Managing Nutrition Support in the EHR Era – We’re All in this Together!
Clinical Nutrition Week 2017
Sponsored by ASPEN Clinical Nutrition Informatics Committee (CNIC)
Tuesday, 2/21/2017
9:45 am to 11:15 am

Are EHR’s Improving in Safety and Efficiency?
Vincent Vanek, MD, FACS, FASPEN
- Regional Medical Informatics Officer, Mercy Health of Ohio
- Chair ASPEN Nutrition Clinical Informatics Committee

Disclosures
I have no commercial relationships to disclose

Learning Objectives
1. Discuss the methodology of the A.S.P.E.N./Academy EHR Survey
2. Review the findings of the A.S.P.E.N./Academy EHR Survey
3. List the recommendations from the A.S.P.E.N./Academy EHR Survey

Managing Nutrition Support in the EHR Era – We’re All in this Together!
1. Are EHR’s Improving in Safety and Efficiency?
   Vincent Vanek, MD, FACS, FASPEN
2. How can we get EHRs to talk to one another?
   Margaret Dittloff, MS, RDN
3. What are the Key Functionalities Necessary in EHRs to Safely Provide Parenteral Nutrition (PN) to our Patients?
   Phil Ayers, PharmD, BCNSP, FASHP

Agenda
1. Brief History behind EHR Implementations
2. Steps in Implementing an EHR
3. Methodology of Initial and Follow Up ASPEN EHR Surveys
4. Findings of the ASPEN EHR Surveys
5. Example of Nutrition Enhancements in an EHR
6. Recommendations from the ASPEN EHR Surveys
History Behind EHR Implementations

• 1991 – IOM calls for transition to EHR within 10 years
• 1996 – HIPAA (initially introduced to standardize electronic healthcare transactions and nation identifiers for providers)
• 1999 – VA implemented EHR (VistA)
• 2000 – IOM published “To Err Is Human: Building a Safer Health System” (44,000-98,000 deaths in U.S./yr due to medical errors)
• 2004 – President Bush established National Coordinator for Healthcare Information Technology (ONCHIT) – charged with developing & implementing an interoperable HIT infrastructure to improve quality and efficiency; set goal to have all Americans treated with EHR by 2014
• 2008 – 11% of non-federal U.S. hospitals had basic EHR and < 2% comprehensive EHR

Steps in Implementing an EHR

• 2/2009 – HITCHEC Act – “Carrot and Stick” approach to getting providers and hospitals to implement EHRs:
  ✓ “Carrot” – starting in 2010 federal government to provide incentive payments for implementing or having an EHR
    ➢ Hospitals up to $11 million over 3 years
    ➢ Provider Offices up to $44,000/provider over 3 years
  ✓ “Stick” – starting in 2015 Medicare decreases reimbursements 1% with an additional 1% each year to maximum of 5% if do not have an EHR
  ✓ EHR Must Meet Meaningful Use (MU) to obtain incentive payments or avoid penalties – implemented in Stages, i.e. Stage 1, Stage 2, and Stage 3

Methodology of Initial and Follow Up ASPEN EHR Surveys

• 2/2012 – Initial EHR Survey – surveyed all ASPEN members from 2/1/2012 to 2/22/2012
• 7/2014 – ASPEN formed the Clinical Nutrition Informatics Committee (CNIC)
• 9/2014 to 1/2015 – Follow Up EHR Survey – CNIC decided to conduct a follow up EHR survey and expand to members of other nutrition societies as well

2. Vanek VW et al. NCP. 2016, 31(3):401-415
Methodology of Initial and Follow Up ASPEN EHR Surveys
- Survey Monkey link emailed to potential participants
- Survey consisted of 20 questions
  - 6 Questions – Discipline, Country, Setting, How long in nutrition support?, What EHR do you use and how long have you used it?
  - 5 Questions – Rate the safety and effectiveness of: 1) Nutrition documentation, 2) Ordering oral diets, 3) Ordering oral nutrition supplements (ONS), 4) Ordering tube feedings (EN), 5) Ordering parenteral nutrition (PN)
  - 2 Questions – What do you like best and least about the nutrition content of your EHR (free text fields)
  - 7 Questions – different between surveys
    - Initial Survey - who enters nutrition orders
    - Follow Up Survey – specific questions about PN ordering and one question on time to complete work before and after EHR

