The Israeli Program for Hospital Quality Indicators-
Methodology framework

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Israel: excellent primary health care, but hospitals must improve

Israel has world class-primary care services and should now focus efforts on bringing its hospitals up to the same high international standards, according to the OECD Reviews of Health Care Quality: Israel.
National Programs For Quality Indicators:

- **Israeli program for quality indicators in community healthcare:** program started at 2004

- **Israeli program for health care quality indicators in hospitals:** program started at 2013
28 general hospitals (300 - 1,400 beds)
41 geriatric hospitals
10 psychiatric hospitals
Our Mission

➢ To promote nationwide health improvement in Israeli hospitals

➢ To provide policy-makers information regarding the quality of care measured by: general hospitals, geriatric hospitals, psychiatric hospitals etc..
Mission (cont.)

- To enhance transparency by publishing the results of the national quality indicators program.
- To evaluate time trends of the indicators chosen for the program; the on-going aspect of the program.
The Israeli program of hospital quality indicators

- Outcome indicators (based on data extracted from medical records)
- Process indicators (based on data reported by hospitals)
Outcome indicators

In depth research

(based on active data collection from the medical records)
Israeli Program For Quality Indicators in General Hospitals: In depth research - Methods

- **Active abstraction** of medical records  [Trained nurses collect data from about 10,000 files a year]
- **Multi-center observational studies**, of either incidence or prevalence design
- **Steering Committees of clinicians** appointed as experts in the clinical aspects of the program
Israeli Program For Quality Indicators in General Hospitals: In depth research - Methods

- **Case-mix and process indicators** are contrasted in multivariate models.

- **Results** presented to the director-general, heads of participating departments, and hospitals directors; each institution receives their results in comparison with others.
<table>
<thead>
<tr>
<th>Design</th>
<th>Neurosurgery 8 wards</th>
<th>Orthopedics 25 wards</th>
<th>General surgery 39 wards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N=1,940</td>
<td>N=2,435</td>
</tr>
<tr>
<td></td>
<td>250 from each ward</td>
<td>100 from each ward</td>
<td>100 from each hospital</td>
</tr>
<tr>
<td>Historical prospective study</td>
<td>---</td>
<td>---</td>
<td>2013: Appendectomy N=6000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100 from each ward</td>
</tr>
<tr>
<td>Historical prospective study</td>
<td></td>
<td></td>
<td>2013: colon-rectum surgery N=3900</td>
</tr>
</tbody>
</table>
Israeli Program For Quality Indicators In General Hospitals: Outcome Indicators for in-depth studies

- **HOSPITAL ACQUIRED INFECTION**
  - Post operative Surgical Site Infection: 30 days monitoring

- **MORTALITY**
  - Post operative mortality: 30, 60, 180, 365 days monitoring

- **RE-OPERATION**
  - Post operative recurrent surgery: 30 days monitoring

- **BLEEDING**
  - Post operative bleeding: 30 days monitoring

- **MECHANICAL COMPLICATION**
  - Post operative leakage/perforation/obstruction: 30 days monitoring

- **HOSPITAL READMISSION**
  - Post operative re-hospitalization: 30 days monitoring
Process Indicators for in-depth studies

PROPHYLACTIC
- The right protocol for I.V. ABx
- The right timing: 30-60 min. before surgery

BOWEL PREPARATION
- Mechanical preparation
- Oral antibiotics

PROCEDURE
- Laparoscopy vs. open surgery
Surgical site infection after colon-rectum surgery
30 days follow up  N=2274

Elective N=1374
SSI 18.1%

Acute N=900
SSI 23.7%

Total: 20.3%
International comparisons - SSI

- **France**: 1.2% in hospital, 7.7% total
- **England**: 9.2% in hospital, 5.8% total
- **Belgium**: 0.5% follow up, 5.8% total
- **Israel**: 2.0% follow up, 18.3% total
Antibiotics within one hour before the first surgical cut in elective colon surgery

