Interprofessional Use and Validation of the AACN Healthy Work Environment Assessment Tool

By Jean Anne Connor, PhD, RN, CPNP, Sonja I. Ziniel, PhD, Courtney Porter, MPH, Dennis Doherty, MSN, RN-BC, Marilyn Moonan, MSN, RN, CPN, Patricia Dwyer, PhD, RN, Laura Wood, DNP, MS, RN, NEA-BC, and Patricia A. Hickey, PhD, MBA, RN, NEA-BC

Background Health care work environments affect patient outcomes, staff satisfaction and retention, and organizational financial viability. The American Association of Critical-Care Nurses (AACN) Healthy Work Environment Assessment Tool (HWEAT) is a resource for patient care units and organizations to assess the work environment and track progress on their journey to excellence.
Objective To validate interprofessional use of the AACN HWEAT across a large free-standing children's hospital.
Methods The AACN HWEAT was administered to staff members across professional categories. Responses were averaged to achieve an overall score and a score for each standard included in the instrument. Nurses' and physicians' scores were further stratified. Test-retest reliability and internal consistency were assessed. Construct validity was measured by correlating the AACN HWEAT and the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (H-SOPS).
Results Of 2621 AACN HWEAT surveys, 1030 (39.3%) were returned for review. The organization-wide HWEAT mean overall score was 3.58 (3.87 for physicians vs 3.54 for nurses, $P = .02$). Test-retest reliability was indicated by Spearman correlation coefficients of 0.50 to 0.68. Internal consistency was shown by a Cronbach α of 0.77 overall (range for standards, 0.77-0.81). Convergent validity between AACN HWEAT standards and AHRQ H-SOPS items was shown by correlation coefficients of 0.30 to 0.52.
Conclusion The AACN HWEAT was both reliable and valid, supporting its interprofessional use as an organizational measure. Active evaluation of health care environments is critical to achieving optimal patient outcomes. (*American Journal of Critical Care.* 2018;27:363-371)

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According to the American Association of Critical-Care Nurses (AACN), a healthy work environment is "imperative to ensure patient safety, enhance staff satisfaction and retention, and maintain an organization's financial viability."[1] The AACN has identified systemic behaviors that maintain patient safety, ensure optimal outcomes, and support excellence in nursing practice. The behaviors are organized into 6 evidence-based standards that are essential for establishing and maintaining a healthy work environment: skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition, and authentic leadership.[1]

The concept of the healthy work environment (HWE) is based on defining and developing the elements of each standard, and learning from the front-line staff about the importance and relevance of those elements and their contribution to satisfaction and retention.[1] The AACN HWE standards emphasize patient- and family-centered delivery of care, driven by evidence with a focus on continuous quality improvement: "The standards align directly with the education and core competencies for all health professionals recommended by the National Academy of Medicine."[1] An example is the core competency of "work in interdisciplinary teams," which includes the ability to collaborate and communicate.[2]

Clinical leaders understand that to safeguard the quality of patient care, attention must be focused on performance of health care teams.

About the Authors
Jean Anne Connor is director of nursing research, cardiovascular and critical care patient services, Boston Children's Hospital, and a clinical instructor of pediatrics, Harvard Medical School, Boston, Massachusetts. **Sonja I. Ziniel** is an assistant research professor, Section of Pediatric Hospital Medicine, Department of Pediatrics, University of Colorado School of Medicine, Aurora, and senior survey methodologist, quality and patient safety, Children's Hospital Colorado, Aurora. **Courtney Porter** is a program administration manager, cardiovascular and critical care patient services, **Dennis Doherty** is a professional development specialist, clinical education and informatics, **Marilyn Moonan** is a professional development specialist, nursing patient services, **Patricia Dwyer** is a nurse scientist, satellite services, and **Laura Wood** is senior vice president, patient care operations, and chief nursing officer, Boston Children's Hospital. **Patricia A. Hickey** is vice president and associate chief nursing officer, cardiovascular and critical care patient services, Boston Children's Hospital, and an assistant professor of pediatrics, Harvard Medical School.

Corresponding author: Jean Anne Connor, PhD, RN, CPNP, Boston Children's Hospital, 350 Longwood Ave, GL259, Boston, MA 02115 (email: Jean.Connor@childrens.harvard.edu).

