

Customizing EMR clickables

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The path to adopting and customizing an electronic medical records system to your practice may not be smooth. But the experience of one practice shows that a concerted effort offers big rewards: reduced errors, improved efficiency, and concise documentation of quality care.

As anyone taking part in the current Medicare data project knows, collecting bundled quality data at the point of billing means interrupting clinic work flow and adding paper charting. This comes at a time when moving to electronic medical records (EMRs) holds the best promise for reducing errors, improving efficiencies, and gathering meaningful data on delivered care.

Improving the transparency of delivered cancer care includes being accountable for delivering the right care for the right cancers in the right setting at the right time. Data to assess these features include not only the facts about a patient but also the prognostic factors for his or her cancer; recommendations for a treatment plan based on an evidence-based guideline, if available and appropriate, and information on whether the patient accepted, modified, or rejected that plan.

Once any treatment plan is instituted, the eventual outcome can be altered by toxicities, patient adherence and completion of therapy, as well as whether and/or how other medical illnesses interact. Physicians want to be sure that the many complex reasons for accepting, modifying, declining, or completing an evidence-based therapy plan are taken into account when data are analyzed. Patients want to be sure therapy is prescribed and delivered based on their individual medical conditions as well as their preferences after appropriate education is provided. Standardizing statements within tumor types when physicians order a treatment regimen is one way to efficiently collect complex and relevant data to fully assess delivered care and outcomes in busy cancer practices.

How we do it

Our practice instituted the Varian EMR system in 2005 and the Aria upgrade in 2006. Clerical staff enter demographic data on every patient seen at our clinics. Specifically trained medical assistants enter patient-reported medical diagnoses, allergies, and medications, as well as family, social, and surgical histories. Many of these assistants are able to input the initial features of a

cancer diagnosis, which is finalized by physicians and mid-level practitioners, based on pathology reports and tumor status. Initial clinical staging is noted prior to final pathologic TNM staging, where appropriate, and tumor features such as estrogen- and progesterone-receptor status and HER2 (human epidermal growth factor receptor 2) status for breast cancer patients. We want to be able to describe all therapies given to our patients by stage and disease features to track care by evidence-based guidelines and by warranted variations.

Adopting treatment standards under NCCN guidelines

Few would argue that the National Comprehensive Cancer Network (NCCN) has done a superb job developing evidence-based guidelines that cover 98% of hematology/oncology practice. At issue is the range of guideline options for various tumor subtypes. Although these guidelines are becoming more detailed over time, currently they don't clarify the priorities for regimens or features that may make one regimen preferable over another.

Our practice has adopted NCCN's evidence-based guidelines; however, as members of Cancer Centers of Excellence (CCE), we have participated in the development and implementation of detailed evidence-based therapy protocols (ETPs) to cover colon, breast, non-small cell lung, small cell lung, ovarian, and prostate cancers, as well as anemia. Each quarter, we finalize 5–10 new detailed pathways under the aegis of 11 national user groups, including those that address supportive and palliative/end-of-life care.

As Chief Quality Officer of CCE and leader of ETP implementation and data collection for my practice, I have worked to develop oncology-customized

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NAME	Betty Smith
AGE	47
PERFORMANCE STATUS	0
PATHOLOGIC STAGE	IIb, right breast cancer, pT2, pN2, pM0, ER+, PR-, HER2+ by FISH
MEDICAL ILLNESSES	Hypothyroid (on levothyroxine), depression (on citalopram)
POSTMENOPAUSAL S/P	TAH/BSO
FAMILY HISTORY	No reported breast, ovary, or colon cancer in three-generational history
INITIAL THERAPY	Core biopsy, lumpectomy with clear margins, and ALND with 4/10 nodes +

ER = estrogen receptor; PR = progesterone receptor; HER2 = human epidermal growth factor receptor 2; FISH = fluorescence in situ hybridization; TAH = total abdominal hysterectomy with bilateral salpingo-oophorectomy; ALND = axillary lymph node dissection

FIGURE 1 Initial data captured for a hypothetical patient with stage IIb breast cancer.

