



Center for Quality and
Productivity Improvement
University of Wisconsin-Madison



SURVEY



UWHC – Smart IV Pumps

One year after the implementation...

Letter to UWHC Healthcare Providers

Dear UWHC healthcare provider,

A group of UW-Madison researchers are studying the impact of smart IV pump technology on work and quality of working life. This survey is part of the effort to evaluate the technology before and after its implementation and subsequent use.

You received the initial survey before the Smart pumps were implemented, and we are now sending you the survey one year following implementation. Your response for each survey round is appreciated.

Participation in the study is voluntary, and there is no requirement for you to be a participant. If you agree to participate in the study, we ask that you complete the following questionnaire, which will tell us about your job, your quality of working life, your perceptions of the technology and your performance. The questionnaire will only take about 15 minutes to fill out. When responding to the questionnaire, you may leave blank any questions you do not want to answer.

No one at your work place will ever see your answers. Your responses are strictly confidential and will be closely guarded. My students, research staff and I will be the only people to ever see your answers. All reports from this study will use combined responses from all of the participants so that no one person can be identified. No answers of individuals or small groups of individuals will ever be released.

It is our hope that through the information we obtain from this study, we can better understand how the smart IV pump technology affects healthcare providers. Thank you for your consideration.

Sincerely,



Professor Pascale Carayon
University of Wisconsin-Madison
Department of Industrial Engineering and Center for Quality and Productivity Improvement
1513 University Ave
Madison, WI 53706
608-265-0503 (office) 608-263-1425 (fax) email: carayon@engr.wisc.edu

Instructions

When completing the questionnaire, you can leave blank any questions that you do not want to answer. Remember that your responses are strictly confidential and will be closely guarded. This questionnaire has been designed to gather information about the work you do, the technology you use, and your quality of working life. Please try to answer all of the questions.

To answer the questions, circle the appropriate response on the scale. For example:

How satisfied are you with the computer you use?
Not Satisfied ←————→ Very Satisfied
1 2 3 (4) 5 6 7

Some questions will require answers similar to the scales above, while other questions will require different responses. Please try to be as accurate as possible.

We appreciate the time you are taking to complete this questionnaire and hope that the information will help us better understand how new technology influences people.

Section A. About your job...

1. Please, check your current job position: ₁ Staff RN ₂ Float/Agency RN ₃ CRNA ₄ MD ₅ Other
2. How long have you worked for your present employer? ₁ less than 1 year ₂ 1 to 2 years ₃ 2 to 5 years
₄ 5 to 8 years ₅ 8 to 15 years ₆ more than 15 years
3. How long have you worked in your current job (position)? ₁ less than 1 year ₂ 1 to 2 years ₃ 2 to 5 years
₄ 5 to 8 years ₅ 8 to 15 years ₆ more than 15 years
4. What unit do you primarily work on?
₁ B4/4 ₂ B4/5 ₃ B4/6 ₄ B6/4 ₅ B6/5 ₆ B6/6 ₇ B6N3 & B6S3 TLC ₈ B4/3
₉ D4/4 ₁₀ D4/C4 ₁₁ D4/6 ₁₂ D6/4 / D6E4 ₁₃ D6/5 ₁₄ D6/6 ₁₅ D6C6
₁₆ F4/5 / F6C5 ₁₇ F4/6 ₁₈ F4M5 ₁₉ F4P4 ₂₀ F4/4 ₂₁ F6/4 ₂₂ F8/4-PICU ₂₃ F6/5
₂₄ F6/6 ₂₅ Emergency Dept ₂₆ PACU / Operating Room ₂₇ Radiology ₂₈ Ambulatory Procedure Center
₂₉ Outpatient clinics ₃₀ First day surgery ₃₁ OSC-Outpatient Surgery Center ₃₂ Other _____
5. What is the shift that you typically work? ₁ Day ₂ pm ₃ Night

Section B. About your perceptions of the smart IV pump technology, also known as the Alaris Medley pump...

