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A R T I C L E   I N F O
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“...If we had nothing but pecuniary rewards and worldly honours to look to, our profession would not be one to be desired. But in its practice you will find it to be attended with peculiar privileges, second to none in intense interest and pure pleasures. It is our proud office to tend the fleshly tabernacle of the immortal spirit, and our path, rightly followed, will be guided by unfettered truth and love unfeigned. In the pursuit of this noble and holy calling I wish you all God-speed.”

Professor Lister, Graduation Address, University of Edinburgh, 1876

Mission in London

The fourth and final phase (1877–1896, King’s College Hospital, London) of Lister was the period at King’s College Hospital. There, his mission was evangelical and apostolic, and there is little doubt that his move from Edinburgh was undertaken for this purpose. However, Lister’s techniques were slow to be adopted by British surgeons, although European surgeons were more receptive. In 1877, Lister accepted the Chair of Surgery at King’s College Hospital, in his crusade to convince his sceptical colleagues in the British capital.

In his inaugural lecture delivered on 1 October 1877 at King’s College Hospital, titled “The Nature of Fermentation,” Lister demonstrated to his audience a series of test tubes containing milk and loosely covered with glass caps. The fact that air had entered the tubes but the milk remained undecomposed showed that organisms from the air were responsible for putrefaction. The lecture was a demonstration: first, that unboiled milk had no inherent tendency to ferment, and second, that the particular organism which he had isolated and grown in pure culture (Bacterium lactis) was the common cause of lactic acid fermentation (Figure 1).

He exhibited his specially designed test tubes, flasks, and sterilisation box (hotbox). His method of diluting fresh milk with so large a quantity of water that each drop of milk would contain only a single bacterium proved beyond doubt that the cause of fermentation was not in the solution but in the insoluble particle. Fermentation did not take place in all the fresh milk into which sour milk drops were introduced, which would have been the case if the agent existed in solution.

Lister demonstrated that cow’s milk obtained under sterile precautions did not ferment. This was the first attempt to isolate a pure culture of B. lactis, the first in the history of bacteriology.

Lister was allowed to bring along his former assistants from Edinburgh, John Stewart and William Watson Cheyne (later Lister’s successor at King’s College). Initially, Lister’s wards at King’s were empty. Gradually, surgeons from other wards and hospitals invited him to try his methods on their patients. A patient with a large tumour of the shoulder was referred to him when other eminent surgeons refused to operate. Lister excised the growth and applied his antiseptic method. Recovery was complete. There was also apathy among the nursing staff. However, Lister possessed the right qualities to deal effectively with the opposition he was meeting in this early London period. He was patient, determined, and convinced of the truth of the gospel that he was preaching.

The treatment of fractured patella had been unsatisfactory so far. The fragments rarely united, the function of the knee was hardly ever restored. In the pre-antiseptic days, no surgeon dreamt of opening the knee joint and fixing the fragments together. Lister reported seven cases of patellar wiring from 1883 to 1884. He treated compound fractures and saved many limbs that, in the old days, would have been amputated. He drained many psoas abscesses and did not hesitate to cut down non-united fractures, excising the fibrous tissues and wiring the freshened bone ends. He removed loose bodies from joints by a free incision. In short, he did many things that were at that time considered dangerous. When in October 1877, Lister performed an open reduction on a fractured...
Lister was on friendly terms with most of the top medical position to his antiseptic system by well-known gynaecologist various chemicals to bacteriology. Except for the occasional opposition to his antiseptic system by well-known gynaecologist various chemicals to bacteriology. Except for the occasional quarrel with him at close encounter. Lister proved to be a courteous and humble gentleman who treated his professional colleagues with respect and commanded the same in return.

He also had good results with fractures of the olecranon process (Figure 3). One of these patients had consulted 18 surgeons before coming to Lister.

I have referred to a case of un-united fractures of the olecranon where eighteen surgeons had been previously consulted. I trust no one here will suppose that I mentioned this circumstance for the purpose of glorifying myself. I mentioned it in order to emphasize what I believe to be the truth, that by antiseptic means we can do operations of the greatest importance for our patients’ advantage, which, without strict antiseptic means, the best surgeon would not be justified in recommending. How wise of those eighteen gentlemen were in counseling against operative interference ...

