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# A reflective analysis of burn wound care: The Australian burns nurse' perspective

Jaynie E. Sands
*Edith Cowan University*

# Edith Cowan University

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# A REFLECTIVE ANALYSIS OF BURN WOUND CARE : THE AUSTRALIAN BURNS NURSES' PERSPECTIVE

By

Jaynie E. Sands B of Hlth Sc (Nursing)

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# USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

**A Reflective Analysis Of Burn Wound Care :**

**The Australian Burns Nurses' Perspective**

**Abstract**

The purpose of this historiographical nursing study was to explore Australian Burn Wound Care from a nursing perspective, at two periods of time. It was the intention of the author to explore practices at the inception of specialised burns units, from the 1950's, presenting an historical perspective, and at the present time, May 1995.

Eleven burns units across Australia participated in the study. There were 22 participants in the research sample. Each burns unit identified the first Charge Nurse (n =11) and the current Clinical Nurse Specialist (n =11), to be involved in the data collection process. The conceptual framework for this study incorporates the Reflective Cycle (Gibbs, 1988) succinctly incorporating the 'who', 'where', 'why', 'when' and 'what' aspects of the historical method of inquiry. An interview guide, used in conjunction with three photographs depicting burn wounds, provided interview structure for the data collection.

A variety of historical data were gathered and analysed. These included scientific medical and nursing texts, foundation minutes, reports and conference papers of Australian and New Zealand Burns Association, to gain perspective of Australian Burn Wound Care. However, the data collated from 1950 to 1996 uncovered no written material on burn wound care. The information available was obtained exclusively from the indepth interviews. The data collated for the current perspective included hospital / burns unit protocols and indepth interviews with key nursing personnel.

A field trip facilitated the data collection, enabling semi-structured, audiotaped interviews in person and the opportunity to visit hospital libraries. The findings of the study have been organised to show burn wound care practices endorsed by Australian burns units, at the inception of specialised facilities, and at the present time.

## Declaration

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

## Acknowledgments

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## Table of Contents

## List of Tables

## List of Figures

# CHAPTER ONE

# INTRODUCTION

## Background of the Study

This study was undertaken to determine how Australian burns units managed the burn wound at the inception of specialised burns units and in the current year of 1995. There is a scarcity of referenced articles from the Australian perspective discussing burn wound care. This is different from the information trends identified in the American literature. In a report published by Rutan (1991), a nineteen year review of nurse authored abstracts presented to the American Burn Association was conducted. It identified that, "... evaluation of wound care techniques (and medication uses) have constantly recurred throughout the study period, totalling 32% of all abstracts concerning direct patient care" (p. 81).

It is not possible to try and determine which way is the best way to manage the burn wound when there is no way of knowing how Australian burns units manage burn wounds other than from anecdotal reports and collegial information sharing. The lack of randomised trials for products frequently endorsed for burn wound care, does not assist the practitioner to select products validated through the research process. Carrougher et al. (1991) state, "Many reports reflect institutional practice not based on randomised, controlled, comparative studies" (p. 276). The practice of burn wound care could be said to be a well entrenched ritual.

Interest in this topic stemmed from the realisation that the treatment applied to the burn wound, may in some cases be detrimental to burn wound healing. The knowledge of moist wound healing principles has been well documented and research advocating the moist wound environment to maximise wound healing have been discussed both at conference forums and in the published literature internationally (Bryant, 1992; Carville, 1994; Krasner, 1993).

The researcher was interested to determine whether nursing practitioners were supportive of the principles of moist wound healing in burn wound care. Traditionally, treatment of the burn wound has been directed at preventing infection from invasive pathogens and opportunistic organisms. It is understandable that the practices advocated in burn wound care would seek to prevent wound infection. Hinds (1987) reminds the practitioner, that the principal cause of death from burn injury is sepsis.

There does not have to be a discrete black and white discussion, one side treating the burn wound to prevent burn wound sepsis, the other side, supporting the burn wound, endorsing the principles of moist wound healing. The researcher postulates that there could also be a mixed approach to the management of the burn wound thus capturing the benefits of both positions in burn wound care.

From an Australian perspective, what are the origins of burn wound care and how has the management of the burn wound changed from that point? How can one advocate best practice in burn wound care, without knowledge of how burn wound care began, and how practices have changed or developed over time?

The qualitative research method of historiography has been employed to explore burn wound care in Australian burns units, at their inception and at the present time. The researcher interviewed the first Charge Nurse and the current Clinical Nurse Specialist of each burns unit, to determine Australian burn wound care practices advocated.

This study explores and describes how burns nurses conducted burn wound care in the past. This historical perspective is now recorded, for reference in the present and indeed, in the future. The way burn wound care is currently managed by burns nurses, will be described and used as a reference to conclude and recommend national directions for future research in clinical practice - to determine what is best practice.

This research provides a starting point. The burn wound care advocated in Australia will be determined. From this premise, clinical practice can be examined from a national perspective; directions for clinical research examining the effectiveness of products utilised in burn wound care can be initiated.

**Importance of the Study**

This study documents the burn wound care practices advocated in Australian burns units at their inception, the origins of specialist units nationally range from the early 1950's to the early 1980's. This study also describes the burn wound care practices currently endorsed, in May 1995, in Australian burns units. The findings of this research, while of specific interest to nurses, will also be relevant to all health professionals involved in burn wound care.

## Purpose of the Research

This is the first accessible and reliable account of the burn wound care recommended by Australian burns units. It provides a starting point for exploring practice issues in burn wound care. The study identifies the premise on which burn wound care decisions are made: the medical model based on the prevention of burn wound sepsis or the supportive model arising from the principles of moist wound healing. The study is the beginning, a starting point articulating the national perspective on burn wound care in Australia - what burn wound care is nationally recommended and which treatments could be explored to potentiate burn wound healing, optimising patient outcomes.

## Definition of Terms

**Burn Wound -**

In the context of this study the 'burn wound' refers to the wound prior to debridement and excludes wounds that have received skin grafts. Burn injury sites that are not included in the breadth of this research are: scalp; face; hands; foot and the perineum.

**Burn Wound Care (BWC) -**

The specific interventions applied in the treatment of the burn wound; cleansing agents; topical agents; dressing products and the routines associated with the care of the burn wound.

**Protocol -**

care plans established for assessment and intervention actions that ensure continuity of care (Schroeder, 1991).

**Superficial Burn -**

Partial thickness burns presneting as red or pink, dry and painful without blister formation. Tissue damage is confined to the epidermis (Trofino, 1991).

**Partial Thickness Burn -**

These burns are painful, moist, red and blistered where tissue damage affects the epidermal and dermal layers of the integument (Trofino, 1991).

**Full Thickness Burn -**

The entire epidermal and dermal layers of the skin are destroyed, the extent of tissue damage can involve the fascia and bone. Wounds are hard, dry and leathery (Trofino, 1991).

**Eschar -**

A necrotic slough produced by the destruction of tissue.

**Pioneer Burns Nurse (HI = historical informant) -**

The informant or participant for the research study providing information on the historical perspective. The pioneer in this context, is the first charge nurse.

**Current Clinical Expert (CI = current informant) -**

The informant or participant for the research study presenting the information for the current perspective (May 1995).

**Inception -**

The inception of the burns unit was the date in which the burns unit became a recognised specialised facility for the management of the burn injured.

**Current -**

The data collection for this study was conducted in May 1995. The information was current for that time.

## Organisation of the Thesis

Chapter Two discusses the literature review undertaken to explore the complexities of burn wound care. Chapter Three outlines the conceptual framework and the research methodology endorsed. The findings of the research project are discussed in Chapter Four. The findings of the project, including the unexpected insights gained through the research process are discussed in Chapter Five. The summary of research findings, together with suggested directions for clinical nursing research in burn wound care, and the conclusion, can be found in Chapter Six.

# CHAPTER TWO

# LITERATURE REVIEW

## Burns Care in the Context of Nursing and Health

Burns care as a specialised area of health care, has not evolved in isolation. Medical specialisation and technological advancement in health has seen the marginalisation of different patient groups. This has perpetuated more focussed, sophisticated interventions, provided by increasingly specialised health professionals, in smaller technologically advanced units within tertiary hospital settings.

When did burns units as specialised centres for the burn injured begin? Harvey Kemble and Lamb (1987) report, "The middle of the nineteenth century saw the concentration of expertise in one place in the opening of a burns unit in 1848 by James Syme (1799 - 1870) of Edinburgh" (p. 2). However, Trofino (1991) states, "(the burns unit concept) ... began just over 50 years ago with the development of the first burns unit in Dzhandelidze, Russia, in 1938" (p. 439). The pioneering Australian burns nurses who participated in this research, identified the period of inception for specialised burns facilities in Australia, as the early 1950's to the early 1980's.

Nursing education during this same period has seen the transition of the nurse trained apprenticeship style in hospital based programmes in the 1950's, to nursing education transferring into university settings from the 1970's, obtaining tertiary qualifications in health science. This transition has seen an effort to actually define what nursing actually is (Chinn & Jacobs, 1987; Kitson, 1993). Nursing scholars have given nursing a professional entity through the development of nursing theories.

The tertiary orientation of nursing education emphasises clinical practice based on rational action (research) rather than tradition. This strengthens the nurse's position on the health care team (Soothill, Mackay & Webb, 1995).

Schumann cited in Trofino (1991) states," The development of the burns nursing speciality evolved from a need for specially trained nurses who provide extensive wound care in addition to basic intensive care" (p. 7).

The burns nurse requires comprehensive skills in burn wound management. Burn wound care discussed in the literature addresses the issues of burn wound sepsis, antimicrobial agents used to reduce bacterial contamination at the wound interface, and types of wound management - exposure, occlusive dressings and biological skin substitutes (Artz, Moncrief & Pruitt, 1979; Bayley, 1990; Marvin cited in Trofino, 1991; McLaughlin, 1990).

The 1980's have seen wound care develop and flourish as a nursing specialty (Dealey, 1994). The recognition that moist wound healing principles promote autolysis of devitalised tissue, re-epithelialisation and fibroblast development has presented different strategies for managing wounds (Carville, 1994; Thomas, 1990).

There has been discussion on the use of antiseptic agents in the wound. Rodeheaver cited in Krasner (1990), "It has been shown that all antiseptics are toxic and that all antiseptic agents will impart a deleterious effect to the wound cells and should not be used" (p. 129).

There have been significant advances in the types of dressing products available for managing wounds.

The first generation of dressings were classified as passive, in that the products available absorbed the exudate from the wound surface, and offered protection to the wound. The current generation of dressing products are termed interactive (Dealey, 1994). The term interactive describes the ability of these products to absorb exudate in the wound, whilst maintaining the temperature and humidity at the wound interface at a constant level. These qualities have been demonstrated to improve the rate of healing through promoting autolysis, cellular activity and an environment for epithelial regeneration and migration.

This study is significant to the nursing of burns patients because it establishes an accessible and credible account of the evolution of burn wound care in Australia. The study will record two episodes in the history of Australian burn wound care. How burn wound care began, at the inception of the burns units and how the burn wound is managed at the present time, in May 1995, from a nursing perspective. This history has not previously been formally recorded in Australia.

## The Qualitative Research Method

In qualitative research, the historiographical method calls for an extensive review of the literature on the subject of interest, this enables the researcher to develop a frame of reference, a conceptual framework for the inquiry (Christy cited in Sarnecky, 1990). The research questions are formulated during this phase of the research process.

Initially, the literature review undertaken, sought to identify Australian references on burn wound care from the late 1950's to the present, 1995. The literature uncovered from the initial search was scant (Millership, 1976; Pegg, 1982; Whiteside, 1976).

The scope of the literature review was broadened to incorporate the burn wound care (BWC) practices advocated in western society and published in the medical and nursing literature from the late 1950's to the present time. The researcher utilised the library computer facilities and the assistance of a specialist librarian to ensure all avenues of information literature were explored. This chapter will provide some essential background, defining the key concepts: functions of the skin; burn wound sepsis; principles of burn wound care and finally, outline the burn wound care strategies described and advocated in the published medico-nursing literature.

Background - The Functions Of The Skin

The intact epithelium (skin) effectively carries out the following functions; (Trofino, 1991) "Defence against trauma and infection, retention of body fluids, regulation of body temperature, production of vitamin D, sensation, secretion and regeneration of new skin" (p. 15). When the skin is breached in the of case the burn wound, the patient is vulnerable to infection. The burn injury presents a massive assault to the body's protective systems against infection (Goldman & Gardner, 1965; Harvey Kemble & Lamb, 1987; Muir & Barclay, 1974; Rylah, 1992).

Burn Wound Sepsis

The concept that drives the debate on the management of the burn wound, is burn wound sepsis. Teplitz is credited with defining burn wound sepsis in the early 1960's: when the number of organisms in the burn wound are measured at 100, 000 per gram of tissue, the bacteria adversely effects the wound environment and causes systemic bacteraemia or sepsis (Rylah, 1992).

Moncrief (cited in Goldman & Gardner, 1965) identified that burn wound infection was the greatest problem in managing the burn injured. Some statistics from their experience during the early 1960's were shared, "50% of burns who present with a total burn surface area of 50 - 55%, died in the late post burn phase, 80% died with septicaemia" (p. 111).

More recently, during the 1980's, Holder (cited in Carvajal & Parks, 1988) found that the pathogens causing burn wound infections had changed over the years but infection remained a major complication of burn injury, responsible for 50% to 75% of inpatient deaths. This position was reiterated by Seligman and Martyn (cited in Martyn, 1990) that whilst significant advances had been made in the last forty years in the treatment of burn patients, infections represented a significant and serious complication of burn injury.

The burn wound is the most common site of infection in the burn injured. The real threat of burn wound sepsis is reiterated in the published literature (Artz et al., 1979; Goldman & Gardner, 1965; Jacoby, 1970; Martyn, 1990; Muir, Barclay & Settle, 1987; Rylah, 1992).

Ward (cited in Rylah, 1992) advised; "Believing infections are straight forward is to fail to appreciate their gravity and to be over optimistic .... they are complicated, insidious, incestuous and intricate" (p. 120).

Principles of Burn Wound Care

Early publications cited prevention of infection as the single rationale governing burn wound care, irrespective of the practices advocated (Ellsworth Laing & Harvey, 1974; Hagerty and Lewis, cited in Goldman & Gardner, 1965; Muir & Barclay, 1974). The role of the burns team is to maintain and restore the functions of the skin until the burn wound is closed (Ward cited in Rylah, 1992; Trofino, 1991).

More recently, the principles of burn wound care documented have included preservation of healing tissue. Robson and Kucan (cited in Wachtel, Kahn & Frank, 1983) state, "...Treatment of the wound itself is based on the precept 'do no harm' .... definitive burn wound treatment is the preservation of injured but viable tissues, capable of survival and regeneration" (p. 59).

Demling and LaLonde (1989) and Head (cited in Fisher & Helm, 1984), stipulated that burn wound care needed to be flexible and changed according to the assessment of the burn wound and the systemic status of the individual client. Konop (cited in Trofino, 1991) succinctly covered the principles of burn wound care from a nursing perspective:

> General local treatments of burn injuries encompass a variety of techniques. Used alone or in combination with one or more other methods, all share common goals. These treatments are employed to promote patient comfort and healing, preserve or restore both function and appearance, and prevent sepsis. A thorough physical, psychosocial, and developmental assessment of the patient serves as the basis for selecting and implementing the treatment modality for the optimum outcome (p. 42).

Strategies Employed In Burn Wound Care

Argamaso and Argamaso (1971) summarised some of the topical agents utilised in burn wound care regimes advocated in the past:

> These have included minced garlic, waxes, various oils, lard, concoctions of blueberries, molasses, 5% or 10% tannic acid, gentian violet, vaseline, aluminium powder, zinc oxide, picric acid, Furacin, Xeroform and Dakin's solution. They have been found to be either toxic, such as high concentrations of tannic acid, which damage the liver, or ineffective because of their poor penetration into the dead tissue. (p. 22)

For the uninitiated, burn wound management has evolved on two fronts, employed over the centuries. The burn wound treated by being left open to the air (exposure method), and the burn wound treated by covering the area with dressings (closed method). Variations on these two strategies have been continued and advocated in a cyclical pattern over time (Lewis cited in Goldman and Gardner, 1965).

> There can be few conditions for which a greater number of different methods of treatment have been suggested than the wound produced by a burn. The very number of different treatments available is a sure indication that no one method has any clear advantage over the others or is universally applicable, although the claims of some authors suggest that they would have us think otherwise ( Muir et al, 1987, p. 55).

Hagerty (cited in Goldman & Gardiner, 1965) stated, "Burn dressings are sacred to many people, and I have no intention of insulting your prejudices by introducing some of my own" (p.70). This statement shares the sentiments of all burns authorities describing burn wound care practices. The literature leads the reader on a lively debate: expose the wound, close the wound, cleanse the wound, do not cleanse the wound. This debate continues regarding the use of antiseptic agents applied to cleanse the wound, and the utilisation of topical antibacterial agents, in burn wound care.

The evolution of burn wound therapies found in the literature has been presented under the sub-headings of: cleansing methods, exposure and topical antimicrobial agents. The methods of managing the burn wound with topical antimicrobial agents has a number of applications which have changed over time. Where the rationale for treatment strategies are provided in the literature, this is included.

Cleansing the burn wound - yes or no

Methods related to the cleansing of the burn wound have been identified. Head (cited in Fisher & Helm, 1984) defined and described these options, "local care of a particular wound or area, spray hydrotherapy or non-submersion and submersion, which may or may not include the agitation of the water" (p. 149).

Local care refers specifically to the wounded area or site. The advocates of the exposure method are divided on this matter. The Americans historically, were divided on this issue: Hagerty (cited in Goldman & Gardner, 1965) did cleanse the burn wound on admission and as part of routine burn wound care.

Lewis (cited in Goldman & Gardner, 1965) did not advocate cleansing the burn wound. The authorities on burn management in the United Kingdom did cleanse the burn wound on admission, but not as part of daily wound care regimes (Muir & Barclay, 1974). Both Lewis (cited in Goldman & Gardner, 1965) and Muir and Barclay (1974) believed that the skin surrounding the burn should be cleansed meticulously and the patient required a dry, cool and light environment.

Spray hydrotherapy or non-submersion refers to the use of a shower head to allow the water to run intermittently or continuously over the burn wounds (Head cited in Fisher and Helm, 1984). Submersion involves the patient being placed in a bath or tub of water submerged for wound cleansing (Head cited in Fisher and Helm, 1984,150).

Both Demling and LaLonde (1989) and Johnson, O'Shaughnessay and Ostergreen (1981) discussed the issue of cross contamination in submersion hydrotherapy. They recommended top to bottom drainage over the tub or bath, or showering, in effect, non-submersive hydrotherapy. The method of cleansing the wound; local care, non-immersion and immersion was discussed in all the publications reviewed.

A number of authorities recommended antibacterial and antiseptic agents to be used in the cleansing of the wound. Claudia (1969) reported, " Burn wounds were scrubbed twice daily with a sterile wash cloth or piece of gauze soaked in pHisoHex [brand name antiseptic agent]" (p.756). Savlon was endorsed by Whiteside (1976). Hibiclens was identified in the burn wound care protocols examined by Gordon (1987) [both Hibiclens and Savlon are Chlorhexidine based cleansing products].

Wright (1978) an Australian pharmacist recommended a 1% solution of hypochlorite, as a general antiseptic agent for the burn wound that was applied as a continuous infusion to the wound dressing or by 'dunking' the injured area (immersion). This treatment of the burn wound was supported by a nursing article (Schumann, 1979) describing a burn case study. Dyer and Roberts (1990) more recently recommended Dakins for hydrotherapy (Dakins is a hypochlorite solution). Hudak, Gallo and Benz (1990) also endorse bleach as a bathing agent, as well as Betadine solutions. Millership (1976) stated:

> There are many views on the use of detergent and antiseptic preparations in the bath water, any of these additives are acceptable providing they do not cause irritation, allergic reaction to the skin or the burned area (p. 17).

However, Staley (1987) advised : "Disinfectants are not used as they are harmful to regenerating tissue and are toxic systemically" (p.30). Some authorities recommended the use of clean solutions such as tap water (Gordon, 1987; Margolius, 1970; Pegg, 1982). While others recommended the use of sterile solutions such as sterile water or saline (Bayley & Smith, 1987; Gordon, 1987).

Exposure Method

Sneve is credited with popularising this management strategy for burn wounds in the United States of America (USA), in 1905 (Artz et al., 1979; Jacoby, 1970). Muir and Barclay (1974) reported of the United Kingdom, "It is of great antiquity but its popularity in its present form is due to the efforts of Wallace of Edinburgh (1949, 1951, 1952)".

Muir and Barclay (1974) described Wallace's method:

> The burned part after being cleaned, is exposed to the air with no covering. The exudate dries, and with the layers of destroyed skin, forms a scab (or eschar). The method depends upon conditions of (a) dryness, (b) coolness, and (c) exposure to light at the burn surface - conditions which are inimical to bacterial growth (p. 68).

Watson (1970) supported the reinstatement of Wallace's method of exposure in burn wound care identifying the advantages firstly as dressings were eliminated, dressings on the wound surface therefore eliminating the medium for infection. Secondly, because the process of removing and reapplying dressings was painful and this necessary practice was eliminated.

Lewis (cited in Goldman & Gardner, 1965) in the USA, advocated the exposure method for burn wound management. "We put them in a bed on a clean sheet,... we do nothing to the topical wound what so ever, ... we do not wash them; we do not dress them" (p.79). Six years later, Lewis (cited in Matter, Barclay & Konickova, 1971), reported that they [the burns unit] converted to the open technique in 1950, the reasons given for the method endorsed were the opportunity for meticulous wound care including debridement.

Jacoby (1970) and Davis (1971) from the USA, discussed the nursing care of burn injured patients nursed using the exposure method. The rationale given for this wound management was the reduced ability of bacteria to multiply in the dry wound environment and the protection provided by dry eschar against bacterial infiltration of the underlying burn wound.

