

Implementing a multisymptom chemotherapy risk assessment tool in two community oncology practices

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Chemotherapy patients are at high risk for developing symptoms that can delay or preclude treatment, affect quality of life, and even lead to life-endangering events. The AIM Higher risk assessment tool helps clinicians identify individual patient risks and develop strategies to manage or eliminate chemotherapy-related symptoms before and during treatment. This article discusses using the AIM Higher process for prechemotherapy risk assessment and describes how it can improve patient care. The implementation of the tool in two community oncology practices is discussed.

Patients undergoing chemotherapy are at risk of developing treatment-related symptoms, such as neutropenia, anemia, nausea/vomiting, and anxiety. When treating patients with cancer, clinicians primarily focus on treating and controlling the tumor, sometimes neglecting the side effects of the treatment. Yet, deficiencies in supportive care can compromise treatment outcomes.¹ Poorly managed side effects and symptoms may result in delayed therapy, dose reductions, omitted doses, increased hospitalizations, poor quality of life (QOL), and financial burdens.² Moreover, the substantial deficit in patient QOL resulting from chemotherapy-induced side effects has been found to be an independent predictor of survival.¹ A proactive approach to risk assessment can prevent or minimize side effects and have a positive impact on patient QOL.^{2,3}

History of AIM Higher

The AIM Higher risk assessment tool was created as one of the many interventions of the AIM Higher initiative, a quality improvement program designed to improve Assessment, Information provision, and Management of symptoms. Supportive Oncology Services (founded by the West Clinic in Memphis, Tennessee) sponsors AIM Higher.^{1,4} The initiative was designed to optimize supportive care

in community oncology practices in the following five core groups of symptoms:

- nausea/vomiting,

KEY POINTS

Side effects of chemotherapy can affect a patient's treatment outcome and quality of life.

Patient education, risk assessment, and symptom management can minimize or prevent many side effects.

The AIM Higher risk assessment tool was designed to improve supportive care for the five most common chemotherapy-related symptoms: nausea/vomiting, diarrhea/constipation, depression/anxiety, anemia, and neutropenia.

The AIM Higher program helps practitioners individualize treatments for specific patients and symptoms.

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- diarrhea/constipation,
- depression/anxiety,
- anemia, and
- neutropenia.

Clinical practice guidelines for symptom management help practitioners and patients make decisions about healthcare for specific clinical circumstances.^{5,6} As the American Society of Clinical Oncology noted, sound clinical guidelines must take into account “validity, reliability, reproducibility, clinical applicability, clinical flexibility, clarity, multidisciplinary process, review of evidence, and documentation.”^{5,6}

AIM Higher program coordinators found that using evidence-based guidelines for risk assessment could increase the quality of patient care, specifically in the following three key areas:

- assessment of symptoms,
- information provided to patients about symptoms, and
- management of symptoms.

Kelley Moore, RN, Vice President of Clinical Projects for Supportive Oncology Services, noted that, at the inception of the AIM Higher initiative, few practices used standardized tools to assess risk, document assessment, and educate patients.⁴ The AIM Higher initiative is committed to creating change in these areas and specifies the following three steps to do so:

- practice analysis: conduct a comprehensive evaluation of existing symptom management tools and processes;
- quality-improvement plans: develop a clinic-wide improvement plan based on findings in the practice analysis; and
- implementation: execute and evaluate the quality-improvement plan.¹

Assessment tool and neutropenia

A task force of eight nurses who sought to review available risk assessment tools for neutropenia initiated the AIM Higher risk assessment tool for oncology. At the time,

a risk assessment tool was in place that focused on chemotherapy regimens associated with a moderate to high risk of neutropenic complications. The AIM Higher task force expanded this goal to create a tool that incorporated symptoms in addition to neutropenia.²

