Electronic Health Records and Treatment Plans – Multiple Opportunities

Institute of Medicine

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Partners Healthcare System
Some personal thoughts:

• Treatment plans have been endorsed for some time, but implementation has been minimal

• Implementation has been minimal because of the incremental work without a clear benefit perceived by many providers

• Manual processes will always be a deterrent to implementation of treatment plans

• Electronic health records can improve safety, quality and efficiency of cancer care

• EHRs can facilitate the use of treatment plans both increasing ease of use, and accuracy and completeness
Why Treatment Plans???
“Medicine has become the art of managing extreme complexity – and a test of whether such complexity can, in fact, be humanly mastered.”

“There are degrees of complexity, though, and medicine and other fields like it have grown so far beyond the usual kind that avoiding daily mistakes is proving impossible even for our most super-specialized.”
Need for Patient-Specific Decision Support Assistance

Facts per Decision

Proteomics and other effector molecules
Functional Genetics: Gene expression profiles
Structural Genetics: e.g. SNPs, haplotypes

Decisions by clinical phenotype
i.e., traditional health care

Human Cognitive Capacity

From Carolyn Compton, NCI
The Treatment Plan

• A form of “Checklist” – listing and codifying data needed to make a treatment decision, putting them down in a logical and complete document.

• Resistance by providers
  – “Not necessary – unneeded extra work burden”
  – “I know what I am doing”
  – “I know what my intent is”
  – “I tell my patients what they need to know”
  – etc
The Reality of our Work Lives

• There are more data that we must process when making clinical decisions, than we sometimes admit to, and the amount of data is increasing rapidly

• We are continually distracted in our work – by calls about other patients, other non-clinical issues, etc

• We work under ever increasing time pressure and stress

• We work in a field where infrequent errors with potential to harm patients are too frequent – the airline phenomenon
  
  – 132,000 treatment visits at DFCI per year (enterprise wide)
  – If “accurate” 99.99% of time,
  – 132 errors per year will occur
Treatment Plans

- Treatment plans represent a critical decision point in initiating a new direction in therapy for a patient.

- Treatment plans represent an aggregate of critical clinical data, at a particular time point in a patient’s course, that should already be in an oncology EHR, but not necessarily well organized.

- These data should help to guide a provider through a thought process for making the best treatment decision.

- ...and would help to articulate this to the patient, facilitate an interactive exchange between provider and patients, and give the patient a written copy to take home with her.
Components of a Treatment Plan

- Critical clinical data, organized in one location, and presented in a coherent way
- Goals of treatment
- Specifics of treatment
How can EHRs Help?

• Specify data that are required to be part of the treatment plan

• Automatically pull data from elsewhere in an EHR, where it exists, entering it into the Treatment Plan, avoiding manual re-entry – and avoiding errors of omission, transcription, etc

• Automatically saves treatment plan, and allows you to print it for the patient. “cc’s” are also sent to associated providers

• Act as a “force function” – could be required to initiate a new therapy
  – Either in workflow – “no treatment plan, no treat”
  – IT enforced – treatment plan needs to be completed before the system will allow you to order a new chemotherapy regimen
Certification Commission for Health Information Technology (CCHIT)

- One of the government sanctioned groups to certify EHRs for Meaningful Use

- A long history of comprehensive certification of EHRs
  - Security
  - Functionality
  - Usability

- Certification “modules”
  - Ambulatory
  - Other specialties (cardiology, mental health)
  - Clinical research

- In December 2008 ASCO and NCI petitioned CCHIT to develop oncology specific criteria

- In July 2010 an oncology work group was initiated to develop oncology specific criteria, and in November 2010 proposed criteria were posted for public comment. Final criteria are likely to be released in late Spring 2011
Certification Commission for Health Information Technology (CCHIT) – Some Basic Principles

• Essential data must be entered into the EHR, and be structured (codified) data

• Codified data permits decision support, safety functions and utilization of data for derivative “products” such as the treatment plan

• Clinic workflow and EHR must be “in synch” and support each other
“The system shall provide the ability to generate electronic output and/or printed copy of the treatment plan for each patient, including:”
CCHIT Treatment Plan Requirements
DRAFT from Public Comments Period

