



## Technology to Improve Patient Satisfaction and Outcomes

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Hawaii Dietetic Association Meeting  
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  - American Dietetic Association's Nutrition Informatics Committee
  - HIMSS Analytics for Informatics Survey

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## Learning Objectives

- Understand how nutrition informatics is impacting dietetics practice in hospitals today
- Identify how current technology trends are influencing food & nutrition system implementations
- Utilize computerized food and nutrition management systems to support innovative ways to increase patient satisfaction and improve patient outcomes.

**Learning Codes:**  
1065 – Informatics (New!)  
8018 - Environmental, agricultural and technologic influences on food systems


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## Nutrition Informatics

***"The effective retrieval, organization, storage, and optimum use of information, data, and knowledge for food and nutrition related problem solving and decision making. Informatics is supported by the use of information standards, information processes, and information technology."***

(ADA Nutrition Informatics Work Group, 2007)  
Adapted from the definition of biomedical informatics in Biomedical Informatics by Shortliffe & Cimino Springer Science & Media 2006

## Nutrition Informatics

***140 Characters or Less...*** 

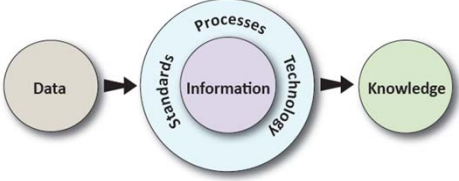
***"The intersection of information, nutrition, and technology."***

(ADA Nutrition Informatics Committee, 2010)

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## From a Process Perspective . . .

Nutrition Informatics is the intersection of information, nutrition and technology.





E. Ayres - 2008  
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## Key Drivers of Change in Health Care

- Health Information Technology
  - Implementation and adoption of Electronic Health Records (HITECH Act & Meaningful Use Regulations)
  - Health information exchange to achieve improvements in healthcare
  - Standards for Interoperability
    - Health Level Seven & other Standards Development Organizations
- Technology explosion
  - Mobility & Access—New devices, new methodologies

*Anything really is possible!*

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## “HITECH Act”


- Health Information Technology for Economic and Clinical Health (HITECH Act)
- Signed into law Feb. 17, 2009
- Goal: To improve health care delivery and patient care through unprecedented investments in health information technology (HIT)

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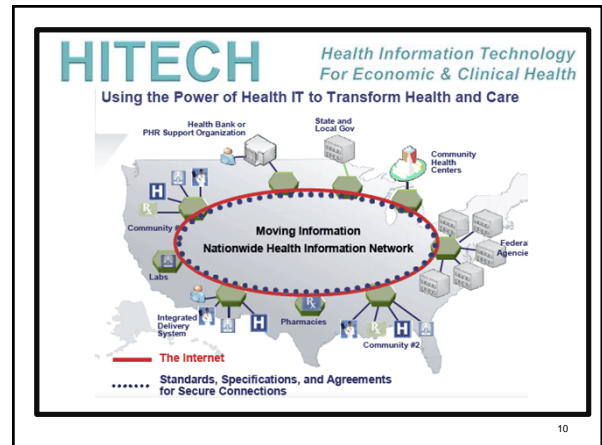
## ‘Meaningful Use’ Regulations

Criteria established for Medicare- and Medicaid-participating providers and hospitals to receive incentives for using electronic health records (EHRs) in a meaningful manner which includes:

- Electronically capturing health information in a coded format
- Using that information to track key clinical conditions
- Communicating that information in order to help coordinate care and
- Initiating the reporting of clinical quality measures (e-measures) and public health information



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## “The Age of Meaningful Use”

“Most important is the role of meaningful use as a vision of how information can be brought to bear in new ways for the improvement of health and health care. . . . Electronic information, especially standards-based information, can become dynamic, interacting with other information to (for example) generate useful safety alerts, call attention to treatment alternatives, enable instantaneous assessments of quality of care or outcomes for patients, or contribute to public health surveillance. We have never, in the history of medicine, had such tools at our disposal.”

A Message from Dr. David Blumenthal, (former) National Coordinator for Health Information Technology (February 23, 2011)

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## EMR/EHR Adoption: How Are We Doing?

