

## Early Irish Brain Surgery and Antiseptic Agents (1889).

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### INTRODUCTION

Ulster Medical Society (UMS) President, Dr. Henry O'Neill (1891-1892), championed the use of antiseptics for more than 25 years of medical practice. Curiously, the author's recent purchase of an unassuming and worn journal from an antique dealer has returned attention to Dr. O'Neill's career and public health advocacy efforts in Ireland. This article provides a snapshot of O'Neill's specific antiseptic practice recommendations, and provides a transcript of his hand-written guide for brain surgery from July of 1889.

### Dr. Henry O'Neill (1853-1914)- "Health"

Dr. O'Neill was remembered in his British Medical Journal 1914 obituary<sup>1</sup>: his 'Indomitable spirit drove him on to work which would have put a strain on a much younger man'. He earned a nickname of "Health" at some point, perhaps for his radical views<sup>2</sup>, or perhaps simply for his commitment to public hygiene<sup>3</sup>. He was a 'a voluminous writer, chiefly on sanitary and professional matters.'<sup>1</sup> Briefly, his service to the medical profession includes House-Surgeon and Surgeon at Belfast Royal Hospital, President of North Ireland Branch of the British Medical Association, and Ulster Medical Society President (1891-1892). His contributions to Belfast were spirited and impressive. He was a physician then city councilman, an advocate for adequate public housing and nutrition, a pathologist that practiced public health law.

### Antiseptic treatments (1891) - A call for action

O'Neill lauded Joseph Lister for his understanding of germ theory. Historically, there was an existing premise that air was a mass with disturbing properties referred to as miasmas theory. Lister embraced a shift in thinking that there "... was something in the air, not the air itself, which caused fermentation and putrefaction..."<sup>5</sup> In 1907 Franklin Clark published a brief history of antiseptic surgery, noting during Lister's time: "the air contained morbid elements, capable of inducing inflammation and suppuration, a problem which as yet had not been solved"<sup>5</sup>. Lister believed that attempts to control the wounded area would prevent these minute particles in the air from introducing the inflammation and pus formation (suppuration). Lister said, these minute particles are '...the germs of various lowest forms of life...'.<sup>5</sup>

In eagerness to advocate for this germ theory, O'Neill's 1891 opening Presidential speech to the Ulster Medical Society (UMS) records his call for action for use of antiseptics<sup>4</sup>. In his address to UMS, he made these significant statements regarding Lister's impact:

- '...antiseptic surgery, by the evolution and perfecting of which he (Lister) has done more to relieve the suffering and to diminish the mortality in surgical cases than has been accomplished by any other surgeon during the last century'.
- '(Lister knew the...) difficulty of killing germs, after they had once made their way into the tissues, it was absolutely necessary that such organisms should be prevented from gaining access to the wounds at all.'

There was expressed concern over the origin of 'germs' and the source of infections that occur pre and post-surgery. The verbiage aligns with the prevailing thoughts of the time. O'Neill stated '...pus formation was the result of the action of germs falling from the surrounding air into a wound.'<sup>4</sup> He likened the process of pus formation to that of 'fermentation'. Like Lister, his messaging to colleagues called for prevention of the germ from entering the surgical field; '...since germs were floating in the air, were suspended in water, and were attached to the instruments and bandages that were used in the treatment of wounds,'<sup>4</sup> there must be action to kill the germs before contact.

Historic antiseptic agents varied. According to O'Neill, Lister had recommended 'a solution of double cyanide of mercury and zinc' for his surgeries. 'Germicidal reagents' were valued in both pre-operative preparations; and during surgery, intended for both 'wounds and suppurating surfaces.' Table 1 presents a list of O'Neill's '...necessary antiseptic treatments.' Shaving of the surgical area was absolute. Most wounds were encouraged to be washed with soap and water; however, turpentine, ether, and alcohol were favorable for the first washing. The value of some agents over others lied within the ordering of the application. Some agents appear to counteract the effects brought on by the previous agents.

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**Table 1:**'Necessary Antiseptic' Agents (Dr. O'Neill 1891)<sup>4</sup>

Antiseptic Agents:
Turpentine
Ether
Alcohol
Carbolic acid solution
Corrosive sublimate (mercury)
Mercury
Germicidal reagents
Soap and water
Boiled clean water
Bicarbonate of soda (for instruments)

Dr. O'Neill believed the use of antiseptic treatments would allow for advancement of surgeries '...successfully performed in regions which were looked upon by the older surgeons as entirely outside the range of surgical operations.'

