

# JOSEP TRUETA I RASPALL

## TRUETA METHOD

### The eponym

**Trueta method.** Care of open fractures by the following steps: meticulous cleansing with soap and water; if necessary, shaving the surrounding area; thorough debridement; extirpation of all the damaged tissue (especially bone fragments), reduction of the fracture, and extensive immobilisation in a plaster cast<sup>1</sup>. It is also known as Trueta method, Trueta treatment, Trueta technique<sup>2</sup>, Spanish method, Orr-Bastos-Trueta technique<sup>3</sup>, Orr-Trueta treatment, and Orr treatment<sup>2</sup>.



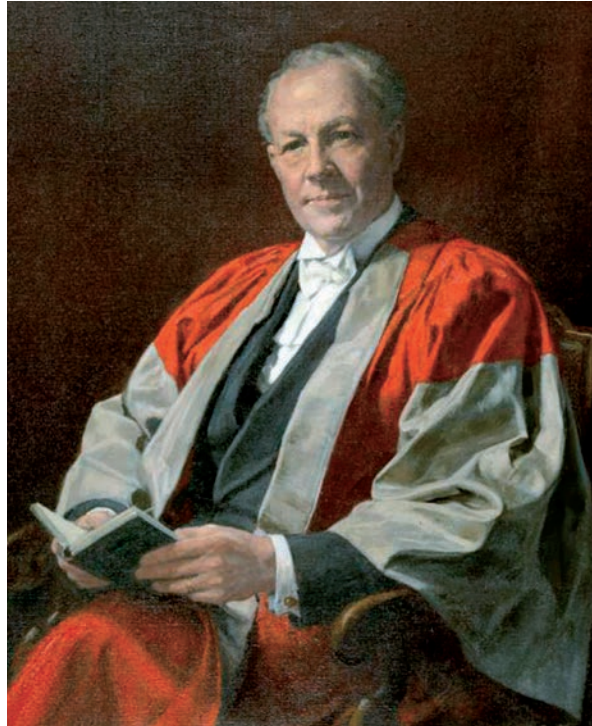
Josep Trueta i Raspall  
(1897-1977)

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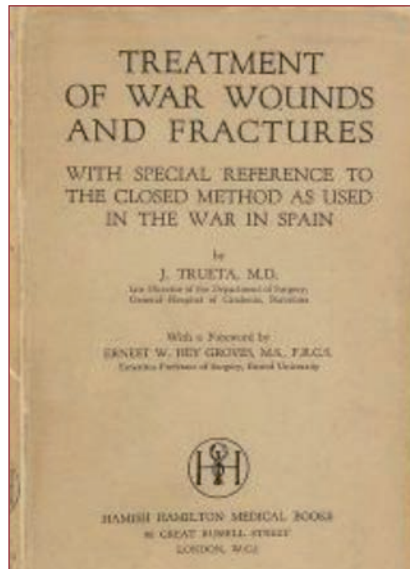
Josep Trueta i Raspall was born in Barcelona on 27 October 1897. He was the second son of Rafael Trueta, a physician, and Mercè Raspall. His paternal grandfather, Josep, imbued in him passions for long walks, politics, and sport –interests his father would also encourage in him. Josep Trueta was a keen swimmer, footballer, boxer, tennis player, and athlete. He also practiced fencing, mastering the epee, sabre, and foil; fencing enabled him to become ambidextrous (he was originally left-handed), so he was able to operate using both hands later in life.

From a young age, he wished to be a painter, and he began to study painting. However, his father was keen for him to continue the five- or six-generation family tradition of dedication to science and medicine and managed to convince him that a good artist needed to know anatomy thoroughly: “Study medicine and learn anatomy, and if you still insist on painting, then don’t take up your career”. He combined his medical studies with painting and had two exhibitions of his work during his university years. However, later he himself would say: “Once I was able to undertake dissection with my own hands, I immediately realised what my mission in medicine should be: to create art in the human body”<sup>5</sup>. He graduated in September 1921, having been an intern in Professor Ferrer Solervicens’ Department of Internal Medicine from 1919 to 1921, and completed his doctorate in Madrid in 1922 (until well into the twentieth century, Madrid was the only city in Spain where doctoral studies could be done)<sup>6</sup>. In the same year, he returned to Barcelona to work alongside his respected teacher, Professor Corachán, in the Department of Surgery at the *Hospital de la Santa Creu*. In late December 1923, he married Amèlia Llacuna, with whom he would have four children. However, he earned his first salary as a physician on call at the *Caixa de Previsió i Socors Anònima d’Accidents* (a mutualised hospital). He also earned money administering Salvarsan injections against syphilis<sup>5</sup>.