US EMR Adoption Model <sup>SM</sup>			
Stage	Cumulative Capabilities	2010 Final	2011 Q1
Stage 7	Complete EHR, CCD transactions to share data; Data warehousing; Data connectivity with ICD, ambulatory, OP	1.0%	1.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full E-PACE	3.2%	3.5%
Stage 5	Closed loop medication administration	4.5%	5.9%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	10.5%	10.7%
Stage 3	Hyperclinical documentation (flow sheets), CDSS (error checking), PACS (enable outside facility)	49.0%	48.4%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	14.6%	14.1%
Stage 1	Ancillaries - Lab, Rad, Pharmacy - All Installed	7.1%	6.7%
Stage 0	All Three Ancillaries Not Installed	10.1%	9.6%

Data from HIMSS Analytics<sup>SM</sup> Database © 2011 N = 5,289    n = 6,276

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## The Dietetics Profession & Informatics

**NEW**

### Results from 2011 Nutrition Informatics Survey As of March 18, 2011

- Built upon Research conducted in 2008
- 3342 Respondents
- 99% Confidence with 2.2 Confidence Interval

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## Primary Practice Area

Nearly half of the respondents indicated that their primary practice area surrounds clinical nutrition. This was also the most frequently selected response in the previous research.

Area	Percent – 2008	Percent – 2011
Clinical Nutrition	35.6%	43.3%
Community	13.1%	13.8%
Food and Nutrition Management	9.6%	9.0%
Student	9.5%	7.2%
Consultation and Business	8.0%	8.5%
Education	7.9%	7.6%
Research	3.2%	2.7%
Dietetic Intern	3.1%	NA
Informatics	NA	1.4%
Other	10.0%	6.5%

Which of the below best describes your current primary practice area, or if you are a student, level of education.

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## Setting for Primary Position

One-third of respondents reported working at an acute care facility that provides either inpatient or outpatient services. None of the respondents reported working for a trade association. In the previous research, acute care – inpatient was also most frequently selected (22 percent)

Less than one percent identified:

- Contract Food Management Company
- Research Unit or Center
- Pharmaceutical Distributor
- Software/Hardware Vendor
- Assisted Living Facility
- Professional Association
- Correctional Facility
- Trade Association

N= 3102

What is the setting of your primary position? (Not asked of students) 15

## Mechanism for Accessing Electronic Data Professional Respondents

Nearly all respondents reported that they access electronic data via a dedicated computer located in their office. Another third access information using a shared workstation. This question changed from 2008 and can not be compared to the previous data.

A direct comparison to the 2008 data can't be done because the questions were rewritten. Those responding to the 2008 survey were most likely to report having access to a computer somewhere at their workplace (97 percent). They also reported having access to a computer at their workstation (89 percent).

N= 3102

By which mechanism do you have access to electronic data at your workplace at the time you need it to do your job? 16

## Technology/Computer Applications Most Likely To Be Accessed Electronically

Respondents were most likely to report that they access patient education materials and nutrient databases electronically. Nutrient database was most frequently selected previously.

Area	Percent – 2008	Percent – 2011
Patient education materials	72.1%	81.5%
Nutrient database	78.4%	81.1%
Evidence-based library	77.7%	78.4%
Continuing professional education	66.8%	78.0%
Professional journals	67.3%	77.3%
Recipes/menus	75.3%	75.8%
Lay literature	66.4%	73.1%
Drug data/information from patients/clients	NA	70.7%
Data information about patients	64.7%	66.8%
Standards of practices	64.5%	66.8%

We have listed a number of areas in which you may require data to support your daily work activities. Through which means have you accessed this data in the past six months.

