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Best Practices: Optimizing Supportive Care Interventions in Electronic Health Records
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Best Practices: Optimizing Supportive Care Interventions in Electronic Health Records

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Mary E. Cooley, PhD, RN, FAAN; David F. Lobach, MD, PhD, MS

* = Presenter

Presenter Disclosure Information

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Faculty Disclosure

	No, nothing to disclose
x	Yes, please specify:

Company Name	*Honoraria/ Expenses*	*Consulting/ Advisory Board*	*Funded Research*	*Royalties/ Patent*	*Stock Options*	*Ownership/ Equity Position*	*Employee*	*Other (please specify)*
UptoDate				x				
Pfizer	x							
Johns Hopkins University Press				x				

True Patient-Centered care

- Patient distress must be visible to clinicians
- Easy for patients to report; easy for clinicians to respond
- Assessed and managed with evidence-based protocols
- Outcomes tracked

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Patient-Reported Outcomes

Clinical Decision Support (CDS)*

- The act of providing clinicians, patients and other healthcare stakeholders with pertinent knowledge and/or person-specific information, intelligently filtered or presented at appropriate times, to enhance health and health care[1]

The right information to the right person at the right time in the right setting in the right format

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Improvements with use of PROs + CDS[2]

- Patient-clinician communication
- Clinician awareness of symptoms
- Symptom management
- Patient satisfaction, QoL, and OS
- Tolerance of treatment
- Fewer unplanned admissions or ED visits for uncontrolled symptoms

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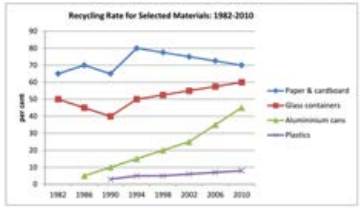
Use of PROs[3]

EHR



Referral

Outpatient appointment

ED visit

Improved survival with Sentinel PRO[4]

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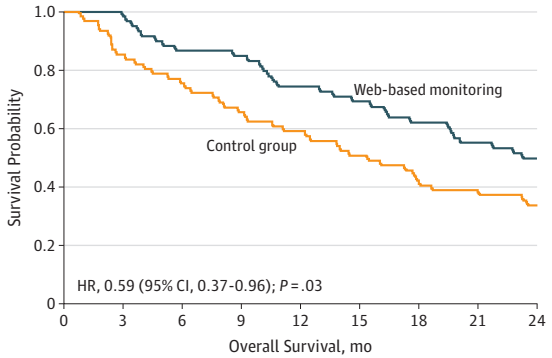
Figure 2. Kaplan-Meier Curves for the Overall Survival (OS) Analysis

A Intention-to-treat analysis

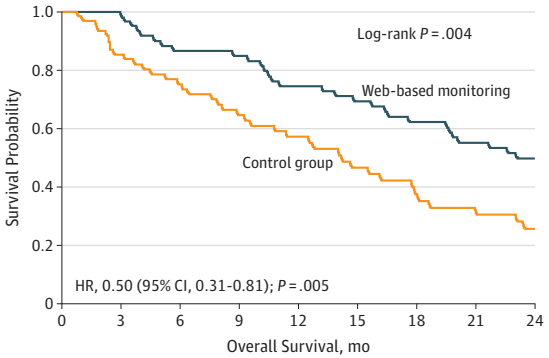


No. at risk

Web-based monitoring	60	60	51	48	43	39	35	31	27
Control	61	52	45	38	34	29	24	22	19

Source	Median OS	12-mo OS, %	24-mo OS, %
Web-based monitoring	22.5 mo	75	50
Control	14.9 mo	56	34

B Censoring of crossover analysis



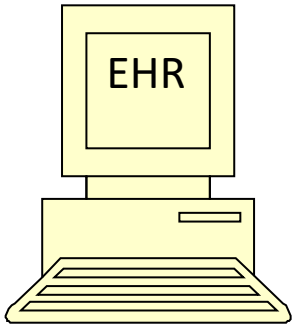
No. at risk

Web-based monitoring	60	60	51	48	43	39	35	31	27
Control	61	52	43	33	26	20	15	13	11

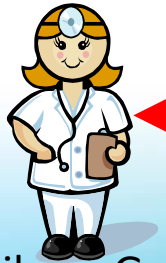
Source	Median OS	12-mo OS, %	24-mo OS, %
Web-based monitoring	22.5 mo	75	50
Control	13.5 mo	53	26

eRAPID^2

eRAPID



SEVERITY-TAILORED
ADVICE or
CONTACT YOUR
ONCOLOGY TEAM



Velikova G, MD, PhD

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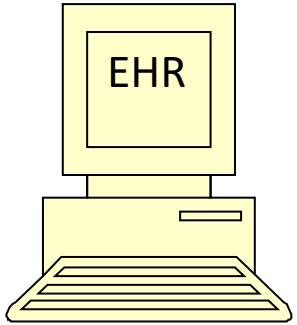
PROMIS-T[5]

