



Aburel, Eugen Bogdan (1899–1975)

Continuous Epidural Analgesia

The first report of single dose epidural local anaesthetic injection for pain relief in labour was in 1906 by Walter Stoeckel. In 1931, Eugen Aburel, a Romanian obstetrician working in Paris, presented the first description of a technique for continuous epidural analgesia in labour. His report before the Society of Obstetrics and Gynaecology of Paris was given on 12 January, 1931. After extensive research involving detailed dissection, Aburel concluded that the uterus had a double sensory innervation. To obviate the need for repeated injection, and in the absence of long-acting local anaesthetics, Aburel developed his technique by introducing a soft, flexible silk catheter through a needle into the epidural space, at either the caudal or lumbar level. The needle was withdrawn and the catheter left in place for subsequent injections of 0.5% cinchocaine. He experimented with other local anaesthetics but ultimately achieved his best results with 0.5% cinchocaine plus 1:100,000 adrenaline, which lasted for 3–5 hours.

Eugen Bogdan Aburel was born in Galatzi, Romania. His initial leaning was to a career in engineering, but he changed to medicine and graduated from Iassy University, Romania in 1923. He studied surgery and psychiatry before choosing obstetrics and gynaecology. In 1928 he went to Paris and combined clinical work in the Tarnier and Boucicant Hospitals with research in the physiology department of the Sorbonne. He returned to Romania in 1933 and was appointed professor of obstetrics and gynaecology at Iassy University in 1936. In 1945 he moved to the same chair at Bucharest University, which he held until his retirement in 1969. His academic output was prodigious, with over 700 publications. The limitation of these publications to Romanian and French journals, plus the lack of scientific exchange between east and west, meant that the pioneer work of Aburel was not fully acknowledged until the 1970s.



Eugen Bogdan Aburel

Selected Publications

Aburel E. La topographie et le mécanisme des douleurs de l'accouchement avant la période d'expulsion. *CR Soc Biol Paris* 1930; 103: 902–4.

Aburel E. L'anesthésie locale continue (prolongée) en obstétrique. *Bull Soc Obstét Gynéc Paris* 1931; 20: 35–7.

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Alcock, Benjamin (b. 1801)

Alcock's (Pudendal) Canal

The space within the pelvic (obturator) fascia that transmits the pudendal vessels and nerve was first described in detail by Benjamin Alcock in Robert Todd's *Cyclopaedia of Anatomy and Physiology*, which was published in six volumes between 1835 and 1859:

In a canal in the obturator fascia the artery (int pudendal) is contained through the posterior part of the third (perineal) muscle; by some it is maintained to be between the fascia and the muscle . . . but this is not correct; the vessel being in the fascia, and not extreme (lateral) to it . . .

The description is often incorrectly attributed to the English apothecary and surgeon, Thomas Alcock.

Born in Kilkenny, Ireland, 'the son of a doctor, descended from a long line of doctors', Benjamin Alcock was a pupil of Abraham Colles and graduated from Dublin University. He taught anatomy in the private schools of medicine in Dublin from 1825 until

his appointment, in 1849, as the first professor of anatomy at the new Queen's College in Cork. He was reputedly hot-tempered, and in 1853 a dispute arose between Alcock and the university over the interpretation of the Anatomy Act. Alcock resigned at the behest of the Lord Lieutenant of Ireland, who felt his position in the college 'was not beneficial, nor of good example'. After an unsuccessful petition to Queen Victoria, Alcock went to America. He was never heard of again.

Selected Publications

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228, 946, 1085, 1137, 1138.

Aldridge, Albert Herman (1893–1983)

Aldridge Sling

Albert Herman Aldridge was born in Victor, New York on 19 July 1893. He was brought up on a farm, and after taking his undergraduate degree in science entered the medical school at the University of Syracuse and graduated MD in 1918. He served for two years as a medical officer at the United States Naval Hospital in Chelsea, Massachusetts. He then did one year as an obstetric resident at the Sloane Hospital for Women in New York, followed by two years as a gynaecology resident in the Women's Hospital in the state of New York. Thereafter he joined the staff of the Women's Hospital, from which he carried out a private practice of obstetrics and gynaecology for more than 50 years, ultimately retiring in 1977. He was surgeon-in-chief of the Women's Hospital from 1938 to 1955 and held the rank of professor of obstetrics and gynecology at the College of Physicians and Surgeons, Columbia University. In this position he

built a strong training programme in obstetrics and gynaecology, although his main clinical interest was in operative gynaecology.