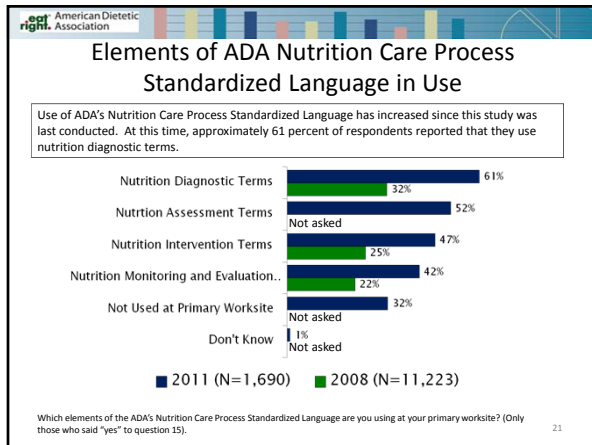
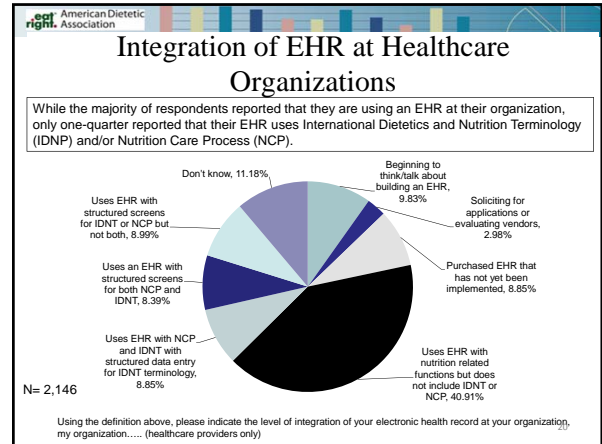
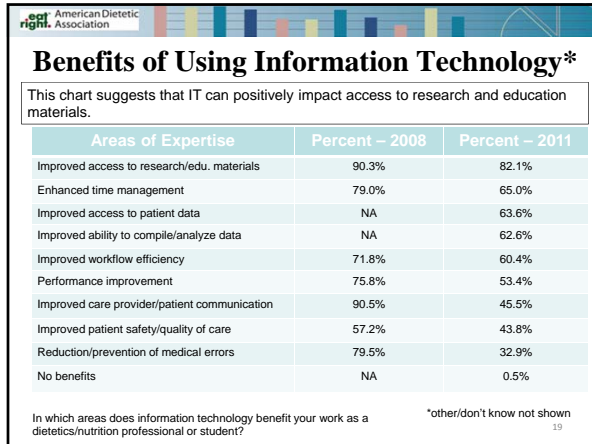
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## Applications/Technologies Used in Past 6 Months

Respondents were most likely to report that they used web tools for collaboration and communication to support daily activities. Three-quarters also reported using clinical nutrition management technologies in the past six months.

N= 3342

Please indicate which of the following technologies or computer applications you have used in the past six months to support your daily activities. 18



### Technology Trends

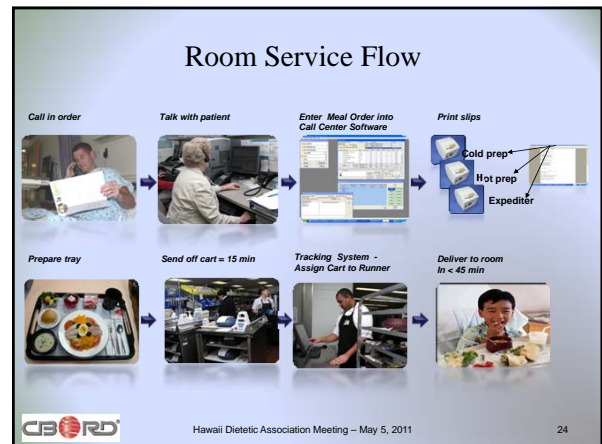
- AHA Hospitals & Health Networks magazine's annual "Most Wired" survey benchmarks Information Technology in four areas:
  - Infrastructure
  - Business and Administrative Mgmt
  - Clinical Quality and Safety
  - Care Continuum
- Going Mobile
  - Beside computing
  - "WOW's" (Workstations on Wheels)
  - Tablets PC market soars!

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### System Innovations & Trends


- Hotel-style Room Service – "What you want, when you want it."
- Modified Bedside Room Service – Host/hostess using Wi-Fi tablets take orders for immediate or future delivery
- Meal ordering integration with in-room Interactive Patient Systems
- Multiple "Pods" replacing traditional traylines

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## Pod Assembly Systems

- Based on LEAN / "Pull" principles
- Deconstructs traditional linear tray assembly by using smaller teams to prepare each tray, typically a floor or unit at a time
- Faster tray assembly rate
- Increased accountability & fewer mistakes
- Load-balance: Open & Close as volume changes




\* Schematic Copyright by Alladin Tempirte  
http://www.alladintempirte.com/ancillary/#

Source: Foodservice Director, January 2009

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## Feeding Today's Hospitalized Patients



- Patients' conditions and co-morbidities are more complex with higher acuity levels
- Diet orders range from liberal to infinitely more complex
- Patient safety and liability issues are mission critical
- Productivity, cost savings, & streamlined work flows—need to achieve more with less
- Meanwhile the number of reporting requirements, privacy controls, and audit procedures continue to increase

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## Manual Diet Office Operations



Is this really what you want your patients to see?

