A physician who fails to enter the body of a patient with the lamp of knowledge and understanding can never treat diseases. He should first study all the factors, including environment, which influence a patient’s disease, and then prescribe treatment. It is more important to prevent the occurrence of disease than to seek a cure.” These remarks may appear obvious today, though they were made over two thousand years ago by the great physician Charaka in his famous Ayurvedic treatise Charaka Samhita. Centuries later, before the germ theory was established, the first modern-day preventionists began advocating what we now understand as infection control.

Oliver Wendell Holmes (1809-1894)

Man’s mind, once stretched by a new idea, never gains its original dimensions” - Oliver Wendell Holmes

Oliver Wendell Holmes was an American physician, poet, professor and lecturer at Harvard University. Dismayed by the “painful and repulsive aspects” of primitive medical treatment of the time—which included grisly practices such as bloodletting and blistering which began in the dark ages and lasted well into the 19th century — Holmes emphasized close observation of the patient and humane approaches. Amongst his many laurels was Harvard Medical School’s prestigious Boylston Prize, for which he submitted a paper on the benefits of using the stethoscope, a device with which many American doctors were not familiar at the time. In 1837, Holmes was appointed to the Boston Dispensary, where he was shocked by the poor hygienic conditions. Based on his work there, he published a paper, “The contagiousness of puerperal fever,” wherein he argued that the cause of puerperal fever, a deadly infection contracted by women during or shortly after childbirth, stems from patient to patient contact via their physicians. Holmes gathered anecdotal evidence of doctors who had become ill and died after performing autopsies on patients who had likewise been infected. In concluding his case, he insisted that a physician in whose practice even one case of puerperal fever had occurred, had a moral obligation to purify his instruments, burn the clothing he had worn while assisting in the fatal delivery, and cease obstetric practice for a period of at least six months. He was sharply criticised by his colleagues for what they believed were extremist views at the time. In fact, an opponent of Holmes’s theory regarding the contagious nature of puerperal fever, wrote that doctors are gentlemen, and gentlemen’s hands are clean. His then controversial work is now considered a landmark in the germ theory of disease. Looking back it’s evident that Holmes was far beyond his time. Soon after his appointment as dean at the Harvard Medical School, he considered granting admission to a woman. Facing opposition not only from students but also from university overseers and other faculty members, she was asked to withdraw her application. Harvard Medical School would not admit a woman until 1945. The same year, in another controversial move, he admitted two African-American students who had been previously rejected by four schools despite impressive credentials. This sparked a fierce debate amongst the students and faculty and Holmes was eventually forced to terminate their admission. His exceptional broadmindedness and thirst for fresh ideas probably stemmed from his interest in subjects other than medicine. It’s interesting to know that Oliver Wendell Holmes was equally renowned amongst Boston’s literary elite. He made an indelible imprint on the literary world of the 19th century. His poems, humorous essays and books won him many honorary degrees from universities around the world.

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Ignaz Philipp Semmelweis (1818-1865)

Around the same time, in another part of the world, a Hungarian physician of German extraction was struggling with his own discoveries on puerperal fever. Ignaz Philipp Semmelweis, now described as the “pioneer of antiseptic policy,” similarly observed that the incidence of puerperal fever could be drastically reduced by the use of hand disinfection in obstetric clinics. Semmelweis was appointed assistant professor at the obstetrical clinic of the Vienna General Hospital in 1846. The Viennese hospital had two maternity clinics. The first clinic had an average maternal mortality rate of about 10% due to puerperal fever, whereas the second had a mortality rate less than 4%. The poor reputation of the first clinic was well known in the community and women begged to be admitted to the second clinic. Some women even preferred to give birth in the streets and strangely puerperal fever was rare among women giving street births. Semmelweis wondered what possibly protected those who delivered on the streets from these lethal endemic influences. Greatly disturbed by the situation in the first clinic, he undertook detailed comparative studies between the two clinics. The clinics used the same obstetric techniques, they were equally overcrowded and the climate was the same. The only difference being that the first clinic was the teaching service for medical students, while the second clinic had been selected for the instruction of midwives only. In 1847, while Semmelweis struggled to comprehend the association, a breakthrough occurred following the death of a close colleague, who had been accidentally injured with a student’s scalpel while performing an autopsy. His own autopsy revealed pathology similar to other women dying from puerperal fever. Semmelweis immediately proposed a connection between cadaveric contamination and puerperal fever. He concluded that the medical students carried “cadaverous particles” on their hands from the autopsy room to the patients they examined in the first obstetrical clinic thus accounting for the higher mortality rate in this clinic. He instituted a policy of hand washing between autopsy work and obstetrics, with a solution of chlorinated lime (calcium hypochlorite), which he found worked best to remove the putrid smell of infected autopsy tissue. Miraculously, the mortality rate in the First Clinic dropped by 90%, and was then comparable to that in the Second Clinic. The mortality rate continued to decline steadily and for the first time ever, the death rate was zero in two months in the year following this discovery. Semmelweis’ hypothesised that there was only one cause, that all that mattered was cleanliness. Despite various publications of evidence based results where hand-washing reduced mortality to below 1%, his observations conflicted with the established scientific and medical opinions of the time and his ideas were rejected and ridiculed by the medical community. He was dismissed from the hospital and harassed by the medical community in Vienna, being eventually forced to move to Budapest. In Budapest, he took up an unpaid, honorary position as head-physician of the obstetric ward of St. Rochus Hospital. When he joined in 1851, childbed fever was rampant at the clinic. He found one fresh corpse, another patient in severe agony, and four others seriously ill with the disease. After taking over in 1851, Semmelweis virtually eliminated the disease. During 1851–1855, only eight patients died from childbed fever out of 933 births (0.85%). However, his medical colleagues in Budapest continued to believe that puerperal fever was due to uncleanness of the bowel. Therefore, extensive purging was the preferred treatment. Infact, when Semmelweis’ successor was appointed at the maternity clinic, immediately, mortality rates jumped sixfold to 6%, but there were no inquiries and no protests. Almost no one — either in Vienna or in Budapest had the humility or the foresight to acknowledge Semmelweis’ life and work. In 1865, Semmelweis was committed to an asylum, where he died a broken and frustrated man. His practice earned widespread acceptance only years after his death, when Louis Pasteur confirmed the germ theory and Joseph Lister practiced and operated, using hygienic methods, with great success. The so-called Semmelweis reflex, a metaphor for a certain type of human behaviour characterized by reflex-like rejection of new knowledge because it contradicts entrenched norms, beliefs or paradigms — is named after Semmelweis, whose perfectly reasonable hand-washing suggestions were ridiculed and rejected by his contemporaries. Sadly, even a century and a half after his efforts, puerperal sepsis still remains the second leading cause of maternal mortality in developing countries as per a 2008 WHO report.

References