At a meeting of the New York Obstetrical Society on 10 March 1942, Aldridge presented his rationale for surgical relief of urinary stress incontinence using transplantation of rectus fascia. He began by stating, 'Unfortunately, we have not acquired either a complete knowledge of the anatomic structures in and about the female urethra or an entirely satisfactory explanation of the physiology of the delicate urethral sphincter mechanism which is responsible for the control of urination'. Aldridge declared that the standard vaginal repair procedures may not be successful, 'due not so much to faulty techniques as to the fact that there has been unusual destruction of the urethral sphincter muscles themselves and perhaps of their nerve and blood supply'. He then went on to

review seven surgical techniques developed between 1910 and 1929: 'The purpose in all of these techniques was to prevent the escape of urine by providing external pressure on the urethra as a substitute for the normal sphincter mechanism which had been destroyed or was congenitally absent'. Aldridge felt that 'the good results claimed for all the techniques briefly described above have been attained through improved support for the urethra and partial urethral stricture'.

Aldridge described his own modification, which involved incising the fascial strips from the aponeurosis over the rectus and oblique muscles. These strips were mobilised from lateral to medial, and the strips were then pushed through the rectus muscles 2 cm from the midline. Through an anterior vaginal incision these strips were then sutured together to form a sling beneath the urethra. Aldridge outlined the merits of his operation as follows:

It seems fair to state that the new procedure which has been described has certain advantages over those previously recommended, in that: 1) It utilizes the rectus abdominus muscles which are always well developed and easily accessible. 2) It involves no displacement of the recti muscles or possible loss of function through damage to their nerve or blood supply. 3) It develops a fascial sling in a position and manner which provides additional support and external pressure to the urethra at the point where it is likely to be most effective, i.e., at the junction of the urethra and bladder and 4) it takes advantage of the favorable anatomic relationship of the recti muscles to the urethra. By utilizing the normal variation and position of these muscles, in response to changes of intra-abdominal pressure, compression of the urethral lumen is automatically increased at the exact times when it is most necessary in order to prevent leakage of urine.

Held in high esteem for his innovation in gynaecological surgery and as a teacher, Aldridge was honoured in 1952 by the award of an honorary LLD degree from the University of Leeds in England. He became president of both the New York Obstetrical Society and the American Gynecological Society. Married for 55 years, he had two sons, one of whom



Albert Herman Aldridge

became an obstetrician/gynaecologist and the other a poet. He retired to the gentler climate of Pinehurst, North Carolina and died there on 13 November 1983 in his ninety-first year.

Selected Publications

Aldridge AH. Transplantation of fascia for relief of urinary stress incontinence. *Am J Obstet Gynecol* 1942; 44: 398–411.

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Allen, Edgar (1892–1943) Doisy, Edward Adelbert (1893–1986)

Oestrogen

The basic physiology of the female reproductive cycle slowly came to be understood in the early twentieth century through isolation of the hormones that governed the cycle. The word ‘hormone’ was first suggested in 1905 by Ernest Starling (1866–1927) for ‘the active substances secreted into the blood stream . . . by the ductless or endocrine glands’.

As early as 1896, Emil Knauer (1867–1935), a Viennese gynaecologist, showed that the ovaries regulated female sexual maturity, when he transplanted mature ovaries into immature female rabbits and observed the rapid development of mature sex characteristics. He postulated that the mature ovary produced some sort of ‘generative ferment’ that was carried from the ovary via the blood stream.

