

Country of the month: Italy

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General information on the country

Italy is one of the leading European countries, with more than 60 millions inhabitants, with a very long history of culture, since the old age, in greek period, with many philosophic schools also involved in medicine, as Parmenide di Elea, in roman age and in the Middle age with the Salerno Medical School (fig. 1), in the Renaissance and finally in the modern age.

Our cities are well known for the arts, the history , for the design and fashion, but also for the quality of life, the foods (the Mediterranean diet is recently considered protective from many neurodegenerative diseases, theorized by Ancel Benjamin Keys (1904 - 2004), a famous american physiologist who decided to live in the Cilento, a beautiful Southern Italy area , experiencing on himself this diet) and finally for the human relationships of their inhabitants.



Fig. 1. A miniature depicting the Schola Medica Salernitana from a copy of Avicenna's *Canons*

The Italian health system

It is fully public, since 1970, with the majority of the hospitals that are administered by the Regions, who also are in charge of the primary care. Private hospitals exist , some of which may be also fully supported by the Regions. Pure private clinical practice also is possible.

Italian citizens receive completely gratuity assistance for hospital care; they have to pay a ticket related to salary for outclinic patient care and for drugs .

The Italian University System and the Medical School

Also the large part of the Italian Higher Education system is public, including the majority of the best Universities. We have many historic Universities, with a long tradition from more than 7 centuries Bologna (founded in 1088), Padua (founded in 1222), Naples (founded in 1224), Siena (1240) (fig 2-4), and others. The total Universities in Italy are around 90, with 40 Medical School, the majority public (4 private). The access to Medical School is regulated by a national selection, after a multiple choice test examination, establishing a national list, also giving priorities in the selection of the university.

Fig 2

The anatomical theatre of Padua University, by Girolamo Fabrici d'Acquapendente in 1594, professor of anatomy, physiology and surgery.

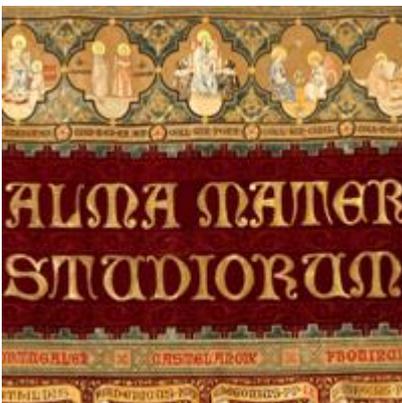


Fig 3. Bologna is the oldest Italian University, founded in 1088. It has been in the centuries considered the Alma Mater studiorum.

Fig 4

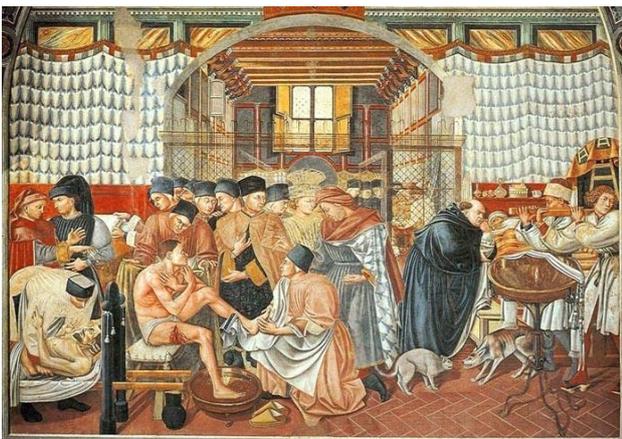


Fig 4b and c

Fig. 4. a. Santa Maria della Scala (Siena) was one of Europe's first hospitals and one of the oldest hospitals in the world surviving as hospital until few decade ago. 4 b and c. Frescoes in the Pilgrim's Hall by Domenico di Bartolo

The post graduate school of Neurology

Table 1 shows the list of the Neurology post-graduate Schools, all linked in Italy with the Universities and University Hospitals. An agreement may be also present with the non University Hospitals. The duration of the training is 4 years. The access is regulated by a national multiple test examination, with similar rules than the access to Medical School. The neurologists in training receive a salary (1800 euros/monthly) and their activity is divided between clinical practice , learning following the different teaching courses and research following at least three research projects (also drug trials). The training period terminates with the discussion of a thesis. At least 160 new positions are present every year differently distributed in the different Schools.