PROMIS T



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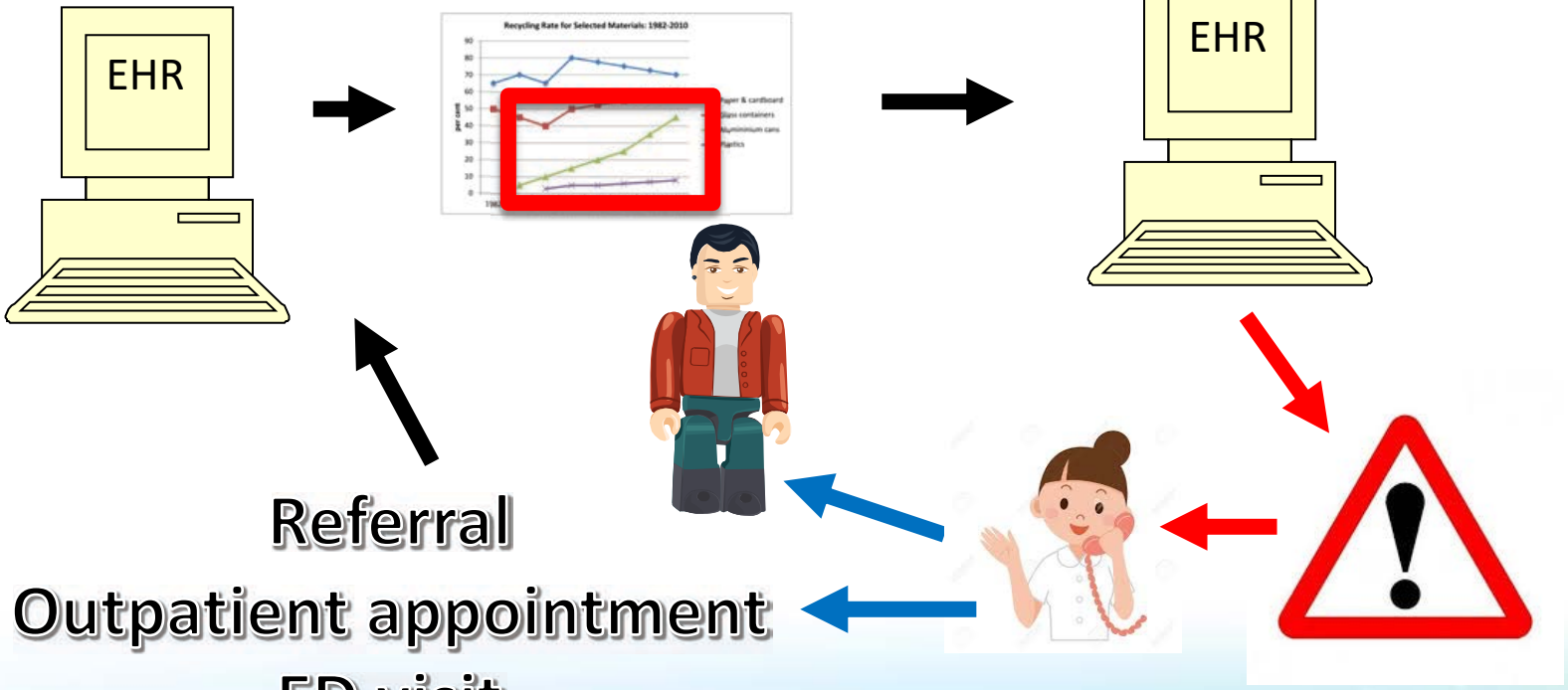
NLP in symptom control



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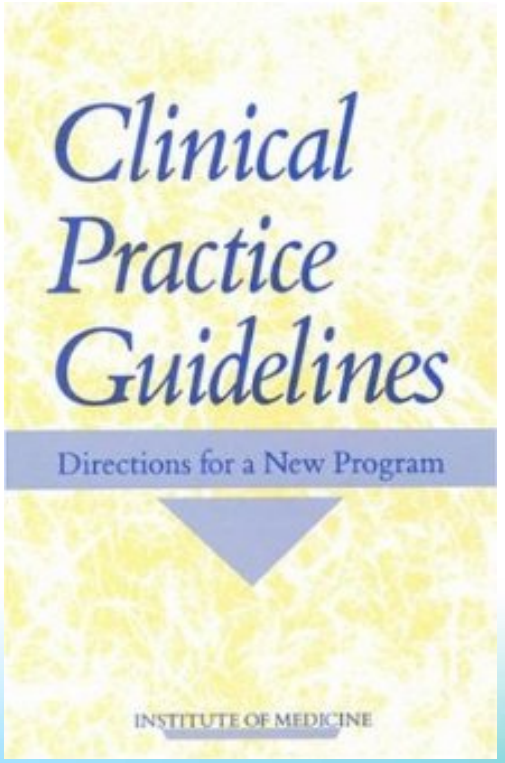
Clinical Guidelines often not used

- Innovative approaches are needed to integrate evidence-based palliative care into routine oncology care
- Clinical guidelines (CG) can enhance symptom management but often are not used in the practice setting[6]
- It takes an average of 5 years for a CG to be adopted into the practice setting[7]



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CDS can integrate Clinical Guidelines

- Clinical Guidelines for symptom assessment and management
  - NCCN; ESMO; MASCC; ASCO
- Clinical Decision Support can facilitate the dissemination and adherence to these Clinical Guidelines[8]

What's needed if CDS systems are to improve practice[9-11]

- Clinical Decision Support as part of the workflow
- **Specific recommendations** rather than assessment alone
- Clinical Decision Support at the time and location of decision-making
- Computer-based Clinical Decision Support

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Sample Algorithm for Moderate Pain -- Proposed

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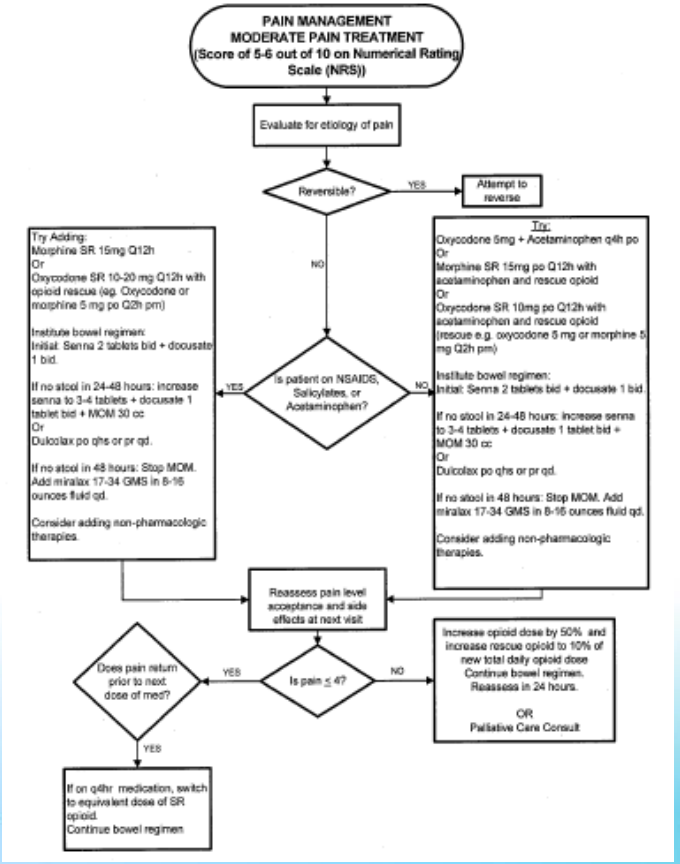

