

A System-Wide PICC Line Network

Barriers to Integration: Challenges to Creating a System-Wide PICC Line Network

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Executive Summary

Early in 2006, Integrated Strategic Alliances & Networks (ISAN) set out to investigate why efforts to establish a district wide PICC¹ had lost momentum before coming to fruition. First launched as a working group, the intended goal of the PICC Line Network was to establish a unified approach to PICC care and insertion throughout the Thames Valley area (including the use of a single, common type of catheter, infusion pump, connectors, and other supplies), and to facilitate timely access to this procedure for patients outside of London.

While project participants achieved several important victories (such as the creation of a common patient education booklet/PICC insertion record, the standardization of some equipment, and the development of on-site capacity within certain community hospitals), the effort ultimately fell short of its goal. Consequently, patients in some outlying communities are still finding it difficult to locate a facility that will accommodate a referral for PICC insertion. Care providers at one London hospital report they continue to receive such requests, which they are often unable to accommodate. (In some cases, more than one institution has already refused these patients.)

The history of this project goes back to 2003, when leaders of the Thames Valley Hospital Planning Partnership (TVHPP²) identified a system problem within their catchment areas; namely, many rural patients were finding it difficult to obtain timely access to PICC line insertion. Until approximately January of that year, community hospitals in the Thames Valley district had referred patients who required the procedure to one of three sites at the two London hospitals – London Health Sciences Centre (LHSC – University Hospital and South Street Hospital) and St. Joseph’s Health Care (SJHC) London. However, these institutions were eventually forced to stop accepting such referrals for out-of-area patients due to budget constraints, although requests from community hospitals continued to pour in. (SJHC, which had handled the bulk of referrals for community PICC insertions, discontinued the service early in 2003, when it became clear that due to the manner in which hospitals are reimbursed for the procedure, they could not recoup the costs involved for patients not directly under their care.) This situation prompted front-line clinical staff – both in the community hospitals and within the larger centres – to express concern over what they perceived as an emerging gap in care. This in turn spurred hospital leaders to press for a solution through the TVHPP.

Consequently, late in 2003, TVHPP representatives asked ISAN to investigate the situation by gathering basic information about PICC line insertions in the district. This included finding out how many of the procedures were being performed at each of four sites within two London hospitals; which departments at the respective hospitals were responsible for PICC insertions of varying degrees of difficulty; and, the role of each community hospital with respect to PICC line insertions. ISAN set about obtaining this information by surveying contacts within each of the

¹ PICC (Peripheral Intravenous Central Catheter) Line. A PICC line is a catheter that is inserted into the arm and threaded upward until the tip rests in a large blood vessel near the heart. A PICC line can be used to deliver intravenous therapies – chemotherapy drugs, for example -- over a prolonged period. PICCs pose a lower risk of complications like infection and bleeding than other central catheters.)

² The TVHPP is a voluntary partnership of the eight hospitals in London, Middlesex, Elgin and Oxford Counties. (www.lhsc.on.ca/isan/projects/tvhpp/tvhpp/)

district's community hospitals and asking questions about the institutions' roles with respect to PICC line insertions.

The 2003 survey revealed that only two community hospitals – Woodstock General Hospital and St. Thomas Elgin General Hospital – possessed the in-house expertise necessary to perform routine PICC insertions. The survey findings also indicated that while oncology patients comprised the majority of patients needing PICC lines, a growing number of other patients required the devices to deliver other types of therapy. Demand was expected to rise in step with the increasing acuity, and fragility of the hospital population. For their part, representatives of the two London hospitals emphasized that their organizations did not possess sufficient resources to accommodate requests for routine PICC line insertions from surrounding community hospitals; though they acknowledged it was appropriate for the larger centres to accommodate more difficult cases.

Based on the survey findings, over the next 18 months, ISAN worked with stakeholders across Thames Valley to develop a PICC Line Network. In addition to contributing human and other resources to the project, ISAN also scheduled meetings, recruited participants, and facilitated a number of related tasks. The PICC Line Working Group, a sub-set of the larger constituency, composed primarily of front-line health care professionals responsible for PICC insertion and/or management, began meeting in June 2005. The PICC Line Working Group was formed with the mandate to provide direction and guidance to the larger network and to develop strategies to address and respond to recommendations emerging from three sub-committees or task groups: Patient education, Competency /Training, and Proposed Funding Models.

The committees charged with the tasks of assuring a high level of competency and training, and brainstorming new funding proposals did indeed devise some exciting ideas for improving service delivery to community hospital patients (such as a PICC-mobile, and a circuit of PICC clinics overseen by a traveling nurse); but ultimately these groups were unable to agree on a workable model. Identified barriers to moving forward included union difficulties that would arise if several community hospitals hired a traveling PICC nurse in a 'casual' capacity, and the fact the nurse would need the authority to order x-rays in these institutions.

By December 2005, it was clear that commitment to, and interest in, the Working Group's mandate had dissipated. This was reflected in poor turnout at the Group's last few scheduled meetings. This perception was reinforced by a lack of response to ISAN's repeated efforts to organize a conference (tentatively slated for Spring 2006) for members of the Working Group. Upon following up with Working Group participants, ISAN's regional leader, and the project chair came to the conclusion that the PICC Network was no longer a priority for either the clinical or management staff that had been involved to that point in time.

In an attempt to identify the factors that may have limited the project's success, input was sought from key members of the PICC Line Working Group. These individuals (representatives of community hospitals, community care access centres, home nursing service providers, and the three London hospital sites providing PICC insertions) were initially contacted via e-mail, and then interviewed by telephone. An informal survey based on three open-ended questions formed the basis of these conversations. Queries focused on two areas: the successes achieved by the

PICC Line Working Group, and the barriers that may have prevented the project from reaching its full potential. Participants were also asked to suggest what might have been done differently in order to surmount, or sidestep these obstacles in any similar future project.

On balance, feedback obtained through the survey was positive. All respondents stated that meeting with other stakeholders and learning more about the challenges they encountered with respect to PICC insertion and management had been a very valuable experience, irrespective of any other outcomes. The majority of interview subjects also identified the patient education booklet as a positive achievement. Several individuals also praised the wealth of expertise and knowledge around PICC line insertion and management that exists in the Thames Valley district; and, the commitment to improving patient care that was demonstrated by project participants.