Fourteen practices nationwide participated in the effort, which spanned 2–3 years. To create a comprehensive tool, the task force and the participating practices used evidence-based sources such as published journal articles, oncology reference books, and current guidelines (American Society of Clinical Oncology, National Comprehensive Cancer Network, National Cancer Institute).²

How the risk assessment tool works

The pretreatment risk assessment tool is a two-page document that lists symptoms (neutropenia, anemia, etc.) and their associated risk factors in separate sections (Figure 1). Clinicians note each patient’s listed risk factors and chemotherapy regimens associated with increased toxicity for each symptom. A blank space is provided under each symptom for other risk factors not specified on the document. Patients with one or more risk factors may be at increased risk for a symptom and thus require additional intervention.

Once the risk is defined and clearly identified, with “yes” or “no” written in the space provided, the clinician can list interventions, education, and further instructions in the space for “comments.” The clinician then signs the form and files it in the patient’s medical record so that each member of the cancer care team can monitor the patient’s risk and manage side effects throughout treatment.⁷

How to implement the risk assessment tool

Practices must analyze their needs based on the following questions:

- Do we currently perform any type of risk assessment?
- Where and when should risks be assessed?
- Who is responsible for preventing and managing symptoms?
- Who should perform the risk assessment?
- Do we have guidelines in place for managing symptoms, starting with risk assessment and continuing through intervention?
- Is there a link between risk assessment and symptom management?
- What are the challenges?
- What is the value?
- What are our strong points?

The oncology teams then need to use the findings of the practice analysis to develop a plan of action. The improvement plan may consist of determining who is responsible for performing risk assessments, the timing and location of performing the risk assessment, a communication pathway for sharing findings from the risk assessment that required action, how to use the tool for documentation, and a designated location in the medical record for the tool.

Oncology team members need to be trained about the AIM Higher risk assessment and supporting processes’ procedure and goals, as established by the practice analysis and plan of action, before they implement the risk assessment tool. Because they are at the front line of symptom management, oncology nurses are in an ideal position to develop guidelines with physicians, assess patient risk, and implement the guidelines, which result in more effective management of patient symptoms.^{3,4,8}

The risk assessment tool is most effective when used before the patient’s first cycle of chemotherapy. Several AIM Higher practices implement the tool during a prechemotherapy class, allowing providers to assess risk and teach patients how to manage their side effects.¹ The AIM Higher process provides a solid framework to analyze

a practice, develop a quality-improvement plan, and implement the plan.¹

Even after the tool has been effectively implemented, the process should be continually reevaluated to improve the original plan and implement new or improved components. The practice should form a team to conduct the evaluation, develop a feedback mechanism for integrating suggestions from the staff, establish the timing for evaluating progress toward implementation of the risk assessment tool, and communicate findings in a clear way that leaves room for continuous improvement. In addition, analyzing the use of the risk assessment tool and the implementation processes may prompt wide-ranging decisions to improve symptom management. Such decisions might include the need to develop management guidelines and the process for launching guidelines based on the risk assessment information.

Pennsylvania Oncology Hematology Associates and Eastern Connecticut Hematology Oncology Associates found that the tool serves multiple purposes

- It helps providers determine which patients are at greater risk of developing symptoms.
- It is used as part of a prechemotherapy teaching session.
- It helps providers plan customized interventions and teaching strategies.
- It improves patient outcomes (including fewer symptom-related clinic visits and phone calls).
- It helps standardize care to be consistent with current practice guidelines.
- It increases patient and staff satisfaction.
- It provides a centralized location to document risk assessment.
- It may reduce overall costs.^{1,7}
- It can be used as a teaching tool for new staff.

