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An Evaluation  
*of the*  
Tele-Wound (Pixalere)  
Telehealth Initiative  
Final Report

*A Picture Speaks Louder than Words*

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## Acknowledgements

Interior Health acknowledges and thanks all who were involved with the PixaLere pilot project.

- Interior Health Community Care clients in the involved communities
- Linda Comazzetto, Project Sponsor
- Wendy Grywacheski, Wound Ostomy Specialist
- Interior Health Community Care Staff in Kamloops, Revelstoke and 100 Mile
- Interior Health Information Management and Information Technology staff

## Executive Summary

Interior Health is faced with several challenges related to wound management:

- Lengthy wait times (approximately 6 weeks) associated with community care visits by the specialist
- Human and capital resource utilization related to extensive travelling
- Continuity of information during the episode of care, resulting in inconsistencies applying the most effective method of treatment

To address these challenges Interior Health launched a pilot project of the Pixalere wound management system in May 2004 in three communities within the Thompson Cariboo Shuswap (TCS) Health Service Area: Kamloops (half of the group), 100 Mile House and Revelstoke. An interim evaluation of the project was carried out in October 2004 with encouraging results. A final evaluation was completed in February 2005 with the purpose of:

- determining if the pilot project met its objectives
- assessing if it is advisable to expand this application throughout Interior Health
- providing recommendations for future direction considering the lessons learned through the project.

Evaluation methods included stakeholder surveys of the community nurses and clients; informal interviews with the wound ostomy specialist for TCS and the project sponsor; information from meetings during the pilot project; and information from the literature.

The evaluation showed the following key strengths of the Pixalere project:

- Clients acceptance of this approach to wound care service delivery
- A high degree of staff satisfaction using Pixalere as a tool to improve the quality of wound management in the community
- Efficient use of resources, allowing for increased access to the wound care specialist
- Efficient use of resources, supporting best practices of the use of products

The evaluation confirmed that the objectives of the Pixalere pilot were achieved and that there are substantial benefits to clients and staff of Interior Health to continue using, and to expand the use of the Pixalere program. A number of issues were identified through the pilot project and these issues should be addressed. The following recommendations have been made in regards to expanding this system throughout Interior Health:

- Create a Steering Committee with representation from across Interior Health.
- Project management should be addressed at 2 levels – clinical and technical.
- Create a clinical working group with representation of the wound specialists and community nurses from across Interior Health.
- Use a phased approach to roll this out across Interior Health.
- Address issues identified through the pilot project by incorporating detailed plans into the project charter

## Background

In May 2004 a one year tele-wound pilot project was initiated in three communities within the Thompson Cariboo Shuswap (TCS) Health Service Area: Kamloops (half of the group), 100 Mile House and Revelstoke. The purpose of the tele-wound project was to use a software program (Pixalere) and a digital camera to assist community nurses in the assessment of wounds. This system offers a method of reviewing wounds that enable the Wound Nurse Specialist to provide expert and timely assistance to the community nurse in the treatment of difficult to heal wounds.

A study carried out in the Central Okanagan found that for a sample population of 386 community clients, 46% were seen for a wound related issue. Many of these wounds are complex or chronic in nature. Chronic wounds are among the most intractable conditions confronting community nurses, many of whom lack the specialty skills required to treat wounds adequately. According to literature, wounds can heal twice as fast if a specialist is involved in the treatment of the wound. Within Interior Health access to wound/ostomy specialists is difficult as the number of these nurses is very limited:

- 1 – Thompson Cariboo Shuswap HSA
- 1 – East Kootenay HSA
- 1 – Kootenay Boundary HSA
- 2 – Kelowna
- 1 – Vernon
- 1 – Penticton

As a result, Interior Health is faced with several challenges related to wound management:

- Lengthy wait times (approximately 6 weeks) associated with community care visits by the specialist
- Human and capital resource utilization related to extensive travelling
- Continuity of information during the episode of care, resulting in inconsistencies applying the most effective method of treatment

The objectives of the pilot project were to gather information to evaluate whether the incorporation of the Tele-Wound Care Management System – “Pixalere” - in the management of complex wounds within Community Care in the Thompson Shuswap Cariboo Health Service Area of Interior Health will:

1. Standardize wound assessment and documentation;
2. Facilitate implementation of wound protocols;
3. Improve the quality of wound care by using best practice protocols;
4. Increase accessibility to clinical wound specialists for clients in the community with complex wounds;
5. Increase the appropriate use of standardized advanced wound care products leading to reduced costs of complex wound management;
6. Ascertain efficacy and usability of laptop technology and camera/photo quality and its interfacing capabilities;
7. Ensure compatibility of wound care technology with InterRAI technology.

