

Thomas Willis' paediatric general practice

SUMMARY

Thomas Willis (1621–1675) is regarded as the founder of modern clinical neuroscience and one of the great physicians of the 17th century.¹ What is not often appreciated is that Willis at the start of his career practiced as a consulting physician on horseback around the towns and villages of Oxfordshire. This paper examines Willis' paediatric practice during his early general practice as described in his case notes and published writings. These cases demonstrate a wide range of paediatric illness.

INTRODUCTION

Thomas Willis (pictured below) did not come from a medical family and was born on a Wiltshire farm in Great Bedwyn.

He took his MA from Christchurch College, Oxford in 1642. However, his clinical training was curtailed because of the Civil War (he served 2 years in an auxiliary regiment) and after only 3 months of clinical training he was licensed to practice on 8 December 1646.²

Willis didn't just become the celebrated physician and neuroanatomist: like all doctors he had to find his path. The brevity of Willis' medical education is regarded as a fortunate event, as it left his mind unencumbered by the traditional



medical training of that time, and open to learn the art and science of medicine.³ His early years after qualification were also hard as he slowly built a reputation working as a humble medical practitioner in Oxford (he had to share a horse with Dr Richard Lydall [1621–1704] another practitioner). They obtained their first patients from the town markets and its surrounding towns and villages by 'casting waters' (a method of medical management that involves inspecting the patient's urine while taking a history from the patient's relatives).

John Aubrey, the 17th century biographer, related that 'the custom of keeping markets has been common among Persons of his Profession'.⁴ Willis' practice strikes a chord with us today, in that he too was obliged to compete within this market environment against those who would be termed nowadays as 'alternative medical practitioners'. One third of the cases in Willis' notebook had consulted such practitioners before seeing Willis, and about whose practice Willis himself was scathing, describing them as 'a sword in a blind man's hand'.⁵

Willis had been qualified only 4 years when he started writing these casenotes, giving us a fascinating insight into 17th century medical practice. Most of Willis' patients came from the villages around Oxford. Only a third were able to pay a fee, the remainder paid in kind.⁶ Interestingly, the case notes do not suggest the future path of greatness that Willis would take through his pioneering work in neuroanatomy. Instead they show a young man working under difficult conditions trying to serve his patients and at the same time develop his skill and knowledge in medicine.

The case notes were written hurriedly in Latin. In many of the case histories given, Willis was often called only after an empiric had failed to cure a patient. This could be many days after a child had begun to first suffer from painful symptoms and is typical of attitudes regarding children and their health at that time.

Willis' practice was state of the art, being based on acceptance of Harvey, a traditional Galenic infrastructure, iatrochemistry, and Gassendi's psychology together with Anglican High Church theology.⁷

I have used *Willis' Oxford Casebook* by Kenneth Dewhurst and the *London Practice of Physick* translated by Samuel Pordage (1685) as the source materials. Ten of the 50 cases described in the casebook concern children and some of these, together with other paediatric cases in his writings, are the subject of this paper. These cases complement his later records where he was writing as the eminent and learned physician.

INFECTIOUS DISEASE

Infectious disease was a very major burden on 17th century health. Willis would describe individual cases of epidemics such as diarrhoea or typhus (but these occurred later on in Willis' career.) An outbreak of influenza in April 1658 led him to treat almost 1000 patients a week for a short period.⁸

Typhus

Willis wrote a book on the epidemics of Camp Fever (typhus) in the Winter of 1655.⁹

Willis relates the extraordinary case history of a 7-year old boy who initially followed along a similar pattern until in the third week:

*'Heaviness and stupidity were followed by a palsy in the tongue and throat: which affect grew so much in a short space, that afterwards the diseased was not able to swallow at all, but things put into his mouth presently came forth again, nor did anything descend into his stomach ... besides the violence of the disease, there was a danger lest he should dye through hunger.'*¹⁰

Willis' treatment for this development was:

'An instrument was made of a flexible

*whale-bone, and a lawn button, fix'd to the end of it: and this being thrust into the throat opened for a time its closure, that a passage was made for food given: after the use of this a day or so he could swallow again, and afterwards take in food enough ... he recovered a perfect health and continues still well.*⁹

Louse-borne typhus fever has been associated with armies for centuries. Neurological manifestations including lethargy, confusion, delirium, and fixed neurological signs are well recognised.¹⁰

Osteomyelitis

Willis relates the story of this 10-year-old boy, the son of F Pordlings of Clifton, who was treated by an empiric for 4 months before Willis was called in. Willis relates how the boy:

*'Suffered a pain at the top of his humerus ... Then for about the last 3 months the place has been ulcerated and the tumour on the humerus has suppurated. At length I was called along with a surgeon about a cure. The surgeon explored the affected places deeply with his instrument and in each arm found bones which were unequal and decayed.'*¹¹

One can only wonder at the torments this boy must have suffered. The medical history is strongly suggestive of osteomyelitis. Willis does not relate the patient's outcome, but it is most likely to have been hopeless.

