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# Tools for Assessing Nausea, Vomiting, and Retching

## A Literature Review

### KEY WORDS

Cancer  
CINV  
Emesis  
Measurement  
Nausea  
Oncology  
Quality of life  
Retching  
Scale  
Symptom assessment  
Symptom distress  
Symptom experience  
Symptom occurrence  
Tool  
Vomiting

**Background:** Chemotherapy-induced nausea, vomiting, and retching are recognized as having an impact on patients' overall physical well-being, quality of life, and treatment decisions. Although there are many tools available to measure aspects of these symptoms, few offer a complete and concise clinical assessment. **Objective:** The purpose of this article was to provide a comprehensive overview of the various instruments available for the assessment of cancer-related nausea, vomiting, and retching. Analysis included symptoms measured, period evaluated, type of questions posed, and aspects of each symptom measured. **Methods:** Searches were conducted to find relevant articles using nationally recognized oncology Web sites and 4 electronic databases including PubMed, MEDLINE/CINAHL and CINAHL/EBSCO, and Cochrane. **Results:** This review includes a total of 25 instruments that were identified as meeting the inclusion criteria of having been developed, or adapted, for the adult population, with an oncology focus. **Conclusion:** The ideal instrument would include measurement of all 3 symptoms while remaining clear, concise, and clinically relevant. **Implications for Practice:** Although only 1 instrument came close to meeting these criteria, this review provides nurses with specific information on a variety of instruments to assist providers in selecting the most appropriate instrument for their specific clinical setting. This comprehensive critique of instruments is important for nurses attempting to select a tool to guide optimum care for patients in the clinical setting.

Approximately 1 437 180 new cancer cases were diagnosed in the United States in 2008.<sup>1</sup> For those patients receiving chemotherapy, studies have shown that despite

recent advances in antiemetic therapy, approximately 38% to 64% of patients develop chemotherapy-induced nausea and vomiting (CINV).<sup>2-4</sup> Based on patient testimony, these symptoms

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are among the most commonly reported symptoms during chemotherapy and impact the patients' lives in the arena of ability to function, quality of life, and fulfillment of chemotherapy treatments.<sup>2,4-10</sup> Research has shown that patients receiving chemotherapy report nausea and vomiting to be among the most distressing and feared symptoms.<sup>11-13</sup> Fear of this experience may cause patients to withdraw from potentially beneficial treatment.

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## ■ Background

Nausea, vomiting, and retching, although related, are actually 3 distinct symptoms. Definitions provided by Rhodes and McDaniel<sup>14</sup> in 2001 clearly articulate the uniqueness of each symptom as follows:

- Nausea is an unpleasant sensation experienced in the back of the throat and the epigastrium that may or may not result in the expulsion of material from the stomach.
- Vomiting involves the actual forceful upward expulsion of contents from the stomach.
- Retching is the attempt to expel contents of the stomach without actually bringing anything up.<sup>14</sup>

Therefore, to adequately address the patient's experience with these symptoms requires each symptom to be measured independently.

Useful assessment of the symptoms requires more than just an accounting of its presence—yes or no. To obtain the information needed for focused interventions, the assessment must be comprehensive and requires a clear sense of other aspects of the symptom experience.

The nausea, vomiting, and retching experience of patients receiving chemotherapy can be separated into 3 periods. Some patients experience pre, or anticipatory, nausea and vomiting prior to the initiation of chemotherapy. Osoba and colleagues<sup>15</sup> report that patients who experience pre or anticipatory nausea have a higher incidence of nausea and vomiting during and after chemotherapy. Patients often experience acute nausea, vomiting, and retching occurring during the first 24 hours following chemotherapy. Research has also shown that as many as 50% to 60% of the patients who receive moderately or highly emetogenic chemotherapy also experience delayed nausea and vomiting, which can continue for days following treatment.<sup>5</sup> The majority of the information available for each period focuses only on nausea and vomiting. Comprehensive assessments are needed to determine if all periods should also be addressed for retching.