Using the smart IV pump...	Strongly agree						Strongly disagree
1. ... enables me to accomplish tasks more quickly.	1	2	3	4	5	6	7
2. ... improves the quality of care I provide.	1	2	3	4	5	6	7
3. ... improves the safety of care I provide.	1	2	3	4	5	6	7
4. ... enhances my effectiveness on the job.	1	2	3	4	5	6	7
5. ... makes it easier to do my job.	1	2	3	4	5	6	7
6. ... increases the safety of care provided to our patients.	1	2	3	4	5	6	7
7. Because of the smart IV pump technology, patients and their families feel they receive safer care.	1	2	3	4	5	6	7
8. The pump is easy to use in emergency situations.	1	2	3	4	5	6	7
9. Drug libraries and Guardrails® increase patient safety and quality of care.	1	2	3	4	5	6	7
10. Using Guardrails® helps prevent medication errors.	1	2	3	4	5	6	7
11. If a problem occurs, the pump is able to identify it and give an appropriate alarm.	1	2	3	4	5	6	7
12. I trust the pump is working correctly.	1	2	3	4	5	6	7

13. Please circle the number that best reflects your acceptance of the smart IV pump technology:

Dislike very much
and don't want to
use.

Like very much and
eager to use.

1 2 3 4 5 6 7 8 9 10

14. How would you rate your interaction with the smart IV pump?

a. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

b. Frustrating 0 1 2 3 4 5 6 7 8 9 Satisfying

c. Rigid 0 1 2 3 4 5 6 7 8 9 Flexible

15. Learning to operate the smart IV pump. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

16. Exploring new features by trial and error. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

17. Remembering medications in the drug library. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

18. Knowing the available channel labels. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

19. Navigating through the programming software. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

20. Tasks can be performed in a straightforward manner. Never 0 1 2 3 4 5 6 7 8 9 Always

21. Supplemental training materials. Confusing 0 1 2 3 4 5 6 7 8 9 Clear

22. Speed of programming smart IV pump. Too slow 0 1 2 3 4 5 6 7 8 9 Fast enough

23. Reliability and durability of smart IV pump. Unreliable 0 1 2 3 4 5 6 7 8 9 Reliable

24. Smart IV pumps tend to be... Noisy 0 1 2 3 4 5 6 7 8 9 Quiet

25. Correcting your mistakes. Difficult 0 1 2 3 4 5 6 7 8 9 Easy

26. Designed for all levels of users. Never 0 1 2 3 4 5 6 7 8 9 Always

27. Smart IV pump functions as I expect. Never 0 1 2 3 4 5 6 7 8 9 Always

The following questions ask about alarm messages and alert messages. (*Audio alarms and/or screen alarms notify the user of delays or incorrect actions occurring during the pump programming process. Alert messages are messages on the screen alerting the user he/she is programming a medication either above or below the predefined Guardrails® limit.*)

28. Alarm messages for pump functioning. Frustrating 0 1 2 3 4 5 6 7 8 9 Acceptable

29. Alert messages for the drug library. Frustrating 0 1 2 3 4 5 6 7 8 9 Acceptable

30. Alert messages for the drug library. Useless 0 1 2 3 4 5 6 7 8 9 Useful

31. Your level of confidence in responding to alert messages. Not at all confident 0 1 2 3 4 5 6 7 8 9 Very confident

32. Air-in-line alarms. Annoying 0 1 2 3 4 5 6 7 8 9 Useful
33. Beeps resulting from a delay. Annoying 0 1 2 3 4 5 6 7 8 9 Useful

Section C. About the characteristics of your work environment...

	Rarely	Occasionally	Sometimes	Fairly often	Very often		
1. How often are you clear on what your job responsibilities are?	1	2	3	4	5		
2. How often can you predict what others will expect of you on the job?	1	2	3	4	5		
3. How much of the time are your work objectives well-defined?	1	2	3	4	5		
4. How often are you clear about what others expect of you on the job?	1	2	3	4	5		
5. How often does your job require you to work very fast?	1	2	3	4	5		
6. How often does your job require you to work very hard?	1	2	3	4	5		
7. How often does your job leave you with little time to get things done?	1	2	3	4	5		
8. How often is there a great deal to be done?	1	2	3	4	5		
	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
9. I often have to deal with new problems on my job.	1	2	3	4	5	6	7
10. On my job, I often have to handle surprising or unpredictable situations.	1	2	3	4	5	6	7
11. To be successful on my job requires all my skill and ability.	1	2	3	4	5	6	7
12. On my job, I seldom get a chance to use my special skills and abilities.	1	2	3	4	5	6	7
13. My job is very challenging.	1	2	3	4	5	6	7

How much influence do you have....