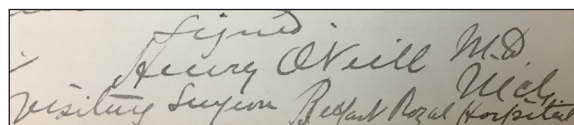
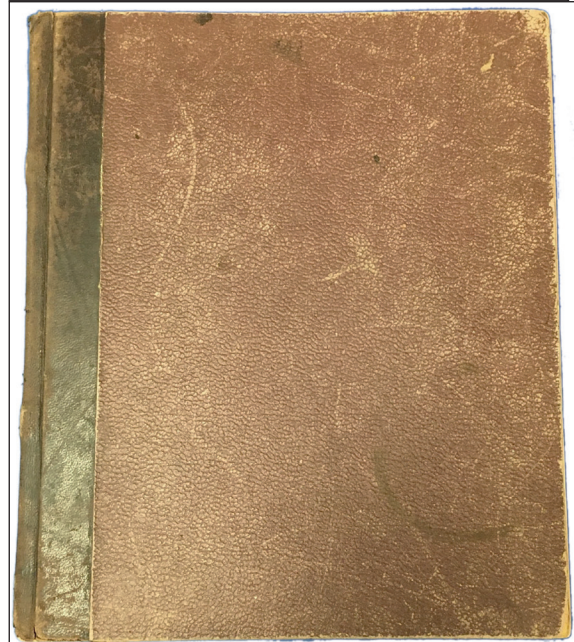
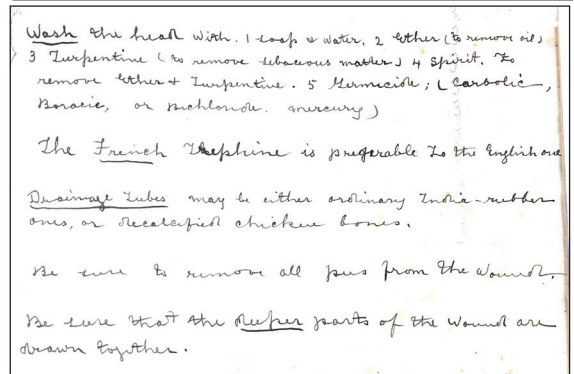
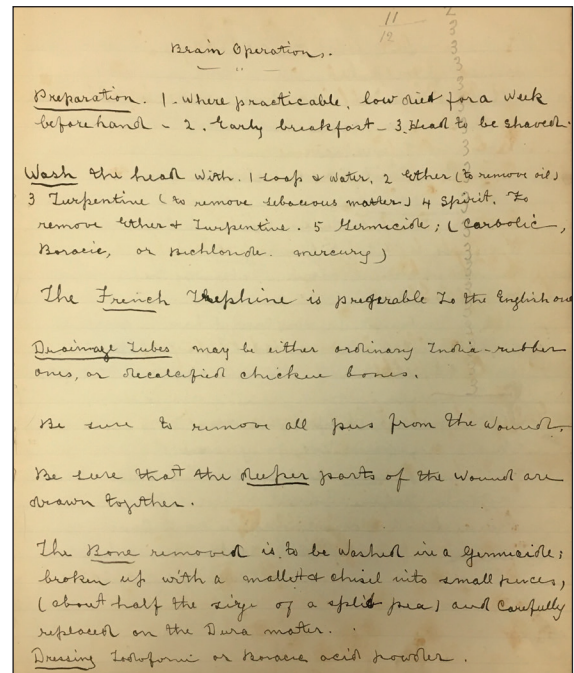
<sup>4</sup> O'Neill explained in his 1891 UMS speech the need for hygienic care before, during, and after the surgical procedure. The following is an excerpt of his suggested a pre-surgery hygienic procedural routine in his own words:

- 'Hands of the operator and his assistants should be purified by washing and brushing them in warm water and soap, and then with corrosive sublimate solution 1 in 1,000, or carbolic acid solution 1 in 40, and, lastly, in alcohol.'
- 'Instruments should be steel, with metal handles, nickel plated, so that they can be readily boiled in clean water, or with 1 per cent. Bicarbonate of soda added to the water.'
- 'Patient should be laid on a dry linen sheet' and covered with a similar sheet, except over the parts to be operated on.'

### Antiseptic practices with brain surgery

O'Neill attested to 4 brain operations in a handful of years, all with positive outcomes. Indeed, he believed through careful antiseptic treatment, 'cerebral surgery' would be 'no exception' to the types of surgical procedures that could be performed. O'Neill concluded the '...the greatest importance in the success of any operation, ... can only be accomplished when the surgeon secures for the wound and everything that is brought into contact with it a thoroughly aseptic condition.'<sup>4</sup> Table 2 presents the procedure for brain surgery from his 1891 address.

