

# The Bates-Jensen Wound Assessment Tool (BWAT): Development of a Pictorial Guide for Training Nurses

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## Abstract

Wound documentation is essential for communication between health-care providers and to determine appropriate treatment plans. Accurate and meaningful wound documentation requires consistent, thorough wound assessment and a method of tracking assessment data. The Bates-Jensen wound assessment tool (BWAT) is a standardized tool designed for easy assessment, meaningful communication and accurate

tracking of wounds. In order to use the tool, nurses must have a working knowledge of wound vocabulary and wound-assessment skills. Because many nurses are visual learners, the authors decided to create a visual method of training nurses in the use of the BWAT. In this article, we describe the development and validation of a pictorial guide that can be used to augment wound assessment and documentation using the BWAT.

## Introduction

**A**ccurate wound assessment is a key component of wound management. It is necessary both for decision-making regarding topical treatment based on wound status and for signalling signs of deterioration that require other interventions.<sup>1</sup> This is a skill that all health-care professionals involved in wound care should be able to perform. However, Doughty<sup>2</sup> has described it as a process that should be simple but is in fact complex—requiring visual and physical assessment skills combined with clinical judgment and experience.

One standardized wound-assessment instrument is the BWAT. In the early 1990s, Barbara Bates-Jensen developed the pressure sore status tool (PSST) as an instrument to measure and track wound healing. Use of the PSST provides objective numerical scores before, during and after treatment and at the time of healing. The PSST has been validated and has demonstrated reliability with both nurses specializing in wound care and licensed nurses in long-term care settings.<sup>3,4</sup>

In 2001, the PSST was revised and renamed the BWAT. The tool name was changed after requests from

users who were having difficulty getting the tool approved for use with chronic wounds that were not pressure ulcers. The BWAT contains 13 items to assess the wound: size, depth, edges, undermining, necrotic tissue type, amount of necrotic tissue, granulation and epithelialization tissue, exudate type and amount, surrounding skin colour, peripheral tissue edema and induration. Each item has five categories with an associated score, one of which the nurse must choose as the most appropriate response. The sum of these scores indicates the progression of wound healing.

Consistent use of the BWAT within facilities provides a quantifiable method of documenting wound assessments and can help to set benchmarks for the healing of wounds of different etiologies.<sup>5</sup>

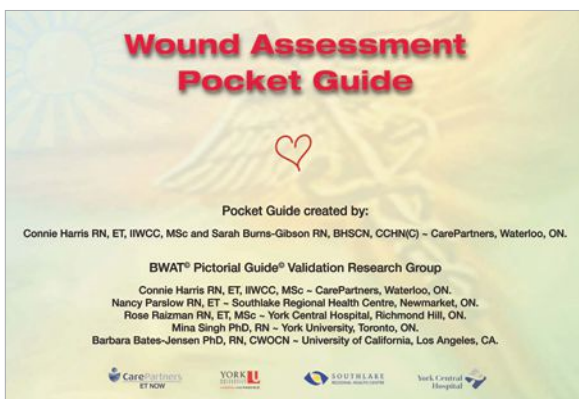
However, in order to use the BWAT accurately, nurses must have a working knowledge of wound vocabulary and wound-assessment skills. Formal training in the use of the BWAT is generally accomplished on an institution-by-institution or nurse-by-nurse basis, with no organized uniformity in education. Most experts believe

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that showing wounds or providing photographs of wound characteristics is the preferred method for teaching nurses wound assessment skills. While some clinicians have created educational resources for the BWAT accompanied by wound photographs, there is no validated pictorial guide for training.

FIGURE 1

### The BWAT pictorial guide



### Development of the Pictorial Guide

Early in 2008, three enterostomal therapy nurses (ETNs), Connie Harris, Nancy Parslow and Rose Raizman, were working as clinical nurse specialists in wound care in acute and community nursing settings in Southern Ontario. They recognized that, if they wished to introduce the BWAT as the assessment and documentation instrument in their organizations or facilities, wound assessment education would also be needed. The clinicians hypothesized that the creation of a visual or pictorial guide to the BWAT would facilitate this educational process, and thus increase the accuracy of wound assessments. Validation of the photographic content would be necessary in order for the pictorial guide teaching tool to have any merit or credibility.