In 2 years, the conversion had been effected. Sir James Paget (1814–1899), Sir Thomas Spencer Wells (1818–1897), Sir Jonathan Hutchinson (1828–1913) and others had been convinced by Lister’s methods and theory. The editor of the British Medical Journal summed up: “We heartily congratulate ourselves and the profession that Mr. Lister’s coming to London has been so speedily followed by a signal triumph of that great principle in surgery, which had been accepted everywhere else almost before it was even listened to in London.”

An event of importance in the history of surgery and bacteriology was the Seventh International Medical Congress held in London in 1881. It was attended by 3000 delegates from all over the world. Keynote addresses were delivered by Pasteur, Rudolf Virchow (1821–1902), Robert Koch (1843–1910), among others, on the effects of micro-organisms on tissues and the prevention by vaccination. Lister made an acquaintance with Koch and his work that was useful for his own research.

In 1890, a 4-year-old boy was admitted to King’s Hospital for a crush injury of the right foot. Gangrene set in and Lister himself performed a Syme’s amputation. Sixty-two years later, this same patient was admitted again for cataracts. The stump had carried him through all the years without problem. He worked as a coal heaver; his only disability was his rejection for active service in the First World War.

Those London Surgeons who had uttered hard words against Lister while the latter was in Edinburgh found it impossible to quarrel with him at close encounter. Lister proved to be a courteous and humble gentleman who treated his professional colleagues with respect and commanded the same in return.

For the 15 years that Lister occupied the Chair of Clinical Surgery at King’s College, he fell into the routine of the London consultant surgeon: early private operations, morning consultations at home, afternoon hospital rounds, and evening attendance at Medical Societies’ meetings. The medical circle was large and hospitable. Lister was on friendly terms with most of the top medical personalities of the day.

In 1878, he was appointed Surgeon-in-Ordinary to Queen Victoria, and later in 1900, Sergeant Surgeon on the death of Sir James Paget. On the whole, life in London was even less strenuous than that had been in Edinburgh. Public and private engagements were less exacting; Lister found time to continue his experimental work on a whole range of topics, from the germicidal powers of various chemicals to bacteriology. Except for the occasional opposition to his antiseptic system by well-known gynaecologist Lawson Tait, such effusion was becoming rare. They were gradually merged into the alternative school of aseptic surgery. Londoners had become accustomed to Lister’s presence among them, and had discovered that he was a true man. A new generation of surgeons arose that was more receptive to new ideas, and quite a number of them were occupying important posts in hospitals and medical journals.

**Scepticism and Opposition**

The claim to have discovered a new surgical principle necessitating radical changes in technique was very different from mere claims for invention of some novel surgical treatment. The medical profession was startled by Lister’s findings, and many comments, some favourable, others adverse, began to appear. The leading British medical journal—the Lancet—published an appreciative article on the significance of the antiseptic principle. However, there was some confusion with Lister’s methods with the discovery of carbolic acid. There were some in the medical profession incapable of perceiving that any discovery had been made at all and were anxious to minimize its importance.

Never the type of person to display any generosity to a younger colleague, Sir James Young Simpson (1811–1870), Professor of Midwifery at Edinburgh, suggested that all Lister had done was merely to extol the virtues of carbolic acid. He made some disparaging remarks at the British Medical Association meeting in Dublin in 1867. On 21 September 1867, an anonymous letter signed “Chirurgicus” appeared in the Edinburgh Daily Review, referring to the use of carbolic acid by French surgeons.

**CARBOLIC ACID IN SURGERY**

Sir,

In your issue of yesterday you have reprinted from the North British Agriculturist a long and interesting article on the use of carbolic acid in surgical practice. But the article is I fear, calculated to bring down upon us some discredit—particularly our French and German neighbours—in as far as it attributes first surgical employment of carbolic acid to Professor Lister of the University of Glasgow, who has used it a few months whilst it has been employed for years by some Continental surgeons in the same cases and complications … I have, for example, lying before me a thick volume on the subject written by Dr Lemaire of Paris …. In this learned and able work he an Dr Lemaire discusses at great length the application of carbolic acid to agriculture, hygiene, veterinary practice, medicine and surgery … He dwells upon its use in many diseases, medical and surgical. I am, etc., CHIRGURCUS.