Portrait of Josep Trueta



Soon, he would opt to specialise in traumatology and began intensive research and consulting activity in this specialty. Later, Corachán entrusted him with the direction of the *Caixa de Previsió* (1929-1939), and he carried out surgical interventions at the *Clínica del Remei*. In the early 1930s, with Corachán, he undertook a study trip to central Europe<sup>6</sup>. On returning from this trip, he definitively chose to focus on surgical pathology of the locomotor system, as is reflected in his publications from that period<sup>7</sup>. In 1933, he was assistant to the chair of surgical pathology at the *Universitat de Barcelona*. In 1935, he was appointed head of surgery at the *Hospital de la Santa Creu i Sant Pau*<sup>7</sup>. When professor Ribas i Ribas passed away, Trueta succeeded him as professor of surgical pathology at the *Universitat Autònoma de Barcelona*<sup>6</sup>.



*Cover of Trueta's **Treatment of war wounds and fractures, with special reference to the closed method as used in the war in Spain** (1939)*

## **Trueta method: one of many contributions to orthopaedic surgery and traumatology**

In 1924, the American surgeon Hiram Winnett Orr published an article describing a method for treating chronic osteomyelitis based on thoroughly draining the tissues around the infected bone and closing the opening with a large plaster dressing<sup>5</sup>. Trueta, at Manuel Corachán's request, tested this procedure with patients in his department and obtained surprising results. This led him to test this treatment on fresh wounds. Gradually he perfected the technique, adding new aspects: foreign bodies and the remains of deteriorated tissue had to be removed, perfect excisions and drainage had to be done, and then the lesion had to be immobilised with plaster bandages. The results of his research were consolidated into the five points that became known worldwide as the "Trueta method"<sup>7</sup>: immediate surgical treatment, cleansing, excision

of the wound, drainage, and immobilisation using plaster dressings. In order for the wound to heal, these five points must be strictly followed. As Trueta himself explained<sup>5</sup>: "All the points are of vital importance, but the success of its application revolves around the third point: excision of the wound. Without a correct excision, even though the other points are faithfully adhered to, the technique does not work and may even be dangerous...".

In 1934, he presented this new technique to the *Societat Catalana de Cirurgia*. Although received with certain scepticism, with only some surgeons –including Gubern Salisachs– deciding to use it, the good outcomes achieved led to the new method gradually coming into more widespread use. In 1936, he presented the method for curing open wounds for the second time before the same society<sup>8</sup>.

That same year, the Spanish Civil War started. Trueta treated war wounds with the method he had employed on other wounds. The arrival in Barcelona of Colonel J. d'Harcourt, a famous army surgeon, did much to advance the use of Trueta method when the army adopted it. The surgeon himself applied it very successfully during the Republican offensive on Teruel (December 1937 - January 1938) and established a diagram for coordinating treatment of injuries in their different stages from the field hospital to the rearguard<sup>5</sup>.

The climate of war in Barcelona and the great number of wounded people that Trueta treated caused the wonders of that "miraculous" treatment to spread around the city and to the front. The results he obtained led him to write a paper, *Tractament actual de les fractures de guerra* (Current treatment of war fractures), published in 1937 in *La Medicina Catalana* where he described the technique; in 1938, a book entitled *Tractament de les ferides de guerra* (Treatment of war wounds) was published by the *Generalitat de Catalunya* (Government of Catalonia), and translated into Spanish, French, and English (the English

version, published in 1939, was entitled: Treatment of war wounds and fractures, with special reference to the closed method as used in the war in Spain). Trueta method enabled victory over the heretofore enemy of wounded combatants: gangrene.