The factor most often cited as a barrier to fully meeting the project's objectives was lack of support at a senior level -- due in part to the loss of some key project champions through job changes and restructuring. More than half of respondents also named a shortage of resources, and lack of a unified vision and clear-cut structure as standing in the way of fully achieving the project objectives.

The majority of interview subjects also offered thoughtful suggestions for improving the probability of success in any future efforts to establish a regional PICC Line Network. The most frequently raised proposal involved undertaking a comprehensive study of both the costs and outcomes associated with different models of PICC line insertion.

Introduction

Background

In early 2006, ISAN undertook a project focussed on identifying barriers to the successful creation of a seamless, cost-effective, system-wide PICC Line Network in Thames Valley. The intent behind establishing a PICC Line Network was to bridge gaps in access to PICC lines (particularly for patients under the care of community hospitals), and to achieve more consistent care through the adoption of common practices and equipment.

Purpose

The purpose of this assessment report, *Challenges to Creating a System-Wide PICC Line Network*, is to identify:

- The project's successes
- Barriers to achieving the Working Group's original objectives
- How these barriers might be overcome in any similar, future undertaking

The above-mentioned assessment project was initiated in March 2006, and continued to May 2006. The information upon which this report is based was collected through a series of telephone interviews with individuals who were involved in the PICC Line Working Group.

Methods and Findings

Materials and Method

Key members of the PICC Line Working Group were notified via e-mail of ISAN's aim to conduct a project 'post-mortem' by soliciting participants' perceptions about the barriers they encountered while attempting to create a system-wide approach to PICC line insertion and management.

An independent interviewer and researcher was contracted to conduct this informal survey, and prepare a report based on the findings, at arm's length from any of the stakeholders.

The interviews were based around three questions (see Appendix B) that detailed the following:

- A. Successes.** One question asked respondents to name what they felt were any successes to come out of the project.
- B. Barriers.** One question asked interviewees to identify any factors they felt may have led the project to lose momentum, or fail to fully achieve its original objectives.
- C. Suggested improvements.** One question solicited suggestions around strategies the interviewees believed could possibly have improved the project's prospects for fully achieving its potential, or might maximize the chances of a similar, future effort meeting with success.

Respondents were permitted to provide multiple responses to each query.

The original e-mail identified a deadline of April 15th, 2006. However, due to scheduling challenges, information was collected until the end of May 2006.

In the course of conducting the survey, the researcher also investigated how PICC line insertions are carried out at various sites, including which insertion techniques are employed, and how the patient travels through the system step-by-step. For example, in some cases the procedure is performed at the patient's bedside before transfer to the radiology department where PICC placement checked via chest x-ray. In others, the lines are inserted at a centralized location under the guidance of medical or diagnostic imaging services.

Survey Population

Ten individuals who had attended at least one meeting of the PICC Line Working Group were identified as potential survey participants.

Confidentiality/Ethical Issues

As an independent contractor, the writer/interviewer signed a confidentiality agreement with ISAN. Interviewees were informed that their responses would not be connected with either their names or roles in the completed report.

Research Limitations

There are several limitations inherent in the type of research upon which this report is based. First of all, due to the number of people who participated in the PICC Line Working Group, it was not feasible to solicit the opinions of all the individuals involved; therefore, the sampling of opinions may not be truly representative of the larger group. Secondly, due to the lag between the point when the issues around PICC line access were identified and the time that interviews were conducted, several working group members had retired, changed jobs, or otherwise become lost to follow-up; those who were no longer involved possessed limited knowledge about what transpired after their departure. As well, some of the working group members who participated in the survey had not attended all of the meetings. Furthermore, it is possible that when the PICC Line Working Group was first formed, some individuals who could have played a valuable role were either not identified, or declined the opportunity to be involved, due to factors such as conflicting commitments, or lack of management support. Some interviewees may also have been reluctant to be completely candid about their concerns or criticisms, despite the 'arms-length' measure of hiring an independent contractor with no ties to ISAN or any of the other agencies involved, and the reassurance that responses would not be linked to the respondents' names and/or roles. Thus, the information collected here may be incomplete. Additionally, while the interview format allows for the collection of complex, shaded information, the responses garnered through this type of interview are sometimes more difficult to categorize than those gathered via questionnaire. Finally, the fact that the interviewer specifically asked whether one proposed strategy might have improved the project's chance of success could have increased the likelihood respondents would view that suggestion favourably.

Findings

Successes

Contacts were asked to name any aspect of the PICC Line project that they felt had been successful, or gone well.

A majority (7 of 10) of interview subjects felt the opportunity to meet other care providers involved in PICC insertion or management, particularly during the first general meeting, had been a positive experience that helped them understand the needs and concerns of other agencies and care providers. *It worked as a forum for discussion*, noted one participant. Another participant added: *Just the fact we had the ability to get together and voice our concerns, was a huge success.* A third respondent stated: *To me, the greatest thing was just getting to meet some of the other people, and look at different ideas.* The same individual noted this type of networking not only provided participants with insight into how other agencies delivered care, but also alerted front-line workers to small ways in which they could assist one another. For example, the respondent recalled: *Someone said, 'look, if you put extensions on those PICCs it would be a lot easier for us.'*

Nearly as many interviewees (6 of 10) named the patient education/PICC record booklet as a positive outcome that would hopefully help standardize care. (At the time of the survey, none of the respondents had seen the final draft of the document.) One representative from a community-nursing agency praised the document for providing in-home community health nurses with a clearer idea of where to turn for help in troubleshooting problems like blockages. Even the process of drafting the booklet was cited as educational. *The discussion at the table garnered a huge learning curve for a lot of (participants) – like, oh, I had no idea that this was why that happened, or this is why they requested heat on it*, one interviewee explained. (It is, however, worth noting that perhaps unbeknownst to the subcommittee that drafted the patient education booklet, a group of health professionals at one London hospital site had already produced their own patient education materials -- a pamphlet and video. Building on this existing framework rather than replicating it might have freed up time and energy that could have been directed towards achieving other goals.)

