LA TRASFORMAZIONE DIGITALE PER INTEGRARE SANITÀ E SOCIALE

Sorrento 8-9 Aprile 2019 Hotel Tramontano

PROGRAMMA 8 APRILE
Dal Fascicolo Sanitario Elettronico alle applicazioni

Sergio Pillon
s.pillon@scf.gov.it
Un esempio di uso virtuoso del FSE
Materials and Methods Primary care data were collected from a cohort of 606,403 Israelis (of whom 3135 were diagnosed with CRC) and a case control UK dataset of 5061 CRC cases and 25,613 controls. The model was developed on 80% of the Israeli dataset and validated using the remaining Israeli and UK datasets. Performance was evaluated according to the area under the curve, specificity, and odds ratio at several working points.

Results Using blood counts obtained 3–6 months before diagnosis, the area under the curve for detecting CRC was 0.82 ± 0.01 for the Israeli validation set. The specificity was 88 ± 2% in the Israeli validation set and 94 ± 1% in the UK dataset. Detecting 50% of CRC cases, the odds ratio was 26 ± 5 and 40 ± 6, respectively, for a false-positive rate of 0.5%. Specificity for 50% detection was 87 ± 2% a year before diagnosis and 85 ± 2% for localized cancers. When used in addition to the fecal occult blood test, our model enabled more than a 2-fold increase in CRC detection.

Discussion Comparable results in 2 unrelated populations suggest that the model should generally apply to the detection of CRC in other groups. The model’s performance is superior to current iron deficiency anemia management guidelines, and may help physicians to identify individuals requiring additional clinical evaluation.

Conclusions Our model may help to detect CRC earlier in clinical practice.
Tanti dati: un problema ed una soluzione allo stesso tempo

Il modello Israeliiano
But the problem is also part of the solution...
Data as a resource

DATA is the new OIL

“I ask that you think of Data as "the next natural resource"

Ginni Rometty, IBM CEO

MEDinISRAEL
Previous Work – Descriptive

Variations in Hemoglobin Before Intestinal Cancer Diagnosis

Prof. Varda Shalev MD MPA


Prof. Varda Shalev
Maccabi-MedicalCS
Personalized Predictive Analytics
and Big Data
Early detection of Colorectal Cancer
Big Data the 'new gold' in Healthcare Dive

Each time there is a new IT development, the rush into the newly created vacuum is unavoidable.

- "Healthcare is becoming a gold mine," one executive is reported. More than 2.310 digital health projects were reported. The amount expected to be produced is expected to reach 3.000 by 2019.

- Human data and the ability to transform healthcare and health history, medical claims, and academic research into digital data a day — or about 30% of the data produced in 2017, according to a recent report.

- The data are coming from the United States, where 86% of the population has health insurance. The data is sold in the U.S. market.

How Israel Turned Decades Of Medical Data Into Digital Health Gold

Amir Mizroch

Amir is the Director of Communications at Start-Up Nation Central.

Guest post by Moshe Bar Siman Tov, Director General of the Israel Ministry of Health.

All over the world, healthcare systems are struggling to provide the service their patients demand while also working within the legal and budgetary constraints set by governments or other institutions like insurance companies and hospitals. Digitization of medical records and new medical technologies have yet to touch large swathes of the world’s medical institutions. In many countries, because of differences in the way records are kept, healthcare services and organizations are unable to "talk" to each other and cannot share data. That makes for inefficiency; if data cannot be shared between institutions, things as basic as blood tests need to be repeated each time a patient goes to a different doctor or institution.
Tutti abbiamo dispositivi che misurano «i passi», associabili alla frequenza cardiaca..
E al sonno....

**Frequenza cardiaca**

<table>
<thead>
<tr>
<th>Giorno</th>
<th>Settimana</th>
<th>Mese</th>
<th>Anno</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

260 bpm
150 bpm
119 bpm
50 bpm
49 bpm
59 bpm

**Sonno**

<table>
<thead>
<tr>
<th>Giorno</th>
<th>Settimana</th>
<th>Mese</th>
<th>Anno</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ora di dormire: 00:10
Ora di alzarsi: 08:01

**Qualità sonno**

76

Assicurati un sonno della durata sufficiente per avere tanta energia. Sai andato a dormire alle 00:10 la scorsa notte, che è un po' tardi.