## Topical Antimicrobial Agents Used in Burn Wound Care

### Silver Nitrate

Park (1967) identified that, "0.5% silver nitrate solution was first used in 1950 (as a topical antibacterial agent) and then abandoned. Recently, however it has won favour" (p.57). Davis (1971) advocated the method using silver nitrate solution 0.5% on wet dressings: "...the approach is considered revolutionary in its theory. Silver nitrate does not lend any assistance to the body in healing. It merely cuts infection permitting the body's natural processes to take over" (p.22).

Nursing publications (Bonine, 1966; Maxwell et al., 1966) began describing burn wound care utilising silver nitrate 0.5% wet dressings. The wet gauze dressings were forty layers thick (approximately 1 inch thick), laid on the wound secured with stockinette or a cotton bandage, then irrigated every 2 hours to keep them moist. The rationale for this method of wound management was given by Moyer et al. in Wood et al. (1966):

> ...colloidal metallic silver and soluble silver salts, in minute concentration, have antimicrobial and bactericidal properties.... They do not interfere with proliferation of epidermis, are not detrimental to viable cells, are not antigenic, and have not contributed to the development of resistant strains of pathogenic organisms (p.518).

The general consensus of daily dressing changes was evident throughout these publications with the exception of Maxwell, Liness, McDonnough and Kinder (1966), who acknowledged that the dressings could be changed as frequently as every four hours, depending on the wound's bacterial cultures. Silver nitrate 0.5% solution as wet dressings for the burn wound was also advocated by: Bonine (1966); Davis (1971); Jacoby (1970); Margolius (1970); and Shaw (1971).

However, the cleansing agent recommended for the wound when utilising silver nitrate 0.5% as a burn dressing, was not consistent. Wood et al. (1966) reported second daily baths in modified Locke's solution. The rationale being that heat loss was minimised and water and electrolyte balance was stabilised. Wood et al. (1966) advised that the desquamating epithelium and silver salts formed a slough on the wound surface. He recommended repeated cleansing using Wescodyne [a synthetic detergent and an iodine preparation], 3% hexachlorophane and water.

Maxwell et al., (1966) recommended modified Locke's solution in large, severe burns, to combat heat and electrolyte loss from the wound. In cases of smaller burns, a bath of warm water with half a box of table salt added was advocated. Margolius (1970) recommended isotonic saline as a cleansing solution for burn wounds. The purpose of the salt in bath water or use of isotonic saline as a cleansing agent was not elaborated by Margolius (1970) or Maxwell et al. (1966).

Muir and Barclay (1974) described how nitrate 0.5% wet dressings had a good prophylactic effect, particularly against Pseudomonas, although this did not effectively control established infection. Artz et al. (1979) found that silver nitrate behaved as a bacteriostatic agent effective in controlling all organisms found in the burn wound. Artz et al (1979) cautioned against the use of silver nitrate in the infected burn wound as the product does not penetrate the wound therefore providing only superficial bacteriostatic effort.

Harvey Kemble and Lamb (1987) described the method of using 0.5% silver nitrate wet dressings. Modifications on the original method advocated were noted, with the wet gauze dressing thickness being recommended as half an inch, and the cleansing agent recommended was warm normal saline. These identified changes in this dressing technique were not substantiated in the publication.

Carvajal and Parks (1988) and Martyn (1990) described the dressing technique for silver nitrate 0.5% wet dressings consistent with Moyer's method of 1965. Carvajal and Parks (1988) cautioned against this agent's effectiveness in burns greater than 50% body surface area. The cost of nursing time to properly attend this type of dressing was also highlighted in the literature (Carvajal & Parks, 1988; Martyn, 1990). Ward in Rylah (1992) found a disadvantage of utilising this method was the bulky nature of the dressings which impinge on patient mobility, limiting range of movement critical to rehabilitation.

The current nursing literature on silver nitrate has not identified changes to the method. Silver nitrate wet dressings were recently recommended for burn wound care, by Hinds (1987) and Dyer and Roberts (1990) with daily dressing changes. The cleansing agent recommended by Dyer and Roberts (1990) was a hypochlorite solution, but the rationale for this was not identified. Konop (cited in Trofino, 1991) recommended twice daily changes; this was advocated as rapid debridement of the eschar was facilitated.

Disadvantages identified with 0.5% silver nitrate wet dressings were; patient discomfort in a continuously wet environment (Muir & Barclay, 1974); loss of electrolytes requiring supplement (Artz et al., 1979; Barclay & Muir, 1974; Carvajal & Parks, 1988; Martyn, 1990); poor penetration of the eschar by the product (Artz et al., 1979; Carvajal & Parks, 1988; Martyn, 1990; Ward cited in Rylah, 1992) and the product caused black staining of the patient, the environment and the staff (Artz et al., 1979; Muir & Barclay, 1974; Carvajal & Parks 1988; Ward cited in Rylah, 1992).

Nitrofurisone

This product is also known as Furacin. Hagerty (cited in Goldman & Gardner, 1965), advocated that the burned patient be washed thoroughly on admission using Septisol [a brand name] antiseptic agent. The burns are then dressed with a layer of fine mesh impregnated with Furacin and secured with dry gauze. Hagerty (cited in Goldman & Gardner, 1965) could not substantiate his position scientifically:

> I believe I find it limits - the amount of infection ... it would be so hard for us to get a statistically significant number of cases that would be comparable that I can only give you a subjective point of view (p. 78).

Both Ellsworth Laing and Harvey (1974) and Muir and Barclay (1974) recommended the use of Nitrofurisone 1% impregnated on to gauze as the inner dressing layer applied directly to the burn wound, then secured with an outer layer of gauze and a bandage. The rationale for using this agent was stated by Ellsworth Laing and Harvey (1974). "Furacin is an antibacterial agent, any mild infection may be eliminated by the frequent changing of the dressing ie. at least daily" (p. 56).

In uninfected wounds, Ellsworth Laing and Harvey (1974), suggested a regime of dressing changes twice weekly utilising Furacin. In using this closed method, the skin surrounding the burn should be washed with Savlon 1% [brand name Chlorhexidine based antiseptic]; however, no contact with the burn wound was advised.

Muir and Barclay (1974) advised that the dressing be inspected every day when using Furacin, and the outer dressing changed immediately if exudate had soaked through the outside layers. It was recommended that the whole dressing be changed after three days. Subsequent complete dressings were only advised when exudate came through the outer dressings. This dressing regime was advocated in a nursing article by Davis (1971).

Wachtel (cited in Carvajal & Parks, 1988) reported that nitrofurazone had limited application in burn wound care. The method described involved two dressings per day, using a semi-closed method (this means that the topical agent is spread onto one layer of gauze or impregnated into tulle gras, and this is laid directly over the burned area). Demling and LaLonde (1989) and Konop (cited in Trofino, 1991) also recommended two applications to the wound surface daily.

Nitrofurazone was not advocated in burn wounds with a thick eschar. Both Demling and LaLonde (1989) and Konop (cited in Trofino, 1991) indicated that Nitrofurazone had been a useful agent where bacterial resistance had developed to other topical agents.

Disadvantages of utilising Nitrofurazone as a topical agent were identified as: pain on application (Demling & LaLonde, 1989; Konop cited in Trofino, 1991); nephrotoxicity when large amounts are used (Demling & LaLonde, 1989); and lack of effective combat of Pseudomonas (Demling & LaLonde, 1989; McLaughlin, 1990; Konop cited in Trofino, 1991).

Mafenide Acetate

This product is also known as Sulfamylon. Muir et al. (1987) stated:

> Sulfamylon is a sulphonamide derivative which has been known since the early 1940's, but was not then extensively investigated because it was found to be relatively inactive against Gram - positive organisms, particularly streptococci, which at that time were the main cause of trouble (p. 71).

Artz et al. (1979) supported the history of this topical agent. Claudia (1969) found the origin of this preparation to be Germany, where it was employed on war wounds during the Second World War. The strength of this topical agent for use in the treatment of burns ranged from 8.5% (Claudia, 1969), to 10% (Henley, 1969) and 11.1% (Artz et al, 1979) in the literature. There is no rationale stipulated for this difference in the product's composition.

Nursing publications described the wound management for patients being treated with Sulfamylon (Argamaso & Argamaso, 1971; Claudia, 1969; Henley, 1969). The patients were bathed daily - either sponged or immersed in a bath, depending on the severity of their burns.

The Sulfamylon cream was spread onto the wound with a spatula or a gloved hand and left exposed. The literature was consistent suggesting two applications daily. However, Shaw (1971) suggested two or three applications daily; no rationale was indicated for this frequency of dressings.

Muir and Barclay (1974) described two methods of application for Sulfamylon. The total burn surface area directed the method endorsed. For burns covering up to 10% of the body, an absorptive dressing was recommended. An inner layer of Sulfamylon impregnated gauze over the wound surface, with an a layer of wool or fluff gauze secured with a bandage was described. Only the outer dressing should be changed when exudate soaks through the outer layer. For burns greater than 10% of the body surface, a single layer of antiseptic dressings (also called semi-closed method) were advocated; these could be changed frequently.

Burn authorities, Artz et al. (1979) and Carvajal and Parks (1988) described sulfamylon used in conjunction with exposure, with the cream being applied topically twice a day. Carvajal and Parks (1988) rationalised the use of the exposure method with this agent stating:

> Both the retardation of epithelialization and absorption of the drug are exacerbated by closed dressing techniques ... semi-closed technique can be used provided the fine mesh gauze is kept to only one layer (p113).

Demling and LaLonde (1989) and Martyn (1990) stipulated that this topical agent (strength 8.5%) could be applied every 12 to 18 hours in conjunction with exposure. Demling and LaLonde (1989) noted, "Antibacterial action is not inhibited by pus or secretions... some antibacterial action will persist in the eschar for up to 72 hours" (p.300). In contrast to this statement, Konop (cited in Trofino, 1991) reported Sulfamylon needed to be applied to the exposed burn two or three times daily as, "...it is broken down by the tissue enzymes eight to ten hours after application" (p. 49).

Historically, nursing publications identified the rationale for advocating sulfamylon as: preventing infection, preventing burn wound sepsis and preserving the viable tissue in the wound (Argamaso & Argamaso, 1971; Claudia, 1969; Henley, 1969; Shaw, 1971). The more recent rationale for the endorsement of treatment with Sulfamylon can be summarised as; reducing the bacteria present in the burn wound by penetrating the burn eschar (Artz et al., 1979; Carvajal & Parks, 1988; Demling & LaLonde, 1989; Harvey Kemble & Lamb, 1987; Konop cited in Trofino, 1991; Martyn, 1990; McLaughlin, 1990; Ward cited in Rylah, 1992); useful in burns where infection is established (Carvajal & Parks, 1988; Demling & LaLonde, 1989; Konop cited in Trofino, 1991; Martyn, 1990; McLaughlin, 1990; Ward cited in Rylah, 1992) and where resistant organisms have developed against other topical agents utilised (Carvajal & Parks, 1988; Demling & LaLonde, 1989; Konop cited in Trofino, 1991; Martyn, 1990; McLaughlin, 1990; Ward cited in Rylah, 1992).

Disadvantages of Sulfamylon as a topical agent include: pain on application (Artz et al., 1979; Carvajal & Parks 1988; Demling & LaLonde 1989; Harvey Kemble & Lamb, 1987; Konop cited in Trofino, 1991; Muir & Barclay, 1974; Muir et al., 1987); metabolic acidosis due to systemic absorption (Artz et al., 1979; Carvajal & Parks, 1988; Demling & LaLonde, 1989; Konop cited in Trofino, 1991; Martyn, 1990; McLaughlin, 1990) and impairment of wound healing (Carvajal & Parks, 1988; Demling & LaLonde, 1989; Konop cited in Trofino, 1991; Martyn, 1990).

Silver Sulphadiazine Cream (SSD)

Fox is credited with the development of silver sulphadiazine cream for local burn treatment, in 1968 (Artz et al., 1979; Matter et al., 1971). This topical agent proved to be effective against Pseudomonas bacteria and was demonstrated to be painless on application and soothing for the patient. The product was recommended for use daily or alternate days using the closed method. Fox (cited in Matter et al., 1971) noted that as wounds treated with SSD began to show no growth cultures, the nursing practices in burns units changed. The use of sterile gowns, masks and meticulous isolation techniques were discontinued.

Artz et al. (1979) state, "The penetration of the drug into the burn wound and surrounding tissues appears to be intermediate between that of Mafenide and silver nitrate" (p. 263). They also reported that bacterial resistance whilst using SSD had not been reported, however in the clinical setting staphylococcal proliferation was evident, and more common than when Mafenide or silver nitrate was used.

Utilisation of silver sulphadiazine in burn wound care was discussed utilising all methods in the medical literature; exposure (Carvajal & Parks, 1988; Demling & LaLonde, 1989); semi - closed (Carvajal & Parks, 1988; Demling & LaLonde, 1989; Muir et al., 1987; Whiteside, 1976) and closed dressings (Carvajal & Parks, 1988; Muir et al., 1987; Whiteside, 1976). Carvajal and Parks, (1988) described the build up over the burn wound, seen when silver sulphadiazine is utilised. This characteristic of SSD cream was also reported by Demling and LaLonde (1989).

Consensus was apparent regarding the daily or twice daily application of this topical agent. SSD was found to be the most commonly used topical agent Head (Fisher & Helm, 1984). This was supported in the nursing literature. Nursing publications reported that the topical agent most frequently endorsed in burn wound care was Silver Sulphadiazine (SSD) cream (Bayley, 1990; Jacoby, 1970; McLaughlin, 1990; Mikhail, 1988; Millership, 1976; Rylah, 1992; Staley, 1990).

Wound care regimes when using SSD as the topical agent were advocated daily (Bayley, 1990; Beal, 1982); twice daily (Bayley, 1990; Carvajal & Parks, 1988); three times a day (Gordon, 1990); alternate days (Locke & Guzzard, 1991) and every three days (Jeffcott, 1990). However, the most frequently recommended treatment regime when utilising this topical agent was twice daily (Bayley & Smith, 1987).

Advantages of SSD as a topical agent were identified as: broad spectrum antibacterial agent (Artz et al., 1979; Demling & LaLonde, 1989; Head cited in Fisher & Helm, 1984; Konop cited in Trofino, 1991; Muir et al., 1987); non-toxic (Carvajal & Parks, 1988;

Head cited in Fisher & Helm, 1984); painless on application (Demling & LaLonde 1989; Head cited in Fisher & Helm, 1984; McLaughlin, 1990; Rylah, 1992) and it maintains a soft pliable wound which encourages patient movement (Demling & LaLonde, 1989; Head cited in Fisher & Helm, 1984).

Disadvantages of this topical agent were cited as: topical sensitivity to product - reaction rates were identified in the literature between 4% - 10% (Carvajal & Parks, 1988; Demling & LaLonde, 1988; McLaughlin, 1990); ineffective penetration of eschar (Head cited in Fisher & Helm, 1984; Konop cited in Trofino, 1991; McLaughlin, 1990) and an altered appearance of the wound when using this topical agent (Muir et al., 1987).

**Biological Skin Substitutes**

This literature review has explored the care of the burn wound (exclusive of burns to the face, hand and perineum) and the wound management endorsed during the period from admission to the burns unit, through until surgical debridement. Biological skin substitutes, whilst most often endorsed for the excised burn wound, have also been identified as an appropriate dressing for partial thickness burn wounds by some authorities.

A biological skin substitute is defined by Demling and LaLonde (1988) as, "... previously living tissue, including amnion membranes, xenograft and homograft, or cadaver skin, has been used for a number of years ..." (p.59).

Wachtel, Kahn and Frank ( 1983) and Hartford (cited in Fisher & Helm 1984) advocated porcine xerografts (pigskin) or amniotic membranes for the uniform partial thickness burn following the debridement of blisters and loose skin.

The use of amnion in partial thickness burns was recommended by Thompson, Prasad and Feller (cited in Carvajal & Parks, 1988) In their study of partial thickness burns, they compared amnion with Silver Sulfadiazine dressings. Those burns treated with amnion healed at a faster rate and the patients found the burn wounds were less painful.

Nursing publications (Bayley, 1987; Trofino, 1991) acknowledged the utilisation of biological skin substitutes for the partial thickness burn. It was also reported that this method assisted in reducing infection in the burn wound (Jacoby, 1970).

The advantages of utilising a biological skin substitute over conventional dressings in the partial thickness burn were cited in the literature as: healing is enhanced with more rapid re-epithelialisation (Demling & LaLonde, 1988; Hartford cited in Fisher & Helm, 1984; Thompson, Prasad & Feller cited in Carvajal & Parks, 1988; Wachtel et al., 1983); the loss of protein, fluid, electrolyte and other substances is much reduced (Wachtel et al., 1983); the wound becomes pain free (Demling & LaLonde, 1988; Hartford cited in Fisher and Helm, 1984; Thompson, Prasad & Feller cited in Carvajal & Parks, 1988) and bacterial growth is inhibited when the biological dressing is placed on viable uninfected wounds (Demling & LaLonde, 1988; Hartford cited in Fisher & Helm, 1984).

Demling and LaLonde (1988) also identified synthetic skin substitutes. Examples of synthetic skin substitutes discussed and described were Biobrane, Duoderm and Opsite.

> Adherence to the wound is definitely the most important to maximize re-epithelialization rate as well as minimise inflammation and fibrosis. The dressing must be permeable to water vapour and oxygen in order to avoid producing a totally anaerobic condition at the wound surface, yet be nonpermeable to bacteria (p. 59).

Smith (1995) described Biobrane as, "... a biosynthetic wound dressing constructed of a silicone sheet with a nylon fabric partially embedded into the film" (p. 317). The product has been available as a wound dressing for 15 years (Smith, 1995). Biobrane has been recommended in the literature for that management of scalds and flash flame burns in paediatric settings (Bishop, 1995; Demling, 1995). The advantages of utilising Biobrane were identified as immediate comfort, protection, enhancing patient compliance and parental satisfaction. These advantages were supported by Demling (1995) with the additional economic benefit of a reduced hospital stay by 50%.

## Unmedicated Dressing Options for Burn Wound Care

An Australian burns unit recommends Fixomull retention dressing (Sperring & Wood, 1993) for the management of the superficial and partial thickness burn wound. Advantages of this management strategy were identified as patient comfort and improved mobility. Additionally, the maintenance of the dressing does not require special attention as it is incorporated into the usual daily showering routine of the patient.

Hydrocolloid dressings have been recommended for the superficial and partial thickness burn wound (Dealey, 1994; Hermans & Hermans, 1986; Orr & Hain, 1994; Thomas, 1990). The products cited in the literature for use were Granuflex, Comfeel or Spiroflex. The advantages of this dressing were identified as patient comfort, reduced frequency of dressings and cost effective wound management.

Orr and Hain (1994) recommended Intrasite Gel as a suitable dressing product that could be utilised to debride slough from the burn wound. The endorsement of hydrogels in wound care for this purpose, is extensive in the nursing literature (Carville, 1994; Dealey, 1994; Thomas, 1990). The advantages of hydrogels include painless application, maintenance of wound temperature and enhancement of the autolytic process - the separation of slough.

## Action of antimicrobial agents

Topical antimicrobial agents are recommended by burns authorities, for burn wound care, predominantly to reduce the risk of infection and to decrease the number of bacteria present in the burn wound. Mc Swain and Kerstein (1987) stated:

> Historically the eschar separated from the underlying tissue between day 10 and 14. This separation was the result of autolysis caused by bacterial proliferation. Topical antimicrobials prevent this autolysis and, thus, the burn eschar remains adherent for a much longer period (p.349).

In 1969 Claudia reported delay in eschar separation during Sulfamylon treatment. Bayley (1990) found that this was the case with the use of any antimicrobial agents.

Hudak et al. (1990) found that the patients metabolic rate may be increased with the use of antimicrobial agents and that these products inhibit the rate of wound epithelialisation.

## Research Questions

The research questions have been developed from the literature review undertaken to determine the channels of inquiry for this research. The research questions are:

What is the Australian perspective on burn wound care?

How were the protocols determined?

When were the protocols implemented?

How have the protocols been updated?

Why are these practices advocated?

## Summary

Publications specialising in the management of the burn injured, referenced articles, and nursing publications including burns case management strategies, have been explored to describe how the burn wound care has been implemented since the inception of specialised facilities. Burn wound care recommended the use of various substances with differing degrees of intensity and frequency of touching the burn wound. The variation of these treatment regimes needs to be questioned. Why do some recommend antimicrobial agents and others none? What is the best treatment for the burn wound?

The Australian perspective on burn wound care could not be ascertained from the published literature available. The researcher has established the accepted practices in western medicine, that have been applied in the management of the burn wound between the early 1960's to 1995. The literature identified that the specialist centres for burn care in the United States of America and England principally influence the wound management practices in Australia. This research will discover the historical and the current burn wound management strategies employed in Australian burns units from a nursing perspective. The factors influencing wound management practices will be determined.

# CHAPTER THREE

# METHODOLOGY

## Introduction

This chapter provides an overview of how burns care has evolved in the wider setting of acute western health care. It discusses the specialisation of medicine, changes in nursing, and generic developments in wound care. The processes followed in the conduct of this nursing inquiry will be described. This study explored how Australian Burns Units have managed one component of burn care, the treatment of the burn wound.

The project design, conceptual framework, setting and population sample will be defined, with the ethical considerations being clearly set out. The instrument used to collect the data - the interview guide and photographic models, will be discussed with the interview technique employed being outlined. Demographic data collected from participants in the study will be described. The process of data collection will be sequentially outlined. The data analysis will be presented with the findings, in Chapter 4. The chapter concludes with a summarisation of this chapter on the research methodology.

## Research Design

As a nursing clinician, the researcher has experienced variation in the management of the burn wound in different burns units. It was of interest to the researcher when inquiring about burn wound care practices, that the practices were often endorsed because 'we have always done it this way'. This position as clinical justification for nursing actions in the management of the burn wound was inadequate. There was no comprehensive rationale provided for the particular management strategies advocated.