In 1922, two young American scientists, Edgar Allen and Edward Doisy, working at the Washington School of Medicine in St Louis, noted that the injection of fluid from the ovarian follicle of sow’s ovaries into ovariectomised mice produced the changes of a mature oestrus cycle. In their 1923 report they attributed this result to an ‘ovarian hormone’:

This hormone seems to be an efficient substitute for the endocrine function of the ovaries of the nonpregnant animal. It is probable that its alternate presence and absence in the circulation is sufficient to explain the mechanism of estrual phenomena in the genital tract in the absence of pregnancy . . . It is probable that this hormone is produced under the influence of maturing ova by their follicle cells. Since it is obtained from the ovaries of hogs and cattle and produces results in the mouse and rat, it is not species specific. It is probably produced in all ovaries as their ova mature, and therefore is probably common to all female animals.

Following this work, they moved on, Allen to the University of Missouri and Doisy to St Louis University, but continued to collaborate. Doisy later isolated oestrone and oestradiol at about the same time as Adolf Butenandt (1903–1995) of Göttingen, Germany.

Edgar Allen was born in Canyon City, Colorado on 2 May 1892. He grew up in Providence, Rhode

Island and received his education at Brown University. During the First World War he served in France with the Brown University Ambulance Unit. After his PhD in 1921 he was appointed to the department of anatomy at the Washington School of Medicine at St Louis, where he did his work with Doisy. In 1922 he became professor of anatomy at the University of Missouri and, in 1933, was appointed to the chair of anatomy at Yale University. His entire career was devoted to the study of ovarian hormones and their relationship to the reproductive cycle. He died of a heart attack on 3 February 1943, while on patrol with the United States Coast Guard off Long Island, New York.



Edgar Allen



Edward Adelbert Doisy

Edward Adelbert Doisy was born on 13 November 1893 in the small town of Hume, Illinois, where as a youth he delivered papers and worked on a farm. His initial university education was at the University of Illinois and he later transferred to Harvard University, where he received his PhD in biochemistry in 1920. He was made professor of biochemistry at St Louis University in 1923 and remained there the rest of his professional life, becoming head of the department in 1924. He isolated vitamin K in 1939, for which he shared the Nobel Prize for physiology and medicine in 1943. He died on 23 October 1986 at the age of 92, having lived almost twice as long as his co-discoverer, Edgar Allen.

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- Allen E, Doisy EA. The extraction and some properties of an ovarian hormone. *J Biol Chem* 1924; 61: 7–11.
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Apgar, Virginia (1909–1974)

Apgar Score

Virginia Apgar was born in Westfield, New Jersey on 7 June 1909. She graduated BA from Mount Holyoke College in Massachusetts in 1929, and four years later she received her MD from Columbia University College of Physicians and Surgeons in New York. The first four years of her medical career were spent as a surgical intern and resident at the Presbyterian Hospital in New York; she then switched to anaesthesia and served her residency at the Presbyterian Hospital, in the Wisconsin General Hospital in Madison and at the Bellevue Hospital in New York. In 1939, she was the second woman to take the diploma of the American Board of

Anesthesiology. She was appointed to the Columbia Presbyterian Medical Center and, in 1949, was the first woman to receive a full professorship at Columbia University. During her 21 years as an anaesthetist she was said to have given 20,000 anaesthetics and to have provided analgesia for a similar number of women during delivery. It was at the Sloane Women's Hospital that she developed and applied the Apgar Score.

Apgar introduced a simple technique for newborn assessment based on systematic appraisal of five criteria: heart rate, respiration, reflex irritability, muscle tone and skin colour. Each of these signs was rated as

Eponyms and Names in Obstetrics and Gynaecology

0, 1 or 2 and assessed at one minute of age. The total became the Apgar Score. In her introduction to the paper she wrote:

Resuscitation of infants at birth has been the subject of many articles. Seldom have there been such imaginative ideas, such enthusiasms, and dislikes, and such unscientific observations and study about one clinical picture . . . the poor quality and lack of precise data of the majority of papers concerned with infant resuscitation are interesting.