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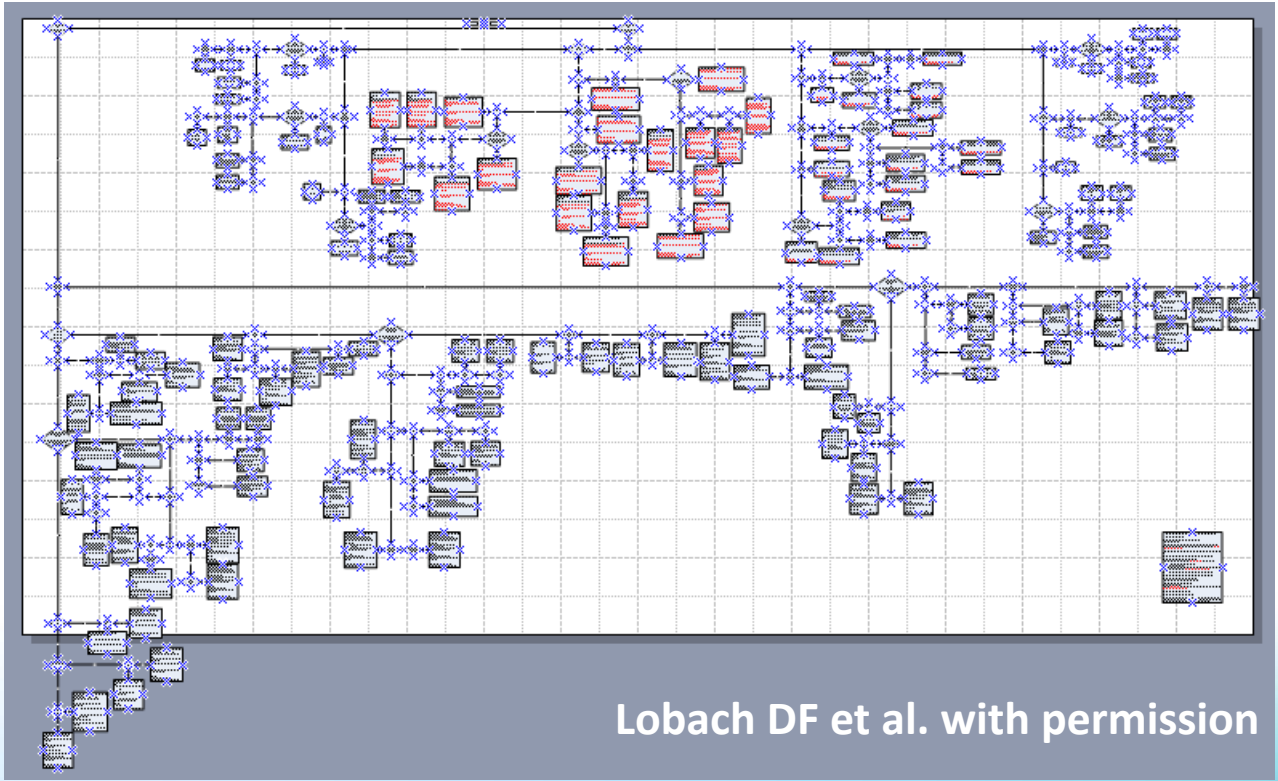
Sample Algorithm for Moderate Pain– Actual



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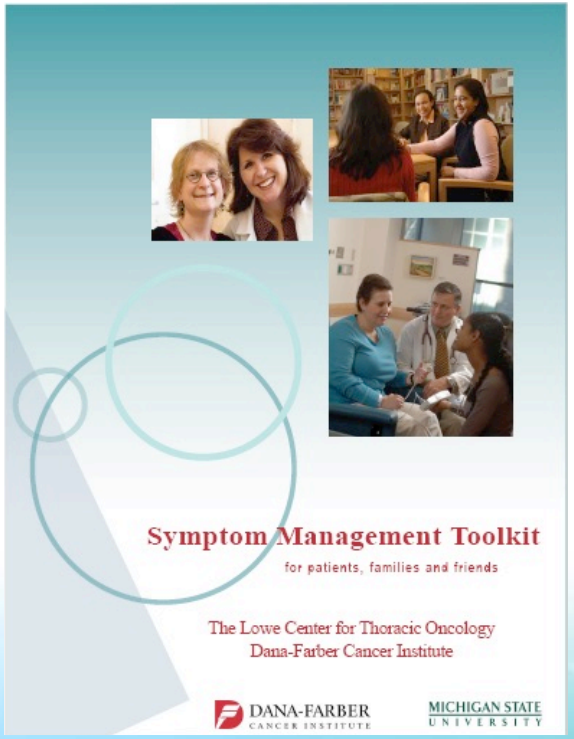
Data needed by algorithms

- EHR
  - Co-morbidities
  - Laboratory data
  - PRO data from patient
  - Medications prescribed
  - Oncology Treatment history (chemo, radiation, surgery)
- Patient report
  - PRO of Symptoms
  - Medications actually taken