Chemotherapy-induced nausea and vomiting has been shown to greatly impact perceived quality of life during treatment. The intensity of this impact appears to be at least somewhat related to certain characteristics of the experience, including duration, frequency, severity, and distress, as well as the consequences of the experienced symptoms. This is especially true for those patients who experience delayed nausea and vomiting.<sup>5</sup> Reducing the length and severity of CINVR helps patients retain their ability to maintain normal life functions including caring for themselves and sustaining their relationships with others.<sup>6</sup> Failure to effectively treat nausea and vomiting may lengthen hospital stays<sup>16</sup>;

increase medical complications such as malnutrition, dehydration, and electrolyte imbalances; and contribute to physical and mental deterioration.<sup>17</sup> As indicated above, information regarding this aspect of retching is less well known than for nausea and vomiting.

Nurses play a significant role in identifying and managing chemotherapy-induced nausea, vomiting, and retching (CINVR) symptoms, yet the process for accomplishing this is complex. Previously, the primary authors conducted a performance improvement project aimed at improving the management of nausea and vomiting related to high-dose chemotherapy on an inpatient bone marrow transplant unit. This project provided the groundwork and identified the need for tools to accurately measure CINVR.<sup>18</sup> Such tools must be able to accurately measure the symptoms of interest in a reliable manner. In addition, the tools must be realistic to use in the practice setting—either research or clinical, especially as symptom management research moves into the clinical arena. The usefulness of an effective assessment tool can help engage patients in the process of evaluating treatment experiences. In clinical practice, tools will facilitate the involvement of patients in the monitoring and individualization of their own care. It can also enhance patient-provider communication and shared decision making in the practice setting. This patient-centered approach can reduce the intensity and distress of the symptom experience and potentially lead to improved health outcomes.<sup>19</sup>

Tools have been available for many years to assist care providers in monitoring the frequency, severity, and duration of CINVR symptoms. However, trying to understand these symptoms remains a challenge for many health care professionals. This is related to both the subjectivism of the symptoms<sup>9</sup> and the number of tools available. In addition, it is now understood that the interaction of 2 or more of these symptoms has a greater affect on an individual than the total power achieved by each symptom working separately.<sup>20</sup> Unfortunately, many tools do not include all 3 symptoms. In addition, others lack documentation regarding reliability and validity. Therefore, the desire is to identify a tool that is clear, concise, and clinically useful (so as to not burden the patient or the provider), as well as able to provide valid and reliable data for the evaluation of interventions for evidence-based practice.

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## ■ Purpose

The purpose of this literature review was to conduct a thorough evaluation of available CINVR assessment tools. This information will provide clinicians and researchers with a comprehensive examination of the various instruments available, including period evaluated, type of questions posed, and aspects of each symptom measured. The information can then be used by health care professionals to evaluate the individual components of each tool and determine the most appropriate one for their setting.

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## ■ Review Methodology

The search for CINVR tools began with a review of nationally recognized oncology Web sites for information related to the

topic. These Web sites included the American Cancer Society, Oncology Nursing Society, National Comprehensive Cancer Network, and Multinational Association of Supportive Care in Cancer (MASCC) for information related to our topic. The search was then expanded using MEDLINE/CINAHL and CINAHL/EBSCO, and Cochrane databases using the following keywords: nausea, vomiting, retching, CINV, measurement, tool, symptom experience, symptom distress, symptom occurrence, symptom assessment, quality of life, cancer, oncology, emesis, and scale.

The search period spanned from 1980 to 2009. Initially, 412 abstracts were identified; these were narrowed to 123 abstracts that discussed tools available in an English version. Searches were then conducted to seek information regarding documentation of tool reliability and validity, tool use in the adult oncology population, and availability of the tool in print form in order that it could be evaluated. To complete the search, a hand search through the reference lists of retrieved articles was also completed.

Initial review of the selected articles provided the content for development of the components that would guide the evaluation of all of the tools. The acceptance of the components was validated based on the clinical experience of the authors as well as the findings of an earlier performance improvement project examining nausea and vomiting in high-dose chemotherapy patients.<sup>18</sup> Each tool was then critiqued for the inclusion of measures of duration, frequency, severity, and distress for each of the 3 symptoms: nausea, vomiting, and retching. Reviewers also recorded the number of questions that addressed nausea, vomiting, and retching; the period queried; and the scale used for the assessment. Relevant notes were added in a comment fashion to guide the final critique process.