Pennsylvania Oncology Hematology Associates

Sarcoma patients are at risk for many chemotherapy-related symptoms because of the intense regimens they receive. A nurse implemented the AIM Higher multisymptom risk assessment tool during the prechemotherapy visit for all new sarcoma patients beginning in March 2005 at Pennsylvania Oncology Hematology Associates (POHA).⁹

In addition to the five symptoms AIM Higher generally included in the tool (nausea/vomiting, diarrhea/constipation, depression/anxiety, anemia, and neutropenia), based on their experience the nurses also chose to assess and monitor patients' risk for oral mucositis, peripheral neuropathy, cardiac toxicity, and encephalopathy. The risk assessment was done and filed in patients' charts before their chemotherapy education and treatment initiation. Thus, nurses could focus on educating patients about their individual risks; patient education continued throughout treatment visits as well as during the follow-up/nadir visit.

Furthermore, nurses developed specific interventions to address each chemotherapy-induced symptom based on current published guidelines. Throughout treatment, patients were asked to rate various symptoms on a scale of 0–10. Following patient outcomes and symptom development made it possible to modify symptom interventions during the first 2 months of using the tool. The most noted changes were for nausea/vomiting and constipation.

The decline in symptom severity as described in the patients' ratings demonstrates that a proactive approach to patient education and symptom management can produce favorable outcomes. The pretreatment risk assessment tool allowed treatments to be individualized by providing care providers with risk information in addition to the expected effects of a drug or combination of drugs. In sum, risk

identification encourages nurses to seek symptom management guidelines and educate patients individually about their treatment, both of which positively affect patient care and QOL.

Eastern Connecticut Hematology Oncology Associates

Eastern Connecticut Hematology Oncology Associates (ECHO) adopted the AIM Higher risk assessment tool to complement treatment of patients with various diagnoses. Since its implementation, the tool has been used to customize patient education, standardize symptom management plans, and address newly identified areas of care.

Before the risk assessment tool was incorporated into practice, patients were not formally educated about their treatment. They often learned the side effects of their chemotherapy chair-side from the infusion nurse on the first day of treatment. However, with the risk assessment tool, ECHO clinicians developed a prechemotherapy teaching class tailored for each patient. At this meeting, the nurse practitioner conducted the risk assessment analysis, which was further used to help adjust medications for symptom management.

With the risk assessment tool, the practice was also able to standardize antiemetic regimens and provide more aggressive intervention for patients at greater risk for nausea and vomiting.

As the AIM Higher process became more integrated into the practice, patients' need for mental health support became clear. This prompted the practice to seek increased collaboration with clinical social workers attuned to the needs of cancer patients and enabled patients the option to pursue therapy sessions. Physicians and nurse practitioners continued to provide medication management for depression and/or anxiety experienced by their patients. Furthermore, the early warning provided by the risk assess-



Pre-Treatment Risk Assessment

Patient: _____ Diagnosis: _____
 Regimen: _____ Date: _____

NEUTROPENIA

- Myelosuppressive Chemo Regimen
- Hx of Severe and/or Febrile Neutropenia
- Pre-existing Neutropenia
- Extensive Prior Chemotherapy
- Previous/Concurrent Radiation to Marrow
- Advanced or Uncontrolled Cancer
- Bone Marrow Involvement
- Poor Nutritional Status (e.g., low albumin)
- Poor Performance Status (ECOG ≥ 2)
- Elevated LDH (NHL)
- Active Tissue Infection
- ↓ Immune Function (consider other co-morbidities)
- Other _____
- Open Wounds
- Age > 65

Risk identified? _____ Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

Bladder Cancer paclitaxel/cisplatin or carboplatin methotrexate/vinblastine/doxorubicin/cisplatin (MVAC)	Head & Neck paclitaxel/ifosfamide/mesna/cisplatin Non-Hodgkin's Lymphoma cyclophosphamide/doxorubicin/vincristine/prednisone (CHOP) dexamethasone/cisplatin/cytarabine/prednisone (DHAP) etoposide/methylprednisolone/cisplatin/cytarabine (ESHAP)	Ovarian Cancer paclitaxel docetaxel topotecan
Breast Cancer docetaxel (T)/doxorubicin (A) docetaxel (T)/doxorubicin (A)/cyclophosphamide (C) doxorubicin (A)/paclitaxel (T) AC→T, AC	Non-Small Cell Lung Cancer cisplatin/paclitaxel docetaxel/carboplatin	Small Cell Lung Cancer etoposide/cisplatin topotecan+/-paclitaxel
Cervical paclitaxel/cisplatin	Testicular Cancer vinblastine/ifosfamide/cisplatin (VIP)	Sarcoma doxorubicin/ifosfamide mesna/doxorubicin/ifosfamide/dacarbazine (MAID)