1. Patient name
2. Patient record number
3. Date of birth and age
4. Patient phone and email
5. Physician name and contact information
6. Problem list
7. Allergies
8. Medication list
9. Advanced directives
10. AJCC staging including anatomic and non-anatomic data, prognostic data, location of metastatic disease if applicable
11. Height, weight, BSA, AUC (if applicable)
12. Treatment intent (curative vs palliative)
13. Name of chemotherapy regimen (R-CHOP)
14. Specific chemotherapy drug names, doses and schedule
15. Number of treatment cycles
16. Estimated duration of therapy
17. Major toxicities (short and long-term – may be manually added or pulled from resource data based on chemotherapy drugs
18. Radiation therapy plan (if applicable)
“For any treatment plan generated for a patient at the initiation of a course of treatment, the system shall provide the ability to save each plan”

“A new treatment plan must be completed at the initiation of each new therapy”
ASCO Health Information Technology (HIT) Workgroup

• Vendor lab at annual mtgs
  – “Ticket” of basic functionality to get into lab
  – ASCO’s attempt to drive direction of EHR development – treatment summaries, QOPI reporting, etc
  – Gives attendees a chance to see many vendor products at once

• Symposium in 2007 & 2009 and again in 2011
What else might a treatment plan embedded in an EHR do?

- Auto-generate patient teaching sheets specific to the drugs outlined in the treatment plan
- Auto-generate a patient consent specific to the drugs outlined in the treatment plan
- Serve as an “auto-fill” for the creation of a post-treatment summary care plan
Dana-Farber’s Approach

- This is a work in progress – initially focused on providers and not patients, but will focus on patients in phase II

- We believe the success of this effort will be dependent on eliminating duplicative efforts – enter something just once

- We believe we will end up needing a “force function” for full implementation

- This is currently part of our Pay for Performance work with BCBSMA
  - To improve quality and reduce errors
  - To allow for proactive management of patients by nurse navigators
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<tr>
<th>Date</th>
<th>Subject</th>
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<tr>
<td>02/09/2011</td>
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<td>Imaging IV and Contrast Administration</td>
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<td>01/28/2011</td>
<td>Referrals</td>
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<td>01/27/2011</td>
<td>Pre-Sedation Evaluation</td>
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<td>01/27/2011</td>
<td>Pre-Sedation Evaluation</td>
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<td>Patient Note</td>
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<td>Procedure Note</td>
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<td>12/15/2010</td>
<td>Patient Note</td>
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<td>Patient Note</td>
</tr>
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<tr>
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<td>11/17/2010</td>
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<td>Patient Note</td>
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<td>11/13/2010</td>
<td>Patient Note</td>
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Subject: Amended: Oncology Treatment Plan #2 DFCI 02/11/2011 (Stopped)

Patient: XXXCDETEST, REGB 252305 (DFCI) 12/01/78
Author: Electronically Signed by Lawrence N. Shulman, M.D.

Status: Signed
Visit Date: 02/11/2011

- BOC - Notes Module

Breast Cancer

Problems
Pernicious anemia
Low back pain
Von Willebrand disorder
Borderline Hypertension
FH Poly C Of Colon:
Comment: Type: Chronic

Medications
Colace (DOCSUATE Sodium) 100 MG (100MG TABLET Take 1) PO TID PRN constipation x 30 days #90 Tablet(s)
Dilaudid (HYDROMORPHONE Hcl) 2 MG (2MG TABLET Take 1) PO Q4H x 30 days #180 Tablet(s)
Diltiazem 30 MG (30MG TABLET Take 1) PO QID x 30 days #120 Tablet(s)
Fragmin (DALTEPARIN Sodium 2,500 Units) 2500 UNITS (2500/0.2ML DISP SYRING ML) SQ QD x 30 days #30 Pre-filled Syringe(s)

Allergies
CISPLATIN-AQ - Anaphylaxis

Breast Cancer

Staging
Dx Date (Pre Therapy): 02/09/2011
T: T2
N: N1
M: M0
Group Stage: II B
Prov. Stage: II B
Site: Right
LVI: Absent