Permission to utilize the guide was granted by the author of the BWAT, Barbara Bates-Jensen, who agreed to act as an advisor to the project. The employers of the clinicians all agreed to support this project. Mina Singh, Graduate Program Director in the School of Nursing, Faculty of Health, at a university affiliated with the two acute-care facilities, agreed to serve as a secondary researcher to assist with methodology and analysis for the project.

Before beginning any development activities, ethics

approval was obtained from the ethics review boards of the acute-care hospitals, university and community nursing agency. This included informed consent to use wound photographs of patients for this educational purpose, including those of patients from one additional site. No identifying information appears on any of the photographs in the project and none was released to any of the participants in the validation phase.

The proposal for the BWAT pictorial guide consisted of three phases of development and testing.

### Phase One

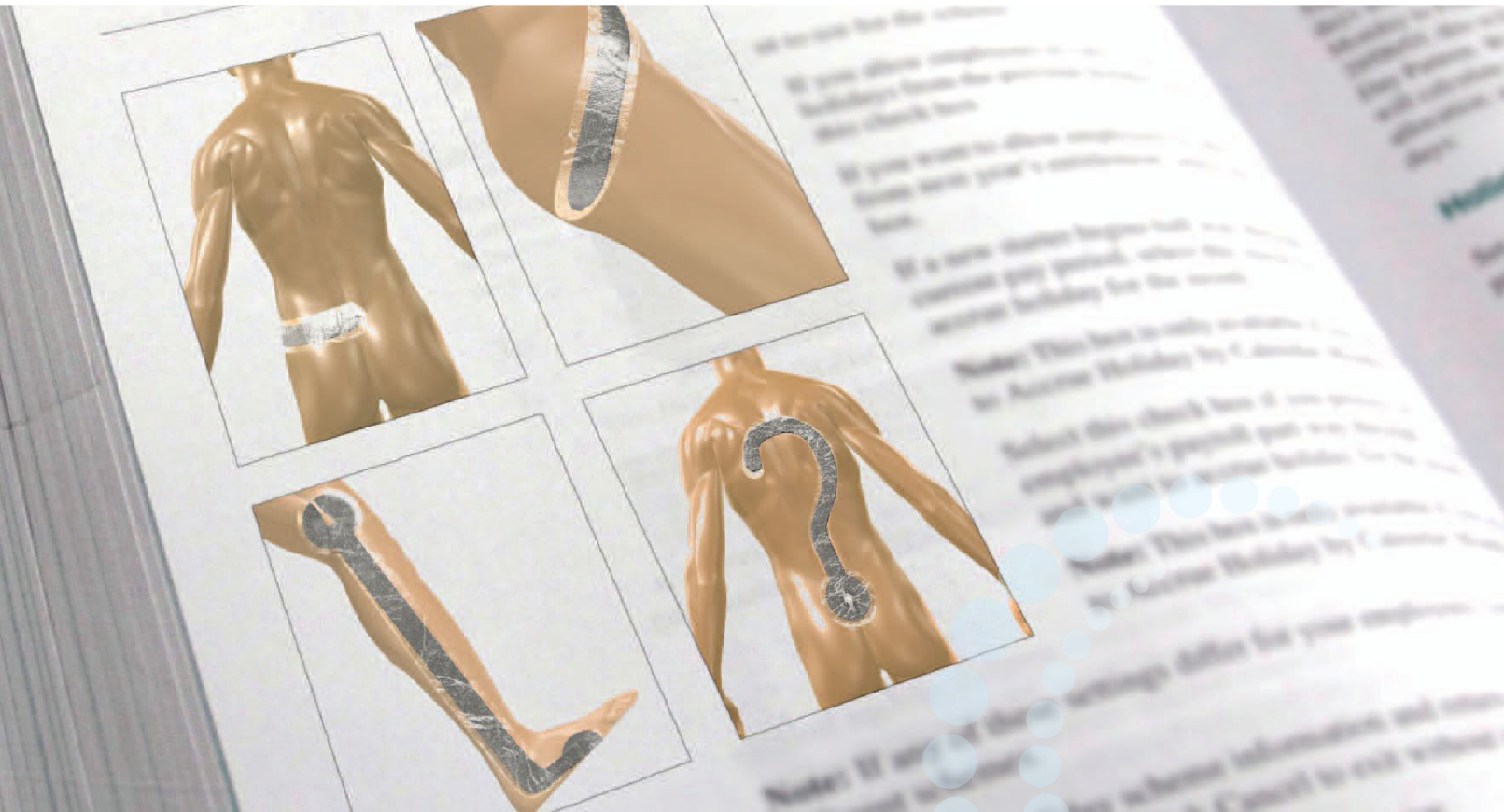
First, digital wound photographs were gathered by the three ETN researchers. Photographs were obtained for each of the five descriptors for 11 of the 13 wound characteristics on the BWAT: depth, edges, undermining, necrotic tissue type and amount, exudate type and amount, skin colour surrounding the wound, peripheral tissue edema, granulation tissue and epithelialization (the items *wound size* and *peripheral tissue induration* were not included at this point). A total of 75 photographs were chosen to depict the 11 characteristics. These photographs were of varying etiologies: 22 were pressure ulcers, five were diabetic foot ulcers, 18 were venous stasis ulcers, 23 were surgical wounds and seven were of other etiology.

