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Why should nursing students study research and its methods?

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Article Date: 29 June 1999
Nuritinga Issue 2
June 1999

Abstract

It is the students of nursing who will lead their discipline into an era of scientific advancement and professionalism (Radjenovic & Chally 1998, p.26). Therefore, it will be argued that, research and its methods should be taught to nursing students. There are a multitude of other reasons why research and its methods should be taught to students, some of which will be looked at in this paper. These reasons include; improving quality of client care, validating alternative medicines which enables client choice, allowing students to learn research processes in an environment which is safe, improving relations between the fields of nursing and medicine, allowing better utilization or decreasing costs to community health funding, and finally to allow nursing to continue to progress, into the future, as a profession.

Research is an endeavor to find solutions to problems (Treece & Treece 1982, p.3). To place a more precise definition on the term O'Toole states 'Research [is] the systematic, rigorous investigation of a situation or problem in order to generate new knowledge or validate existing knowledge' (O'Toole 1997, p.1397). Regardless of which definition chosen, research has the ability to join the processes of theory, education and practice. Consequently, theoretical ideas, which have been proven by the process of research, can then be used in practice. Students have the capacity to learn the foundations of research and its methods. Students are not only capable of learning to comprehend research processes but also their practical value. These skills can also teach a student to become a critical user of research outcomes and assess with confidence which research data is applicable and which is not as well the ability to utilize it effectively (Beanland, Schneider, Lobionda-Wood & Haber 1999, pp.5-6).

There are two types of research or research methods which are generally applied. The first type of research method is the science/quantitative method. This utilizes the processes of induction (theory-building) and deduction (theory-testing). This is a process, which ignores the subjective such as 'ideas, intentions and emotions' and encourages the objective, such as 'numbers, percentages and statistics'. This teaches a student the importance of measuring elements, which incorporates description, correlation, explanation and predication. Quantitative research can improve nursing knowledge by validating nursing as a 'scientific' discipline (Roberts & Taylor 1998, pp.13-14). The second predominant method in research, which is equally important, is the qualitative/interpretive method. This is a more subjective process which is interested in 'ideas, intentions and emotions', with human experience being integral. This teaches students the value of individual experience and the capacity for knowledge to change, depending on the environment and circumstances in which the study is conducted. Qualitative research can improve individual client care. (Roberts & Taylor 1998, pp.15-16).
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Historically, nursing has always been working towards becoming a more research-based discipline, albeit slowly (Abbott & Sapsford 1998, p.165). There were and still are many issues attached to this quest. Nursing was, and still is to a certain extent, dominated by women. Nursing research could only progress as more women gained independence and became educated (Treece & Treece 1982, p.16). Consequently, as women gained their identity, so to did nursing and nursing research. One such woman, who eventually became a major icon of nursing, was Florence Nightingale. Ms Nightingale was a strong advocate for research and the quest for new facts, with her main objective being to improve the quality of client care (Treece & Treece 1982, p.16). Today, research is not only being performed in order to improve client care but also to improve the credibility of nurses as professionals (Cleverly 1998, p.267). A report was released in 1972, titled the Briggs report, this report suggested that in order for nurses to become professionals, research was imperative (Smith & Hunt 1997, p.xi). Another important historical aspect to consider, is, if nurses are to continue to act as patient advocates, negotiating between the client and the doctor and the client and the system, the need for increasing credibility is essential (Bonawit 1989, p.169).

Research is an integral part of any discipline. If nursing is to be taken seriously as a discipline, research needs to be continued and advanced. Often, research is performed on issues, which are already familiar to the researcher and to the field of nursing (Treece & Treece 1982, pp.3-15). As Cleverly (1998) stated when discussing the importance of research and higher education: [it is important] 'to broaden our concept of research and encourage individuals to develop the talents they already have' (Cleverly 1998, p.270). Consequently, research gives nurses a basis to revise and redefine processes already in practice as well as an enabling them to make professional decisions. As the discipline of nursing grows so to will the need for new and improved research methods and techniques. Thus, as students, it is necessary to learn the foundations of research and be aware of their implications in order to build on them (Treece & Treece 1982, pp.3-15). A study performed by K. Parahoo, in Northern Island, on research utilization by practicing nurses demonstrated that those nurses who had studied a degree course, which incorporated research methodology, were 17.4% more likely to use research in practice than those who did not study a degree orientated course. An overall total of 89.2% of nurses believe that 'research expertise is of value to the nurse in clinical practice' (Parahoo 1997, p.287).

The discipline of nursing incorporates education, theory and practice. All of these processes are connected by research. Research is the process by which the nursing knowledge base increases and becomes tested. Students in an educational environment can be taught all of these processes. Education allows students to learn many different theories and to analyze them in comparison to any research findings that may be available to them. Student nurses do not necessarily need to become researchers themselves, but it is important that they are capable of critically analyzing research data and utilizing it in the appropriate situation (LoBiondo-Wood & Haber 1990, p.5).

Nurses with Bachelor of Nursing degrees are expected to be consumers of research, that is, they must understand each step of the research process and its relationship to every other step. Such understanding must be linked with a clear idea about the standards of satisfactory research. This comprehension is necessary when critically reading and understanding research reports, thereby determining the validity and merit of reported studies (Beanland, Schneider, LoBiondo-Wood & Haber 1998, p.7).
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This process has developed, and in the last few years encouraged, the practice of evidence based nursing. Consequently, proven scientific research is now becoming an integral part of client care delivery (Beanland, Schneider, LoBiondo-Wood & Haber 1998, p.7).

Nursing in order to be of maximum benefit must be suitable to the community it assists (Beanland, Schneider, LoBiondo-Wood & Haber 1999, p.4). Hence, when undertaking research it is important that the consumer is considered to be a significant aspect of the study, as learning skills and instigating interventions that are useless is a waste of time and resources (Treece & Treece 1982, p.15). Lynaugh & Fagin (1988) would argue that nursing care should be focused on the client, the client's family or the community as opposed to the illnesses and diseases involved (Lynaugh & Fagin 1988 in National Institute of Nursing Research 1999, p.1). Nurses are well placed to perform clinical based research as they often spend long periods of time with clients. If students have the ability to be part of a research team in clinical practice, then they can see the outcomes of the work they do and are therefore more likely to become interested in research and research utilization (Treece & Treece 1982, p. 15-25). As Parahoo (1998) once again demonstrates 85.7% of nurses believe that 'research often leads to real practical advances in nursing care'. It has been proven, by Diane Storer-Brown, that students who have been taught the importance of research and its methodology are the ones most likely to utilize it in practice (Storer-Brown 1997, p.260).