A subsequent report, *Further Observations on the Newborn Scoring System*, was published by Apgar and her colleague Stanley James (1925–1994) 10 years later. This paper summarised the experience of eight years between 1952 and 1960 with newborn scoring in 27,715 live births. It confirmed the correlation of a poor score with neonatal mortality as well as the acid-base status of the newborn. They felt the main benefit of the scoring system was in the selection of infants for resuscitation:

The method has been found to be a valuable guide both in teaching and clinical practice in deciding which infants to resuscitate. By its use, delivery room personnel learn to observe several physical signs at once, evaluating them rapidly, and act accordingly.

She developed this technique to ensure systematic and consistent appraisal of the newborn so that resuscitation would be instituted promptly if necessary. The simplicity of this evaluation has assured its universal adoption, and it has been said that ‘every baby born is first seen through the eyes of Dr Virginia Apgar’.

In 1959, on her fiftieth birthday, she received the degree of master of public health from Johns Hopkins University. At this point, she joined the staff at the National Foundation March of Dimes, where she became head of the division of congenital malformations. By 1967, she was appointed director of the basic research department within the Foundation and the following year became vice-president for medical affairs. At the same time, she held an appointment as clinical professor of pediatrics in teratology at Cornell University Medical College. Her stature and energetic speaking schedule ensured that recognition and funding for research in birth defects increased considerably during her tenure at the Foundation.

The tributes paid to Virginia Apgar during her life and after her death provide a picture of a single, very energetic woman with a broad range of interests and

talents. She was apparently a fast talker, fast walker and fast driver, claiming that her car tyres never wore out as they rarely touched the ground. She started flying lessons when she was 59 years old. Apgar was a considerable musician and played viola and cello in a string quartet in her home town of Teaneck, New Jersey and, occasionally, with the Teaneck Symphony. She was one of the founders of the Amateur Chamber Music Players and the Catgut Acoustical Society. Under the influence and tutelage of a former patient, Apgar became a skilled instrument maker. This began when the patient was convalescing in hospital and noticed that a shelf in the public phone booth was made of ‘a fine well-seasoned piece of curly maple’, which apparently had a good resonance to the drumming fingers. She felt it would make an ideal back of a viola and asked Apgar if she could arrange to have the shelf removed and replaced with another. In keeping with the standard mentality of hospital



Virginia Apgar

administration they refused. Thus, late one night, Apgar and the patient, suitably equipped with carpentry tools, 'liberated' the shelf and replaced it with a piece of identically stained plywood. It was with this piece of wood that Apgar crafted her first viola under the guidance of her former patient. Over the years, she made three other string instruments, the last of which was finished by her tutor just after Apgar's death. Ultimately, the instruments – a cello, violin, viola and mezzo violin – were purchased by a group of paediatricians and donated to Columbia University College of Physicians and Surgeons.

On the twentieth anniversary of her death in 1994, a 20-cent stamp with Virginia Apgar's portrait was issued in the US Postal Service's Great Americans Series. That same year, at the American Academy of Pediatrics annual clinical meeting in Dallas, Texas, a quartet of paediatrician musicians played some of Apgar's favourite chamber music on the instruments she had crafted.

Virginia Apgar's newborn score is used almost universally. She claimed that her main reason for developing this method of early appraisal of the neonate was to

redirect some of the attention from the mother to the newborn infant at a very critical stage when, if required, resuscitation efforts would yield great benefit. As she later said, 'I wanted to find a way to get doctors to pay attention to the baby'. Some have altered the wording and sequence of the five cardinal signs to produce the acronym APGAR: Appearance, Pulse, Grimace, Activity and Respiration.

Virginia Apgar died in her sleep on 7 August 1974. The memorial service held in her local church was attended by a mix of prominent medical and local people, including the local traffic policeman with whom she had so many encounters.

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Apgar V. A proposal for a new method of evaluation of the newborn infant. *Curr Res Anesth Analg* 1953; 32: 260–7.

Apgar V, James LS. Further observations of the newborn scoring system. *Am J Dis Child* 1962; 104: 419–28.