Table 1. Numbers of new neurologists in training in 2018 in the different Universities

University	no
Bari	7
Bologna	7
Brescia	4
Cagliari	4
Naples "Vanvitelli "	4
Catania	3
Catanzaro	4
Chieti	3
Cattolica, Roma	6
Ferrara	3
Firenze	8
Genova	5
L'Aquila	1
Messina	4
Milano	9
Milano-Bicocca	5
Modena	3
Napoli Federico II	5
Padova	6
Palermo	4
Parma	3
Pavia	4
Perugia	5
Piemonte orientale	3
Pisa	4
Politecnico Marche	2
Roma La Sapienza	14
Roma Tor Vergata	6

San Raffaele Milano	4
Salerno	2
Siena	4
Torino	4
Trieste	2
Udine	2
Univ. Campus Biomed	4
Verona	7
Total	169

The history of Italian Neurology

The history of Italian neurology has long been bound up with the treatment and study of mental disorders: the Società Frenopatica Italiana (Italian Phrenopathic Society) was founded in 1861 with the aim of studying the anatomy and physiology of the brain and nerves, as well as the organization of hospitals for the treatment of mental illness.

At the onset of the 1900s, several scientists, involved mainly in investigation of the anatomy and physiology of the central and peripheral nervous system and its pathological conditions, began to see the usefulness of an autonomous development of the neurosciences as a separate field. They created the Italian Society of Neurology (Società Italiana di Neurologia, SIN), which was officially founded in 1907 with Leonardo Bianchi, professor at the University of Naples as its first president. The individuals involved in this endeavour were the founders of the modern Italian neurology: Leonardo Bianchi, Carlo Besta, Amico Bignami, Ugo Cerletti, Cesare Lombroso, Giovanni Mingazzini, Onofrio Fragnito, Ottorino Rossi, Camillo Negro, Enrico Morselli, Eugenio Tanzi, Ernesto Lugaro, Camillo Golgi, and so on (Fig.s 4-9). These founders of Italian neurology came from various prestigious Italian neurological schools: – the school of Turin, founded by Cesare Lombroso, Camillo Negro, Ernesto Lugaro, and Dino Bolsi – the school of Rome, with Giovanni Mingazzini, Ugo Cerletti who developed the electroshock strategy for caring behavioral disorders, and Guido Gozzano , one of the founders of the modern electrophysiology – the school of Pavia with Cesare Lombroso (who subsequently moved to Turin), Casimiro Mondino and Ottorino Rossi – the school of Naples with Leonardo Bianchi and Vito Maria Buscaino.



Fig. 5 - Leonardo Bianchi, the first President of the Italian Society of Neurology, professor in Naples.

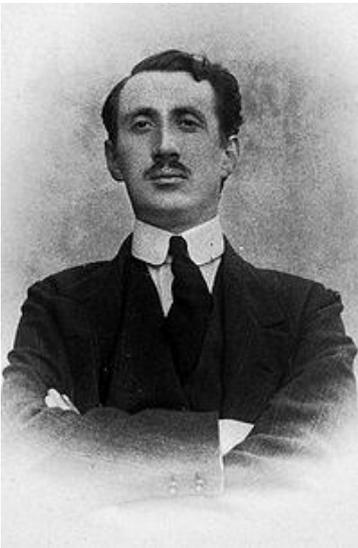


Fig. 6 - Gaetano Perusini, one of the first neurologists describing the clinical and neuropathologic findings of senile dementia, after known as Alzheimer's disease.



Fig 7. Drawings by Gaetano Perusini reporting neurons in various stages of neurofibrillary alterations.



Fig 8 - Camillo Golgi (1843 – 1926), Nobel Prize in 1908.

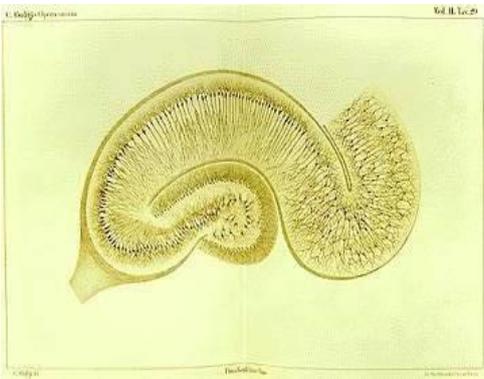


Fig.9 - Hippocampus in a drawing of Golgi



Fig. 10 - Giovanni Mingazzini (1859 – 1929). Professor at University of Rome. He described the Mingazzini's manoeuvre, to detect minor paresis.



Fig.11 - Rita Levi-Montalcini (1909 – 2012), neurologist, neuroscientist, Nobel Prize, 1986. She was educated at Turin University, where she worked until 1946, when she immigrated in USA. She came back to Italy after 1960, becoming director of a Neuroscience Centre at CNR, Rome. She was also President of the Multiple Sclerosis Foundation and life-senator.

In the period between the Second World War and the end of the 1950s, services for the treatment of neurological and mental disorders were generally located in psychiatric hospitals and the discipline was called *Clinica delle Malattie Nervose e Mentali* (Nervous and Mental Diseases Clinic). Subsequently, in several hospitals, special units of neurology and neuropathology were created, separated from general medicine units, but until 1960 the law governing the general organization of hospitals did not make provision for units of neurology in all major hospitals (indeed, there existed only a handful of neuropathology units, in large cities like Genoa, Milan, Rome, Turin, etc).