The initial focus was placed on tools that were developed to assess only nausea, vomiting, and/or retching symptoms. Later, the process was expanded to include several widely used, oncology-related, quality-of-life and ability-to-function tools. The intent was to review how the identified symptoms of CINVR were addressed in these larger tools. Final inclusion of a tool for evaluation involved availability of the tool in English, ability to use the tool in a clinical practice setting, and the tool's capability to provide data that could be used to evaluate evidence-based practice. The goal was to find self-report tools, ideally with the potential of being able to reproduce for use in electronic documentation. Tool length was taken into consideration to avoid additional burden for this potentially nauseated and fatigued patient population and to respect time constraints of the care providers. The ideal instrument needs to be clear and concise, yet provide useful information not only for the clinical setting but also for research.

## ■ Findings

The comprehensive literature search yielded more than 20 instruments that addressed nausea, vomiting, and retching (Table). Some of the instruments had more than 1 version in

the literature. The versions may have included additional items, used different scales, or demonstrated evidence of evolution over time. Although the importance of addressing overall quality-of-life issues is widely recognized in the oncology population, the purpose of this review was narrowed to evaluating only the CINVR symptom experience. Therefore, when broader oncology tools such as the Organization for Research and Treatment of Cancer QLQ-C30<sup>24</sup> were examined, only the items that addressed CINVR were reviewed. Twenty-four tools evaluating nausea were identified that met the inclusion criteria. Thirteen tools measured vomiting as a separate experience. Only 3 tools included a separate assessment of retching. The number of CINVR-related questions in each tool ranged from 2 to 17. The most detailed tools included assessment of frequency, duration, severity, and distress caused by these symptoms. For the final selection of assessment tools to be included in this review, earlier original versions of tools were added only if they varied significantly from the most current version available. Information regarding the validity and reliability information available is also included in the Table. The amount of information available regarding the validity and reliability of the tools included in this review varied greatly. Often, articles would make reference to the established validity and reliability without providing details of the data available.

## Nausea Experience

Of the 24 tools that addressed nausea in the oncology population, many were designed to focus on the patient's more broad functional status or quality-of-life issues. One tool, the Morrow Assessment of Nausea and Emesis,<sup>33</sup> specifically asked questions regarding pretreatment nausea. Another tool, the MASCC Antiemesis Tool,<sup>34</sup> individually addressed both acute and delayed nausea and vomiting. By completing the assessment on multiple days, the other tools could be used to capture these data for the different phases. All but one of the tools included were developed to be used as self-report questionnaires, although assistance could be provided for those who are weak or unable to read or complete on their own. One tool, the Behavioral Observation tool, requires nurses to assess the patient's experience and report patient behaviors. The research using this tool did not find it to be as sensitive as self-report tools, but it may be a reasonable alternative when a patient is not able to communicate verbally with staff about his/her experience.<sup>22</sup>

Four characteristics of nausea typically were measured including duration, frequency, severity, and associated distress. Duration was measured by asking the patient if they had experienced nausea and/or the number of hours that nausea was experienced during the time frame addressed. Frequency was measured as the number of nausea episodes during the same period. Severity was measured using a categorical rating scale, usually Likert-type, such as none, mild, moderate, or severe. Some used a visual analog scale (VAS) or numerical rating scale (NRS). A clear exception to this pattern is the Nausea Questionnaire,<sup>39</sup> which ranks descriptors based on the position of the word within each set. In addition, the