Responses to the safety and effectiveness questions of the 5 different Nutrition Content Areas in the ASPEN EHR Survey

1. Highly safe and effective
2. Moderately safe and effective
3. Usually safe and effective, but opportunities for improvement
4. Needs improvement before I would consider it completely safe and effective
5. Serious safety and effectiveness concerns and needs urgent changes

Responses to the safety and effectiveness questions of the 5 different Nutrition Content Areas in the ASPEN EHR Survey

FAVORABLE RESPONSES
1. Highly safe and effective
2. Moderately safe and effective

UNFAVORABLE RESPONSES
3. Usually safe and effective, but opportunities for improvement
4. Needs improvement before I would consider it completely safe and effective
5. Serious safety and effectiveness concerns and needs urgent changes

Response Rates for the ASPEN EHR Surveys

<table>
<thead>
<tr>
<th>Nutrition Societies Response Rates</th>
<th>2012 Initial EHR Survey</th>
<th>2014 Follow EHR Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPEN members only</td>
<td>864/5,810 (14.9%)</td>
<td>393/6,179 (6.4%)</td>
</tr>
<tr>
<td>Non-ASPEN Members in Database</td>
<td>236/33,165 (0.7%)</td>
<td>282/1,189 (1.3%)</td>
</tr>
</tbody>
</table>

TOTAL 1,989/55,902 (3.6%)

NOTE: Individuals in 2014 Survey of other nutrition organizations were instructed to not respond if they had already received the survey as a member of another nutrition society
1 Medical Nutrition Council members only – includes ASN members who practice clinically
2 Clinical Nutrition Managers, Dietitians in Nutrition Support, Medical Nutrition Practice Group, and Pediatric Nutrition Dietetic Practice Group

Background Information from the ASPEN EHR Survey

<table>
<thead>
<tr>
<th>2012-ASPEN</th>
<th>2014 - ASPEN</th>
<th>2014-Non-ASPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietitian</td>
<td>676 (78%)</td>
<td>315 (80%)</td>
</tr>
<tr>
<td>Physician</td>
<td>98 (11.5%)</td>
<td>51 (13%)</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>51 (6%)</td>
<td>11 (3%)</td>
</tr>
<tr>
<td>Nurse/NP</td>
<td>35 (4%)</td>
<td>14 (3.5%)</td>
</tr>
<tr>
<td>Not specified</td>
<td>4 (0.5%)</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Located in U.S.</td>
<td>790 (91%)</td>
<td>371 (94%)</td>
</tr>
<tr>
<td>Practice Setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital only</td>
<td>605 (70%)</td>
<td>291 (74%)</td>
</tr>
<tr>
<td>Outpt only</td>
<td>19 (2%)</td>
<td>8 (2%)</td>
</tr>
<tr>
<td>Both</td>
<td>189 (22%)</td>
<td>87 (22%)</td>
</tr>
<tr>
<td>Home Care</td>
<td>51 (6%)</td>
<td>7 (2%)</td>
</tr>
<tr>
<td>Time in Nutrition Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 years</td>
<td>82 (9%)</td>
<td>43 (11%)</td>
</tr>
<tr>
<td>3-5 years</td>
<td>118 (14%)</td>
<td>44 (11%)</td>
</tr>
<tr>
<td>5-10 years</td>
<td>183 (21%)</td>
<td>67 (17%)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>481 (56%)</td>
<td>239 (51%)</td>
</tr>
<tr>
<td>Currently Using EHR</td>
<td>742 (86%)</td>
<td>347 (94%)</td>
</tr>
</tbody>
</table>