Ideally, hospital care environments are safe, healing, and humane.[1] However, the external pressures of declining health care reimbursement, increasing regulatory demands, growing acuity and patient complexity, and heightened health care operational constraints have a negative impact on work environments.[3] Issues involving communication, collaboration, and staffing all affect the quality of care provided to patients and families.[3,4] Clinical leaders understand that to safeguard the quality of patient care, attention must be focused on the performance of health care teams.[3] The use of reliable and valid tools that comprehensively capture work climates is required to achieve and sustain environments of excellence.

In 2009, the AACN developed the web-based Healthy Work Environment Assessment Tool (HWEAT) as a resource to measure baseline status and subsequent progress of a hospital unit's journey to implement and sustain the standards.[5] To date, the measure has undergone limited reliability and validity testing in clinical settings.[5-7] The purpose of this project was to provide additional information about the reliability and validity of the AACN HWEAT as well as to evaluate the tool across professional staff categories and patient care areas to support its use as an organizational measure.

Project Setting

The project setting was a large, urban, quaternary care, free-standing children's hospital located in the northeastern United States. The hospital comprises 2 campuses and multiple satellite clinics. The larger of the 2 campuses includes 4 intensive care units totaling 101 beds of the hospital's 405 inpatient beds. The organization has approximately 25 000 inpatient admissions and more than 557 000 ambulatory clinic visits annually. In the last year, more than 26 500 surgical procedures were performed at the hospital. The organization has been recognized with American Nurses Credentialing Center "Magnet" status since 2008, achieving redesignation in

2012 and 2018. Each of the 4 intensive care units has achieved AACN "Beacon Gold" status.

Methods

This project had a descriptive, nonexperimental correlation survey design. Two survey instruments were used: the AACN HWEAT and a comparison tool, the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (H-SOPS).

American Association of Critical-Care Nurses Healthy Work Environment Assessment Tool

In 2009, the AACN formed an expert panel to develop the HWEAT.[5] The AACN HWEAT is a generalizable survey for use in any organization or department. It is not intended to diagnose specific challenges, but rather to identify areas for improvement. The 18-question survey assesses each of the 6 HWE standards with 3 unique items. Respondents are asked to indicate their level of agreement or disagreement with each statement using a 5-point Likert scale (1 = "strongly disagree"; 5 = "strongly agree"). Mean scores are calculated for each of the 6 standards as well as for the overall survey. The overall score is interpreted as follows: 4.00 to 5.00, "excellent"; 3.00 to 3.99, "good"; and 1.00 to 2.99, "needs improvement."

The AACN HWEAT has undergone limited reliability and validity testing in clinical settings.[5] After the instrument was developed, the questions and scales were reviewed for face validity and administered to 2 groups of 250 nurses. Both samples were tested for reliability and showed internal consistency, with identical factor structures and Cronbach α values of 0.80 or better.[5] In 2016, Huddleston and Gray[6] further assessed the psychometric properties of the AACN HWEAT with 28 nurse leaders and 203 direct care nurses in an acute care setting. Building on the preliminary testing by AACN and the VitalSmarts developers, the investigators demonstrated high internal consistency of the HWEAT (Cronbach $\alpha = 0.97$). The Pearson product moment correlation showed a positive correlation between variables ($r = 0.583$-0.789, $P < .05$). Test-retest assessment between 2 survey periods did not reveal a significant difference in scores. The scale content validity index was strong, with a score of 96.63. The investigators conducted concurrent validity testing, correlating the AACN HWEAT with the Practice Environment Scale of Nursing Work Index. A strong correlation was found, with coefficients for the survey items ranging from 0.42 to 0.69 ($P < .05$). Although the investigators reported that the AACN HWEAT demonstrated strong psychometric properties, they stated that future work by the team would include the development of 2 new tools to measure the health of the work environment in the acute care setting.[6] In 2015, Aboshaiqah[7] surveyed 1007 nurses in a large tertiary care hospital in Saudi Arabia. Before the administration of the AACN HWEAT, the investigator confirmed the tool's reliability, with an average Cronbach α value of 0.956.[7]

Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture

In 2004, the AHRQ released the H-SOPS to help hospitals assess how employees perceive their work environment with regard to patient safety.[8] The self-report survey is completed by staff members, who are asked to answer questions pertaining to several unit- and hospital-level "safety culture" dimensions in addition to outcome-related questions such as event reporting and overall perception of safety. Safety culture dimensions include areas such as supervisor/manager expectations, teamwork within/across units, communication about errors, staffing, and management support for patient safety. Validity testing of the tool indicated that most of the dimensions demonstrate acceptable reliability (Cronbach $\alpha > 0.70$).[8,9] The H-SOPS has been used annually by our organization since 2010, providing data to assess interprofessional use and construct validity between the 2 measures.

