

## Milestones

# Ignaz Philipp Semmelweis and Puerperal Fever

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Puerperal fever has been recognized for nearly 3000 years as a ruthless killer. The earliest mention seems to be in the Indian texts of the Ayurveda which date back to 1500 BC and also in 500 BC by Hippocrates. The entity still commands the wary respect of modern day obstetricians. Varied etiologies had been ascribed to puerperal fever including the retention of milk (and hence the term milk fever), “seduction, remorse and fretting”, possession by spirits and the like<sup>1</sup>.

In the 18<sup>th</sup> century, deaths from puerperal infection were an uncommon entity before obstetrics was institutionalized. They were also uncommon in women who delivered at home. Practitioners of then modern obstetric practices in lying-in hospitals did not have the knowledge of asepsis. There was no concept of hand cleaning between internal examinations of women in labor or even after performing autopsies. Added to this was the use of contaminated instruments, dressings, overcrowding of patients and a general lack of hygiene. The spread of infection was rampant and inevitable resulting in lethal epidemics. At the time, English practitioners such as White, Gordon and Blundell published on the phenomenon and raised the possibility of an infective etiology of puerperal fever. Oliver Wendell Holmes was a professor of physiology and pathology at the Harvard Medical School. He was not a practicing obstetrician but studied the published literature and concluded that puerperal fever was contagious and it could be prevented.

Around the 1840's, Ignaz Philipp Semmelweis was seized by this subject in Europe. He was a Hungarian obstetrician from the University of Pest working in Vienna. Unschooled in foreign languages, he remained

unaware of the published literature and the teachings of Holmes<sup>2</sup>. The Vienna General Hospital (Allgemeines Krankenhaus) had two obstetrics clinics, and Semmelweis was a surgeon, clinician, and instructor of medical students in the first clinic. The second clinic was only different in that it was used for the instruction of midwives instead of physicians. It baffled him that the second had nearly 10 times fewer deaths by puerperal fever. The first clinic had attained such a reputation for deaths by the fever that women cried and begged not to be taken into it. Semmelweis, in an attempt to resolve this problem in his clinic, began studying autopsies of puerperal fever fatalities.



**Figure 1.** Ignaz Philipp Semmelweis.

When his friend and former instructor, Jakob Kolletschka, died of an infected wound accidentally inflicted during a postmortem dissection, Semmelweis was present during this autopsy also. Because of his careful observations of puerperal fever victims, he was able to recognize that these women had experienced the same pathological changes as Kolletschka did from his infected wound. He deduced that the toxins which caused puerperal fever, like Kolletschka's disease were transmitted through the blood, and that medical students were bringing it into the first clinic from the dissection table. Semmelweis noticed that the medical students in the first clinic, unlike the midwives in the second, were treating women directly after dissections and without washing their hands. Once he instated a policy requiring the students to wash their hands and scrub them in chlorinated lime solution before examining women, the clinic's puerperal fever death rate drastically dropped. When he extended the policy to cover all instruments used on laboring women, he practically eliminated the fever from his hospital. Semmelweis, like Holmes, was met with stiff opposition from his peers, notably the more established and decorated ones. Despite opposition from professional peers, Semmelweis stood by his findings. In 1861, he published his views on puerperal fever in a book titled *Die aetiologie, der begriff und die prophylaxis des kindbettfiebers*, or "The cause, concept and prevention of child-bed fever"<sup>3</sup>. The conflict resulted in Semmelweis being denied reappointment at the Vienna General Hospital. This took a toll on him. Disillusioned, depressed and at times irrational, he returned to Budapest and was committed to a psychiatric sanatorium. He died after two weeks of admission. The popular story of his death resembles a Greek tragedy that like his colleague, Kolletschka, he died from septicemia from a wound to his finger. Others believe his death was due to injuries from being assaulted at

the sanatorium<sup>4</sup>. By working hard to improve conditions for obstetrics wards in both Hungary and Vienna, he holds a place in the history and advancement of obstetrics as well as for discovering that puerperal fever is caused by microorganisms transmitted through the blood stream. His work served as a stepping stone to the advances made by medicine through Joseph Lister, Louis Pasteur and Sir Alexander Fleming.

In retrospect, Semmelweis was honored and feted. Standing in his honor are monuments in Budapest, Vienna and his birthplace, Varhely. A museum was established there on the centenary of his death in 1965. Much later, an American society called Semmelweis Society International was established in his honor. The society encourages the process of peer review and improving standards for patient safety<sup>5</sup>.

#### References

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