Half of the respondents (5 of 10) said the move towards using some common equipment – namely, a particular type of pump – was also an important step towards standardizing care. Two subjects noted room for further improvement still exists, explaining that adopting common supplies could cut down on wastage. For example, currently one kind of clave (a cap that protects the outer end of the catheter) put in place at the hospital might be discarded and replaced with a different type when a home care nurse checks the PICC.

One interview subject said the project goals and the ideas raised by participants were excellent. A single respondent mentioned being particularly impressed with the district's wealth of expert knowledge and skills around PICC line insertion and management. Finally, another interviewee noted that an earlier survey around PICC line practices had helped form a broad picture of how the lines are inserted and managed across the region, and the role each agency or institution plays with respect to these procedures and practices.

It is also worth noting that since the PICC Line Working Group was first launched, one of the participating community hospitals³ has improved their patients' access to PICC lines. While the original intent of the project was to develop a system-wide approach, the fact that a community hospital developed specialized capacity on-site is in itself a significant success.

Barriers

Interviewees were asked to single out any factors they felt had caused the project to lose momentum, or had stood in the way of achieving the project's full potential.

A majority (8 of 10) mentioned either lack of support at a senior level, or lack of active participation by senior decision-makers as key factors in slowing the project's progress. Several respondents noted that while the input from front-line workers was extremely valuable during the initial, consultative, brainstorming phase of the project, such individuals do not possess the authority to implement change. One respondent stated the issue this way: *There was not someone (from each place) who could make the decisions about money at the table.* Another participant echoed the sentiment: *There was no way front-line workers were in the position to make decisions that almost needed to be made at the director level.* However, several interview subjects also acknowledged that due to the length of the project, and hospital downsizing, some core Working Group members, including managers who championed the PICC Line Network, were lost to the project through retirement or job changes. One respondent also noted that many managers are now shouldering larger portfolios than in the past— and consequently, are faced with a greater number of conflicting priorities; making it difficult to devote the necessary time and energy to an issue that could be seen as principally a community hospital concern.

A lack of resources was cited as an obstacle by the majority of interviewees (6 of 10).

Half of the respondents (5 of 10) believed the PICC Line Working Group had, in effect, 'aimed low', focusing its energies on what participants perceived to be 'easy wins' in lieu of tackling larger issues. In part, this may have been due to the composition of the PICC Line Working Group. Since most participants were front-line health care providers, and thus, likely unschooled in cost analysis, drafting business plans, and related skills, they may have felt uncomfortable attempting such tasks, or believed their efforts would be more effective if they focused on issues within their own spheres of knowledge and expertise.

Two respondents indicated that frustrations around funding also played a role in the working group's decision to focus on more limited, short-term wins in lieu of taking a broader-based approach. Some participants believed resolving the funding issues around outpatient PICC lines would simply be too difficult – and thus chose instead to concentrate their efforts on more easily achieved goals, or simply drop out of the project.

Some people opted out because they said, 'we're not going to spend time on this if we don't know there's already funding in place', stated one respondent. Another added: *No-one wanted to do a huge amount of work putting a business case together if we couldn't get consensus on what (the*

³ Tillsonburg District Memorial Hospital. One of the surgeons took on the task and the hospital supported the decision by stocking the necessary equipment

funding) was going to look like. The attitude was, ‘we’re not going to spend any more time doing this project unless we know we have funding in place. And you can’t make a case for funding unless you have the details of the project in place – so things got stalled.

Half of respondents (5 of 10) identified differences in philosophy and models of care delivery as a significant obstacle to achieving a unified vision.

Within the London hospitals providing this service, philosophies and practices (including insertion technique, and the step-by-step process by which patients travel through the system) around PICC line insertions vary widely, not only between hospitals, but also from site to site.

At one London hospital site, specially trained IV nurses carry out routine PICC line insertions at the patient’s bedside. The nurse accompanies the patient to the radiology department, where the device’s placement is checked by x-ray -- a process that can consume hours of the nurse’s time, depending on the distance traveled, and the wait for imaging. Providers at this location insert the PICC line with a relatively large-bore needle -- a technique that carries a risk of failure. The task of PICC placement is limited to two individuals; the underlying philosophy being that providers must perform a large number of procedures in order to maintain a high level of competency. (Competency is a concern because a single vein can only be used a few times due to the resultant scarring. The more reinsertions, the more likely the patient will one day end up with no usable vessels.) Providers at this location eschew midlines – a form of IV access that can be left in place for several weeks, but is easier and cheaper to insert than a PICC line. (Since the tip of a midline rests in the upper arm rather than near the heart, there is no need for a chest x-ray to ensure the tip has not advanced into the organ itself. As well, since midlines travel a shorter, straighter path than PICCs, it’s often possible to insert the former ‘blind’, whereas imaging guidance is needed in up to 50% of PICC insertions.) The concern is that other care providers might use the lines inappropriately unbeknownst to the caregivers who inserted them. Midline catheters can only be used in carefully selected cases, since substances like total parenteral nutrition (TPN) or very caustic medications can damage blood vessels when administered via midline. (To avoid such injury, these therapies must be diluted by very rapid, powerful blood flow.)

At a second London hospital site, routine PICC placements are performed in a centralized location (interventional radiology) by specially trained nurses, under the guidance of fluoroscopy and ultrasound procedures. These nurses also employ a technique known as micro-insertion, using a finer-bore needle to place the PICC line in the vein. In the hands of these providers (who are responsible for inserting PICC lines for the majority of the region’s cancer patients) this method is nearly 100% successful.

A third London hospital site shares elements of both approaches. Working in pairs, specially trained IV nurses (drawn from a larger pool) insert PICC lines at the patient’s bedside. At this site – which is smaller than either of the others – these nurses also attend grand rounds, so they are able to take part in discussions around the type of therapies the lines are likely to be used to administer. Therefore, it’s possible to employ other delivery devices – such as midlines – where appropriate.

Advocates of each approach strongly believe that their method is the safest, most efficient and cost-effective. As well, a few practitioners appear more committed to protecting their “turf” – and the status quo -- than considering alternative delivery models that might conceivably improve capacity and efficiency without sacrificing quality. These divergent philosophies and clinical practices create roadblocks to the coordination of care.