**Table • Summary of Measures for Nausea, Vomiting, and Retching**

Tool	Nausea			Vomiting			Retching			No. of N/V/R Questions	Period	Scale	Reliability and Validity	Comments
	Duration	Frequency	Severity	Duration	Frequency	Severity	Duration	Frequency	Severity					
ASDS-2 <sup>21</sup>		X	X			X				3 Questions	Past 3 wk	5-Point Likert	Cronbach $\alpha$ of .91 for symptom experience, .90 for symptom occurrence, and .76 for symptom distress. Content and construct validity supported ( $P = .009$ ). <sup>21</sup> Interday reliability for nausea, 0.72 ( $P < .0001$ ). Intershift reliability for verbal nausea, 0.20–0.35. Construct validity supported; correlation between the observed behavior and verbal complaints of nausea was 0.80 ( $P < .001$ ). <sup>22</sup>	6-Item tool assesses symptom occurrence and distress
Behavioral Observations <sup>22</sup>	X						X				Past 12 h		Supported by the NCI and World Health Organization. Reliability and validity data not readily found.	6 Nurse-reported patient behaviors to supplement self-report
CTC <sup>23</sup>		X		X						2 Questions	Previous 24 h, each visit, or weekly	5-Point grading		Nausea severity (oral/IV intake), vomiting frequency and severity (emetic episodes/IV fluids/life-threatening consequences)
EORTC QLQ-C30 <sup>24</sup>		X						X		2 Questions	Past week	4-Point Likert	Internal consistency in functional scales revealed Cronbach $\alpha = .74$ , and .72 for symptom scales. Consistency reliability, Cronbach $\alpha = .62$ ; test-retest correlation coefficient, 0.44; negative correlation shown with nausea, vomiting, and retching on QOL (discriminant validity). EORTC nausea and emesis items highly correlate with Osoba Module (convergent validity). QOL subscales were affected significantly by episodes of nausea, emesis, or retching ( $P < 0.01$ ). <sup>8,25</sup>	Tool assesses severity of 28 symptoms, plus overall health and QOL
ESAS		X								1 Question	At time of assessment	10-cm NRS	Overall Cronbach $\alpha = .79$ . Demonstrated test-retest validity. Responses correlated with corresponding measures from the FACT and MSAS instruments. <sup>26</sup>	Tool addresses severity of 10 symptoms. Daily results can be graphed for longitudinal assessment

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**Table • Summary of Measures for Nausea, Vomiting, and Retching, continued**

Tool	Nausea		Vomiting		Retching		No. of N/V/R Questions	Period	Scale	Reliability and Validity	Comments
	Duration	Frequency	Severity	Distress	Duration	Frequency					
ESAS-M <sup>27</sup>		X					1 Questions	Past 3 d	4-Point Likert	Construct validity with RSCL. <sup>28</sup>	Tool addresses 11 symptoms
FACT-G <sup>29</sup>		X					1 Question	Past 7 d	5-Point Likert VCS	Coefficients of reliability and validity were uniformly high. Pearson correlation with FLIC, 0.79. Test-retest correlation coefficients between 0.82 and 0.92. <sup>29</sup>	27-Item tool divided into 4 QOL domains
FLIC <sup>30</sup>			X				1 Question	Past 2 wk	7-Point Likert	FLIC validated as a measure of the overall functional quality of cancer patient's day-to-day life. Construct validity shown. Stability shown in factor analysis. Concurrent validation done. <sup>30</sup>	Impact of symptoms on daily functioning/QOL; total of 22 questions
FLIE <sup>6</sup>	X		X				18 Questions	Past 5 d	7-Point Likert (100-mm VAS)	Internal consistency Cronbach $a = .79$ . Spearman correlation $r = 0.74-0.97$ . <sup>31</sup> Negative correlation between symptom experience and perceived QOL. <sup>5</sup>	Quantity of N/V and their effect on daily functioning
INRV <sup>32</sup>	X	X		X	X	X	8 Questions	Previous 12 h	5-Point Likert	Spearman correlation coefficient, 0.87. High rate of agreement between INRV and INV-2. <sup>32</sup>	Preferred by patients over INV-2
MANE <sup>33</sup>	X	X	X	X			5 Questions with multiple components	During and until 24 h after treatment	Yes/no, no. of hours, Likert scales	Test/retest reliability, 0.61-0.78. Construct validity, <sup>33</sup> 0.72-0.96.	Addresses pretreatment and hours after treatment up to >24 h posttreatment, duration, severity of N/V at its worst, use and effectiveness of antiemetic
MAT <sup>34</sup>	X	X	X	X			4 Questions	Once per chemotherapy cycle	Yes/no, NRS for nausea severity	Internal consistency, Cronbach $a = .77-.82$ . Concurrent validity (MAT with INRV) correlation $r = 0.86$ , $P < .001$ . <sup>35</sup>	Tool to be used 24 h and 4 d after chemotherapy. Addresses acute and delayed N/V
MDASI <sup>36</sup>		X					2 Questions	Past 24 h	0- to 10-Point NRS	Correlation coefficient, 0.09. Internal consistency, 0.82-0.91. Significant difference in symptom severity and symptom interference between patients with poor and good performance status ( $P < .001$ ). <sup>37</sup>	Tool addresses severity of 13 symptoms at their worst, plus 6 questions regarding symptom impact on life functions