> The AACN HWEAT was administered to all health care team members across the enterprise.

Survey Administration

The project was reviewed and approved as a quality assessment of an ongoing staff survey by the hospital's institutional review board. Permission was also received from AACN leadership and VitalSmarts to validate the AACN HWEAT using an internal software data collection tool. Following the 2 approvals, the AACN HWEAT was administered to all health care team members (physicians, nurses, and additional members) by patient care unit as a web survey using the survey software Qualtrics. Respondents were invited by email to participate in the survey. Additional team members included social workers, therapists, child life specialists, clinical assistants, patient service associates, and administrators. Email reminders were sent 1 and 2 weeks after the initial invitation went out. Each respondent was entered in a raffle of 6 gift cards worth $50 each, with at

Table 1
Demographic characteristics of respondents from the first and second waves of the AACN HWEAT survey administration

Characteristic	No. (%) of respondents to survey		*P* value
	Wave 1 (n = 1030)	Wave 2 (n = 167)	
Position			.77
Nurse	779 (75.6)	134 (80.2)	
Physician	45 (4.4)	6 (3.6)	
Social worker	38 (3.7)	7 (4.2)	
Therapist	12 (1.2)	1 (0.6)	
Child life services	20 (1.9)	5 (3.0)	
Clinical assistant	30 (2.9)	4 (2.4)	
Patient service associate	29 (2.8)	3 (1.8)	
Administrator	10 (1.0)	2 (1.2)	
Other	8 (0.8)	2 (1.2)	
Unknown	59 (5.7)	3 (1.8)	
Hospital campus			.27
Main	917 (89.0)	153 (91.6)	
Satellite	82 (8.0)	9 (5.4)	
Unknown	31 (3.0)	5 (3.0)	
Work location			.62
Heart center	167 (16.2)	20 (12.0)	
Surgical inpatient unit	171 (16.6)	35 (21.0)	
Medical inpatient unit	225 (21.8)	28 (16.8)	
Intensive care unit	177 (17.2)	40 (24.0)	
Procedure units	46 (4.5)	6 (3.6)	
Operating room	100 (9.7)	13 (7.8)	
Emergency department	40 (3.9)	8 (4.8)	
Support services	50 (4.9)	9 (5.4)	
Other	32 (3.1)	4 (2.4)	
Unknown	22 (2.1)	4 (2.4)	

Abbreviation: AACN HWEAT, American Association of Critical-Care Nurses Healthy Work Environment Assessment Tool.

Table 2
Test-retest statistics of survey items by American Association of Critical-Care Nurses healthy work environment standard

Standard	Test-retest range (Spearman correlation)
Skilled communication	0.53-0.68
True collaboration	0.57-0.64
Effective decision-making	0.50-0.64
Appropriate staffing	0.50-0.68
Meaningful recognition	0.57-0.67
Authentic leadership	0.60-0.62

least a 1 in 100 chance to win a prize. Three weeks after the original invitation was sent, the survey was sent again to a random sample of 200 respondents stratified by position (physician, nurse, and others). Reminder emails were sent with the same timing as the first survey. Each respondent received a $10 gift card for participation in the second survey. Unique identifiers were used, allowing individual surveys from the first administration to be linked to those of the second administration. Identifiers of the patient care units were also retained to allow comparison of unit-level results of the AACN HWEAT with unit-level results of the AHRQ H-SOPS, which was administered as a web survey at the end of February 2014.

Data Analysis

Descriptive statistics were used to summarize the location, specialty, and discipline of employee respondents. Participant responses were aggregated and averaged to obtain the overall AACN HWEAT score and the score for each standard. Test-retest reliability was determined for individual items as well as subscales using agreement and correlational measures such as Spearman correlation coefficients. The internal consistency of subscales was assessed by using the Cronbach α. Construct validity was assessed by using confirmatory factor analysis to corroborate how items were distributed across subscales. Convergent and discriminant validity of the AACN HWEAT standards were determined through subscales and specific items from the validated AHRQ H-SOPS.