* p<0.05

Favorable Responses to 5 Nutrition Content Areas

- Favorable responses for each content area ranged from 44% to 62%
- None of the 2014 favorable responses were significantly better than the 2012 responses and Ordering ONS and Ordering PN were significantly lower
- 2014 Non-ASPEN favorable responses significantly higher compared to 2014 ASPEN favorable responses for Ordering PN
- TOTAL Responses –
  - Ordering ONS significantly higher than other 4 areas
  - Ordering Oral Diets significantly higher than Nutrition Documentation
Comparison Favorable Responses by Discipline
• Combining all 3 survey groups from 2012 and 2014
• Only significant differences in discipline compared to all other disciplines combined was with Nutrition Documentation
  ✓ Dietitians had a higher Favorable response rate
  ✓ Pharmacists had a significantly lower Favorable response rate

<table>
<thead>
<tr>
<th>Discipline</th>
<th>% Favorable Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition Documentation</td>
<td>57.3% (52/91)</td>
</tr>
<tr>
<td>Ordering Or. Dts.</td>
<td>62.5% (87/139)</td>
</tr>
<tr>
<td>Ordering Or. Supp.</td>
<td>62.3% (88/140)</td>
</tr>
<tr>
<td>Ordering Tube Feedings</td>
<td>65.8% (77/117)</td>
</tr>
<tr>
<td>Ordering PN</td>
<td>57.6% (54/94)</td>
</tr>
</tbody>
</table>

p = .05 – discipline’s score significantly better than the other discipline combined.

Comparison Favorable Responses by Length of Time EHR in Use
• Combining all 3 survey groups from 2012 and 2014
• Only consistent differences across all 5 Nutrition Content Areas were:
  ✓ Respondents using the EHR 1-3 years significantly more favorable responses than Respondents using EHR < 1 year
  ✓ Respondents using the EHR > 10 years significantly more favorable responses than Respondents using EHR < 1 year

<table>
<thead>
<tr>
<th>Length of Time EHR in Use</th>
<th>% Favorable Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>60.1% (59/98)</td>
</tr>
<tr>
<td>5 years</td>
<td>62.0% (105/169)</td>
</tr>
<tr>
<td>5+ years</td>
<td>64.2% (127/198)</td>
</tr>
<tr>
<td>10+ years</td>
<td>70.8% (67/95)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>78.6% (67/88)</td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>59.4% (57/96)</td>
</tr>
</tbody>
</table>

p = .05 – group’s responses significantly better than prior group.

Comparison Favorable Responses by Vendor
• Combining all 3 survey groups from 2012 and 2014
• KLAS is non profit organization that ranks EHR vendors each year – some re-arranging of vendor ranks from 2011 to 2014
• Most of the respondents used one of the two top ranked vendors
• Average Favorable responses for all 5 Nutrition Content Areas significantly correlated with the Vendor’s KLAS Rank in 2014

Example of Enhancements in EHR
• Unpublished data - Mercy Health of Ohio - 19 hospitals
• All adult pts admitted 4th Quarter 2014
• Comparison pts with Admission Nutrition Screen (NS) positive vs. negative NS
• NS Pos. pts had higher hospital mortality, LOS, readmission rate, and hospital charges
• NS Pos. pts had higher frequency of Malnutrition Discharge Dx but still 86% had none
• Dietitian’s Malnutrition Assessment was not recorded discretely so could not factor into analysis

Mercy Health of Ohio EHR Enhancements from Malnutrition Study
• Need to implement Mercy Health wide standardized Malnutrition Policy and Procedure
• Need to switch to a standardized, validated malnutrition screen on admission
• Need to standardize dietitian documentation and record discretely
• Improve accuracy of physician documentation regarding malnutrition such that can accurately code for and receive appropriate reimbursement for malnutrition

SUMMARY
• All healthcare systems either have or soon will have an EHR
• The ASPEN EHR Survey should be a wake up call for EHR Vendors, EHR Programmers, EHR Implementation Teams, and Nutrition Clinicians that the Nutrition content of the current EHRs need improved!!
• EHR Implementation is a “Clinical” Project NOT and “IT” Project” – NUTRITION CLINICIANS NEED TO BE INVOLVED!!
  ✓ Work for EHR Vendors
  ✓ Be a part of the healthcare system EHR Build/Support Teams
  ✓ Formation of Clinical Nutrition Informatics Committees within your organization
How Can We Get EHRs to Talk to One Another?