MSAS <sup>37</sup>	X	X	X	X	X	X	X	8 Questions	Past week	Yes/no 4-point Likert	Subscale Cronbach $\alpha = .580-.882$ . Correlation between severity and frequency $r = 0.80$ . Convergent, discriminant, and construct validity supported. <sup>37</sup>	Tool addresses 32 symptoms
MSAS-SF <sup>37</sup>	X		X	X	X	X	X	4 Questions (2 questions if yes, then Likert)	Past week	Yes/no, plus 5-point Likert	Subscale Cronbach $\alpha = .76-.87$ . Subscales showed convergent validity with FACT subscales. Subscale correlation coefficients with FACT-G range, 0.68-0.74. Convergent validity supported. Test-retest correlation coefficients for subscales ranged from 0.86 to 0.94 at 1 d, and 0.40 to 0.84 at 1 wk. <sup>37</sup>	Tool addresses 28 physical symptoms, plus room for patient to add 2 additional, and 4 psychological symptoms
MSAS-SF <sup>38</sup>	X		X	X	X	X	X	4 Questions (2 questions if yes, then Likert)	Past week	Yes/no, plus 5-point Likert	Subscale Cronbach $\alpha = .76-.87$ . Subscales showed convergent validity with FACT subscales. Subscale correlation coefficients with FACT-G range, 0.68-0.74. Convergent validity supported. Test-retest correlation coefficients for subscales ranged from 0.86 to 0.94 at 1 d, and 0.40 to 0.84 at 1 wk. <sup>38</sup>	Tool addresses 28 physical symptoms, plus room for patient to add 2 additional, and 4 psychological symptoms
Nausea Profile <sup>39</sup>		X						17 Questions	Tested before, during, or after treatment session	0- to 9-Point NRS	Construct validity, correlates with VAS for nausea ( $r = 0.71$ , $P < .01$ ). Factor analysis shows ability to distinguish the 3 dimensions of nausea: somatic, GI, emotional. <sup>39</sup>	Symptom checklist for describing nausea experience; measures 3 dimensions of nausea: somatic, GI, and emotional distress
Nausea Questionnaire <sup>40</sup>		X	X					11 Questions	Past chemotherapy experience	Word choice, 6-point scale, VAS	Correlation coefficient = 0.89 between physician and nurse responses. ONI and VAS show higher correlations than the NRI with physician and nurses' estimates. <sup>40</sup>	Combines the NRI, ONI, and VAS; measures distress and severity of nausea
NCI <sup>41</sup>		X		X				2 Questions	Past 24 h	4/5-Point grading	Reliability and validity data not readily found.	Grades nausea severity as related to intake/IV; vomiting related to frequency and need for hospitalization

*continues*

**Table • Summary of Measures for Nausea, Vomiting, and Retching, continued**

Tool	Nausea			Vomiting			Retching			No. of N/V/R Questions	Period	Scale	Reliability and Validity	Comments
	Duration	Frequency	Severity	Duration	Frequency	Severity	Duration	Frequency	Severity					
NRI <sup>40</sup>		X							9 Sets		Circle word descriptors	Internal consistency, Cronbach $\alpha = .83$ . With exception of set 5, all item-to-total correlation were significant ( $P < .05$ ). <sup>40</sup>	Categories of nausea descriptors ranks value of each word based on position of word in set	
ONI <sup>40</sup>		X							1 Question	Nonspecific	6-Point scale	Interrater reliability correlation coefficient of 0.89. <sup>40</sup>	Addresses severity of nausea using descriptive	
Osoba Nausea and Emesis Module <sup>8</sup>		X			X			X	10 Questions	Past 24 h	4-Point Likert	Cronbach $\alpha = .85$ , test-retest correlation, 0.77. Discriminant and convergent validity supported. <sup>8</sup>	Assesses N/V/R affect on functioning and well-being. Groups N/V together, retching questions stand alone.	
RSCL-M <sup>42</sup>		X			X			X	2 Questions	Past week	4-Point Likert	Cronbach $\alpha = .88$ . Convergent validity with MOS SF-36 PF subscale, Pearson $r = -0.59$ . Discriminant validity with MSPSS $r = -0.21$ . ANCOVA indicated significant differences in physical distress among patients with different treatment profiles ( $F_6 = 13.171, P < .001$ ). <sup>42</sup>	Addresses a total of 28 physical and psychological symptoms	
SEI <sup>43</sup>		X	X	X	X			X	4 Questions	Chemotherapy cycle or weekly	5-Point Likert	Cronbach $\alpha = .91$ for symptom, .85 symptom occurrence, .84 symptom distress. Test-retest reliability $r = 0.93$ , symptom occurrence $r = 0.94$ , symptom distress $r = 0.92$ . Construct validity supported ( $P < .01$ ). <sup>43</sup>	Total of 9 questions; measures symptom experience as sum of symptom occurrence and distress	
SES <sup>44</sup>		X	X	X	X			X	3 Questions	Past week	5-Point Likert	Cronbach $\alpha$ ranged from .92–.96. Construct validity supported ( $P = .0005$ ). <sup>44</sup>	Assesses 8 symptoms; mailed questionnaire	