Separate from this pilot project, Interior Health has moved to the standardization of wound products across the authority. Some of the new products available can substantially reduce wound healing time when used properly; when not used properly these products can substantially increase costs without affecting treatment time. With existing financial and human resource restraints, the utilization of these resources in an efficient and effective manner is crucial.

Approximately 20 community nurses, one wound/ostomy specialist and over 100 clients were involved in this pilot project. As Pixalere is a web-based application the original intent of the project was to send the assessment and wound image in real time to the central database for immediate feedback. However, wireless technology was not implemented as part of the pilot – instead community nurses complete the information during the home visit, and then upload the information when they are in the office. This sends a notification to the wound nurse. The wound nurse then reviews and gives advice on the client's treatment which is available to the community nurse for the next visit. If immediate consultation is required the community nurse pages the wound nurse.

"Pixalere contains a database of all products, product costs and the ability to track precisely how much product has been used over a specified time period. Using Pixalere, it is now possible to generate an exact report on how much money is being spent on specific products and product categories, both globally and for individual patients or areas" (Webmed Technology, 2004). While data is now available for those nurses and clients using Pixalere, comparison data is not



available for non-Pixalere use, as manual tracking to collect this information is too time consuming, and so does not occur.

## ***Evaluation Results***

The evaluation consisted of stakeholder surveys of the community nurses and clients; informal interviews with the wound ostomy specialist for TCS (Wendy Grywacheski) and the project sponsor (Linda Comazzetto); information from meetings during the pilot project; and information from the literature. The surveys incorporated a rating scale as well as the ability to provide comments for all questions. The evaluation attempted to assess if the pilot project met its objectives. The following is a summary of the findings of the evaluation process.

### **Staff Satisfaction Survey:**

Thirteen community nurses completed the survey (Appendix A). Survey results indicate a high degree of staff satisfaction using Pixalere, as well as perceived value in the use of this technology. 92% of the community nurses believed that the use of Pixalere improved the quality of wound management in the community. 92% of those surveyed viewed Pixalere as effective in bringing benefits to both clients and staff and the same number would like to continue to use Pixalere in the future. 100% of those surveyed felt it was important to explore the use of technology to enhance delivery of quality client care in Home and Community.

92% of the community nurses believed that they could provide the best possible care to their client because they had access to a specialist. 67% stated that an increased number of clients were able to access the expertise of the specialist.

The community nurses were split on whether the use of dressing supplies indicated by the specialist led to reduced cost of complex wound management. Five believed costs were saved, six were neutral and one disagreed. A similar split occurred when asked about an increase in healing time, with 50% agreeing they noticed an increase in healing time and 50% being neutral on this. Within this pilot comparisons between traditional and Pixalere methods could not be made as statistics are not collected for those cases where Pixalere is not utilized. However, a study performed by WebMed Technology and the Fraser Health Authority (Appendix C) compared two groups – one group using Pixalere and the other using a “traditional” approach. The study found “average heal-time improvements of 32% with some etiologies realizing a better heal time of 85%” and “a 39% lower cost of treatment per wound profile” (MedWeb Technology, 2004).

The community nurses felt that the use of the technology was well accepted by their clients, with 100% agreement that clients were comfortable with the computer and camera. 92% said that clients willingly participated with this new technology.

Pixalere functionality was rated high within the community nurses survey with 100% reporting that the menus adequately capture the information required and 92% viewing navigation time as reasonable. However, even though the equipment used (laptops and digital cameras) is portable, it was found that nurses were not taking the laptops into the client's homes. The nurses found it easier to take an assessment sheet with the digital camera into the client's homes and enter the information into the system upon their return to the office. As a result double charting is occurring.