Margaret Dittloff, MS, RDN
Academy of Nutrition and Dietetics, Chicago, IL

Learning Objectives
Upon completion of this session, the learner will be able to:
1. Define interoperability, the role of interoperability in nutrition care, and why it matters
2. Discuss Health Information Exchanges and why sharing information is so difficult
3. Create a plan to allow seamless information sharing for patients across the continuum of care

Interoperability
The ability of a system to exchange electronic health information with and use electronic health information from other systems without special effort on the part of the user.

Disclosures
• Academy of Nutrition and Dietetics, Research Project Manager

Non-federal Acute Care Hospital Electronic Health Record Adoption


Waste in Healthcare Spending

Inaccessible patient information → 40% → Incomplete clinical records
Potential adverse effect in 44% patient-physician encounters
Delayed care or additional services nearly 60% of the time

Source: https://www.healthit.gov/sites/default/files/pdf/ehr-sharing-infographic.pdf
Infographic design by emk514
Why is it so hard?

- Different EHRs or even same vendor/different build or version
- “custom” data integrations (redundant?)
- Information blocking
- Query has workflow challenges


Interoperability Depends on Standards

Using a Common Language

“Semantics”

Vocabulary / Code Sets / Terminology Standards provide standardized (coded) terms to describe clinical information

Examples:
- Patient Medications (RxNorm & National Drug Code (NDC))
- Problems (ICD-10 & SNOMED CT)
- Labs (LOINC)
- Nutrition eNCT (Nutrition Problem/Diagnosis) mapped to SNOMED

Value Set Authority Center (VSAC)

National Library of Medicine

Supplies sets of data for quality measures and HL7 C-CDA Standard

Available with complimentary UMLS license
### Value Sets for Oral Nutrition & Enteral Formulas

<table>
<thead>
<tr>
<th>Value Sets Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content/Structure “syntax”</td>
</tr>
<tr>
<td>Content and Structure Standards (implementation guides) define what information and the format used to convey it (e.g., “form letter template”)</td>
</tr>
<tr>
<td>Examples:</td>
</tr>
<tr>
<td>• HL7 ADT messages</td>
</tr>
<tr>
<td>• HL7 Consolidated-CDA R2 “Care Summary Record”</td>
</tr>
</tbody>
</table>

### HL7 Consolidated Clinical Document Architecture (C-CDA)

<table>
<thead>
<tr>
<th>Document Types</th>
<th>C-CDA (R 1.1)</th>
<th>C-CDA (R2.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity of Care Document (CCD)</td>
<td>Nutrition Section Plan of Treatment (Recommendation)</td>
<td></td>
</tr>
<tr>
<td>Discharge Summary</td>
<td>Discharge Diet Nutrition Section Plan of Treatment (Recommendation)</td>
<td></td>
</tr>
<tr>
<td>Progress Note</td>
<td>Nutrition Section, Plan of Treatment</td>
<td></td>
</tr>
<tr>
<td>Consult Note</td>
<td>Nutrition Section, Plan of Treatment</td>
<td></td>
</tr>
<tr>
<td>Care Plan (NEW)</td>
<td>Health Concern, Intervention</td>
<td></td>
</tr>
<tr>
<td>Referral Note (NEW)</td>
<td>Nutrition Section, Plan of Treatment</td>
<td></td>
</tr>
<tr>
<td>Transfer Summary (NEW)</td>
<td>Plan of Treatment (Recommendation)</td>
<td></td>
</tr>
</tbody>
</table>

### Transport, Security & Services

Transport standards define the method or “how” to move secure messages/information between different electronic systems.