Symptom Management Toolkit

- Promotes self-care for symptoms



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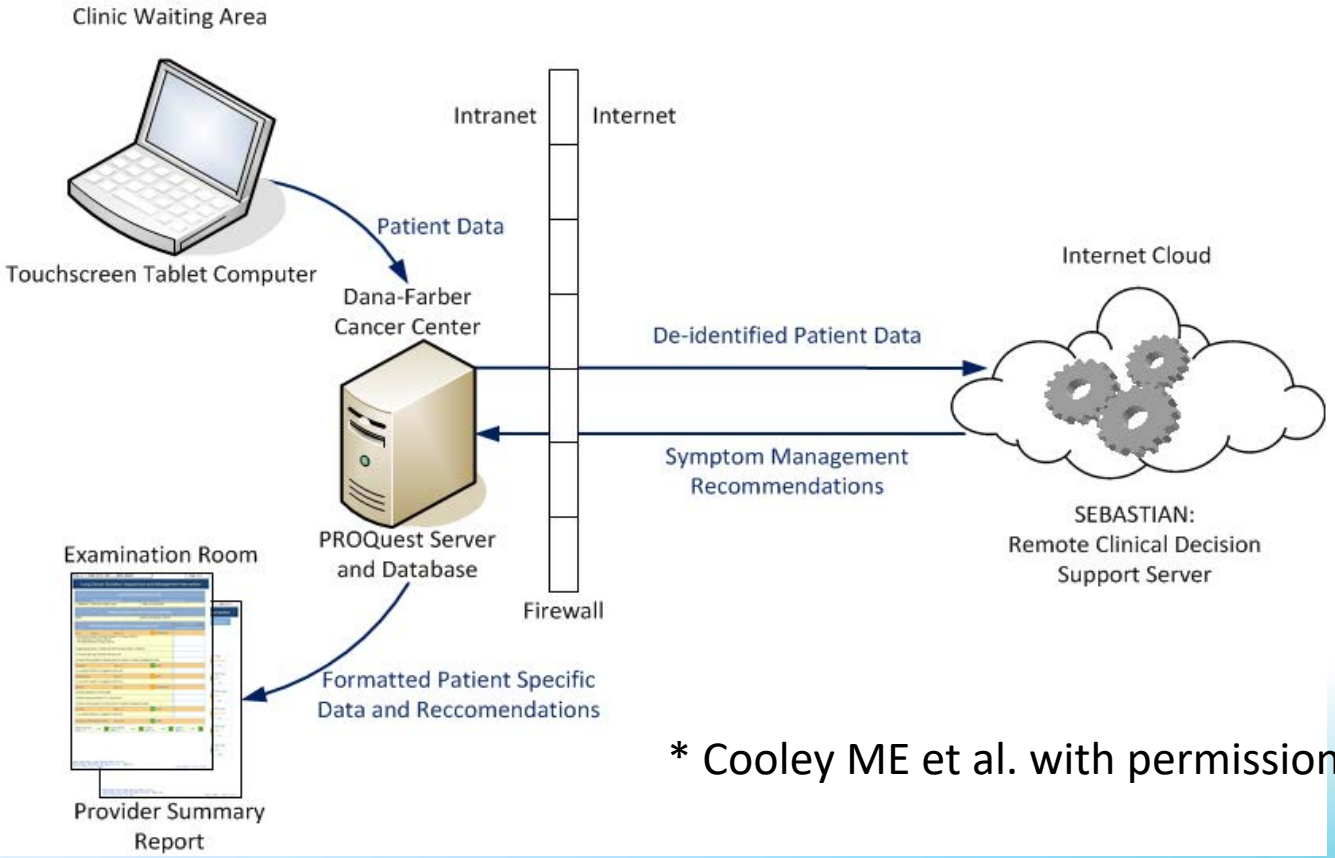
Coordinated View of SAMI-L System*



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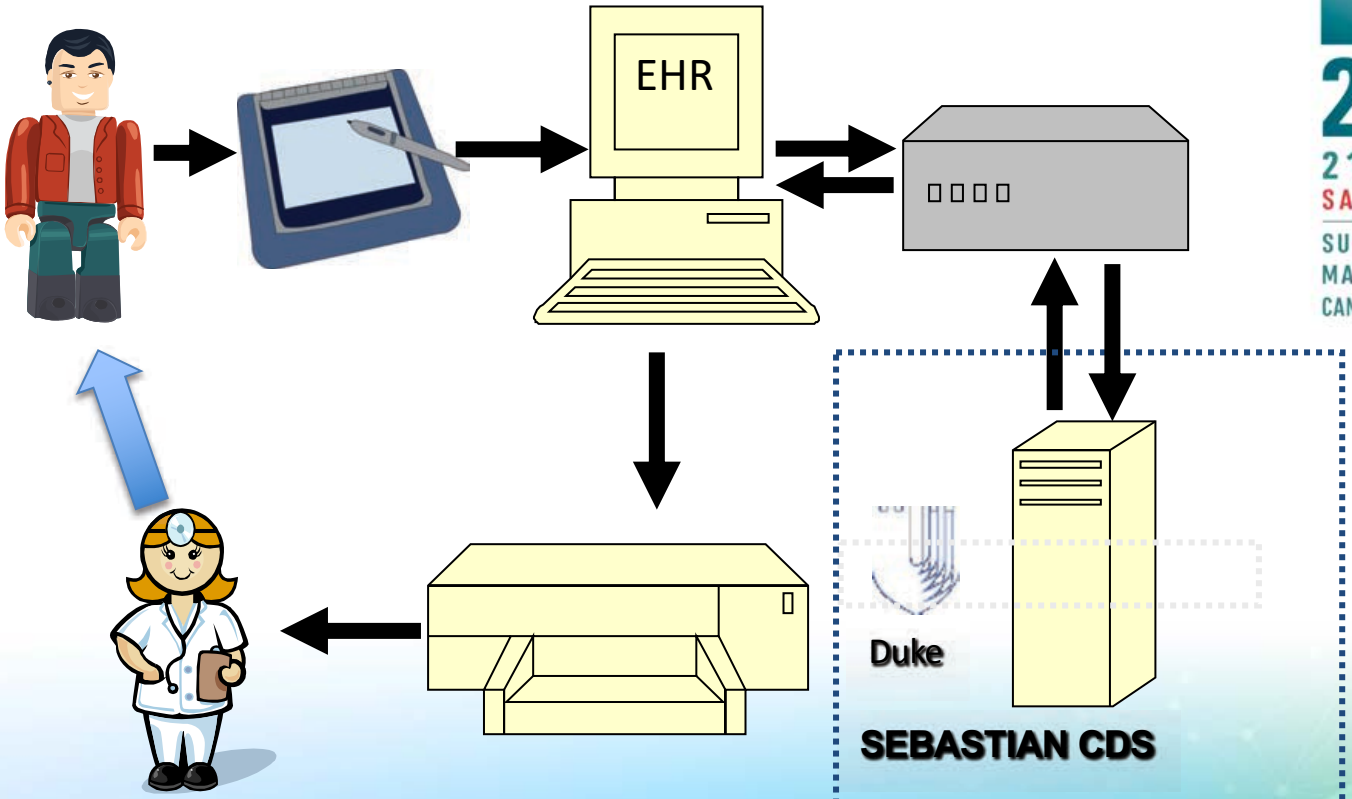
SAMI Process[12, 13]