The practices in burn wound care stemmed from tradition, not from the findings of recent clinical research, nor through systematic, objective assessment of the burn wound or the individual patient's clinical situation.

In pursuing the historical approach to investigate burn wound care from an Australian perspective, the literature was consulted. The proposed methodology for conducting historiographical research is not concrete, authorities on historiography have different opinions regarding the research process. Glass cited in Brink and Wood (1989) and Kruman cited in Leininger (1985), did not suggest a conceptual or theoretical framework. Matejski cited in Munhall and Oiler (1986) and Sarnecky (1990) advocated the utilisation of a conceptual framework in the research process. Sheldon and Pappworth (1983) and Barzun and Graff (1992) stated that there was no formalised method for conducting historical research. These identified references however, emphasised the process of stringent review of primary and secondary sources during the data collection phase, for the purposes of reliability and validity.

The design for this study followed the methodological steps of historiography described by Sarnecky (1990). Christy cited in Sarnecky (1990) stipulated, "The first step as in any research effort, is to choose a problem area of study" (p. 3). The researcher reviewed the published literature available on burn wound care practices in Australia, the information was scant (Millership, 1976; Pegg, 1982; Whiteside, 1976).

The literature review outlined in Chapter Two refined the questions to be addressed in the research inquiry. Streubert and Rinaldi-Carpenter (1995) state;

> The historian formulates questions regarding events that influenced the chosen subject [in this case burn wound care] questions beginning with how, why, who, and what are asked in the light of the ideas, events, institutions, individuals that existed and thus may shed light on the subject (p. 201).

Christy cited in Sarnecky (1990) states, "The desired circumscription is facilitated by a selection of a theoretical framework for the study" (p.3). This is reinforced by Streubert and Rinaldi-Carpenter (1995). The researcher defined the boundaries after consulting the literature and defining the management of the burn wound, within the two existing themes of western treatment: the mechanistic medical model of care and the supportive or nurturing model of care, emerging in the nursing profession.

## Conceptual Framework

Sarnecky (1990) identified the need for a framework within which the boundaries of the historical inquiry could be defined. In consulting the literature to find an appropriate framework for the project, the researcher found that factors in determining burn wound care could be related to the philosophy of health or healing held by the health professional advocating or prescribing the burn wound care.

The way nursing practitioners conduct the practice of nursing actions, in fact any action is influenced by their individual knowledge and experience, their professional body's collective knowledge and experience and the knowledge of the broader society.

How do practitioners formulate their knowledge base, how do they decide what is 'true' and 'real' about practice situations and thus determine what nursing interventions are appropriate?

The conceptual framework for this study incorporates the Reflective Cycle (Gibbs, 1988). The impetus to incorporate this model into the conceptual framework has been succinctly articulated by Palmer, Burns and Bulman (1993):

> Reflection is initiated by uncomfortable feelings and thoughts that arise from a realisation that the knowledge one was applying in a situation was not in itself sufficient to explain what was happening in that unique situation (p. 13).

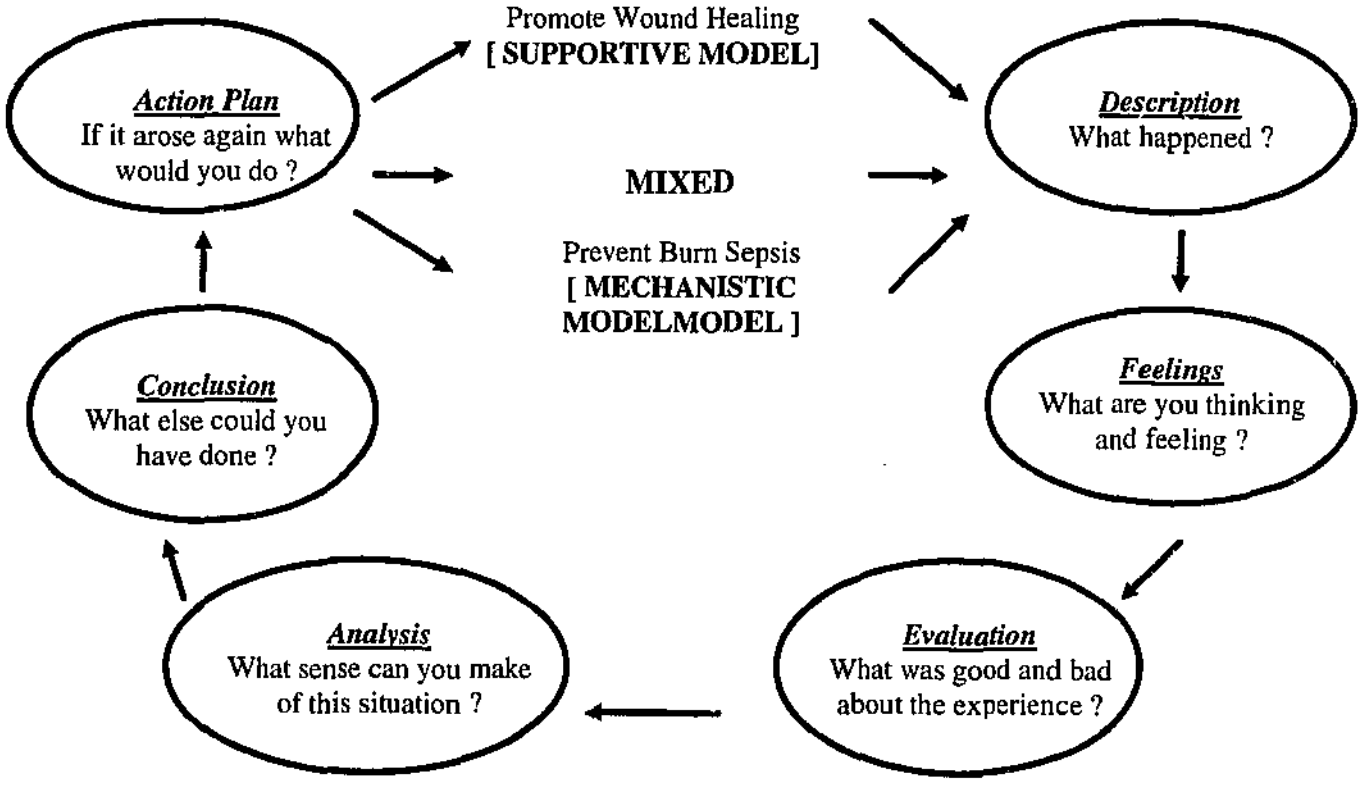


**Figure 1. Conceptual Framework** The Reflective Cycle (from Gibbs in Palmer, Burns and Bulman, 1993) adapted by the researcher for this study.

The concept of 'knowledge' has been debated and discussed by Berger and Luckmann (1991), who describe, "...the general ways by which 'realities' are taken as 'known' in human societies". This deals with, "... the empirical variety of 'knowledge' in human societies but also with the processes by which any body of 'knowledge' comes to be socially established as reality" (p. 15).

Berger and Luckmann (1991) acknowledge that what is known differs from one society to another. Nurses are people who also have an empirical variety of knowledge that is socially fostered within the profession. Claxton cited in Walsh and Ford (1990) has described beliefs, "...as fixed assumptions people have about the way things are or at least how they ought to be. Such a belief involves a personal commitment to something being a certain way." (p. 151).

To understand the position of nursing and the body of knowledge accepted as true and real within the nursing profession, an understanding of the historical development of nursing knowledge with the global concept of health, needs to be outlined. Traditionally, health has been approached in a mechanistic way. This is evident in both medicine and in nursing.

McKeown (1989) states that there are three views: "...the relationship of mind and body; the body interpreted as a machine; and the body controlled as a machine" (p. 4). The researcher accepts the position suggested by McKeown (1989), that the mechanistic view has tended to dominate in schools of medicine in recent times.

> Physics, chemistry and biology are considered to be sciences basic to medicine; medical education begins with study of structure and function of the body, continues with examination of disease processes and ends with clinical instruction on selected sick people (McKeown, 1989, p. 7).

The extensive work of Dubos (1960) described the dualism that has been evident in western medicine over the centuries, the two themes are, "Health preserved by way of life and health restored by treatment of disease" (p. 3). The discipline of nursing has been influenced strongly by the medical model, the mechanistic approach to health and disease (Davies, 1986). This influence has been apparent in the trajectory of nursing education since nursing became institutionalised. Therefore, nursing practice has tended to be based on the mechanistic approach to providing care. Walsh and Ford (1990) state:

> Nursing prior to the 1970's unfortunately had little research tradition. In addition it had no sense of a body of professional knowledge unique to nursing; it was devoid of theory except a notion of subservience to medicine. Thus, nursing care was not based on nursing fact but rather on what doctors thought nurses ought to know and on an oral tradition of beliefs passed on from sister to student. (p. 151)

Over the last four decades the nursing literature suggests that the nursing profession is exploring and developing models of practice, through the generation of theory development and nursing research (Fawcett, 1993).

One theory of nursing which has been developed is Jean Watson's Theory of Human Caring. Watson (1985) states, "Health refers to unity and harmony within the mind, body and soul" (p. 4). Fawcett (1993) affirmed that Watson's Theory of Human Caring

focuses on the whole person, which contrasts with natural science, which reduces phenomena to their parts.

The nursing literature reveals that examination into nursing practice by nurses, has raised several points of concern. A major concern identified is the need for further inquiry, exploring and questioning why nurses do what they do in nursing practice (Walsh & Ford, 1990).

This study, explores nursing practice and knowledge specifically related to the care of the burn wound at two specific periods of time, in Australian burns units, at their inception and at the present time. The researcher postulates that how nurses care for burn wounds is influenced by the body of knowledge held as 'true', or the beliefs by which health professionals determine this care.

Berger and Luckmann (1991) have discussed what is 'true' and 'belief' in the context of how it becomes established. Knowledge is developed, transmitted and maintained in society. As nurses are members of a professional culture and a social culture, this knowledge will also influence their practice. The "processes questioning validity" or the invalidity of the information internalised as 'true' or 'belief' are not formalised.

As nurses were educated in the past from a medical model, with a mechanistic approach to health - the body interpreted and controlled as a machine, it could be assumed that this would influence early burn wound care (BWC) protocols. Treatment of the burn wound by preventing infection, burn wound sepsis in BWC, endorses the mechanistic model.

Recent BWC protocols may demonstrate a shift in approach to a more supportive view of health. The promotion of wound healing in BWC endorses the supportive model. BWC protocols which are based on the promotion of healing are evidence of the supportive model of health.

The conceptual framework (Figure .1.) incorporates two fundamental positions of managing health, the mechanistic approach endorsed by the medical model and the holistic supportive approach endorsed in contemporary nursing models. These positions are depicted as whole circles, and there is overlap of these spheres.

In this study the Mechanistic Model represents strategies in the treatment of the burn wound to prevent infection and the Supportive Model represents strategies in treatment of the burn wound that promotes wound healing.

The researcher formulated two themes that were apparent in western health care delivery at this time. It would be reasonable to expect that some practitioners would hold mixed views and implement burn wound care strategies that both prevent infection and support the burn wound. This is depicted by the overlap of the two spheres. These two themes are incorporated into the Reflective Cycle (Gibbs, 1988) to examine the 'who', 'why', 'where', 'when', and 'what' aspects of this research. The conceptual framework guided the researcher as to how the boundaries of the inquiry could be clearly defined.

Identifying Sources

The next step for the researcher is to identify the material needed to study the research question (Shafter cited in Sarnecky, 1990). Accordingly, "The data may include a variety of evidence, such as documents (written materials) or information from pertinent living individuals (oral histories or interviews)" (Sarnecky, 1990, p.4). This necessitates consultation of both primary sources and secondary sources to elucidate the information. Fox cited in Sarnecky (1990) states:

> Primary source information is preferred, as it emerges from those who have personally witnessed events, it is considered original and is thought to have existed at the time of the event (p. 4).

The researcher planned to utilise the following primary sources:

(a) Burn wound care protocols in place at the inception of the burns unit;

(b) Burn wound care protocols in place and at the present time;

(c) Semi-structured interviews conducted with the first charge sister (the pioneer), to ascertain burn wound care practices, through discussion of burn wound care utilising the Reflective Cycle and three colour photographs;

(d) Semi-structured interviews conducted with the current practicing Clinical Nurse Specialist, to ascertain burn wound care practices, through discussion of burn wound care utilising the conceptual framework developed for the research and three colour photographs;

(e) The Australian and New Zealand Burns Association (ANZBA) to examine conference papers and minutes of annual meetings and review discussion regarding burn wound care;

(f) Any minutes of meetings held in the individual Australian burns units to determine changes in burn wound care practices;

(g) Hospital library archive material pertaining to the burns unit with information about burn wound care practices.

A secondary source of information is described by Fox cited in Sarnecky (1990) as, "...those which are somehow removed from the original events and are hearsay accounts are less reliable" (p.5). Secondary sources include material such as books, articles, research and unpublished material on the care of burn wounds. Those utilised in this study are included in Chapter Two of this report, the Literature Review.

The qualitative methodology of historiography facilitated the exploration and description of burn wound care in Australia, through interviewing the key nursing practitioners involved in burns units, at each unit's inception and then at the present time. The first Charge Nurse, the historical informant (HI) and the current Clinical Nurse Specialist, the current informant (CI) were identified as primary sources of information for the data collection. (Sheldon & Pappworth, 1983; Streubert & Rinaldi-Carpenter, 1995)

This type of historiographical research was described by Hamilton in Streubert and Rinaldi-Carpenter (1995) as an intellectual exploration of historical events. This historiographical study explores, "... the attitudes and ideas of people who are not considered the intellectual thinkers of [the] period, such as the ideas of the practicing nurse" (Streubert & Rinaldi-Carpenter, 1995, p.199).

Setting

The specialist burns units of Australia were identified and confirmed through telephone discussion with government health departments in each state. Thirteen burns units were

identified using this process. Eleven burns units participated in the study, across six states of Australia. The Northern Territory did not have a recognised burns referral centre at the time of the study. The constraints of time and the process of ethical review at two hospitals made their inclusion in the study prohibitive. The participating burns units included five adult units, five paediatric units and one mixed unit catering to the needs of both adults and children.

Sample

Interviews with each pioneer Charge Nurse (HI) and the current Clinical Nurse Specialist (CI) would establish what resources or directives influenced the protocols. The practices endorsed could be research based or learned through the traditional passage of expert nurse to novice. Streubert and Rinaidi-Carpenter (1995) describe the sample used for this inquiry as purposeful sampling. "This method of sampling selects individuals for study participation based on their knowledge of a phenomenon for the purpose of sharing that knowledge" (p 43).

Twenty-two interviews were conducted, eleven interviews with pioneering Charge Nurses, the historical informants (HI) and eleven interviews with practising Clinical Nurse Specialists, the current informants (CI).

The pioneering charge nurse (HI) was able to be contacted and interviewed on eight occasions. Where this nurse could not be traced for the interview, the hospital nominated the next most pioneering person: in one case this individual was the second charge nurse who had worked in the burns unit with the pioneering charge nurse. In the second instance the participant was the nurse educator on the burns unit and prior to that

a student nurse on the burns unit. In the third case, the nurse interviewed had worked in the burns unit as a graduate registered nurse with the first charge nurse.

Five of the HI had retired from nursing. Seven HI were actively employed in the nursing profession: six in administrative positions and one practicing clinically in the burns unit. All participants nominated were able to discuss the BWC practices endorsed at the time of the burns unit's inception.

The current specialist practitioner was difficult to identify. The clinical nurse specialist title is not used consistently for the same level of nursing personnel, due the variation in nursing career structures in the different states of Australia. After negotiation and discussion with individual contact persons at each burns unit, the researcher was able to make contact with the appropriate clinical personnel and eleven face to face interviews were conducted, at the preferred location of the research participant.

In three cases the informants for the current perspective were not the clinical nurse specialist for the burns unit. In two cases the individual originally approached identified a more experienced burns nurse to be involved in the interview process and data collection. In one instance, the original informant, the clinical specialist for the current perspective, nominated an experienced clinician to sit in on the interview, as it was anticipated that the clinical specialist would have to leave midway through the interview process.

On these three occasions, when there was a second nominated informant, the process of formal invitation to participate in the interview process was extended and the nominated informant was provided with an informed consent by the researcher.

Each informant was asked to complete a Demographic Data Sheet for the purpose of describing the informant population for each perspective: past and present. The Demographic Data Sheet (Appendix A) asked the informant to identify their age, clinical experience, burns nursing experience, nursing qualifications and position at the time they were involved in the burns unit. Every informant completed this documentation at the time of the interview. This provides information describing the nurses, the participants involved in the study without identifying the individuals.

## Ethical Considerations

The researcher holds the rights of confidentiality and anonymity of all the study participants as the utmost importance. All participants, institutions and individuals had the research project clearly explained in the Letter of Introduction (Appendix B), Invitation to Participants (Appendix C) and Letter of Consent (Appendix D). These letters included a signed declaration from the researcher promising to abide by the participants rights to confidentiality and anonymity at all times.

The researcher understood the participants were voluntary and had the right to withdraw from the study at any time, and respected the participants' right to take this decision. The contact names are known only to the researcher, and were kept in a locked filing cabinet at the researchers' home.

To preserve the anonymity of the Burn Units, the coding system in place has allowed all identifying material and contact names to be erased from the data collected. No reference has been made to any specific Burns Unit or informant by name in the report.

Each informant was asked to read and complete a consent form which stated the researchers obligations to provide an informed consent and ensure confidentiality of the material discussed. Each informant was given a copy of the Researchers Declaration (Appendix E) at the time of the interview. The transcripts of the interviews and the research data are kept in a locked filing cabinet at the researcher's home.

## Data Collection

The fourth step is the data collection (Sarnecky, 1990). In this inquiry, the interview process with pertinent nursing personnel formed the bulk of the information. Seldon and Pappworth (1983) state, "Interviews are usually best confined to those areas where primary written evidence is either unavailable ... or is non-existent" (p. 57).

The literature review conducted to identify Australian publications, describing burn wound care, during the period when burns units have been established in Australia revealed a scarcity of literary material. The presentations (pertaining to burn wound care) delivered at the Australian and New Zealand Burns Association (ANZBA) conferences, have not been published in referenced journals.

### Procedure

The hospitals were contacted by the researcher with a Letter of Introduction (Appendix B) addressed to the Director of Nursing of the relevant hospitals accompanied by a copy of the research proposal, the Invitation to Participants (Appendix C) and the Consent Form (Appendix D). On receipt of the research proposal eight hospitals arranged direct liaison between the current CNS and the researcher to facilitate the research process.

In the remaining three hospitals, the arrangements for the interviews were finalised following the formal process of Ethical Review of the research proposal. This necessitated that the final arrangements for the interviews at these hospitals were made by phone or fax after the researcher had begun the field trip, visiting every particpating hospital.

The burns units were requested by letter to provide copies of the initial burn wound care protocol and the current burn wound care protocol for the researcher. Three institutions reviewed the proposal through the Ethics Committee, which necessitated some minor changes to the proposal. Unfortunately due to the time constraints for ethical review of the proposal, two burns units were not included formally in the research process.

When the Director of Nursing accepted the invitation to participate in the study, a file was created. Each state was colour coded by the researcher and given a number (ie. 1). The institutions in each state was identified by a second number (ie 1.1). The burns nurses were coded into two sub-groups to categorise the historical informants (HI - the past) from the current CNS's (CI - the present). The strict categorising of information was essential and guarded against mislocation or incorrect identification of the data. (Minichiello, Aroni, Timewell & Alexander, 1990)

The nursing sub-groups of the pioneering participants, (HI's) were coded B, and the current participants, (CI's) were coded as A, for each participating hospital. The contact names of the proposed informants were fixed inside the file. These contacts were invited by Letter of Participation (Appendix C), to consent to an semi-structured, audiotaped interview to discuss burn wound care.

Instruments

The researcher decided upon semi-structured interviews, informed by an interview guide developed by the researcher, adapted from the Reflective Cycle (Gibbs, 1988). Minichiello et al.(1990) describes this type of interviewing as, "... focussed .... the qualitatively-oriented in-depth interviewing model" (p.92). Morse (1991) provided support for this choice, " ...focussed or semi-structured interviews are defined as those organised around areas of particular interest, while still allowing considerable flexibility in scope and depth" (p. 191). The Interview Guide utilised for the interview process is included in Appendix F. In-depth interviewing is defined by Taylor and Bogdan cited in Minichiello et al. (1990) as;

> Repeated face to face encounters between the researcher and informants directed to understanding informants' perspectives on their lives, experiences or situations as expressed in their own words (p. 93).

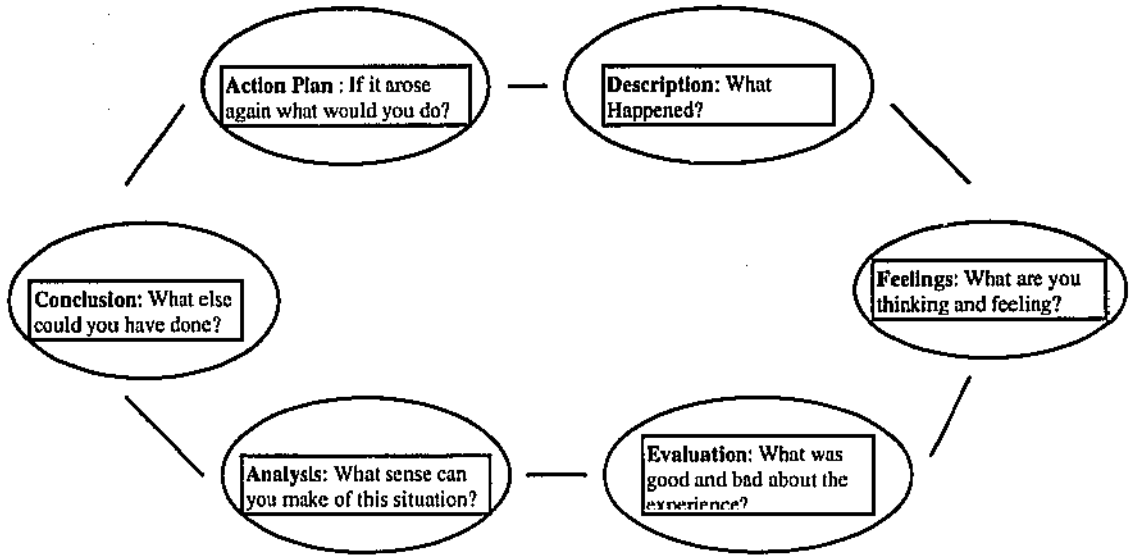


**Figure 2. The Reflective Cycle** (from Gibbs in Palmer, Burns & Bulman, 1993)

The interview guide is based on the work of Gibbs (1988), who developed the Reflective Cycle (Figure 2.) for examining incidents and nurturing reflective practice in nursing (Palmer et al, 1993). The researcher developed questions in keeping with the stages of the Reflective Cycle to elucidate the answers to the research questions exploring burn wound care.