Nearly as many (4 of 10) subjects singled out lack of a clear, common vision or a well-defined structure as impediments to forming a system-wide PICC Network. In the words of one respondent: *We were just thrown together to try and figure out what the problem was...it was just too vague a question. I don't think we had a clear vision.* Another individual stated: *There wasn't collective consensus that we needed a regional PICC line program, in the end.* This observer also named loose, extended time-lines and nebulous goals as factors that may have impeded the project's progress. A third participant added: *We didn't have a structure underneath ourselves before we started the work. We fell apart because I don't think we knew who we were reporting to.* This lack of framework (for example, a decision-making hierarchy consisting of working groups, a small steering committee and a strategic planning committee) may have diffused the working group's effectiveness.

Some respondents offered possible explanations as to why the Working Group wasn't able to achieve a common vision – or even consensus on many key issues. Three respondents noted some participants might have only been interested in addressing issues faced by their own agency or institution – and consequently were not committed to resolving broader concerns. *Because we all had our own interests, it was difficult to cut through the mumbo jumbo and arrive at a common vision,* one individual admitted. Another identified ‘not enough buy-in’ as a significant barrier. Three participants also pointed to the sheer number of participants as a barrier to achieving a common vision. Three respondents also noted that in some instances, a few individuals with strong, less-than-flexible philosophies around what constitutes best practice with regard to PICC insertion, slowed progress by dominating discussions and committee agendas.

A number (3 of 10) of respondents pointed out that some key individuals who could have offered invaluable insights and expertise had either been brought on board too late in the process, or excluded entirely. (It isn't clear exactly why this occurred – a lack of support in the form of help handling any resulting backlog of work, and a lack of awareness on the part of potential participants about problems with PICC line access may both have played roles.) The involvement of these potential participants (some of whom had helped create patient education tools around PICC insertion and management before the Working Group was formed) could arguably have at least shortened the process of drafting the new patient education booklet.

A single interview subject voiced the belief that efforts to establish a region-wide PICC Line Network may have “fizzled out” partly as a result of two area community hospitals developing an in-house capacity to insert PICC lines, with the result that only a few low volume sites continue to have access problems. Having said this, at the time of this writing (July 2006), a representative of one London site reported that all three London hospital PICC line sites continue to turn away numerous requests from outlying community hospitals.

Suggested Success Strategies

Interviewees were asked what they felt might have been done differently to make the project more successful. They were also asked what might improve the odds of success for any future attempt to establish a PICC Line Network.

To facilitate this discussion, the interviewer offered an example suggested by the first subject interviewed: setting up a project to look at patient outcomes like adverse events and quality care issues (such as waiting times), as well as costs, and standardization -- perhaps by enlisting an MBA candidate or a student working towards a Masters degree in Nursing.

A sizeable majority of respondents (8 of 10) expressed strong support for this idea, noting this type of research could help pinpoint areas where cost savings could be made, and capacity increased, as well as helping to garner support from senior management. For example, findings from such a study might help convince hospital leaders that PICC insertion is truly a district-wide issue – if, say, community hospital patients who can’t otherwise gain access to PICC insertions end up presenting to Emergency departments in London-area hospitals and thereby drive up costs for these institutions. Similarly, if such research suggests standardization improves patient outcomes, and an institution could be seen as negligent for not moving forward, members of senior management would be more likely to devote the necessary attention and resources to implement change. This type of impartial, objective evidence might also help dampen the debate around whether one method of care delivery or insertion method is more efficient, and/or cost effective, than another.

A minority of interview subjects (4 of 10) said setting up the Working Group in a ‘more project-like fashion’ (for example, employing a more structured framework with a small steering committee, and sticking to rigid time frames) could have helped improve the project’s chances of success. One individual also noted that employing a dedicated project coordinator with expertise in conducting literature searches, interpreting research, and running committees, would have been “a boon” to the project. Related suggestions included restricting the size of the core working group once the initial consultative phase was complete but continuing to run workshops, presentations and informational sessions for front-line workers.

Nearly as many respondents (3 of 10) suggested obtaining more ‘buy-in’ from senior management at the outset. In the words of one interviewee: *You’d need executive sponsorship – maybe from the chief nursing officer at each hospital, who says, yes, this is important, and we know it’s going to cost money and time, but we’re going to do it. Without that, directors and managers are just trying to fit the project in with everything else, so it just fizzles away. I would recommend senior leadership at the hospitals sign a formal charter for project sponsorship – and they need to know what it’s going to cost in time, resources, and people.*

One respondent named increased government funding as the key to resolving issues around PICC line insertion and management. Another suggested that, had the money and resources been available, it might have been timely to dovetail the project into the South West Local Health Integration Network (LHIN) s as part of an integrated strategy.

Three interview subjects offered suggestions for procedural “tweaks” that might have made it easier for participants to participate in meetings and stay abreast of any developments. One respondent noted the use of videoconferencing might have made it possible for community hospital representatives to become more involved in the Working Group’s proceedings. Another participant noted that scheduling meetings first thing in the morning seemed to improve attendance. A third noted that an electronic newsletter might be useful for keeping health professionals in the region who are involved in PICC insertion and care up-to-date on issues like changes to policies regarding heparin use.

Additional Suggestions

The interviews that form the basis of this report indirectly reveal that the project falling short of creating a system-wide PICC Line Network cannot be attributed to a scarcity of initiative, commitment, or dedication to patient care. Many of the health care providers who were surveyed went above and beyond their routine responsibilities by soliciting input from colleagues in other parts of the country, creating their own patient care materials, traveling to other institutions to share their expertise, and job shadowing in various sites where PICC insertions are performed. In fact, one of the most significant successes of this project – the creation of on-site capacity in two additional community hospitals – was achieved in large part through the efforts of these very motivated professionals. Some of these individuals indicated that, given the appropriate support, they would be willing to assist other institutions – for example, by helping to educate other health professionals in PICC insertion and management, and conducting clinics in nearby communities. Therefore, **it is strongly suggested that any subsequent efforts to organize a system-wide PICC network further leverage this wealth of talent.** This could include offering interested nurses incentives to perform outreach education, or conducting research comparing the outcomes of different PICC insertion techniques while pursuing an advanced degree. (The detailed data sheets kept on every individual PICC insertion performed at LHSC’s Victoria hospital, and SJHC London could help facilitate such studies.)