One such clinical field, which is likely to require significant research, by nurses and nursing students is that of alternative medicine. Clients are increasingly demanding these types of therapies (Ching 1998, p.173). Ching's (1998) study, in Sydney, demonstrated that 50% of the participants (the general public) in its survey had used some form of alternative health care. Some of these therapies include reflexology, massage and therapeutic touch. This data would suggest that not only is it important for nurses to research these therapies but also students as they are/or will be the ones who perform some of the skills requested. It is important before using these methods of alternative healing to validate their usefulness. Another important aspect associated with the implementation of alternative health practices is that often, limited training facilities are provided in practice, some nurses may be performing these skills untrained. Therefore, to ensure safety, 'research, education and policy development' is necessary, particularly for students (Ching 1998, pp.173-176)

Participating in established research projects significantly improves a student's ability to appreciate and understand the need for research with in the profession of nursing (Howard, Baeuchesne, Shea & Meservey 1996, p.34). Nowhere better than in real life situations can the ethics of subjects' rights and scientific integrity be clarified. Likewise, valuation of the research project itself, the enthusiasm for it, and the quest for answers beyond what is known, must be experienced (Gueldner, Clayton, Bramlett & Boettcher 1993, p.18).

Under these conditions, participating in an established project allows students somewhere to learn and gain experience in a safe environment (Howard, Baeuchesne, Shea & Meservey 1996, p.34). The student may take on the role of research assistant, being assigned tasks such as, gathering relevant statistics, consulting with other disciplines, helping to write a grant and interviewing. Although students play a significant role with in the project, they are not fully responsible and therefore they have the opportunity to have some one to consult and learn from as problems arise. Thus the student can slowly take on the role of researcher as well as its responsibilities like deadlines and the need for accuracy without the pressure of being solely responsible. The student can also witness the consequences of their research project if and when it is implemented (Howard, Baeuchesne, Shea & Meservey 1996, p.34)
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A good example of this is a research project conducted in the United States of America, incorporating the skills of both student nurses and student medics. It is important to remember that one of the main focuses of health care is the maintenance and improvement of health. It would therefore seem logical, in some research projects, to utilize the individual skills of both disciplines. A research project was undertaken at the University of Colorado, Denver, USA, combining The School of Nursing and The School of Medicine. The predominant aims of the project were to improve department development, sharing knowledge between the departments and to encourage interdisciplinary teamwork between the students (Smith, Barton & Baxter 1996, pp. 27-29).

The outcomes of this project were significant, and demonstrated that the majority of students enjoyed discussing similar topics with students from other disciplines and valued each other's opinions. Students also appreciated the informal environment, the appreciation given to them from other disciplines for their skills and also being exposed to techniques from other disciplines. Of particular benefit to the nursing students was seeing some of their own researchers successfully presenting results and arguing issues with some of their future medical colleagues. Finally, both nursing students and medical students could appreciate the role both disciplines could have on a research team (Smith, Barton & Baxter 1996, p.29).

In order to move forward into the future, nursing research needs to move on from the past. Research in the past has focused on what nurses did for their clients (Leininger 1985, p.31). Research of the future needs to focus more on constructing a 'unique scientific body of knowledge', which any discipline requires in order to be viewed as a discipline (LoBiondo-Wood & Haber 1986, pp.ix-13). It is also imperative that the research performed becomes the basis for forming and directing 'theory-based' nursing practice. This will create a directive in nursing research prioritizing particular issues. Thus, consumer needs of 'cost, quality, availability and accessibility' of health services will be addressed. This process should start from the very beginning of the nurse's career, as a student. Students need to be introduced to the methodology of research, to be able to understand and analyze any research documentation presented to them and more importantly to be capable of implementing appropriate research (LoBiondo-Wood & Haber 1986, pp.ix-13).

This paper has shown that nursing students should learn research and its methods. There are a multitude of reasons why this should happen. Some of which include increasing the professionalism of nursing as a discipline, improving the quality of nursing care to the community, validating the use of alternative medicines and strengthening the links between other disciplines in the nursing students future practice. It is also important to remember that research is not only about producing new knowledge but also about building on and improving on the knowledge that nurses and students already have. It is therefore important that students learn, through education, appropriate theories, which will create a solid foundation for their future practice and enable them to apply this knowledge in practice. These foundations are not only useful for student nurses who are anticipating becoming future researchers but also as nurses, who will be implementing research findings in practice, establishing evidence based practice. Being able to critique research findings allows a nurse practitioner and a student to differentiate between successful and unsuccessful studies before implementing them. This not only has positive ramifications for patient care, cost control and efficiency but also for the enhancement of nursing credibility as a profession and the student nurse's confidence.
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References


Beanland C., Seneider Z., LoBiondo-Wood G. & Haber J. 1999, Nursing Research (first edition), Mosby Publishers Australia, NSW.


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Fragmentation of aged care delivery: a study of HACC services

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June 1999

Abstract
The 1980's brought about changes in the delivery of health care. A number of services became available to help support elderly and disabled people in their homes. However, these were seen to be limited and fragmented.

The Home and Community Care Program was developed with the intention of extending and coordinating the delivery of these services. It has become evident though, that services provided by the HACC Program remain fragmented, which has led to the problem of duplication of services and the multiple assessment of clients. These problems raise doubts about the effectiveness and the efficiency of the Program.

Funding and allocation of services remain contentious issues. These limited resources are facing increasing demands from the early discharge of acute care hospital patients, from younger disabled people, and from the increasing number of frail elderly people living within the community. In addition, the question of whether the allocation of resources should be focused on the clinical aspects of care or the social aspects, which would enhance quality of life for the client, remains an issue.