The questions explored the 'who', 'why', 'where', 'when', and 'what' aspects of the research inquiry, in keeping with the historiographical methodology of the inquiry. The Interview Guide is included in the appendix (Appendix F). Examples of the questions under the sub-headings of the Reflective Cycle are: Description - 'How was this burn wound managed after admission?'; Feelings - 'What are you thinking and feeling with regard to the management of this burn wound?' ; Evaluation - 'What are the advantages and disadvantages of the dressing you have described?'; Analysis- 'Why is burn wound

care done this way?'; Conclusion - 'What other wound care could be employed?' and Action Plan - 'Are there plans to change the burn wound care it the future?'

The Interview Pictorial Model (Appendix G) used in conjunction with the Interview Guide shows three colour photographs depicting the three categories of burn wound: superficial, partial thickness and full thickness burns. The rationale for utilising photographs was to ensure that each participant discussed the same depth of burn injury during the interview and there was no ambiguity concerning burn wound classification.

There remains variation in classification systems. Muir et al. (1987) illustrated four different classification systems for burn injury describing skin destruction. These authors stated that numerical systems "...has lead to confusion in the past and should be abandoned" (p. 57). The classification of burn wounds has evolved over the last two decades. The traditional classification for the depth of burn injury was; first degree, second degree and third degree (McLaughlin, 1990). More often today, the classifications of burn injury are described in terms of the depth of damage to the skin.

Ellsworth Laing and Harvey (1974) discuss two classifications of burn injury partial thickness and deep. Artz, Moncrief and Pruitt (1979) describe two classifications of burn depth: partial and full, however partial is divided into superficial and deep partial injury. Other classification scales describe three depths of injury: superficial, partial thickness and deep (Harvey Kemble & Lamb, 1987; Wachtel, Kahn & Frank, 1983). Fisher and Helm (1984) refer to four classifications when discussing depth of burn injury, which was also supported in Trofino (1991).

A classification system defining three depth of burn injury was chosen for the study tool. The experienced burns nurses who participated in the pilot study, agreed on the

selection of three photographs chosen for the Interview Pictorial Model, to support the Interview Guide, depicting superficial, partial thickness and full thickness burn wounds. The colour photographs were selected over the initial model of two dimensional diagrams shown in black and white in Trofino (1991), as the researcher and the pilot participants agreed that there was no ambiguity in burn classification.

## Pilot Study

The pilot study is a research process used to test the data collecting instrument, in this inquiry, the interview technique of the researcher and the semi-structured interview guide. Burns and Grove (1992) state, "When the protocol (in this case interview guide) has been satisfactorily developed, it needs to be pilot tested on subjects similar to those who will be used in the study" (p. 366).

Four burns nurses were approached to participate in the pilot study. The researcher had planned to conduct four pilot interviews (two interviews with paediatric burns nurses and two interviews with burns nurses from an adult setting). However, due to the time constraints between initiating the pilot interviews and commencing the data collection trip around Australia, two interviews were completed for the pilot study.

The initial interview took one hour and five minutes to complete. During this first interview, discussion took place concerning the word 'advocate'. The informant felt that this term was not clear in the context of the interview process. Another area of

discussion and clarification was the question concerning 'thoughts and feelings'. The informant felt this question would in some instances raise anxieties or concern as to the 'hidden agenda' of the interview.

The researcher reflected on this feedback and determined that the question was relevant and would provide different information about burn wound care. The informant raised another interesting point, in that the informant did not need to be advised of the different stages of the Reflective Cycle (Gibbs, 1988).

The interview flowed more smoothly when the questions were asked without identifying what particular stage of the Reflective Cycle was being addressed. The second interview took 48 minutes as the researcher had reconsidered the interview process carefully, based on the feedback obtained from the first pilot interview. The researcher did not use the sub-headings of the Reflective Cycle during this interview. The second interview progressed smoothly and without query. From the pilot study the researcher was able to determine the best questions and cross checking questions to achieve the answers (Minichiello et al., 1990).

During the pilot study, it became apparent that the researcher would have to provide concise information to each participant prior to commencing the interview process. This study was exploring one component of burn care, the management of the burn wound. The researcher found that during the pilot study the participants were inclined to discuss other issues related to the management of the burned injured, not specifically burn wound care.

Issues such as nutrition and pain control during the dressing procedure were described by the pilot participants.

As a result of this finding, the researcher acknowledged at the beginning of each interview during the data collection process, the awareness of other issues such as pain management and nutrition which impact on burn wound care. By providing this acknowledgment and validating the importance of these issues in the care of the burn injured patient, the information boundaries for the interview were established. In this approach, the researcher values the participant's expertise and focuses the participant's attention almost exclusively on information pertinent to burn wound care.

The field trip undertaken by the researcher, took the following route around Australia: Adelaide, Gawler, Brisbane, Sydney, Wagga Wagga, Melbourne, Hobart and Perth. The field trip was not the only option considered for conducting the data collection interviews, the alternative of telephone interviews was investigated but rejected by the researcher. The opportunity to meet the individual informants, visit the hospital libraries, review annual reports and archival material, were benefits that could only be realised through visiting the participating hospitals. The field trip took 24 days and allowed approximately two days for each hospital, thus allowing flexibility in the interview times at the convenience of the two informants for each centre.

The researcher tried to converse with each informant twice by telephone before the interview meeting, to facilitate rapport building and trust with the participants (Minichiello et al., 1990; Sheldon & Pappworth, 1983). The researcher advised each informant that the interview could take up to an hour, which was the time estimated following the pilot interviews, to develop rapport and actually conduct the interview.

The researcher arranged the schedule for the interviews in advance, in accordance with the flight plan for the data collection. The researcher advised each informant of the dates available at each location and reassured each participant that if their personal commitments intervened the time of the interview could be renegotiated. The researcher planned initially to carry out no more than one interview per day. However, due to the necessity of adapting to the availability of the participants within the schedule of the field trip, on two occasions the researcher needed to conduct two interviews on one day.

All interviews were to be audiotaped and later transcribed. Prior to beginning the data collection field trip, the researcher worked carefully to devise a work strategy that would minimise the effects of equipment failure in the event that the audiotape was ineffective. The researcher planned to listen to the completed audiotape on the return journey back to the hotel. On two occasions there was difficulty with the audiotape and the interview was not recorded. This was noted immediately following the interview meetings, as the researcher had listened to the completed audiotape on the return journey back to the hotel. The researcher could reflect on the interview and immediately record notes, remembering the details from the interview.

The written Interview Guide was invaluable when these instances occurred. The researcher had made notes during sixteen of the twenty-two interviews which prompted the recall of other relevant details. On the six occasions where notes were not recorded during the interview, the researcher found that the action of writing when the informant was talking, inhibited the flow of conversation.

On one occasion the informant did not want the interview audiotaped, however the participant did wish to be an informant on burn wound care practices and gave consent for the researcher to take detailed notes during the interview instead.

In one case, the informant was not consistent about the procedures in place at the time of involvement in burn wound care. The informant was able to direct the researcher to a colleague who worked in the burns unit at the same time. This nurse was contacted to cross reference the protocols developed from the interview transcript.

Unfortunately, time did not permit the researcher to meet with this second primary informant during the field trip. As a result of this, the development of the protocol for that period and place, has taken place largely by phone and fax.

The audiotapes were transcribed by the researcher as soon after the interview as possible to capture the mood and context of the dialogue. The researcher would listen to the audiotape once prior to beginning the process of typing the transcript of the interview. This assisted the researcher to review and reflect on the questioning technique and timeliness of the questions (Minichiello et al, 1990).

The process of transcribing each audiotape was facilitated by a portable lap top computer. Each audiotape took between 7 and 9 hours to transcribe.

The researcher used a system recommended by Minichiello et al. (1990), to organise each transcript. The researcher used the same font for both the participant and the researcher. The commentary made by each party was identified by the individual as initials at the beginning of each statement. If the conversation was interrupted or either party made a comment, sigh or paused, this w. s identified in brackets with ( ) being the researcher, and [ ] being the participant. The researcher followed the recommendations of Minichiello et al. (1990) and left wide margins on either side of the transcripts to allow for comments and coding of the text.

Once the audiotape was transcribed the file containing the contact name and address of the participant was checked to ensure: correct coding of the disc file and correct colour coding. Each file contained the demographic data sheet of the participant and their returned consent form. The file also included any written material that the participant had provided about burn wound care, such as unit protocols, articles or previous ANZBA conference programmes or minutes.

The researcher kept a journal on the data collection field trip. This proved to be a useful debriefing tool for the researcher. Since returning the journal has served as a guide for detailing research issues which could not be addressed during the data collection trip due to time constraints.

The absence of written material to confirm or support the content of the interviews made this methodology difficult. According to Streubert and Rinaldi-Carpenter (1995), "Researchers use historical design if they believe something from the past will explain something in the present or the future" (p.197). The researcher checked the annual reports and hospital archives at each institution, however there was little material to support the rich information gained through the interview process. The history of burn wound care has not been preserved through time.

Reliability And Validity

The data collection for this study, the primary sources, the interview transcripts and the protocols developed by the researcher from each transcript for each informant formed the foundations of this study. LoBiondo-Wood and Haber (1994) state:

> Validity of documents is established by external criticism; reliability is established by internal criticism. ...External criticism judges the authenticity of the data source. The researcher seeks to ensure that the data source is what it seems to be. Only if the data source passes the test of external criticism does the researcher begin internal criticism (p. 272).

The researcher's goal has been to establish factually, the burn wound care practices in place at the inception of the Australian Burns Units, and the burn wound care practices currently endorsed. According to LoBiondo-Wood and Haber (1994), "To judge reliability the researcher must familiarise herself with the time in which the data emerged. A sense of context and language of the time is essential to understanding a document "(p. 272). The medico-nursing literature regarding the burn wound care practices in the western world between the early 1960's to 1995 was obtained and critiqued.

The information gathered through the interview process for this nursing inquiry was supported by the literature reviewed.

The data collated for the historical perspective, did not uncover any written protocols on the subject of burn wound care. A review of the early ANZBA conference papers and journals [1960's] did not provide an insight into to specific management of the burn wound at the inception of specialised burns units. The information available to the researcher was that exclusively obtained through the interview process. The researcher developed a protocol from each transcript and asked each historical informant to verify if the protocol accurately reflected the practices that were endorsed at the inception of the burns unit.

The data collated for the current perspective included documented evidence. Three informants (CI's) were able to provide documented evidence of the burn wound care practices endorsed in the Burns Unit. In two cases the documents were hospital endorsed unit specific protocols. In one case the document was taken from the hospital's Policy Manual. In each case, there was no discrepancy between the documentation and the informants' description of burn wound care concerning full thickness burn injury.

However, the wound management practices of superficial and partial thickness burn wounds was not outlined. The researcher had incomplete documented evidence from three burns units describing the current burn wound care practices endorsed, and no documented evidence from the eight other participating Burns Units.

To ensure that the researcher had a clear understanding of the wound care practices endorsed at each institution, a protocol was developed from each transcript, and sent to the respective informant.

The researcher asked each participant to read the developed protocol and make any necessary changes, so that the protocol developed accurately reflected the BWC practices currently endorsed. Twenty-one of the twenty-two protocols were returned by the research participants; six had made comments clarifying BWC practices.

According to LoBiondo-Wood and Haber (1994), "The researcher using historical methods attempts to establish fact, probability, or possibility" (p. 272). Fitzgerald (cited in Munhall & Oiler-Boyd, 1993) states:

> The following guidelines may be helpful to the investigator when setting out the requirements for establishing fact. Two independent primary sources that corroborate one another establish fact, as does one primary source corroborated by an independent secondary source that contains no substantial contrary evidences (p. 369).

Figure 3 on p.62 entitled 'Establishing Fact, Probability, and Possibility with the Historical Method', has been included as a useful reference articulating the criteria required for the three levels of reliability in historical research inquiries.

| | |
|---|---|
| **Fact** | Two independent primary sources that agree with each other.<br>or<br>One independent primary source that receives critical evaluation and one independent secondary source that is in agreement and receives critical evaluation and no substantive conflicting data. |
| **Probability** | One primary source that receives critical evaluation and no substantive conflicting data.<br>or<br>Two primary sources that disagree about particular points. |
| **Possibility** | One primary source that provides information but is not adequate to receive critical evaluation.<br>or<br>Only secondary or tertiary sources. |

(from Fitzgerald in Munhall & Oiler-Boyd, 1993, p. 370)

**Figure 3. Establishing Fact, Probability, and Possibility with the Historical Method**

The researcher developed a methodological flow chart as a visual reference, describing the process of data collection for this historiographical study. The flow chart is set up under the domains of hospital, researcher and research participant.

There are boundaries of responsibility in the research process, these domains identify the responsibility for each step of the data collection process. The positioning of the researcher in the middle column represents the co-ordination function and lateral communication required of the researcher between the hospital and individual participants, in facilitating the process of data collection. The Data Collection Flow Chart is shown on page 62.

## Data Collection Flow Chart

| INSTITUTION | RESEARCHER | PARTICIPANT | TIME |
|---|---|---|---|
| | Letter of Invitation to to Hospitals | | Feb, 1995 |
| Ethical Consideration | | | |
| Identification of possible participants and Request for copies of written past / current BWC protocols | | | |
| | Letter of Invitation to Identified Participants | | Mar, 1995- Apr, 1995 |
| | | Confirm Participation | Apr, 1995 - May, 1995 |
| | Pilot Test Interview Tool | | May, 1995 |
| | Informed Consent to each Participant | | May, 1995 |
| | Plan Field Trip and advise hospitals | | Apr, 1995 - May, 1995 |
| | Telephone the participants to develop rapport | | May, 1995 |
| | Notify Participants dates in each location | | May, 1995 |
| | Telephone the participants build research relationship | | May, 1995 |
| | Conduct Interviews | Available for interview process | May, 1995 - June, 1995 |
| | Transcribe Interviews | | May, 1995 - June, 1995 |
| | Develop draft BWC Protocols from each interview transcript | | June, 1995 - July, 1995 |
| | Return draft BWC Protocols for to each participant for changes and verification of document content validity. | | July, 1995 |
| | | Signified draft BWC protocols returned to researcher | Sep, 1995 |
| | Remind participants to return verified draft BWC protocols | | Oct, 1995 |
| | National BWC protocols established for the inception of Burns Units and BWC at the current time | | Nov, 1995 |

## Data Analysis

The researcher transcribed each audiotape and documented what each participant identified as the wound care practices for each category of burn injury: superficial partial thickness and full thickness burn wounds. The researcher developed a protocol from each interview transcript, for each participant. This was a way of checking that what was discussed at the interview, was in fact the burn wound care practices endorsed by the participant.

The researcher sent each participant a copy of the protocols developed from the transcript of their interview, for clarification. The structure for each protocol followed the interview questions that were utilised during the audiotaped interview. This provided a familiar framework for the participant as they were guided through the discussion on burn wound care for the three depths of burn wound. The researcher wanted to be sure that the interpretation of the management of the burn wound had been correctly ascertained from the transcript.

The absence of any supporting primary or secondary sources, necessitated that the participant determined the content validity (Polit & Hunger, 1993). This also provided the participant with the opportunity to reflect on the information and add or correct details that had been omitted or that were misinterpreted by the researcher. In ascertaining the interpretation was correct, the protocols developed by the researcher, were validated by the participants' signature. Two of the developed protocols were not returned to the researcher. Telephone contact with the individual participants confirmed that the content of the protocols had been correct.

The researcher grouped all the historical informants together and collated the data from the interview transcripts to formulate the burn wound care delivered to patients at the inception of specialised burn units - the historical perspective. The researcher followed the same process for the current informants to collate the current trends and management in burn wound care today - the present focus.

Three informants representing the current practice, were able to provide some hospital information on burn management. In two cases this material described the burn wound care discussed at the interview. The information provided in the third instance was predominantly about the admission procedure and prescriptive management of the burn injury (such as burn first aid and fluid replacement regimes).

The data obtained from the paediatric settings provided rich material informing the researcher of apparent trends in burn wound care, specific to paediatrics. Where these trends were not apparent in adult settings, the findings will be discussed separately.

The fifth step (Sarnecky, 1990) in an historiographical inquiry is the research report (Burns & Grove, 1992; Streubert & Rinaldi-Carpenter, 1995). "This phase entails organisation, integration, and analysis of the collected data into a logical sequence characterised by lucidity, coherence and an absence of lacunae" (Sarnecky, 1990, p.5).

The BWC protocols (past and present) for each burns unit were examined individually, and then compared with the other participating burn units for the two episodes in time (past and present). This allowed a description of burn wound care from an Australian perspective.

The final step in the research process is described by Fox cited in Sarnecky (1990) as, "...the application of the increased understanding of past issues and events to future directions" (p.5) (Burns & Grove, 1992; Streubert & Rinaldi-Carpenter, 1995).

## Summary

This chapter has described in detail the processes undertaken in the conduct of this historiographical nursing research exploring burn wound care in Australian Burns Units, at the inception of specialised facilities in Australia, and at the present time (1995). The material obtained through the field trip and interview process provided a wealth of knowledge. The findings of this study are the outcome of thorough data collection procedures, which required coding of material and meticulous attention to detail, this ensured that vital information was not misplaced or lost from the study.

# CHAPTER FOUR

# FINDINGS

## Introduction

The research findings for this nursing study are discussed in this chapter. The researcher has collated the rich material concerning burn wound care. The findings are presented under the sub-categories: the historical perspective and the current perspective. The findings represent two episodes of time in the history of burn wound care in Australian burns units. The researcher has presented the information obtained from the adult and paediatric burns units in the main work. The research questions serve as a guide to present the information in a logical sequence. Specific differences in current burn wound care practices pertinent to adult and paediatric settings will be highlighted and discussed under the sub-sections of superficial, partial thickness and full thickness burn injury.

The research questions were:

What is the Australian perspective on burn wound care?

How were the protocols determined?

When were the protocols implemented?

How have the protocols been updated?

Why are these practices advocated?

The information is presented covering the historical perspective first. The questions outlined above serve as subheadings, to present the information sequentially to the reader. The findings of the study for the current perspective on Australian burn wound care are then presented with the subheadings of superficial, partial thickness and full thickness burns. The questions outlined above will be addressed under each category.

This presents the reader with an overview of the variation and similarities in practices throughout the burns units in Australia.

## The Historical Perspective

The inception of specialised burns units in Australia began in the mid 1950's and slowly evolved across the nation with the last burns unit achieving specialist status in the early 1980's. Prior to the development of specialised facilities that focused expertise in burns management, burn injured patients were managed in the ward areas of hospitals.

The research participants (n = 11) for the historical informants were predominantly the first Charge Nurse of the burns unit at its inception. In two cases the participant was another nominated representative: one was a student nurse at the inception of the burns unit, and then later, the nurse educator in the burns unit. The other nurse participant was a student nurse when she worked with the first Charge Nurse at the inception of the burns unit.

The researcher's experience in burns nursing had demonstrated that burns nurses were not a fluctuating population, burns nurses appeared to stay within the specialty of burns. To describe the nursing population who were pioneer burns nurses, demographic data was collected concerning age group, nursing qualifications, length of employment in burns and other nursing experience. The demographic data for the nurse participants for the historical perspective is collated on Table 1.

The age range of the historical informants varied from 35 - 69 years inclusive. The range in years of nursing experience was 11 to 42 years, with the mean calculated at 28.36 years. The range of burns nursing experience was 4 - 30 years, with the mean calculated at 11.95 years. Seven participants are employed in the nursing profession: six in administrative positions, one as a clinician in a burns unit. Five participants have retired.

**Table 1. Demographic Data of the Historical Nurse Participants**

| UNIT | AGE RANGE | POSITION | QUALIFICATIONS | NURSING EXPERIENCE | BURNS NURSING |
|---|---|---|---|---|---|
| 1H | 35 -39 | Charge Nurse | RN<br>Cert. ENB 264 Burns and Plastic Surgery | 11 | 4 |
| 2H | 45 - 49 | Nursing Supervisor | RN | 12 | 5 |
| 3H | 65 - 69 | Charge Nurse | RN | 35 | 30 |
| 4H | 40 - 44 | RN | RN | 20 | 16 |
| 5H | 40 - 44 | Nurse Educator | RN<br>Cert. Mental Retardation<br>Cert. Paediatrics<br>Cert. Management<br>B.App.Sc. (nursing) | 24 | 14 |
| 6H | 65 - 69 | Charge Nurse | RN<br>Ward Sister's Diploma<br>Dip. Nursing Admin. | 42 | 4.5 |
| 7H | 45 - 49 | Charge Nurse | RN<br>RM<br>Dip. Tropical Diseases and Health<br>Cert. Cardiothoracic Nursing<br>Dip. Nurse Ed.<br>B.H.Sc (nursing) | 32 | 4 |
| 8H | 55 - 59 | Charge Nurse | RN<br>Midwifery | 40 | 7 |
| 9H | 50 - 54 | Charge Nurse | RN<br>Midwifery<br>Cert. Acute Care<br>Cert. Ward Management<br>Cert. Quality Management<br>B.H.Sc. (nursing) | 32 | 17 |
| 10H | 50 - 54 | Charge Nurse | RN<br>Midwife<br>Diploma Ap. Sc. (nursing)<br>Bach. of Business | 33 | 10 |
| 11H | 50 - 54 | Charge Nurse | RN<br>Midwife<br>Diploma of Ward Management | 31 | 20 |

The demographic data collected from the pioneering population would have been more relevant to the study if the researcher had altered the questions concerning the participants' burns experience to measure their actual period as the Charge Nurse in the Burns Unit. The information collected does not allow the researcher or the reader to ascertain how long the pioneering nurse worked in the burn unit, as the Charge Nurse. The information concerning the nurse's qualifications does not indicate the individual's nursing qualifications at the time they were a Charge Nurse in the Burns Unit.