Another suggestion for future consideration targets the apparent information ‘disconnect’ in the flow of information between ground-level clinical staff, and management both from the top-down, and from the bottom-up. In retrospect, inviting front-line staff to step outside their “comfort zone” by asking them to think strategically, on a systems level, may have been a mistake. While these professionals undoubtedly brought a great deal of insight and experience to the table when addressing questions about how to improve care at the bedside, they may not have possessed the specialized knowledge necessary to overcome administrative, and financial barriers to integration and system development. **It may be possible to remedy this shortcoming in the future by creating an additional structural ‘layer’ -- say, a committee similar to the Clinical Integration Working Group which was once part of the TVHPP -- to provide clinical leadership at a senior management level, and act as a conduit between front-line personnel and management.** Not only would this strategy facilitate communication between the clinical and management tiers, thereby improving the likelihood of leadership ‘buying in’; this smaller, streamlined body would be ideally positioned to serve as a steering committee.

On a more functional level, building on the Working Group’s successful adoption of a single infusion pump by standardizing the types of PICC supplies used throughout Thames Valley could further improve consistency of care across the region while cutting costs.

Conclusion

Despite the fact the PICC Line Working Group was ultimately unable to create a system-wide Network, the project did achieve several positive outcomes: a greater awareness of PICC line-related issues faced by other health care professionals, and a clearer understanding of the roles each institution or agency plays with respect to PICC line insertion and management.

The group also took significant steps towards the standardization of care. The three London hospital sites agreed to begin using the same make of PICC line, purchasing it through a single vendor; community agencies and hospitals throughout the district adopted one type of infusion pump; and, all of the organizations involved collaborated in the creation of a common, shared patient education tool.

Even viewed purely as an exercise that helped these disparate groups negotiate a unified approach to front-line PICC care, the patient education tool represents a laudable achievement. Similarly, the fact that two of the community hospitals were able to develop specialized on-site capacity for performing PICC insertions – thanks at least in part to the efforts of Working Group members -- can be seen as a triumph.

It should also be noted that at least a few of the factors that impeded the project's progress lay outside of the Working Group's control (the downsizing that led to the loss of key project champions, for example) and might not arise during future efforts to revive the PICC Line Network. Furthermore, the lessons learned over the life of the Working Group could substantially increase the likelihood that subsequent attempts to form a system-wide PICC Network would fully succeed.

Finally, from the ISAN perspective, this report and its assessment of the process can be used to provide some valuable 'lessons learned' and insights into how to structure future clinical integration initiatives.

Appendix A: Initial Survey Findings

PICC (Peripherally Inserted Central Catheter) line Survey Summary Report

Hospitals surveyed: Alexandra Hospital (Ingersoll)
Four Counties Health Services (Newbury)
Strathroy Middlesex General Hospital
Woodstock General Hospital
St. Thomas-Elgin General Hospital
Tillsonburg District Memorial Hospital

BY: Integrated Strategic Alliances & Networks
London Health Sciences Centre/St. Joseph's Health Care, London

RE: PICC (Peripherally Inserted Central Catheter) line Survey

DATE: October 31, 2003

Background:

Recently the two London hospitals have received a small number of referrals from community hospitals to insert PICC lines. This is a new request and as a result ISAN was asked to gather some basic information about the current activity of the community hospitals in Thames valley with respect to their role with PICC line insertions.

Contacts within each of the community hospitals in Thames Valley were surveyed by telephone and asked a series of questions about their role regarding PICC line inserts. Contacts were interviewed between July and September 2003.

1. Do you insert PICC lines at your facility? If Yes, who does it?

Alexandra	No
Four Counties	No
Strathroy	Yes, but rarely - Internist
Woodstock	Yes, all - most PICC lines are inserted by the nurse but several MDs also do inserts
St. Thomas-Elgin	Yes - Radiologist
Tillsonburg	No

**2. Do you refer patients to other facilities to have PICC lines inserted?
If Yes where?**

Alexandra	Yes, refer to a nurse at Woodstock General Hospital, and now some CCAC nurses have the skill to insert PICC lines
Four Counties	Yes, refer to London
Strathroy	Yes, refer to London, especially LHSC

Woodstock	No
St. Thomas-Elgin	Yes, but very rarely - refer to London
Tillsonburg	LHSC, but very rarely 2-3/year

a) If YES, under what circumstances?

Alexandra	When patients need long term IV therapy
Four Counties	When needed
Strathroy	Most times when needed
Woodstock	Not applicable
St. Thomas-Elgin	Only when it looks like it will be a very difficult case
Tillsonburg	When patient need long-term medication

b) Do you expect this pattern to continue?

Alexandra	Yes, volumes too low to develop in-hospital expertise
Four Counties	Yes
Strathroy	Yes, volumes too low to keep skill level up if we did it
Woodstock	Yes
St. Thomas-Elgin	Yes
Tillsonburg	Yes

c) Are you currently charged a fee by other facilities for them to do this?

The people surveyed were not aware of what financial charges, if any, they incurred as a result of referring cases out. In one case (St. Thomas- Elgin), patients have been referred to them for PICC line insertion and there was an issue about who paid for what.

d) If not, would you be prepared to pay if it presented a financial issue for the hospital?

The people interviewed were not in a position to answer this question and so in most cases it was not asked.

3. If there was an opportunity for in-service training in PICC line insertion and maintenance on the part of your staff do you think that would increase your capacity to do your own?

Alexandra	Not applicable, volumes too low
Four Counties	Not applicable
Strathroy	Not applicable, volumes too low
Woodstock	Not applicable, have the skills already
St. Thomas-Elgin	Not applicable, physician has skills
Tillsonburg	Not applicable, do own in-house education re: PICC line management

4. Data Q'n: How many PICC lines did you insert during 2002-03?

Alexandra	about 1/month
Four Counties	None
Strathroy	Not sure, infrequent
Woodstock	Not applicable
St. Thomas-Elgin	25-30 per year
Tillsonburg	None

a) Do you expect this volume to decrease, increase or stay the same in the coming year or so?