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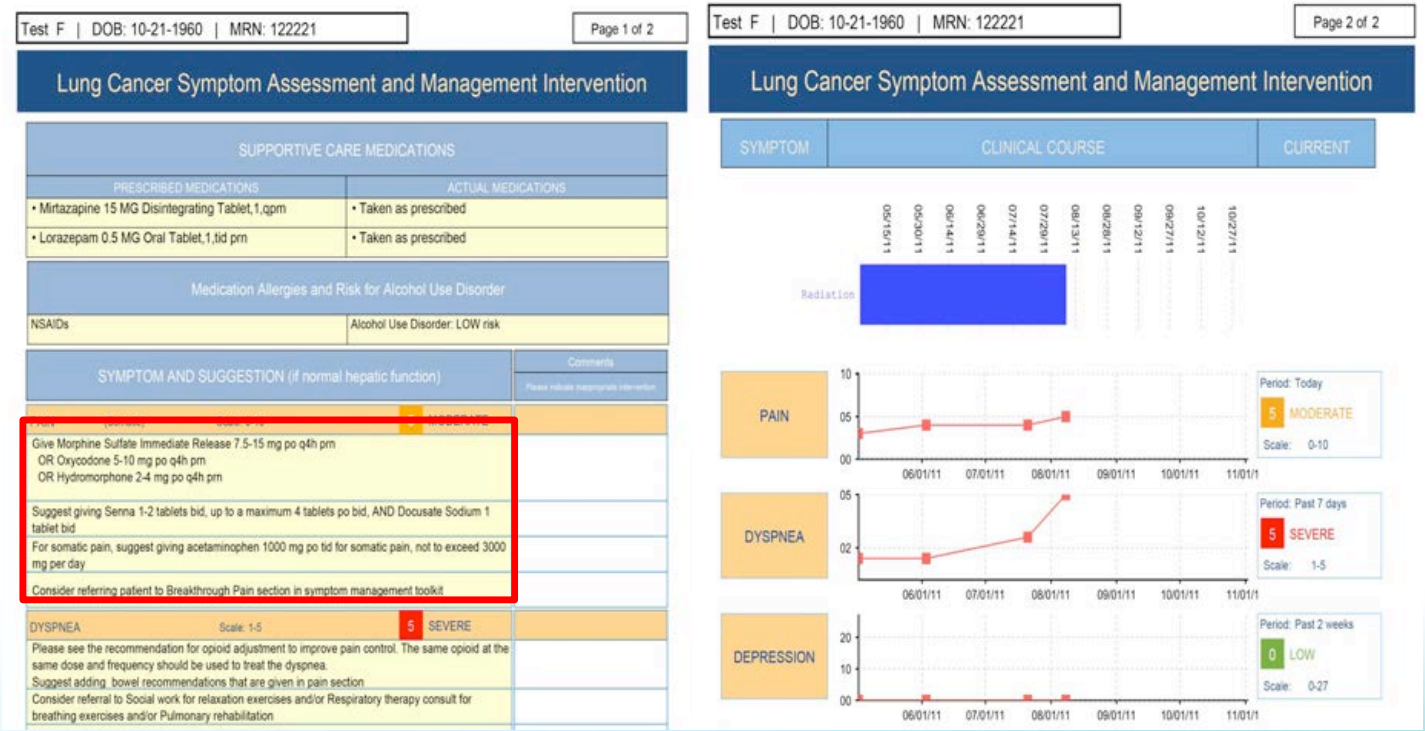

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Lung Cancer Symptom Assessment and Management Intervention

SUPPORTIVE CARE MEDICATIONS

PRESCRIBED MEDICATIONS	ACTUAL MEDICATIONS
• Mirtazapine 15 MG Disintegrating Tablet,1,qpm	• Taken as prescribed
• Lorazepam 0.5 MG Oral Tablet,1,tid prn	• Taken as prescribed

Medication Allergies and Risk for Alcohol Use Disorder

NSAIDs	Alcohol Use Disorder: LOW risk

SYMPTOM AND SUGGESTION (if normal hepatic function)	Comments
Give Morphine Sulfate Immediate Release 7.5-15 mg po q4h prn OR Oxycodone 5-10 mg po q4h prn OR Hydromorphone 2-4 mg po q4h prn	
Suggest giving Senna 1-2 tablets bid, up to a maximum 4 tablets po bid, AND Docusate Sodium 1 tablet bid	
For somatic pain, suggest giving acetaminophen 1000 mg po tid for somatic pain, not to exceed 3000 mg per day	
Consider referring patient to Breakthrough Pain section in symptom management toolkit	
DYSPNEA Scale: 1-5 **5** SEVERE	
Please see the recommendation for opioid adjustment to improve pain control. The same opioid at the same dose and frequency should be used to treat the dyspnea. Suggest adding bowel recommendations that are given in pain section	
Consider referral to Social work for relaxation exercises and/or Respiratory therapy consult for breathing exercises and/or Pulmonary rehabilitation	

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Lung Cancer Symptom Assessment and Management Intervention

SYMPTOM	CLINICAL COURSE	CURRENT

05/15/11 05/30/11 06/14/11 06/29/11 07/14/11 07/29/11 08/13/11 08/28/11 09/12/11 09/27/11 10/12/11 10/27/11

