The Real Project starts with EMRAM Stage 7

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CIO Marina Salud S.A.
Who are we?

- Reference population of more than 150,000 inhabitants (+ tourism)
- Specialized care: 1 Hospital + 2 Integrated Health Centers
- Primary Care: 11 Basic Health Zones > 34 Health Centers and Auxiliary Offices

Hospital:
- 206 beds
- 7 general ORs + 4 ambulatory
- Physician Staff: 200
- Nursing Staff: 360
- Facilitators: 40

(More than 1,200 employees)
What we did?

- March 22th, 2007 - Agreement signed
- July 2nd, 2007 - Kick off
- October 8th, 2007 - Scope Review
- May 25th, 2008 - System Validation
- September 1st, 2008 - Integration Test
- December 15th, 2008 - Go live
- January 26th, 2009 - Emergency’s Department Start-up
2011- First HIMSS recognition

EMRAM
Stage 6

FOCUS AREAS

- Physician Documentation and Closed Loop Meds
- Physician Documentation with Clinical Decision Support

PHYSICIAN DOC

- Structured documentation
- Clinical pathways

CLOSED LOOP MEDS

- Close look to transversal process for both doc and meds

FOCUS ON THE SUM OF PARTNER KNOWLEDGE+ LOCAL PROCESS TRANSVERSAL VIEW

4–5 JUNE 2014
ISTANBUL, TURKEY
2012 - Second HIMSS recognition

EMRAM Stage 7

- EMR/Paperless Environment and Paperless Validation
- Data Driven Clinical Workflow and Processes
- Clinical Decision Support Capabilities (CDSC)
- Entreprise DataWareHouse (DWH)
- Downtime process

FOCUS AREAS

PAPERLESS VALIDATION
Exception to ideal workflow; determine need for 100 paper scanned

CDSC
Dose range checking
Sepsis algorithm
Decrease unnecessary preoperative chest X-ray

DWH
Government reporting: i.e. ED triage time

7x24 Downtime process
2012: The last good budget

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Annual Operating Expense</td>
<td>109,999,496€</td>
<td>106,359,093€</td>
</tr>
<tr>
<td>Total Depreciation</td>
<td>10,214,646€</td>
<td>8,557,471€</td>
</tr>
<tr>
<td>Total Payroll Expense</td>
<td>59,789,767€</td>
<td>56,079,746€</td>
</tr>
<tr>
<td>Total IS Operating Expense as a Percent of Total Operating Expense</td>
<td>2,42%</td>
<td>1,90%</td>
</tr>
<tr>
<td>Total IS Depreciacion</td>
<td>1,862,378€</td>
<td>1,621,616€</td>
</tr>
<tr>
<td>Total IS Salary Expense</td>
<td>696,750€</td>
<td>516,948€</td>
</tr>
<tr>
<td>Total IS Operating Expense</td>
<td>1,962,268€</td>
<td>1,506,923€</td>
</tr>
</tbody>
</table>
Could IT help?

The impact of the EMR is evident in stages 6 and 7 (and not in previous ones) in:

- Quality of care
- Patient safety
- Operational efficiency
What do we need?

- Employees
- IT Systems
- Processes
Examples of Operational Efficiency

### Nursing documentation

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Contribution</th>
<th>Impact</th>
<th>Cases</th>
<th>Hours/year</th>
<th>FTE Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>All discharged patients have a 50% of the report's content is generated automatically</td>
<td>50% of the report's content is generated automatically</td>
<td>5 minutes per report</td>
<td>11,728</td>
<td>977.33</td>
<td>0.56</td>
</tr>
<tr>
<td>Continuity of care between departments</td>
<td>Single database per patient</td>
<td>15 minutes per discharge</td>
<td>11,728</td>
<td>2,932.00</td>
<td>1.69</td>
</tr>
</tbody>
</table>

### Physician documentation

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Contribution</th>
<th>Impact</th>
<th>Cases</th>
<th>Hours /year</th>
<th>FTE physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable remote visits</td>
<td>Structured clinical information available anywhere at any time. Protocols integrated.</td>
<td>Time per visit reduced from 15 to 5 minutes</td>
<td>5,828</td>
<td>971</td>
<td>0.56</td>
</tr>
<tr>
<td>Greater access to documentation</td>
<td>Single database per patient.</td>
<td>Minutes per 10 discharge</td>
<td>11,728</td>
<td>1,955</td>
<td>1.13</td>
</tr>
<tr>
<td>Documentation in Operating Room</td>
<td>Integration of monitoring devices</td>
<td>Minutes per major 7 surgery</td>
<td>8,608</td>
<td>1,004</td>
<td>0.58</td>
</tr>
</tbody>
</table>
Examples of Operational Efficiency

### Documentation area

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Impact</th>
<th>Cases</th>
<th>Hours/year</th>
<th>FTE Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of medical record information electronically</td>
<td>4 Minutes per movement (discharges, consultations, and minor surgery)</td>
<td>193,718</td>
<td>12,914.53</td>
<td>7.47</td>
</tr>
<tr>
<td>Improved coding</td>
<td>5 Minutes per major and minor surgery</td>
<td>14,994</td>
<td>1,249.50</td>
<td>0.72</td>
</tr>
<tr>
<td>Automatic distribution of discharge report</td>
<td>5 Minutes per report</td>
<td>6,824</td>
<td>568.67</td>
<td>0.33</td>
</tr>
</tbody>
</table>