During the early 1980's the trend in health care was to move away from caring for the elderly and people with disabilities as in-patients of institutions, and the process of deinstitutionalisation began. As a consequence, a variety of organisations developed services to provide support and assistance to elderly and disabled people living in their homes.

Some of these services are provided by groups such as the Multiple Sclerosis Society, the Migrant Resource Centre, and the Stroke Club of Tasmania, which target particular groups of people within the community (TACPS,1999). Organisations such as Red Cross, St John Ambulance, and Speak Out Association of Tasmania also offer a variety of services to assist the elderly living in the community. One of the more prominent providers of services for the elderly is the Home and Community Care (HACC) Program (TACPS,1999). The development of the HACC program was part of the process of shifting the balance of care away from more intensive types of residential care and toward community based care (Mathur, 1996:11).

During the mid 1980's the HACC Program was established to assist people to live independently, by providing supportive services (Bevan & Jeeawody, 1998:68). The intention behind the development of the HACC Program was to improve the quality and range of services available to support elderly people and people with disabilities who live in the community (Mathur, 1996). The Home and Community Care Review Working Group describe the objectives of the HACC Program...
as redressing the imbalance between institutional and community care, expanding the options available to individuals, improving coordination of services and improving the assessment of individuals (HACCRWG, 1989:1). The idea was to provide a greater range of services more efficiently and appropriately to those who needed them.

The HACC Program is funded and administered by both the Commonwealth and State Governments (DHHCS, 1993:3), and these funds are made available to organisations that provide services for elderly people, people with disabilities, and their carers, to assist them to remain in the community (Sax, 1993:111). The HACC Program was designed to coordinate a wide range of services including home help, delivered meals, paramedical services, respite care, services for dementia sufferers, transport, home maintenance and modification, lawn mowing, laundry services, shopping, food services, training, and other new service types (Sax, 1993:112). The provision of one or more of these services would enable people with disabilities to remain living independently in their own homes.

One of the problems surrounding the provision of services to support elderly people living in their homes is that information regarding the services may be inadequate. Many people know that there are services available, but do not always understand them (Budge, 1998:152). If the public are uninformed about the services available to assist the elderly, then those who could benefit from them may be missing out on valuable assistance, thereby making their lives more difficult. Another issue involved in the lack of knowledge about the provision of services is that people may fear that asking for assistance will have ramifications leading to a loss of autonomy and control over one's own life. Budge (1998:152) maintains that there are many frail older people who struggle to manage alone at home because they fear the consequences of seeking help.

Prior to the mid 1980's the Australian aged care system was generally perceived as heavily oriented towards residential care, with a poorly developed and fragmented home care system (AIHW, 1997:259). Gibson (1998:37) states that the development of the HACC program brought together under one financial and administrative umbrella an array of pre-existing fragmented services. While one of the aims of the HACC program was to address the problem of fragmentation of services, it seems that the nature of the program has perpetuated, rather than alleviated, this problem. Gibson (1998:64) notes that, the very structure of the HACC program, with a multiple of large and small agencies funded to provide a range of services (some providing only one service, others virtually the full spectrum of home based care), means that clients of the program may be receiving assistance from one, two, three or more agencies.

The problem of fragmentation of services within the HACC program is evident not only in the provision of services, but also in the assessment of clients. Assessment in the HACC program presently is characterised by the same fragmentation which occurs in service delivery (HRSCCA, 1994:109). Although one of the objectives of the HACC program is to increase the comprehensiveness of the process of client assessment particularly for those with complex needs (DHS, 1995:44), it is evident that this problem has not been resolved. Clients who require services provided by HACC may often be interviewed by several different people each representing a particular service. The DOCS: Transcript of Evidence, (cited in HRSCCA, 1994:109) identified that people may have five or six different assessments, which frequently seek the same information.
For many people who wish to remain independent within the community, the need to ask for assistance may be associated with feelings of embarrassment and humiliation. In addition, the process of allowing strangers into the home, and then having to divulge a substantial amount of very personal information to them must be traumatic for many elderly people, especially if this process has been repeated a number of times. It is apparent that being assessed by a number of service providers is stressful for consumers and may not lead to appropriate provision of services (HRSCCA, 1994:109).

Not only does the problem of multiple assessment of clients raise concerns about their privacy and comfort, but it also raises issues such as whether the system is working efficiently and economically. HRSCCA (1994:109) questioned the efficiency of each service provider conducting their own assessments, especially when assessments have already been carried out by other service providers.

When considering the repetition of assessment and services by various providers, the public may be concerned whether the funds allocated to the HACC program are being used as appropriately as they could be. Howe (1997:316), stated that during the development of HACC there was little documentation of the allocation of funds or the establishment of the client base.

No firm data were available to counter criticisms of unnecessary proliferation of HACC services, and anecdotes of politicians' ageing but otherwise fit aunties having their houses renovated and lawns mowed weekly by HACC home maintenance services added to the view that services were provided to individuals with little need (Howe, 1997:316).

While the appropriateness of the distribution of services among clients may be questioned, the process of funding each service provider also appears to be an ongoing problem. DHHCS (1993:v.) identified that services are provided by a wide range of service providers and are funded in different ways and sometimes by different levels of government and through different funding programs. Added to the confusing process of gaining funding, the service providers are facing increasing demands for their services. Gibson (1998:68) notes that the clients of HACC service providers are becoming increasingly dependent, and need more assistance with activities of daily living. As a result of having to provide more services to clients who have become more dependent, service providers need to restrict the number of clients. This has resulted in the actual termination of services to less dependent clients (Gibson, 1998:68). Consequently, people who would benefit from some of the services offered by HACC, are not receiving the assistance that they need.

A further problem with funding appears to be that available funds are being directed away from the frail aged and allocated to discharged hospital patients or to younger people who have disabilities. Howe (1997:321) maintains that with hospitals trying to work within their budget, community care services will be increasingly reoriented to the acute care and primary care systems thereby drawing funds away from the elderly clients. In addition, Gibson (1998:68) suggests that services, and consequently funding, are being directed towards younger people with disabilities because they often have more severe handicaps, and also tend to have strong support from advocates. This further exacerbates the problem of elderly people not receiving the support they need in order to remain independent in their homes. Davidson et al. (1993:205) state that the ability of older people to remain independent in their homes is often dependent on the economical and timely provision of assistance and support services. If the health care system is unable to provide these services to the
elderly, the burden of care will increasingly fall onto family members, who will need to provide more care for their elderly relative.