The general response was that the hospitals would like to see the volumes increase as they see important benefits to patients by having PICC lines when they need long-term IVs and have poor IV access.

5. Other comments or questions?

Chemotherapy patients were most consistently mentioned as patients with PICC lines.

People are becoming more aware of PICC lines and their value.

Patients who need long-term medication are a growing population of PICC line users.

Most community hospitals have patients with PICC lines although Woodstock and St. Thomas-Elgin do most inserts themselves. One on-going need is for training in the management of PICC lines.

6. General Conclusions

- a) If there are changes or developments in PICC line inserts (new standards, procedures etc.), facilities that do this work on an on-going basis could organize a training workshop to share this new information.
- b) Hospitals who manage PICC lines only (do not do inserts) need to ensure they have current and on going training opportunities for their staff, if not already doing so.
- c) Hospitals who currently refer patients out for PICC lines do so because there is a very low volume need for this procedure and not enough critical mass to support developing in-house expertise in doing PICC line inserts. This referral pattern is likely to continue.
- d) The most common population for PICC lines is oncology patients. However, there is a small but growing group of people with small veins and people who need long-term medication who are seen as benefiting from PICC lines.
- e) PICC lines are seen as adding value and quality of care to patients who need long-term medications as well as patients who require intensive use of medications over a few months or so. It is an important tool in the treatment of patients and will likely grow as the acuity and fragility of the hospital population grows.

Appendix B: Interview Questions

- 1) What would you say were any successes to come out of the project, or anything that went particularly well?
- 2) Why do you think the project lost momentum, or wasn't able to achieve its aim of creating a PICC Line Network?
- 3) What do you think could have been done differently to make the project more successful, or improve the chance a similar, future venture might succeed?

Appendix C: Survey Respondents

Survey Respondents (Group Name)

- 1) St. Joseph's Health Care London
- 2) London Health Sciences Centre
 - a. University Hospital (IV Program)
 - b. Victoria Hospital (Interventional Radiology)
 - c. London Regional Cancer Program
- 3) Woodstock General Hospital
- 4) Strathroy Middlesex General Hospital
- 5) Tillsonburg Memorial Hospital
- 6) CARE Partners (Community Health Service)
- 7) Oxford Community Care Access Centre
- 8) Elgin Community Care Access Centre

Appendix D: Patient Education/Record Booklet

(Please see attached)

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Community Care

Medical Directive for P.I.C.C. Flushing - 2006

Any Positive Pressure Device - CLC2000 (Blue T) / Ultra Site (White)

Pre-Infusion	10mL NS (Push/Stop Method)
Post-Infusion Flush	10mL NS (Push/Stop Method)
Maintenance Flush (weekly)	10mL NS
Pre & Post Blood Drawing	Pre 5mL NS & pull back 5mL blood - <u>Discard</u>
	Post 10mL NS (Push/Stop Method)
Pre & Post Intermittent TPN	Pre 10mL - 20mL NS Post 10mL - 20mL NS

Do Not flush Pain Pumps unless doctor orders.

Non-Positive Pressure Device - CLAVE (blue)

Pre-Infusion	10 mL NS (Push/Stop Method)
Post-Infusion Flush	10mL NS (Push/Stop Method) & 5 mL Heparin 100 u/mL (Clamp during last 0.5 mL)
Maintenance Flush (weekly)	10mL NS (Push/Stop Method) & 5mL Heparin 100 u/mL (Clamp during last 0.5 mL)
Pre & Post Blood Drawing	Pre 5mL NS & pull back 5mL blood - <u>Discard</u>
	Post 10mL NS & 5mL Heparin 100 u/mL (Clamp during last 0.5 mL)
Pre & Post Intermittent TPN	Pre 10mL NS Post 10mL NS & 5 mL Heparin 100 u/mL (Clamp during last 0.5mL)

Steps:

Wipe end of catheter with Chlorhexidine or Alcohol swab and allow to completely dry.

Insert appropriate device into end of line.

Inject 10 mL NS using a push stop motion (turbulence cleans line of any accumulation of medication).

Inject second syringe with appropriate solution depending on device:

A. If it is a regular lock, Interlink System or needleless cap is used:

Inject 5 mL heparin using positive pressure.

(Close clamp while still injecting - 0.5 mL should still remain in syringe.)

B. If it is a positive pressure device:

Screw on syringe injecting your agencies choice of solution and then unscrew (positive pressure will then occur).

Introduction

The open-ended P.I.C.C. is a Peripherally Inserted Central Venous Catheter. This catheter was designed to allow your veins to receive long-term medication without any irritation. It is made of a non latex material.

The catheter may be inserted by either a nurse at your bedside, or by the radiology department where a nurse or physician will perform the procedure using special x-ray equipment. You may feel minimal discomfort with the initial insertion of the needle. The tip of the catheter will be placed in the largest vein of your body.

The line will be secured with a dressing. This dressing's appearance may vary depending on your agency. The visiting nurse/agency will change your dressing weekly.

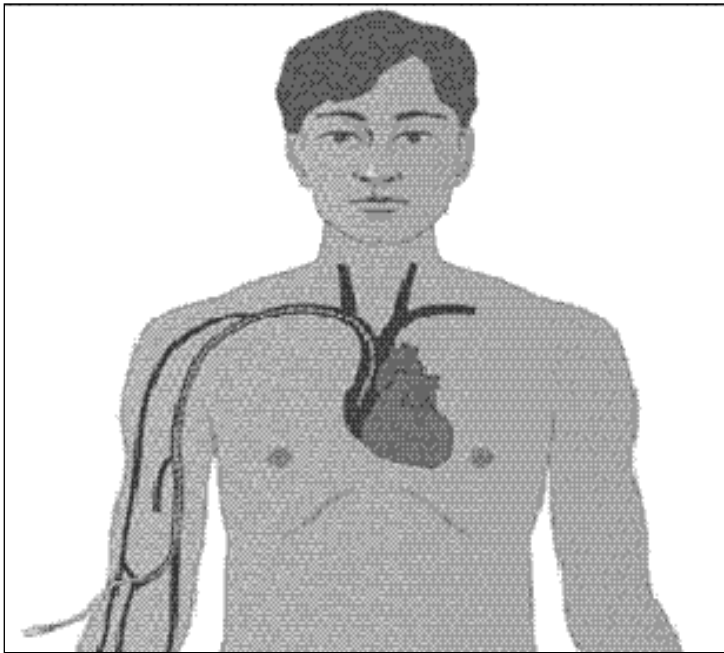
It is important that your dressing is always be dry and intact. If at any time you notice that some of your catheter has come out of your arm, you should contact your nurse immediately.