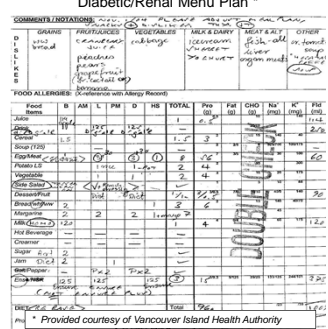
Or expect your staff to use accurately?

\* Tray ticket provided courtesy of Banner Boswell

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## Standardize & Prevent Errors

### Diabetic/Renal Menu Plan \*



- RD or Diet Tech must manually calculate patient meal plans
- Diet office staff have to use this info to correct the menu or tray ticket!

\* Provided courtesy of Vancouver Island Health Authority

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## Goals and Benefits of Food & Nutrition Management Systems

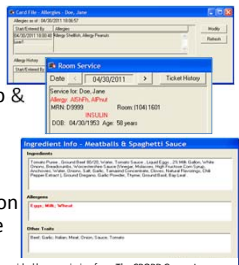
- Maximize patient satisfaction
- Ensure patient safety with diet and allergy appropriate foods
- Control your food costs
- Eliminate manual and repetitive tasks
- Redirect staff toward patient care activities
- Improve workflow & communication
- Security and patient privacy monitoring tools (HIPAA/HITECH)



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## Food Allergies & Patient Safety

- System allergy checking & alerts
  - Interfaced to patient record
  - Highlighted at order entry
  - Items blocked at entry
  - Double-checked at tray prep & assembly
- Ingredient Verification
  - Access to review detailed recipe/ingredient information in room service and bedside menu entry



\* Screens provided by permission from The CBORD Group, Inc.

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**St. Rita's Medical Center**

### Food Cost Savings with Room Service

- St. Rita's Medical Center in Lima, Ohio went live with room service in Feb. 2010:
  - Meals per patient day decreased from 3.86 to 3.06
  - Tonya Burnett, Director of Nutrition Services, reports:
 


*"We have saved over \$116,000 in food costs in the first 10 months."*

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**St Vincents & Mater Health Sydney**

### Bedside Menu Service Implementation

- 950 bed, multi-hospital campus:
  - Dominant patient groups were 50-64y, 65-74y, & > 80y
  - Avg LOS = 5-6 day
  - Patients with high acuity & malnutrition rates of 35-60%
- Changed from traditional selective menus to "Bedside Menu Service" with Nutrition Assistants using wireless laptops on ergonomic trolleys" in 2010



Source: Lazarus, C. *Meals on Wheels: Optimising Nutrition Care using a Bedside Menu Service*. Data presented at CBORD Annual User Group Conference, October 2010.

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**St Vincents & Mater Health Sydney**


### Bedside Menu Service Outcomes

- Patient Satisfaction increased
  - Press Ganey scores: Up from 75<sup>th</sup> to 85<sup>th</sup> percentile
  - Letters of Commendation: Up from <5 per month to 30-40
  - Increased contact reduced meal issues
- Nutrition staff satisfaction & morale improved
  - NA's are now ward-based, not office-based & utilising nutrition knowledge
  - Spending more time with patients (60% up from 19%)
  - Dietitian's reported 100% satisfaction

Source: Lazarus, C. *Meals on Wheels: Optimising Nutrition Care using a Bedside Menu Service*. Data presented at CBORD Annual User Group Conference, October 2010.

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### Room Service Pilot in Pediatric Hospital Setting




- Pilot study at The Hospital for Sick Children (2008)
- Prospective, cross-sectional inpatient study (n= 54):
  - 3 days current cold-plated tray & 3 days hotel-style room srv
- Improved satisfaction
  - With food temperature (P<0.05)
  - Perception of food (P<0.05)
  - Meal serving times (P<0.05)
  - Perception that food met patient needs (P<0.05)
- Food cost decreased at breakfast and lunch
- Reduction in food waste at all meals

Source: Kuperberg, K. et al. How will a room service delivery system affect dietary intake, food costs, food waste and patient satisfaction in a paediatric hospital? A pilot study. *Journal of Foodservice*, 19 (255-261); 2008.

