

Jean Talairach

'Jean Talairach' (1911–2007) was a French [neurosurgeon](#) and neuroanatomist best known for developing the [Talairach Atlas](#), a [landmark](#) coordinate-based system for locating structures within the [human brain](#). His work laid the foundation for modern [stereotactic neurosurgery](#) and [neuroimaging](#).

Early Life and Education

- Born in [Perpignan, France](#), in [1911](#).
- Originally trained in mathematics and music before shifting to medicine.
- Studied medicine in Paris and became interested in neuroanatomy and psychiatry.

Career and Contributions

- Head of the Department of Stereotactic and Functional Neurosurgery at [Sainte-Anne Hospital](#) in Paris.
- Collaborated with radiologist Pierre Tournoux to publish the influential Co-Planar Stereotaxic Atlas of the Human Brain in 1988

¹⁾.

- Developed the [Talairach coordinate system](#), allowing for precise three-dimensional localization of brain structures using anatomical landmarks.
- The Talairach space became a foundational reference in both surgical planning and functional neuroimaging (e.g., [fMRI](#), [PET](#)).

Legacy

- Considered one of the pioneers of [functional neurosurgery](#) and brain mapping.
- The Talairach atlas remains widely cited and has influenced other coordinate-based brain atlases and software.
- Died in Paris in 2007 at the age of 95.

See also

- [Talairach Atlas](#)
- [Talairach coordinate system](#)
- [Stereotactic neurosurgery](#)
- [Neuroimaging](#)

Jean Talairach (January 15, 1911 – March 15, 2007) was a neurosurgeon who practiced at the [Sainte-Anne Hospital](#) in Paris, and who is noted for the [Talairach coordinates](#).

Talairach's contributions in the development of stereotactic instrumentation and methods, cerebral anatomy, neurophysiology, epilepsy, stereotactic biopsy and interstitial irradiation of tumors, radionuclide ablation of the pituitary gland, and surgical treatment of pain, movement disorders, and psychiatric illnesses are legend.

He arrived at Ste. Anne in 1937 at 28 years of age,

His legacy is enormous ²⁾.

On March 15, 2007, one of the giants in the field of neurosurgery disappeared. Jean Talairach left his foot-prints on the historical path of neurosurgery. His many achievements covered the whole field of functional neurosurgery, from psychosurgery to stereotactic biopsies of brain tumors and including, amongst many others, the treatment of movement disorders, pain and epilepsy. Beyond his technical achievements, he established a strict and demanding line of thought, which, even if not always evident, still dominates the current philosophy of functional and stereotactic neurosurgery. Born on January 15, 1911, in Perpignan, the capital of French Catalonia, he moved to Paris to complete his medical studies, which he had started in Montpellier. Influenced by his famous cousin, the psychiatrist Henri Ey, he embraced the field of psychiatry at the Hôpital Sainte-Anne, where he became the head of one of the services in 1945. Uncommonly in the field of psychiatry at the time, he was very quickly convinced that organic relationships existed between neuropsychological disorders and the functions of the human brain. He promptly became interested in the therapeutical opportunities offered by neurosurgery. He is purported to have said: 'Psychosurgery is too important to be left to neurosurgeons alone;' and he joined the neurosurgical service, which had been set up by Marcel David at the Hôpital Sainte-Anne. Although not a neurosurgeon, he became head of the department of stereotactic surgery. At that time he started to show the qualities which were to characterize him for the rest of his life: rigor, critical thinking and an intense ethical concern about the implications any technique may have for the patient, an obsession with precise methodology and the necessity to have everything clearly worked out before being stated and applied. For this very reason he designed his own stereotactic frame and several accessories which, combined with a very rational methodology, formed an approach still used by a large number of functional neurosurgical teams in France and other countries. His use of double grids and long-distance stereoradiology, minimizing the magnification coefficient, enabled the development of simple but rigorous arithmetical rules to correct parallax errors and allowed the safe placement of penetrating probes and tools with minimal risk of damaging vessels. The replaceability of his frame and its compatibility with neuroradiological methods available at the time (ventriculography, double-incidence angiography and biorthogonal images) meant that electrodes and biopsy probes could be positioned in accordance with anatomical structures as known at the time. Along the same lines, he and Pierre Tournoux worked on anatomical atlases, relating the vessels to anatomical structures and minimizing the individual variability by developing the proportional grid system. This system proved so valuable that it was universally used and later integrated into the SPM software to display the anatomofunctional data of functional neuroimaging in SPECT, PET and later MEG. Like Hiro Narabayashi, a neurologist who became a functional neurosurgeon, the psychiatrist Jean Talairach had the flexibility of mind to become a neurosurgeon when he felt that this method would best help his patients. His flexibility was also demonstrated when, after the advent of levodopa (which reduced the need for stereotactic treatment of movement disorders), he applied his methodology to other areas and practically invented the field of stereotactic biopsy for brain tumors and used brachytherapy as treatment when resection was not the best choice. He was helped in this by Gabor Szikla, exiled from Budapest, whose technical perfectionism matched Jean Talairach's tendencies. At the same time, his friendship with another famous neurologist, Jean Bancaud, led to the development of a