- This list is not comprehensive. Other regimens are associated with intermediate or high risk of febrile neutropenia.
- Consider CSF in regimens administered with curative/adjuvant intent (to maintain Relative Dose Intensity – RDI).

ANEMIA

- Myelosuppressive Chemo Regimen
- Bone Marrow Involvement
- Nutritional Deficiency/Malabsorption
- Previous Radiation to Marrow
- Blood Loss—Surgical, GI, GYN
- Transfusion Within Past 6 Months
- Active Infection
- Chronic Illness
- Other _____
- Renal Insufficiency
- Pre-existing Anemia

Risk identified? _____ Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

cisplatin/5-FU cyclophosphamide/doxorubicin/5 FU cyclophosphamide/doxorubicin/vincristine/prednisone (CHOP)	cyclophosphamide/mitoxantrone/vincristine (CNOP) etoposide/cisplatin paclitaxel/cisplatin or carboplatin	paclitaxel/doxorubicin topotecan
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NAUSEA / VOMITING

- Emetogenic Treatment Regimen
- Female
- < 50 years
- Hx of N/V with Anesthesia/Analgesics
- Radiation to Abdomen
- Hx of Hyperemesis with Pregnancy
- GI malign and/or Adv / large Tumor Burden
- Prior Inadequate Control of N/V
- Hx of Motion Sickness
- Other _____

Risk identified? _____ Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

Intermediate Risk (occurs in at least 30% of patients) amifostine > 500mg/m ² arsenic trioxide etoposide gemcitabine interleukin-2 12-15 mil units/m ² irinotecan melphalan > 500mg/m ² mitomycin mitoxantrone	oxaliplatin > 75mg/m ² procarbazine teniposide topotecan	High Risk (occurs in >30% to 90% of patients) busulfan > 4 mg/day carboplatin carmustine cyclophosphamide cytarabine dacarbazine dactinomycin daunorubicin doxorubicin	epirubicin hexamethylmelamine idarubicin ifosfamide lomustine mechlorethamine methotrexate > 1000mg/m ² streptozocin
Very High Risk (occurs in 99% of patients) cisplatin			

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Pre-Treatment Risk Assessment

ANXIETY / DEPRESSION

Chemotherapy/Other Rx Personal or Family Hx of Anxiety/Depression Loss of Social/Emotional Support
 Pancreatic, Brain, GYN, Lung, H&N Cancer Drug or Alcohol Abuse Loss of Financial Resources
 Relapsed/Refractory Disease Impaired Sexual Function Loss of Functional Abilities
 Uncontrolled Pain Altered Physical Appearance Other _____

Risk identified? _____ Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

asparaginase	interleukin	procarbazine	vinblastine
interferon	intrathecal methotrexate	tamoxifen	vincristine

ORAL MUCOSITIS

Chemotherapy ↓ Salivation
 Current or Prior Radiation to H&N Area Geriatric Patient
 Hx of Mucositis Poor Fitting Oral Prosthesis
 Hx or Presence of Dental Disease Other _____

Risk identified? _____ Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

5-FU	dactinomycin	doxorubicin	methotrexate	thioguanine
bleomycin	daunorubicin	etoposide	mitoxantrone	vinblastine
cytarabine	docetaxel	floxuridine	plicamycin	

CONSTIPATION

Chemotherapy Geriatric Patient
 Hx of Constipation Current Narcotic Use
 Antiemetics Oral Iron
 Inactivity Other _____