While the HACC program may cater for the basic needs of the elderly which includes hygiene and nutritional needs, there seems to be a lack of funding to provide a more holistic level of care. Possibly due to the limited resources available to the service providers, the primary focus of services appears to be on the clinical needs of the client. The focus of care does not tend to include aspects such as socialisation and activities that promote good quality of life.

Many quality of life activities should be mainstream provisions for the old as well as the young. The elderly, like the rest of the population, want access to recreation and sport, further education, socialisation, and information and counselling services (Healy, 1990:142).

This lack of opportunity for the frail elderly to access activities that would enhance their quality of life is an area that should be addressed. Healey, (1990:142) suggests that due to the limited resources available, and the increasing demand placed upon services, the priority should be those in most need. She then raises the question as to which is the greater need: maintaining a satisfactory quality of life or preventing institutionalisation?

Clearly, the limited resources available to HACC and the service providers impacts upon the type and level of assistance available to the elderly. In April, the current Government began to address this issue by making an increased number of Community Aged Care Packages available to the elderly. Bishop (1999:1) states that the Federal Government is responding to older people's clearly expressed desire to stay at home for as long as possible. This expansion in services will offer assistance to 100 in every 1000 people over the age of seventy years (Bishop, 1999:1). While this package may assist approximately ten percent of those aged over seventy, the remaining ninety percent may have to rely on the assistance of family members, or alternatively try to cope at home alone. While this expansion of services is desperately needed in the community, the 1999 budget has revealed that there will be substantial cuts to the funding of nursing homes. This indicates that perhaps there has not been an increase in funds available for aged care, but merely a shift in the allocation of funding.

It may be seen that there are a number of services available to assist the elderly to remain living within the community. While the development of the HACC Program was intended to coordinate and increase the range of services available, the problem of fragmentation still exists. The clients of HACC encounter multiple assessments for services which are frequently duplicated by service providers. These issues raise doubts about the efficiency of the program, and the appropriateness of the allocation of funds and resources. The question of whether the limited resources available should be used solely for the clinical aspects of care, or for the more social aspects which may enhance quality of life for the client, remains an issue.
References


Bishop, B., 1999 Media release. 30-3-99.


Prevention of extravasation in intravenous therapy: a review of the research evidence

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June 1999

Abstract

Intravenous therapy is now considered to be completely routine for nurses as they are involved in many of its aspects including managing intravenous cannulation and drug administration, and peripherally inserted central lines (Rogers 1997:546). As nurses have a growing responsibility in intravenous therapy and its management it is important that they anticipate the associated health risks, particularly those associated with peripheral intravenous cannulation devices (Fuller 1998:675). One potential problem associated with intravenous therapy, and perhaps the most frequent complication, is that of extravasation (Clarke 1997: 202; Jackson 1997: 22; Weinstein 1997: 524; Bohony 1993: 45; Springhouse Corporation 1993:132; Wood and Gullo 1993: 46).

Extravasation is the accidental leakage of drugs or infusion fluid into the perivascular or subcutaneous tissue (Navarro 1998: 38; Clarke 1997: 202; Springhouse Corporation 1993: 132). Extravasation of vesicant drugs or fluids commonly results in severe local tissue damage which may cause prolonged healing, infection, tissue necrosis, multiple debridements, cosmetic disfigurement, nerve damage, loss of function of an extremity, and possibly amputation (Brown et all 979; Upton et all 979; both cited in Pettit and Hughes 1993: 70; Springhouse Corporation 1993: 281). Clearly extravasation is an inherent danger of intravenous therapy and as such early detection in conjunction with prompt treatment will significantly reduce the complications following intravenous extravasation (Weinstein 1997: 518; Pettit and Hughes 1993: 73). More importantly, nurses must have knowledge of ways in which to prevent IV-related problems such as extravasation as prevention is the key to decreasing such complications (Pettit and Hughes 1993: 77). This essay will discuss intravenous extravasation, in particular its prevention and treatment with regard to new developments and improvements in nursing care found in the research literature.

While extravasation has been reported with a number of access devices, it is most common with venous access ports (LaRocca 1994:115). LaRocca notes that accidental needle dislodgement was the most common cause of extravasation (1994:115). Pettit and Hughes argue that while venous puncture may occur on occasion, particularly when sharp needles are used, other explanations for extravasation have been proposed (1993: 70).

One explanation involves an association with irritation of the venous endothelium and vessel wall, causing vasoconstriction and diminished blood flow within the vein, ultimately increasing pressure and leading to rupture of the vein, thus allowing fluid to extravate into surrounding tissues (Clarke 1997: 202; Hecker 1988 cited in Pettit and Hughes 1993: 70). Another mechanism of injury involves the infusate extravating through the insertion hole that was made at the entrance to the
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vein, while the cannula tip remains within the lumen of the blood vessel (Hecker 1992 cited in Pettit and Hughes 1993: 70). This will only occur if the flow proximal to the cannula tip is obstructed and the valves distal to the tip must be closed so that a high intra-luminal pressure develops in the vicinity of the cannula tip, expanding the hole in the venous wall and allowing fluid to extravate into perivenous tissues (Lewis and Hecker 1991; Hecker 1984 both cited in Pettit and Hughes 1993: 70).

Pettit and Hughes acknowledge that a variety of pharmacologic agents including solutions and electrolytes, antibiotics, vasopressors, and chemotherapeutic agents have been shown to cause or contribute to IV extravasation injuries (1993: 70). Solutions and electrolyte complications include a local sclerosing effect, leakage of the vein and/or tissue necrosis (Collinge and Aranda 1984 cited in Pettit and Hughes 1993: 71). Antibiotics have been implicated in the increased incidence of extravasation and the potential for severe local reactions and necrosis in both infants and adults in a number of reports (Brown et al 1979; Upton et al 1979 both cited in Pettit and Hughes 1993: 72). Extravasation of vasopressors such as adrenaline, noradrenaline and dopamine have been shown to cause tissue necrosis due to intense vasoconstriction of the smooth muscle of capillaries, resulting in ischaemia (Pettit and Hughes 1993: 71).

