill 10, the most profound piece of legislation ever enacted by the National Assembly and the most profound piece of legislation with respect to healthcare reform ever introduced in Quebec"

Lawrence Rosenberg, M.D.
Ph.D.
Executive Director
Jewish General Hospital

Next opportunity is to prescribe the best way to plan across the new integrated network and help drive Quebec's healthcare reform.

Call to Action Take away –
How could you use Prescriptive Analytics?

Strategic

- Prescribe the best way to **plan for aging demographics, change in funding programs and new innovative treatments** across all providers in a network
- Understand the impact to **access, quality and cost of care** if care treatments are moved to different levels of care
- **Optimize facilities and service lines** across integrated care

Tactical

- Understand the **impact on the hospital as a whole of implementing a new clinical service** in one area given interactions through-out
- Optimize ED visits and hospital admissions to **reduce costs or increase revenue by 10%**
- **Optimize hospital casemix** volumes to improve access to care

Operational

- **Which surgical cases should we increase/decrease** to meet demand, improve care or increase revenue?
- What is the **impact if a new operating room was opened**, or one closed or reassigned?
- What is the **optimal way to schedule procedures** in the operating room?

Department → Facility → Integrated Care

RIVERLOGIC
Optimizing Decisions through Advanced Analytics

Hôpital général juif
Jewish General Hospital

CGI

Questions

For more information:
julie.richards@cgi.com

RIVERLOGIC
Optimizing Decisions through Advanced Analytics

Hôpital général juif
Jewish General Hospital

CGI