To obtain these 75 images, photographs were shared electronically with the developer of the BWAT so that she could validate their content, which was rated as either matching or not matching the characteristic. The art director of the CAWC, Robert Ketchen, volunteered to rate the quality of the photographs based on publication standards as either acceptable or not acceptable.

### Phase Two

The second phase of development occurred with 15 ETNs attending a Canadian Association for Enterostomal Therapy Ontario Regional Meeting. Informed consent was obtained and participants completed a brief survey. The survey included demographic characteristics and questions about the current wound-assessment techniques used by participants. The 15 ETNs had a mean of 11.5 years of experience (standard deviation 9.37), and 80 per cent of them spent the majority of

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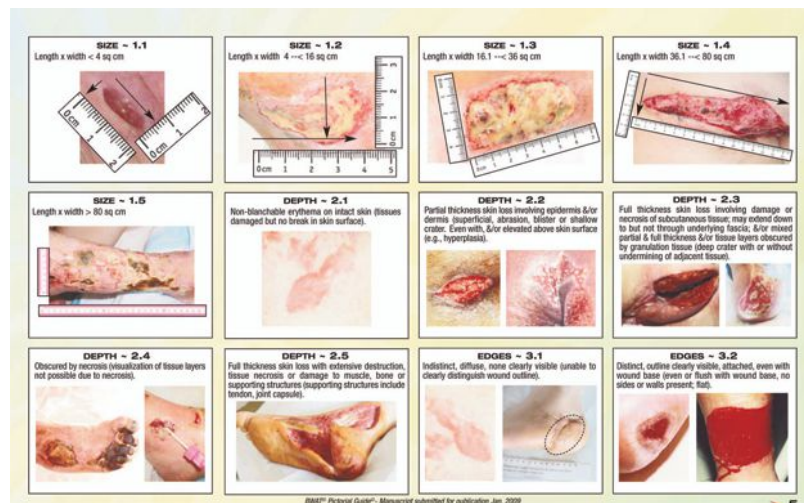
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FIGURE 2

## An example of a page from the BWAT pictorial guide



their time working in wound care. The BWAT was already being used by five of the ETNs in their practice; four ETNs used an agency-created tool and another four had no tool (two participants did not respond to the question).

The validation exercise consisted of a PowerPoint presentation showing the 75 photographs (Figure 3), providing one or two examples of each of the five

wound characteristics for each item. Pen and paper evaluation forms were used by participants independently and simultaneously in a silent (non-verbal) session to indicate whether the photographs matched the characteristic (yes or no response), and to generate comments and feedback about how the photographs could be improved. Those photographs that met consensus remained in the guide. Consensus was defined as 75 per cent of the raters endorsing a photograph.