September 21, 1867.

In 1865, Dr Francois Jules Lemaire (1814–1886) of Paris had published the 2nd edition of his book Du Coaltar Saponine Disinfectant Energique, on the properties of carbolic acid as an agent in arresting suppuration in surgery and as a dressing in wounds and compound fractures. This anonymous person was no less than Simpson, the discoverer of chloroform anaesthesia. In an article in the Lancet of 2 November 1867, he wrote that it was erroneous to credit Lister with having introduced carbolic acid into surgery, because other workers had long advocated its use in midwifery, surgery, and hygiene. After accusing Lister of knowing very little about medical literature, Simpson pointed out that other authors had anticipated him in his theories and applications in connection with carbolic acid. “Let me here take the opportunity of briefly pointing out that Mr. Lister has been most undoubtedly preceded
by other authors in all his leading theories and uses in connection with this subject.” Simpson concluded.

In France, meanwhile, Dr Declat had published a review of French literature on antiseptics. Amazingly, these foreign publications were apparently unknown to Lister, although he was fluent in French. Lister claimed that he had never heard of Lemaire. He tried unsuccessfully to locate Lemaire’s book in Glasgow. He then went to Edinburgh, where he found what he was looking for in the library of the University. A feasible explanation was that he was too immersed in his own research to pay attention to others’ works of equal or greater importance.

Simpson may be correct, but Lister never claimed himself to be the discoverer of the use of carbolic acid. Lister only introduced and

Figure 1. Lister’s drawing of microscopic slide of *Bacterium lactis*. The Collected Papers of Joseph, Baron Lister, Plate XI, 1909. Facsimile copy kindly provided by the Royal College of Surgeons of Edinburgh.
popularised the principles of antiseptic surgery. In a letter to the Lancet on 5 October 1867, he replied:

Since I addressed you a week ago, I have seen Dr. Lemaire’s work on carbolic acid … I may repeat that I never claimed to have been the first to use carbolic acid in surgery. The success which has attended its employment here depends not so much on any specific virtue in it, as on the wonderful powers of recovery possessed by the injured parts when sufficiently protected against the pernicious influence of decomposition. I selected carbolic acid as the most powerful of known antiseptics … Whether they employ this agent or some other of analogous properties, it is only by the light of sound pathology, and strict attention to practical details, that they can hope to attain in their fullest measure the magnificent results which the antiseptic treatment is capable of affording.

Another ardent opponent of Lister, Robert Lawson Tait (1845–1899) was a gynaecological surgeon from Birmingham who vigorously reputed the germ theory as a cause of sepsis. He lavishly used soap and hot water in his operating room, with low mortality. By 1880, he was able to reduce his mortality rate after ovariotomy to 6% by his “soap-and-water surgery.” He said: “Let us hear no more of the nonsense about the bad results in surgery of pre-Listerian times as having been cured by Lister. It is not the truth.” When it was pointed out to him that he had not used Lister’s methods properly, Tait replied, “My answer is that if the proper use of the dressing is above my intelligence it is useless for general application.”

Another sceptic, John Hughes Bennett, Professor of Medicine at Edinburgh, dismissed the germ theory as without foundation. “Where are the germs? Show them to us and we will believe. Has anyone seen the germs?” He asked in an article “The atmospheric germ theory” published in the Edinburgh Medical Journal of 1868.

Sir Arthur Conan Doyle (1859–1930), himself an Edinburgh medical graduate, described the scenes during his own student years of 1876–1880: “Archer is one of the carbolic men. Hayes is the leader of the cleanliness-and-cold-water school, and they all hate each other like poison.” It was frank, reasoned opposition, not hostility. Such open antagonism was an exciting impetus to new development. So much for professional jealousy and medical polemics of 19th-century Scotland and England!

**From Antisepsis to Asepsis**

To many surgeons, the most compelling argument against antisepsis was the apparent efficacy of alternative methods in reducing surgical morbidity and mortality from hospital disease. The term “cleanliness” was used in opposition to antisepsis. Cleanliness was implemented by keeping patients, their wounds, and their surroundings dirt free. By the 1880s, there was a shift in the position of antisepsis. There was a convergence between the proponents and opponents of antisepsis, with both sides modifying their positions. The antiseptic system aimed at destroying the microbes by chemical means, either before gained access to a wound at the time of infliction or so soon afterwards that they had no chance of multiplying. It further aimed at prevention by chemical means of access of microbes to the wound till healing was complete.