Chemotherapeutic agents are the most toxic of intravenous pharmacologic agents (Del Guido and Menonna-Quinn 1998: 59; Pettit and Hughes 1993: 72). All antineoplastic ingredients have the ability to cause severe and widespread tissue necrosis if extravasated during administration due to their cytotoxic effect (Pettit and Hughes 1993: 73; Wood and Gullo 1993: 42). Consequently these antineoplastic drugs, in addition to those previously mentioned, are known as vesicants. That is, they have the ability to cause cellular damage or destruction or tissue necrosis upon leakage into the subcutaneous tissue as a result of extravasation (Navarro 1998: 38; Clarke 1997: 202; LaRocca 1994:114). Damage will be greater if the extravasation occurs over areas with little subcutaneous tissue or over nerves, tendons, or joint spaces (LaRocca 1994: 114).


If extravasation has occurred, prompt treatment must be undertaken to minimise complications. Weinstein cites that if vesicant extravasation is suspected it should be treated as a presumed extravasation (1997: 525). LaRocca asserts that treatment of extravasation is controversial (1994:114). This may be due to the small number of clinical studies documenting the efficacy of treatment (Pettit and Hughes 1993: 73). Clearly allowing the extravasation of known vesicants as a
test to determine effective treatment therapies would be unethical, and as such nurses and other
health care providers have been forced to rely upon those treatments found effective in clinical care
reports in humans and in (cruel) animal studies (Pettit and Hughes 1993: 73).

Upon recognition of extravasation the infusion must be stopped immediately to prevent further
Lakocca 1994:114). An attempt must be made to aspirate back the remaining drug in the needle and
tubing to remove any residual drug (Navarro 1998: 38; Weinstein 1997: 527). Weinstein also
suggests superimposing normal saline to dilute the extravated agent (1997: 527). If a vesicant has
extravated, its specific antidote must be administered by IV push to intentionally extravate it via the
same route as the extravated vesicant, thus decreasing the risk of tissue necrosis (Weinstein 1997:
527; Zenk 1980 cited in Pettit and Hughes 1993: 73). The needle must be removed, followed by the
administration of antidotes with multiple punctures into the suspected extravasation site (Weinstein
1997: 527). For example, hyaluronidase is used in the extravasation of solutions and electrolytes
such as dextrose 10% and greater, parenteral nutrition, and calcium and potassium solutions;
antibiotics such as gentamicin and ampicillin (Pettit and Hughes 1993: 74); and chemotherapeutic
agents such as vincristine and teniposide (Weinstein 1997: 524). The antidote phentolamine is
administered when vasopressors such as dopamine and noradrenaline extravate into subcutaneous
tissues (Pettit and Hughes 1993: 74). The affected extremity must be elevated to promote venous

Depending on agency protocol, a cooling or heat pack must be applied to the site of extravasation
(Weinstein 1997: 527). It has been argued that in the case of most antineoplastic extravasations, ice
or a cold compress should be applied 15 to 30 minutes four times a day, with the exception of the
vinea alkaloids, where heat application is recommended (Navarro 1998: 38; Weinstein 1997: 525,
526). The rationale for using ice or a cold compress is that it decreases blood supply and drug
absorption into subcutaneous tissues, and constricts peripheral veins, thus resulting in a decreased
blood supply to the affected area (Weinstein 1997: 526). This helps minimise localised pain;
decreases the destructive effect of white cell components; and improves the survival of marginally
injured tissues due to the slowing of cellular metabolic rates (Weinstein 1997: 526).

Conversely, the rationale for using heat is to promote healing after the first 24 hours by increasing
blood supply to the affected area and to enhance absorption of the vesicant agent (Weinstein 1997:
526; Springhouse Corporation 1993:136). Opponents, however, feel that heat increases metabolic
demands and therefore may decrease cellular destruction of vesicant agents (Weinstein 1997: 526).

To minimise surface inflammatory and erythematous reactions topical antidotes must be applied
(Weinstein 1997: 527). In addition, if there is evidence of partial thickness or full thickness skin
loss it requires further treatment guided by current evidence-based theories of moist wound healing,
which involves protecting the wound with a sterile dressing, providing a moist environment, and
using a topical antibacterial cream to keep the affected area potentially free of infection (Pettit and
Hughes 1993: 75). Products that are effective in treating extravasation-related tissue injuries include
transparent dressings such as Tegaderm and Op-Site, and hydrocolloid wafer dressings such as
DuoDerm (Pettit and Hughes 1993: 76). Another alternative is Vigilon, a gel-type sheet dressing
which, unlike the previously mentioned products, provides a moist environment requiring adhesion
to the skin (Pettit and Hughes 1993: 76).
It is integral to document the circumstances surrounding the extravasation incident, in addition to photographing the site if possible, to help follow the course of injury and evaluate the effectiveness of treatment (Pettit and Hughes 1993: 76; Wood and Gullo 1993: 43). It is also important to recognise that if another IV is required a site well above the site of extravasation must be selected, as a slow leak may occur if it is started below the site (Bohony 1993: 45, 46). Pettit and Hughes argue that if possible the same vein should not be used for subsequent cannulation as injury to a vein following extravasation is often difficult to assess (1993: 77).

While it is important that nurses are able to provide prompt and effective treatment when an extravasation occurs, it is vital that they are knowledgeable with regard to the ways in which to help prevent it. In addition, they must be aware of those who have a greater risk of intravenous extravasation. Those at risk include the elderly, as their veins have lost much of their elasticity and as such they are less likely to close around an intravenous catheter effectively, allowing fluid to seep around the cannula and into the surrounding tissues (Bohony 1993: 45). Infants, unconscious patients, those receiving infusions via an infusion pump or push, and those requiring resuscitation are at greatest risk for extravasation injury (Brown et al. 1997; Burd et al. 1985 both cited in Pettit and Hughes 1993: 70). Cancer patients are also at risk, as they often have veins that are fragile, small, or sclerosed from prolonged chemotherapy treatments, and as such extravasation may be inevitable in such high-risk patients (Wood and Gullo 1993: 42). Those with IVs placed near joints and in deep veins are also at risk (Bohony 1993: 45). The use of rigid steel cannulas also significantly increase the risk and incidence of extravasation when compared with a plastic or Teflon catheter (Fuller 1999: 233; Bohony 1993: 45; Springhouse Corporation 1993:132).