Pixalere functions in a similar manner to InterRai in that the nurses can download their information at the office before visiting their client's home. During their visits nurses are able to work off-line, and upon returning to their office they can upload the information collected.

There are several reasons why the laptops are not being used in the clients' homes:

1. Pixalere was rolled out just before the summer and only a limited number of nurses were trained. With the summer came vacations and the need for non-trained nurses to follow up on Pixalere patients. The only way this could be done was using a manual assessment form.
2. Pixalere was rolled out prior to InterRai. A limited number of laptops had the wound image built into it. Nurses used to keep these laptops on a pool so they could share them. When InterRai was implemented, many more laptops were deployed but these did not have the "wound image". All laptops will be re-imaged to include both Pixalere and InterRai. The usage of the laptops in the homes will be monitored to see if usage increases with Pixalere available on all laptops.

While 83% of the respondents indicated that the training was adequate, 66% would like additional training if possible. The areas requiring further training include the use of the technology (taking photos, uploading and downloading photos, and uploading information to the server), the functionality within Pixalere (treatment window, navigating through the Pixalere menu), and processes (following up on patients from another nurse, making sure the specialist provides me with feedback).

### **Client Satisfaction Survey:**

Clients were also surveyed for satisfaction with the technology in the treatment of their wounds and their responses were very positive. 91% felt comfortable with the community nurse using the digital camera and computer and 9% were neutral. 82% of the clients liked to see the pictures of their wound and some clients requested printed copies. 100% of the clients were satisfied with the quality of service provided to them and felt that every effort was made to respect their needs, thoughts and feelings.

### **Specialist Feedback:**

Wendy G, the only wound ostomy nurse providing service across the TCS health service area cited numerous benefits with the use of the Pixalere program:

1. Improved access to specialist services was viewed as a significant benefit. The use of the Pixalere system allowed the specialist to view standardized assessment information as well as digital photos remotely. This saved time by avoiding lengthy telephone explanations describing the condition of a wound, as well as guaranteeing more accurate feedback. Reduced travel allowed the wound specialist to increase her number of consultations. She states that she can consult three times as many cases with Pixalere than without, thereby making more effective use of scarce resources, and providing more equitable access to specialist consultation across the target population. Without Pixalere it is anticipated an additional specialist would be required to keep up with the workload.
2. Promoting staff knowledge and providing just in time learning: All our community care nurses feel their skill level and self confidence in caring for complex wounds

has improved with access to the Pixalere project and direct access to a wound ostomy specialist.

3. More efficient use of wound care products: Interior Health had a standardized process in place prior to the introduction of Pixalere. Pixalere supported this standardization by ensuring the most effective product and treatment methods were used at the right time. Results from this can include decreased nursing visits, increased healing time and avoidance of costs associated with inappropriate use of products.
- One example of this is with implementing venous compression as best practice. The Pixalere program enabled the specialist to identify when this treatment was more appropriate and to have this initiated more consistently.

Venous leg ulcers drain a lot - nursing visits are usually required every 2 days without compression and once/week with compression. They take approximately 12-16 weeks to heal.

9 patients without compression = 432 visits (12 weeks x 4 visits/week x 9 patients)

9 patients with compression = 108 visits (12 weeks x 1 visit/week x 9 patients)

This gives us 324 visits to provide service to other patients in the region. In this case the benefits are decreased visits and eventual healing as opposed to decreased healing time.

- Another example is the use of VAC therapy. This type of therapy requires that an expert be available to supervise. Pixalere allowed for the wound ostomy specialist to provide remote supervision of this therapy. During the evaluation period there were 7 patients on VAC therapy.

Without VAC therapy – a typical wound will take 8 weeks to heal with 3 visits per day by the community nurse. For our 7 patients this is equivalent to 1,176 visits (8 weeks x 7 days x 3 visits/day x 7 patients)

With VAC therapy (supervised by the specialist) a typical wound takes 4 weeks to heal at 3 visits per week by the nurse. For our 7 patients this is 84 visits (4 weeks x 3 visits/week x 7 patients)

During this trial period healing time improved and nursing visits were reduced by over 1000 by the appropriate use of VAC therapy.

