

RYE PHARMACEUTICALS CLINICAL EVIDENCE LITERATURE REVIEW THERAPEUTIC GOODS DOC 2007

DATABASE SEARCH

1. *CINAHL – Cumulative Index to Nursing & Allied Health Literature.*

Keywords Searched:

- Tea Tree Oil / or Burns / or Gels (full text) Results 720
- Burnaid Results 0
- Emergency Medical Services / or Burns / or first aid burns dressings or First Aid Results 13375
- Hydrogel dressings or Hydrogel Results 257

Combined search of parameter 4 & 5 Results 9

Clinical articles found related to: Burnaid, Hydrogel Burns Dressings and Burns first aid were;

Hudspith J. Ryatt S. **ABC of Burns: first aid and treatment of minor burns....**BMJ.2004 Jun 19; 328 (7454): 1487-9

Jandera V.Hudson DA. De wet PM Rode H. Cooling the burn wound: evaluation of different modalities **Burns.** 2000 May; 26(3): 265-70

2. Ovid MEDLINE (R) 1996 to Present with daily update

Keywords searched:

- Tea Tree Oil / or Burns / or Gels Results 14833
- Burnaid Results 2
- Emergency Medical Services / or Burns / or first aid burns dressings or First Aid Results 19567
- Hydrogel dressings or Hydrogel Results 871

Combined search parameters 4 & 5 Results 6

Clinical articles found related to: Burnaid, Hydrogel Burns Dressings and Burns first aid were;

Faoagali J. George N. Leditschke JF. 1997 Does Tea Tree Oil have a place in the topical treatment of Burns? **Burns: journal of the international society for burn injuries** 23(4):349-51, 1997 Jun.

Price J. 1998 Letters to the editor, **Burns: journal of the international society for burn injuries** 24 1998; 80-83

T J Coats, C Edwards, R Newton and E Staun 2002. The effect of gel burns dressings on skin temperature **EMJ** 2002;19;224-225

H L Ashworth, T C S Cubison, P M Gilbert and K M Sim. 2001 Treatment before transfer: the patient with burns **EMJ** 2001;18;349-351

Osti E., Osti F. 2004 Treatment of Cutaneous Burns with Burnshield (Hydrogel) and a semi-permeable adhesive film **Annals of Burns and Fire Disasters** Vol XVII Spetember 2004.

Osti E., Osti F. 2002 Cutaneous burns of various degress. Our experience with Burnshield. Preliminary data **Annals of Burns and Fire Disasters** Vol XV Decmber 2002.

3. Science Direct

Keywords searched:

- Burns
- PreHospital
- First aid
- Trauma
- Dressings
- Cooling
- Analgesia

Clinical articles found related to: Burnaid, Hydrogel Burns Dressings and Burns first aid were;

Keith Allison, Keith Porter. 2004 Consensus on the pre-hospital approach to burns patient management **Injury** Vol 35, Issue 8, August 2004; 734-738

4. Pub Med

Keywords searched:

- Prehospital management of Burns Results 37

Clinical articles found related to: Burnaid, Hydrogel Burns Dressings and Burns first aid were;

Lonnecker S, Schoder V. 2001 Hypothermia in patients with burn injuries; influences of prehospital treatment **Chirurg** 2001 Feb,72(2):164-7

5. GOOGLE Websearch

Keywords searched;

- Burnaid Hydrogel dressings Results 36
- Burns first aid dressings Results 1,120,000 (first 100 references reviewed)

Clinical articles found related to: Burnaid, Hydrogel Burns Dressings and Burns first aid were;

Rebecca A McCormack, Erik La Hei, Hugh C O Martin. 2003 First aid management of minor burns in children: a prospective study of children presenting to the Children's Hospital at Westmead, Sydney **MJA** 2003; 178:31-33.

Hudspith J. and Rayatt S. 2004 First aid and treatment of minor burns **BMJ** 2004;328:1487-1489

Bain G, Kuwahata H, Raymond B, Foster R. 2005 Tea Tree/Hydrogel Dressing used in Wound Care **RIRDC** August 2005 Publication Number 05/114.

6. RYE Pharmaceuticals Literature Database.

P.Hart, C.Brand, C.Riley, Prayer and Finley-Jones. 2000 Terpinen-4-oL, The main component of the essential oil of Melaleuca Alternifolia (tea tree oil) suppress inflammatory mediator production by activated human monocytes. **Inflammation Research** 49,200 619-626.

P.Hart, C.Brand, C.Riley, Prayer and Finley-Jones. 2001. The water soluble components of essential oil of Melaleuca Alternifolia (tea tree oil) suppress the production of superoxide by human monocytes, but not neutrophils active in vitro. **Inflammation Research** 50,2001 213-219.

J. Finley-Jones, P.Hart, T.Riley, C. Carson. 2001. Anti-inflammatory Activity of Tea Tree Oil. **A report for the rural industries research and development corporation.** Feb 2007.

