



75 years on from the Cocoanut Grove nightclub fire: The birth of modern burns care

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INTRODUCTION

Last November saw the commemoration of the 75th anniversary of what is to this day the worlds deadliest nightclub fire and the 2nd deadliest single-building fire in US history. On Saturday the 28th of November 1942 fire broke out at the ever popular Cocoanut Grove Nightclub claiming the lives of 492 men and women and seriously injuring hundreds more. While the chaotic events that transpired that night became one of the USA's greatest tragedies, they were also the catalyst for the creation of life saving fire safety laws and revolutionary advancements in the treatment of burns patients

THE FIRE

At 10:15pm flames were seen leaping from the top of one of the plastic palm trees in the Melody Lounge on the basement level. The fire rapidly spread to the ceiling and wall drapery. Panic was instantaneous and the crown in the Melody Lounge pushed up the stairs to the main level of the club. The first to reach the top of the stairs stopped to try and open the emergency exit at the top of the stairs but tragically it was welded shut. Bodies were later found piled at the emergency exit and on the stairs. Countless witnesses describe a fire ball bursting into the main entrance. Within 3 minutes flames were seen bursting onto the street from the Broadway exit, some 250ft and one story from where the fire started.

Survivors describe horrific scenes of genuine mass panic. Most patrons tried to escape via the front entrance revolving door however in the mass hysteria people tried to force the door in both directions thus resulting in the door not moving. This not only prevented escape but prevented firefighters gaining access through the main entrance. Scores of deceased were found piled against the revolving door. The main exit from the dining room was hidden by drapes and locked and was eventually forced open by firefighters on the street but only once the fire was well and truly established.



NEW BURNS CARE

No patients received tannic acid dressings, which was the previous standard of care for burns as Cope and Moore had realised that while it worked to seal the burns, it actually delayed wound healing and damaged viable epithelium.

As patients entered the hospital they were stripped of their dirty/ wet clothes and had sterile towels placed over their burns. T.V access was obtained and then Interns and medical students who were capped, masked, scrubbed and wearing gloves, applied sterile gauze soaked in either petroleum jelly or Boric acid ointment. No washing of the burns nor debriding of the epidermis was undertaken. Morphine was given to all patients as was 2g of sodium sulfadiazine as antibiotic prophylaxis

The theory was that a burn wound needed a moist sterile barrier to infection while it healed or declared itself, and that in a burns disaster the simplest effective treatment was the superior treatment. Debriding of superficial wounds was thought to be unnecessary and by excluding this it freed up skilled workers for other duties.

At BCH tannic acid was continued as treatment of choice but they began to trial petroleum jelly soaked gauze also. There were 33 deaths; 19 the first day.

FLUID RESUSCITATION

Fluid balance was one of Dr Moore's greatest contributions to the field of medicine and he applied this to burns care. Plasma resuscitation was widely used on the battle front in WW2 but its use in burns was not described. Massachusetts General Hospital had a total of 611 potential transfusions stored in their new blood bank. At BCH they had to call on the Red Cross for plasma and between the two sites 1065 transfusions were administered to just over 100 patients in the first 30hrs. This form of fluid resuscitation for burns was in its infancy, being 26yrs prior to the creation of the parkland formula. Transfusions were initiated based on blood pressure and titrated on BP and urine output

BURN DEBRIDEMENT

Cocoanut Grove provided Cope and Moore the opportunity to trial sharp debridement and immediate grafting of full thickness burns for the first time. In 1942 there was only one paper published describing this technique, where prior, eschar and "slough" was soaked off with saline or pyruvic acid dressings for up to 25 days before grafting.

In 1947 Cope and Moore published their case series of 58 full thickness burns in 38 patients from the cocoanut grove fire who underwent debridement and SSG within a few hours of injury. They demonstrated an average graft take of over 70%

PENICILLIN

At the time of the Cocoanut Grove Fire, burns surgeons already knew that Staphylococcus was responsible for a significant proportion of their infected wounds and graft loss. The use of Sodium Sulfathiazide was not proving effective in treating the infections. Thirteen of the nightclub survivors were among the first humans to be treated with the new antibiotic, penicillin. In early December Merck and Company rushed a 32-liter supply of the drug, in the form of culture liquid in which the Penicillium mold had been grown, from New Jersey to Boston. The drug was crucial in combating staphylococcus.

According to the British Medical Journal: "Though bacteriological studies showed that while most of the burns were infected, the second-degree burns healed without clinical evidence of infection and with minimal scarring. The deep burns remained unusually free of invasive infection. [20]As a result of the success of penicillin in preventing infections, the US government decided to support the production and the distribution of penicillin to the armed forces.

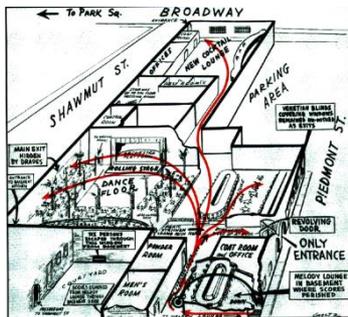
HOSPITAL

The injured and deceased were sent to two main hospitals, Boston City Hospital and Massachusetts General Hospital.

The timing of the fire was fortunate for Massachusetts General Hospital (MGH). Less than a year after the Pearl Harbor attack, MGH had started organizing itself in preparation for a catastrophe. It had published a disaster manual, stockpiled sterile supplies and had also established its own blood bank which was a novel idea at the time.

The first patients arrived at MGH at 10:30 pm. 114 casualties were sent to there. 75 were either dead on arrival or died soon thereafter. Dozens died in those first few hours from major injuries, some from asphyxia. Of the 114 patients only 19 patients survived to be admitted to the wards. At Boston City Hospital 134 cases reached the wards of the hospital and were counted as admissions. 180 corpses reached the ED Floor; in addition, between 10 and 15 individuals, still breathing on arrival at the ED, died within a few minutes and were not counted as hospital admissions.

Mass Gen had received a small amount of funding from the government after the Pearl harbour bombings to research management of burns disasters as burns were the cause of a significant loss of man power during the war. As the cocoanut grove victims started arriving at MGH Drs Oliver Cope and Francis Moore commenced a trial of their new theory in burns care.



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