**Intervalll frequenza cardiaca**

- Estremo: 146~162 bpm
- Anaerobico: 130~145 bpm

**intervallo di Frequenza Cardiaca**

**Sonno totale**

7 ore 46 min

**Sonno profondo**

27%

**Sonno leggero**

56%

**Sonno REM**

18%

**Continuità sonno profondo**

54 punti

**Sveglio**

1 volta

**Qualità respiro**

70 punti

**Pisolini**

0 minuti

HUAWEI TruSleep™ supporta solo le statistiche per 3 ore o più di sonno.

**Qualità del sonno (media)**

71

La tua qualità di respirazione durante il sonno registrata è sotto la media per 5 giorni in questa settimana, un aumento del 0 giorni rispetto alla scorsa settimana. Migliora la tua qualità di vita!

Con l'aumento di peso, il contenuto di grasso del palato molle e la parete della gola e il volume dei tessuti molli intorno al collo aumentano, aspetto che porta a rassodamento per respirazione irregolare. L'esercizio fisico regolare e una dieta sana possono prevenire l'aumento di peso.
Ma per persone anziane o fragili i dati dei «sensori» sono ancora piu’ importanti..
Indicatori di profilo del glucosio (con valori del glucosio)
1 gennaio 2019 - 31 marzo 2019 (90 giorni)
IMPOSTAZIONE GLUCOSIO BASSO CONSENTITO: Medio
IMPOSTAZIONI OBIETTIVO MEDIO: 154 mg/dL (A1c: 7.0% o 53 mmol/mol)

A1c stimata 6,5% o 48 mmol/mol

FONTE: Freestyle Libre 2.2.13
Freestyle Libre 1.0
The Effect of a Continuous Patient Monitoring System on Reducing Falls, Pressure Ulcers and Hospitalization in Skilled Nursing Facilities

A. Hassan - A. Sela

VATIKIM Geriatric center, Tel Aviv, Israel

Introduction

Background: In the skilled nursing facility, acute changes in condition can result in unplanned hospitalizations for the elderly, often due to falls with injury, or as the result of the onset of an acute medical illness. The introduction of new technological solutions that incorporate continuous vital sign monitoring and surveillance of patient activity in bed can be utilized to improve outcomes among the nursing home population.

Objective: To assess the effects of continuous monitoring in reducing hospitalizations of post-acute care residents in a skilled nursing facility. This was studied using Vitalerter, a contactless patient monitoring system that continuously transmits real-time information on pulse, respiratory rate, and level of activity in bed directly to the nursing staff, and instantly alerts when these values fall outside of preset parameters.

Methods

This study was conducted at the VATIKIM Geriatric Center, a 250-bed facility in Tel-Aviv Israel. A 6 months monitoring period was compared to observe before-after outcome information. Data on patients' falls, early diagnosis and treatment at the facility, and re-admissions to hospital rates, were collected.

Contactless sensors that monitor patient heart and respiratory rates, and in/out of bed status, were utilized.

All data was provided to caregivers on monitors and at the nursing station. Alerts regarding changes in vital signs or bed exit were transmitted to nurses for further assessment and intervention.

Results & Conclusions

We reviewed 64 patient records for our evaluation vs 64 checked before the test. The transfer rate to the hospital decreased by 38%, pressure ulcers decreased by 80% and the falls rate decreased by 56%.

<table>
<thead>
<tr>
<th>Vatikim facility - Outcome data</th>
<th>Before evaluation</th>
<th>Evaluation (monitored patient)</th>
<th>Improvement %</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Residents</td>
<td>64</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>28</td>
<td>54.4%</td>
<td>25</td>
</tr>
<tr>
<td>Women</td>
<td>36</td>
<td>45.6%</td>
<td>39</td>
</tr>
<tr>
<td>Age (Avg)</td>
<td>78</td>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

Results

- Fall from bed: 9 to 4, 62.5% improvement (-56%)
- Pressure Ulcers: 6 to 1, 9.38% improvement (-83%)
- Readmission to Hospital: 13 to 8, 20.31% improvement (-38%)

In this study, the implementation of Vitalerter, a continuous patient monitoring system has demonstrated a significant decrease in the total number of falls, pressure ulcers and a trend towards reduction in the transfer rate to hospitals, thus improving the overall quality of care for the elderly.
Variations in hemoglobin before colorectal cancer diagnosis.

Goldshtein I, Neeman U, Chodick G, Shalev V.