Other Tumor Characteristics
Breast Cancer

Problems
Pernicious anemia
Low back pain
Von Willebrand disorder
Borderline Hypertension
FH Polyp Of Colon:
  Comment: Type: Chronic

Medications
Colace (DOCUSATE Sodium) 100 MG (100MG TABLET Take 1) PO TID PRN constipation x 30 days #90 Tablet(s)
Dilaudid (HYDROMORPHONE Hcl) 2 MG (2MG TABLET Take 1) PO Q4H x 30 days #180 Tablet(s)
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Breast Cancer

Staging
  Dx Date (Pre Therapy): 02/09/2011
  T: T2
  N: N1
  M: M0
  Group Stage: IIB
  Prov. Stage: IIB
  Site: Right
  LVI: Absent

Other Tumor Characteristics

Reviewed
Breast Cancer

Staging
Dx Date (Pre Therapy): 02/09/2011
T: T2
N: N1
M: M0
Group Stage: IIB
Prov. Stage: IIB
Site: Right
LVI: Absent

Other Tumor Characteristics
ER: Positive
PR: Positive
HER2/neu IHC: +3
HER2/neu FISH: Positive

Histology Grade
Inv Histology: Ductal
Inv Hist Grade: Poorly Diff (grade 3)

Treatment Plan #2 (Stopped)

Regimen
Goal of Treatment / Indication: Curative / Adjuvant / Neo-adjuvant;
Diagnosis: Breast
Regimen: AC EVERY 2 WEEKS/PACLITAXEL EVERY 2 WEEKS
Chemo Med:

CYCLOPHOSPHAMIDE (600 mg/m²) IV BOLUS Daily Days: 1 x 4 cycles
DOXORUBICIN (60 mg/m²) IV PUSH Daily Days: 1 x 4 cycles
PACLITAXEL (TAXOL ) (175 mg/m²) IV BOLUS Daily Days: 1 x 4 cycles
Regimen

Goal of Treatment / Indication: Curative / Adjuvant / Neo-adjuvant;
Diagnosis: Breast
Regimen: AC EVERY 2 WEEKS/PACLITAXEL EVERY 2 WEEKS

Chemo Med:

- CYCLOPHOSPHAMIDE (600 mg/m2) IV BOLUS Daily Days: 1 x 4 cycles
- DOXORUBICIN (60 mg/m2) IV PUSH Daily Days: 1 x 4 cycles
- PACLITAXEL (TAXOL ) (175 mg/m2) IV BOLUS Daily Days: 1 x 4 cycles

Risk / Side Effects:
neutropenia and fever
alopecia
neuropathy

Additional Information
Planned Growth Factor: Pegfilgrastim;

Active Concurrent Oral Chemotherapy:
Tamoxifen 10 MG (10 MG TABLET Take 1) PO

Parameters to Treat:  anc > 1000

ECOG Performance Status: 1=Restricted in physical strenuous activity;

Reason for Stopping
Was the treatment administered as planned or with Modifications: Administered as Planned;
Reason for Stopping: Completed Planned Therapy;
Disease Status at End of Treatment: No Evidence of Disease;
### Staging

<table>
<thead>
<tr>
<th>Pre Therapy</th>
<th>Dx Date</th>
<th>Date Estimated</th>
<th>Tumor Size (cm)</th>
<th>Tumor Type</th>
<th>Group Stage</th>
<th>Prov. Stage</th>
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<tr>
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<td>T2</td>
<td>N</td>
<td>M</td>
<td>IIB</td>
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#### Other Tumor Characteristics

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<thead>
<tr>
<th>ER</th>
<th>PR</th>
<th>HER2/neu IHC</th>
<th>HER2/neu FISH</th>
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<td>Positive</td>
<td>Positive</td>
<td>+3</td>
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#### Histology Grade

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<tr>
<th>Extra Nodal Extension</th>
<th>Inv Histology</th>
<th>Inv Hist Grade</th>
<th>EIC</th>
<th>DCIS Histology</th>
<th>DCIS Nuc Grade</th>
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<tbody>
<tr>
<td>Yes</td>
<td>Ductal</td>
<td>Poorly Diff (grade 3)</td>
<td></td>
<td>Comedo Solid</td>
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<tr>
<td>No</td>
<td>Lobular</td>
<td></td>
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#### Sites of Recurrence/Metastasis