4. The ability to track and compare healing times and best practices: Pixalere's reporting capabilities allow for the tracking of such things as product costs per wound type, healing time, number of visits needed per wound type, etc. This allows comparisons of wound types with outcomes to ensure the most cost effective treatment options are being utilized. Wendy believes this will prove very beneficial once all community nurses are using this in a consistent manner. (See Appendix B for examples).
5. The privacy and confidentiality of information: The Pixalere system is a secure system. During the pilot several facilities that do not have Pixalere would take digital photos and send them to the specialist via email. The use of e-mail for this purpose is not best practice as it violates FOI and patient security standards, and does not support sharing of patient information in a secure form with other healthcare professionals. Additionally, e-mail photos do not allow for wound comparison with previous images or tracking of product usage and specialist recommendations. It does not allow for reporting capabilities and there is no consistency from one nurse

to another. This habit is not recommended and should not be encouraged. Pixalere implementation throughout IH is one way to stop this practice.

6. Soft benefits: it is believed that the use of Pixalere provides efficiencies and savings that are not easily measured. These include:

- Surgical treatment avoidance: during the trial period a Revelstoke client was healed and a graft surgery was cancelled; a client in Kamloops community successfully healed two large ulcers and avoided surgery.
- Decreased number of admissions to acute care and Emergency room as complex wounds can be treated and infections controlled in the community more effectively.
- Reduced length of stay at an acute care facility and discharge to community care as the confidence exists that a wound care specialist will be overseeing complex wounds.

#### **Information from meetings:**

Participants in the pilot project provided information that can be used for future planning.

The following areas should be explored for further development:

- a. When planning for the expansion of the program, adequate time for training should be a priority and additional training to the existing sites should be included.
- b. Physicians' access to Pixalere should be included.
- c. Explore the impact of future Pixalere modules, e.g. IV home therapy, palliative care, ostomy care, etc.
- d. Complete a privacy impact assessment
- e. Determine how Pixalere will be imaged for the desktop setting – e.g. ambulatory care clinic – those nurses not requiring a mobile unit.

- f. IT coordination for combo image and Windows XP deployment; installation of Pixalere's upgraded versions and implications of hosting our own data.
- g. Identify who will provide user support when the project reaches a larger scope
- h. Implications of community nurses not using air-cards vs the costs of using them, e.g. airtime charges.
- i. Determine whether other mobile technology should be evaluated and recommended (e.g., NEC).
- j. Identify how Pixalere can or should ultimately be linked /interfaced with Meditech such that wound treatment in the community becomes part of the electronic health record.
- k. Identify champion nurses in each community who are willing to embrace the new technology
- l. Update policies and procedures on when and how to use Pixalere including best practices, referral patterns and client visit criteria.
- m. Develop an evaluation plan including measures to collect data on number of patients, number of patient visits, response time, and user satisfaction for the wound / ostomy nurses and community care nurses.
- n. The current planning for expansion involves solely the community setting. It would be worth exploring the implementation of Pixalere to include not only community but residential and acute care wounds since the same wound ostomy nurse is involved in their treatment.

## ***Conclusion***

The number of wound ostomy specialists is extremely limited in Interior Health. These professionals provide consultations to acute care, residential, ambulatory, and community based clients. They are unable to see all clients with complex wound care needs, particularly in rural and remote areas. Wounds heal faster when a specialist is



involved in their treatment; additionally, wounds are costly to treat. Therefore, it is imperative to make the best use of the resources available. The evaluation of this pilot project indicates that the use of the Pixalere system contributes to using resources more efficiently. The evaluation showed the following key strengths of the Pixalere project:

- Clients acceptance of this approach to wound care service delivery
- A high degree of staff satisfaction using Pixalere as a tool to improve the quality of wound management in the community
- Efficient use of resources, allowing for increased access to the wound care specialist
- Efficient use of resources, supporting best practices of the use of products

## ***Recommendations***

A number of recommendations can be made from the pilot project to support the roll-out of Pixalere across Interior Health:

- Create a Steering Committee with representation from across Interior Health.  
This committee would ensure commitment to the project and would assist in the removal of barriers.
- Project management should be addressed at 2 levels – clinical and technical. A wound specialist familiar with the product is required half-time to work on the project to ensure changes to clinical processes occur to support tele-wound.  
Policy and procedure changes should be documented. An experienced project

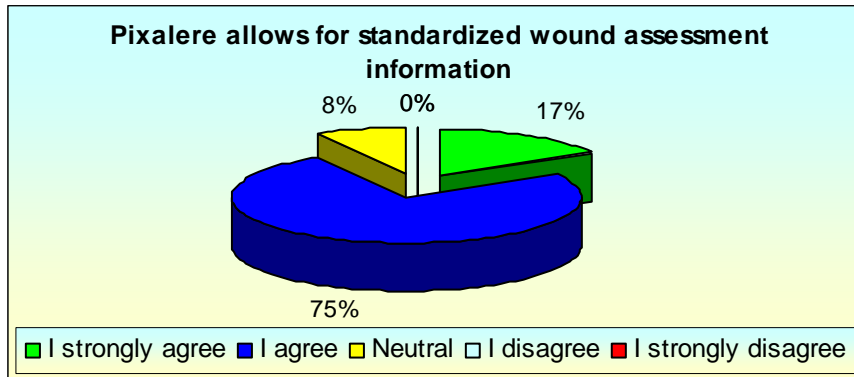
manager should also be assigned half-time to manage the rollout across Interior Health, using strong project management.

- Create a clinical working group with representation of the wound specialists and community nurses from across Interior Health. This working group would be involved in decisions regarding the implementation and use of Pixalere to ensure the system supports their practice.
- Use a phased approach. The working group and project leaders, with support from the steering committee, should develop a project charter detailing how this project can be rolled out across Interior Health using a phased approach.

## ***References***

Murphy, Sean. (2004). *Pixalere Phase One Implementation: Fraser Health Authority – Chilliwack Health Unit*. WebMed Technology Incorporated.

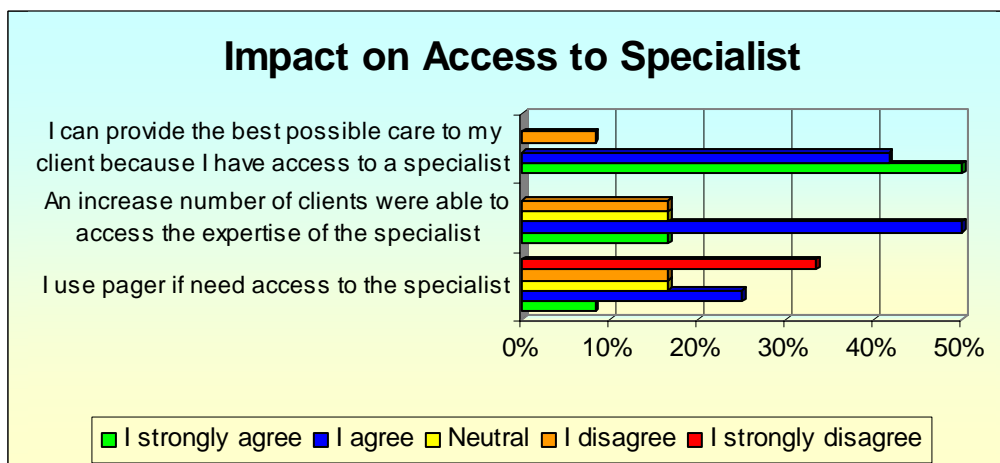
## APPENDIX A



*“The Pilot project has opened up access to advanced wound care resource “*

*“I think the pilot project has been a great start to treating wounds more efficiently and successfully”.*

*“The Pixalere project is a great communication tool for diverse regions. We have been able to provide more patients with better wound care”.*



*Pixalere provides access to wound specialist in a timely manner.*

*All our community care nurses feel their skill level and self confidence in caring for complex wounds has improved with access to the Pixalere Pilot project and direct access to Wendy G.*