In 1939, Trueta left Catalonia, going to Perpignan, where he awaited a visa to travel to Venezuela. There, at the request of the British government's Foreign Office, which had sent observing surgeons to interview Trueta in 1937 and 1938<sup>6</sup>, two female physicians from England invited him to London to give conferences on the treatment of the wounded at *Hospital General de Catalunya* (now, *Hospital de la Santa Creu i Sant Pau*). In London, he also recounted his experiences in evacuating the wounded and the passive defence service during the more than 300 air raids Barcelona had weathered. The Minister of Health appointed him "Advisor on War Wounds"<sup>4</sup> and the Trueta family moved to Great Britain. In 1940, he was employed by Oxford University. The same year he joined the *Consell Nacional de Catalunya* set up in London. In 1941, he wrote *The spirit of Catalonia*, informing the Anglo-Saxon world of Catalonia's contribution to the birth and development of Western civilization.

In 1943, he was appointed director of the accident and emergency department at Radcliffe Infirmary<sup>6</sup>, and on 6 May 1943, Oxford University bestowed the degree of *Doctor honoris causa* upon him<sup>7</sup>. He had published *Atlas of traumatic surgery*.

The usefulness of the basic principles of his method lost neither currency nor validity with the appearance of antibiotics<sup>4</sup>. Trueta method would be applied successfully during the Second World War, and later, in the Korean and Vietnam wars, saving thousands of human lives. In the latter war, all medical officers were instructed in the principles and techniques of debridement and delayed closure of wounds. Nevertheless, Trueta lamented that he would be remembered for this aspect since "the

Josep Trueta  
immobilizing  
a fracture  
(c. 1930s)



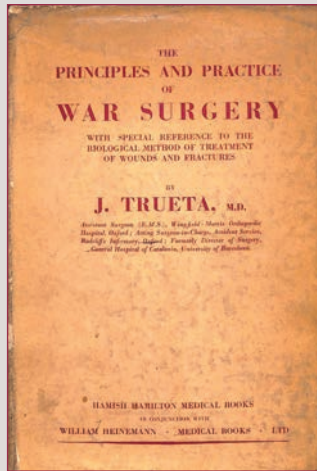
technique... has been conducted on our equals, victims of war..." considering that "surgeons, according to the oath of our profession, should be making war on war"<sup>4</sup>.

### Other important contributions of Josep Trueta to science: dual renal circulation and the study of bones

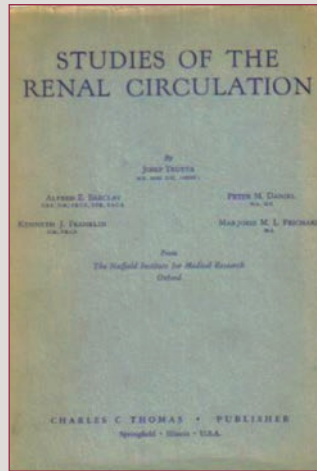
Though his method for treating wounds is Trueta's best-known contribution to medicine, his scientific activity was broad-ranging, and his contributions in several areas were extremely important.

The discovery of dual renal circulation is one of his most important findings. The process of discovery began in 1936, during the Spanish Civil War, when he observed that renal failure often occurred after trauma from accidents or injuries caused by bombings. In Oxford, in 1942, along with Barnes, he carried out a number of research projects on animals, experiments using angiography to determine the calibre of renal

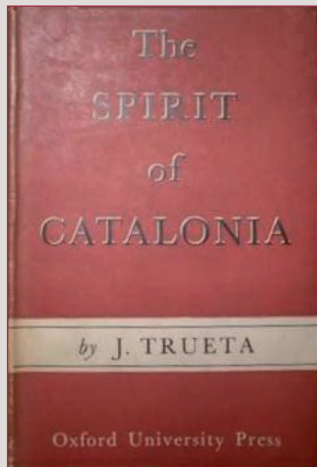




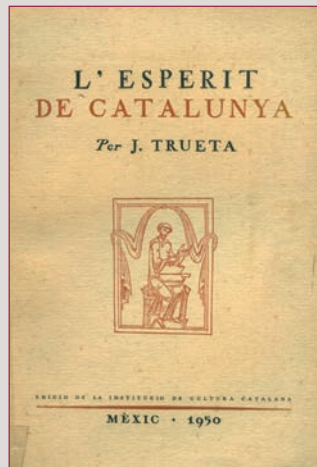
Left: Cover of *The principles and practice of war surgery: with reference to the biological method of the treatment of war wounds and fractures*, by Josep Trueta, published in London in 1943



Right: Cover of *Studies of the renal circulation*, by Josep Trueta. Published in Springfield (Ill., USA) in 1947