Radiation

PAIN — Period: Today — 5 MODERATE — Scale: 0-10

DYSPNEA — Period: Past 7 days — 5 SEVERE — Scale: 1-5

DEPRESSION — Period: Past 2 weeks — 0 LOW — Scale: 0-27

06/01/11 07/01/11 08/01/11 09/01/11 10/01/11 11/01/11

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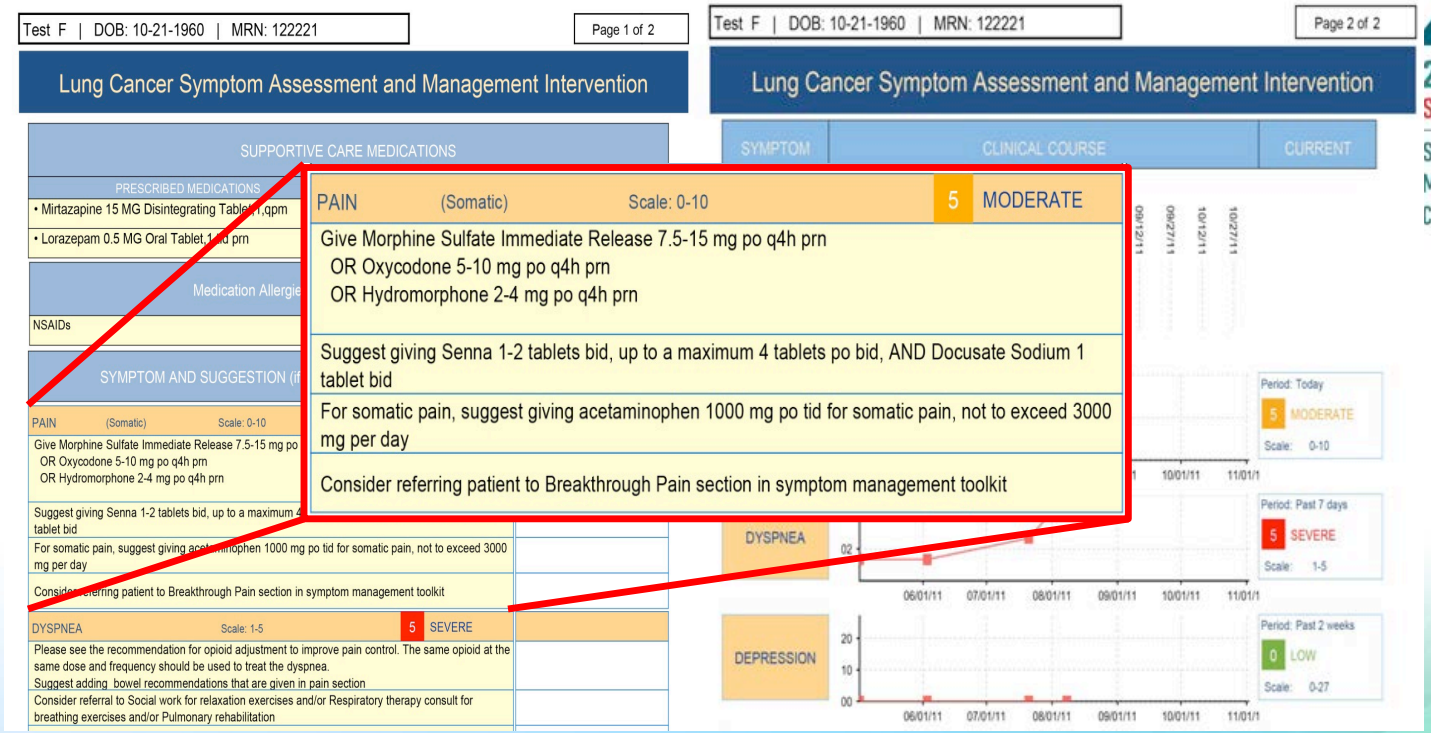

…Report delivered to Clinicians

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Lung Cancer Symptom Assessment and Management Intervention

SUPPORTIVE CARE MEDICATIONS	
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• Lorazepam 0.5 MG Oral Tablet,1,tid prn	• Taken as prescribed

Medication Allergies and Risk for Alcohol Use Disorder	
NSAIDs	Alcohol Use Disorder: LOW risk

SYMPTOM AND SUGGESTION (if normal hepatic function)	Comments (Please indicate inappropriate intervention)
PAIN (Somatic) Scale: 0-10 — 5 MODERATE	
Give Morphine Sulfate Immediate Release 7.5-15 mg po q4h prn OR Oxycodone 5-10 mg po q4h prn OR Hydromorphone 2-4 mg po q4h prn	
Suggest giving Senna 1-2 tablets bid, up to a maximum 4 tablets po bid, AND Docusate Sodium 1 tablet bid	
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Consider referring patient to Breakthrough Pain section in symptom management toolkit	
DYSPNEA Scale: 1-5 — 5 SEVERE	
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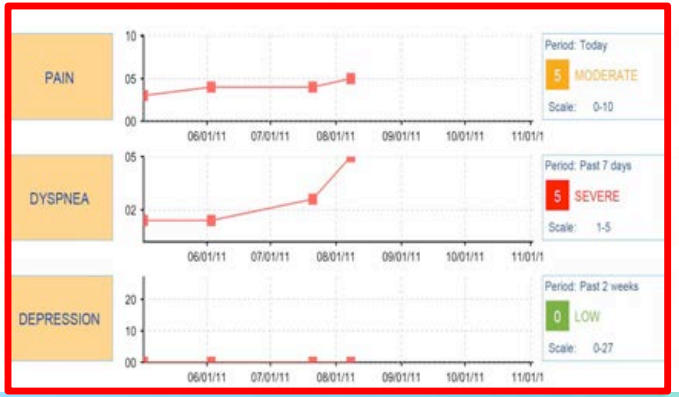
Lung Cancer Symptom Assessment and Management Intervention