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### RS Pilot – Improved Dietary Intake

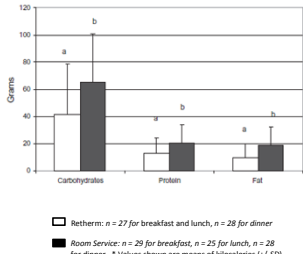
- Increased energy (↑ 45%) consumption at lunch, (P<0.05)
- Trend towards increase at breakfast & dinner



Source: Kuperberg, K. et al. How will a room service delivery system affect dietary intake, food costs, food waste and patient satisfaction in a paediatric hospital? A pilot study. *Journal of Foodservice*, 19 (255-261); 2008.

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### RS Pilot – Improved Dietary Intake



**Nutrient Intakes for Lunch:**

- Carbohydrate ↑ 46%
- Protein ↑ 39%
- Fat ↑ 48%

Source: Kuperberg, K. et al. How will a room service delivery system affect dietary intake, food costs, food waste and patient satisfaction in a paediatric hospital? A pilot study. *Journal of Foodservice*, 19 (255-261); 2008.

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## Diabetes & Hyperglycemia

- Prevalence: 25.8 million people in US have diabetes<sup>1</sup>
  - 8.3% of the population (including undiagnosed)
- Hospital discharges listing diabetes have more than doubled
  - ~ 22% of all hospital inpatient days incurred for people w/ diabetes
  - Accounting for half of \$174 billion US med. expenditures for diabetes
- Poor glycemic control in hospitalized patients linked to poor outcomes (higher morbidity, increased complications & LOS)
  - As many as 1/3 of hospitalized patients will experience significant hyperglycemia
  - Yet recent RCT findings highlight the risks of severe hypoglycemia resulting from tight glycemic control using insulin

Sources: (1) Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. [www.cdc.gov/diabetes](http://www.cdc.gov/diabetes). Accessed online April 2011

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## Improving Glycemic Control

- AACE/ADA Consensus Statement on Inpatient Glycemic Control stated:

“Scheduled subcutaneous administration of insulin, with basal, nutritional, and correction components, is the preferred method for achieving and maintaining glucose control.”

Source: American Association of Clinical Endocrinologists and American Diabetes Association Consensus Statement on Inpatient Glycemic Control Diabetes Care June 2009 32:1119-1131; published ahead of print May 8, 2009, doi:10.2337/d09-9029

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## Glycemic Control Recommendations

- Involvement of interdisciplinary team focused on glycemic control
- Integration of blood glucose monitoring with nutritional care
- Coordination of the timing of insulin administration, blood glucose monitoring and meal service
- Ensuring adequate intake coupled with insulin therapy to reduce risks of hyperglycemia

Source: McKnight KA, Carter L. Front Trays to Tube Feedings: Overcoming the Challenges of Hospital Nutrition and Glycemic Control. Diabetes Spectrum. October 2008 21:233-240.

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## Inadequate Intake Among Hospitalized Patients

Multiple factors can contribute to inadequate intake including:


- Increased needs from catabolic stress
- Altered taste and appetite
- Nausea, vomiting, & GI distress
- Timing of meals/snacks not consistent with patient’s usual patterns
- Patient’s food preferences or usual foods not offered
- Delayed or skipped meals because of scheduled procedures
- Patients’ or family members’ lack of understanding of nutritional care plan
- Lack of knowledge among medical staff on current trends on nutrition and meal-planning

Source: McKnight KA, Carter L. Front Trays to Tube Feedings: Overcoming the Challenges of Hospital Nutrition and Glycemic Control. Diabetes Spectrum. October 2008 21:233-240.

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## Leverage Nutrition Systems to Support Diabetes Meal Management


- List carbohydrates on menus and meal delivery tickets
- Order entry screens display nutrient info and sub-totals for the meal and the day
- Prompts help staff suggest appropriate choices and reinforce diet education
- Insulin alerts trigger procedures to notify nursing when room service meals are ordered
- Tray tracking systems improve communication with staff on the floor



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## Nutrition Informatics is Now!

- Look around you. Nutrition informatics has already begun to impact dietetics practice.
- Use technology and nutrition informatics as a tool to support your practice of nutrition.
- Nutrition informatics is in alignment with the future of healthcare - growth in the use of technology to ensure safety, positive outcomes and satisfaction of patients.



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Thank You!

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