To help minimize the risk of extravasation, it is important when selecting a site for peripheral IV cannulation that areas difficult to immobilize should be avoided, particularly those near areas of flexion such as the antecubital fossa; or surrounding tendons, nerves, or arteries (Pettit and Hughes 1993: 76); or areas of inflammation or infection (Jackson 1997: 22). Suitable veins include those on the dorsum of the hand, and the cephalic and basilic veins of the forearm (Jackson 1997: 22). It is important that existing IV sites are not reused as vascular integrity diminishes over time (Wood and Gullo 1993: 44). Furthermore, multiple venipunctures encourage extravasation if the vein used to administer the drug is distal to the previous site (Wood and Gullo 1993: 44). If a venipuncture is unsuccessful, a different vein in the opposite arm should be chosen. If, however, this is not possible, an insertion site in the same vein that is proximal to the previous one should be selected to prevent extravasation from the upstream venipuncture (Wood and Gullo 1993: 44).

Another way in which to help prevent extravasation that is also an integral part of IV care, is maintaining patency of the cannula (Dougherty 1997: 41). During regular use, the patency of the device must be determined with flushing (Dougherty 1997: 41; LaRocca 1994:114). Studies comparing the use of sodium chloride 0.9% for injection with heparin solution as a flush solution for peripheral IV lines in adults conclude that heparin sodium is no more effective than normal saline 0.9% for maintaining catheter patency (Peterson and Kirchoff 1991; Goode et al. 1991; Hamilton et al. 1988; Epperson 1984 all cited in Fuller 1998: 677). Normal saline 0.9% can also reduce drug incompatibilities and does not cause the side-effects associated with heparin (Fuller 1998: 677; Dougherty 1997: 42). It appears that the recommendation is to eliminate heparin flushes in peripheral cannulae (Good et al. 1991 cited in Dougherty 1997: 42). Weinstein asserts that the cannula should be flushed with 3 to 5mL of normal saline between each drug infused, and 8 to 10mL upon completion of infusion of a drug or drugs (1997: 521). With regard to central venous
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To prevent cannula dislodgement and allow for easy visual inspection of the insertion site a clear, occlusive dressing should be used (Fuller 1999: 234; Bohony 1993: 45; Pettit and Hughes 1993: 77; Wood and Gullo 1993: 45). To help reduce venospasm a glyceryl trinitrate patch may be applied proximal to the cannula site as it produces venodilation (Clarke 1997: 202). When the dressing is changed and/or before administration of medication, it is important that a thorough assessment of the IV site must be performed (Dougherty 1997: 41). While hourly assessment with accompanying documentation of the IV site is sufficient for most patients receiving an IV infusion, observations should be more frequent for those receiving irritant and vesicant medications or solutions as they carry a high risk of causing tissue necrosis (Clarke 1997: 202; Pettit and Hughes 1993: 77).

Vesicant agents are commonly administered using the two-syringe technique or through the side port of a free-flowing peripheral IV line (Weinstein 1997: 520). The two-syringe method allows for proper assessment of blood return and resistance in the vein (Weinstein 1997: 520; Wood and Gullo 1993: 45). Conversely, the side-port method increases the time the vein is exposed to the vesicant, but reduces its concentration and pressure on the vein (Wood and Gullo 1997: 45). It has been argued that nurses prefer the side-port method for administering vesicants as it decreases the probability of cannula movement (Wood and Gullo 1993: 45).

With regard to the sequencing of vesicant drug administration, Weinstein argues that it is unimportant (1997: 521). Wood and Gullo claim that the sequencing of chemotherapy--related drugs is controversial as some nurses administer the vesicant between two nonvesicants; while others always administer the vesicant last (1993: 43). Some evidence indicated that a patient is less sedated from an antiemetic and better able to report symptoms when the vesicant is administered first (Weinstein 1997: 521; Wood and Gullo 1993: 45). A vesicant may also be less likely to leak through a damaged vein if administered first, as vascular integrity declines through the course of successive cytotoxic injections (Weinstein 1997: 521; Otto (ed) 1990 cited in Wood and Gullo 1993: 46). Conversely, some clinicians believe that when a vesicant is administered after a nonvesicant its irritating effects may be minimized (Wood and Gullo 1993: 46). It is also assumed that because a vein tolerated a nonvesicant it will also tolerate a vesicant (Navarro 1998: 38; Weinstein 1997: 521).

For those who have small, fragile veins and are in need of long-term indefinite chemotherapy, continuous infusion of vesicant drugs, or both, a vascular access device such as an implanted port, tunneled catheter, or a nontunneled central venous catheter may be indicated as they decrease the risk of extravasation (Weinstein 1997: 522; Wood and Gullo 1993: 44); and because a vesicant should never be administered as a continuous infusion into a peripheral vein (Weinstein 1997: 519). Central venous delivery has become essential as a result of an increased awareness of the complications associated with the use of vesicant, sclerosant, antiviral, and phiebogenic agents (Todd 1998: 297).

Todd claims that a peripherally inserted central catheter is the preferred device in many situations to other central venous access devices as it is associated with far fewer complications (1998: 297). For
instance, it reduces a patient's exposure to multiple repeated venipunctures and associated trauma as the insertion involves one cannulation only, and as such it preserves their peripheral veins for future vascular access (MacRae 1998: 99; Todd 1998: 299). It is inserted under local anaesthesia using a topical anaesthetic cream over the skin in the antecubital fossa, via a peripheral vein, usually the cephalic or basilic, and is threaded through the axillary vein into the lower third of the superior vena cava (Todd 1998: 299, 300). It is indicated for use in the administration of vesicant chemotherapy, phlebogenic drugs, intravenous hydration, total parenteral nutrition, and continuous narcotic infusions (MacRae 1998: 99; Todd 1998: 299).