Abstract
We have conducted the present case-control study to examine whether long-term variations in blood hemoglobin (Hb) levels within the normal range could detect subtle gastrointestinal bleeding in the early development of colorectal cancer (CRC). A total of 1074 CRC cases aged 45-75 years that have been diagnosed with CRC and had normal Hb levels were frequency matched for age and sex with cancer-free individuals at a ratio of 10 controls per case. Our retrospective analysis indicates that starting from 4 years prior to cancer diagnosis, a progressive significant (P<0.001) decrement in Hb levels (0.28 g/dl per 6 months) was found among cases but not among controls. CRC patients were characterized in an on-going, long-term, logarithmic decrement in Hb levels. Such small changes within the normal Hb range could be missed by health providers, but automatically detected by computerized alert algorithms.

PMID: 20543703 DOI: 10.1097/CEJ.0b013e32833c1be0
[Indexed for MEDLINE]
Nuovi device di telemonitoraggio forniscono parametri in modo non invasivo e continuo
<table>
<thead>
<tr>
<th>Measure</th>
<th>Measurement Record</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIA</strong> Pressione arter</td>
<td>Report</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SV</strong> Stroke volume</td>
<td>Report</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood Gases</strong></td>
<td>Report</td>
<td></td>
</tr>
<tr>
<td><strong>pCO2</strong> Pressione parz di CO2</td>
<td>3 mmHg</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 35</td>
<td>35 to 45</td>
<td>&gt; 45</td>
</tr>
<tr>
<td><strong>pH</strong> pH capillare</td>
<td>7,3</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 7,38</td>
<td>7,38 to 7,44</td>
<td>&gt; 7,44</td>
</tr>
<tr>
<td><strong>CO2</strong> Contenuto di CO2</td>
<td>2 mmol/L</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 23</td>
<td>23 to 29</td>
<td>&gt; 29</td>
</tr>
<tr>
<td><strong>Hematology</strong></td>
<td>Report</td>
<td></td>
</tr>
<tr>
<td><strong>Hgb</strong> Emoglobina</td>
<td>15,1 g/dL</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 14</td>
<td>14 to 17,4</td>
<td>&gt; 17,4</td>
</tr>
<tr>
<td><strong>Hct</strong> Ematocrito</td>
<td>42 %</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 42</td>
<td>42 to 54</td>
<td>&gt; 54</td>
</tr>
<tr>
<td><strong>RBC</strong> Eritociti</td>
<td>4,92 M/μL</td>
<td></td>
</tr>
<tr>
<td>Below Range</td>
<td>In Range</td>
<td>Above Range</td>
</tr>
<tr>
<td>&lt; 4,4</td>
<td>4,4 to 5,7</td>
<td>&gt; 5,7</td>
</tr>
</tbody>
</table>
IT IMPROVES THE CONTINUUM OF CARE BY CREATING A CONTINUUM OF DATA

MEDinISRAEL
HELP PATIENTS TO CONTROL THEIR CONDITIONS
PREDICT FUTURE DETERIORATION
50% OR MORE OF CANCER TREATMENTS BEGIN WITH THE WRONG DOSE OR WRONG MEDICINE
Il Big Data in sanità non vuol dire solo dati sanitari

Sociale e sanitario, assieme, per supportare la FRAGILITA’; cronicità è un concetto ormai superato dall’evoluzione della medicina, siamo tutti cronici ma le priorità devono essere per i più fragili
Big Data refers to the mass of structured and unstructured data generated worldwide. In healthcare, this encompasses everything from electronic medical records to internet-connected (IoT) devices.

It spans four dimensions:

**Volume**

Life sciences/pharma businesses are awash with patient-related data of all types, every day. Artificial intelligence enables healthcare providers to parse through large amounts of data and perform complex analytical tasks quicker and with greater accuracy.

**Velocity**

Waiting for answers from data troves tends to slow things down in a time-sensitive industry. To maximize the value of big data, meaningful insights must be extrapolated as it streams in.

**Veracity**

Establishing trust and accuracy in big data is imperative in the healthcare industry. Data assurance includes guaranteeing that data analytics are error-free and credible.

**Variety**

Big data comes from a myriad of sources, such as IoT devices and social media. New and actionable insights can be found when various data types are analyzed together.

Source: IBM Industry Insights, Rezarfish
Lesson Learned, la corsa all’oro...

- Arrivano i cercatori...poi
- Arrivano i fornitori...poi
- Arrivano le banche...poi

Chi è si è arricchito?
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Grazie

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