*I love being able to access a specialist if I have a problem.*

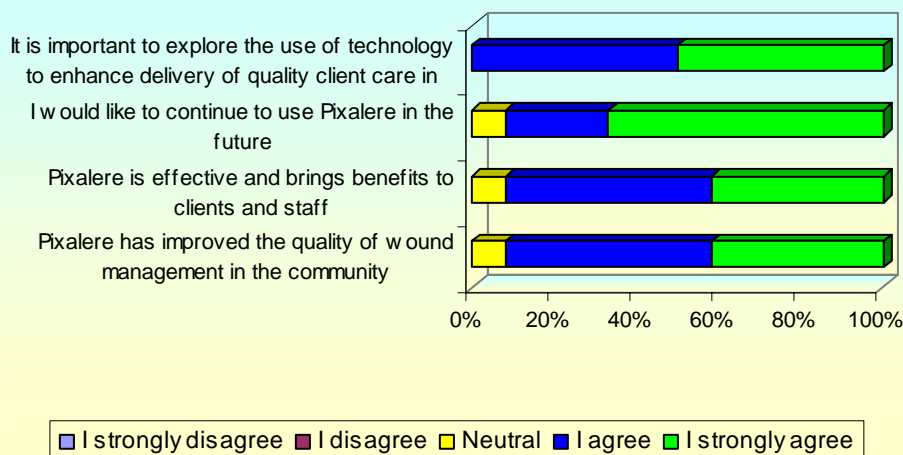
*I like the fact I am able to easily contact a wound care specialist;*

*It is nice to know that there is someone at a large body of knowledge that we can access.*

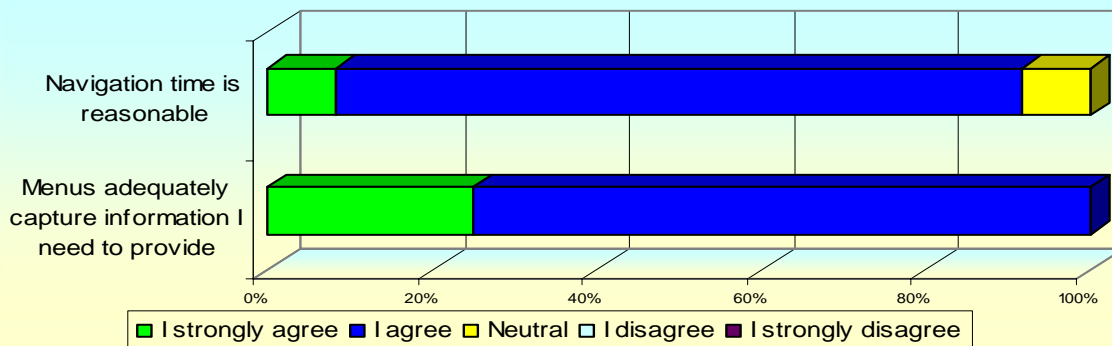
*Faster turn around time for response from specialist.*