SYMPTOM	CLINICAL COURSE	CURRENT



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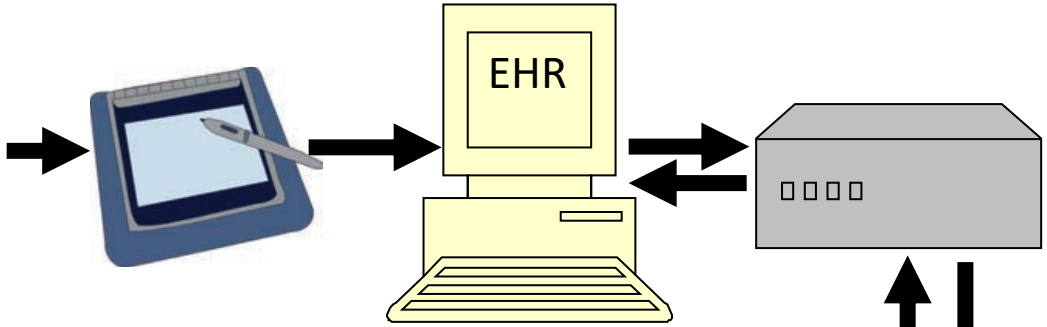
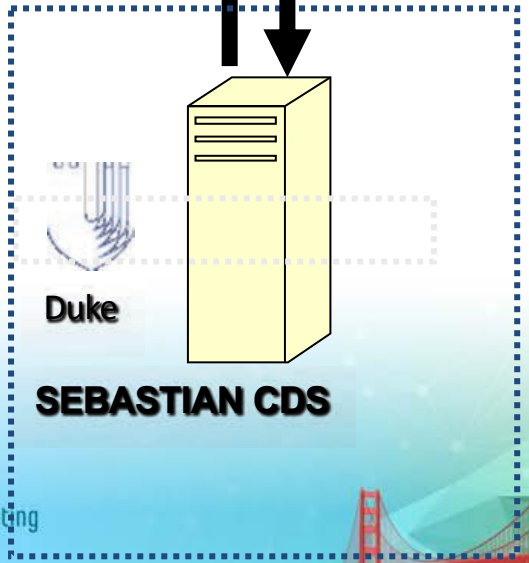
CDS integration into EHR





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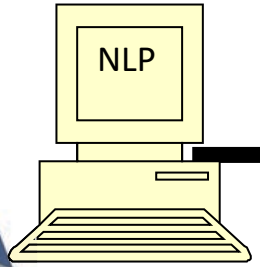
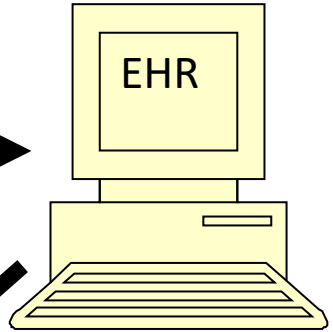
Automated alerts + CDS advice in EHR





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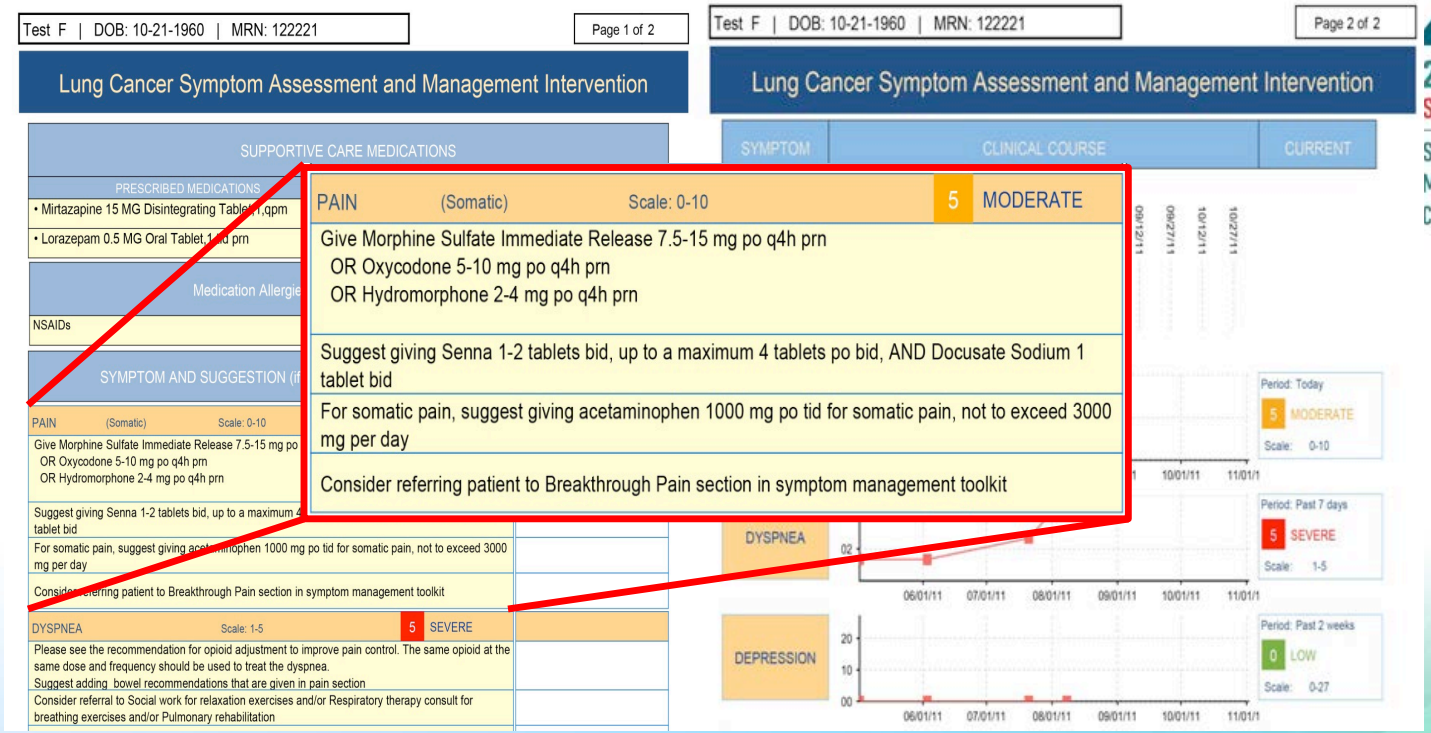
Report delivered to Clinicians' EHR



