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Burn first aid issues again—“Not seeing the forest for the trees”



Dear Doctor Wolf,

An increase in the incidence of burn injuries in the home has been reported during the COVID pandemic likely arising from prolonged isolation and avoidance of hospital visits due to fears of exposure to SARS CoV-2 [1].

In “Concerns regarding self-treatment of burns during COVID-19 lockdown” (Burns. Sep. 2020. Volume 46; 6: pp1486) Lee and George note the inclination to “self-treat” in this setting using hydrogel burn dressings may lead to preventable complications and delay expert assessment because of erroneous assumptions regarding the capacity of the user to determine burn depth [2].

In light of these concerns, closer scrutiny of commercial burn first aid “alternatives” like hydrogel burn dressings is of benefit given the poorly supported efficacy of the product in this role [(3),4] and inconsistent use across a wide spectrum of pre-hospital sectors [5,6].

For example, some EMS have discarded hydrogel burn dressings [7], others employ “hybridized” configurations such as only using the dressing function [8] or applying TBSA or age-based caveats [9] both approaches unsupported by evidence, whilst many employ hydrogel burn dressings as an option of last resort for “no water” scenarios. The technology has also been described as an “adjunct” to existing burn first aid [10].

Using hydrogel burn dressings as a contingency for “no water” burn scenarios belies the rarity of such events [11], the known delayed clinical effectiveness of water cooling [12] and the unlikely immediate availability of the product at hand for any burn emergency.

In the private sector, various water-cooling approaches are recommended by influential first aid organisations through in-house education programmes, at the same time, garnering substantial revenue through sale of “burn first aid” kits that feature hydrogel burn dressing products [13,14].

Elsewhere, hydrogel burn dressing companies exploit sponsorship pathways or benefit from promotional opportunities through private burns advocacy groups, charities and support agencies [15] or appear in local burn first aid recommendations [16].

The marketing of hydrogel burn dressings also benefits through the kudos of a continuing presence in the many commonly employed “minor” burn first aid guidelines [17] and the general appeal of “handy” consumer products [3].

At the same time, no universally accepted burn first aid model has been embraced by the expert bodies [18], including the role of hydrogel burn dressings in a cooling, dressing or dual role capacity, and only one burns association has published a formal “hydrogel position statement” outlining the preferred application of HBD in burn first aid [19].

Significant variation also exists in the hydrogel burn dressings industry itself with some manufacturers still promoting the technology as a primary burn first aid option

[20], others as a complimentary adjunct to existing first aid [21] or to treat “minor” burn injuries only [22].

Hydrogel burn dressing examples above highlight just one subset of the plethora of approaches to burn first aid and the confusion such variation must inevitably generate. Of note is the fact hydrogel burn dressings is the only intervention promoted and used in both lay and professional (EMS) practice despite its lack of clinical credentials.

In real world practice, the implications for the lay responder reacting under extreme duress to potentially devastating and painful injuries to a loved one or workmate, is a split-second reflexive decision driven by fear and anxiety to choose between an hydrogel burn dressings from a kit, apply a “home remedy”, try to recall one of the innumerable recommended practices while at the same time attempting to assess the extent and severity of the burn to determine whether emergency medical care resources are required.

That an attending ambulance may well employ a completely different form of burn first aid on arrival further exemplifies the bewildering current predicament of this area of pre-hospital care.

Given compelling evidence for a 20-minute water-cooling, simple dressing model [23–28] the inevitable conclusion is to see hydrogel burn dressings, like “home remedy” alternatives perpetuated by the internet commentariat [29], removed from burn first aid altogether in order to encourage use of the most effective form of care at the same time moving both the EMS and public mindset towards a standard model through innovative educational methods [30,31].

This should incorporate a redefined role for EMS focused on aggressive warming strategies to offset or prevent any cooling induced hypothermic complications, effective dressing, enhanced analgesic options and supportive managements instead of primary cooling.

The impetus to improve public education and compliance with burn first aid recommendations remains omnipresent on a global scale if further increases in preventable burn injuries are to be avoided [32–35]. This cannot occur without broader efforts to clearly define and establish universal parameters for burn first aid.

While hydrogel burn dressings retain an important role in hospital wound management, their continued inclusion in pre-hospital recommendations and practice guidelines and in the consumer market, serves only to distract from these goals and further highlights “the urgent need for international standards” via consensus within the expert burns community [36].

Burn first aid would benefit specifically from two innovations to reach its well documented clinical potential as an acute burn care intervention on a global scale – standardization and simplification. The argument for a single water-cooling model of burn first aid in the pre-hospital setting for all

thermal burns – irrespective of size or complexity, is compelling in my view. Lee and George have identified yet another reason to adopt this position and remove distracting “alternatives” like hydrogel burn dressings.