The participants approved 73 per cent (n=55) of the 75 photographs presented, which meant that 20 photographs were rejected and needed to be replaced. In addition, 10 new photographs had to be obtained to represent the characteristics of wound size and peripheral tissue induration. Furthermore, the researchers determined that five of the validated photographs were not optimal: one because pre- and post-assessment photographs were able to better demonstrate assessment of edema, two because the position of the camera created an awkward angle and better images were obtained, and two because the amount of undermining was not clear. The alternate photographs were provided for these items for validation in the next round, during the final phase of development of the pictorial guide. Of the photographs that were retained from phase two, many required cropping or the addition of dotted lines to show undermining, or measuring guides to provide size references. These changes were made.

### Phase Three

The third phase of validation was performed online. In this phase, nine nurses (eight ETNs and one master's-prepared wound specialist) were asked to rate the wound photographs, but only seven responded. As with the previous group of nurses, this group also had approximately 10 years of experience, with 75 per cent of their practice devoted to wound care. The BWAT was used by three nurses in their practice, while the other four used a facility-developed or informal tool.

A PowerPoint presentation and electronic data-collection forms were used by these nurses to independently rate the photographs as accurately reflecting the BWAT characteristic that it appeared with. The participants answered "yes" or "no" and were asked to provide

*continued on page 38*



Initial validation exercise—item 10.3 = non-pitting edema extends  $\geq 4$  cm around wound. This photo was rejected.

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comments on how the photograph could be improved if they had answered “no.”

The nurses reviewed 53 (Figure 4) photographs, 17 of which were new photographs to represent the 10 characteristics of wound size and peripheral tissue induration and 36 of which were replacement photographs for those not validated in phase two. More than one photograph was used to demonstrate some of the characteristics, such as induration, epithelialization and granulation, where “before and after” photographs were utilized. Nine of the photographs were of pressure ulcers, 14 were of venous ulcers, 13 were of surgical wounds, three were of diabetic foot ulcers and 14 were of other etiology. The panel of nurses approved all 53 of the wound photographs, with a minimum consensus level of 57 per cent (one item) and maximum of 100 per cent (21 items) Although the item with only 57 per cent consensus did not meet the original desired consensus level of 75 per cent, a decision to include it was made by the researchers because the comments indicated that the participants were thinking about the appearance of deep tissue injury rather than the peri-wound hemosiderin deposits that the photograph captured. Four additional items only achieved 71 per cent consensus, but, with a sample of seven, it was not possible to achieve 75 per cent, and the researchers agreed that these photographs would be considered to be validated.

### Summary

For the purposes of the development of the pictorial guide (Figure 1), 128 photographs were reviewed. Of

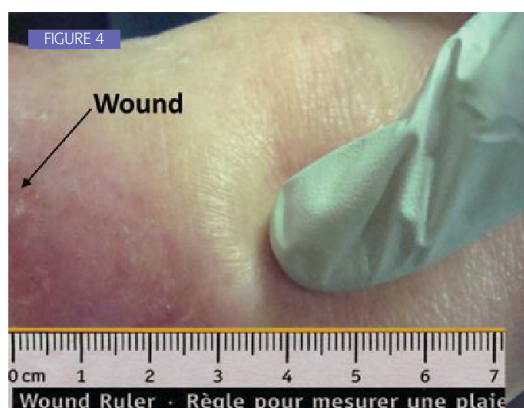
these, 103 were validated and appear in the pictorial guide to demonstrate the 65 BWAT characteristics (Figure 2). The pictorial guide includes photographs of wounds of various etiologies. The photographs have been evaluated for both their ability to depict wound characteristic item choices on the BWAT and their photographic clarity for duplication and publication purposes. It is hoped that use of the BWAT pictorial guide as an educational tool will improve nurses’ skill in conducting and documenting wound characteristics as a first step to improving the quality of wound-care outcomes.

Note: The BWAT may be used free of charge, with permission from the author, and is available at: [www.geronet.med.ucla.edu/centers/borun/modules/Pressure\\_ulcer\\_prevention/puBWAT.pdf](http://www.geronet.med.ucla.edu/centers/borun/modules/Pressure_ulcer_prevention/puBWAT.pdf). The BWAT includes two pages that provide guidelines for use of the tool.