Lister’s principle was to render the wound, the surrounding skin, the surgeon’s hands, and his instruments germ free by an antiseptic, namely, carbolic acid (Figure 4). He chose the word “aseptic,” from the Greek ἀ, negative, and σεπτικ, I make putrid,
Disinfection of instruments

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruments boiled and placed in 1/20 carbolic acid lotion till required.</td>
<td>Instruments boiled just before operation, and placed in salt solution.</td>
</tr>
<tr>
<td>Before use rinse with 1/2,000 sublimate.</td>
<td></td>
</tr>
</tbody>
</table>

Sponges

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swabs are boiled and placed in soaked in 1/2,000 and wrung out as required.</td>
<td>Boiled or steamed swabs and dried are sublimate solution employed.</td>
</tr>
</tbody>
</table>

Stitches

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catgut immersed in 1/20 carbolic acid solution is used.</td>
<td>Only materials which can be sterilised by ligatures are rinsed in 1/2000 sublimate solution before use. Heat is used.</td>
</tr>
</tbody>
</table>

General precautions during operation

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands and instruments are rinsed in a basin of 1/2,000 of sublimate solution from time to time.</td>
<td>No antiseptic solution for hands.</td>
</tr>
<tr>
<td>The surgeon must be extremely careful to avoid contamination during operation.</td>
<td></td>
</tr>
</tbody>
</table>

Drainage of the wounds

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>No drainage required unless in exceptional circumstances, drainage tube is most efficacious</td>
<td>No drainage is required unless in exceptional circumstances, gauge wicks are left in the wound</td>
</tr>
</tbody>
</table>

Dressings

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterilised gauge or wool containing antiseptics stored in them in metal cases, which are not opened till required.</td>
<td>Gauge or wool disinfected by heat.</td>
</tr>
</tbody>
</table>

Aseptic area around site of operation

<table>
<thead>
<tr>
<th>Limited use of antiseptics</th>
<th>Surgery without antiseptics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towels boiled and placed in 1/2,000 sublimate are lightly rung out and placed around area of operation.</td>
<td>Towels boiled or steamed placed around an area of operation are placed around area of operation.</td>
</tr>
</tbody>
</table>

Antiseptic Surgery (1882):

Rather than a historical successor to antisepsis, asepsis was a parallel innovation. Although Lister was perfecting his methods, others had been introducing practices that later came to be considered aseptic.

St. Clair Thompson, Lister’s house surgeon, recalled that Lister never wore a gown; he operated in his street clothes, sometimes with only a towel across his chest. His “operating gown” was an old blue frock coat worn for years in the dissecting room, stiff and glazed with old blood!

In Germany and Austria, surgeons made no dissections at post-mortem 24 hours before an operation. At operation, their hair and beards were carefully attended to; the coat, collar, and waistcoat were removed; and a clean apron and jacket were put on. The surgical team’s hands and arms were washed in hot water and carbolic acid solution, and nailbrush was diligently used. A basin of antiseptic solution was frequently used during the operation. The operating theatre was thoroughly washed with carbolic soap before the operation. Instruments were soaked in carbolic acid solution. The patient was cleansed before brought in. During the operation nothing was allowed to touch the patient unless it was beyond suspicion.

Loud talking and coughing were strictly forbidden. Von Mikulicz-Radecki suggested face masks in 1897. Rubber surgical gloves were introduced by William Stewart Halsted (1852–1922) of Johns Hopkins University to protect the hands of the surgeon and assistants in 1898. Thus, by 1900, most of the modern fundamentals in operating theatre techniques had been widely adopted. The progression from antisepsis to asepsis can be seen as:

Antisepsis:

\[ \text{Surgeon} = \text{Dirty} \]
\[ \text{Antisepsis} = \text{Clean} \]

Therefore:

\[ \text{Patient (clean)} + \text{Environment (dirty)} = \text{Infection} \]
\[ \text{Patient (clean)} + \text{Antisepsis environment (clean)} = \text{No infection} \]

Asepsis:

\[ \text{Surgeon} = \text{Clean} \]

Therefore:

\[ \text{Patient (clean)} + \text{Aseptic environment (clean)} = \text{No infection} \]

In summary, antisepsis at the end of the 19th century was gradually being replaced by asepsis. Depending on one’s view, this new procedure can be seen as a refinement of Listerism or as a refinement of the general cleanliness as advocated by Lister’s opponents. Cleanliness and the germ theory were merged into the theory and practice of asepsis.