Cover of *The spirit of Catalonia* (left) by Josep Trueta, published in Oxford in 1941, and the translation to Catalan, *L'esperit de Catalunya* (right), published in Mexico in 1950





vessels and the effects of decreased blood volume on their calibre, and studies on the stimulation of different types of nerves. These and other later studies led Trueta and his collaborators to form a new concept regarding renal circulation: they discovered the kidney's second circulation<sup>9</sup>: "Blood entering the kidney potentially has two paths to traverse this organ. According to circumstances it may travel almost exclusively through one or the other of these channels, or else in variable proportion through each". In 1947, he published the book *Studies of the renal circulation*, which would be translated into Spanish two years later<sup>7</sup>. Trueta summarised this discovery thus<sup>5</sup>:

"In reality, the kidney offers two potential circulations: one greater and the other lesser. Sometimes the blood can travel almost exclusively via one or the other. In cases of experimental or clinical shock, a deviation of cortical circulation occurs, which is reduced and may even be annulled toward the juxtamedullary glomeruli, a channel through which transit is faster, even to the point of not allowing the blood time to release its oxygen to the renal cells, as proved by the existence of the same proportion of oxygen in the blood of the renal vein as in the artery".

Furthermore, and especially noteworthy in this book on eponyms, this area of research gives rise to another eponym bearing Trueta's name, "Trueta experiment", described as<sup>1</sup>: "Diverse pathological circumstances (ischaemia, toxic reactions, excitation of the sciatic nerve) reduce circulation through the kidney's cortical and lead the blood toward the juxtamedullary glomeruli (short circuit or shortcut); the formation of urine is thereby severely reduced or annulled".

In 1949, Josep Trueta was appointed professor of orthopaedics at Oxford University and, as he would later say, "so, with a certain sadness, I closed my chapter on renal research". In 1955, Lord Nuffield made a

significant donation, enabling construction of a large research centre at Wingfield-Morris Hospital and the Nuffield Orthopaedic Centre was established. Completed in 1958, it contained laboratories, a library, a conference hall, etc.<sup>4</sup>. The chair and laboratory encouraged Trueta's investigative labours even further, and he continued his research on the bones. This was an area in which his other great contributions to medicine were centred<sup>4,10</sup>: bone growth and its stimulation, osteomyelitis, circulation of the femoral head, degenerative arthritis of the hip, circulation of the femoral head in infants, and osteogeny and calcification. The problems of bone circulation, of bone formation and, above all, osteoblasts and their origin, occupied the latter years of his research activity. Until he retired from the chair in late 1965<sup>7</sup>, he directed numerous research projects in the department.

Research on these subjects was an important part of his workload when, in 1976, the disease that would end his life the next year first manifested. He had published over 200 works and 20 monographs. He had received recognition and awards from around the world, and twice had been nominated for the Nobel Prize. In Spain, due to political circumstances, any honours would arrive late. It was not until 1969 when he received the Virgili Prize from the *Societat de Cirurgia de Barcelona*. A year later, he was designated Honorary Academic of the *Reial Acadèmia de Medicina de Barcelona*. In 1972, he was appointed a numerary member of the *Institut d'Estudis Catalans* and in 1976 he was awarded a *Doctor honoris causa* from the *Universitat Autònoma de Barcelona*. He was also awarded the Gold Medal of Barcelona and the Grand Cross from the Order of Carlos III. In autumn 1976, already very ill, he delivered what would be his last public speech at *Hospital de la Santa Creu i Sant Pau* in Barcelona. These are words that have been reproduced many times in many publications and which partially sum up his thoughts<sup>5</sup>: "Having left Catalonia when democracy died there, it is a source of great satisfaction to me that this award is bestowed on me just as democracy is being reborn... Freedom is consubstantial with my

life. Today's act signifies a true return to my land, which I left because I did not want to see my people's freedom die".

He had returned to Catalonia after retiring in Oxford, and he died on 19 January 1977. Posthumously he was awarded the *Medalla d'Or de Sant Jordi* (Gold Medal of the Generalitat of Catalonia, the highest award for excellence in various spheres of civil life) and the *Premi Jaume I* (James I Prize for achievement in science). Shortly after his death, the *Acadèmia de Ciències Mèdiques de Catalunya i de Balears* paid him homage, and its journal, *Annals de Medicina*, published the speeches from the ceremony<sup>11</sup>.

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