It is clear that IV extravasation is a serious complication associated with intravenous therapy. An important nursing skill is the ability to assess and recognise the signs and symptoms associated with extravasation early with routine inspection of the IV site. While the care of the intravenous device is the responsibility of both the nurse and patient, the key to decreasing extravasation injury is nursing's awareness of potential hazards of intravenous therapy (Pettit and Hughes 1993: 77). Nurses mustn't become complacent about the risks involved in intravenous access of any kind as they expand their practice into more sophisticated realms (Rogers 1997: 546). Clearly the emphasis should be on perfecting intravenous technique and safety in conjunction with the use of prudent preparation measures in case an extravasation should occur (Fuller 1998: 675; Weinstein 1997: 518). To improve care and reduce the risks of complications of intravenous therapy such as extravasation it is important that nurses make informed decisions in practice through reading about new developments and improvements in the research literature.
References


Clarke, A. 1997,'The nursing management of intravenous drug therapy' British Journal of Nursing, 6 (4), pp201-206.


Fuller, A. 1999,'Selecting equipment for peripheral intravenous cannulation' Professional Nurse, 14 (4), pp233-236.

Fuller, A. 1998' The management of peripheral IV lines' Professional Nurse, 13 (10), pp675-678.


Rogers, R (ed) 1997,'The principles of IV therapy' Professional Nurse, 12 (8), p546.


Oral versus axilla temperature measurement: a review of the evidence

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June 1999

Abstract

The contribution of research to improved deliverance of quality health care is emerging as a widely recognized area known as evidence-based practice. The benefits of this approach to health care can be seen in a variety of fields within the discipline of nursing. In recent years, research regarding the reliability of different temperature measurements on different sites of the body has concentrated upon comparing new techniques and devices with established methods. Oral and axillary temperature-taking are both accepted methods of measuring temperature. Currently these established techniques are being compared to new techniques such as tympanic membrane temperature measurements to ascertain the reliability of both the new and accepted methods. In this process, comparisons and contrasts of axillary and oral findings often emerge. The results amongst several studies present both similar and different findings and the variability of research results is noted by many researchers. Factors such as clinical setting, age group and cost-effectiveness emerge as relevant considerations for practice.

Davis (1993, p.267) identifies the debate over the best method for assessing temperatures as being a long and continuous one. Recent research such as a study conducted by Irvin (1999, p.85) confirms the complexity of comparing different methods of temperature-taking. Irvin's study is a comparison of the oral thermometer versus the tympanic thermometer, a relatively new instrument developed over a decade ago (1999, p.85). Irvin (1999, p.85) highlights the problems of oral measurement which are eliminated with the infrared tympanic thermometers such as a patient's hot or cold oral consumption, smoking and mouth breathing. O'Toole (1998, p.780) also identifies external influences on oral findings including factors such as teeth brushing and tachypnoea. Despite the identified possibilities of inaccuracies in oral measurements Irvin (1999, p.89) concludes in her study that it may be premature to label the oral thermometer as less accurate than the tympanic thermometer. The benefits of the established oral thermometer are addressed in other research studies.

Benefits of oral thermometers include easy access to the sublingual pockets in the oral cavity, patient comfort and quick response time to changes in core body temperature (O'Toole, 1998, p.780). Similarly, axilla measurements have positive aspects such as patient comfort and safety and convenience in young children and unconscious patients (O'Toole, 1998, p.780-781). Relatively new research has concentrated upon the effectiveness of axilla measurements of febrile states in infants and young children as opposed to its convenience. In their study comparing axilla and oral temperatures, Haddock et al (1996, p.124) conclude that axillary temperatures should not be relied upon to detect fever in infants and young children. This conclusion follows the results of their study which showed that axillary temperatures indicated febrile states in only 27.8% of the children who
were febrile by oral and tympanic measurements (1996, p.124). The implications of studies such as these, whilst warranting further investigation force the nursing profession to look beyond ritualistic practice toward evidence-based practice (O'Toole, 1998, p.p.781).

Buswell (1997, p.359) states that nursing research has always differed on the topic of insertion periods for mercury filled thermometers. A study conducted by Cutter (1994, p.610) indicates the implications this has on nurses' knowledge on how long to leave thermometers in both oral and axilla sites. Cutter (1994, p.608) highlights the inconsistencies in different studies' suggestions of how long to leave thermometers in situ in different sites of the body. The confusion surrounding this area is reflected in the results of this study which showed that the majority of nurses were not leaving thermometers in situ in accordance with the recommended time periods (1994, p.616). The implication of this study as discussed by Cutter (1994, p.616) is the highlighted need for staff education. The inconvenience of leaving an oral thermometer in for ten minutes which is one recommended time period is however noted by Cutter (1994, p.616). This leads to a discussion on alternative devices such as tympanic membrane thermometers (1994, p.616).

O'Toole (1998, p.784) highlights studies which compare tympanic membrane temperature-taking favourably to oral measurements with a mercury thermometer. In the detection of fever however, O'Toole (1998, p.784) suggests that according to other studies the reliability of tympanic as opposed to oral measurements is questionable. In a study by Lanham et al (1999, p.42) published in Pediatric Nursing, results indicated that infrared tympanic thermometers (ITT) may not be accurate in determining the presence of fever in children under the age of six. Being a relatively new temperature-monitoring product, studies such as these add to the knowledge base about the use of ITT. The availability of research such as this is identified by Thompson (1998, p.58) as essential in delivering evidence-based care.

In addition to infrared tympanic thermometers, the axillary infrared device is a relatively new product designed for use in neonates with a specially designed probe that slides into the axilla (O'Toole, 1998, p.784). As O'Toole (1998, p.784) notes however, studies on the accuracy and reliability of this device can not be found and Thompson (1998, p.58-59) states that this unavailability of new product research is a barrier for nurses in the development of an evaluative culture. Whilst it has been highlighted that the accuracy of axilla thermometers in detecting fever in children under the age of six is not reliable, axillary temperature-taking does achieve more reliable results in neonatal settings according to a study conducted by Cusson et al (1997, p.206).

Cusson et al (1997, p.202) studied the effect of environment on body site temperatures in full-term neonates. The conclusions reached in this study suggest that for neonates in superheated environments, axillary temperatures are a more reliable method of ascertaining a correct temperature, thus reducing unnecessary medical intervention, in contrast to ITT (Cusson, 1997, p.206). This highlights the importance of age and clinical settings in deciding which site and device is most appropriate (O'Toole, 1998, p.786). Furthermore, O'Toole (1998, p.786) highlights the inappropriateness of using ITTs which have been calibrated using average adult temperatures on children and neonates.