Development of theatre design and technique

<table>
<thead>
<tr>
<th>Method</th>
<th>Innovator</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling of instruments</td>
<td>Spencer Wells (London)</td>
<td>1850s</td>
</tr>
<tr>
<td>“Soap-and-water” cleanliness</td>
<td>Lawson Tait (Birmingham)</td>
<td>1850s</td>
</tr>
<tr>
<td>Boiled dressing</td>
<td>Lister (Edinburgh)</td>
<td>1860s</td>
</tr>
<tr>
<td>Complete haemostasis</td>
<td>von Bergmann (Berlin)</td>
<td>1880</td>
</tr>
<tr>
<td>New hospital design: air filtration, separate septic and aseptic theatres, metal and glass theatre furniture, skin preparation, caps and gowns.</td>
<td>Neuber (Kiel)</td>
<td>1883</td>
</tr>
<tr>
<td>Steam sterilisation</td>
<td>von Bergmann</td>
<td>1885</td>
</tr>
<tr>
<td>and Schimmelbusch (Berlin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber gloves</td>
<td>Halsted and Bloodgood</td>
<td>1890</td>
</tr>
<tr>
<td>from Baltimore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face masks</td>
<td>von Mikulicz-Radecki (Breslau)</td>
<td>1896</td>
</tr>
</tbody>
</table>

The last important professional decision made by Lister was in June 1902. Shortly before his coronation, King Edward VII was ill from abdominal pain. On 24 June 1902, Sir Frederick Treves...
(1853–1923), one of the monarch’s three Sergeant Surgeons recommended an operation “acute typhilitis [appendicitis].” According to Treves, at the consultation, all agreed that there was an abscess and it should be opened. Two of them decided on immediate operation. Lord Lister hesitated a bit. With some reluctance, he sanctioned the operation. Lister, as the most senior of them all, communicated the decision to operate immediately to the King. Treves then drained the King’s appendical abscess successfully. On the occasion of his deferred coronation, Edward VII honoured Lister with membership of the newly created Order of Merit. He was also made a Knight Commander of the First Class of the Order of the Dannebrog (Denmark).

In 1902, at a banquet to Lister by the Royal Society of London, the American Ambassador devoted to Lister a few simple words: “My Lord, it is not a profession, it is not a nation, it is humanity itself which with uncovered heads salute you.” The University of London conferred upon Lister the degree of Doctor of Science in 1903 in the Royal Albert Hall.

On 5 April 1907, on the occasion of his 80th birthday, Lister was presented with the Freedom of the City of London (Figure 5). In 1908, Glasgow presented him with the Freedom of the City of Glasgow.

Lister died on the morning of 10 February 1912. His will stated that he should be buried besides his wife in West Hampstead Cemetery, declining to be interred in Westminster Abbey.

During the packed public memorial service at Westminster Abbey on 16 February 1912, the congregation consisted of, along with members of Royal Personages, the Diplomatic Corps, Ministers of State, civic dignitaries, and delegates from Universities and Medical and Scientific Societies, both British and foreign. The pall-bearers were representatives of the Order of Merit; the Royal Society; the Royal College of Surgeons of England; the Universities of London, Edinburgh, and Glasgow; King’s College Hospital, and the Lister Institute (Figure 6). The choir sang George Frideric Handel’s anthem:

When the ear heard him, then it blessed him, and when the eye saw him
it gave witness of him; he delivered the poor that cried, the fatherless,
and him that had none to help him. Kindness, meekness and comfort were in his tongue.

If there was any virtue, and if there was any praise, he thought on those things.
His body is buried in peace, but his name liveth evermore.