Risk identified? _____

Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

thalidomide	vincristine
vinblastine	vinorelbine

DIARRHEA

Chemotherapy Enteral Feedings
 Radiation to Colon/Abd/Pelvis Lactose Intolerance
 Hx of Diarrhea/Bowel Disease Other _____

Risk identified? _____

Comments: _____

CHEMOTHERAPY REGIMENS ASSOCIATED WITH INCREASED TOXICITY

5-FU	erlotinib	irinotecan
docetaxel	gefitinib	oxaliplatin

- **Neurotoxicity** – high-dose cyclophosphamide, high-dose cytarabine
- **Peripheral Neuropathy** – bortezomib, carboplatin, cisplatin, docetaxel, oxaliplatin, paclitaxel, paclitaxel protein-bound, thalidomide, vinblastine, vincristine, vinorelbine
- **Cardiac Toxicity** – doxorubicin, epirubicin, liposomal doxorubicin, mitoxantrone, trastuzumab
- **Hand and Foot Syndrome** – capecitabine, liposomal doxorubicin

Other Toxicities to Consider: _____

Signature: _____

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ment tool allowed the oncology team to initiate treatment earlier for patients with anxiety and/or depression.

Not only has the AIM Higher tool and process helped improve existing services and treatment, it has helped ECHO provide more comprehensive care for its patients and has helped clinicians anticipate problems and resolve them more quickly and effectively.

Conclusion

Risk assessment is an important tool in taking a proactive step in symptom management and cancer care. The AIM Higher process provides oncology practices with an established protocol for risk assessment and symptom management; yet, as is shown by the experiences at POHA and ECHO, it also provides clinicians with the flexibility to meet the unique needs of their practice. Thus, by adopting the AIM Higher risk assessment tool, oncology practices can build on an established protocol to take steps to effectively manage chemotherapy-related symptoms, which leads to improved staff efficiency, pa-

tient safety, and quality of care.

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References

1. Fallon J, Fortenbaugh C. Using the AIM Higher process to implement a multisymptom prechemotherapy risk assessment tool. Poster presented at the Oncology Nursing Society 31st Annual Congress; May 4–7, 2006; Boston, Mass.
2. Quargnenti A. Chemotherapy side effects: developing a risk assessment tool for use with patients prior to their first cycle of chemotherapy. Paper presented at the Oncology Nursing Society 30th Annual Congress; April 28–May 1, 2005; Orlando, Fla.
3. Ropka ME, Padilla G, Gillespie TW. Risk modeling: applying evidence-based risk assessment in oncology nursing practice. *Oncol Nurs Forum* 2005; 32:49–56.
4. Moore K. Nurses improving practice: champions of success in symptom management. Continuing education monograph for oncology nurses. Pittsburgh, Pa: OES; 2005.
5. Gralla RJ, Osoba D, Kris MG, et al. Recommendations for the use of antiemetics: evidence-based, clinical practice guidelines. *J Clin Oncol* 1999;17:2971–2994.

6. Anonymous. The periodic health examination. Canadian task force on the periodic health examination. *Can Med Assoc J* 1979;121:1193–1254.

7. Quargnenti A, Krawchuk C, Fallon J, Fortenbaugh C. AIM Higher tool identifies patients at risk for neutropenia. *Special Interest Group Newsletter* February 2006. Available at: <http://onsopcontent.ons.org/publications/SIGNewsletters/neutro/neutro4.1.html>. Accessed November 30, 2006.

8. White N, Maxwell C, Michelson J, Bedell C. Protocols for managing chemotherapy-induced neutropenia in clinical oncology practices. *Cancer Nurs* 2005;28:62–69.

9. Leahy N, Fortenbaugh C. Implementing a multi-symptom risk assessment tool in the sarcoma population. Poster presented at the Oncology Nursing Society 31st Annual Congress; May 4–7, 2006; Boston, Mass.

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