“clickables” in our EMR that prompt physicians to order therapy according to our ETPs. Specific regimens appropriate to each ETP panel are available for clickable ordering. Notations may be added for preferences by clinic or health plan, if needed. There are also options for non-ETP regimens when the guideline does not apply or has not yet been developed. The panels are customized by disease and capture the important descriptions of therapy by goal (curative or palliative), type, and line of therapy. Disease-specific therapy panels cover prevention; neoadjuvant therapy; adjuvant therapy; initial therapy; and first-, second-, and third- or higher-line treatment of metastatic/recurrent disease. Prompting therapy within the normal physician ordering workflow speeds ordering and data collection and improves adherence to and tracking of evidence-based guidelines.

Figure 1 shows typical data entered in the EMR for a hypothetical breast cancer patient. The physician discusses treatment options and the risks/benefits of adjuvant therapy with the patient. The patient agrees to adjuvant chemotherapy with trastuzumab (Herceptin), followed by radiation therapy and subsequent treatment with an aromatase inhibitor for 5 years.

The physician then goes to the “orders panel” in the EMR and opens the breast cancer panels, which, in turn, open a series of standardized, clickable options to capture the “what and why”

for all physician orders:

- *Lab work*, with most labs for breast cancer already listed (others pop up if an “expansion button” is clicked, or the physician can type in others).

- *Diagnostic tests*, with specific tests customized to breast cancer and evidence- and practice-based preferences.

- *Referrals*, with commonly used referrals customized to breast cancer.

- *Procedures* customized to those appropriate for breast cancer.

- *Physician therapy and follow-up orders* customized to breast cancer and our ETPs. Options in this panel for the practitioner to click on include drop-down lists (per ETPs and non-ETPs, if open) for adjuvant therapy (Figure 2); neoadjuvant therapy; prevention/high risk; and first-, second-, and third-line (or higher line) treatment of metastatic/recurrent disease. Practice or health-plan preferences can be noted with an asterisk or other notations.

- *Therapy rationale*, a drop-down list to quickly note the reasoning for the treatment plan selected and any warranted variations from it (Figure 3).

- *Therapy initiation*, a clickable drop-down list (Figure 4) to order scheduling of standard practice protocols after the treatment plan is selected.

Once the patient has been placed on a regimen, an “on therapy” panel (Figure 5) is opened to note ongoing orders at follow-up visits. The options can be customized to specify dose-reduction percentages for specific toxicities, schedule

changes, or practice standards.

All sections of these data-entry panels allow free-text typing of additional information. The more we standardize modification options, the easier it is to click and track variations and for nurses/staff to read and track changes.

Building your case

Like many EMR systems, Varian has a detailed regimen-ordering section specifying dosing, delivery, and modifications. Our practice has built standard regimens for each tumor type with a notation of standard Hesketh nausea levels to pair initial nausea therapy with expected severity. Physicians and nurses evaluate whether specific patient issues warrant an upstage in Hesketh level when the treatment is ordered in the system. Although physicians can become highly adept at using this section, it is far more time consuming and does not have the “customizability” of the physician

- TCHn × 6-H
- AC-TH-H
- TC × 4
- TACn × 6
- FACn × 6
- XRT to breast
- Tamoxifen × 5 years
- Tamoxifen × 5 years, then letrozole × 5 years
- Anastrozole × 5 years
- Tamoxifen until menopausal, then aromatase inhibitor × 5 years
- Tamoxifen × 2–3 years, then exemestane × 2–3 years
- Letrozole × 5 years
- Exemestane × 5 years

TCHn × 6-H = docetaxel (Taxotere)/carboplatin with filgrastim (Neulasta) support × 6 with weekly trastuzumab (Herceptin) × 18, followed by trastuzumab every 3 weeks (q3w) × 13; AC-TH-H = doxorubicin (Adriamycin)/cyclophosphamide q3w, followed by weekly paclitaxel plus concurrent trastuzumab × 12, followed by trastuzumab q3w × 13; TC × 4 = docetaxel/carboplatin with filgrastim support × 4; TACn × 6 = docetaxel/doxorubicin/cyclophosphamide with filgrastim support × 6; FACn = fluorouracil/doxorubicin/cyclophosphamide with filgrastim support × 6; XRT = X-radiation therapy

FIGURE 2 Breast cancer adjuvant therapy drop-down list showing pre-populated therapeutic options. Physician’s specific choices in this hypothetical example are checked.