comprehensive methodological, scientific and intellectual approach to epilepsy surgery. Their partnership produced invaluable results and concepts. They participated in the classification of epilepsies, using their understanding of the mechanisms of seizure generation and propagation. Their multidisciplinary approach to pharmacoresistant epilepsies, which included the development of stereo electro-encephalography, has set standards in the surgical treatment of this disease. Jean Talairach had an impressive personality. The extent of his knowledge, the rigor of his mind, the ethical concepts which were always perceptible behind his ideas and approaches, the extreme honesty of the evaluation of his results, and his charismatic humanism attracted a crowd of neurosurgeons, neurologists, radiologists and pathologists from around the world, fascinated by and devoted to him and his closest collaborators Jean Bancaud and Gabor Szikla. Most French stereotactic and functional neurosurgeons feel indebted to his leadership and are proud to have been his pupils. Several renowned foreign neurosurgeons spent a fellowship with him, among them Patrick Kelly and Nicholas Zervas from the United States, Miguel Manrique from Spain, Claudio Munari from Italy, Tomokatsu Hori from Japan, Osvaldo Betti from Argentina, Mariano Bordas-Ferrer from Paraguay, Guy Bouvier from Canada, and many others. The magnitude of a career is measured by the importance of the contributions and achievements. Jean Talairach disappeared this year, but the impact of his tremendous work in functional and stereotactic neurosurgery will remain as it concerns the fundamental concepts³⁾.

Interne des hôpitaux psychiatriques de la Seine (1938). Mobilisé en 1939, il est envoyé dans l'Est de la France, à Belfort. Engagé volontaire en 1944 (neurochirurgien-chef de l'équipe neurochirurgicale D de la 1re armée). Docteur en médecine, faculté de médecine de Paris (1940), chef de clinique dans le service du professeur Jean Delay à la clinique des maladies mentales et de l'encéphale la même année. Neurochirurgien à l'hôpital d'instruction militaire du Val-de-Grâce, service de Marcel David (1942). Médecin des hôpitaux psychiatriques (1945), neurochirurgien assistant à l'hôpital Paul-Brousse à Villejuif, dans le service de Marcel David (1947). Assistant puis adjoint de Marcel David, qui prend la direction du centre neurochirurgical des hôpitaux psychiatriques de la Seine, hôpital Sainte-Anne à Paris (1950). Responsable de la section stéréotaxique créée par ce dernier (1958). Chef de service de neurochirurgie fonctionnelle de l'hôpital Sainte-Anne (1962). Maître de conférences agrégé, neurochirurgien des hôpitaux (1966). Créateur et directeur de l'unité de recherche Inserm 97 "Neurophysiopathologie et thérapeutique des épilepsies" (1970-1973) à l'hôpital Sainte-Anne à Paris, premier laboratoire de recherche en Europe sur la chirurgie de l'épilepsie associant cliniciens et fondamentalistes. Jean Bancaud lui succèdera en 1974 et poursuivra ses travaux. Jean Talairach est décédé à Paris en avril 2007.

The [stereoencephalography](#) of Jean Talairach (SEG) makes it possible to obtain an individualized anatomofunctional map, based on the proportion of the telencephalum with an inter-commissural line CA-CP. The aim of this paper was to design a method for the preparation of these maps, without need for the use of stereotactic equipment, and to apply this to the anatomofunctional localization of cortico-subcortical lesions. With the aid of a CAD programme (AUTOCAD v. 11), the images obtained using magnetic resonance (MR), with visualisation of the CA-AP line, skull X-ray (Rx) and cerebral angiograph (ADS) were superimposed. This was subsequently squared, as suggested by Talairach, permitting comparison between the maps (by standardization of the CA-CP line at 25 mm.) or with a stereotactic map. A total of 104 patients were studied, divided into three groups: A. Control 10 patients with slight HSA, with no ADS pathology. B. Resection of the lesion. 38 patients with vascular lesions (30) or benign tumours of less than 3mm (8). C. Epilepsy. 56 patients with drug-resistant epilepsy, with or without a visible lesion on RM (26 and 30 patients respectively). Outstanding

amongst the results obtained were: confirmation of the close relationship of the telencephalum with the CA-AP line. Using our method there was great precision in superimposing anatomical structures. There was an error of less than 0.5cm in superimposing the corpus callosum and the pericallosum artery or Galen's vein. This made it possible for us (in group B) to localize subcortical lesions larger than 1cm without using a stereotaxic guide. In these cases we were guided by the cortical venous pattern which led to the lesion. In group C, use of these maps allowed us to obtain a functional surgical document exactly the same as the anatomofunctional maps of the SEG of Talairach ⁴⁾.

1)

Talairach, J, and Pierre Tournoux. Co-Planar [Stereotaxic Atlas](#) of the [Human Brain](#) : 3-Dimensional Proportional System : An Approach to Cerebral Imaging. Stuttgart ; New York: G. Thieme ; New York : Thieme Medical Publishers, 1988. Print.

2)

Kelly PJ. Stereotactic navigation, Jean Talairach, and I. Neurosurgery. 2004 Feb;54(2):454-63; discussion 463-4. PubMed PMID: 14744292.

3)

http://histoire.inserm.fr/content/download/16994/122150/file/TALAIRACH_doc2.pdf

4)

Pulido Rivas P, Sola RG. [Anatomo-functional localization in cerebral cortex. Application of imaging systems as a guide for resection of cortical lesions]. Rev Neurol. 1996;24 Suppl 1:S5-61. Spanish. PubMed PMID: 9053275.

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