% patient who receive Abx within one hour prior to first surgical cut

- 2%
- 48%
- 95%
### Multivariate Analysis: Logistic model for SSI colon surgery

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Odds Ratio</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute patient</td>
<td>Yes</td>
<td>1.2</td>
<td>0.152</td>
</tr>
<tr>
<td>Abdomen surgery in the past</td>
<td>Yes</td>
<td>1.4</td>
<td>0.004</td>
</tr>
<tr>
<td>Age</td>
<td>&gt;65</td>
<td>0.9</td>
<td>0.318</td>
</tr>
<tr>
<td>Charlson index</td>
<td>+3</td>
<td>1.1</td>
<td>0.377</td>
</tr>
<tr>
<td>Extensive resection</td>
<td>Yes</td>
<td>1.1</td>
<td>0.622</td>
</tr>
<tr>
<td>Surgical technique: Laparoscopic vs. Open</td>
<td>Open</td>
<td>1.3</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>(ref) Lap</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Colon preparation &amp; prophylactic antibiotics</td>
<td>No</td>
<td>1.8</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Partial</td>
<td>1.5</td>
<td>0.090</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>1.0</td>
<td>Ref.</td>
</tr>
<tr>
<td>Drain</td>
<td>Yes</td>
<td>2.16</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Long operation (&gt;75%)</td>
<td>Yes</td>
<td>1.9</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

C-statistics=74

Adjusted to wards
Process indicators

(Hospital-Reported data)

Started January 2013
✓ 2012: Obligation to report data to the Ministry of Health: National health insurance law

Mandatory report
Transparent publication
The Advisory Committee for Quality Indicators

Model used to choose indicators: (Chassin et. al. 2010)

- Evidence-based
- Reliability of the data
- Outcome versus process
- Not potentially harmful
- Importance of topic to the health system

Cooperation of various Israeli professional medical societies
✓ Determine and define a uniform measurement algorithm and preparation of hospital computer systems accordingly

✓ Map data and computer systems in each hospital and create profile book for each hospital per indicator
✓ Unidentified personal data
✓ Once per quarter
Data Validation at Data Extraction Level: conducted to ensure complete data extraction, covering the entire relevant population (compared to data in MOH’s hospitalization database)

Data Validation based on Medical Files: Each indicator has a sample of at least 20% of cases. Trained nurses collect several key variables for each indicator. The nurses are blinded to the data reported by hospital.
**Examples Validation Findings:**

- We found a 10%-40% error rate in coding for procedures and diagnoses. Example: 30% of cases, in one hospital, reported as Acute Stroke, were found to be Status Post stroke!

- Reporting Incorrect Times
  - Instead of reporting time-to-needle; reporting was the time patient entered the PCI room
  - Inability to extract CT start time; various other times reported
External Feedback – validation findings

Reporting Program Results – Hospital directors receive indicator results for their hospitals with option of appealing results

Publication – Identified publication of results beginning with the second performance measurement year
Hospitals conduct barrier mapping to locate areas of weakness and improve the quality of care. The hospitals improved care processes for patients with myocardial infarction, stroke, and femoral neck fractures.
Program progress

- **2009**: Outcome indicators, In depth research
- **2012**: Obligation to report data to the Ministry of Health
- **2013**: General hospitals started to report data to the Israeli program of hospital quality indicators
- **2014**: Geriatric and psychiatric hospitals started to report data to the Israeli program of hospital quality indicators
- **2015**: Emergency medical service start to report data to the Israeli program of hospital quality indicators
Stroke

Standard stroke evaluation for suspected stroke patients

Alerting hospital to arrival for cases of suspected stroke

Intravenous thrombolytic treatment (IVtPA) for Acute Ischemic Stroke

Head CT/MRI within 25 minutes of arrival at hospital for patients with Acute Ischemic Stroke

Carotid duplex performed within 72 hours of admission to ER for patients with suspected TIA

Performing a Functional Independence Measure (FIM) Assessment upon admission and discharge to rehabilitation departments for patients who suffered Acute Ischemic Stroke
Aspirin given to patients with suspected Acute Coronary Syndrome (ACS)

Transmission of ECG results to hospitals prior to arrival for cases of suspected STEMI

PCI performed within 90 minutes of arrival at hospital for patients with STEMI

Aspirin given at discharge to patients with Acute Myocardial Infarction
Femoral Neck Fracture repairs within 48 hours

Administration of proper antibiotic prophylaxis for femoral neck fracture repairs

Performing a Functional Independence Measure (FIM) Assessment upon admission and discharge to rehabilitation departments for patients who suffered femoral neck fractures
Administration of antibiotic prophylaxis within the hour prior to the initiation of colon and/or rectum resection

Administration of proper antibiotic prophylaxis for femoral neck fracture repairs