**Implementation Specifications for Services** (i.e., the infrastructure components deployed and used to address specific interoperability needs)

- Direct protocol (secure email messaging)
- X.509 (for digital certificates)
- DNS+LDAP (locating and authenticating recipient’s certificates)

### MU: Transitions with Summary of Care Record - 2014

<table>
<thead>
<tr>
<th>Meaningful Use Measure</th>
<th>Professionals</th>
<th>Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of providers who took an exclusion</td>
<td>98.2%</td>
<td>98.2%</td>
</tr>
<tr>
<td>Performance</td>
<td>86</td>
<td>96</td>
</tr>
<tr>
<td>Mean Performance</td>
<td>86%</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>80%</td>
<td>71%</td>
</tr>
<tr>
<td></td>
<td>75%</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>85%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Community & State HIE Efforts
2014 survey found:
• 106 HIE efforts were operational -11% from 2012
• 21 were planning to become operational -60% from 2012

*Not including HIE networks led by single vendors or consortium of vendors such as EPIC’s Care Everywhere Network or CommonWell Health Alliance.

Source: Julia Adler-Milstein, Sunny C. Lin, and Ashish K. Jha

Stakeholders Engaged in Operational HIE Activities

Top Five Commonly Exchanged Data

Significant Barriers to Health Information Exchange
• Developing a sustainable business model
• Integration into care planning workflows
• Lack of funding$
• Limitations of current interface standards
• Competition with EHR vendors

HIE Success Milestones
San Antonio – first major Texas city to fully engage all hospitals to exchange medical information through local IHE!

Source: http://hietexas.org/summer-2016/milestone-all-major-san-antonio-hospitals-sharing-securely

Nutrition Across Care Settings
• Enteral Use Case
• Transferred to Rehab Hospital or LTPAC with EN or PN
• Discharged to home (Home Health – Infusion Services)
Nutrition and the CDA

**Goal** – map the nutrition care process to the CDA structure

- Increased number of document types allowed for addition of nutrition content
- Nutrition Section
  - Nutrition Status Observation
  - Nutritional Assessment
- Nutrition Recommendation

The Nutrition Section represents diet and nutrition information and overall nutritional status of the patient based on the nutrition assessment findings.

Describes the overall nutritional status of the patient including findings related to nutritional status.

Represents the pt’s nutrition abilities and habits including intake, diet requirements or diet followed.

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To improve the interoperability of nutrition and diet order information across the continuum of care, it is critical that health care providers and sending and receiving system vendors have a clear understanding of the components involved in ordering, preparing, and providing meal trays, formula feedings, and nutritional supplements to patients and residents.
FHIR® NutritionOrder Resource

- Standard Terminology developed using SNOMED CT

Enteral Feeding Nutrition Order and Observations Feedback
- Create and store NutritionOrder Resources in “FHIR server”

Concept: Embedded or Mobile TF App Actual-to-Goal Amounts
- Get Resources and Generate a quick graph of the actual delivered volume/energy vs. what was ordered.
Learning Assessment Questions

1. Semantic interoperability depends on structured clinical content that use the same
   a) message format
   b) standardized terminology and value sets
   c) emerging open-source APIs
   d) infrastructure services

2. Using clinical terminology and structured nutrition data in our nutrition assessment and progress notes within the electronic health records will enable
   a) speed of data entry
   b) improved dietitian workflow
   c) use of nutrition concepts for quality improvement and outcomes research
   d) provider engagement

References


What Are the Key Functionalities Necessary in EHRs to Safely Provide PN to Patients

Phil Ayers, PharmD, BCNSP, FASHP
Mississippi Baptist Medical Center
Clinical Associate Professor
University of Mississippi School of Pharmacy

Disclosures

Baxter
Fresenius Kabi
Janssen
Mallinckrodt

Call to Action

• 2015 work group was formed consisting of members of ASPEN, ASHP, AND
  – Experts in PN
  – EHR Functionality
  – Health Information Technology (HIT) standards

• Publish a call to action paper in journals of participating organizations. A Call to Action for Optimizing the Electronic Health Record in the Parenteral Nutrition Process.
Goals