Abbreviations: ANCOVA, analysis of covariance; ASDS, Adapted Symptom Distress Scale; CTC, Common Toxicity Criteria; EORTC, Organization for Research and Treatment of Cancer; ESAS, Edmonton Symptom Assessment Scale; ESAS-M, Modified ESAS; FACT-G, Functional Assessment of Cancer Therapy-General; FLIC, Functional Living Index-Cancer; FLIE, Functional Living Index-Emesis; GI, gastrointestinal; INVR, Index of Nausea, Vomiting, and Retching; IV, intravenous; MANE, Morrow Assessment of Nausea and Emesis; MASCC, Multinational Association of Supportive Care in Cancer; MAT, MASCC Antiemesis Tool; MDASI, MD Anderson Symptom Inventory Core Items; MOS SF-36, Medical Outcomes Study-Short Form; MSAS, Memorial Symptom Assessment Scale; MSAS-SF, MSAS Short Form; NCI, National Cancer Institute; NRI, Nausea Rating Index; NRS, numerical rating scale; N/V/R, nausea, vomiting, and retching; ONI, Overall Nausea Index; PF, Physical Functioning; QOL, quality of life; RSCL-M, Rotterdam Symptom Checklist-Modified; SEI, Symptom Experience Index; SES, Symptom Experience Scale; VAS, visual analog scale; VCS, verbal categorical scale.

Common Toxicity Criteria<sup>23</sup> examines both nausea and vomiting separately, in relation to the symptom's influence on a patient's ability to maintain oral intake or need for intravenous fluid replacement. Distress, when included, is most often measured using Likert-type scales ranging from none to severe distress or discomfort. Some tools address distress by how patients perceive the symptom's impact on their daily/social functioning or quality of life.

## Vomiting Experience

Vomiting as a separate physical experience was addressed in 13 of the 24 tools that met the inclusion criteria. Duration is measured in both number of hours and as yes/no questions. Frequency is measured by the number of vomiting episodes in the specified period. The time frame addressed ranges from the past 12 hours to during the past week. Three tools inquire regarding the number of vomiting episodes the patient experienced in the past 12 to 24 hours. In the Index of Nausea, Vomiting, and Retching (INVR),<sup>32</sup> the vomiting assessment addresses volume as measured in cups. The Common Toxicity Criteria<sup>23</sup> includes assessing the need for intravenous fluids or total parenteral nutrition and the potential for life-threatening consequences. Severity is addressed in 4 tools using 4- to 6-point Likert scales. Distress produced by vomiting is evaluated in 6 tools, with questions ranging from asking about a specific emetic episode to the distress caused by vomiting in the past week. The Functional Living Index-Emesis<sup>6</sup> and Osoba Nausea and Vomiting Module<sup>8</sup> addressed the effect of vomiting on the patient's ability to perform life functions. The MASCC Antiemesis Tool includes both acute and delayed vomiting in conjunction to the acute and delayed nausea as indicated above.