Results

One-thousand thirty of 2621 employees responded to the first survey wave (response rate, 39.3%). Of the 9 categories of employee position, the largest proportion of respondents identified themselves as nurses (n = 779; 75.6%). Most respondents practiced at what was referred to as the main hospital campus (n = 917; 89.0%). Of the 9 work locations, medical inpatient units, intensive care units, surgical inpatient units, and heart center had the highest proportions of respondents. The response rate for the second wave survey was 83.5% (167/200). No significant differences were apparent in any of the respondent characteristics between the 2 survey waves (Table 1).

The organization-wide HWEAT mean overall score was 3.58. Each of the 6 standards scored in the "good" range, with meaningful recognition having the lowest score (3.34) and effective decision-making having the highest score (3.82). When nurse and physician respondents were compared, physicians had significantly higher scores than nurses, both overall (3.87 vs 3.54, $P = .02$) and for 4 of the 6 standards: skilled communication ($P < .001$), true collaboration ($P < .001$), appropriate staffing ($P = .008$), and meaningful recognition ($P < .001$). The greatest difference was found for meaningful recognition (3.77 vs 3.29, $P < .001$).

Table 3
Internal consistency of AACN HWEAT

Standard and dimension	Correlation of item to own dimension	Correlation of item to other dimensions, mean (range)	Cronbach α
1: Skilled communication			0.77
Maintain frequent communication	0.78	0.58 (0.54-0.65)	
Actions match words	0.82	0.64 (0.59-0.71)	
Zero tolerance for disrespect and abuse	0.84	0.52 (0.45-0.58)	
2: True collaboration			0.81
Staff involved in decision-making	0.84	0.61 (0.57-0.66)	
Able to influence policies, procedures, and bureaucracy	0.83	0.59 (0.56-0.63)	
Input seeking for decision-making	0.83	0.62 (0.55-0.69)	
3: Effective decision-making			0.77
Consistent use of data-driven, logical decision-making process	0.75	0.50 (0.46-0.53)	
Right departments, professions, groups are involved	0.84	0.59 (0.53-0.64)	
Patient's perspective is considered in important decisions	0.84	0.60 (0.57-0.68)	
4: Appropriate staffing			0.81
Enough staff to maintain patient safety	0.86	0.55 (0.50-0.59)	
Right mix of nurses and other staff to ensure optimal outcomes	0.84	0.59 (0.56-0.65)	
Support services level allows nurses and staff to focus on care	0.83	0.54 (0.49-0.57)	
5: Meaningful recognition			0.80
Formal recognition system makes staff feel valued	0.82	0.59 (0.55-0.62)	
Staff members let people know when they've done a good job	0.86	0.55 (0.51-0.58)	
Motivating opportunities for personal growth	0.83	0.58 (0.54-0.64)	
6: Authentic leadership			0.78
Staff have positive relationship with nurse leaders	0.84	0.60 (0.56-0.63)	
Nurse leaders understand dynamics at point of care	0.84	0.62 (0.58-0.66)	
Nurse leaders play role in making key decisions	0.76	0.56 (0.49-0.62)	

Abbreviation: AACN HWEAT, American Association of Critical-Care Nurses Healthy Work Environment Assessment Tool.

For test-retest reliability, Table 2 shows the ranges of Spearman correlation coefficients for the survey questions within each standard; the minimum value was 0.50. Internal consistency was confirmed with a Cronbach α of 0.77 overall (range for standards, 0.77-0.81) (Table 3). Results of the confirmatory factor analysis demonstrate standardized coefficients of 0.63 or higher (Table 4). The 6 standards were found to correlate strongly with each other, with Spearman correlation coefficients of 0.62 or higher (Table 5). Evidence for convergent validity was shown by moderate to strong correlations between the AACN HWEAT standards and the AHRQ H-SOPS dimensions and individual items (Table 6).