Therapy on ETP
 Therapy modified for:
 patient preference
 medical reasons
 social reasons
 financial reasons
 Therapy declined for:
 patient preference
 medical reasons
 social reasons
 financial reasons

ETP = evidence-based therapy protocol

FIGURE 3 Breast cancer therapy rationale drop-down options.

order section. Embedding standard options for standard diseases and their subtypes within guidelines, with warranted variations that can be tracked by building clickable options, certainly meets the needs of the practice while respecting the time of busy clinicians. Having standard regimens organized by categories and disease states also helps prompt busy clinicians for the many aspects of decision-making that need to be documented. This feature of the EMR facilitates therapy, ordering, authorizations, and outcome and cost analysis. Additional check boxes may be placed on the same page to indicate whether a patient accepts, modifies, or declines treatment.

Panels also have been built for anemia therapy, including chemotherapy-induced anemia, Medicare's restricted chemotherapy-induced anemia guidelines, anemia of myelodysplasia, and anemia of renal insufficiency. Standard lab workups and follow-up can be incorporated into the prompts, as can growth factor guidelines, dose modifications or escalations, and stop orders. Tracking transfusions also is a customizable clickable option. Other panels for supportive, palliative, and end-of-life care orders allow tracking and quantification of the large amount of integrative care we deliver.

Further, the complex responses of patients with incurable malignancies to recommendations for supportive/palliative care or hospice (offered alone or integrated into various therapeutic regimens) can be tracked. These data will

Detailed chemotherapy teaching
 Chemotherapy consent pre-therapy
 Chemotherapy calendaring
 N/V medication orders per Hesketh practice guideline
 Supportive medication per protocols
 Financial counseling on patient costs
 Pre-authorization, if needed
 Free/discount care referral, if needed
 Notify physician if therapy not able to be given for reevaluation

N/V = nausea/vomiting

FIGURE 4 Breast cancer therapy initiation drop-down options.

help explain the thought processes of patients and their family members after we conduct our many educational sessions on alternatives to active therapy when cure is not possible.

Still haven't gone digital?

For practices that still use paper to record physician orders, sheets can be designed to note:

- patient name and age;
- diagnosis and stage (and whether the patient has progressed or developed metastases after prior staging);
- where the metastases are located;
- performance status;
- goal of therapy (curative/palliative);
- type of therapy (preventive; neo-adjuvant; adjuvant; initial; metastatic/recurrent);
- line of therapy (first-line, second-line, etc.);
- on clinical trial or not; and
- specific therapy plan.

Standard regimens for the practice can be listed and checked. Nurses can then use this information for authorizations, data tracking for the practice, and entry into chemotherapy-dispensing systems, such as Lynx Mobile or Pyxis. Although tracking and reporting of paper-based data in the absence of an optical character recognition system is more cumbersome, a standardized order sheet does allow practices to track and

Continue therapy, same dose and schedule
 Modify therapy dose for:
 toxicity
 vacation
 patient preference
 medical illness
 10%
 20%
 Other (type in): _____
 Modify schedule due to:
 toxicity
 vacation
 patient preference
 medical illness

FIGURE 5 On therapy panel, used during follow-up visits.

report their delivery of specific therapies by disease, stage, tumor details, performance status, and patient features with outcomes (complete or partial remission, minor response, stable or progressive disease, or no evidence of disease).

Moving forward

A customizable physician ordering section in an oncology-specific EMR facilitates the efficient capture of complex decision-making and therapy as part of the normal physician work flow. Once populated with standardized data-entry options, this EMR system can be activated and updated, as needed, across multiple sites in a practice or across multiple practices in organized oncology groups (such as Cancer Centers of Excellence) that have agreed to practice and collect data together on ETPs. Physicians have the key data to move the healthcare debates from finger pointing over high-cost drugs to outcomes and value for delivered care with warranted variations. When physicians can present transparent and accountable care to patients and payers, they will take a large step toward a seat at the table to negotiate for quality cancer care for our patients.

ABOUT THE AUTHOR

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Conflicts of interest: Dr. Bosserman is a speaker for Varian on the use of EMR.