In a study conducted by Davis, similar findings to Cusson's research were noted regarding the use of ITT in the neonatal setting (1993, p.270). Whilst Davis recommends that tympanic measurement should not be used for infants under the age of three, the study showed that in older children...
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Oral versus axilla temperature measurement identified temperature elevations that oral measurement did not and therefore should be considered for regular use in children older than three years (1993, p.270).

Thompson, in his article on evidence-based nursing, discusses the importance of developing the knowledge, skills and values of health professionals (1998, p.59). Studies such as Cutter's survey of current practices in temperature-taking highlight the need for uniform methods and therefore knowledge of studies which suggest recommended methods and times (1994, p.608). However, in this overview of new research on oral, axilla and other temperature-taking methods it has been demonstrated that this is not a 'black and white' issue. Different authors recommend different 'optimum' times that a thermometer be left in situ and Cutter's study reflects the implications such varied recommendations has on clinical practice (1994, p.608).

The minimum time period suggested for oral thermometers to be left in place, as stated by Cutter (1994, p.610) is three minutes. 37.3% of her respondents left oral thermometers in for one minute; 34% left them in for two minutes; 18.7% left them in for three minutes and 4% left them in for over three minutes (1994, p.610). Studies such as these are important as they highlight the need for nurse education whilst they also reflect the impact that varying recommendations by authors have on clinical practice. Results such as these may also indicate that the reason for temperature research being a 'long and continuous' process could be due to inaccuracies and discrepancies in methods (Davis, 1993, p.267).

Irvin (1999, p.88) identifies the emphasis presently placed on cost efficiency in the health care setting and how this influences choices regarding temperature-taking methods. Whilst mercury-in-glass thermometers appear to be relatively inexpensive, Buswell (1997, p.360) identifies 'hidden' costs associated with their use such as cleaning solutions, breakage and nursing time cleaning the thermometers. O'Toole (1998, p.786) discusses the ongoing cost associated with infrared thermometers, both axilla and tympanic, which have disposable covers in addition to the initial cost of instrumentation. Single-use thermometers such as the TempaDot are identified by Buswell (1997, p.362) as the most cost efficient in addition to concluding that they may be the most beneficial for patients.

Buswell (1997, p.362) states that: "Nursing must become more research-based for the benefit of patients and the future of the profession." Following this Buswell (1997, p.362) recommends that single-use thermometers, in addition to being cost-effective, should be advocated by nurses for use when appropriate due to its success in research projects. However, in O'Toole's 1998 report on temperature measurement devices the single-use thermometers' limitations are highlighted (1998, p.782-783). O'Toole (1998, p.782) notes that in two studies, axillary temperatures obtained with a TempaDot thermometer were on average 0.25-0.29 C higher than those obtained with a mercury thermometer. This difference was attributed to the flatter shape of the TempaDot thus allowing it to achieve closer contact with the patient's skin than the mercury thermometer's rounded bulb (O'Toole, 1998, p.783-784). Another limitation of the disposable or single-use thermometer is its inability to record temperatures below 35.5 C (O'Toole, 1998, p.784).

Electronic thermometers and their efficiency are evaluated in recent studies concentrating on new temperature measurement devices. It is suggested by Pontious et al that the ideal position to use such thermometers is in the sublingual pocket as electronic thermometers used in the axilla produce lower measurements then the mercury thermometer (1994, p.121). Similarly, Loveys (1998, p.920) comments on the electronic thermometers insensitivity for detecting fever, achieving 50-70%
accuracy. According to O'Toole (1997, p.784), electronic thermometers can measure temperatures from 26.7°C to 42.2°C which is a greater range than the TempaDot is capable of. This type of thermometer is expensive to buy and can be difficult to place orally due to the weight of the probe, which is attached to a flex (O'Toole, 1997, p.784).

In O'Toole's 1998 publication of temperature measurement devices she states that: "...it is apparent that some devices have been widely researched and others have had little or nothing at all published except for the manufacturer's data sheets (1998, p.786). As previously mentioned, the accuracy of the axillary infrared device cannot be commented on due to lack of research (O'Toole, 1998, p.784). This situation is supported by Loveys (1998, p.920) who also comments on the lack of data analyzing the devices' sensitivity and specificity. Cutter (1994, p.616) comments that consideration should be given to replacing thermometers with the appropriate device in association with extensive education to minimize risks.

The perceived lack of new product information is not conducive to establishing an evaluative culture in the health care setting (Thompson, 1998, p.59). It does appear however, that comparing and contrasting new and established temperature measurement devices is a complicated process with many variables, as Lanham et al comment in their own study: "Variability in research design and inconsistent/mixed findings limit the comparability of this and previous research (1999, p.42)."

Lanham et al, for example describe axillary and oral readings as a reflection of the shell temperature of the body as opposed to measurements of core temperatures which are reflected in rectal and tympanic measurements (1999, p.39). In contrast, Irvin (1999, p.85) states that core temperatures can best be measured in the mouth, rectum and the axilla. Both research articles are 1999 publications and whilst they may have been conducted at differing intervals before publication, such a large discrepancy in definitions reflect the variability associated with measuring temperature.

Despite new developments in temperature taking devices and sites, the oral and axilla temperature-taking methods continue to be comparable to contemporary products such as the infrared tympanic thermometer. It has been demonstrated that axilla and oral measurement devices also continue to evolve with the introduction of the infrared axilla device and single-use and electronic thermometers. Comparing and contrasting new products with established items and each other is problematic due to inconsistencies in both research methods and clinical practice. Continued studies analyzing the accuracy and reliability of different devices in different sites is important however for the encouragement of evidence based practice. Factors such as clinical setting and age group have also been identified as areas that require further investigation to clarify recommendations and to ultimately enhance the deliverance of evidence-based quality care.
References


Cutter, J., 1994, 'Recording patient temperature - are we getting it right?' Professional Nurse, vol.9, no.9, pp.608-616.


