Leveraging technology to support participatory medicine: Hospital focused research
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Health Information Technology drivers

- Organizations, standards and legislation
- Quality care and patient safety
- Savings and efficiencies
- Clinical decision-making and research
- Healthcare costs
- Patient expectations (satisfaction)
- Patient engagement

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Introduction to nutrition informatics in Australia

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Abstract
Aim: The aim of this study was to provide an introduction to nutrition informatics, including a brief history and a rationale of its importance for Australian dietetics.
Methods: The study method used was a narrative review informed by a literature review and expert consultation with the Academy of Nutrition and Dietetics.
Results: Nutrition informatics has demonstrated potential to improve efficiencies, reduce costs, support research and ultimately enhance patient care. Governments and organisations have identified this as an emerging priority area. The Dietitians Association of Australia has launched initiatives to advocate and provide strategic advice on dietetic involvement in biomedical informatics and specifically nutrition informatics.
Conclusions: If nutrition standards and processes are not integrated into information systems, dietitians may inherit technologies that do not support dietetic work practices, and opportunities to enhance nutrition services may be missed. It is recommended that dietitians be aware of the opportunities and potential benefits of nutrition informatics, become familiar and involved in technology initiatives, and take the lead in guiding the development and implementation of technologies that may impact patient nutritional care.

Key words: electronic health record, informatics, information technology, nutrition care, nutrition informatics.
Participatory medicine

A movement in which patients shift from being mere passengers to responsible drivers of their health, and in which providers encourage and value them as full partners.

Active involvement and collaboration by patients, professionals and caregivers to:
• Improve care/outcomes
• Reduce medical errors
• Increase patient satisfaction
• Reduce the cost of care

Sources: Society of Participatory Medicine webpage: http://participatorymedicine.org/about
Joint Commission: https://www.jointcommission.org/busting_the_myths_about_engaging_patients_and_families_in_patient_safety/
Drivers – DHA Mission and Values

Mission:
- Transforming Dubai into a leading healthcare destination by fostering innovative and integrated care models and by **enhancing community engagement**.

Values:
- **Consumer centricity** - To prioritize the individual experience in the care delivery process through a coordinated set of services that are tailored to the needs, safety and preferences of the consumers, their families and their caregivers. Individuals, with their families and careers should be involved in decisions about their care and treatment.
- **Efficiency**
- **Engaged and motivated workforce** - To create a work environment that can motivate and attract talented healthcare workforce. The aim is to create engaged, attentive and accomplished workforce that provides distinctive and compassionate care and foster patient trust.
- **Accountability and transparency**
- **Innovation** - To embrace an innovative and interdisciplinary approach to clinical care that strives to enhance the lives of the communities served.
- **Excellence**

Source: Dubai Health Authority webpage: [https://www.dha.gov.ae/en/Aboutus/Pages/Vision.aspx](https://www.dha.gov.ae/en/Aboutus/Pages/Vision.aspx)
Drivers – accreditation

JCI accreditation standards for hospitals:

• Care of Patients: Food and Nutrition therapy (Standard COP.4 and COP.5)
• Prevention and Control of Infections (Standard PCI.7.4)
• Patient and Family Rights (Standard PFR.2)

The hospital supports patients’ and families’ rights to participate in the care process.

Source: Joint Commission International webpage: http://www.jointcommissioninternational.org/
Nutrition Focus – hospital malnutrition

- Diversity across countries in the Middle East – change in nutrition-related health patterns (Galal, 2003)

- 6% - 58% hospitalised patients malnourished or at risk of malnutrition (Al-Zeer et al, 2015)

- Food intake < 50% during the first week is independently associated with prolonged LOS (Allard et al, 2015)

- Food intake < 25% independently associated with prolonged LOS and higher mortality rates (Agarwal et al, 2013)
The right technology
Integrating people & technology:
Tailor the experience to your population

- Tablet at bedside
- Room service call center
- Interactive patient system
Significant increase in patient face-to-face time, enhancing patient engagement, leading to:

- **Improved patient satisfaction**
  (Maunder et al., 2015; Folio et al., 2002; Oyarzun et al., 2000; Dougherty, 1993)

- **Increased nutritional intake**
  (Maunder et al., 2015; Petnicki et al., 1998)

- **Increased staff satisfaction**
  (Maunder et al., 2015; Oyarzun et al., 2000)

- **Decreased waste**
  (Folio et al., 2002; Oyarzun et al., 2000)

- **Decreased costs**
  (Maunder et al., 2009; Petnicki et al., 1998; Mosqueira & Harris, 1996)
Results – patient experience

Patient service preference

- ↑ NA time with patients from 0.33 to 3.5 minutes (p<0.05).
- ↑ patient awareness of NAs and their role.