The BWAT pictorial guide is available in published format on glossy card stock in a 16-page spiral-bound booklet and in a companion DVD containing a PowerPoint presentation with a recorded audio script, and a competency-testing PowerPoint file containing 35 wounds with which to practise the BWAT scoring. These can be used for teaching the BWAT in groups or as a self-learning activity. Please contact [resources@carepartners.ca](mailto:resources@carepartners.ca) for further information.

### References

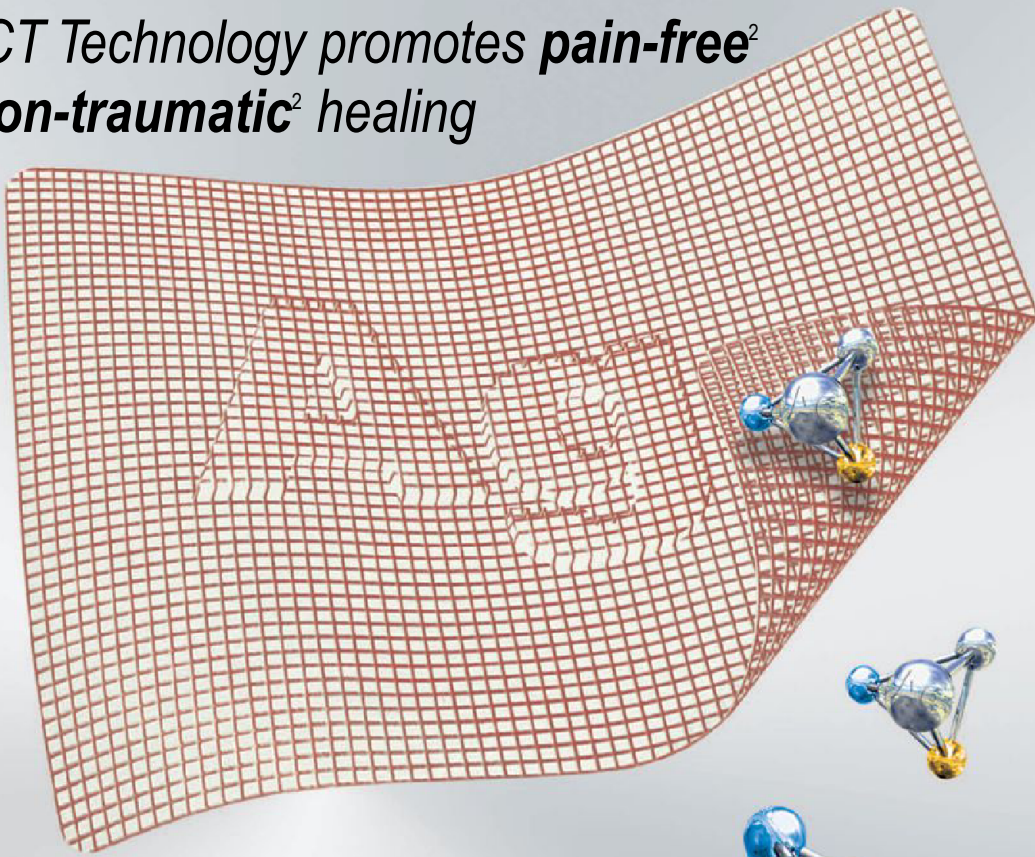
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Peripheral tissue edema. 10.3 = non-pitting edema extends  $\geq 4$  cm around wound (non-pitting edema appears as skin that is shiny and taut). These photos were validated in Phase Three.

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<sup>1</sup>Lazareth, I., S. Meaume, M. Sigal-Grinberg, P. Combemale, T. Guyadec, A. Zagnoli, J.L. Perrot, A. Sauvadet, S. Bohbot, *The Role of a Silver Releasing Lipido-colloid Contact Layer in Venous Leg Ulcers Presenting Inflammatory Signs Suggesting Heavy Bacterial Colonization: Results of a Randomized Controlled Study*, **Wounds A Compendium of Clinical Research and Practice**, Vol. 20, No. 6, June 2008

<sup>2</sup>Lazareth, I., Z. Ourabah, P. Senet, H. Cartier, A. Sauvadet, S. Bohbot, *Evaluation of a New Silver Foam Dressing in Patients with Critically Colonised Venous Leg Ulcers*, **Journal of Wound Care**, Vol. 16, No. 3, March 2007.

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