The researcher perceived that the pioneering Charge Nurses (HI) might have been less experienced when they were appointed to the position of Charge Nurse, than in the current situation, within the various nursing career structures apparent nationally. This feeling or belief cannot be substantiated by the demographic data.

What is the Historical Perspective on Australian Burn Wound Care

The researcher utilised the interview guide and colour photographs of three burns: superficial, partial thickness and full thickness, to ascertain how each depth of burn injury was managed after admission to the Burns Unit.

The researcher was presented with a rich matrix of information from the interview process. The research material obtained through the interview process could not be supported by written material. At each hospital, the library was accessed to explore the archives and annual reports, for any material pertaining to the history and practices of the burns unit. The validity of the study relied solely on the transcript information from the interviews.

The process utilised to maximise the validity of the sole source of information - the interview transcripts, has been described in the chapter concerning the research methodology.

In summary, the researcher developed proposed burn wound care protocols from each transcript, for superficial, partial thickness and full thickness burn wounds. These developed protocols were sent to the respective research participants, to ensure that the management of each burn wound was interpreted correctly by the researcher, from the interview transcripts. This action validated the information and content of each interview ensuring that the interpretation of the researcher was correct.

The wound management described by the historical informants has been presented on the following tables: Table 2 shows the BWC practices for the superficial burn wound; Table 3 shows the BWC practice for the partial thickness burn and Table 4 shows the BWC practice for the full thickness burn wound.

All cleansing agents, topical agents and dressing products referred to by the participants are described in the Glossary of Products used in Burn Wound Care (Appendix H).

## Table 2. The historical perspective : BWC for the superficial burn wound.

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1H | Lux flakes and warm water | Closed Method:<br>Wound dressed with Bactigras, gauze, combine and crepe bandage. | Closed Method:<br>Dressing attended every three to four days according to surgeon's preference. |
| 2H | Saline, Hibitane or Cetavalon | Closed Method:<br>Wound covered with tulle gras, gauze and crepe bandage.<br><br>Exposure Method:<br>Neomycin ointment applied to the wound and left open | Closed Method:<br>Dressing left intact up to 7 days as per surgeon preference. If "strike through" occurred the dressing was removed and the wound reviewed.<br>Exposure method:<br>Daily wash with Neomycin being reapplied prn to keep the wound moist. |
| 3H | Saline or Chlorhexidine | Closed Method:<br>Wound dressed with tulle gras and gauze. | Closed Method:<br>Dressing attended every three to four days according to surgeon's preference. |
| 4H | Savlon | Closed Method:<br>Silvazine was applied directly to the wound, Jelonet and gauze were laid over the area and secured with crepe bandage. | Closed Method:<br>Dressings were changed daily in conjunction with daily bath. |
| 5H | Lux flakes and warm water | Closed Method:<br>Silvazine was applied to the wound and covered with Melolin.<br>Exposure Method:<br>Mercurochrome was applied to the wound to dry the area. | Closed Method:<br>Daily bath and dressing routine.<br><br>Exposure Method:<br>Mercurochrome applied prn. |
| 6H | The wound was not washed: The skin surrounding the wound was washed daily with soap and water. | Exposure Method:<br>The burn was left to completely dry out - this often required splinting or restraints.<br>Closed Method:<br>Tulle gras was laid over the wound, combine and crepe bandage secured the dressing. | Exposure Method:<br>Special bed cradles with heating lights were used to encourage the drying of the wound.<br>Closed Method:<br>The dressing was left intact for up to four days depending on surgeon's orders. |
| 7H | Chlorhexidine used when the patient was showered. Salt was added to bath water when bathing was indicated. | Exposure Method:<br>Patient was nursed under laminar flow. | Exposure Method:<br>The wound was not washed after the admission shower / bath. |
| 8H | Saline | Exposure Method:<br>The wound was smeared with Olive Oil. | Exposure Method:<br>Oil was reapplied BD and prn to keep the wound moist. |
| 9H | Lux Flakes and warm water | Closed Method:<br>Silvazine was applied directly to the wound, then covered with Jelonet, Velband and secured with crepe bandage. | Closed Method:<br>Dressing was carried out daily in conjunction with daily bath. |
| 10H | Warm bath with salt added | Exposure Method:<br>Sulphamylon gently smeared directly to the wound and the area left exposed. | Exposure Method:<br>The patent was nursed under a bed cradle fitted with warming lights. The patient was bathed twice a day and the Sulphamylon reapplied. |
| 11H | Warm water and Velvet soap | Exposure Method:<br>No topical agents were applied. Mercurochrome would be applied to any broken blisters. | Exposure Method:<br>Daily bath and wound inspection. |

**Table 3 . The historical perspective : BWC for the partial thickness burn wound**

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1H | Lux flakes and warm water | Closed Method:<br>Silvazine was applied directly to the wound, Chux impregnated with Silvazine were laid over the area and secured with combine and crepe bandage. | Closed Method:<br>Daily Lux Bath and rinse with warm water. |
| 2H | Saline, Hibitane or Cetavalon | Closed Method:<br>Neomycin ointment applied to the wound, covered with tulle gras, gauze and crepe bandage.<br><br>Exposure Method:<br>Neomycin ointment applied to the wound and left open | Closed Method:<br>Dressing left intact up to 7 days as per surgeon preference. If "strike through" occurred the dressing was removed and the wound reviewed.<br>Exposure method:<br>Daily wash with Neomycin being reapplied prn to keep the wound moist. |
| 3H | Saline or Chlorhexidine | Exposure Method:<br>The site was splinted / patient restrained to keep the wound still. This facilitated the build up of serum on the wound. | Exposure Method:<br>The wound was not washed, the skin surrounding the wound was gently cleansed. |
| 4H | Savlon | Closed Method:<br>Silvazine was applied directly to the wound, Jelonet and gauze were laid over the area and secured with crepe bandage. | Closed method:<br>Dressings were changed daily in conjunction with daily bath. |
| 5H | Lux flakes and warm water | Closed Method:<br>Silvazine was applied to the wound and covered with Melolin. | Closed Method:<br>Daily bath and dressing routine. |
| 6H | The wound was not washed:<br>The skin surrounding the wound was washed daily with soap and water. | Exposure Method:<br>The burn was left to completely dry out - this often required splinting or restraints.<br><br>Closed Method:<br>Tulle gras was laid over the wound, combine and crepe bandage secured the dressing. | Exposure Method:<br>Special bed cradles with heating lights were used to encourage the drying of the wound.<br>Closed Method:<br>The dressing was left intact for four to seven days depending on surgeon's orders. If exudate came through the dressing it was reinforced with extra combine. |
| 7H | Chlorhexidine used when the patient was showered. Salt was added to bath water when bathing was indicated. | Closed Method:<br>Blisters were deroofed. SSD was applied directly to the wound, covered with combine and secured with crepe bandage. | Closed method:<br>Patients were showered or bathed daily and had six hourly dressing changes. |
| 8H | Saline | Closed Method:<br>(A) Saline compresses were applied to the wound and damped frequently to keep them moist.<br>(B) Saline compresses were kept moist by placing combine over the gauze, then Bilroths and securing with a crepe bandage. | Closed Method:<br>Both (A) and (B) were changed three times a day. |
| 9H | Lux Flakes and warm water | Closed Method:<br>Silvazine was applied directly to the wound, then covered with Jelonet, Velband and secured with crepe bandage. | Closed Method:<br>Dressing was carried out daily in conjunction with daily bath. |
| 10H | Warm bath with salt added | Exposure Method:<br>Sulphamylon gently smeared directly to the wound and the area left exposed. | Exposure Method:<br>The patent was nursed under a bed cradle fitted with warming lights. The patient was bathed twice a day and the Sulphamylon reapplied. |
| 11H | Warm water and Velvet soap | Closed Method:<br>Silvazine was applied directly to the burn, Melolin was laid over the wound and secured with crepe bandage. | Closed Method:<br>The patient was bathed daily and the dressings reapplied. |

## Table 4. The historical perspective : BWC for the full thickness burn wound

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1H | Lux flakes and warm water | Closed Method:<br>Silvazine was applied directly to the wound, Chux impregnated with Silvazine were laid over the area and secured with combine and crepe bandage. | Closed Method:<br>Daily Lux Bath and rinse with warm water. |
| 2H | Saline, Hibitane or Cetavalon | Closed Method:<br>Neomycin ointment applied to the wound, covered with tulle gras, gauze and crepe bandage.<br><br>Exposure Method:<br>Neomycin ointment applied to the wound and left open | Closed Method:<br>Dressing left intact up to 7 days as per surgeon preference. If "strike through" occurred the dressing was removed and the wound reviewed.<br>Exposure method:<br>Daily wash with Neomycin being reapplied prn to keep the wound moist. |
| 3H | Saline or Chlorhexidine in the bath on admission | Exposure Method:<br>The area was splinted / patient restrained to keep the wound still. This facilitated the build up of serum on the wound. | Exposure Method:<br>The wound was not washed, the skin surrounding the wound was gently cleansed. |
| 4H | Savlon | Closed Method:<br>Silvazine was applied directly to the wound, Jelonet and gauze were laid over the area and secured with crepe bandage. | Closed method:<br>Dressings were changed daily in conjunction with daily bath. |
| 5H | Lux flakes and warm water | Closed Method:<br>Silvazine was applied to the wound and covered with Melolin. | Closed Method:<br>Daily bath and dressing routine. |
| 6H | Sponged with warm water with salt added | Closed Method:<br>Soframycin smeared onto the wound or impregnated on tulle laid over the wound, covered with combine and secured with crepe bandage | Closed Method:<br>The dressing was left intact for up to four days. If the exudate came through the dressing it was reinforced with extra padding. Medical staff determined when the dressing was changed. |
| 7H | Chlorhexidine used when the patient was showered. Salt was added to bath water when bathing was indicated. | Closed Method:<br>Silvazine was applied directly to the wound, covered with combine and secured with crepe bandages.<br>Exposure Method:<br>Patient was nursed under laminar flow with wounds exposed. | Closed method:<br>Patients were showered or bathed daily and had dressing changes prn if exudate came through the dressing<br>Exposure Method:<br>Skin surrounding the burn was cleansed with warm water with salt added. Contact with the wound was avoided to promote drying of the eschar. |
| 8H | Saline | Closed Method:<br>(A) Saline compresses were applied to the wound and damped frequently to keep them moist.<br>(B) Silver nitrate compresses were placed on the wound, and damped frequently to keep them moist.<br>* Another method for keeping the compress moist was placing combine, then Bilroths over the compress and securing with a crepe bandage. | Closed Method:<br>Both (A) and (B) were changed three times a day.<br>The patients were nursed under special bed cradles with heating lights to alleviate hypothermia |
| 9H | Lux Flakes and warm water | Closed Method:<br>Silvazine was applied directly to the wound, then covered with Jelonet, combine and secured with crepe bandage or Setanet. | Closed Method:<br>Dressing was carried out daily in conjunction with daily bath. |
| 10H | Warm sponge bath with salt added | Exposure Method:<br>Sulphamylon gently smeared directly to the wound and the area left exposed. | Exposure Method:<br>The patent was nursed under a bed cradle fitted with warming lights. The patient was bathed twice a day and the Sulphamylon reapplied. |
| 11H | Warm water and Velvet soap | Closed Method:<br>Silvazine was applied directly to the burn, Melolin was laid over the wound and secured with crepe bandage. | Closed Method:<br>The patient was bathed daily and the dressings reapplied. Silvazine was reapplied to exposed areas prn. |

How Were the Burn Wound Care Protocols Determined

There were no written protocols available to provide confirmation of the burn wound care practices endorsed from an historical view point. The researcher utilised the Interview Guide (Appendix F), developed for the research project in three cycles during the interview, to discuss the burn wound care practices endorsed for superficial, partial thickness and deep burn wounds.

Due to the gradual progression of specialisation across Australia, the historical informants came from different periods of progression in the history of burns units. The historical informants came from the mid fifties through to as recently as the early nineteen eighties. The historical informants (HI) were the first Charge Nurse, at the inception of each burns unit.

The question of how burn wound care was determined historically, has evolved over the passage of time between the mid 1950's and the early 1980's. The historical informants of the earliest burns units described a medical model of determining burn wound management. There were consistent themes evident across all three depths of burn wound management. Informant HI2 stated, "*The dressing choice was made by the surgeon of the day*". The wound care practices endorsed were medically driven. HI1 and HI8 concurred: "*It was the surgeon's orders, I mean they really did tell you what to do*".

During the nineteen sixties the medical staff determined how the burn wound would be managed. HI7," *It was the traditional way of managing the burn. I didn't have any pre burns unit experience and was guided by medicos in the first instance in terms of*

*[*wound*] management*". The distance between Australian cities was an identified barrier to the sharing of information. Each participant stated or implied that the isolation was a great difficulty when looking to solve the complex clinical problems of the burn injured client.

Informant HI4 reflected, "*Unfortunately I didn't really think much, in those days I had just finished my training and you did what you were told*". The business of decision making concerning patient care was directed by the medical staff. HI4, "*We didn't have a lot of time for talking (nurses) in those days you didn't have a lot of input ... you did what you were told and you didn't question why*". HI4 went on to discuss the role of the Charge Nurse, "*...she worked along side you taught you everything, did everything*".

Information available to the nurse was that knowledge passed on from the experienced nursing practitioners in the burns unit, transmitted orally to the more junior less experienced nurses and student nursing staff. No participant referred to journals and scientific papers on burn wound care available to nursing staff.

Informant HI2 recalled:

> *The dressing choice was made by the surgeon of the day. In those days nurses really didn't start talking about overseas practices or you know what people were doing overseas ... in fact a lot of them would have been absolutely, you know disgusted if you had said ah, 'I've heard', I mean (that) would not have ah gone down well at all.*

The threat of burn wound sepsis clearly described in the burns literature during this period (1960's) and examined during the literature review for this study, became apparent in the interview transcripts.

Both HI3 and HI5 stated, "*The key factor was to prevent burn infection*". HI5 elaborated, "*... the main problem was sepsis control, making sure that a superficial burn was not converted to a deep burn by infection*". This position was reaffirmed by HI6, "*You tried very hard to keep your patient free of pain and free of infection, which was the biggest problem*".

The source or reference point for the burn wound management practices endorsed could not be identified by all participants. HI8, "*... it was looked upon as having an antiseptic type of approach to it ... and I don't know how they developed it or where it came from*" (statement regarding Silver Nitrate dressings in burn wound management). However, in some cases a particular surgeon, known to be an expert in the field was known to the historical informants, as the influencing body of knowledge. HI5 stated, " *Surgeon X who was head of our unit, his mentor was Surgeon Y who ran the burns unit in Melbourne, he was the guru for all the paediatric burns and in fact, adult burns as well if you speak to anyone in burns, Surgeon Y was the guru*".

Another participant HI11 recalled: "*... burns had always been done that way. Because the doctor in charge of the ward at that time was very influenced by a Scottish surgeon, A. Wallace and he was a great believer in the open method of management*". Some historical informants identified that the medical staff were influenced by the American or English model of burn wound management. HI5 stated, "*I would say that we followed an English or UK model rather than an American model of burn management*".

From the interview transcripts, a collaborative approach to burn wound management, evolved as the years progressed. Initially, HI5 described nursing involvement:

*"Different surgeons had their preferences for different ointments and methods, the sister in charge at that time had been there quite a while and did make suggestions, but most of us stayed well in the background and did what we were told".*

From the inception of a more recently established burns unit HI9 recalled: "*We* [the medical director and HI9] *reviewed everything we did, the literature, what other people were doing overseas and our experience, changes to practice were made because we wanted to do the best for our patients".*

The lack of documentation pertaining to burn wound care could be due to the oral nature of the history of nursing. The emphasis on documentation was not present at the time of inception, of the majority of Australian burns units. This was not exceptional, but rather the norm for professional nursing at that time. The traditions and rituals of nursing were transferred orally from Sister (Charge Nurse) to the student apprentice. The knowledge contained within the unit was the knowledge that was shared and transmitted.

When Were the Protocols Implemented

The passage of time is again evident when the different treatment strategies are described by the historical informants. Some of the methods described by the earlier informants were in place prior to the introduction of Silver Nitrate solution and the development of Silver Sulphadiazine. Informants HI1, HI2 and HI4 conferred," *The dressings employed had been in place for some time without changes being made".* Reflected in the transcripts, each nurse recalled with clarity the patient suffering and the seemingly overwhelming task of the burns nurse.

HI3 remembered,"... *When I was nursing in 1948-1949, I can remember a young woman came in she was badly burned and she was nursed on the chest ward. I don't know if she survived*". Without exception the historical informants recalled a particular patient scenario and descriptively shared their perception as a burns nurse, of the patient's endurance of pain and dressing procedures.

The transcripts from the first burns units described a cyclical pattern of exposure then closed dressing methods. The historical informants reported these cycles of change, between these two options, emphasised that each change was an endeavour to decrease the incidence of burn wound infection. The use of the tulle dressing was described. Informants HI1 and HI2 described the implementation of burn wound treatment strategies reported: "*Trial and error I suppose ... they used tulle a lot and that is sort of an historical dressing that's been around forever*" (this method was in place when HI1 began in the unit).

Unfortunately, memory did not permit some informants recalling the names of specific medicated powders that were used in conjunction with the exposure method. There was also a period of wet dressings (saline soaks) described as one of closed dressing techniques employed, prior to the introduction of Silver Nitrate. The frequency of dressing changes were exclusively determined by the surgeons. One informant HI11 remembered the principle endorsed by the burns consultant, "*A wound inspected is a wound infected*". Another informant HI7, reported that the frequency of dressings was based on individual patient assessment, the presence of exudate on the outer dressing, odour from the wound or fever, as opposed to any standard dressing regime.

How Were The Protocols Updated

By examining the interview transcripts, the burn wound care practices endorsed and how they were updated at different stages can be determined, in the evolution of the burns care. The literature review for this study described the different products that have been developed over the last four decades for use in burn wound care. As these dressing agents became available in Australia, these practices were advocated in burn wound care.

Why were the BWC Practices advocated

The researcher has organised the dressings advocated by the historical informants at the inception of each burns unit in a longitudinal and chronological sequence. Whilst each informant was unable to identify exactly when dressing practices changed, it is apparent that wound management practices endorsed were those advocated in the current medico - nursing literature for that time.

| | |
|---|---|
| 1950's | Exposure Method |
| | Closed Method<br>[tulle] |
| Early 1960's | Saline Soaks |
| | Exposure / Closed Method<br>[dependent on depth] |
| Mid / Late 1960's | Closed Method<br>[Silver Nitrate] |
| | Exposure / Closed Method<br>[Sulfamylon] |
| Late 1960's | Exposure / Closed Method<br>[SSD] |
| Early 1970's | Closed Methods<br>[SSD / Bactigras based on burn depth] |

**Figure 4. Time Line Showing BWC at The Inception of Australian Burns Units**

## The Current Perspective

The various nursing career structures, evident nationally are testament to the various titles associated with the nurse who is responsible for the clinical care of patients in burns units throughout Australia. As with the demographic data collected for the historical informants, the demographic data collected for current informants, has the same weaknesses. It is not possible for the researcher or the reader to determine the length of time that the nurse has held the position or the educational background of the nurse at the time the nurse commenced in the position.

**Table 5. Demographic Data of the Current Nurse Participants**

| UNIT | AGE RANGE | POSITION | QUALIFICATIONS | NURSING EXPERIENCE | BURNS NURSING |
|---|---|---|---|---|---|
| 1C | 25 - 29 | RN | RN<br>Bach. Ap. Sc. | 6 | 5 |
| | 30 - 34 | Nurse Unit Manager | Bach Ap. Sc.<br>Grad. Dip. Nursing Education | 10 | 7 |
| 2C | 35 - 39 | Clinical Nurse Specialist | Bach. Ap Sc. | 15 | 6 |
| 3C | 40 - 44 | Clinical Nurse Consultant | RN | 24 | 10 |
| 4C | 35 - 39 | Unit Head | Dip. Ap. Sc.<br>Psychiatric Certificate<br>Bach. Ap. Sc. | 20 | 13 |
| 5C | 25 - 29 | Clinical Nurse | RN<br>Paediatric Cert.<br>Grad. Dip. Adv Clinical Nursing-Burns | 5 | 4 |
| 6C | 40 - 44 | Clinical Nurse Specialist | Bach. Ap. Sc. (nursing) | 21 | 12 |
| 7C | 35 - 39 | Clinical Nurse Consultant | Bach. Nursing<br>Critical Care Cert.<br>Midwifery Cert. | 13 | 8 |
| 8C | 35 - 39 | Nurse Manager | RN<br>Renal / Respiratory / ICU Certificate<br>Bach. Ap. Sc. (adv. nursing / nursing admin) | 20 | 13 |
| 9C | 40 - 44 | Clinical Nurse Consultant | Bach. Ap. Sc. (nursing) | 25 | - |
| 10C | 45 - 49 | Clinical Nurse Consultant | RN (Paeds.)<br>Midwifery Cert.<br>Dip. Ap Sc. | 25 | 15 |
| 11C | 30 - 34 | Associate Charge Nurse | RN | 10 | 7 |

The age range of the current informants on burn wound care was 25 - 49 inclusive. The nursing experience of participants ranged from 5 - 25 years, with a mean of 16.16 years. The burns nursing experience of these nurses ranged from 4 - 15 years, with a mean of 9.09 years.