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Arias-Stella, Javier (b. 1924)

Arias-Stella Reaction

In 1954 Javier Arias-Stella described atypical endometrial changes in association with early pregnancy. These consisted of marked hypertrophy of the secretory glands and hyperchromatic and pleomorphic nuclei with occasional atypical mitotic figures suggestive of early adenocarcinoma. He felt these cellular changes were due to hormonal production from trophoblastic tissue:

Secretory change, usually exaggerated, with simultaneous proliferative activity of variable degree and cellular enlargement, principally of the nuclei, are main histological features which occur in these areas displaying maximum change. When extreme secretory activity is combined with an equally great proliferative effect, one sees groups of glands with very vacuolated, foamy cells, which are practically without lumens. Here and there are cells with hypertrophic nuclei, sometimes monstrously enlarged and hyperchromatic. Usually these enlarged

nuclei show variations in shape, some being lobulated or elongated while others assume more bizarre forms.

Later, he and others emphasised the association of this pattern with ectopic pregnancy. In the days before sensitive hCG assays, ultrasound and laparoscopy, the finding of the Arias-Stella endometrial reaction without chorionic villi at uterine curettage was a diagnostic pointer to ectopic pregnancy. Subsequently it has been commonly found with intrauterine pregnancy and in response to pharmacological induction of ovulation. It was later pointed out that Somers Sturgis (1905–1991), working in the ovarian dysfunction clinic of the Massachusetts General Hospital, Boston, had described these endometrial changes in the 1930s.

Javier Arias-Stella, a pathologist from Lima, Peru, was born on 2 August 1924. He described his findings

Eponyms and Names in Obstetrics and Gynaecology



Javier Arias-Stella

while working as a Kellogg Foundation fellow in pathology at the Memorial Center for Cancer and Allied Diseases in New York. In 1962 he was appointed head of the department of pathology at the Peruvian University in Lima. He was later active in political life and was appointed minister of public health (1963), minister of foreign affairs (1980) and, in 1983, permanent representative of Peru to the United Nations.

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- Arias-Stella J, Gutierrez J. Frecuencia y significado de las atipias endometriales en el embarazo ectopico. *Rev Lat Amer Anat Patol* 1957; 1: 81–7.
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- Sturgis SH. Arias-Stella phenomenon. *Am J Obstet Gynecol* 1973; 116: 589.

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Aschheim, Selmar (1878–1965)

Zondek, Bernhard (1891–1966)

Aschheim–Zondek Pregnancy Test

For centuries physicians and quacks, sometimes one and the same, have made medical predictions from inspection of the urine. They were appropriately known as ‘piss prophets’, and one of the most common predictions was that of pregnancy. In 1928 Aschheim and Zondek, working at the Charité Hospital in Berlin, reported a sensitive and specific

test for pregnancy based on a substance in the urine that stimulated the ovarian follicles of mice. They thought this was the gonadotrophic-stimulating substance produced by the anterior pituitary, which they had discovered earlier that year and called prolan. They believed there were two components to prolan: one governing follicle maturation (prolan A) and the

Eponyms and Names in Obstetrics and Gynaecology

other luteinisation (prolan B). These were later called follicle stimulating hormone (FSH) and luteinising hormone (LH).

The test consisted of injecting the first morning specimen of urine subcutaneously into 3- to 4-week-old mice. The test was positive if haemorrhagic ovarian follicles or corpora lutea developed after five days. The test was positive in 77 of 78 pregnant women, and there were only two false positive results in 198 controls. This level of sensitivity and specificity was a stunning development at the time. Understandably, but incorrectly, they attributed the reaction to the high output of anterior pituitary hormone in pregnancy:

We cannot demonstrate any specific substance for pregnancy, for the anterior pituitary hormone is produced in every organism. The only thing characteristic of pregnancy is the tremendous increase in the anterior pituitary hormone and its heavy excretion in the urine.

Subsequently, other work showed the hormone responsible to be produced by the placenta and not

the pituitary, so it was given the name human chorionic gonadotrophin (hCG).

Selmar Aschheim was born on 4 October, 1878 in Berlin, Germany. His medical studies were taken at the universities of Freiburg, Hamburg and Berlin. He practised obstetrics and gynaecology and also worked at the gynaecological pathology laboratory at the Charité Hospital in Berlin, where he was appointed director in 1912. It was here that he and Zondek carried out their work on the pituitary-ovarian relationship. He became a professor at the University of Berlin in 1931 but had to leave in 1936 when Hitler's influence became manifest. He moved to France, was granted citizenship and eventually became director of the laboratory in the Maternité in Paris. He died on 15 February 1965.