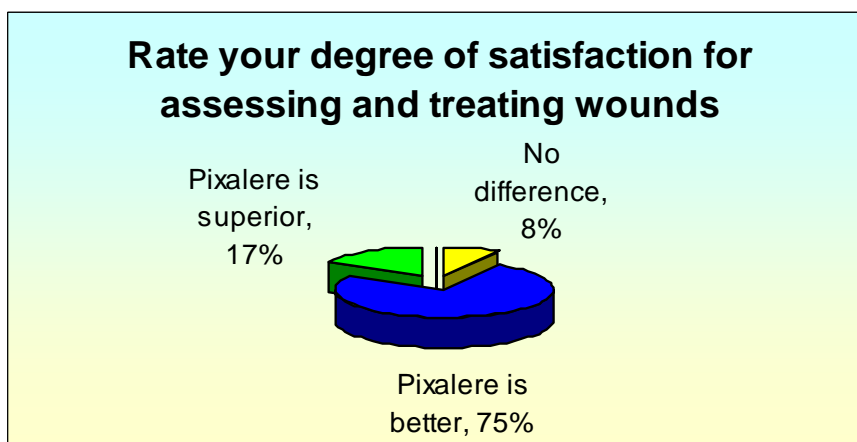
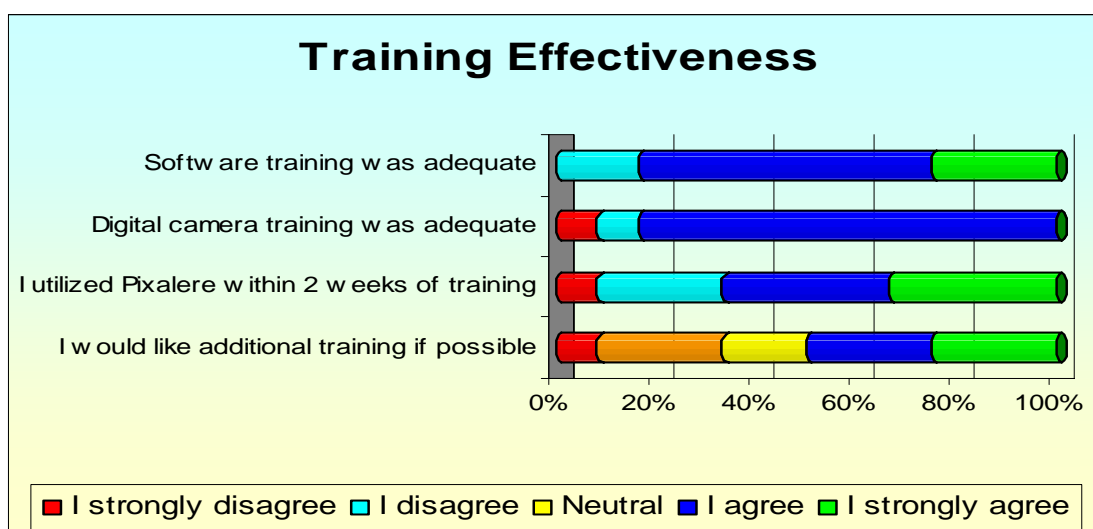
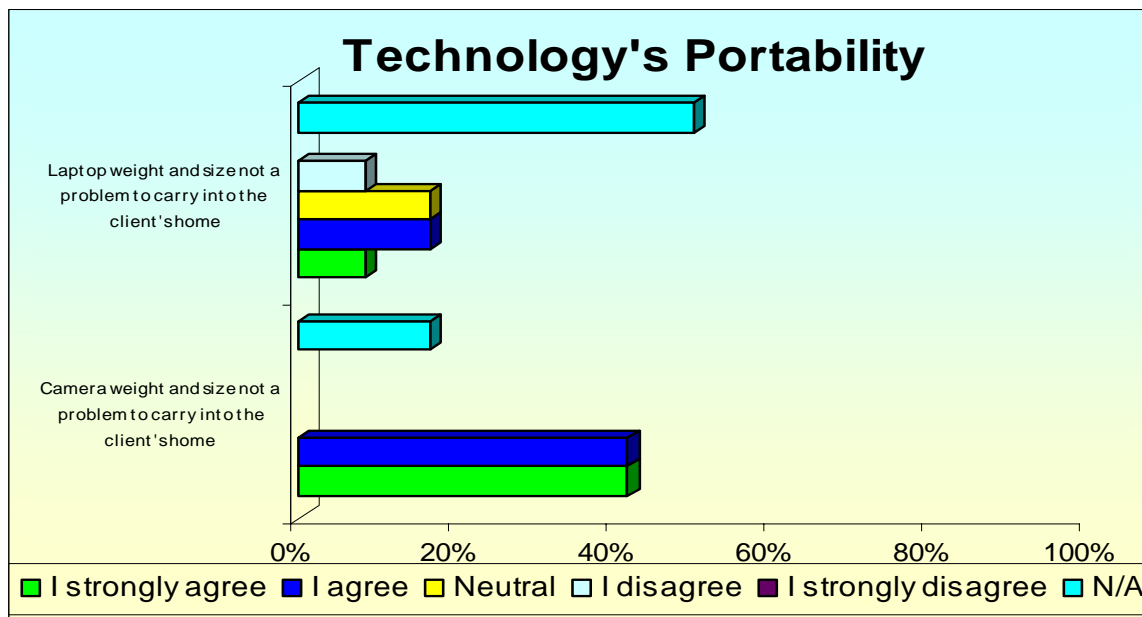
*Easier access to wound care specialist*

