Economics, Ethics and Muda:
A New Appreciation for Ontario’s Health Care System and Academic Health Sciences Centres?

Dr. Bob Bell, President & CEO
Breakfast with the Chiefs
October 19, 2005
Health care Spending in Canada

Total Health Expenditure as a Percentage of Gross Domestic Product, Canada, 1975 to 2004

- Actual
- Forecast
“What’s Good for General Motors is Good for America”
-Charles Wilson, GM Chairman, 1955 Senate hearings

GM Assembly Plant, Flint Mi., 1956
GM Assembly Plant, Flint Mi., 2001
“And the cost of providing health coverage for 1.1 million GM workers, retirees and dependents is estimated to be $5.6 billion this year. Their coverage is enviable -- at most, small co-payments for visits to doctors and for pharmaceuticals but no deductibles or monthly premiums. GM says health expenditures -- $1,525 per car produced; there is more health care than steel in a GM vehicle's price tag -- are one of the main reasons it lost $1.1 billion in the first quarter of 2005. Ford's profits fell 38 percent, and although Ford had forecast 2005 profits of $1.4 billion to $1.7 billion, it now probably will have a year's loss of $100 million to $200 million.”
WOODSTOCK LANDS TOYOTA PLANT – Just the Beginning

As many as 9,000 spin-off jobs are expected from the huge undertaking, backed by $125 million in government money.

Today’s Economy
Toronto Medical Discovery Tower - The Economy of the Future?
About IGTx

The Image-Guided Therapy (IGTx) Group
Ontario Cancer Institute, Princess Margaret Hospital, University Health Network
Departments of Radiation Physics, Radiation Medicine Program
Departments of Radiation Oncology, Medical Biophysics, University of Toronto

Principal Investigators
- Dr. David A. Jaffray, Head, Radiation Physics
- Dr. Jeffrey H. Siewerdsen, Scientist, OCI

Contact Information
Ontario Health care System

• Our brand - an asset, not a liability

• Makes Ontario’s economy competitive today

• Educated, mobile and healthy workforce

• Health science centers offer good jobs today & may offer tomorrow’s economic drivers
There is new ammunition in the war against cancer. These are the bullets.

Revolutionary new pills like GLEEVEC combat cancer by targeting only the diseased cells. Is this the breakthrough we've been waiting for?
Sarcoma Response to Gleevec

STI- Responder

baseline

+ 8 weeks

+ 6 months
Sarcoma Response to Gleevec
Proof of Principles

• Dissimilar cancers have common features
• Therapy targeted to molecular alterations is possible
• Cancer as chronic disease
• How do we assess cost of treatment?
Incremental Cost/QALY Gained

- Difference in cost
- Divided by difference in QALY
- \((\triangle \text{ cost}/\triangle \text{ QALY})\)
- \(\triangle \text{ QALY} = \text{ difference in years of life} \times \text{ difference in health status}\)
### Table 4. Cost per QALY league table

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Extra cost per QALY gained (1990 £)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP advice to stop smoking</td>
<td>270</td>
</tr>
<tr>
<td>Hip replacement</td>
<td>1,180</td>
</tr>
<tr>
<td>Cholesterol testing and treatment (all adults aged 40–69)</td>
<td>1,480</td>
</tr>
<tr>
<td>Kidney transplantation (cadaver)</td>
<td>4,710</td>
</tr>
<tr>
<td>Home haemodialysis</td>
<td>17,260</td>
</tr>
<tr>
<td>Hospital haemodialysis</td>
<td>21,970</td>
</tr>
<tr>
<td>Erythropoietin treatment for anaemia in dialysis patients</td>
<td>54,380</td>
</tr>
<tr>
<td>(assuming 10% reduction in mortality)</td>
<td></td>
</tr>
<tr>
<td>Neurosurgery for malignant intracranial tumours</td>
<td>197,780</td>
</tr>
</tbody>
</table>
# Level of Evidence Underlying Calculations

<table>
<thead>
<tr>
<th>Evidence quality</th>
<th>Cost per QALY gained (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;£3K</td>
</tr>
<tr>
<td>I. At least one randomised controlled trial</td>
<td>Strongly recommended</td>
</tr>
<tr>
<td>II. Well designed controlled trial</td>
<td>Strongly recommended</td>
</tr>
<tr>
<td>III. Expert consensus or opinion</td>
<td>Supported</td>
</tr>
<tr>
<td>IV. Conflicting or inadequate evidence</td>
<td>Not proven</td>
</tr>
</tbody>
</table>
Gleevec in GIST

- Incremental Cost - $45,000/year
- Incremental life years - 3
- Improvement Quality of Life - (0.25 → 1.0)

\[
\text{Incremental Cost} / \text{QALY} = \frac{45}{4} = \$11,250/\text{QALY}
\]
Avastin - New Drug Starves Tumor Blood Supply

How Avastin Starves a Tumor

Tumors need blood, and they have a devious way to get it:

» They secrete a protein called VEGF that docks with receptors in nearby blood vessels, stimulating the growth of new blood vessels.