Tuberculosis

Willis describes several cases of tuberculosis including one case of tuberculous laryngitis. In another case history, he describes a boy who died of pulmonary tuberculosis. Willis gave his treatments which included medicines and ointments for the chest:

'In fact everything grew worse, the

*cough more troublesome than before and the respiration more difficult: though he only complained about the pain in his chest and would not allow himself to be moved or lie on his other side. Appetite now weak, body more swollen, colour of his face and lips livid. There was little or no hope of his recovery. April 9th he died.'*¹²

Tuberculosis was very common in the 17th century. In this history one cannot exclude the possible development of an empyema in this unfortunate child.

ABDOMINAL PATHOLOGY

Infestation with worms

These are a commonly encountered problem in child health care. Willis relates his experience with three cases, the first two record successful management using, in the first case, a powder of his preparation and, in the second, by drinking mare's milk.¹³

Willis also, in the following case, attributes worms as a cause of neonatal convulsions:

*'Formerly to a child miserably troubled with convulsions, so that he seemed even a dying, I gave a dose of Mercurius Dulcis with Rosin of Jalap; With his stools whereof he had four, he voided 12 worms and presently grew well.'*¹⁴

Constipation following fever leading to dehydration and overflow constipation

The resilience of children to illness and their robustness in spite of aggressive medical treatment is illustrated in the following case:

'Feb 8, 1650. For the small son of F. Wise of Dorchester ... this child, aged 3, after lying sick for 2 weeks of a fever, at first acute, and then more mild, for the last 6 days had taken no food: his stomach is swollen, and as it were distended, and similarly his

*hypochondria: he had frequent and painful bowel motions, passing yellowish and greenish fluid. Breath evil smelling.'*¹⁵

Willis gave his medicines including mercury, coral dissolved in vinegar (as part of an alchemical preparation), treacles, and syrup of lemons. Within 2 days his appetite returned and he completely recovered. A full diagnosis is difficult, but the most likely opinion would be that the child had become dehydrated following a fever, which leads to constipation with some overflow incontinence.

Perforated appendicular abscess

A perforated appendix is a surgical emergency, with successful surgical treatment becoming routine only in the 20th century.

Willis eloquently describes the outcome for An. Mason aged 16 years:

*'After about a fortnight, I was summoned to visit the patient, and found her so weak that she could suffer to be moved in her bed: her pulse rapid and weak: sleep infrequent and disturbed.'*¹⁵

Willis prescribed a clyster, which is similar to an enema, but administered by a pipe into the anus and sometimes mixed with an opiate; but he dared not advise using either an emetic or any strong drug:

*'An acute paroxysm of fever with slight delirium and convulsive movements of her hands and arms ... a sleepless night with delirium. Feb 11th ... She continued in this way until February the 17th, the paroxysm returning once very 24 hours. Then an abscess near her belly burst and she vomited up blood and excreted downwards foul-smelling pus. She became senseless and motionless and the next day expired.'*¹⁵

RENAL DISEASE

Nephrotic syndrome

It is my experience that the first presentation of nephrotic syndrome in childhood is seen by GPs. This case, one of the earliest in the medical literature, reflects a similar presentation to Thomas Willis:

'Henry Jones, the son of Walt Jones This boy, aged 8, was distended in various parts of his body: his flesh, though muscular, is tumid, hard and so swollen that it does not easily yield to the pressure of a finger. On his face both cheeks appear to have developed a stiffness also affecting his arms, legs and hands, but without any sense of pain. His stomach is health, his appetite good, and his body still strong and robust as earlier.'

Willis speculates on the cause of this and, noting that otherwise the patient is completely asymptomatic, concludes:

*'The proper secretion through the kidneys does not take place nor does evacuation through insensible transpiration, as the pores of the skin are blocked up ... the curative intentions will be (after the proper evacuation of the whole) to arouse the veins and provoke the urine: and then, by anointing the external parts, to procure the imperceptible opening and transpiration of the pores.'*¹⁶

Willis is describing a nephrotic syndrome-like illness. He eloquently relates his understanding of the reasons for the accumulation of fluid in the body leading to the tense oedematous skin turgor seen in this condition. Henry Jones, the 8-year-old boy, made a complete recovery, and one can speculate that the most likely cause was a minimal change nephrotic syndrome. Henry Jones later became Bishop of Sunningwell.