Cox, Mann, Markham, Gustufason, Warmington and Wyllie. 2001. Determining the antimicrobial actions of Tea Tree Oil. **Molecules** 6, 87-91.

Carson, Mee, Riley. 2001 Mechanism of Action of Melaleuca alternifolia (Tea Tree) Oil on staphylococcus aureus Determined by Time-Kill, Lysis, Leakage, and salt tolerance assays and electron microscopy. **Antimicrobial Agents and Chemotherapy** June 2002 p 1914-1920.

Literature Review: The role of hydrogel (Burnaid) in the first aid treatment of burns.

Mark Rosenthal, CNS AICU Prince of Wales Hospital Randwick NSW, Bachelor of Nursing QUT, Grad Cert Critical Care Nursing. RYE Pharmaceuticals Product Support Management. March 2007.

The aims of first aid should be to stop the burning process, cool the burn, provide pain relief, and cover the burn (1). It is well known that cooling a burn lessens pain and decreases burn depth, hence speeding healing times and decreasing the risk of scarring (3). If immediate first aid cooling of the burn does not occur, intense inflammation causes progression of the depth of the burn over 48 hours (2). Even though it has been established that early first aid is vital and is relatively simple to administer, there is still a large percentage (47%) of non compliance in adequate first aid received by patients who present to hospital (4). More needs to be done to prevent burn injuries given that in Australia annually more than 200,000 people are accidentally burned, 20,000 are taken to hospital and 115 die every year from burns (5).

Australian and New Zealand Burns Association (ANZBA) guidelines on first aid cooling for burns are; cool the burn surface with cool running water for up to 20 minutes up to 3 hours after the burn (6). Ordinary tap water with a temperature 8 to 20 degree C is suitable (7). Burnaid is a hydrogel containing >90% water and a small percentage of Melaleuca oil impregnated into a proprietary gel. It is designed for use as a first response treatment to cutaneous burn injury. (8) Clinical trials have clearly demonstrated the beneficial effects of cooling the partial thickness burned wound for at least one (1) hour by means of either repeated cold tap water compresses at ± 15 C or with Melaleuca Hydrogel (9).

In many cases continuous flushing with tap water can be impractical or logistically impossible to continue whilst transporting a patient. Cooling or first aid interventions in many cases are stopped for patients to be transferred for medical treatment (3). Burnaid hydrogel is an ideal transport medium that continues the cooling process whilst mobilizing the patient. Cooling with tap water for prolonged periods, especially in minor burns can also be impractical. In the event that general activities must continue, and if the burn is a minor injury, a water gel product may be applied (7). In a country that values its water resources there are many areas that have insufficient quantities of fresh cool water required to provide first aid for burns. In a recent interview in regards to rural management of burns, Dr Peter Maitz, Director of Burns Unit at Concord Hospital identified this as a problem. "As cold running water can be a hard thing to find in the bush, I advise people to purchase a hydrogel dressing which you can get from a pharmacy and keep handy in the first aid kit. These moist specially packaged bandages work using evaporation to quell the burning process". (5)

Guide lines for first aid treatment have been reviewed in aspect of this issue of water not being available. Dr John Greenwood, Director Royal Adelaide Hospital (RAH) Burns Unit, presented guidelines initiated by the RAH at the 2005 ANZBA scientific meeting. If water not available smear hydrogel (Burnaid) or hydrogel sheets over the surface of the burn (15).

Cooling the burned area is an emergency measure that both clinically and experimentally has always shown benefits (8). Cryotherapy improves the tissue response to thermal injury. This is achieved by a reduction in post burn hyperthermia, reduced inflammatory and microvascular changes, and less tissue necrosis and fibrosis. In addition there is less release of histamine, prostaglandins, thromboxanes, as well as reduced aerobic metabolism, less lactate production and metabolic acidosis. (9)

The inflammatory reaction involves a network of mediators which signal a variety of cell types, including lymphocytes, macrophages and neutrophils, to release products important in the killing of micro-organisms but which also cause tissue damage and pathology (11). This inflammation process is not only reduced through immediate cooling but may also be benefited from the small amount of Melaleuca Alternifolia (Tea Tree) Oil present in Burnaid. Vitro studies have shown Tea Tree Oil enables neutrophils to remain fully active in an acute inflammatory response, whilst suppressing monocytes inflammatory mediators thereby preventing oxidative tissue damage in a prolonged inflammatory state (12).