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Lung Cancer Symptom Assessment and Management Intervention

SUPPORTIVE CARE MEDICATIONS

PRESCRIBED MEDICATIONS

• Mirtazapine 15 MG Disintegrating Tablet 1 qpm

• Lorazepam 0.5 MG Oral Tablet 1 qd prn

Medication Allergie

NSAIDs

SYMPTOM AND SUGGESTION (if

PAIN (Somatic) Scale: 0-10

Give Morphine Sulfate Immediate Release 7.5-15 mg po
OR Oxycodone 5-10 mg po q4h prn
OR Hydromorphone 2-4 mg po q4h prn

Suggest giving Senna 1-2 tablets bid, up to a maximum 4
tablet bid

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Consider referring patient to Breakthrough Pain section in symptom management toolkit

DYSPNEA Scale: 1-5 5 SEVERE

Please see the recommendation for opioid adjustment to improve pain control. The same opioid at the same dose and frequency should be used to treat the dyspnea.
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Consider referral to Social work for relaxation exercises and/or Respiratory therapy consult for breathing exercises and/or Pulmonary rehabilitation

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Lung Cancer Symptom Assessment and Management Intervention

SYMPTOM | CLINICAL COURSE | CURRENT

09/12/11 09/27/11 10/12/11 10/27/11

Period: Today
5 MODERATE
Scale: 0-10

10/01/11 11/01/1

DYSPNEA

Period: Past 7 days
5 SEVERE
Scale: 1-5

06/01/11 07/01/11 08/01/11 09/01/11 10/01/11 11/01/1

DEPRESSION

Period: Past 2 weeks
0 LOW
Scale: 0-27

06/01/11 07/01/11 08/01/11 09/01/11 10/01/11 11/01/1

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Potential Benefits of Tailored Recs

- Clinician support and education with tailored symptom assessment and management recommendations
- Timely referrals
- Decreased patient and family distress
- Further decrease in patient visits for symptom management and unplanned admissions
- Outcomes can be analyzed and algorithms improved / adjusted

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QUESTIONS?

References

1. Osheroff JA, Pifer EA, Teich JM, Sittig DF, Jenders RA. Improving outcomes with clinical decision support: an implementer's guide. Chicago: Healthcare Information and Management Systems Society Press; 2005
2. Basch E et al. Implementation of patient-reported outcomes in routine medical care. Am Soc Clin Oncol Educ Book 2018 May 23;(38): 122-134
3. Basch E, et al**.** Overall Survival Results of a Trial Assessing Patient-Reported Outcomes for Symptom Monitoring During Routine Cancer Treatment. JAMA .2017 Jul 11;318(2):197-198. doi: 10.1001/jama.2017.7156.
4. Denis F, et al. Comparing Web-Based Symptom Monitoring vs Routine Surveillance Following Treatment for Lung Cancer. *JAMA.* 2019;321(3):306-307. doi:10.1001/jama.2018.18085
5. Wagner LI et al. Bringing PROMIS to practice: brief and precise symptom screening in ambulatory care. Cancer 2015;121:927-34
6. Borneman T, Piper BF, Sun VC, Koczywas M, Uman G, and Ferrell B, *Implementing the Fatigue Guidelines at one NCCN member institution: process and outcomes.* J Natl Compr Canc Netw, 2007. **5**(10): p. 1092-101.
7. Balas EA, Boren SA. Managing clinical knowledge for health care improvement. In: Bemmel J, McCray AT, editors. Yearbook of Medical Informatics 2000: Patient-Centered Systems. Stuttgart, Germany: Schattauer Verlagsgesellschaft mbH; 2000:65-70.
8. Latoszek-Berendsen A, Tange H, van den Herik HJ, and Hasman A, *From clinical practice guidelines to computer-interpretable guidelines. A literature overview.* Methods Inf Med, 2010. **49**(6): p. 550-70.
9. Bright TJ, Wong A, Dhurjati R, Bristow E, Bastian L, Coeytaux RR, Samsa G, Hasselblad V, Williams JW, Musty MD, Wing L, Kendrick AS, Sanders GD, and Lobach D, *Effect of clinical decision-support systems: a systematic review.* Ann Intern Med, 2012. **157**(1): p. 29-43.
10. Kawamoto K, Houlihan CA, Balas EA, and Lobach DF, Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success. BMJ, 2005. 330(7494): p. 765.Cooley ME, Lobach DF, Johns E, et al. Creating computable algorithms for symptom management in an outpatient thoracic oncology setting. *Journal of pain and symptom management.* Dec 2013;46(6):911-924.e911.
11. Lobach DF. The road to effective clinical decision support: are we there yet? BMJ 2013;346:f1616
12. Cooley ME, Lobach DF, Johns E, Halpenny B, Saunders T-A, Del Fiol G, Rabin MS, Calarese P, Berenbaum IL, Zaner K, Finn K, Berry DL, **Abrahm, JL**. Creating computable algorithms for symptom management in an outpatient thoracic oncology setting. J Pain Symptom Manage 2013;46:911-924 PMID: 23680580
13. Lobach DF, Johns EB, Halpenny B, Saunders TA, Brzozowski J, Del Fiol G, Berry DL, Braun IM, Finn K, Wolfe J**,** Abrahm JL, Cooley ME. Increasing complexity in rule-based clinical decision support: the Symptom Assessment and Management Intervention. JMIR Med Inform. 2016;Nov 8:4(4):e36 PMID: 27826132
14. Koleck TA, Dreisbach C, Bourne PE, Bakken S. Natural language processing of symptoms documented in free-text narratives of electronic health records: a systematic review. JAMIA 2019 (16 pp)

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