Administration of proper antibiotic prophylaxis for cesarean section

Central line-associated bloodstream infections (CLABSI)

Incidence of Clostridium difficile
Psychiatric Readmission within 30 days of discharge

Treatment plan documented within 5 days of admission date

Detailed hospitalization summary within 2 weeks of discharge

Ensuring Continuity of Care – Setting appointments for discharge patients for continued primary care

Assessing all psychiatric ER patients for measure of risk posed to themselves and/or others during initial check-up
Infants aged 13 months who have received a single dose of MMR/V vaccine

Infants aged 18 months who have received 4 doses of the Hib-Dtap-P vaccine
Administration of antibiotic prophylaxis within the hour prior to initiation of colon and/or rectum resection
% of patients given antibiotic prophylaxis on time per hospital (2009 survey)

SSI 18.1%
Trends 2009-2014
Antibiotic Prophylaxis for Colon Resection

* Data displayed is median of hospital compliance with quality indicator
Hospitals variation - Antibiotic Prophylaxis for Colon Resection

2013 – percentiles (10%, 25%, 50%, 75%, 90%)

2014 – percentiles (10%, 25%, 50%, 75%, 90%)
FEMORAL NECK FRACTURE REPAIRS WITHIN 48 HOURS
Trends 2009-2014
Femoral Neck Fracture Repair within 48 Hours

* Data displayed is median of hospital compliance with quality indicator
Hospitals variation: Femoral Neck Fracture Repair within 48 hours

2013 – percentiles (10%, 25%, 50%, 75%, 90%)

- 40%
- 56%
- 77%
- 81%
- 85%

2014 – percentiles (10%, 25%, 50%, 75%, 90%)

- 56%
- 72%
- 80%
- 89%
- 92%
Femoral Neck Fracture Indicator Barrier Mapping – Weekends

Compliance based on hospital admission day
Femoral Neck Fracture by surgery type

Compliance based on surgery type

- **Total replacement**: 33% in 2009, 52% in 2013, 70% in 2014
- **Hemiarthroplasty**: 53% in 2009, 66% in 2013, 76% in 2014
- **Fixation**: 64% in 2009, 74% in 2013, 80% in 2014
Comparison to OECD data

- Switzerland: 39.9%
- Spain: 43.1%
- Portugal: 46.6%
- Slovenia: 55.6%
- Israel: 73.2%
- OECD (19): 75.8%
- Belgium: 82.9%
- Ireland: 83.2%
- Canada: 83.2%
- Finland: 84.2%
- New Zealand: 84.5%
- Czech Republic: 85.1%
- Germany*: 85.2%
- Hungary: 88.3%
- United...: 88.4%
- Sweden: 93.4%
- Denmark*: 94.3%
- Netherlands: 95.1%
- Iceland: 95.8%

* Health Care Quality Indicators (HCQI) 2001-2011 Data Collection.
• Health Care Quality Indicators (HCQI) 2012-2013 Data Collection.
Results and Findings

PCI within 90 Minutes of Arrival at Hospital for Patients with ST-Elevation MI
Temporal Trends, 2013-2014
PCI within 90 minutes for patients with STEMI

* Data displayed is median of hospital compliance with quality indicator
Hospitals variation: PCI within 90 minutes for STEMI

2013 – percentiles (10%,25%,50%,75%,90%)

54% 61% 68% 75% 82%

2014 – percentiles (10%,25%,50%,75%,90%)

49% 67% 80% 87% 92%
Percentage of PCIs Performed within 90 Minutes – stratified by gender

Men
- 2013: 70%
- 2014: 79%

Women
- 2013: 56%
- 2014: 69%
Kaplan-Meier: Time to Catheterization
To summarize the first 3 years

- The combining of outcome surveys and the process indicator program proved fruitful and valid:

  Those indicators that were chosen on the basis of in depth local studies, were easier to get consensus and easier to implement.
To summarize the first 3 years

- We realize that the program is well accepted by most of the hospitals and in some cases the implementation is impressive.

- There is no way to shorten the adjustment period of the hospitals to the program — this is a change in institutional culture.

The results of the validation led to changes in the derivation of the information the hospitals submit to the program.
Recommendations for international program

- Uniform definition of hospital – no. of beds
- Outcome \ process measurements
- Well defined statistical framework – minimal no. of available patients for each indicator per year in order to enter the analysis
- Defined topics in focus for measurement
- Validation framework
Thank you!