### Preference cards in OR

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL Surgical Procedures</td>
<td>11,874</td>
<td>11,727</td>
<td>12,414</td>
</tr>
<tr>
<td>Scheduled Procedures</td>
<td>10,453</td>
<td>10,173</td>
<td>10,897</td>
</tr>
<tr>
<td>TOTAL Increase 2013-11</td>
<td>540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% TOTAL INCREASE related to 2011</td>
<td>%-1,25</td>
<td>%5.53</td>
<td></td>
</tr>
</tbody>
</table>

### BUDGET

<table>
<thead>
<tr>
<th>BUDGET</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL Expenses Medical Supplies</td>
<td>$ 12,297,370</td>
<td>$ 10,719,001</td>
<td>$ 9,466,640</td>
</tr>
<tr>
<td>Expenses in Surgical Area</td>
<td>$ 4,304,079</td>
<td>$ 3,751,650</td>
<td>$ 3,313,238</td>
</tr>
<tr>
<td>TOTAL Savings 2013-11</td>
<td>-$ 990,841</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% SAVINGS IN SURGICAL AREA related to 2011</td>
<td>%29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Examples of Operational Efficiency

Source: marinaSalud Managing Control
Examples of Quality of Care

Full nursing process

• 100% of patients with nursing care plans
• 100% of patients with nursing care report
• 5 rights in the close loop medication process
• Full paperless nursing care process: assessment, diagnosis, care planning and evaluation of results.
Examples of Quality of Care

Pressure ulcers (PU)
- 99.42% of hospitalized patients had Norton risk scale for pressure ulcer assessment.
- In 1,561 patients, 72 PU prevalence of 4.61%.
- Only 28 PU are hospital waste prevalence of 1.79%.

Falls
- 72,832 stays were recorded.
- Conley risk rating scale to 1,555 patients.
- 126 falls were recorded.
- Incidence rate of 1.73 x 1000.

The patient was:
- 44% wandering.
- 32% lying.
- 11% sitting.

Phlebitis
- 128 patients analyzed.
- Selected dressing:
  - Transparent 59.63%
  - Bandages or mesh 37.61%
  - Opaque 2%

Degree of phlebitis:
- No presence 86.24%
- Signs 10.09%
- Phlebitis 3.67%
Examples of Quality of Care

**IEM pre-op**

- 2009: 1.91
- 2010: 1.59
- 2011: 1.21
- 2012: 1.03
- 2013: 0.89

**IEMAR**

- 2009: 1.3
- 2010: 1.2
- 2011: 1.03
- 2012: 0.98
- 2013: 0.93

**ICSIA**

- 2009: 0.88
- 2010: 0.9
- 2011: 0.94
- 2012: 0.94
- 2013: 0.93
Examples of Quality of Care

**Complexity. Relative weight.**

- 2009: 0.9446
- 2010: 0.9712
- 2011: 1.0566
- 2012: 1.0957
- 2013: 1.1141

**ICAR (complications)**

- 2009: 1.12
- 2010: 1.09
- 2011: 1.04
- 2012: 1
- 2013: 0.92

**IRAR (readmissions)**

- 2009: 1.1
- 2010: 1.06
- 2011: 1.01
- 2012: 0.93
- 2013: 1

**IMAR (mortality)**

- 2009: 1.47
- 2010: 1.47
- 2011: 1.23
- 2012: 1.05
- 2013: 0.92

**Complexity. Relative weight.**

- 2009: 0.9446
- 2010: 0.9712
- 2011: 1.0566
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**ICAR (complications)**

- 2009: 1.12
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- 2009: 1.1
- 2010: 1.06
- 2011: 1.01
- 2012: 0.93
- 2013: 1

**IMAR (mortality)**

- 2009: 1.47
- 2010: 1.47
- 2011: 1.23
- 2012: 1.05
- 2013: 0.92
Examples of Patient Safety

**Absolute Deaths Observed & Predicted**

- Deaths Obsv
- Deaths Pred
- UL 95% CI
- LL 95% CI

**% SEPSIS Deaths Observed & Predicted**

- In four months 32% reduction of deaths observed front predicted

Incomes for sepsis per month

Incomes for sepsis per year

Organised by: HIMSS Europe
Examples of Patient Safety

Pre-operative chest x-ray rule
- In pre-operative test plan, chest x-ray rule is canceled if patients is <60 years
- 988 x-ray avoided first year

Early diagnosis of cervical cancer
- Automatic alert in case of alarming result, reducing gynecologist visit time and sending letters to the patients in case of normal results (without intervention of staff)
- Reduced 30% process time

Alerts in case of allergies on medication
- The prescription process alerts the doctor for allergies to medication
- 1292 alerts in allergies and doctors cancelled 392 prescriptions (30.34%)

Intensive immunization in HIV patients
Vaccination influenza, hepatitis, pneumococcal reaching 99% in the target population.

- 90% reduction in readmission for respiratory and during the first 6 months, no cases of infection by hepatitis and pneumococcal income in the target population were detected.
Conclusions

IT is not enough

Innovation in processes is essential

Without people is not possible
Thank You!

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