## Pixalere Effectiveness



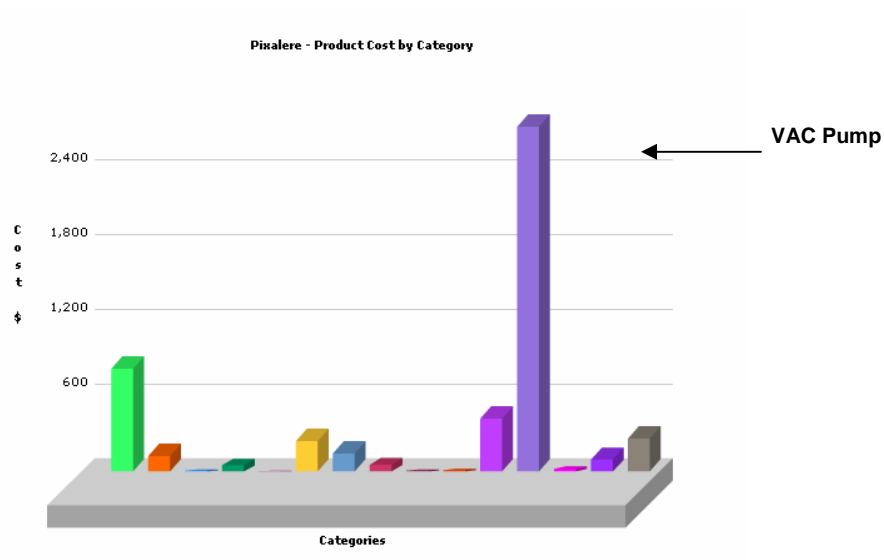
## Pixalere Functionality





## **APPENDIX B: Reports**

### **Product Usage by Category (Feb 16, 2005)**



### **Summary**

Total Cost :	\$4939.5
Total Units :	987.3
Average Cost per Patient :	\$60.98
Average Usage per Patient :	12.19 Units
Number of Matching Patients :	81 Patients
Average Cost per Wound Profile :	\$47.96
Average Usage per Wound Profile :	9.59 Units
Number of Matching Wound Profiles :	103 Wounds
Average Cost per Wound Assessment :	\$10.83
Average Usage per Assessment :	2.17 Units
Number of Matching Assessments :	456 Assessments
Total Number of Patients :	84
Total Number of Wound Profiles :	110
Total Number of Wound Assessments :	653

### **Pixalere Statistics**

#### **Product Cost**

June 2004 - \$94.32  
July 2004 - \$183.08  
August 2004 - \$107.07

Septembet 2004 – \$46.67  
October 2004 – \$1440.96  
November 2004 – \$376.82  
December 2004 – \$931.42  
January 2005 – \$1209.26  
February 2005 (current to the 9<sup>th</sup>) - \$253.16 **Total: 4642.71**

### **Number of Visits**

June 2004 - 27  
July 2004 - 88  
August 2004 – 74  
Septembet 2004 – 33  
October 2004 – 77  
November 2004 – 72  
December 2004 – 100  
January 2005 – 106  
February 2005 (current to the 9<sup>th</sup>) – 24 **Total: 601**

### **Total Number of Patients Added**

June 2004 - 6  
July 2004 - 18  
August 2004 – 10  
September 2004 – 6  
October 2004 – 14  
November 2004 – 7  
December 2004 – 10  
January 2005 – 7  
February 2005 (current to the 9<sup>th</sup>) – 2 **Total: 80**

### **Wound Profile Statistics – June 2004 to Feb 9 2005**

Total Number of Wound Profiles – 106  
Open Wound Profiles - 58  
Closed Wound Profiles - 48  
Total Number of Alpha Assessments - 634  
Total Number of Wound Profile Assessments - 60

## **APPENDIX C**



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