	Very little	A little	Moderate amount	Much	Very much
14. ... over the variety of tasks you perform?	1	2	3	4	5
15. ... over the availability of supplies and equipment you need to do your work?	1	2	3	4	5
16. ... over the order in which you perform tasks at work?	1	2	3	4	5
17. ... over the amount of work you do?	1	2	3	4	5
18. ... over the pace of your work, that is how fast or slow you work?	1	2	3	4	5
19. ... over the quality of the work that you do?	1	2	3	4	5
20. ... over the decisions concerning which individuals in your work area do which tasks?	1	2	3	4	5
21. ... over the hours or schedule that you work?	1	2	3	4	5
22. ... over the decisions as to when things will be done in your work area?	1	2	3	4	5
23. ... over the policies, procedures, and performance in your work area?	1	2	3	4	5
24. ... over the availability of materials you need to do your work?	1	2	3	4	5
25. ... over the training of other workers in your work area?	1	2	3	4	5
26. To what extent can you do your work ahead and take a short rest/break during work hours?	1	2	3	4	5
27. In general, how much influence do you have over work and work-related factors?	1	2	3	4	5

28. How much challenge is there on your job? (circle one number)

There is very little challenge on my job; I don't get a chance to use any special skills and abilities and I never have jobs which require all my abilities to complete them successfully.	Moderate challenge	There is a great deal of challenge on my job; I get a chance to use my special skills and abilities and often have jobs which require all my abilities to complete successfully.
1	2	3
4	5	6
7		7

29. How much uncertainty is there in your job? (circle one number)

Very little; I almost always know what to expect and am never surprised by something happening unexpectedly on my job.	Moderate uncertainty	A great deal; I almost never am sure what is going to happen, and unexpected things frequently happen.
1	2	3
4	5	6
7		7

30. Which number to the right best describes the atmosphere in your work environment?

Calm		Busy, but reasonable		Hectic, chaotic
1	2	3	4	5

Section D. About your quality of working life...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. I am not willing to put myself out just to help the hospital.	1	2	3	4	5
2. In my work I like to feel I am making some effort, not just for myself but for the hospital as well.	1	2	3	4	5
3. To know that my own work had made a contribution to the good of the hospital would please me.	1	2	3	4	5
	Never	Rarely	Occasionally	Often	Always
4. At the end of the workday, I am completely exhausted, mentally and physically.	1	2	3	4	5
5. There is a great amount of nervous strain connected with my daily work activities.	1	2	3	4	5
6. My daily work activities are extremely trying and stressful.	1	2	3	4	5
7. In general, I am unusually tense and nervous on the job.	1	2	3	4	5
8. All in all, how satisfied would you say you are with your job?	<input type="checkbox"/> ₁ Very much satisfied <input type="checkbox"/> ₂ Somewhat satisfied <input type="checkbox"/> ₃ Not too satisfied <input type="checkbox"/> ₄ Not at all satisfied				
9. If you were free to go into any type of job you wanted, what would your choice be?	<input type="checkbox"/> ₁ I would want the job I have now. <input type="checkbox"/> ₂ I would want to retire and not work at all. <input type="checkbox"/> ₃ I would prefer some other job to the job I have now.				
10. Knowing what you know now, if you had to decide all over again whether to take the job you now have, what would you decide?	<input type="checkbox"/> ₁ I would decide without hesitation to take the same job. <input type="checkbox"/> ₂ I would have some second thoughts. <input type="checkbox"/> ₃ I would decide definitely not to take the same job.				
11. In general how well would you say that your job measures up to the sort of job you wanted when you took it?	<input type="checkbox"/> ₁ Very much like the job I wanted. <input type="checkbox"/> ₂ Somewhat like the job I wanted. <input type="checkbox"/> ₃ Not very much like the job I wanted.				
12. If a good friend of yours told you he or she was interested in working in a job like yours for your employer, what would you tell him or her?	<input type="checkbox"/> ₁ I would strongly recommend it. <input type="checkbox"/> ₂ I would have doubts about recommending it. <input type="checkbox"/> ₃ I would advise the friend against it.				