A handwritten journal drafted by Dr. O'Neill was discovered online and purchased by the author of this article in April of 2021. The small journal was manufactured by R. Carswell & Son Manufacturing Stationers, Belfast; the label still holds tightly, the binding intact. The journal is worn, with pages missing, and begins with a list of patient admissions and



**Table 2:**

*Brain surgery procedure excerpts from UMS 1891 address, (Dr. O'Neill 1891)<sup>4</sup>*

Procedure:
<ul style="list-style-type: none"> <li>• 'The shaved and disinfected scalp before the skull is exposed'</li> <li>• Position of lesion marked by 'puncture perforation of the scalp'</li> <li>• 'After all hemorrhage has been arrested the skull is opened, either by using a trephine or a chisel'.</li> <li>• Bone is placed in antiseptic solution</li> <li>• '...exploring syringe, with a fine needle about 4 inches long, is best suited for the purpose.'</li> <li>• Forceps for the removal of abscess</li> <li>• 'A fine drainage tube passed along the track to the abscess cavity'</li> <li>• '2 per cent. Boracic Acid solution' applied to area of abscess</li> <li>• Drainage tube inserted</li> <li>• 'Flap is now secured by sutures of sterilized silk, catgut, or horsehair'</li> <li>• 'In wounds of the brain rest is secured by keeping the room dark and quiet'</li> </ul>

*Quote marks identify Dr. O'Neill's own words*

discharges. The entries span the years of 1889 until fall of 1899 including diagnosis criterion, admissions and payments received, various remedies and medicinal preparations. Figures 1-3 present original images of the journal and his writings.

Page two presents a carefully articulated brain operation procedure dated 1889. He purposely orders the steps of preparing the patient, handing of the removed bone, and antiseptic measures. Table 3 presents a transcription of these two journal pages in his words. His written procedures align with his opening address to UMS where he similarly presents brain operation. Note the discussion of washing of the head with a multi-step regimen where ether, turpentine, and spirits were necessary agents. Randomly, he indicates the 'French trephine is preferable to the English one', but offers no explanation for his opinion. He concludes his entry with caution to surgeons that 'every head case should be considered as serious, few should be looked on as hopeless'.

## SUMMARY

Dr. Henry 'Health' O'Neill served as Ulster Medical Society (UMS) President from 1891-1892, during the evolving shift in physician thinking regarding germ theory. 'We are

**Table 3:**

*Transcript of Dr. O'Neill's July 11<sup>th</sup> 1889 medical journal entry: Brain Operation*

Brain Operation
<p>Preparation:</p> <ol style="list-style-type: none"> <li>1. Where practicable, low diet for a week before hand,</li> <li>2. Early breakfast,</li> <li>3. Head to be shaved.</li> </ol> <p>Wash the head with</p> <ol style="list-style-type: none"> <li>1. Soap and water,</li> <li>2. Ether (to remove oil),</li> <li>3. Turpentine (to remove sebaceous matter,</li> <li>4. Spirit to remove ether and turpentine,</li> <li>5. Germicide (carbolic, boracic, or bichloride mercury).</li> </ol> <p>The French trephine is preferable to the English one.</p> <p>Drainage tubes may be either ordinary India-rubber ones, or recalcified chicken bones.</p> <p>Be sure to remove all pus from the wound.</p> <p>Be sure that the deeper parts of the wounds are drawn together.</p> <p>The bone removed is to be washed in a germicide; broken up with a mallet and chisel into smaller pieces (about half the size of a split pea) and carefully replaced on the Dura matter.</p> <p>Dressing Iodoform or Boracic acid powder</p> <p>Put on enough dressing to last for one, two, or three weeks, and leave undisturbed as long as possible.</p> <p>Treatment:</p> <p>Keep the head high, and cool (illegible and ice-cap)</p> <p>Exclude light and noise.</p> <p>Keep movements regular.</p> <p>Diet: milk, beef tea, and chicken soup.</p> <p>Bad symptoms:</p> <ol style="list-style-type: none"> <li>1. High temperature</li> <li>2. Pain in the head</li> <li>3. Rigors</li> <li>4. Fits</li> <li>5. Vomiting.</li> </ol> <p>When any of these occur, take off the dressing and examine again.</p> <p>A surgeon must be very careful how he gives a certificate that there is no danger to life in a head wound, however apparently slight. What appears a scalp wound may be a fractured skull, Erysipelas too may ensue. He should never certify before 2 weeks and seldom before four. Every head case should be considered as <u>serious</u>, few should be looked on as hopeless.</p>



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rapidly approaching the time when we shall become health officers, our duties then being to prevent rather than cure disease.' Newly recognizing organisms in the air as causative agents for '...disease and fermentation...', O'Neill called for physician action through: '...antiseptic surgery, which rapidly revolutionized the treatment of wounds'. Through his UMS Presidential address and his personal journal O'Neill memorialized a variety of early 1890's antiseptic agents, a summary of hygienic surgical practices, and rare account to cranial surgery procedures and patient aftercare in 1889. In conclusion, O'Neill's obituary states he was dedicated to the field of public health, and it was his life-work.<sup>1</sup> His nickname, 'Health', alludes to the breadth of community health contributions to Belfast and the citizens of Ireland during his lifetime.

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