Discussion

The information obtained from this assessment provides further psychometric evidence supporting interprofessional use of the AACN HWEAT across a large children's hospital. The AACN HWEAT was both reliable and valid. Although the tool has been used primarily among acute and critical care nurses,[6,7] our experience supports consideration of wider use of the instrument in multiple health care settings. Evidence continues to point to a strong link between work environments and patient safety, staff recruitment and retention, and organizational financial stability.[1,10,11] Health care systems must recognize evaluation of work environments as a key strategic and operational goal. Team-based evaluation is needed, as all health care professionals contribute to and are accountable for their work environments.

In our project, the staff as a whole reported the health of the hospital-wide work environment as "good," with each standard also rated as "good." Stratification of responses showed significantly more positive evaluations by physicians than by nurses. However, except for the standard of skilled communication, both physicians' and nurses' scores overall and by standard fell into the "good" range. These findings may indicate an opportunity, when developing improvement initiatives, to explore interprofessional differences before implementation. Much of the published literature has focused on nursing practice environments and nurses' perceptions of those practice environments, with a strong relationship found between poor practice environments and adverse patient outcomes.[12-17] In 2014, Ulrich and colleagues,[12] using an expanded version of the AACN HWEAT administered to the membership of the AACN, reported a deterioration in critical

Table 4
AACN HWEAT confirmatory factor analysis

Standard and dimension	Standard					
	Skilled communication	True collaboration	Effective decision-making	Appropriate staffing	Meaningful recognition	Authentic leadership
1: Skilled communication						
Maintain frequent communication	0.74					
Actions match words	0.82					
Zero tolerance for disrespect and abuse	0.65					
2: True collaboration						
Staff involved in decision-making		0.78				
Able to influence policies, procedures, and bureaucracy		0.73				
Input seeking for decision-making		0.79				
3: Effective decision-making						
Consistent use of data-driven, logical decision-making process			0.77			
Right departments, professions, groups are involved			0.78			
Patient's perspective is considered in important decisions			0.63			
4: Appropriate staffing						
Enough staff to maintain patient safety				0.77		
Right mix of nurses and other staff to ensure optimal outcomes				0.82		
Support services level allows nurses and staff to focus on care				0.73		
5: Meaningful recognition						
Formal recognition system makes staff feel valued					0.75	
Staff members let people know when they've done a good job					0.78	
Motivating opportunities for personal growth					0.75	
6: Authentic leadership						
Staff have positive relationship with nurse leaders						0.75
Nurse leaders understand dynamics at point of care						0.79
Nurse leaders play role in making key decisions						0.66

Abbreviation: AACN HWEAT, American Association of Critical-Care Nurses Healthy Work Environment Assessment Tool.

care nurses' work environments and their perception of quality of patient care since 2008.Our hospital-wide interprofessional results, with an aggregated mean score of 3.58, or "good," overall and for each standard, are similar to those of Huddleston and Gray[6] in 2016 and Aboshaiqah[7] in 2015. Although no benchmark to guide organizations has been published, we have administered the AACN HWEAT to interprofessional staff in our critical care and cardiovascular programs annually since 2010[18,19] and have recently expanded it to an enterprise-wide assessment. We have established a target benchmark of "good" for the overall score and for each of the standards, with the expectation that we are always striving for "excellent." The health of work environments is multidimensional, and extensive research has demonstrated that excellence in the work environment results from strong and engaged commitment to each of the 6 standards.[1] Each standard requires ongoing attention and should be viewed as a continuous opportunity for improvement.[1] Therefore, it is critical to have a reliable and valid measure to support such continuous improvement.

Our test-retest assessment indicates that the AACN HWEAT is a reliable measure. Moreover, the results of the internal consistency analyses of the subscales and of the confirmatory factor analysis provide strong evidence of the internal reliability and validity of the 18-item tool. Finally, the correlations between the AACN HWEAT and the AHRQ

Table 5
Interclass correlation between American Association of Critical-Care Nurses healthy work environment standards

Standard	Standard					
	Skilled communication	True collaboration	Effective decision-making	Appropriate staffing	Meaningful recognition	Authentic leadership
Skilled communication	1.00					
True collaboration	0.75	1.00				
Effective decision-making	0.68	0.75	1.00			
Appropriate staffing	0.62	0.67	0.63	1.00		
Meaningful recognition	0.68	0.68	0.63	0.67	1.00	
Authentic leadership	0.72	0.73	0.71	0.70	0.71	1.00