## Retching Experience

Only 3 tools ask specific questions regarding retching. The Osoba Nausea and Vomiting Module<sup>8</sup> includes 5 separate Likert-type questions to assess the impact of retching on daily functioning and patient well-being. The INVR inquires regarding the number of retching episodes in the previous 12 hours and the distress felt by these episodes. The Behavioral Observation tool asks the care providers if they have witnessed the patient retching. The duration and severity of retching were included as part of the instrument review; however, because they were not found on the tools examined, those 2 columns were not included in the Table in the section on retching.

## Assessment Periods

Twelve tools address the past week to as far back as the previous chemotherapy cycle. Three of the tools reviewed were developed to utilize 3- to 6-day recalls. Three tools address the previous 24-hour period. Three tools address the immediate present to the previous 12-hour period. The other tools are either nonspecific in their evaluation period, or it was stated they could be adapted to meet the user's needs.

## Discussion

The CINVR experience is composed of 3 separate symptoms. To obtain a complete understanding of the patient's total experience, each symptom requires evaluation. Nursing plays a crucial role in the assessment and management of these symptoms. To impact the patient's experience, nurses need to have the tools available to help them assess each symptom in a timely manner. Early and accurate assessment can lead the way to timely, patient-specific interventions and minimize the symptom experience. This review indicates that the tools available vary in the comprehensiveness of their assessment of all 3 symptoms, with retching being included least often and in less detail. In fact, because of this limited presence in the assessments, the relevance of information collected regarding retching is not well known.

Four aspects of nausea were assessed: duration, frequency, severity, and associated distress. Because of the subjective nature of the experience, nausea may be the most difficult symptom for care providers to measure. However, research has shown that it has a stronger negative impact on quality of life than vomiting<sup>5</sup>; thus, it is critical to include in assessments. Questions related specifically to vomiting evaluated 5 components: duration, frequency, volume, severity, and distress. Few tools looked at all of the components. Although some of the instruments assess retching together with vomiting, retching was seldom assessed as its own symptom. When retching was addressed, the focus was on frequency and its associated distress. Assessing retching as a separate symptom may help identify and quantify the total experience of chemotherapy patients. When asked about their chemotherapy experience, patients may not report having had an emetic episode if no matter was expelled. This has the potential of reducing assessment information. By separating out the retching experience, care providers may develop a more complete understanding of the patient's experience. Adequately addressing the frequency, severity, and duration of each of these symptoms positively impacts the patient's quality of life, their ability to maintain normal life functions, and their ability to maintain relationships with others.<sup>5-8</sup>

Timely and complete assessments are essential because research has shown that most health care professionals significantly underestimate the incidence and severity of nausea, especially when it is delayed. The periods addressed in the questions varied greatly and ranged from the time of assessment to the past treatment experience, with many of the tools using recall to address long periods. It has been reported that these extended recall periods provide quality information when addressing chemotherapy's impact on a patient's health-related quality of life.<sup>45</sup> However, a real-time or 12- to 24-hour recall time frame would facilitate more timely interventions, making these tools better suited for the acute-care clinical practice setting. In the outpatient setting, the period needs to address whatever time frame is relevant to the current phase of treatment.

Three types of scales were used most frequently. The VAS often uses 0- to 100-mm visual line anchored by verbal

descriptors. Numerical rating scales use a unidimensional line, with evenly spaced numerical markings, and verbal categorical scales (VCSs), such as Likert-type scales. The VAS requires patients to convert a subjective sensation to a mark on a straight line provided on the assessment tool. It is extremely difficult to identically reproduce this line and therefore difficult to analyze data obtained for use in research studies. The VAS can also be difficult to explain to patients and must be administered on paper or electronically. The NRS can be administered either verbally or graphically and has been found to be similar in sensitivity to the VAS. It can be more easily understood by patients and is able to generate data that can be statistically analyzed. The VCS asks for level of agreement with a particular statement, usually rating the experience as mild, moderate, or severe. A study done by Borjeson and colleagues<sup>46</sup> found good agreement between VAS and VCR when assessing nausea intensity. However, the study did find that the VAS was more sensitive to detecting early changes in patient-reported nausea. Scales using a VCS often require less patient teaching and are easier for clinicians and researchers to interpret.<sup>47</sup> More recently, a similar study was done regarding various assessment tools for pain. The authors' recommendations were to use the NRS when needing a clinically practical tool that could also be used for audits and research.<sup>48</sup> Clinicians can also take into account the current measurement scale already in use in their clinical setting. If the VAS or NRS is already used for pain assessment in their organization, it may be more patient friendly to use the same scale to assess CINVR.