Until this milestone is reached, COVID scenarios or otherwise, the situation appears to be one of “not seeing the forest for the trees”.

Conflict of interest

The author declares no conflict of interest. The author declares no funding or sponsorship has been received.

REFERENCES

- [1] Ellison K. More burn injuries are occurring in kitchens during pandemic. Thanksgiving may see a rise in these accidents. The Washington Post; 2020 November 23. Available from: https://www.washingtonpost.com/health/cooking-burns-thanksgiving-accidents/2020/11/20/2d2663f0-2a0f-11eb-9b14-ad872157ebc9_story.html [Accessed 22 December 2020].
- [2] Lee JDE, George S. Concerns regarding self-treatment of burns during COVID-19 lockdown. Letter to the Editor. Burns 2020;46(6):1468–9. <https://doi.org/10.1016/j.burns.2020.06.007>.
- [3] Goodwin N, Spinks A, Wasiak J. The efficacy of hydrogel dressings as a first aid measure for burn wound management in the pre-hospital setting: a systematic review of the literature. Int Wound J 2016;13(August (4)):519–25. [doi:http://dx.doi.org/10.1111/iwj.12469](http://dx.doi.org/10.1111/iwj.12469).
- [4] Cuttle L, Kempf M, Kravchuk O, George N, Liua P-Y, Changa H-E, et al. The efficacy of Aloe vera, tea tree oil and saliva as first aid treatment for partial thickness burn injuries. Burns 2008;34(11):1176–82. [doi:http://dx.doi.org/10.1016/j.burns.2008.03.012](http://dx.doi.org/10.1016/j.burns.2008.03.012).
- [5] Allison K, Porter K. Consensus on the prehospital approach to burns patient management. Emerg Med J 2004;21(January (1)):112–4. <https://doi.org/10.1136/emj.2003.008789>.
- [6] Walker A, Baumber R, Robson B. Pre-hospital management of burns by the UK fire service. Emerg Med J 2005;22(March (3)):205–8. [doi:http://dx.doi.org/10.1136/emj.2004.015784](http://dx.doi.org/10.1136/emj.2004.015784).
- [7] Ambulance Victoria. 375 Manningham Road Doncaster Victoria Australia. 2020 Clinical Practice Guidelines. Available at: <https://www.ambulance.vic.gov.au> Clinical Practice Guidelines. CPG A0805 CPG P0803 2020. <https://cpg.ambulance.vic.gov.au/#/tabs/tab-0/info> [Accessed 9 December 2020].
- [8] Queensland Ambulance Service. Queensland Ambulance Service GPO Box 1425 Brisbane QLD 4001. Publications. Other. Clinical Practice Manual. Clinical Practice Guidelines. Trauma. Burns. CPG_TR_BU_0120 January. 2020 Available at: https://www.ambulance.qld.gov.au/docs/clinical/cpg/CPG_Burns.pdf [Accessed 24 December 2020].
- [9] District of Columbia Fire and EMS Department. 14th Street, NW, 5th Floor, Washington DC 20009 Available at: <https://fems.dc.gov> EMS Protocols. EMS Protocols Publication. Attachment(s). <https://fems.dc.gov/sites/default/files/dc/sites/fems/publication/attachments/DC%20FEMS%202017%20Protocol%20Update%20-%20April%201%2C%202019%20Part%201.pdf> [Accessed 23 December 2020].
- [10] Holbert MD, Griffin BR, McPhail SM, Ware RS, Foster K, Bertoni DC, et al. Effectiveness of a hydrogel dressing as an analgesic adjunct to first aid for the treatment of acute paediatric thermal burn injuries: study protocol for a randomised controlled trial. Trials 2019;20(January (1)):13. [doi:http://dx.doi.org/10.1186/s13063-018-3057-x](http://dx.doi.org/10.1186/s13063-018-3057-x).
- [11] BRANZ Burn Registry of Australia and New Zealand 9th Annual report. 2018/2019. “Place of injury – Activity at time of injury”. Pages 24–26. Available at: https://www.monash.edu/_data/assets/pdf_file/0009/2191752/BRANZ-annual-report18_19_FINAL.pdf [Accessed 22 December 2020].
- [12] Rajan V, Bartlett N, Harvey JG, Martin HCO, La Hei ER, Arbuckle S, et al. Delayed cooling of an acute scald contact burn injury in a porcine model: is it worthwhile? J Burn Care Res 2009;30(4):729–34. [doi:http://dx.doi.org/10.1097/bcr.0b013e3181ac059b](http://dx.doi.org/10.1097/bcr.0b013e3181ac059b).
- [13] St John Ambulance UK. 2020. <https://www.sja.org.uk/Shop>. First Aid Kits. Burns First Aid Kits. Burnshield EasyCare Burn Kit. Available at: <https://www.sja.org.uk/first-aid-supplies/first-aid-kits/burn-first-aid-kits/burnshield-easycare-burn-kit/> [Accessed 24 December 2020].
- [14] St John Ambulance Australia. 2020. <https://stjohn.org.au> First Aid Facts. English. Burn or Scald. Available at: https://stjohn.org.au/assets/uploads/fact%20sheets/english/Fact%20sheets_burn%20or%20scald.pdf [Accessed 24 December 2020].
- [15] Burnshield Head Office. 33 Scott Street, Waverley, Johannesburg, South Africa, 2090. 2020. <https://www.burnshield.com/> Burn shield and the Treatment of Burns. Available at: <https://www.burnshield.com/burnshield-and-the-treatment-of-burns/> [Accessed 22 December 2020].
- [16] Cremorne Medical Centre. Cremorne, Sydney, NSW. Available at: <https://www.cremornemedical.com.au/news-articles/burns-awareness-month-quick-burns-first-aid-guide/> [Accessed 24 December 2020].
- [17] Hudspith J, Rayatt J. ABC of burns. First aid and treatment of minor burns. BMJ 2004;328:1487–9. <https://doi.org/10.1136/bmj.328.7454.1487>.
- [18] Goodwin NS. Just the tip of the iceberg—inconsistent information on a global scale and the need for a “standard” model of burn 1st aid. Burns 2019;45(3):746–8. [doi:http://dx.doi.org/10.1016/j.burns.2019.01.009](http://dx.doi.org/10.1016/j.burns.2019.01.009).
- [19] Australian and New Zealand Burns Association. Albany Creek, Queensland, Australia. First Aid/Hydrogel Statement. June 2012-2. Viewed November 30. 2020. Available at: <https://anzba.org.au/care/first-aid/first-aidhydrogel-statement/>.
- [20] Waterjel Technologies. 50 Broad St, Carlstadt, NJ 07072. 2020. <https://www.waterjel.com>. Burn MD FAQ's. Available at: <https://www.waterjel.com/burn-md/burn-care/> and <https://waterjel.com.au/fx-business/why-water-jel.html> [Accessed 21 December 2020].
- [21] Mundipharma Pty Limited GPO Box 5214 Sydney NSW. 2001 (Australia). <https://mundicare.com.au/> Mundicare Burnaid Dressing. Available at: <https://mundicare.com.au/products/burnaid-dressing/> [Accessed 23 December 2020].
- [22] Dukal Corporation 2 Fleetwood Ct, Ronkonkoma, NY 11779. (USA). <https://burnaid.com/> First Aid for Burns. Available at: <https://burnaid.com/first-aid-for-burns/> [Accessed 24 December 2020].
- [22] First Aid Distributions Choice Medical Supplies. 205 Murphy Street, East Bendigo, Vic, 3550. 2020. <https://www.firstaidistributions.com.au/> First Aid Kits and Supplies. Burn Treatment. Burn Hydrogel Dressing. Available at: <https://www.firstaidistributions.com.au/products/burnhydrogeldressing> [Accessed 20 December 2020].
- [23] Ófeigsson ÓJ. First-aid treatment of scalds and burns by water cooling. Postgrad Med 1961;30(4):330–8. [doi:http://dx.doi.org/10.1080/00325481.1961.11694415](http://dx.doi.org/10.1080/00325481.1961.11694415).
- [24] Wood FM, Phillips M, Jovic T, Cassidy JT, Cameron P, Edgar DW, et al. Water first aid is beneficial in humans post-burn: evidence from a bi-national cohort study. PLoS One 2016;11(1):e0147259. [doi:http://dx.doi.org/10.1371/journal.pone.0147259](http://dx.doi.org/10.1371/journal.pone.0147259).