Renal stone with possible localised renal inflammation

Renal stones are infrequently seen in paediatric practice. There are many causes of renal stone disease including infection, medication, hypercalciuria, and inborn errors of metabolism.¹⁷ Willis

described the following case history of John Drew a 10-year-old boy, who:

*'Has suffered for 14 days with terrible pains in his loins: night and day, almost completely without sleep, he has lain on his bed howling and continually wailing.'*¹⁸

Willis relates how Drew feels this malady first in the upper part of his loins. It then descends to the lowest spinal vertebrae: it stays there with the pain persisting almost without a break. Willis then gives his clinical thoughts:

*'When I first saw the patient and enquired carefully about the nature of his ailment nothing more seemed likely than that it was truly nephritis: and that sand or a stone had slipped from the kidneys into the ureters, and sticking as it passed through had caused this acute torture. To this place the pain seems to have taken itself from the region of the kidney, moving internally. Further in pissing the flow of urine halted and was restored only with pain and great difficulty. When he was first ill he suffered from vomiting. Furthermore, each morning I found three or four stones in the chamber pot. His great grandfather died of the stone.'*¹⁸

Willis is concerned about other causes opining that:

*'To prevent accepting this opinion like a sheep there arose quite a suspicion, either of an arthritic tumour impacted in the lumbar vertebrae and muscles, or else of an abscess or inflammation in the part, the humours having been attracted there by the acute pain and gradually heaped themselves together.'*¹⁸

Willis prescribed a clyster. By the fourth day, there had been little recovery, and Willis instigated cupping. Thereafter the progress was sustained, and 4 days later the child had made a complete recovery.

Today we would find it inconceivable that a child could be left in such severe pain for 14 days before medical

assistance is called. We know that financial reasons would not have been a factor for this family and it may well have been that other practitioners would have been consulted first and failed.

RESPIRATORY DISEASE

Willis directly describes asthma in adults but not in childhood. This case I believe is asthma that Willis has mistakenly taken for consumption for reasons which will become understandable. Taken from the 1674 *Pharmaceutiae rationalis* published in the London *Practice of Physick*,¹⁹ the events leading to Willis' final dramatic prescription occurred in 1669:²⁰

*'A boy about 10 years of age, subject from his infancy to be often troubled with a cough, has undergone in late years some great and tedious fits of that distemper, that is to say he is wont at times to fall ill of a hollow and shrill sounding cough without spitting, which almost continually toys him day and night, and so tormenting him for many days, nay and weeks, it brings him to a very great weakness. Afterwards the course of the disease being pass'd over, (which happens not until the store of morbid matter be consum'd) in a short time he becomes well enough again, and as free as may be from any distemper of the thorax, till the morbifick matter (as it seems) being heaped together.'*¹⁸

All his other treatments failing, Willis advised a period abroad to a 'region hotter than ours' and this, as he relates, cured the patient:

*'He took my advice, and about the beginning of November went to Montpellier, where passing half a year, he had only two slight touches of illness: Since being return'd to England, he enjoys thanks be to God, a perfect health quite free from his cough.'*¹⁹

A biographer of Willis relates that this boy was none other than Willis' firstborn son, also called Thomas Willis. Willis' concern about his son having consumption is justified. Willis himself was not a stranger

to infant death, with five of his nine children dying in childhood, but not in the immediate neonatal period. Hughes feels the most likely explanation for their deaths is that of tuberculosis, which they contracted from their parents.² Willis' wife Mary was a chronic consumptive dying of this disease in 1670²⁰ as indeed did Willis himself in 1675.² Thus Willis was fortunate that his oldest son, Thomas, had asthma and not consumption.

JUDICIAL EXECUTION AND RESUSCITATION OF AN INNOCENT MOTHER OF A STILLBORN CHILD

Willis slowly established what was to become a lucrative medical practice around Oxford and Oxfordshire. This was no doubt enhanced by the spectacular 'resurrection' of Anne Green, a maidservant. Green had been publicly hanged in December 1650, outside Oxford Prison for infanticide. She was cut down and taken to the house of Sir William Petty where the hangman had brought her for anatomisation as sanctioned by Royal Charter.²¹ There, signs of life were noted and Willis and Petty resuscitated her.

Willis and Petty later made court appearances at Anne Green's appeal. Willis plead for the court's mercy on the grounds that 'the foetus was not only abortive or stillborne, but also so imperfect, that it is impossible that it should have been otherwise.'²²

Green was subsequently pardoned, married, and had three children before dying in 1665.

