MOMENTS IN MEDICINE

ON THE EFFECTS OF THE ANTISEPTIC SYSTEM

Joseph Lister, 1870

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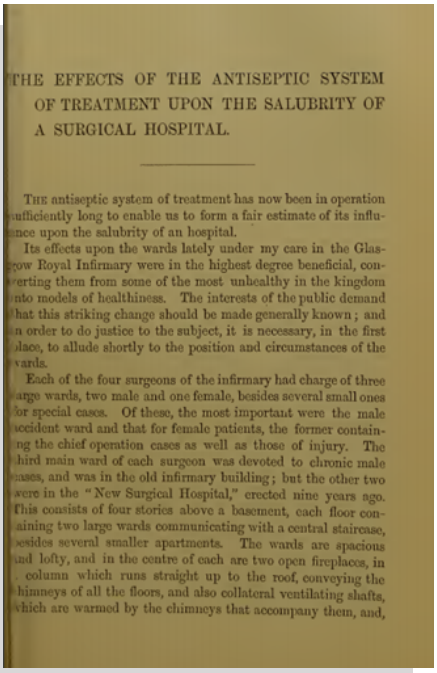
Joseph Lister was a surgeon at the Royal Infirmary in Glasgow. He began to use carbolic acid as an antiseptic after reading about Pasteur's work in 1864. This paper describes the effects of 'the antiseptic system' (disinfection of wounds, surgical instruments and surgeons' hands with carbolic acid) on the spread of pyemia (sepsis), erysipelas (a bacterial skin infection), and hospital gangrene, over a three-year period. It relies mainly on statistics, rather than individual case studies, and concludes with a plea for the introduction of the antiseptic system in hospitals.

You can read this digital version from the Royal College of Surgeons of England on the Internet Archive.



THE EFFECTS OF THE ANTISEPTIC SYSTEM OF TREATMENT UPON THE SALUBRITY OF A SURGICAL HOSPITAL.

THE antiseptic system of treatment has now been in operation sufficiently long to enable us to form a fair estimate of its influence upon the salubrity of an hospital.

Its effects upon the wards lately under my care in the Glasgow Royal Infirmary were in the highest degree beneficial, converting them from some of the most unhealthy in the kingdom into models of healthiness. The interests of the public demand that this striking change should be made generally known; and in order to do justice to the subject, it is necessary, in the first place, to allude shortly to the position and circumstances of the wards.

Each of the four surgeons of the infirmary had charge of three large wards, two male and one female, besides several small ones for special cases. Of these, the most important were the male accident ward and that for female patients, the former containing the chief operation cases as well as those of injury. The third main ward of each surgeon was devoted to chronic male cases, and was in the old infirmary building; but the other two were in the "New Surgical Hospital," erected nine years ago. This consists of four stories above a basement, each floor containing two large wards communicating with a central staircase, besides several smaller apartments. The wards are spacious and lofty, and in the centre of each are two open fireplaces, in a column which runs straight up to the roof, conveying the chimneys of all the floors, and also collateral ventilating shafts, which are warmed by the chimneys that accompany them, and,

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At this time, it was already recognised that infections occurred more often in hospital wards than in private homes. Effective antiseptic treatments for wounds had existed since antiquity (e.g. frankincense, turpentine), but without an understanding of the cause of infection they were applied erratically and with varying degrees of success. One in two surgical patients died of post-operative infection.

Lister was not the first physician to use carbolic acid as an antiseptic. In 1847, Ignaz Semmelweis had tried (and failed) to introduce disinfection in Vienna's General Hospital, to prevent puerperal fever (an infection that can affect women following childbirth). Doctors such as Jules Lemaire in Paris also started using carbolic acid for wound disinfection in the 1860s.

Lister's 1870 pamphlet was, however, the first to use statistical data to support the use of antiseptic. While his methods were praised and readily adopted on the Continent, it took until the 1890s for British doctors and nurses to accept them.

Questions

Read page 4 (in the digital version, or the excerpt reproduced on the next page) .

1. **What were conditions like in the hospital where Lister worked?**
2. **What risks were associated with surgery without the use of antiseptic?**
3. Lister uses statistics as evidence for the effectiveness of antiseptic, for example the table of deaths after amputations on page 10. **How convincing are these statistics as an argument for the use of antiseptic?**
4. **Why do you think it took so long for the widespread use of antiseptic to be adopted?**

FURTHER READING

Find out more about the history of infection control in this 2018 article on *The Conquest of Pus*. (CC-BY)

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TRANSCRIPTION (SELECTED EXCERPTS)
ON THE EFFECTS OF THE ANTISEPTIC SYSTEM
Joseph Lister, 1870

From page 4:

But to the great disappointment of all concerned, this noble structure proved extremely unhealthy. Pyaemia, erysipelas, and hospital gangrene soon showed themselves, affecting, on the average, most severely those parts of the building nearest to the ground[1] including my male accident ward, which was one of those on the ground-floor; while my female ward was on the floor immediately above. For several years I had the opportunity of making an observation of considerable, though melancholy, interest—viz., that in my accident ward, when all or nearly all the beds contained patients with open sores, the diseases which result from hospital atmosphere were sure to be present in an aggravated form ; whereas, when a large proportion of the cases had no external wound, the evils in question were greatly mitigated or entirely absent. This appeared striking evidence that the emanations from foul discharges, as distinguished from the mere congregation of several human beings in the same apartment, constitute the great source of mischief in a surgical hospital. Hence I came to regard simple fractures, though almost destitute of professional interest to myself and of little value for clinical instruction, as the greatest blessings; because, having no external wound, they diminished the proportion of contaminating cases. At this period I was frequently compelled to oppose the wishes of the managing body, who, anxious to provide hospital accommodation for the increasing population of Glasgow, for which the infirmary was by no means adequate, were disposed to introduce additional beds beyond those contemplated in the original construction.

[1]Statistics collected by desire of the managers established the fact that the ground-floor wards were, on the average, most liable to pyaemia, whoever might be the surgeon in charge; and that those on the floor immediately above came in next in this respect.

From page 10

Mortality after amputations

Before the Antiseptic Period.

1864.

Seat of Amputation.	No. of Amputations.	Recoveries.	Deaths.
Shoulder	1	0	1
Arm	3	1	2
Forearm	3	2	1
Thigh	1	1	0
Leg	4	3	1
Knee	2	1	1
Ankle	3	2	1
Totals	17	10	7

1866.

Arm	2	1	1
Elbow	1	0	1
Forearm	2	2	0
Thigh	4	0	4
Knee	2	1	1
Leg	1	1	0
Ankle	2	1	1
Totals	18	9	9

On the other hand, we have –

During the Antiseptic Period.

1867

Seat of Amputation.	No. of Amputations.	Recoveries.	Deaths.
Arm	1	1	0
Forearm	2	2	0
Knee	2	2	0
Leg	1	1	0
Ankle	1	1	0
Totals	7	7	0

1868.

Arm	1	1	0
Forearm	2	2	0
Thigh	1	1	0
Knee	8	5	3
Ankle	5	5	0
Totals	17	14	3

1869.

Shoulder	2	2	0
Arm	2	2	0
Forearm	2	1	1
Thigh	1	0	1
Knee	3	2	1
Leg	3	3	0
Ankle	3	3	0
Totals	16	13	3