After the service, a company of close friends and relatives attended a private burial ceremony at West Hampstead cemetery. The tomb bore the short inscription:

Joseph Lister, born April 5th 1827, died February 10th 1912.

In conclusion, one of the most significant achievements in medicine of the 19th century was the establishment of the principles of antisepsis. Lister was not only one of many people who experimented with new techniques, but also stood above all those who had contributed to this accomplishment, and justly so. Innovations and discoveries in medicine that have not involved a question of priority are rare.

As Johann Wolfgang von Goethe (1749–1832) had stated, “The most beautiful discoveries are made not so much by the men as by the period.” Although Lister was the chief architect, there were others who laboured diligently and faithfully, whose names were associated with this magnificent achievement, but have not been apportioned laurels. The archives of medical history give scant reference to Semmelweis, Calvert, Watson, and Lemaire.

As had been mentioned, Lister had to be informed about the works of Pasteur and the role of carbolic acid as a disinfectant by his colleagues. A book on the importance of carbolic acid by Lemaire was already in its 2nd edition before Lister commenced his work on compound fractures. The fact that he pleaded ignorance to these French works, although he was fluent in this language, had been a serious indictment on Lister. Moreover, he was in Vienna not long after Semmelweis started washing hands between deliveries. Lister could have been more aware of medical advances in other countries. Possibly, he was too concentrated with his own researches to take notice of other matters of equal or greater significance. Sir William Osler (1849–1919) concluded, “In science the credit goes to the man who convences the world, not the man to whom the idea first occurs.”

Before Lister, it was unknown for a surgical wound to heal without local sepsis. Hospital gangrene was the most dreadful of all surgical complications. A third of patients were expected to die after amputation. It was the efforts of Lister that changed all this and heralded the modern age of safe surgery. It is ironic that his name is perpetuated in a few surgical instruments (Figure 7) and

Figure 5. The last public photograph of Lister, on his way to receive The Freedom of the City of London in 1907. Courtesy of the Wellcome Library, London.

Figure 6. Lord Lister’s funeral service at Westminster Abbey. Photograph courtesy of the Wellcome Library, London.
has ever developed resistance?

surgery made safe by antiseptics and asepsis, to which no microbe
derations in evolution of surgery, dividing its history into two

acknowledge this. Today’s hospitals face the problems of cross-

1. He was a thoughtful scientist.
2. He appreciated immediately the significance of the works of
3. He devised methods of preventing the access of germs to clean
4. He had the tenacity and single mindedness to spread his

Lord Lister had changed the whole face of surgery, an uncertain

the dorsal tubercle of the distal radius adjacent to the extensor pollicis longus tendon at the wrist.

the reasons for Lister’s greatness can be summarised as:

1. He was a thoughtful scientific surgeon who carried out care-
   fully controlled experiments and applied them to the practice of
   medicine and surgery. In this aspect, he was a successor to
   John Hunter.
2. He appreciated immediately the significance of the works of
   Louis Pasteur that germs caused infections, putrefaction, and
   gangrene.
3. He devised methods of preventing the access of germs to clean
   wounds and destroying them in contaminated wounds. He,
   thus, introduced antiseptic surgery, which subsequently led to
   the development of future aseptic surgery.
4. He had the tenacity and single mindedness to spread his ideas
   in spite of opposition from conservative surgeons of his
day.

Lord Lister had changed the whole face of surgery, an uncertain

infections and nosocomial infections. Would it not be sound to
return to Lister’s era and to restart from there the evolution of
surgery made safe by antiseptics and asepsis, to which no microbe
has ever developed resistance?

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The Wellcome Library, London, supplied photographs of Lister’s
father, Lister’s ward, Lister’s last photograph, and Lister’s funeral.

Selected Bibliography

   1903;14:367–8.
3. von Bergmann E. Plugging with iodoform gauze in operations performed in
5. Bloch OT. A clinical lecture on the antiseptic treatment of wounds. Delivered at
9. Cameron HC. A short account of the evolution of Lister’s system of antiseptic
   Medical Museum; 1927, p. 13–76.
10. Cameron HC. Lord Lister and the evolution of modern surgery, Glasgow 1861-

37. Illingworth C. Lister oration: on the interdependence of science and the healing