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<tr>
<th>Date Identified</th>
<th>Location</th>
<th>Comments</th>
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<tr>
<td>T</td>
<td>Bone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bone Marrow</td>
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### Comments

<table>
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<tr>
<th>Add Recurrence</th>
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### Add Treatment Plan

<table>
<thead>
<tr>
<th>Save</th>
<th>Cancel</th>
<th>History</th>
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### AJCC edition: 7

<table>
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<tr>
<th>DX : Breast</th>
<th>Tumor Type: Breast</th>
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# Patient Chart Reference

## Allergies

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Reaction</th>
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<tr>
<td>CISPLATIN-AQ</td>
<td>Anaphylaxis</td>
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<tr>
<td>Platinum Complexes</td>
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<tr>
<td>- Flushing</td>
<td></td>
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<tr>
<td>- Hives</td>
<td></td>
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<tr>
<td>- Hypotension</td>
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</table>

## Medications

- Afinitor (EVERCLIMUS) 10 MG (10 MG TABLET Take 1) PO QD x 30 days
- Ailace (RAMIPRIL) 2.5 MG (2.5 MG TABLET Take 1) PO QD x 30 days
- Atvan (LORAZEPAM) 1 MG (1 MG TABLET Take 1) PO Q8H PRN anxiety x 10 days
- Ceftazidime 1000 MG (300 MG VIAL Take 2) IV Q6H x 7 days
- Celebrex (CELECOXIB) 100 MG (100 MG CAPSULE Take 1) PO QID x 30 days
- Colese (DOCUSATE SODIUM) 100 MG (100 MG TABLET Take 1) PO TID PRN constipation x 30 days

## Flowsheets

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<tr>
<th>Item</th>
<th>02/01/2011</th>
<th>01/26/2011</th>
<th>01/05/2011</th>
<th>12/14/2010</th>
<th>11/25/2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIGHT</td>
<td>166 cm</td>
<td>166 cm</td>
<td>166 cm</td>
<td>166 cm</td>
<td>166 cm</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>62 kg</td>
<td>132 kg</td>
<td>193 kg</td>
<td>193 kg</td>
<td>193 kg</td>
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<tr>
<td>TEMPERATURE</td>
<td>97.7 F</td>
<td>98.5 F</td>
<td>98.5 F</td>
<td>98.5 F</td>
<td>98.5 F</td>
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<tr>
<td>BLOOD PRESSURE</td>
<td>132/90</td>
<td>130/90</td>
<td>120/70</td>
<td>120/60</td>
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<tr>
<td>PAIN LEVEL</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

## Problems

- Perennial anemia
- Low back pain - Minor
- Von willebrand disorder
- Borderline hypertension - Minor
- Diabetes mellitus type 2
- Colectomy

## Regimen

### Goal of Treatment / Indication:

- Breast
- Breast

### Diagnosis:

- Breast

### Regimen:

- TRASTUZUMAB WEEKLY/PACLITAXEL WEEKLY
- TRASTUZUMAB WEEKLY/PACLITAXEL WEEKLY

### Chemo Med:

- TRASTUZUMAB (4 mg/kg) IV BOLUS Daily Days: 1
- TRASTUZUMAB (2 mg/kg) IV BOLUS Daily Days: 2-7

### Risk / Side Effects:

<table>
<thead>
<tr>
<th>Effect</th>
<th>Grade</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aral</td>
<td>10</td>
<td>B</td>
</tr>
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</table>

### Modification Planned:

- Aral
Treatment Plans

• I believe they are important now and will become increasingly important as cancer medicine becomes ever more complex.

• I believe the electronic health records are key for safe and high quality oncology practice, and will facilitate the utilization of treatment plans, which in themselves will support safe and high quality care.

• I believe that treatment plans will aid communication between providers and patients in regard to goals of care, resultant treatment choices, and specifics of a proposed treatment.

• I think that we all need to help move this agenda forward.