Table 6
AHRQ culture of safety individual questions vs American Association of Critical-Care Nurses healthy work environment standards[a]

AHRQ question	Standard					
	Skilled communication	True collaboration	Effective decision-making	Appropriate staffing	Meaningful recognition	Authentic leadership
People support one another in this unit.	0.47	0.49	0.45	0.44	0.50	0.45
In this unit, people treat each other with respect.	0.54	0.48	0.45	0.33	0.45	0.46
When one area in this unit gets really busy, others help out.	0.31	0.41	0.35	0.31	0.37	0.30
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.	0.37	0.42	0.37		0.50	0.34
My supervisor/manager seriously considers staff suggestions for improving patient safety.	0.47	0.47	0.46	0.34	0.49	0.52
My supervisor/manager overlooks patient safety problems that happen over and over.	0.31	0.31	0.39		0.32	0.42
We are actively doing things to improve patient safety.	0.45	0.49	0.53	0.37	0.42	0.46
After we make changes to improve patient safety, we evaluate their effectiveness.	0.39	0.43	0.44		0.39	0.40
The actions of hospital management show that patient safety is a top priority.	0.31	0.31	0.42	0.30		0.34
We are informed about errors that happen in this unit.	0.43	0.39	0.38	0.39	0.39	0.36
In this unit, we discuss ways to prevent errors from happening again.	0.49	0.48	0.49	0.36	0.45	0.46
Staff feel free to question the decisions or actions of those with more authority.	0.46	0.50	0.44	0.34	0.43	0.40
Staff are afraid to ask questions when something does not seem right.	0.43	0.47	0.40	0.36	0.43	0.44

Abbreviation: AHRQ, Agency for Healthcare Research and Quality.
[a] Including only results that were 0.30 and greater.

H-SOPS on similar key domains such as staffing, communication, collaboration/teamwork, and meaningful recognition/respect showed moderate to strong convergent validity.

Limitations

Our findings and interpretations should be considered in the context of several limitations. As previously stated, the response rate in our survey was 39.3%. Although incentives were offered to staff members for their participation, the time period of survey data collection coincided with other ongoing surveys, resulting in possible survey fatigue. Our analyses did not include any linkage to patient level data or staffing measures to examine the impact on patient care or staff satisfaction or retention. Future analyses will focus on patient and staffing outcomes. This assessment was at a single site, and results may not be considered generalizable to work environments of other hospitals. However, results of this assessment have informed the development of measurement benchmarks and led to use of the AACN HWEAT in the Consortium for Congenital Cardiac Care–Measurement of Nursing Practice (C4-MNP).[20,21] This nurse-led collaborative is committed to identifying best practices and opportunities for improving care across 30 cardiovascular programs in free-standing children's hospitals through the use of measurement.

Conclusion

As health care organizations move into the future with the goal of providing the highest-quality care, attention must be focused on the performance of the health care team.[22] Early recognition of suboptimal systemic behaviors allows implementation of strong processes and support systems to safeguard against patient harm and ensure clinical excellence. Use of reliable and valid measures of work environments provides accountability at all levels of the organization, from the bedside to the boardroom.[1]

The AACN HWEAT was shown to be a reliable and valid measure for use among interprofessional staff across a large free-standing children's hospital. Use of this measure allows identification of suboptimal systemic behaviors strongly linked with patient safety. Organizational leaders must commit to and collaborate with interprofessional health care teams to implement and sustain environments of excellence. Active evaluation of health care environments is critical to achieving optimal patient outcomes.

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SEE ALSO
For more about healthy work environments, visit the *Critical Care Nurse* website, **www.ccnonline.org**, and read the Ask the Experts piece by Stutzer and Bylone, "Building Moral Resilience" (February 2018).

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CE 1.0 Hour Category C

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This article has been designated for CE contact hour(s). The evaluation demonstrates your knowledge of the following objectives:

1. Describe the development of the AACN Healthy Work Environment Assessment Tool (HWEAT).
2. Describe the results of the validation of the AACN HWEAT across a quaternary care children's hospital.
3. Discuss the evidence for interdisciplinary use of the AACN Healthy Work Environment Assessment tool.

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Jean Anne Connor, Sonja I. Ziniel, Courtney Porter, Dennis Doherty, Marilyn Moonan, Patricia Dwyer, Laura Wood and Patricia A. Hickey

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