- [25] Harish V, Li Z, Maitz PKM. First aid is associated with improved outcomes in large body surface area burns. *Burns* 2019;45(8):1743–8, doi:<http://dx.doi.org/10.1016/j.burns.2019.05.006>.
- [26] Griffin BR, Frear CC, Babl F, Oakley E, Kimble RM. Cool running water first aid decreases skin grafting requirements in pediatric burns: a cohort study of two thousand four hundred ninety-five children. *Ann Emerg Med* 2020;75(1):75–85, doi:<http://dx.doi.org/10.1016/j.annemergmed.2019.06.028>.
- [27] Nature Research. Available at: <https://www.nature.com/nature-research/about>. “The Latest Advice on Burns”. <https://www.nature.com/articles/s41407-019-0186-3#:~:text=The%20advice%20now%20is%20to,damage%20and%20help%20reduce%20pain> [Accessed 14 December 2020].
- [28] London and South East England Burn Network. 2020. <https://www.lsebn.nhs.uk>. Healthcare Professionals. Downloads. LSEBN Initial Management of burns. 2018. Available at: <https://www.lsebn.nhs.uk/website/X13911/files/LSEBN%20Initial%20management%20of%20burns.pdf>. Accessed. Jan 02, 2021.
- [29] Burgess JD, Cameron CM, Cuttle L, Tyack Z, Kimble RM. Inaccurate, inadequate and inconsistent: a content analysis of burn first aid information online. *Burns* 2016;42(8):1671–7, doi:<http://dx.doi.org/10.1016/j.burns.2016.09.017>.
- [30] Burgess D, Cameron C, Watt K, Kimble RM. Cool runnings – an app-based intervention for reducing hot drink scalds: study protocol for a randomised controlled trial. *Trials* 2016;17:388, doi:<http://dx.doi.org/10.1186/s13063-016-1521-z>.
- [31] Skinner AM, La T, Brown H, Peat BG, Muller MJ. Reduced hospitalisation of burns patients following a multi-hospital campaign that increased adequacy of first aid treatment. *Burns* 2004;30:82–5, doi:<http://dx.doi.org/10.1016/j.burns.2003.09.009>.
- [32] Outwater AH, Van Braekel T. Prehospital care of burn injuries in Africa: a review, 1990–2018. *Burns* 2020;46(December(8)):1737–45, doi:<http://dx.doi.org/10.1016/j.burns.2019.08.009>.
- [33] Riaz R, Riaz L, Khan J, Baloch M. Survey on knowledge of first aid management of burns amongst medical and non-medical students in Karachi, Pakistan: need for an educational intervention? *Cureus* 2020;12(January (1)):e6674. <https://doi.org/10.7759/cureus.6674>.
- [34] Frear CC, Griffin B, Watt K, Kimble R. Barriers to adequate first aid for paediatric burns at the scene of the injury. *Health Promot J Aust* 2018;29(2):160–6, doi:<http://dx.doi.org/10.1002/hpja.184>.
- [35] Yu Q, Xiao YQ, Hu XY, Xia ZF. Cognitive level of first aid knowledge regarding small area burn among 2,723 child caregivers in Shanghai: a cross-sectional survey and analysis. *Zhonghua Shao Shang Za Zhi* 2019;35(3):198–204. <https://doi.org/10.3760/cma.j.issn.1009-2587.2019.03.007>.
- [36] Verity Bennett C, Maguire S, Nuttall D, Lindberg DM, Moulton S, Bajaj L, et al. First aid for children’s burns in the US and UK: an urgent call to establish and promote international standards. *Burns* 2019;45(2):440–9, doi:<http://dx.doi.org/10.1016/j.burns.2018.09.003>.