- Increase awareness of EHR vendors of consensus recommendations and guidelines for safe PN ordering
- Recommend to EHR vendors opportunities to improve PN process functionality and clinical decision support
- Encourage HIT standards for PN across the continuum of care
- Publish a joint paper on EN and best practices

Key Areas

- Standardized PN order and label
- Clinical Decision Support (CDS) and warnings for:
  - Macronutrient
  - Micronutrient
  - Toxicities
  - Incompatibilities
- EHR interfaces with Automatic Compounding Device (ACD)
- Ordering cyclic PN
- Transition from hospital to home

Standardization

- Development and implementation of technical and practice standards into a process so that all health care providers deliver the same level of care
- Opportunities exist for standardization at each step in the PN process
- Supported by:
  - ISMP
  - ASPEN 2004 safe practice
  - ASPEN 2007 statement on PN standardization
  - ASPEN 2014 Consensus Recommendations

ISMP Safe Practice Recommendations

- Match prescribing and pharmacy templates
- Build, test and heed automated warnings
- Heighten suspicions of errors
- Carry out effective redundancies
- Provide clear labeling that matches the sequence of ingredients in the PN order templates in EHR PN order form and the ACD
- Educate and validate competency
- Eliminate transcription of PN orders

Errors in PN Administration

A.S.P.E.N. Standardized PN Template for Adult Patients

Order should have same sequence of ingredients and must match label
**A.S.P.E.N. Standardized PN Template for Pediatric and Neonatal Patients**

Order should have same sequence of ingredients and must match label.

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**Clinical Decision Support (CDS)**

- Concentrations
  - Thresholds
- Rates of infusion
- Dextrose
- Lipid emulsion
- Stability
  - Divalent ions (cracking)
- Compatibility
  - Calcium-phosphorus
- Point of prescribing
  - Ensure adequate provision of nutrients, avoid deficiencies, toxicities, instabilities
  - Time of order verification/review

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**Clinical Decision Support**

- Dosing alerts (both upper limits/maximums and lower limits/minimums) available in all possible units of measurement (e.g., amounts per day, amounts per dose, amounts per kg per day, amounts per kg per dose, amounts per liter/volume/concentration, % concentration, etc.), taking into account whether the PN is being administered through a central or peripheral line
- Auto-populating fields
- Require mandatory fields to be completed
- Require all fields to be completed before order entry
- Use of check-boxes or drop-down menus instead of free-text when possible
- Precipitation warnings based on the calcium-phosphate curve

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**EHR and ACD**

- Fully integrated with no manual transcription
- Standardized additive sequence
- Alert when formulation issues are identified
- Ability to quickly change products
- Barcode scanning technology

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**Ordering Cyclic PN**

- Ability to taper up and down
- Taper regimens
- Customize as needed

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**Transition of PN**

- Approximately 40,000 individuals in U.S. are dependent on home PN
- Ability to transfer between systems (interoperability)
- Review the last PN order within the hospital
- Standardization
### Laboratory Monitoring for Home PN Patient

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Week 1, 2, 3</th>
<th>Week 4</th>
<th>Every 3 months prior to MD office visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose, BUN, CR, lyses, Ca, Mg, Phos.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CBC with diff. and reticulocyte count</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total and direct bilirubin, AST, ALT, LDH, ALK Phos, TG</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Serum proteins</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vitamin B12, RBC folate, iron indices, trace elements, vitamin D 25-OH</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

ASPN Core Curriculum 2012
Summary

• Utilize standardized and validated PN Order and Labeling templates as recommended by ASPEN
• Design PN Orders to facilitate ordering based on ASPEN recommendations and incorporate CDS for Adult, Pediatric, and Neonatal Patients
• Analyze workflow from patient specific PN ordering to minimize manual transcription or double documentation and provide appropriate CDS support in all of these steps.
• Include the functionality to order cyclic PN with and without taper up and/or taper down
• Include the functionality to transition from hospital PN orders to home PN orders and vice versa

References

Institute for Safe Medication Practices. ISMP’s list of high-alert medications. 2014