First aid treatments of burns also involve covering the burn and provide analgesia. Burnaid is an ideal dressing to cover the burn but also provides instant and ongoing pain relief in a number of ways. Exposed nerve endings will cause pain but covering the exposed burn and cooling will provide pain relief (1). The efficiency of Burnaid providing pain relief could be attributed to a constant contact layer of hydrogel on the surface of the burn, reducing direct contact of atmosphere air on the exposed nerve endings, allowing for heat transfer through the open cell foam away from the wound. In studies comparing different cooling modalities for burn treatment, it was observed a more immediate and persistent effect on reducing pain using hydrogels was seen (10). The effectiveness of Burnaid Hydrogel on pain may also be attributed to documented affects of Tea Tree Oil having local anesthetic properties. In-vitro studies conducted at the University of Sydney using Melaleuca Oil on isolated nerve preparations indicated a classical local anesthetic action of a reversible nature, but with some apparent difference in mode to a common local anesthetic substance such as procaine (13).

Covering the burn not only creates pain relief it should also provide a clean dressing to protect the wound from further contamination. Cutaneous lesions due to burns constitute a major problem, they are slow to heal, become infected,

cause persistent pain, and lead to unaesthetic scarring and invalidity⁽¹⁰⁾. Burnaid is a sterile dressing that contains a small amount of Tea Tree Oil. The antimicrobial actions of Tea Tree Oil are well documented and may help with prevention of secondary infections related to burns injuries. The active ingredients responsible for killing bacteria and fungi include terpinene-4-ol, alpha-terpineol and alpha-pinene. These substances act to produce inhibition of cell respiration and disruption of cell membrane permeability with the resultant leakage of potassium.⁽¹²⁾

Melaleuca Hydrogel is readily available as a compact, easily transportable light dressing, available in different sizes. A single application of Melaleuca Hydrogel is as effective as repeated cold water compresses and it is unlikely that Melaleuca Hydrogel application could lead to significant hypothermia when applied on a large burn.⁽⁹⁾ Cooling gels are often used by paramedics and are useful in cooling the burn and relieving pain in the initial stages⁽¹⁾. Recent product evaluation of Burnaid within large metropolitan hospital emergency departments has shown positive results. Advantages of Burnaid hydrogel in the emergency situation of note were; good effective analgesia with instant pain relief, patient not lying in wet bed and does not get cold, Burnaid is easy and quick to use as a treatment for burns injuries⁽¹⁴⁾. Burnaid rated highly as an effective first aid measure in the treatment of superficial/partial thickness burns. Burnaid's analgesic and cooling qualities are advantageous during initial burn management phases. Staff evaluating the product (Burnaid) identifies ease of application as a positive characteristic.⁽⁸⁾

REFERENCES:

1. Hudspith and Rayatt, 2004. **First aid and treatment of minor burns.** BMJ 2004;328:1487-1489 (19 June).
2. Dr J Harvey, 2007. **Burns rural workshop lecture notes.** NSW Severe Burn Injury Service lecture 2007.
3. McCormack, La Hei, Martin, 2003. **First-aid management of minor burns in children: a prospective study of children presenting to the Children's Hospital at Westmead, Sydney.** Medicine and the Community MJA 2003; 178: 31-33.
4. Law, 2007. **Australian & New Zealand Burn Association Newsletter.** January 2007.
5. Retailpharmacy, 2006. **Burn awareness needs to be a priority.** www.retailpharmacy.com.au
6. ANZBA, 2007. **First Aid in Burns.** ANZBA protocol website. 2007
7. Singer, 2006. **First aid for minor burns and scalds.** The Alfred Hospital & Work safe Victoria first aid protocol. 2006.
8. Wilson, Jennings, Free, Pacquola, Singer, Cleland, Thompson, 2006. **Product evaluation of Burnaid in the treatment of cutaneous burns.** ANZBA Annual Scientific meeting. Spetember 2006.
9. Jandera, Hudson, Wet, Innes, Rode, 2000. **Cooling the burn wound: evaluation of different modalities.** Burns 26 (2000) 265-270.
10. Osti, Osti, 2002. **Cutaneous burns of various degress. Our experience with burnshield. Preliminary data.** Annals of Burns and fire disasters vol xv December 2002.
11. Brand, Ferrante, Prager, Riley, Carson, Finlay-Jones, Hart, 2001. **The water-soluble components of the essential oil of Melaleuca alternifolia (tea tree oil) suppress the production of superoxide by human monocytes, but not neutrophils, activated in vitro.** Inflammation Research 50 (2001) 213-219.
12. Bain, Kuwahata, Raymond, Foster, 2005. **Tea Tree / Hydrogel dressings used in wound care.** Rural industries research and development corporation August 2005.
13. Spence, **Report on possible local anaesthetic activity of tea tree oil.** The University of Sydney department of pharmacology.
14. Wake, Kitto, Garvin, 2004. **Burnaid product evaluation.** The Royal Adelaide Hospital Audit, 2004.
15. Dr John Greenwood, 2005. **Community first aid protocol for thermal injury.** ANZBA 2005 scientific meeting presentation. Royal Adelaide Hospital, 1st June 2005.