## What is the Current Australian Perspective on Burn Wound Care

In this section discussing the current BWC practices in Australia, the findings are presented under the sub headings of superficial, partial thickness and full thickness burns, as there was notable differences when addressing the research questions concerning BWC. Three burns units were able to provide signified copies of burn wound care protocols endorsing the practices advocated in BWC. All three protocols were recently drafted and dated 1994.

The current BWC practices are described on the tables following: Table 6 shows the BWC practices for the superficial burn wound; Table 7 shows the BWC practices for the partial thickness burn wound and Table 8 shows the BWC practices for the full thickness burn wound.

## Table 6. Current Perspective: BWC for the superficial burn wound

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1C | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Jelonet is laid over the wound followed by saline moistened gauze. Dry gauze, Velband and Tubigrip secure the dressing. | Closed Method:<br>Daily dressing change - though if there is no 'strike thru' the dressing may be left intact for 48 hours. |
| 2C | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Open Method:<br>Wound nursed open with emollient thinly applied topically. | Open Method:<br>Shower BD. Emollient is reapplied BD and prn to keep the wound moisturised. |
| 3C | Shower or bath with warm tap water | Closed Method:<br>Jelonet and gauze is laid over the burn and the dressing is secured with a crepe bandage or Fastanet. | Closed method:<br>Daily shower and dressing change. |
| 4C | The wound is washed with Normal saline 0.9% | Closed method:<br>(A) Duoderm or Opsite is applied to the wound.<br>If the wound is in an area where the above options cannot be applied - then<br>(B) Chlorhexitulle, Vasgauze with Curlix and a crepe bandage is applied. | Closed Method:<br>(A) Left intact for 5 - 7 days.<br><br>(B) Left intact for 5 - 7 days. |
| 5C | Hibitane 1:2000 in warm water | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily bath and dressing for 3 - 4 days until wound assessment shows the wound to be superficial.<br>THEN:<br>(A) Omiderm is applied and left for 5 - 7 days. NB: if meshed Omiderm is applied, Lyofoam is the secondary dressing.<br>(B) Double layer of Bactigras secured with Webril and crepe. |
| 6C | Bath with Infacare, Bath Oil or Lux Flakes (based on nurses preference or patient's skin requirements) | Open Method:<br>(A) Nursed exposed with paraffin-based emollient topically<br>(B) Nursed exposed with aqueous based cream topically | Open Method:<br>Daily bath with the re-application of (A) or (B) 3 - 4 times daily to keep the area moist. |
| 7C | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>(A) Duoderm<br>(B) Opsite | Closed Method:<br>(A) Left intact for 7 days<br>(B) Excess exudate is aspirated from the wound area. |
| 8C | Shower with warm tap water | Open Method:<br>Wounds nursed exposed with no topical agents. | Open Method<br>Daily showering with wound assessment<br>*Closed Method:<br>Noted that some patients prefer a dressing for comfort. |
| 9C | Wash with Chlorhexidine 1:2000 solution | Closed method:<br>Double layer of Bactigras to the wound, with an Silvazine overlay (Silvazine impregnated Chux), Webril and crepe bandage or Tubigrip. | Closed Method:<br>Left intact for 48 - 72 hours depending on exudate from the wound. |
| 10C | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>(A) Silvazine is applied and secured with Melolin and crepe bandage<br>(B) Opsite is applied<br>(C) Duoderm is applied | Closed method:<br>(A) Usually daily though medico's may stipulate intact 48 hours.<br>(B) Left intact for 7 days<br>(C) left intact for 3 - 4 days. |
| 11C | Bath with Johnson's Baby Shampoo as cleansing agent.<br>Contaminated areas rinsed with Cetrimide solution. | Closed Method:<br>(A) Bactigras applied to the wound with gauze bandage and secured with crepe bandage.<br>(B) Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>(A) This dressing can be left intact for up to 7 days.<br><br>(B) Silvazine dressings are reapplied daily following bathing. |

**Table 7. Current Perspective: BWC for the partial thickness burn wound**

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1C | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>(A) Jelonet is laid over the wound followed by saline moistened gauze. Dry gauze, Velband (optional) and Tubigrip secure the dressing.<br>(B) Silvazine is applied to the wound, Silvazine impregnated Chux are laid over this with Defries burns pads secured with Surgifix or Tubigrip. | Closed Method:<br>Both (A) and (B) require daily dressing changes. |
| 2C | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Closed Method:<br>Silvazine is applied to the wound with Ultracare, Melolin or sterile Chux used as the retention dressing.<br>After 48 - 72 hours the wound is assessed for suitability for Fixomulle | Closed Method:<br>The shower and dressing is done twice daily.<br>The patient showers twice a day and pats the retention dressing (Fixomulle) dry. |
| 3C | Bath or shower with Chlorhexidine Gluconate 4%. The patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 4C | Burns Bath has Chlorhexidine Gluconate 20% added to warm water | Closed Method:<br>(A) Chlorhexitulle, Vasgauze and Curlix secured with crepe bandage.<br>(B) On a small area an occlusive dressing (Duoderm or Opsite) could be applied. | Closed Method:<br>(A) Can be left intact for 2 - 7 days.<br><br>(B) Can be left intact for 5 - 7 days |
| 5C | Bath with Hibitane 1:2000 in warm water. | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily dressing for 3 - 4 days until wound assessment shows the wound to be superficial<br>THEN:<br>(A) Omiderm is applied and left for 5 - 7 days. NB: if meshed Omiderm is applied, Lyofoam is the secondary dressing to absorb exudate. |
| 6C | Bath with Infacare, Bath Oil or Lux Flakes (nurse preference or the pt's skin requirements) | Closed Method:<br>Silvazine is applied directly to the burn wound, gauze is laid directly over the area and secured with a crepe bandage. | Closed Method:<br>Daily dressing following bathing |
| 7C | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Duoderm is applied to the wound, secured with Hyperfix at the edges and joins. | Closed Method:<br>Left intact for 72 hours |
| 8C | Shower<br>Immersion - Cetrimide concentrate (2 sachets) added to the water.<br>Sponge - 1 sachet of Cetrimide added to bowl | Closed Method:<br>Silvazine is applied to the wound with gauze as the retention dressing. Rolled wool may also be used in the early stages to accommodate the wound exudate. (Melolin used for burns on the back) | Closed Method:<br>Usually a daily prn dressing. BD to back, chest, hands and face . |
| 9C | Wash with Chlorhexidine 1:2000 solution | Closed method:<br>Double layer of Silvazine impregnated Chux over the wound, Webril and crepe bandage or Tubigrip to secure.<br>Then consider:<br>(A) Double layer of Bactigras to the wound, with an Silvazine overlay (Silvazine impregnated Chux), Webril and crepe bandage or Tubigrip.<br>(B) Hydrocolloid paste applied to Bactigras laid on the wound, with Silvazine overlay, Webril and secured with Tubigrip. | Closed Method:<br>Daily dressing for 48 hours then reviewed.<br><br>(A) and (B) are left intact for 48 - 72 hours depending on exudate from the wound. |
| 10C | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>(A) Silvazine is applied and secured with Melolin and crepe bandage. After 4 - 5 days the wounds are reassessed and other options considered are:<br>(B) Opsite<br>(C) Duoderm | Closed method:<br>(A) Usually daily though medico's may stipulate intact 48 hours.<br><br>(B) Left intact for 7 days<br>(C) Left intact for 2 - 4 days. |
| 11C | Bath with Johnson's Baby Shampoo as cleansing agent. | Closed Method:<br>Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>Silvazine dressings are reapplied daily following bathing. |

## Table 8. Current Perspective: BWC for the full thickness burn wound

| UNIT | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1C | Bath or shower with Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Silvazine is applied to the wound, Silvazine impregnated Chux are laid over this with Defries burns pads secured with Surgifix or Tubigrip. | Closed Method:<br>Daily dressing treatment with outer padding changed prn with exudate 'strike thru'. |
| 2C | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Closed Method:<br>Silvazine is applied to the wound with Ultracare, Melolin or sterile Chux used as the retention dressing. | Closed Method:<br>The shower and dressing is done twice daily. |
| 3C | Bath or shower with Chlorhexidine Gluconate 4%, the patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 4C | Burns Bath has Chlorhexidine Gluconate 20% added to warm water | Closed Method:<br>Silvazine is applied to Chux Towels and laid on the wound Curlix is used to absorb the exudate and this is secured with crepe bandage. | Closed Method:<br>Daily burns bath and dressing change during the exudative phase.<br>Burns bath and dressing changes are made 2nd daily as soon as practicable. |
| 5C | Daily bath with Hibitane 1:2000 in warm water. | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily bath and dressing change. |
| 6C | Daily bath with Infacare, Bath Oil or Lux Flakes (preference based on nurse preference or the patient's requirements) | Closed Method:<br>Silvazine is applied directly to the burn wound, gauze is laid directly over the area, orthopaedic wool and crepe bandage secures the dressing. | Closed Method:<br>Daily dressing following bathing |
| 7C | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Silvazine is applied to the wound Chux impregnated with Silvazine are laid over the area and secured with Surgifix or Crepe bandage.<br>Melolin sheets are used for large surface areas as the retention dressing. | Closed Method:<br>Daily shower or bath with dressing change. |
| 8C | Shower<br>Immersion - Cetrimide concentrate (2 sachets) added to the water.<br>Sponge - 1 sachet of Cetrimide added to bowl | Closed Method:<br>Silvazine is applied to the wound with gauze as the retention dressing. Rolled wool may also be used in the early stages to accommodate the wound exudate. | Closed Method:<br>Usually a daily prn dressing. BD to back, chest, hands and face .<br><br>(Melolin used for burns on the back) |
| 9C | Daily bath / shower with Chlorhexidine 1:2000 | Closed Method:<br>Two layers of Chux towels impregnated with Silvazine laid over the wound, Webril, wool roll or body pads are then secured with crepe bandage or Setanet. | Closed Method:<br>Daily bath / shower with dressings for 2 - 7 days depending on burn size |
| 10C | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>Silvazine is applied and secured with Melolin and crepe bandage or Surgifix. | Closed Method:<br>Daily bath and dressing.<br>*Xeroform is used on wounds with Pseudomonas / infection |
| 11C | Bath with Johnson's Baby Shampoo as cleansing agent. | Closed Method:<br>Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>Silvazine dressings are applied daily following bathing.<br>In extensive burns sites of dressing may be alternated with areas intact for 48 hours. |

Superficial Burns

The variation in BWC for the superficial burn wound, from the current perspective is identified on Table 6. Management strategies range from exposure with no topical agents to closed dressing techniques endorsing the use of Silvazine. On closer examination there were trends apparent that differentiated the care of the superficial burn wound in adult and paediatric settings. For clarity, the adult (Table .9.) and paediatric (Table .10.) settings have been presented separately to depict the trends that are evident. One unit is included in both tables as both paediatric and adult patients are managed in this setting.

**Table 9. BWC for the Superficial Burn in the Adult Settings**

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1 | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Jelonet is laid over the wound followed by saline moistened gauze. Dry gauze. Velband and Tubigrip secure the dressing. | Closed Method:<br>Daily dressing change - though if there is no 'strike thru' the dressing may be left intact for 48 hours. |
| 2 | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Open Method:<br>Wound nursed open with emollient thinly applied topically. | Open Method:<br>Shower BD. Emollient is reapplied BD and prn to keep the wound moisturised. |
| 3 | Shower or bath with warm tap water. | Closed Method:<br>Jelonet and gauze is laid over the burn and the dressing is secured with a crepe bandage or Fastanet. | Closed method:<br>Daily shower and dressing change. |
| 4 | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>(A) Duoderm<br>(B) Opsite | Closed Method:<br>(A) Left intact for 7 days<br>(B) Excess exudate is aspirated from the wound area. |
| 5 | Shower with warm tap water | Open Method:<br>Wounds nursed exposed with no topical agents. | Open Method<br>Daily showering with wound assessment<br>*Closed Method: Noted that some patients prefer a dressing for comfort. |
| 6 | Wash with Chlorhexidine 1:2000 solution | Closed method:<br>Double layer of Bactigras to the wound, with an Silvazine overlay (Silvazine impregnated Chux), Webril and crepe bandage or Tubigrip. | Closed Method:<br>Left intact for 48 - 72 hours depending on exudate from the wound. |

The cleansing agents utilised for burn wound care varied across Australian settings. Most adult settings recommended Chlorhexidine 1:2000 or Chlorhexidine Gluconate 4%. Two units recommended no cleansing agents for superficial burn injury.

The management of the burn wound in adult settings ranged from; exposure with no topical agent; exposure with emollient; closed methods with unmedicated products (Jelonet, Opsite, Duoderm); and one unit recommended Bactigras with a Silvazine overlay (Chux impregnated with Silvazine laid over the Bactigras, not in direct contact with the wound).

**Table 10. BWC For the Superficial Burn Wound in the Paediatric Settings**

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1P | Shower or bath with warm tap water. | Closed Method:<br>Jelonet and gauze is laid over the burn and the dressing is secured with a crepe bandage or Fastanet. | Closed method:<br>Daily shower and dressing change. |
| 2P | The wound is washed with Normal saline 0.9%. | Closed method:<br>(A) Duoderm or Opsite is applied to the wound.<br>If the wound is in an area where the above options cannot be applied - then<br>(B) Chlorhexitulle, Vasgauze with Curlix and a crepe bandage is applied. | Closed Method:<br>(A) Left intact for 5 - 7 days.<br><br>(B) Left intact for 5 - 7 days. |
| 3P | Hibitane 1:2000 in warm water. | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily bath and dressing for 3 - 4 days until wound assessment confirms superficial depth<br>THEN:<br>(A) Omiderm is applied and left for 5 - 7 days. NB: if meshed Omiderm is applied, Lyofoam is the secondary dressing.<br>(B) Double layer of Bactigras secured with Webril and crepe. |
| 4P | Bath with Infacare, Bath Oil or Lux Flakes (based on nurses preference or patient's skin requirements) | Open Method:<br>(A) Nursed exposed with paraffin-based emollient topically<br>(B) Nursed exposed with aqueous based cream topically | Open Method:<br>Daily bath with the re-application of (A) or<br>(B) 3 - 4 times daily to keep the area moist. |
| 5P | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>(A) Silvazine is applied, secured with Melolin and crepe bandage<br>(B) Opsite is applied<br>(C) Duoderm is applied | Closed method:<br>(A) Usually daily though medico's may stipulate intact 48 hours.<br>(B) Left intact for 7 days<br>(C) left intact for 3 - 4 days. |
| 6P | Bath with Johnson's Baby Shampoo as cleansing agent. Contaminated areas rinsed with Cetrimide solution. | Closed Method:<br>(A) Bactigras applied to the wound with gauze bandage and secured with crepe bandage.<br>(B) Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>(A) This dressing can be left intact for up to 7 days.<br><br>(B) Silvazine dressings daily following bathing. |

In the paediatric settings the cleansing agents utilised in burn wound care included; saline; tap water; Johnson's Baby Shampoo; Chlorhexidine 1:2000; Infacare; Bath Oil and Lux Flakes.

The topical management of the superficial burn wound ranged from exposure with the application of emollient or aqueous cream; closed methods including unmedicated dressings (such as Jelonet, Duoderm, Opsite); and medicated options such as Bactigras (Chlorhexitulle is a similar product) and Silvazine.

**How Were the Protocols Determined**

Management of the superficial burn wound by exposure has been well documented (Muir & Barclay, 1974; Trofino, 1991). Informant CI6 reported, "*The method of exposure for superficial wounds has been in place since 1978 and has been seen as an acceptable method of management during that time*". CI2 also advocated the exposure method for superficial burn wounds with additional information concerning the change from a medicated ointment, utilised for exposure treatment in the past to the unmedicated emollient. "*This method of exposure with emollient came about when Infection Control* (Microbiology) *removed topical antibiotic agents such as Neomycin ointment for topical use in the superficial burns*" (this occurred in the late 1980's).

The rationales for endorsing closed dressing techniques were identified as, "... *help in the prevention of infection*" CI1. CI5 stated, "*SSD is applied to all burns [superficial] to provide antibacterial protect for the first few days.... This is primarily because the burn may not have had adequate first aid and could become deeper in the next 48 hours*". CI1 stated that, "*The nursing staff determine the dressing choice*". CI4 and CI7 both supported the principles of moist wound healing in determining dressing options for the superficial burn wound. CI4, "*The wound care is determined according to the wound's appearance, the options of Chlorhexitulle, Hydrocolloids or Opsite are available*".

The burn wound management decision varied from a nursing decision, a collaborative decision and a medical decision. CI3 reported that, "*The wound care is carried out by the nursing staff so the decision probably should rest with the nursing staff as to how it is managed*". CI10 however stated, "*We do not have anything set in concrete, it is a discussion at the time concerning an individual patient .... and it really is a team decision between the doctors and the nurse*". CI11 reported, "*The medical staff determine wound care practices*".

**When were the protocols implemented**

In the case of the superficial burns, all participants identified that this wound is painful; however, the superficial burn wound heals spontaneously within 7 to 10 days of injury. CI1; CI2; CI6; CI8 and CI11 identified that the practices endorsed for the management of the superficial burn had been in place for a number of years. CI8 validated this position on wound management, "*Circumstantially we believe that no intervention is required for this type of injury*".

In some units the process of change regarding the management of the superficial burn wound was an ongoing process. New products were trialed to assess their appropriateness as a burns dressing. CI3 presented this information;

> *Up until 3 - 4 years ago we used to treat every burn that came through the door with Silvazine. The changes in practice came about through increased interest in wound care, and studies being done showing that it was not necessary to have antibacterials on everything. We have changed our way of thinking.*

CI4 stated, "*We are trialing lots of things at the moment, the wound management is updated as we find suitable alternatives that are comfortable and cost effective*". CI9 summarised the position of those units exploring new management strategies, "*I guess the whole emphasis is that you provide an environment that allows the body to do a lot of its own healing*".

**How have the protocols been updated**

A number of participants were aware of other dressing options that could be applied for the management of the superficial burn wound. These products were not utilised in one unit as CI1 reported, " *...the unit tends to keep things pretty standard*". CI11 identified that Bactigras and Silvazine were historical dressings, "*Recently one surgeon has been using Opsite on small areas and there are plans to trial a new product Nugel*".

There was a clear trend identified by the current informants to seek out knowledge and find better practice options for the management of the burn wound (CI2, CI3, CI4, CI7, CI9). CI10 stipulated:

> *We are willing to try anything that is found to be satisfactory ... the criteria would be patient comfort, ease of application, ease of handling the patient outside the hospital and importantly the prevention of infection.*

CI2 stated, "*We are always looking at different things, different aspects, different treatments globally ...the nursing staff and the doctors attend different conferences in Australia and overseas, we learn from other people*". CI3 and CI4 concurred that attending conferences, reading the literature and research and trialing new products was important to better patient care. CI3 emphasised that it was important to, " *...examine practices and question 'why do we do things this way'* ".

CI7 made the point, "*... there would have to be an indication that there was a better way of doing it, patient comfort, cheaper, got patients out earlier*". CI9's interesting observation concerned practitioner familiarity with a dressing product, "*... I don't feel that my skills in assessing the use of that product on a deroofed or denuded area ... I feel more comfortable using Omiderm*" (deroofed or denuded in this context refers to the wound area where blistered skin has been removed).

**Why are these practices advocated**

There were some clear indicators for advocating the practices recommended for superficial burn injury. The units utilising a medicated closed dressing method all stipulated the rationale for the treatment endorsed was the prevention of infection (CI5; CI9; CI10; CI11). Patient comfort was identified (CI1; CI2; CI3; CI4 and CI6) as the rationale for superficial wound management endorsed. CI7 advocated the BWC practices in place as, "*...current practice supports moist wound healing principles and is acknowledged in the literature* ". CI2 and CI4 also identified that the cost effectiveness of the dressing products are a consideration.

Partial Thickness Burns

The cleansing agents for partial and full thickness burns was unchanged from those identified in superficial burn management. One burns unit however, stipulated that the cleansing agent recommended for partial and full thickness burn wounds was Cetrimide, whereas for superficial burns it had recommended warm tap water

The topical management of the partial thickness burn wound also varied between the adult and paediatric settings. The options are presented on Tables 11 and 12 identifying the use of closed dressing techniques using unmedicated options (Jelonet, Duoderm and Opsite) and medicated options of Bactigras (similar product Chlorhexitulle) Silvazine and Silver Nitrate (Silver Nitrate is used in one burns unit. This is the preference of one medical consultant).