13. Using your own definition of “burnout”, select the statement that most closely describes how you feel, and then please circle *one of the numbers to the right*:

- a. I enjoy my work. I have no symptoms of burnout. 1
- b. Occasionally I am under stress, and I don’t always have as much energy as I once did, but I don’t feel burned out. 2
- c. I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion. 3
- d. The symptoms of burnout that I’m experiencing won’t go away. I think about frustrations at work a lot. 4
- e. I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help. 5

14. How likely is it that you will actively look for a new job in the next year? (circle one number)

Not at all likely	Somewhat likely	Quite likely	Extremely likely
1	2	3	4

The following 4 questions are designed to help determine your moods, since the way you feel is a part of your quality of working life. The list of words below describes feelings people have. Please read each item and circle one number for each word, which describes how you have been feeling during the past week, including today.

	Not at all	A little	Moderately	Quite a bit	Extremely
15. Fatigued	1	2	3	4	5
16. Exhausted	1	2	3	4	5
17. Nervous	1	2	3	4	5
18. Tense	1	2	3	4	5

	Never	A few times a year or less, almost never	Once a month or less, rarely	A few times a month, some-times	Once a week, rather often	A few times a week, nearly all the time	Every day
19. I feel emotionally drained from my work.	1	2	3	4	5	6	7
20. I feel used up at the end of the workday.	1	2	3	4	5	6	7
21. I feel fatigued when I get up in the morning and have to face another day on the job.	1	2	3	4	5	6	7
22. Working all day is really a strain for me.	1	2	3	4	5	6	7
23. I feel burned out from my work.	1	2	3	4	5	6	7
24. I feel frustrated by my job.	1	2	3	4	5	6	7

Section E. About your perceptions of your performance...

Please rate the following aspects of your performance at work during the past 3 months.

	Never	Occasionally	Often	Always
1. I accomplished what I wanted.	1	2	3	4
2. I accomplished as much as I could.	1	2	3	4

- 3. I felt my performance was good. 1 2 3 4
- 4. I found it difficult to concentrate on the task at hand. 1 2 3 4
- 5. I felt my productivity was lower than expected. 1 2 3 4
- 6. I lost interest or became bored at work. 1 2 3 4
- 7. I worked more slowly than expected. 1 2 3 4

Please indicate to what extent you agree or disagree with the following statements.

- 8. In general, I am satisfied with the quality of care that I provide.
- 9. I have enough time to complete patient care tasks safely.
- 10. I usually have plenty to do; but I can always follow rules and procedures related to patient safety and standards of care.

	Strongly disagree	Disagree	Neither agree, nor disagree	Agree	Strongly agree
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1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

Section F. About you...

1. What is your gender? ₁ Male ₂ Female

2. What is your education level?

- ₁ Some college or technical training beyond high school (1-3 years)
- ₂ Graduated from college (BA, BS)
- ₃ Some graduate school
- ₄ Graduate degree (Masters, Ph.D., M.D.,)

3. How old are you? ₁ 34 or less ₂ 35-44 ₃ 45-54 ₄ 55+

In order to be able to keep track of your answers to the questionnaire over time, we ask that you provide us with an identifier. Please write down below the last four digits of your Social Security Number:

_____ (last four digits of your SS number)

Please feel free to add any comments regarding the smart IV pump technology.

When utilizing this document please cite:

1. Carayon, P., Hundt, A. S., & Wetterneck, T. B. (2010). Nurses' acceptance of Smart IV pump technology. *International Journal of Medical Informatics*. 79(6): 401-411. PMID: PMC2862878