Bernhard Zondek was born on 29 July 1891 to a family of doctors in Wronke, Germany. He received his MD from the University of Berlin in 1918. He chose postgraduate work in obstetrics and



Selmar Aschheim



Bernhard Zondek

Eponyms and Names in Obstetrics and Gynaecology

gynaecology, despite being discouraged by the professor owing to unimpressive marks in his final student examination on gynaecology. He later became a valued assistant to the same professor. In 1929 he was appointed chief of the department of obstetrics and gynaecology at the Berlin–Spandau Municipal Hospital. Hitler also caused Zondek's departure from Germany, and in 1933 he left for Stockholm, where he spent one year at the Biochemical Institute. In 1934 he emigrated to Israel and an appointment as professor of obstetrics and gynaecology and head of the hormone

research laboratory at the Hebrew University–Hadassah Medical School in Jerusalem. He died on 8 November 1966.

Selected Publications

Aschheim S, Zondek B. Schwangerschaftsdiagnose aus dem Harn (durch Hormonnachweis). *Klin Wochenschr* 1928; 7: 8–9; 1404–11; 1453–7.

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549, 552, 734, 788, 1031, 1335, 1380, 1480, 1684, 1750.

Asherman, Joseph (1889–1968)

Asherman's Syndrome

Asherman's syndrome is described as amenorrhoea due to intrauterine adhesions following vigorous curettage, usually of the early pregnant or post-partum uterus:

This pathological reaction of the uterus is the outcome of a graver injury than usual, such as repeated or deep curettage for missed abortion . . . or as a result of a normal or even very slight injury when the uterus has been harmed by large-scale haemorrhage.

In fact, Asherman's first report on the subject in 1948 did not describe endometrial destruction and adhesions as the cause of amenorrhoea. In a series of 29 cases treated between 1944 and 1946, he attributed the amenorrhoea to stenosis of the internal cervical os:

Following complicated labour or abortion a stenosis or blockage of the internal os of the cervix may occur under certain conditions, thus producing amenorrhoea. This amenorrhoea is not functional but organic; ovulation continues but the uterus does not react and the endometrium remains in a state of inactivity. Hormonal therapy is neither reasonable nor effective, whereas simple removal of the blockage is sufficient to restore menstruation to normal.

Asherman felt that the stenosis was due not to fibrosis but to muscular contraction:

In our opinion, under certain conditions, the uterus reacts to curettage by tetanic contractions, which . . . may also continue so long as to become permanent . . . In the cases under consideration here, prolonged spastic stricture becomes organic in the course of time.

The treatment was simple: the passage of a uterine sound through the internal os and dilatation up to Hegar 7–8. This successfully restored some degree of menstruation in 27 of the 29 cases, ten of whom achieved subsequent pregnancy, albeit with poor outcome in most. Because of the absence of haematometra in his and most other reported cases, Asherman felt that the endometrium remained 'quiescent' and was 'restored to activity as soon as the sound is introduced into the uterus'. He proposed the names 'amenorrhoea traumatica' or 'amenorrhoea atretica' to describe this condition.

In his subsequent report two years later, Asherman came closer to describing the pathological entity we now attribute to his name. Between 1948 and 1950 he collected 65 cases evaluated by hysterosalpingography and in these he correlated the findings of intrauterine adhesions with curettage: 'the regional obliteration of the uterine cavity, due to partial conglutination of the opposing uterine walls'. The menstrual pattern in these patients ranged from amenorrhoea to normal menstruation. For treatment he advocated hysterotomy and digital breakdown of the adhesions. He also speculated that hysteroscopy might become the treatment of choice (as it has):

Also, hysteroscopy, which has so often been mentioned in the literature and just as often discarded, may perhaps be of use for this purpose. If it were possible to see the adhesions and to loosen them instrumentally, using the eye as a guide, the ideal method would have been found.