This sensational case became the subject of doggerel verse, with Willis himself being the subject of the chorus:

*'Thus 'tis more easy to recall the dead than to restore a once-lost Maidenhead.'*²³

In the present day, expert medical witnesses have been involved with several major miscarriages of justice concerning alleged infanticide and are not held in the same high opinion as Willis was after his particular involvement.

CONCLUSION

Willis' notebook and early writings give a

fascinating insight into the mind and clinical work of a young struggling doctor, trying to developing his clinical skill and yet (as we now know) undecided on the subsequent course of his life. His later writings drew heavily on the experience that he gained during this trying period of his professional life.

This is summed up by William Osler's fitting tribute:

*'Willis did two things: he made himself a good scientific man as far as the science of that day went, and he made himself a first class practitioner, and those two sides of the man are presented in his works.'*²⁴

The paediatric cases in his notebooks are largely with infectious disease, embracing epidemics as well as isolated cases. Kidney pathology is also represented. Among his first early works include a description of an epidemic of typhus during the English Civil war. A case like that of Anne Green was an exceptional one by any definition.

The whole works of Thomas Willis not only give a unique insight into the practice, but also an understanding of 17th century medicine, when there was a revolution in medical and scientific thought. In his notebook, however, we see a practitioner early on in his career trying to develop his art, knowledge, and acumen and discover his vocation in medicine. Two other casebooks are known to have existed but are still awaiting rediscovery.

AN Williams

Acknowledgements

I would like to thank the Centre for the History of Medicine, Birmingham University for their support, Dr Margaret Holloway and Dr Janet Collinson for their comments and the Wellcome Institute for the History of Medicine. The work of late Dr Kenneth Dewhurst in restoring the reputation of Thomas Willis should also be acknowledged.

REFERENCES

1. Finger S. *Minds behind the brain: a history of the pioneers and their discoveries*. Oxford: Oxford University Press, 2000: 85–99.
2. Hughes JT. *Eponymists in medicine. Thomas Willis (1621–75), his life and work*. London: Royal Society of Medicine. 1991

3. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 5.
4. Aubrey J. *Brief lives chiefly of contemporaries set down by John Aubrey 1669–1696*. Clark A (ed.). Oxford: Clarendon Press, 1898: 303.
5. Willis T. *The remaining medical works of the famous and renowned physician Dr. Thomas Willis*, tr. Pordage S. 1681: 55
6. Dewhurst K. *Thomas Willis's Oxford lectures*. Oxford: Sandford Publications, 1980: 9.
7. Williams AN. Thomas Willis' practice of paediatric neurology and disability. *J Hist Neurosci* 2003; **12**(4): 350–367.
8. Dewhurst K. *Thomas Willis's Oxford lectures*. Oxford: Sandford Publications, 1980: 10.
9. Willis T. *Dr Willis' practice of physick, being the whole works of the renowned and famous physician*, tr. Pordage S. London, 1684: 610–613.
10. Warrell DA, Cox TM, Firth JD, Benz EJ Jr (eds). *Oxford textbook of medicine*. 4th edn. Oxford: Oxford: Oxford University Press, 2003: 623–625.
11. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 127.
12. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 104.
13. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 106.
14. Willis T. *Dr Willis' practice of physick being the whole works of the renowned and famous physician*, tr. Pordage S. London, 1684: 255.
15. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 89.
16. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 180.
17. Addy DP (ed.). *Investigations in paediatrics*. Philadelphia, PA: W.B. Saunders, 1994: 103–104.
18. Dewhurst K. *Thomas Willis's casebook*. Oxford: Sandford Publishers, 1980: 64.
19. Willis T. *Dr Willis' practice of physick being the whole works of the renowned and famous physician*, tr. Pordage S. London, 1684: 93.
20. Dewhurst K. *Thomas Willis's Oxford lectures*. Oxford: Sandford Publications, 1980: 17.
21. Hughes JT. Miraculous deliverance of Anne Green: an Oxford case of resuscitation in the seventeenth century. *BMJ* 1982; **285**: 1792–1793.
22. Petty W. Petty Papers. In: Dewhurst K. *Thomas Willis's Oxford lectures*. Oxford: Sandford Publications, 1980: 7–8.
23. Dewhurst K. *Thomas Willis as a physician*. Los Angeles, CA: William Andrews Clarke Memorial Library, 1964: 3–4.
24. Viets HR. A patronal festival for Thomas Willis (1621–1675) with Remarks by Sir William Osler, Bart., FRS. *Ann Med Hist* 1917; **1**: 118–124.