

*Tips from the Trenches*

# Using baby oil to remove asphalt from burn

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## INTRODUCTION

Hot mix asphalt concrete is a composite material composed of asphalt mixed with sand, gravel, or stone aggregate. Informally known as *blacktop*, *tarmac*, or just *asphalt*, it is most commonly used in the construction of road surfaces and roofing after being mixed and heated to between 150°C (302°F) and 190°C (374°F). The hot mix asphalt concrete is either heated at a plant away from the construction site or by a mobile mixer on-site, transported to the desired location, offloaded onto the road surface, compacted with a roller, and allowed to dry. Each step in this process represents a risk to workers as the asphalt remains at a high temperature during the entire process. Not surprisingly, hot asphalt burns affect primarily those in the road construction and roofing industries. A review of the Occupational Safety and Health Administration (OSHA) Accident Investigation Summaries yielded 43 reported “hot asphalt” burns and 41 reported “hot tar” burns since 2003, including several fatalities, although injuries are likely underreported.<sup>1</sup>

The binding agent, asphalt proper (also known as *bitumen*, or incorrectly as *tar*), is a dark gray to black viscous petroleum derivative. It is composed of a variety of hydrocarbons, including polycyclic aromatic hydrocarbons (PAHs), high molecular weight phenols, and carboxylic acids, and is highly lipophilic and nonpolar, rendering removal difficult. However, as with other PAH compounds, it is mutagenic and carcinogenic. In construction workers, the carcinogenic risk derives from both chronic dermal and airborne exposure.<sup>2</sup>

## CASE

A 39-year-old male presented to the emergency department with asphalt burns to both upper extremities

following a construction site accident. He had been carrying a bucket of hot asphalt when he tripped and dropped the bucket, splashing the asphalt over him. He presented within 30 minutes of the accident and reported that he could still feel the tar burning him. Both upper extremities were immediately immersed in cold water to cool the asphalt and prevent further thermal injury. Upon surveying the extent of the burn, it was noted that both anterior forearms were affected, and several areas of his face, neck, and shoulders were spattered with asphalt. The burns encompassed approximately 6% of the total body surface area.

Baby oil was directly applied to both upper extremities and the areas of his face, neck, and shoulders that had been splashed. Gauze was then soaked in baby oil and applied to the affected areas. After gently pressing the gauze into the skin and allowing the asphalt to emulsify for several minutes, the gauze was peeled off. This process was then repeated every 5 to 10 minutes, and, at 1 hour, nearly all of the asphalt had been removed. Rubbing of the gauze on skin was avoided to prevent mechanical injury to the damaged skin. Partial thickness (second degree) burns were noted over the anterior right forearm and wrist (Figure 1), where the majority of asphalt was spilled. The areas that had been spattered showed signs of superficial (first degree) burns.

Following the removal of all asphalt, the affected areas were covered with a nonadherent dressing. The patient was then referred to a designated burn care facility for further management.

## DISCUSSION

The ideal agent for asphalt removal from intact skin is one that emulsifies the lipophilic material and promotes micelle formation, thereby releasing it from the adherent

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**Figure 1.** Right upper extremity after several applications of gauze soaked with baby oil. The process was continued until the asphalt was completely extracted from the skin.

surface.<sup>3</sup> Because asphalt is nonpolar, the principle of “like dissolves like” should guide the selection of a dissolving agent. The agent should also be nonirritating and nontoxic because severe burns expose deeper tissues.

Several case reports have suggested various liposoluble and nonpolar agents that will remove asphalt from skin. Several review articles suggest that polysorbates, emulsifying agents found in topical antibiotics such as Neosporin or silver sulfadiazine, are an effective way to remove tar<sup>3,4</sup> or asphalt.<sup>5</sup> Other reports describe the use of butter, vitamin E ointment, and sunflower oil.<sup>6-8</sup>

A 1994 article by Juma supports the use of baby oil to remove asphalt burns.<sup>9</sup> Baby oil is a mineral oil that is produced from the distillate of petroleum and is commonly used as a skin lubricant. It is a highly lipophilic

mixture of alkanes that is miscible with other hydrocarbons, including asphalt. Baby oil is also inexpensive, readily available, nonallergenic, nonirritating, and nontoxic, which were important considerations in our case due to the extent and depth of dermal injury. We were able to remove the asphalt from the skin using multiple applications of baby-oil-soaked gauze.

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## REFERENCES

1. United States Department of Labor. OSHA fatality and catastrophe investigation summaries. Available at: <https://www.osha.gov/pls/imis/accidentsearch.html> (accessed 10 July 2013).
2. Fustinoni S, Campo L, Cirila PE, et al. Dermal exposure to polycyclic aromatic hydrocarbons in asphalt workers. *Occup Environ Med* 2010;67(7):456-63.
3. Bose B, Tredget T. Treatment of hot tar burns. *Can Med Assoc J* 1982;127(1):21-2.
4. Demling RH, Buerstatte WR, Perea A. Management of hot tar burns. *J Trauma* 1980;20(3):242.
5. Bosse GM, Wadia SA. Hot asphalt burns: a review of injuries and management options. *Am J Emerg Med* 2014;32(7):820.
6. Ng K, Dalen D, Rhine D. Management of hot tar burn using vitamin E ointment containing petroleum and polyoxyethylene sorbitan. *CJEM* 2013;15(5):307-10.
7. Tiernan E, Harris A. Butter in the initial treatment of hot tar burns. *Burns* 1993;19(5):437-8.
8. Türegün M, Oztürk S, Selmanpakoğlu N. Sunflower oil in the treatment of hot tar burns. *Burns* 1997;23(5):442-5.
9. Juma A. Bitumen burns and the use of baby oil. *Burns* 1994;20(4):363-4.