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<http://dx.doi.org/10.1016/j.burns.2020.11.020>

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Resveratrol promotes wound healing: A very short overview



With great interest, we have read the recent publication on resveratrol by Zhou et al. [1]. Based on their findings the authors stated that resveratrol has a positive effect on wound healing by attenuating the oxidative stress-induced impairment of cell proliferation and migration.

We absolutely agree on this, but resveratrol seems to be not only a promising candidate for the clinical treatment of cutaneous wound defects [1], resveratrol seems to be much more. Many very interesting publications have been published within the past months dealing with resveratrol and wound healing.

The aim of this letter is to promote a very short overview of some very recent publications (2019 and 2020) dealing with resveratrol and wound healing. One of the major aspects is to encourage the readers to perform more high quality pre-clinical and clinical research on this topic.

Prakoeswa et al. have demonstrated in their recent publication [2] that resveratrol promotes EGF, HGF, PDGF, and TGF- β 1 secretion from mesenchymal stem cells. They concluded that resveratrol facilitates cell proliferation and growth factors secretion in a dose dependent manner [2].

Kaleci and Koyuturk [3], who stated that resveratrol treated cells showed better proliferation, migration rates, and ultrastructural preservation have reported similar results. They mentioned in their recent article that resveratrol administration decreases oxidative stress levels and improves wound healing by increasing cell proliferation and migration quality [3].

Huang et al. [4] have mentioned in their new publication that resveratrol is able to promote healing also in diabetic wounds via angiogenesis. They observed a better diabetic wound healing due to an obvious inhibition of hyperglycemia-triggered endothelial dysfunction and disturbance of angiogenesis. The finally stated that resveratrol has an endothelial protective and pro-angiogenic effect too [4].

An increase in the spread of antibiotic-resistant opportunistic microorganisms causes and will cause serious problems in the treatment of purulent infections, burns and ulcers in future. Shevelev et al. [5] have observed in their paper that resveratrol turned out to be significantly better than some commercial available antimicrobial and anti-fungal products. They stated that resveratrol could be proposed as a promising drug for the topical use in the