When it is time for your catheter to be removed, you will not feel anything.

Helpful Tips

- ▶ Have your visiting nurse's telephone numbers close by
- ▶ Keep a list of your questions, problems, and notes in this book
- ▶ Keep a calendar for clinic appointments and follow-up appointments with your Nurse
- ▶ Review with your nurse your need for supplies and proper disposal method
- ▶ Dressing always needs to be clean and dry

The P.I.C.C. line is threaded through to the largest vein in your body.



A. Non Positive Pressure Device:

1. Inject 10 mL NS using push stop motion.
2. Inject 3-5 mL Heparin 100 u/mL clamping during last 0.5 mL (*creating positive pressure*).

B. Positive Pressure Device (CLC 2000/Ultra Site)

Remove the syringe before clamping.

Please note your Agency's Polices.

17. Lastly, apply stocking net over site including the loose tubing and clamps.

Community Routine Flushing of the Line

If an infusion pump is being used – keep open rate (KVO) must be at 1-2 mL/hr.

Best Practice:

Flush with 10 mL normal saline (using a push stop motion) to clean the line. This should be done before rehooking the line up daily.

Note: Pain Infusion Pump see Agency Protocol.

Your P.I.C.C. only requires flushing weekly if it is not being used. When a medication is given or your line is opened for any reason, **your catheter must be flushed immediately** following the dose.

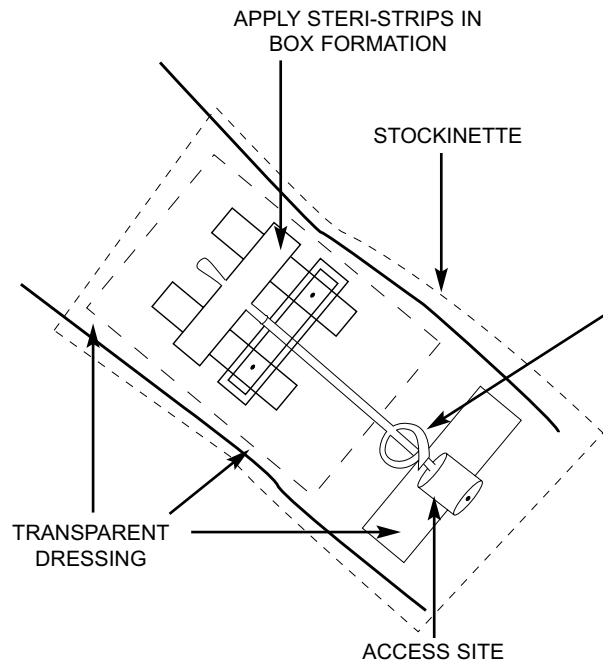
Supplies:

- ▶ Chlorhexidine or Alcohol swab
- ▶ **Non Positive Pressure Device**
 - ▷ 10 mL Normal Saline
 - ▷ 5 mL Heparin 100 u/mL in 10mL Syringe
- OR*
- ▶ **Positive Pressure Device (CLC 2000/Ultra Site)**
 - ▷ 10 mL Normal Saline
 - ▷ 5 mL Normal Saline in 10mL Syringe

Steps Continued:

Ensure the skin has completely air dried

9. Remove and discard old lock and screw on new primed lock. (This needs to be done weekly)
10. Don sterile gloves.
11. Apply steri-strips in a box formation. If the P.I.C.C. is looped out of arm, a steri-strip must also secure the loop. (Make sure it doesn't kink).



12. Apply the transparent dressing over exit site including winged portion and tubing up to clamp. (The more stable the line is, the fewer problems will occur.)
13. Apply tape to secure (caps at end of P.I.C.C.)
14. Open clamp.
15. Cleanse end of line (Allow to air dry).
16. All lines should be flushed.

Important Information When Managing Your P.I.C.C. at Home

- ▶ You cannot swim with a P.I.C.C..
- ▶ Avoid contact sports.
- ▶ Before showering or bathing, your P.I.C.C. dressing needs to be protected.
- ▶ If your dressing gets wet, for any reason, you need to make arrangements to have a new dressing applied by the visiting nurse.
- ▶ Do not lift heavy objects.
- ▶ The P.I.C.C. needs to be flushed weekly if not being used.
- ▶ Your P.I.C.C. needs to be flushed immediately anytime the line is unhooked.
- ▶ Do not use scissors near the P.I.C.C..
- ▶ When you are handling your line for any reason, good hand washing is essential.
- ▶ During dressing changes, a mask may be worn according to your agency's policy.

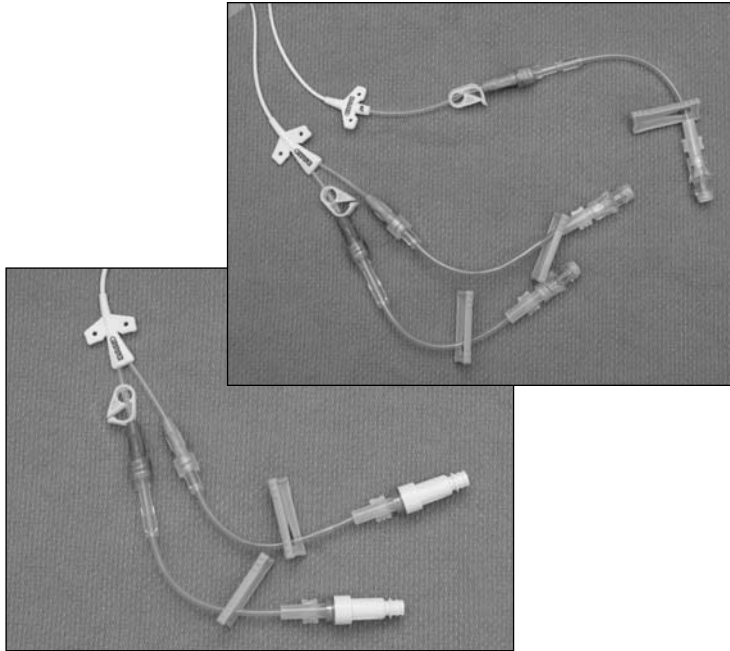
Setting up your home for care of your P.I.C.C.