**Table 11. BWC for the Partial Thickness Burn in Adult Settings**

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1 | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>(A) Jelonet is laid over the wound followed by saline moistened gauze. Dry gauze, Velband (optional) and Tubigrip secure the dressing.<br>(B) Silvazine is applied to the wound, Silvazine impregnated Chux are laid over this with Defries burns pads secured with Surgifix or Tubigrip. | Closed Method:<br>Both (A) and (B) require daily dressing changes. |
| 2 | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Closed Method:<br>Silvazine is applied to the wound with Ultracare, Melolin or sterile Chux used as the retention dressing.<br>After 48 - 72 hours the wound is assessed for suitabi'ity for Fixomulle | Closed Method:<br>The shower and dressing is done twice daily.<br>The patient showers twice a day and pats the retention dressing (Fixomulle) dry. |
| 3 | Bath or shower with Chlorhexidine Gluconate 4%. The patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 4 | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Duoderm is applied to the wound, secured with Hyperfix at the edges and joins. | Closed Method:<br>Left intact for 72 hours |
| 5 | Shower . If the patient is immersed then Cetrimide concentrate (2 sachets) is added to the water. For a sponge 1 sachet of concentrated Cetrimide is added to the bowl | Closed Method:<br>Silvazine is applied to the wound with gauze as the retention dressing Rolled wool may also be used in the early stages to accommodate the wound exudate. (Melolin used for burns on the back) | Closed Method:<br>Usually a daily prn dressing. BD to back, chest, hands and face . |
| 6 | Wash with Chlorhexidine 1:2000 solution | Closed method:<br>Double layer of Silvazine impregnated Chux over the wound, Webril and crepe bandage or Tubigrip to secure.<br>Then consider:<br>(A) Double layer of Bactigras to the wound, with an Silvazine overlay (Silvazine impregnated Chux), Webril and crepe bandage or Tubigrip.<br>(B) Hydrocolloid paste applied to Bactigras laid on the wound, with Silvazine overlay, Webril and secured with Tubigrip. | Closed Method:<br>Daily dressing for 48 hours then reviewed.<br><br>(A) and (B) are left intact for 48 - 72 hours depending on exudate from the wound. |

Closed dressing techniques were recommended by all adult settings. Five of the six adult settings endorsed Silvazine for partial thickness BWC. One unit concurrently recommended Silver Nitrate dressings. One unit chose the unmedicated options of

occlusion utilising Opsite or Duoderm. One unit recommended Jelonet and moist saline gauze. One unit recommended Bactigras dressings at the wound interface, with a Silvazine overlay. The rationale for endorsing the use of a Silvazine overlay was prevention of infection.

An interesting factor was the range and variation of retention dressings utilised with Silvazine. Products that have no absorbent qualities such as Ultracare were advocated through to a variety of multi layered closed dressings comprised of gauze, Chux, Melolin, Webril, Defries Burns Pads, Velband and orthopaedic wool.

**Table 12. BWC for the Partial Thickness Burn in Paediatric Settings**

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1P | Bath or shower with Chlorhexidine Gluconate 4%. The patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br><br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br><br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 2P | Burns Bath has Chlorhexidine Gluconate 20% added to warm water | Closed Method:<br>(A) Chlorhexitulle, Vasgauze and Curlix secured with crepe bandage.<br>(B) On a small area an occlusive dressing (Duoderm or Opsite) could be applied. | Closed Method:<br>(A) Can be left intact for 2 - 7 days.<br><br>(B) Can be left intact for 5 - 7 days |
| 3P | Bath with Hibitane 1:2000 in warm water. | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily dressing for 3 - 4 days until wound assessment shows the wound to be superficial<br>THEN:<br>(A) Omiderm is applied and left for 5 - 7 days. NB: if meshed Omiderm is applied, Lyofoam is the secondary dressing to absorb exudate when meshed Omiderm is used. |
| 4P | Bath with Infacare, Bath Oil or Lux Flakes (preference based on nurse preference or the patient's requirements) | Closed Method:<br>Silvazine is applied directly to the burn wound, gauze is laid directly over the area and secured with a crepe bandage. | Closed Method:<br>Daily dressing following bathing |
| 5P | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>(A) Silvazine is applied and secured with Melolin and crepe bandage. After 48 hours the wounds are reassessed and other options considered are:<br>(B) Opsite<br>(C) Duoderm | Closed method:<br>(A) Usually daily though medico's may stipulate intact 48 hours.<br><br>(B) Left intact for 7 days<br>(C) left intact for 2 - 4 days. |
| 6P | Bath with Johnson's Baby Shampoo as cleansing agent. | Closed Method:<br>Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>Dressings are reapplied daily following bathing. |

The paediatric settings all recommended closed dressings for the management of the partial thickness wound. Five units endorsed the use of Silvazine with one unit concurrently utilising Silver Nitrate dressings. One unit utilised unmedicated dressing options of Duoderm, Opsite or Chlorhexitulle for partial thickness injury, leaving these wounds intact for 2 to 7 days.

In the paediatric settings there was an emphasis on occluding the wound between 48 and 72 hours post injury utilising unmedicated dressings such as Omiderm, Duoderm or Opsite. The rationale for these wound management strategies were the psychosocial benefits for the child. The cessation of daily dressing routines that were painful and frightening, the ability to be discharged home to the care of the family and the community nurse, or distance permitting the Out-Patients Clinic at the Hospital were identified by the current informants. These management strategies also had an economic focus, by facilitating decreased length of hospital stay and cost effectiveness negating the need for continuing daily dressing changes.

**How Were the Protocols Determined**

Silvazine was endorsed in nine burns units. The effective antibacterial properties of Silvazine were stipulated as the rationale for utilising the product for partial thickness burn wounds (CI2; CI3; CI5; CI6). "*The infection control of this product (Silvazine) has seen a dramatic reduction in the Pseudomonas in burns*" (CI8). CI5 and CI6 agreed that, "*Close observation of the burn wound every day is the most important thing before we actually change our management*".

CI9 reiterated the importance of wound assessment, "*Patient assessment includes the source, the mechanism, first aid, wound size and the general health of the patient*". The BWC for the partial thickness burn is determined by either nursing (CI4), collaboratively (CI3; CI8; CI9 and CI10) or medicine (CI1 and CI11). There was evidence of set routines in the management of burn wounds in this regard. CI1 stated, "*Mainly we decide what we are going to put on the wound, the doctors may have some input ... or we might call them and they'll tell us what to put on. But often we have our set routine you know what to do*". This was also evident with CI11.

**When were the protocols implemented**

Closed dressing techniques with Silvazine have been in place for greater than 10 years (CI1; CI3; CI6), greater than 15 years (CI2), and ever since Silvazine was first introduced to Australia (CI8; CI9; CI10; CI11).

**How have the protocols been updated**

Changes to partial thickness burn wound care were identified. "*When I started, partial burns all had Silvazine ... in the late 1980's we started using Chlorhexitulle for the superficial and the clean partial wounds*" (CI4). In another setting (CI7) Silvazine had been the topical agent of choice for the management of the partial thickness burn, until "... *about five years ago when the practice of sealing the wound with Duoderm* (was introduced)".

**Why are these practices advocated**

Where Silvazine was endorsed as the topical treatment for the partial thickness burn injury, the rationales given were: infection control (CI2; CI3; CI5; CI10; CI11); patient comfort (CI2; CI4; CI10; CI11) and cost effectiveness.

Where Silver Nitrate was recommended, infection control was cited as the rationale for endorsing this management strategy. There were conflicting clinical opinions concerning the use of Bactigras in BWC. "*Bactigras ... doesn't have the same antimicrobial actions as Silvazine*". However, CI9 stated, "*Bactigras does have a major role to play in the prevention of infection in the burn wound*".

Full Thickness Burns

The topical agent for the management of the full thickness burn injury was Silvazine in all eleven burns units. One unit concurrently utilises Silver Nitrate wet dressings. The management of this injury was seen to be directed by the medical staff. The gravity of this depth of injury was stipulated in every interview. All informants discussed the multidisciplinary approach in individual burns units to maximise the patient's outcome. The information is collated on Tables 13 and 14 respectively, for adult and paediatric settings. Again the variation in retention dressings is apparent.

## Table 13. BWC For the Full Thickness Burn Wound in Adult Settings

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1 | Bath or shower with Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Silvazine is applied to the wound, Silvazine impregnated Chux are laid over this with Defries burns pads secured with Surgifix or Tubigrip. | Closed Method:<br>Daily dressing treatment with outer padding changed prn with exudate 'strike thru'. |
| 2 | Shower with Chlorhexidine Gluconate 4% (liquid soap) | Closed Method:<br>Silvazine is applied to the wound with Ultracare, Melolin or sterile Chux used as the retention dressing. | Closed Method:<br>The shower and dressing is done twice daily. |
| 3 | Bath or shower with Chlorhexidine Gluconate 4%. The patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br><br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 4 | Chlorhexidine Gluconate 4% (impregnated sponge) and warm tap water | Closed Method:<br>Silvazine is applied to the wound Chux impregnated with Silvazine are laid over the area and secured with Surgifix or Crepe bandage. | Closed Method:<br>Daily shower or bath with dressing change.<br>*Melolin sheets are used for large surface areas as the retention dressing. |
| 5 | Daily shower / bath<br>If the patient is immersed then Cetrimide concentrate (2 sachets) is added to the water. | Closed Method:<br>Silvazine is applied to the wound with gauze as the retention dressing. Rolled wool may also be used in the early stages to accommodate the wound exudate. (Melolin used for burns on the back) | Closed Method:<br>Usually a daily prn dressing. BD reapplication of cream to back, chest, hands and face .<br><br>*For a sponge 1 sachet of concentrated Cetrimide is added to the bowl. |
| 6 | Daily bath / shower with Chlorhexidine 1:2000 | Closed Method:<br>Two layers of Chux towels impregnated with Silvazine laid over the wound, Webril, wool roll or body pads are then secured with crepe bandage or Setanet. | Closed Method:<br>Daily bath / shower with dressings for 2 - 7 days depending on burn size |

**Table 14. BWC For the Full Thickness Burn Wound in Paediatric Settings**

| | CLEANSING AGENTS | TOPICAL APPLICATIONS APPLIED IN BWC | ROUTINES ASSOCIATED WITH BWC |
|---|---|---|---|
| 1P | Bath or shower with Chlorhexidine Gluconate 4%. The patient is rinsed off thoroughly. | Closed Method:<br>(A) Silver Nitrate moist dressings. 8 - 16 layers of moistened gauze is laid over the wound and secured with cotton bandages.<br>(B) Silvazine cream is applied to the wound and Melolin is then secured with crepe bandage or Fastanet. | Closed method:<br>(A) The dressing is moistened every 3 hours. The patient is bathed daily debris is debrided, and dressings reapplied.<br><br>(B) The patient is bathed daily, debris is debrided and dressings reapplied. |
| 2P | Burns bath has Chlorhexidine Gluconate 20% added to warm water | Closed Method:<br>Silvazine is applied to Chux Towels and laid on the wound Curlix is used to absorb the exudate and this is secured with crepe bandage. | Closed Method:<br>Daily burns bath and dressing change during the exudative phase.<br><br>Burns bath and dressing changes are made 2nd daily as soon as practicable. |
| 3P | Daily bath with Hibitane 1:2000 in warm water. | Closed Method:<br>Chux impregnated with Silvazine is laid on the wound and secured with Webril and a crepe bandage. | Closed Method:<br>Daily bath and dressing change. |
| 4P | Daily bath with Infacare, Bath Oil or Lux Flakes (preference based on nurse preference or the patient's requirements) | Closed Method:<br>Silvazine is applied directly to the burn wound, gauze is laid directly over the area, orthopaedic wool and crepe bandage secures the dressing. | Closed Method:<br>Daily dressing following bathing |
| 5P | Bath with Chlorhexidine 1:2000 solution | Closed Method:<br>Silvazine is applied and secured with Melolin and crepe bandage or Surgifix. Xeroform is used on wounds with Pseudomonas / infection | Closed Method:<br>Daily bath and dressing. |
| 6P | Bath with Johnson's Baby Shampoo as cleansing agent. | Closed Method:<br>Silvazine applied to the burn with Melolin and secured with crepe bandage. | Closed Method:<br>Silvazine dressings are applied daily following bathing.<br>In extensive burns sites may be dressed alternately with areas intact for 48 hours. |

## How Were the Protocols Determined

The use of Silvazine for full thickness burn injury has been practiced for some time. Participants identified that Silvazine was the gold standard for the treatment of burns (CI8), particularly the antibacterial properties giving proven and effective control of micro-organisms. The advantages of using Silvazine were identified as; infection control; painless on application; ease of application; patient comfort; and maintenance of the eschar (CI4; CI6; CI11).

The BWC for full thickness burn injury in Australian burns units has been exclusively managed with Silvazine (one unit concurrently utilises Silver Nitrate dressings). CI1 and CI2 reported that Silvazine was routine standard management for full thickness injury. CI5 stated, "*At the moment Silvazine is the best product available for full thickness burns, ... it penetrates the eschar, it has all the antibacterial cover from gram positive, gram negative and some anti-fungal agents*". This position was reaffirmed by CI7 and CI10.

**When were the protocols implemented**

Silvazine has been the topical agent of choice in the management of the full thickness burn wound since the product was introduced to Australia. Matter, Barclay and Konickova (1971), identified Fox, as the pioneer of Silver Sulphadiazine (the American formulation), which was trialed in Australia in 1965. The product was later modified in Australia, with the addition of Chlorhexidine 1%, differentiating the antibacterial composition of the product to the Silver Sulphadiazine endorsed in the United States.

Informants reported, "*This management has been in place since Silvazine was developed*" (CI7 and CI8). This position was substantiated by CI9 and CI10 reporting, "*Silvazine has been demonstrated to be the most effective product for preventing burn wound infection. In Australia we use Silver Sulphadiazine with Chlorhexidine added. Our product, Silvazine was demonstrated to be more effective than the Silver Sulphadiazine without Chlorhexidine added*". CI11 remarked that Silvazine had been used, "*... by Australian burns units historically, ever since it was introduced*".

**How have the protocols been updated**

There was unanimous support for the continued use of Silvazine in full thickness burn wound management. No changes are proposed for full thickness BWC regarding the topical agent endorsed (CI1; CI2; CI3; CI5; CI6; CI11). Informants CI9 and CI10 identified, "*There is nothing else available at this time that is comparable effective*". CI7 discussed how other options have been examined, "*In our unit we do not have any other option for full thickness burns ... consultants have looked at Sulphamylon or Silver Nitrate but from my understanding these are very uncomfortable for the patient and I would not be advocating this without a great deal of consideration*". There was concern from one informant, CI11, for the future management of the full thickness burn wound, "*What is going to happen when the Silvazine is no longer effective, what are we going to use then?*".

Some informants felt that management could be improved by reducing the delay between admission and debridement principally due to reduced theatre access identified by informants (CI4; CI5; CI11). One informant discussed the potential to improve wound management following debridement using biological skin substitutes such as Biobrane and Eaziderm (CI4).

**Why are these practices advocated**

Each informant endorsed Silvazine for full thickness burn injury, identifying the following criteria for the practices advocated: infection control (CI1 - CI11); patient comfort (CI1 - CI11); cost effectiveness (CI5; CI6; CI7; CI8; CI9); ease of application (CI1; CI2; CI7) and protection of the eschar (CI1; CI2).

## Limitations of the Study

The limitations for this qualitative nursing study have been identified as; incomplete recruitment of all burns units (n = 13) to participate in the study (n = 11); small pilot study of the Interview Guide (n = 2); location of both historical and current key nursing participants and the lack of literature pertaining to Australian burn wound care practices, particularly information providing an historical perspective.

Two Australian burns units were unable to participate in the research study. The inclusion of data from these two sites would have contributed to a complete national forum on burn wound care.

The pilot study had planned to test the Interview Guide on two adult and two paediatric burns nurses prior to the data collection trip. Constraints of time allowed only the two adult burns nurses to be interviewed. This small sample, together with the adjustments made to the interview guide, did not negatively influence the effectiveness of the data collection tool for the study.

During the recruitment process, there were difficulties in locating the 'first charge nurse'. Nurse participants who worked in the unit with the first charge nurse participated in the data collection process, providing the historical perspective. The participants for the current perspective were not easily identified in the various nursing career structures nationally. The current participants were nominated by the hospital. However in two situations the nominated contact person referred the researcher to another more experienced nurse practitioner in the burns unit. This participant factor has not threatened the integrity of the study.

The perception of the nurse participants included in the research sample could influence the data collection and findings of the research. The nurses providing the historical perspective had the limitations of reflecting on situations some time ago and relied on the clarity of memory. The nurses providing the current perspective were asked to recall every day practices, influenced by constraints of burns unit based practice and personal beliefs about BWC.

The final limitation of this study was the lack of written material concerning burn wound care in Australia. From an historical perspective, hospital archives were scarce or incomplete and there was no published literature available to determine how the burn wound was managed prior to 1960. From a current perspective, three hospitals provided written material from the burns units concerning burn management, not specifically the BWC practices. The published literature on current Australian burn wound care is scarce.

## Summary

The study sought to determine Australian BWC practices, where they came from, their implementation, rationale and what has changed. The researcher has elucidated and described the burn wound care practices that were advocated at the inception of specialised burns units in Australia. The burn wound care practices currently endorsed have been described to give health professionals a starting point for exploring how to best manage BWC in the future.

# CHAPTER FIVE

# DISCUSSION

## Introduction

This chapter will discuss the literature reviewed, the conceptual framework adapted for the study and the themes of burn wound care that became apparent following the data analysis for both the historical and current practices of burns units across Australia.

The literature reviewed for this nursing research did not shed light on the practices of BWC in Australian burns units at their inception which in some cases was 40 - 45 years ago. In fact the Australian literature specifically pertaining to BWC uncovered throughout the period of this research [1940's - 1996] was scant (Millership, 1976; Pegg, 1982; Sperring, 1993; Whiteside, 1976). Most of the material reviewed originated in the United Kingdom and the United States of America. Initially this was viewed by the researcher as a limitation of the study, however, most historical informants indicated that the practices in the burns unit emulated practice from the UK or from the USA.

The conceptual framework for this research provided the researcher with an effective model on which to determine the roots of Australian burn wound care practices. The conceptual framework adapted from Gibbs' Reflective Cycle (1988) for this nursing study, facilitated exploration of burn wound care in Australian burns units, evolving within the system of western medicine, in Australia. The researcher has identified two themes of management within western medicine: the medical mechanistic approach and the supportive or nurturing approach.

These two themes are evident in the care of the burn injured. The mechanistic approach to care, preventing burn wound sepsis, which controls or manipulates the body to respond to injury or illness. The other theme, the supportive or nurturing approach, supporting the body in its responses to the injury or illness in this case burn injury, to promote comfort and healing.

The different approaches to BWC are depicted using diagrams, allowing a pictorial representation for the approach endorsed. The researcher would understand the mixed approach, when circles representing a mechanistic and a supportive model of BWC to be the optimal. This would indicate that the individual situation of the client is assessed and the appropriate wound care is implemented based on assessment rather than any clinical rituals or routines in burn wound care.

Historical Perspective

The HI's for this nursing study identified that BWC was driven by the medical staff. Every historical informant agreed that the prevention of infection was the priority in burn wound care. The researcher postulates, based on the information obtained through the data collection and subsequent generation of research findings, that BWC at the **inception** of specialised burns units, from the mid 1950's to as recently as 1982, was derived from the mechanistic model, depicted as a single circle, the mechanistic model .

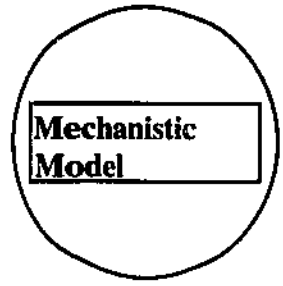


**Figure 5. The Mechanistic Model**

From the research findings, exploring BWC management strategies based on the depth of injury, superficial, partial thickness or full thickness burn did not identify evidence of the supportive model of wound management.

The Current Perspective

The findings of this nursing research concerning BWC from the current perspective (1995) did elucidate evidence of both the mechanistic and supportive models of management when considering BWC. There was a difference in the degree of 'mix', the overlap of these two themes perceived by the researcher.

The superficial burn wound was predominantly managed by the burns nurse. There was clear evidence of consultative and collaborative decision making concerning BWC strategies. The dominant theme in BWC was the supportive model. The nurses identified pain management and patient comfort as rationales for the strategies endorsed. This model of BWC for superficial burn wounds would be depicted, as one circle, the Supportive Model, as in Figure 6.

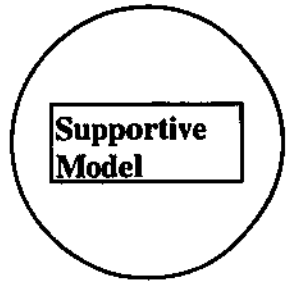


**Figure 6. The Supportive Model of BWC for Superficial Burns**

In the management of the partial thickness burn wound, it was shared between the burns nurse and the medical team. There was evidence in the BWC strategies advocated that a number of units supported standard management for the first 48 - 72 hours for the prevention of infection. There was clear evidence of collaboration and consultation that was reciprocal, between the nurse and the medical team, in BWC for the partial thickness wound.

The researcher found that both the supportive and mechanistic approach could be identified in the management strategies advocated. The model of BWC for partial thickness burns would be shown with equal portions of the mechanistic model and the supportive model overlapping, as depicted in Figure 7.

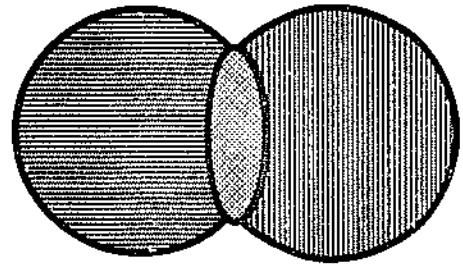

**Figure 7. The Collaborative Model of BWC for partial Thickness Burns**

There was growing emphasis on discharge planning to reduce length of hospital stay, for partial thickness burn injuries, in a number of units nationally. The cost of dressing

products and the advantages and disadvantages of each product in use could be discussed at length. All CI's described the lack of randomised trials comparing products.

The findings of this nursing research identified that BWC for the full thickness burn injury is directed by the mechanistic approach. Every informant verified the seriousness of this depth of injury and tissue destruction. The risk of infection was emphasised. The need to minimise bacterial counts and preserve the eschar intact until surgical debridement was identified by every informant. The current management of the full thickness burn injury would be depicted as in Figure 8.

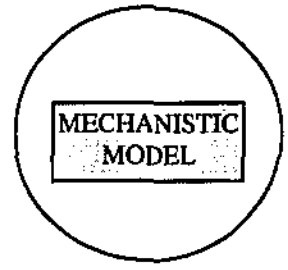


**Figure 8. The Mechanistic Model of BWC for Full Thickness Burns**

This chapter discusses the outcomes evident from the study, exploring Australian burn wound care. The researcher had also included findings that do not directly concern burn wound care, but enrich our knowledge about Australian burns nurses and burns nursing. This information contains some unexpected insights into the preparation of the Charge Nurse, the management of pain in burns settings and the progress of the paediatric settings.