Source: Maunder et al, 2015 Clinical Nutrition ESPEN.
### Results – nutrition intake

<table>
<thead>
<tr>
<th></th>
<th>Paper menu</th>
<th>RSC – Menu Select</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily energy intake</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[kJ, mean ± SD]</td>
<td>6273 ± 1818</td>
<td>8273 ± 2043</td>
<td>0.000</td>
</tr>
<tr>
<td>(kJ, range)</td>
<td>(2769 – 10499)</td>
<td>(3465 – 13201)</td>
<td></td>
</tr>
<tr>
<td>Breakfast [kJ, mean ± SD]</td>
<td>1483 ± 735</td>
<td>2222 ± 1116</td>
<td>0.001</td>
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<tr>
<td>Lunch [kJ, mean ± SD]</td>
<td>1684 ± 565</td>
<td>2399 ± 858</td>
<td>0.000</td>
</tr>
<tr>
<td>Dinner [kJ, mean ± SD]</td>
<td>1668 ± 762</td>
<td>2937 ± 903</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Daily protein intake</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[g, mean ± SD]</td>
<td>66 ± 25</td>
<td>83 ± 24</td>
<td>0.001</td>
</tr>
<tr>
<td>(g, range)</td>
<td>(22 – 135)</td>
<td>(29 – 134)</td>
<td></td>
</tr>
<tr>
<td>Breakfast [kJ, mean ± SD]</td>
<td>13 ± 7.8</td>
<td>18 ± 10</td>
<td>0.007</td>
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<tr>
<td>Lunch [kJ, mean ± SD]</td>
<td>22 ± 11</td>
<td>27 ± 10</td>
<td>0.028</td>
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<tr>
<td>Dinner [kJ, mean ± SD]</td>
<td>24 ± 16</td>
<td>33 ± 16</td>
<td>0.009</td>
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<tr>
<td><strong>Mean energy goal achieved [%]</strong></td>
<td>86%</td>
<td>110%</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Mean protein goal achieved [%]</strong></td>
<td>86%</td>
<td>105%</td>
<td>0.020</td>
</tr>
</tbody>
</table>

*t-test used for parametric data and Man-Whitney U test used for parametric data to determine significance of differences (p<0.05 = significant)

Source: Maunder et al, 2015 *Clinical Nutrition ESPEN.*
Increased patient engagement/food choice and timing control – ‘what they want, when they want it’, leading to:

- Improved patient satisfaction

- Increased nutritional intake
  (McCray et al, 2015; Kuperberg et al, 2008; Williams et al, 1998)

- Decrease waste
  (McCray et al, 2015; Kuperberg et al, 2008)

- Decrease costs
  (McCray et al, 2015; Kuperberg et al, 2008)
Patient foodservice satisfaction

Results – nutrition intake

*Independent t-test used to determine significance of differences (p<0.05 = significant)

Increased patient engagement/food choice and timing control, leading to:

- **Improved patient satisfaction**
  (Barrington et al, 2016 - unpublished)
  - 60% uptake of self ordering

- **Increased nutritional intake**
  (Barrington et al, 2016 - unpublished)
  - Energy intake increase by 20%
  - Protein intake increase by 33%
The power of data driven decisions
Deeper understanding of menu preferences:
- Most/least popular items
- Most/least wasted items
Comparison of product brands/flavours

Menu design information:
- Higher % consumed items – defaults
Identify patients with intake <50% or <25%
Immediate opportunities for nutrition intervention

Determine if patient nutritional intake meeting nutrition goals
Analyse intake compared to diagnosis, diet type, age, SGA…
Compare intervention to outcomes
Data examples

<table>
<thead>
<tr>
<th></th>
<th>Energy (kJ)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
<th>Carbohydrate (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rehab</strong></td>
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<tr>
<td>General</td>
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<td>53</td>
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<td>HEHP</td>
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<td>17</td>
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<td>64</td>
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<td>Diabetic</td>
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<td>20</td>
<td>23</td>
<td>51</td>
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<tr>
<td>Clear Fluids</td>
<td>546</td>
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<td>32</td>
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<tr>
<td><strong>Palliative</strong></td>
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<tr>
<td>General</td>
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<tr>
<td>Soft Diet</td>
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<td>Puree/Minced</td>
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<td>13</td>
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<tr>
<td>HEHP</td>
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<tr>
<td>Full/Clear Fluids</td>
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<td>Service Course</td>
<td>Most Consumed</td>
<td>Least Consumed</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Food Item</td>
<td>n</td>
<td>Intake(%)</td>
<td>Food Item</td>
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<td>Hot Breakfast</td>
<td>Mushrooms</td>
<td>26</td>
<td>95</td>
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<td></td>
<td>Grilled Sausage</td>
<td>43</td>
<td>82</td>
<td>Baked Beans</td>
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<td>Scrambled Egg</td>
<td>229</td>
<td>81</td>
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<td>Cereals</td>
<td>Nutri Grain</td>
<td>9</td>
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<td>Weetbix</td>
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<td></td>
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<td>White</td>
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<td>Milk</td>
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<td>Vanilla Resource Plus</td>
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<td>Vanilla Forticreme</td>
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</table>
References


• McCray S, Krikowa R, Regan K, Maunder K. Do you want to provide food, or do you want your patients to eat? Evaluation of Australia’s first Room Service Choice on Demand implementation. 32nd National Conference of the Dietitians Association of Australia, Perth. Nutr & Diet. 2015;72(Suppl.S1), 4


