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William Cheselden's 1740 presentation of data on age-specific mortality after lithotomy

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William Cheselden (1688–1752) was born in Somerby, Leicestershire. As a teenager, he was apprenticed to a surgeon at St. Thomas's Hospital, London, and passed the final examination of the Barber-Surgeon's Company in 1711. He also studied anatomy with William Cowper (of Cowper's glands of the urethra), with whom he lived. After Cowper's death in 1709, Cheselden continued lecturing on anatomy in his own house, even performing autopsies there secretly. The first edition of his student manual in vernacular, *The Anatomy of the Human Body*, came out in 1713. In 1719, he was eventually elected a principal surgeon at St. Thomas's Hospital.

Cheselden acquired a large and lucrative practice, including Queen Caroline and patients like Alexander Pope, Sir Hans Sloane and Sir Isaac Newton. He was later appointed at the newly founded St. George's Hospital, and finally, in a kind of retirement position, at the Chelsea Hospital. He died in Bath in 1752.^{6,7}

Since his former master at St. Thomas's had had a special licence for performing lithotomies, Cheselden became increasingly interested in the operative treatment of bladder stone, for which he gradually developed his own method.¹ Eventually Cheselden could remove a bladder stone in less than a minute. This method became standard in Britain for nearly two centuries, so the name of William Cheselden remained closely linked with this operation. It is worth considering how he came to decide that it should be introduced in surgical practice.

When he was trying to make his way as a practitioner in London, Cheselden first used high suprapubic lithotomy, which, by then, had become the most common procedure. Although he reported eight successful (private) operations, out of nine done between May and October 1722, his enthusiasm for the suprapubic operation soon faded.

Cheselden's idea was to try a perineal approach. He had heard about this because it had been developed by Friar Jacques de Beaulieu in France in the 1690s with notable – and numerically stated – success. Yet the medical establishment in Paris had rejected it

because, in their eyes, Friar Jacques was not a qualified lithotomist.

Cheselden developed the technique of lateral perineal lithotomy gradually, as with some surgical operations today. He first filled the bladder with water introduced through a catheter, as in the suprapubic approach, then incised the bladder through the perineum.¹ He began using the new technique in August 1725, but had lost four out of 10 patients by 1726, and so slightly altered his technique. He first published an account of his new results in 1732, in an 'Appendix' to the fourth edition of his *Anatomy of the Human Body*:

The first twenty seven patients cut this way recovered, and I believe are all living at this time: Indeed I had cut thirty one who recovered before one died, having cut four more between the 28th was cut, and the time he died; but I scorn to use any fallacious way of representing my success. Some of these being cut in the hospital, and some privately, the truth of this account might be suspected by those who do not know me. I cannot take the liberty to mention the names of private patients, therefore I will give a detail of those only which I cut this way in the hospital, where the first twenty five recovered, to the truth of everyone of which I had above twenty witnesses, and I do believe these patients are all living at this time.^{2(pp. 342–344)}

Considering the claims and counterclaims about the results of different methods of lithotomy in the past,¹ it is not surprising that Cheselden went to considerable trouble to assure his readers of the truthfulness of his results. He presented a list of all 46 patients operated between March 1727 and July 1730, together with their ages and dates of operation. Only two had died by 1732, even though 'many' of at least 32 children under 15 years had had smallpox during their recovery.

Cheselden's fame spread quickly. Indeed, it reached Paris even before he had had time to publish

his results in 1732. It is worth following how his operation was introduced into the French capital that had so severely censured its principal originator, Friar Jacques, 30 years earlier.^{3(p. 362ff)}

Cheselden continued to keep accurate records of his use of the lateral perineal approach, for in the next edition of his *Anatomy* we read:

What success I have had in my private practice I have kept no account of, because I had no intention to publish it, that not being sufficiently witnessed. Publickly in St. Thomas's Hospital I have cut two hundred and thirteen; of the first fifty, only three died; of the second fifty, three; of the third fifty, eight, and of the last sixty-three, six.⁵

If the trend in mortality rates had increased somewhat, Cheselden believed that this was because in the later series the operation were being sought because 'even the most aged and most miserable cases expected to be saved by it.'

Cheselden's report has been included in the *James Lind Library* because it is an early example of a recognition of the need, in trying to make fair assessments of medical treatments, to take account of the age distribution of patients receiving treatment, when age may influence treatment outcome. 'But what is of most consequence to be known', Cheselden wrote, 'is the ages of those who recovered, and those who died.' He grouped his 213 patients in 10-year age groups and reported the number of deaths for each group, thus showing the substantially lower mortality among children than among adults. Table 1 was created from Cheselden's figures.

The importance of this analysis was not noticed for a long time. In spite of the fact that this passage in Cheselden's *Anatomy* was republished unaltered long after his death (for example, a 13th edition was published in 1792), crude (overall) mortality figures after lithotomy continued to be presented as a

measure of the success of the operation well into the 19th century. In a dispute about the interpretation of mortality figures associated with lithotomy in the late 1820s, John Yelloly (1774–1842) drew attention to the importance of Cheselden's age-specific analysis published nearly a century previously, and further stressed that the gender of the patients and the sizes of the bladder stones should also be taken into account.^{3,4}

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Table 1. Cheselden's figures showing lower mortality among children than adults.

Age/years	10 or under	11–20	21–30	31–40	41–50	51–60	61–70	71–80	Total
Operated	105	62	12	10	10	7	5	2	213
Died	3	4	3	2	2	4	1	1	20