Severity of the symptom is often measured as the intensity of the experience. Symptom distress takes into account the physical and emotional suffering related to an individual's response to the symptom.<sup>43</sup> Tools also used the terms *troublesome* and *bothersome* to address the distress of a symptom. Research has shown that the level of distress does not always correlate with the frequency or intensity of a symptom.<sup>49</sup>

Symptom distress is defined as the degree of physical or mental discomfort reported by a patient in relation to a specific symptom.<sup>21</sup> It is viewed by some to be the total response to symptom intensity and frequency.<sup>43</sup> However, it is not always limited to the symptom's intensity, frequency, or duration. Other factors also influence the patient's perceived distress, including the meaning of the illness and other life events.<sup>50</sup> In addition, duration of symptom experience also influences perceived distress. A mild/moderate symptom that persists over a lengthy period can be perceived as more distressing than a single more severe episode.<sup>51</sup> Also, experiencing multiple symptoms at once can result in increased symptom distress.<sup>21</sup> It is the emotional response derived from that symptom that prompts a person to take action and/or implement coping and behavioral skills. Timely interventions and involving the patient in the management of his/her care can aid in reducing symptom distress and improve patient outcomes.<sup>19</sup>

Although a thorough literature review was conducted to search for complete and concise CINVR tools available to be used in the practice setting, no single best tool was identified.

Only the tools developed by Rhodes<sup>32</sup> provide a separate assessment of all 3 symptoms. The period in question is the previous 12 hours, which makes it applicable for real-time symptom management. Rhodes and McDaniel<sup>32</sup> demonstrate the tool's ability to be used in both paper and computerized charting. The INVR utilizes a 5-point Likert-type scale; although this has not been shown to be as sensitive to early changes as the VAS, it has been found to be clinically useful and easy for patients to understand. There have been various versions of this tool published. The INRV<sup>32</sup> revised in 1996 addresses the frequency and distress associated with all 3 symptoms: nausea, vomiting, and retching. It is interesting that distress, not severity, is assessed in real-time symptom management. It could be viewed as unusual to ask a vomiting patient to rate the distress of vomiting as it is occurring. Severity questions may be better received, and the distress lessened by adequate, timely interventions.

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## ■ Future Implications

Future work regarding mechanisms involved in the 3 symptoms addressed will require selection of a valid and reliable instrument that adequately addresses all components of the symptom(s) being studied. The purpose of this literature review was to examine the CINVR tools available and to explore the specific components of each. As the medical community continues its development and integration of information technology and the translation of research into the clinical setting, it will be important to adapt a CINVR assessment tool that could be utilized in both paper and computerized charting. Tools to be considered for clinical use should incorporate evaluation of all 3 symptoms of nausea, vomiting, and retching as separate experiences of oncology patients. Correct timing of measurements is essential for symptom management. An ideal CINVR tool would evaluate the symptom experience as close to real-time as possible. The information gathered from this tool, used in combination with a detailed antiemetic algorithm, could help clinicians improve the CINVR experience. A well-developed CINVR tool would be valuable in both the high-paced clinical setting and at the same time provide detailed-enough information needed for research studies. The high-quality data collected could then be used to help support evidence-based practices and compare the effectiveness of new interventions.

It is also important to minimize the potential for additional burden being placed on patients by the use of lengthy assessment tools. Further investigation should be done to determine if the information gathered in these tools is truly necessary for symptom management. Some of the larger tools developed for research or larger quality-of-life evaluations provide valuable retrospective reviews of the entire chemotherapy experience but would be too time consuming and burdensome for patients to complete several times per day. Questions posed in these tools may help assess a patient's quality of life and functional ability but may not be essential for the real-time management of symptoms in the clinical

setting. Taking this into account may help reduce the number of questions a potentially nauseated person has to answer during an examination and respect the time constraints of the nursing staff. However, the literature search has shown that additional reliability and validity testing may need to be done to support the use of the tools selected and to assess their sensitivity to detecting subtle differences in symptom management.

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