The literature reviewed for this research predominantly discussed the utilisation and effectiveness of antibacterial preparations in burn wound care, supporting a mechanistic approach to wound management and wound healing. The literature did not strongly

reinforce or support practices in burn wound care where supporting and protecting the burn wound were the key principles of wound management.

The literature available would suggest that there is much to be done to evaluate the various practices being advocated by burns units. This is not a situation exclusive to Australia, but a universal trend. The absence of large randomised multi-centred trials in products available for wound care suggest there is much that could be done to find the best options for the three depths of burn wound. The findings of this study provide the foundations for further exploration into the best practice for burn wound care.

The information about Australian burn wound care is presented in the previous chapter. The management of the burn wound from an historical perspective can be aligned with those practices endorsed through medico-nursing publications, originating from burns specialists, in both the United States of America and in the United Kingdom, spanning over the last thirty years.

There is agreement on the management of the full thickness burn injury. The researcher believes that much more could be done to investigate the best way to manage the superficial and partial thickness burn wounds.

Australian practices in burn wound care are consistent with those practice identified in the medico-nursing literature. The range of practices that are popular and accepted indeed supports the need for further investigation in this area of wound management.

## Historical Perspective

It was of interest to the researcher that the burns units in Australia had developed and evolved as specialist centres for the treatment of the burn injured, over a time span of almost thirty years, between the mid 1950's and 1982. From the research process utilising historiography, other knowledge was gleaned that was pertinent in the history of burns units, though not specifically to burn wound care.

### The Pioneering Charge Nurse

The research informants (HI) described and demonstrated resourcefulness and tenacity for their roles as the Charge Nurse. (HI7): "*I vividly remember when I went to take over the Burns Unit, the supervisor of the area gave me the thinnest book, Muir's book* (Muir and Barclay), ... *Muir and Barclay's little book and a Nursing Times article on the care of burns - and that was all, that was it, that was me set up for the job, it was unbelievable*".

Another HI remembered, "*I suppose because I had not been exposed to very much burns care at that period, it used to worry me a little bit that we couldn't do more ...I used to read quite a lot, but of course it was nothing within this climate or within our own particular sphere* (burn management)" (HI6).

Another informant (HI5) clarified the position of how burn wounds were managed. At the time of the interview (HI5) could identify disadvantages of the wound management strategies "... *at the time we didn't think there were any disadvantages, because we did*

*not know about other treatments, we thought we were doing the very best and the most modern treatment that we possibly could*".

The Australian Professional Association for Burns

ANZBA was established in 1975. The Australian and New Zealand Burns Association (ANZBA), is the professional body for burns health professionals. The researcher was able to obtain the first three years proceedings of this organisation from one of the research participants (HI3). ANZBA has held annual conferences and meetings every year. This forum is interdisciplinary, with nurses actively involved in the organisation from the first committee meeting in 1975.

This multidisciplinary organisation provides the ideal forum for discussing and promoting all aspects of burn management. The generation of innovative solutions to the complex problems of the burn injured are developed through networking and sharing information. This forum would be an ideal platform for a nation wide research project exploring BWC practices, to determine the best practices for superficial and partial thickness burn wounds.

Burn Wound Care Revisited

The researcher found the way by which some HI recalled details of burn wound care fascinating. (HI3) remembered the inception of the unit by the superintendent at that time, the relocation of the unit due to an horrific bush fire in the mid sixties, which almost engulfed the original site. Silver sulphadiazine cream was first utilised on those

disaster victims at that time. The treatment strategy of using polyurethane bags with Silvazine cream for burned hands was initiated after the Falklands War.

(HI8) recalled, "*...when I was doing my training here, in the mid fifties, we used to use EUSOL to lift off the slough*". Later during the interview, (HI8) worked through the inception of the burns unit by remembering the academic associations of the hospital and the personalities involved at the time. (HI8) stated, "*With the X University we got professors from Scotland and England and Professor Z, it was his baby so to speak* [the burns unit]".

The descriptive terminology used by the pioneer burns nurse was also fascinating. This highlighted the usefulness of colour photographs to support the interview guide. Two HI participants described the partial thickness burn as a 'moist burn', due to the levels of exudate produced by this wound (HI6 and HI11). The terminology 'partial thickness burn' was not familiar or comfortable. The researcher reassured the informants during the interview, that 'moist burn' was acceptable for the research process.

It was an insightful learning experience; the researcher was not aware of these events as they had occurred in history, nor their impact on burn wound care or the evolution of the burns units. The terminology describing the burn wound has evolved over the years into classification systems, some of the previous terms may have been lost - this nursing study has captured the term of 'moist burn', describing the partial thickness burn wound.

Pain Management

This study did not explore pain management strategies utilised in burn wound care. The research informants however, discussed pain during the interview process. (HI7) reported, "*The nursing staff were conscious of the fact that they were actually inflicting pain in the process of dressing changes which were not well* (managed) *by the types of analgesia that we used ... we were also fearful at the time of addiction in people ... there was a lot of, a lot of pain that wasn't dealt with by analgesics*".

Another informant, (HI8) stated, "*It was horrific, I mean, they mostly are horrific burns. The pain control here was pathetic. When I say pathetic - something like that* (indicating to the full thickness burn photograph) *we would probably give them something like Panadol in those days*". The memory of beliefs concerning pain where reiterated by (HI10), "*Pain was a big factor .. people had this sort of view that children sort of didn't feel pain and that was very distressing*".

The Paediatric Burns Unit

The psychosocial aspects of managing the paediatric patient has changed considerably since the inception of specialist units to the present time. This study did not explore this domain of burns management. However, during the interview process, information regarding psychosocial aspects of care were identified.

The historical informants portrayed a bleak image of the paediatric burns unit. The children were confined to their beds, there were no play leaders, visiting hours were strict - and there were no visitors during doctors rounds. Informants talked about the

isolation experienced by the family and child. *"There was no such thing as a social worker in those days"* (HI10). (HI4) shared, "Then, *I don't think the doctors had much idea about what the parents and the staff and the child were going through*". (HI10) remembered, *"The other thing was that there was not a lot of family involvement ... it made it difficult for me as a person to work with the child because of pain and the lack of family support"*.

## The Current Perspective

The (CI) interviews portraying the paediatric settings, described a multidisciplinary patient focused team managing the burn injured child. The patient and family were participating in care. Interaction between the injured child, parents and siblings is seen as essential - part of the healing process. CI's identified that the patients (children) are able to play together. Parents are encouraged to bring in the child's favourite foods to ensure the necessary and essential nutritional requirements are met.

HI5 succinctly gave the following insight comparing the past to the present situation, *"...the kids were hospitalised, they were in a strange environment, they undertook a painful procedure on a daily basis, they got hysterical and phobic and all those things. Whereas today, we would whack Omiderm on that* (indicating to the partial thickness burn) *and maybe send them home*".

There was an established emphasis on home care management or out patient care. The paediatric settings have evolved more progressively; the CI's from these settings were able to articulate more supportive management strategies for burn wound management.

There was conclusive evidence that the paediatric units have moved away from the traditional daily dressing routine and wound management strategies. The cost effectiveness of the strategies used in the paediatric settings were also stipulated as a sound reason for changing the BWC practices.

Burns do not Occur Discretely on the Body Like Photographs

The research participants, the CI's identified that it was rare in practice to encounter areas of burn that were discrete, superficial, partial thickness or full thickness areas. The injury usually presents as part of a whole burn scenario. HI7 referred to the burn injuries as occurring as mixed burns not as separate and discrete areas.

## Summary

The data collection and subsequent rich information pertaining to burns care, was not isolated to the discreet care of the burn wound. This chapter has described the findings of this nursing study which explored Australian burn wound care. In addition the researcher has gained a valuable insight into; the Charge Nurse - the pioneer; the evolution of the paediatric burns unit - incorporating the psychosocial needs of the child and family, and the issue of pain in burns management. The researcher includes these insights into burn care, so that they may stimulate others, by providing direction for nursing research, investigating these important issues.

# CHAPTER SIX

# CONCLUSION

The researcher has elucidated and described the burn wound care practices that were advocated at the inception of specialised burns units in Australia. The burn wound care practices currently endorsed have been described to give depict a starting point for exploring how best to manage BWC in the future. The current practices have changed significantly compared to BWC at the inception of specialised burns units.

Whilst research is published and available, the impetus to pursue change in practice or begin to reflect on how things are managed requires flexibility. The knowledge of the burns nurse needs to be increased with regard to the intracellular activities of the healing or injured integument. Practitioners need to examine how burn wound care is done and question why practitioners continue to manage burn wounds in the same way, a unit based tradition of custom and practice.

The knowledge concerning wound healing and the intricacies of healing at an intracellular level is available. Practitioners are able to apply the research process to assess the effects of their nursing interventions (ie. BWC practices) scientifically, to determine what strategies have a therapeutic effect on the healing wound.

**Directions for the Future**

This nursing study has identified the ways in which burn wounds are managed in Australia. Recommendations following the completion of this study include the need for controlled, randomised, multi-centre trials to determine how best to manage the burn wound.

Evaluation of all the products utilised in BWC and techniques [ie. frequency of BWC] is essential. Criteria for dressing selection in BWC could then be recommended based on best practice from the perspective of optimal wound care practices; including levels of exudate and pain management. The impact of products on the patient's activities of daily living and cost efficiencies [nursing time and product unit cost] could all be determined. This study has identified the demand for post graduate nursing courses in burn management and short courses to keep nurses informed of trends and practices in wound management, based on the findings of clinical research.

The literature available in Australia on Australian practices in burn wound care were not easily accessed. Literature pertaining to the care of the burn wound needs to be published and accessible on a national level, through an Australian journal. This would provide the conduit for presenting clinical research projects and disseminating the findings across the nation.

In the future, funding should be secured to develop a National Institute for Burns Research, to co-ordinate the research efforts of multidisciplinary, collaborative research teams. This institute would be a vital link for every burns unit, facilitating networking between units and nurturing research relationships between different site, with common interests and goals.

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## APPENDIX A.

### Demographic Data Sheet

**GENDER:** Male..... Female.....

**AGE RANGE:**

| | | |
|---|---|---|
| 20 - 24 | 40 - 44 | 60 - 64 |
| 25 - 29 | 45 - 49 | 65 - 69 |
| 30 - 34 | 50 - 54 | 70 - 74 |
| 35 - 39 | 55 - 59 | 75 - 79 |

**NURSING POSITION:** .....

**NURSING QUALIFICATIONS:** .....
.....
.....
.....
.....

**YEARS OF EXPERIENCE NURSING:** .....

**YEARS OF EXPERIENCE BURNS NURSING:** .....
**(including other hospitals)**

## APPENDIX B.

### Letter of Introduction

Mrs A. Smith
The Director of Nursing Services
All Seasons Hospital
GPO Box XYZ
Perth. WA. 6000

Jaynie Sands
67 Duke St,
Scarborough.
WA. 6019.

30 March 1995

Dear Mrs Smith,

I am a Master of Health Science (Nursing) student at Edith Cowan University, Western Australia. My thesis proposal: "A Reflective Analysis of Burn Wound Care - an Australian Perspective is a descriptive qualitative study examining burn wound care."

The purpose of the study is to describe and compare burn wound management conducted in the individual Burn Units in Australia, at two periods of time.

I am writing to seek your permission to obtain and include the burn wound care protocols endorsed at your hospital; at the inception of the Burns Unit and to the present time. I am interested in establishing the official burn wound care practices advocated in Australia.

If permission is granted a signified copy of the burn wound care protocols will need to be forwarded to me. It would be most helpful if the author (s) names could be given in the correspondence to facilitate further discussion. If this is not possible, the Clinical Nurse Specialist and other key nursing personnel would be useful resources for me. It is anticipated that two interviews will be necessary to clarify the data, in keeping with the methodology proposed.

These interviews will be audiotaped to ensure accuracy in the data collection, this tape will be destroyed once transcription has been carried out. All data collected from your hospital will be kept in the same file. All identifying material will be removed to preserve anonymity during data analysis. I have enclosed a copy of the proposal for your perusal.

Thanking you in anticipation of an early reply,

Yours sincerely,

Jaynie E Sands
RGN,Ba.HSc.(Nursing)

## APPENDIX C.

### Letter of Participation

Mrs .....
The First Charge Nurse,
The Burns Unit,
.....Hospital

Jaynie E Sands
67 Duke Street,
Scarborough.
WA. 6019.
Ph: (09) 245 3727
Fax: (09) 383 2402

6 May 1995

Dear .....,

This proposed research study is examining Burn Wound Care from an Australian perspective. There are currently thirteen Burns Units in Australia. As the researcher, I am looking at the Burn Wound Care from the inception of specialised Burns Units to the Burn Wound Care practices endorsed today. The researcher would interview the Charge Nurse / Clinical Nurse Specialist / Clinical Nurse Consultant of each Australian Burns Unit at the Units inception and at the present time. A study of this nature, recording the burn wound care endorsed in Australia has not been carried out to date. The potential benefits of this study include the improvement of patient care and assistance to people who have burns.

As a participant in the study data collection, the researcher would need to gain your consent to a semi-structured interview about the Burn Wound Care practices endorsed at the Burns Unit, during your career. This interview would be audiotaped to allow accurate transcription of information. There may need to be some correspondence to confirm interview details following transcription by letter or fax.

The researcher declares that as participant in the study, your confidentiality and anonymity would be preserved at all times: once the interview and any follow-up correspondence is completed, all identifying material will be removed from the data.

If you would be willing to participate in this research, could you please sign the authorisation attached and forward it to me, so that I can proceed with the necessary correspondence and arrangements.

Yours sincerely

.....
Jaynie E. Sands

## APPENDIX D.

### Letter of Consent

### Participant Authorisation

I .....(please print),

Am willing to participate in the proposed research to be conducted by Jaynie Sands. I understand that this will involve a semi-structured interview and may require some correspondence to clarify details following the transcription of the audiotape.

I am assured that all identifying material will be removed from the data following analysis, preserving my confidentiality and anonymity completely.

Signed,

.....

## APPENDIX E.

### Declaration Binding the Researcher to Confidentiality

I, Jaynie Sands, do hereby promise to protect the confidentiality of the name - or any identifying information gained by me in the conduct of nursing research relating to Burn Wound Care protocols in Australian Burns Units in 1994 -1995.

..... Date: .....
Signature of researcher

.....
Witness to signature

## APPENDIX F.

### Interview Guide

The Reflective Cycle was developed by Gibb (1988) to explore experiences in a way that allows that experience to be a developmental exercise. To apply this cycle to exploring Burn Wound Care, the researcher will show each interview participant the three photographs of the classifications of Burn Wounds. For each photograph the interview participant will be asked these questions in accordance with Gibb's Model:

**DESCRIPTION**
*What happened when this type of burn wound presented at the Burns Unit?*
(not just the admission details - the ongoing management)

*How was this burn wound managed after admission?*

**FEELINGS**
*What were you thinking and feeling with regard to the management of this burn wound?*

**EVALUATION**
*What was (*good and bad) about the experience which you have described?*
*(try positive / negative or advantages / disadvantages)

*What can you recall about the experience* - *the good and bad elements*
*-Staff or Patient factors*

**ANALYSIS**
*What sense can you make of the situation?*

*Why was the burn wound care done in this way?*

*What were the origins of this burn wound management ?*

*What were the influencing factors in determining how the burn wound would be cared for?*

*When was it put in place (written - if known)?*

*How did it come about - this way of doing things?*

*Why are these practices advocated?*

**CONCLUSION**
*What else could you have done?*

*What other wound care could have been employed*

**ACTION PLAN**
*If this situation arose again what would you do?*

*What are nurses doing today?*

*Are there plans to change the burn wound care in the future?*

*Do you think there should be changes made?*

## APPENDIX G.

### Interview Pictorial Model

Superficial

Partial Thickness

Full Thickness

# APPENDIX H.

## Glossary of Products used in Burn Wound Care

**Cleansing Agents**

**Bath Oil** :(Johnson and Johnson) Mineral oil [parraffin] and fragrance.

**Cetavalon** :brand name for Cetrimide 40% which was diluted to strengths up to 1% as an antiseptic agent.

**Cetrimide** :antiseptic agent utilised in wound care.

**Chlorhexidine** :an antibacterial chemical composition $C_{22}H_{30}Cl_2N_{10}$ effective against a wide variety of gram-negative and gram-positive organisms (Mc Cullough, Ed., 1982).

**Chlorhexidine Gluconate 4%** :antiseptic of chlorhexidine gluconate 4%.

**Hibitane** :concentrated antiseptic chlorhexidine gluconate 5%, 50g / litre.

**Hibitane 1:2000** :dilution of Hibitane in bath water.

**Infacare** :solution of emollient and sodium lauryl sulphate added to bath water.

**Johnson's Baby Shampoo** :**(Johnson and Johnson)** water, Polysorbbate 20, Sodium Laureth Sulfate, Lauroamphaglycinate, and Lauryl Betaine, citric acid, thickener, fragrance, colouring and preservatives.

**Lux Flakes** :thought to be a pure soap. Composition includes boric acid.

**Savlon** :a specifically formulated liquid antiseptic containing Chlorhexidine 0.3% and Cetrimide B.P. 3% (Thomas, 1994).

**Saline** :NaCl in an isotonic solution of distilled water 0.9%.

**Velvet Soap** :thought to be a pure simple soap.

**Topical Agents**

**Bactigras** :(Smith and Nephew) loose cotton leno-weave fabric impregnated with soft white paraffin BP, containing 0.5% w/w Chlorhexidine Acetate BP (Thomas, J. Ed, 1994).

**Chlorhexitulle** :(Roussel laboratories Ltd.)loose cotton or rayon gauze impregnated with soft white paraffin BP, containing 0.5% w/w Chlorhexidine Acetate BP.

**Emollient** :ointment of soft white paraffin.

**Mercurochrome** :a topical antibacterial of merbromin $C_{20}H_8Br_2HgNa_2O_6$ of 1%, 2% or 10% (Mc Cullough, Ed., 1982).

**Neomycin Ointment** :a broad spectrum antibacterial antibiotic produced by *Streptomyces fradiae*, effective against a wide range of gram-negative organisms (Mc Cullough, Ed., 1982).

**Silver Nitrate** :0.5% solution prepared using distilled water as the dilutent. It is an antibacterial solution that is bacteriostatic and effective against the entire spectrum of burn organisms (Trofino, Ed., 1991).

**Silvazine** :(Smith & Nephew) a white hydrophilic cream containing Silver Sulphadiazine 1% w/w, Chlorhexidine Digluconate 0.2% w/w. The cream is a semi-solid oil in water emulsion (Thomas, J., Ed., 1994).

**Soframycin** :Framycetin Sulphate 15 mg/g and Gramicidin 0.05 mg/g. The anhydrous ointment base consists of soft paraffin and lanolin (Thomas, J., Ed., 1994).

**Sulphamylon** :(also called Mafenide) cream that is effective against Pseudomonas infection. It is not effective against gram- positive organisms (Muir, Barclay and Settle, 1984).

**Xeroform** :fine weave cotton gauze impregnated with 3% bithmuth trybromophenate.

**Dressing Products**

**Bilroths** :thin rubber sheet placed over the dressing to keep the dressing moist.

**Chux** :commercially available synthetic household wash cloth, sterilised and packaged as a wound care product.

**Compress** :open weave cotton gauze between 8 and 16 layers thick, moistened as a dressing.

**Combine** :cotton / wool filling with an absorptive cotton layer.

**Defries Burns Pads** :(Defries Industries) cotton wadding absorbant dressing for high levels of exudate in wound management.

**Duoderm** :(Convatac) interactive, hydrocolloid dressing comprised of cellulose, gelatines and pectin backed with a polyurethane foam (Dealey, 1994).

**Exu-dry Pads** :(Baxter) non-adherent highly absorbant dressing.

**Fastanet** :elasticised netting for securing dressings.

**Fixomull** :(Biersdorf) porous synthetic fabric adhesive tape with polyacrylate adhesive.

**Hyperfix** :(Smith and Nephew) apertured, non-woven polyester fabric coated with acrylic adhesive (Thomas, Ed., 1994).

**Jelonet** :(Smith and Nephew) consists of a len-weave fabric of cotton or cotton and rayon impregnated with soft paraffin. This product contains not less than 175 grams of paraffin per square metre (Thomas, Ed., 1994).

**Lyofoam** :(Seton Healthcare Group) a polyurethane foam sheet, the wound contact side is smooth and hydrophilic (Dealey, 1994).

**Melolin** :(Smith and Nephew) non-adherent dressing comprising of a polyethylene terephthalate film bonded with an absorptive layer of cotton, viscose and polyacryonitile fibres, with a layer of apertured non-woven cellulose fabric (Thomas, Ed., 1994).

**Omiderm** :(ITG Laboratories) a transparent, non-adhesive membrane of polyurethane bonded with hydrophilic monomers (Dealey, 1994).

**Opsite** :(Smith and Nephew) an adhesive, vapour permeable, polyurethane film dressing (Dealey, 1994).

**Setanet** :(Seton Healthcare Group) elasticised net used to secure dressings.

**Surgifix** :(Biersdorf) elasticised netting used to secure dressings.

**Tubigrip** :(Boots Company Australia Pty. Ltd) elasticised tubular bandage available in a variety of sizes.

**Tulle gras** :open weave cotton gauze impregnated with soft paraffin (Dealey, 1994).

**Velband** :(Johnson and Johnson) orthopaedic cotton / wool roll with absorptive properties and two way stretch.

**Vasgauze** :loose weave cotton / rayon impregnated with white paraffin.

**Webril** :(Kendall) loose woven cellulose fibre available in a variety of sizes and as bandages that stretch three ways.

**Ultracare** :(Zimmers Pty. Ltd.) non-adherent dressing, three layer laminate sheeting consisting of two outer layers of non-woven rayon around a middle layer of polyurethane foam.