When choosing the best place to do your P.I.C.C. care, keep these things in mind:

- ▷ A sink which is easy to get to
- ▷ Good lighting
- ▷ Away from food areas
- ▷ Away from main activities of the household, but close enough for help if needed
- ▷ A place to put all your supplies: a room with shelves or an empty drawer
- ▷ A room that is easy to keep clean and free of dust
- ▷ A comfortable spot in a room to sit or lie down
- ▷ A safe area away from children and pets
- ▷ A place free of drafts away from open windows, heating ducts and fans

Management of the Medication at Home

Depending on your situation, you may require a single or a double P.I.C.C.. This means there may be one or two totally separate lines encased within the one P.I.C.C. line.

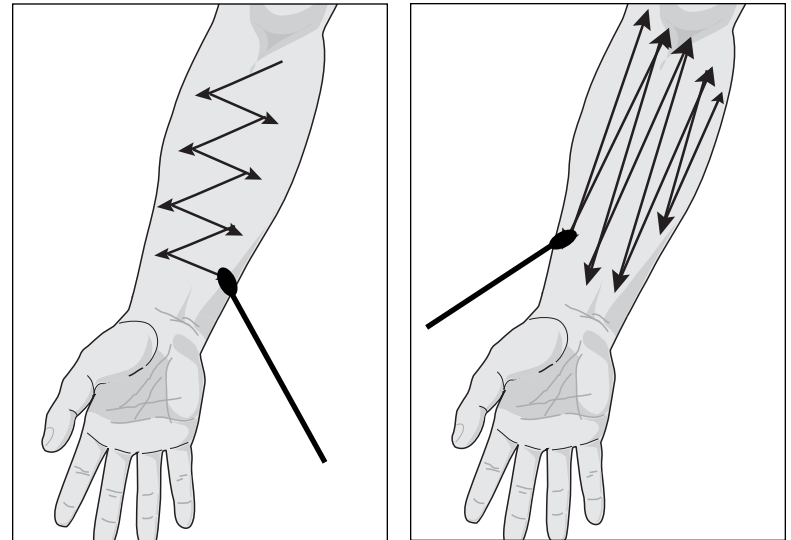


The visiting nurse helps you with the administration of your medication. You may be given a small portable pump that will administer your medication as ordered. Your nurse will explain to you what methods are available and how your medication will be infused.

It is very important that your line is always flushed immediately following unhooking your line or turning off your pump.

Steps Continued:

4. Wash hands again.
5. Take one side of swab stick, using a scrubbing motion, go up & down arm from top to bottom. (The area should go beyond the 10 x 12 cm dressing site). Reverse stick and repeat procedure in opposite direction (from side to side).
6. Take a second swab, after lifting the line run it down the underside of the line. Reverse stick and run down the catheter from the insertion site to the end of the line including the lock.
7. Let site dry completely (approximately 2 minutes).
8. While skin is air drying, prime new lock.



P.I.C.C. TROUBLE SHOOTING

THE PROBLEM	POSSIBLE CAUSE	WHAT TO DO
Moisture is noted at cap when flushing. OR Cap is loose or fell off.	Loose or disconnected cap (attached end of your line).	<ol style="list-style-type: none"> 1. Clamp line immediately. 2. Clean the joint between cap and line. 3. Place a new sterile cap on end. 4. Flush line ending with positive pressure. 5. Clamp line. 6. Call visiting nurse.
Resistance is felt when trying to flush your line. (Do not force solution, line could rupture.)	Could result from: <ul style="list-style-type: none"> - infusing too slow - improper final flush - line kinked 	<ol style="list-style-type: none"> 1. Try to straighten any visible kinks (could be from where clamp was used). 2. Look at the insertion site and dressing area. 3. Call visiting nurse. 4. Call agency which inserted line for correction (medication can be inserted x 2hr which may correct problem).
You are not able to see blood return when drawing back for blood taking.	Your catheter tip may be laying against the wall of your vein. OR Fibrin sheath may have developed.	<ol style="list-style-type: none"> 1. Try taking a deep breath. 2. Raise your arm 3. Cough Line may continue to work but no blood will return.
You notice some leaking of fluid or blood from your line. OR Broken or accidental cutting of the line.	Usually results from a constant kink in line.	<ol style="list-style-type: none"> 1. Clamp above leaking area if possible. 2. Cover with a sterile gauze & dressing. 3. Call visiting nurse immediately (line will need to be removed).

P.I.C.C. TROUBLE SHOOTING

THE PROBLEM	POSSIBLE CAUSE	WHAT TO DO
Swelling and / or Pain of P.I.C.C. arm.	Your body may be reacting to the catheter rubbing inside your vein (mechanical phlebitis). This only would apply first 7-10 days.	<ol style="list-style-type: none"> 1. Apply warm pad (low setting) - discomfort should begin to resolve 2. Call visiting nurse to assess arm. 3. Call resource # if persists.
You are feeling unwell with a fever or chills.	Your line could be infected or you may have another infection not related to your line. Line infection usually results from poor hand washing or dressings not being kept sterile. Some infections start from another site and enter your bloodstream causing your line to become infected.	<ol style="list-style-type: none"> 1 If temp + 38.0 C follow agency's protocol. 2 Call visiting nurse. <p>Always use best practice when managing your line. Good hand washing is essential.</p>
Red, itchy skin around dressing.	<ul style="list-style-type: none"> - Irritation from not allowing the skin to dry completely during dressing changes. - Sensitivity to transparent dressing or solutions used with dressing changes. 	<ol style="list-style-type: none"> 1. Call visiting nurse who may use: <ul style="list-style-type: none"> - barrier spray/wipes prior to dressing change - repositioning line if possible - assess need for further intervention