» Genentech foils this plot with Avastin, a drug that binds with VEGF and prevents that protein from attaching to receptors. New blood vessels don’t form, and the tumor starves.
Avastin

- Approved for use in advanced colorectal cancer in September 2005
- Likely to cost at least $60,000 more per patient when compared to 5FU
- Survival advantage 5 months
- Assuming no degradation of quality of life - Avastin cost/QALY = \(rac{12}{5} \times 60,000 = \$144,000\)/QALY

- Comparison of radiation ($3K) vs. surgery and radiation ($57K) for Rx of acute spinal mets- 27% improvement in walking
- Assume paraplegia = 0, walking =1, relative improvement in quality = .27
- However, life expectancy of entire group = 5/12- therefore, QALY = .27 X 5/12 = .1
- Cost per QALY = $54 K/.1= $540,000/QALY
Cost Effectiveness of Limb Salvage

- No data on change in health status
- No improvement in survival
- Acute costs- Amputation ($1.5K) vs LS ($20K)
- Chronic costs- ($3K/prosthesis)
HOW TO STOP A HEART ATTACK BEFORE IT HAPPENS

Amazingly detailed new heart scans help doctors spot trouble without surgery. How technology could save your life

Mike Fackelman, 50, holds a scan of his heart, which revealed a major blockage of a coronary artery (arrow).
Cardiac Imaging
Resource Allocation & Priority Setting

- Linda Wright MHSc, MSW, RSW
- Eoin Connolly, MA
Ethical Issues

- We have a duty to care for all patients
- Need to treat all patients fairly
- Ethical challenge = To find a fair way to make tough decisions about scarce resources
Ethical Framework: Goals are legitimacy and fairness

- Legitimacy: who has moral authority to make priority setting decisions about available resources?
- Fairness: when does a stakeholder have sufficient reason to accept a priority setting decision as fair?
Ethical Framework: Accountability for reasonableness (A4R)

- **Relevance** – decisions based on reasons fair-minded people can agree are relevant under the circumstances
- **Publicity** – reasons publicly accessible
- **Revision** – opportunities to revisit/revise decisions & mechanism to resolve disputes
- **Empowerment** – optimise effective participation and minimise power differences
- **Enforcement** – to ensure 4 conditions met
A4R in action: Key elements

- Relevance
- Publicity
- Revision
- Empowerment
- Enforcement

Processes
Criteria

- Strategic fit
- Alignment with external directives
- Academic mandate
  - Education
  - Research
- Clinical impact
- Community needs
- Partnerships (external)
- Resource implications - cost effectiveness

Process Elements

- Ensure strategic alignment
- Identify decision-makers
- Define criteria Collect data/information
- Engage internal/external stakeholders
- Develop an effective communication plan
- Communicate decision & its rationale
- Develop decision review processes
- Monitor/evaluate & improve
- Lead by example

Benefits of approach

- **Board**: due diligence, accountability
- **Senior management**: strategic operations, quality improvement, learning organization
- **Staff**: EBMx, political engagement
- **Patients**: fair treatment
- **Community**: sense of involvement
- **Other health care organizations**: shared lessons, system improvement
- **Government**: accountability
What happens if treatment does not meet the cost-effectiveness hurdle?

- Ignore
- Treatment in America?
- Treatment in “private” Canadian centers?
- “Private” treatment in public facilities?
Ethics, TPS & Muda

• Toyota is one of only two auto companies making money on cars
• Taiichi Ohno- father of TPS
• Institute for Healthcare Improvement- Berwick and Spear
• Lean techniques (elimination of muda) in health care
Principles of TPS - Elimination of Muda

- Standardize processes
- Pull, not push efficiency
- Efficiency pull comes from developing people
- Eliminate work that does not add value
100k lives Campaign

Some is not a number. Soon is not a time.
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Standardization - Six Changes That Save Lives</strong></td>
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</tr>
<tr>
<td>1.</td>
<td>Deploy Rapid Response Teams</td>
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<tr>
<td>2.</td>
<td>Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction</td>
</tr>
<tr>
<td>3.</td>
<td>Prevent Adverse Drug Events (ADEs)</td>
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<tr>
<td>4.</td>
<td>Prevent Central Line Infections</td>
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<tr>
<td>5.</td>
<td>Prevent Surgical Site Infections</td>
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<tr>
<td>6.</td>
<td>Prevent Ventilator-Associated Pneumonia</td>
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<tr>
<td>Three Sources of Muda in Health Care System</td>
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<tr>
<td>--------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>• Wrong level of care</td>
<td></td>
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<tr>
<td>• Difficult processes</td>
<td></td>
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<tr>
<td>• Inappropriate resource utilization</td>
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Right Patient - Right Bed

- Criteria for CC admission
- Criteria for acute care setting
- Criteria for community care
Processes

- **ED overcrowding** has little to do with **ED**
- **Bottlenecks**
- **Scheduling**
- **Resources**
- **Processes around** **ED** have major impact on **ED wait**s
Resource Utilization

- The people who determine resource utilization are not our employees
- How do we get physicians to consider resources in therapeutic decision making?
Summary

• Health care is a critical economic asset
• We will face increasing complexity in deciding what services are funded
• We need an ethical framework for decision making
• We need to ensure that we are constantly examining opportunities for improving our systems and developing tools to measure efficiency
Questions or Comments?