From 1970 onwards, the Italian Society of Neurology saw major changes, acquiring a more modern internal organization. Neurology became separate from psychiatry and the Clinics of Mental and Nervous System Diseases started to be called Neurology Departments. In the universities the professors of nervous and mental diseases preferred to be known as professors of neurology, splitting their teaching into neurology and psychiatry. Numerous subspecialties started to emerge and develop, attracting growing interest from young generations of neurologists (neuropsychology, neuropathology, clinical neurophysiology, clinical neurochemistry, neurogenetics, neuroimmunology, neuroimaging, neurorehabilitation, neurophthalmology, etc.).

The SIN board is renewed every two years. Many members greatly contributed to the development of the modern neurology in Italy, some of them with a great international reputation (we remember, between the passed away Presidents, Luigi Amaducci (Florence), for his European work at level of EFNS and EU for development of European Research mainly in Neuroepidemiology and Dementia, Cesare Fieschi (Rome) for his involvement in vascular diseases and stroke care organization, Elio Lugaresi (Bologna) for his contribution in the sleep research (fig 12-14).



Fig. 12 - Luigi Amaducci (1932-98), University of Florence



Fig 13 - Cesare Fieschi (1932-2016), University of Rome La Sapienza



Fig 14 - Elio Lugaresi (1926-2015), University of Bologna

Renato Boeri, who was director of the Istituto Neurologico Besta, had the great merit of founding in 1979 the Italian Journal of Neurological Sciences , which became the Society's official organ. Published by Springer-Verlag and called Neurological Sciences since 2003, over the years it acquired considerable international stature (Fig. 13) increasing in the recent years its IF to 2,289.

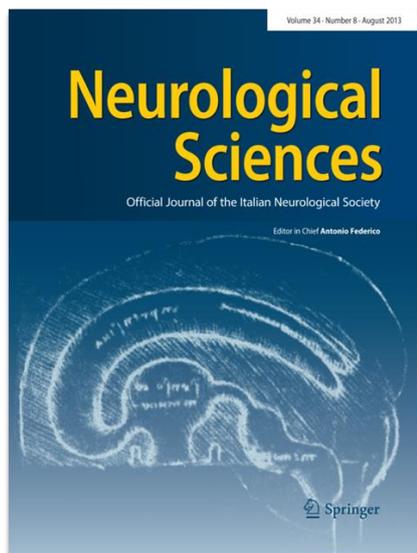


Fig. 13 – Neurological Sciences, edited by Springer-Verlag, organ of the Italian Society of Neurology. Editor in Chief (2013-up-to-date) Antonio Federico.

Italian neurology: the present and future

In 2007, the Italian Society of Neurology celebrated its centenary and a book has been published, marking this milestone (Cento Anni della Società Italiana di Neurologia: le Origini e gli Sviluppi. Siena; Tipografia Senese s.n.c. 2011). Today, the Italian Society of Neurology has more than 2600 members, 19 Study Groups and 16 Adherent Societies all of them active in the different branches of the neurological sciences; it has two journals, one published in English (Neurological Sciences) and the other in Italian (Neurologia Italiana). It has numerous activities to promote the research and organization of neurological care in Italy; it is also particularly active at international level. The passing years have seen major changes in the composition of the membership of the Italian Society of Neurology, with increasing proportions of women and of young people (Table III).

As far as Italian neurological research is concerned, despite the low levels of economic support traditionally channelled by Italian governments into research, neurology is, compared with other disciplines, one of the most active areas of research in Italy. If we look at the number of articles published by Italian neurologists in the leading international journals (Fig. 15) a linear increment is present over the years, taking Italy to third position in Europe (Cruccu et al, 2017).

Currently, Italian neurologists are mainly devoted to emergency care (stroke and other emergency conditions involving the central nervous system, peripheral nerves and muscles), the treatment of complex disorders, like the many neurodegenerative diseases in which the support of complex laboratory investigations, including neuroimaging, neuropathology and neurogenetics, is needed in the diagnostic work up, in order to establish the exact pathogenesis and best course of treatment, and, finally, the treatment of many chronic diseases such as dementia, Parkinson's disease and parkinsonisms, multiple sclerosis and the sequelae of many diseases of the central and peripheral nervous systems and muscles. Emergency, complexity and chronicity are, in neurology, different aspects of the same conditions; in all these ambits, it is only through proper integration of science, therapy, teaching and relationships with patients and caregivers that we might achieve a more effective approach to the care of patients with neurological diseases. In the SIN web site (www.neuro.it) are present all the data about the different hospital neurologic structures. A data base on the Stroke Units is under construction.

Table III - Number of and profile of members of the Italian Society of Neurology (2019)

Total members 2654 (7 honorary)

- Males 1315
- Females 1339

Young members (under 35 y) 629 (22 %)

- Males 282
- Females 347

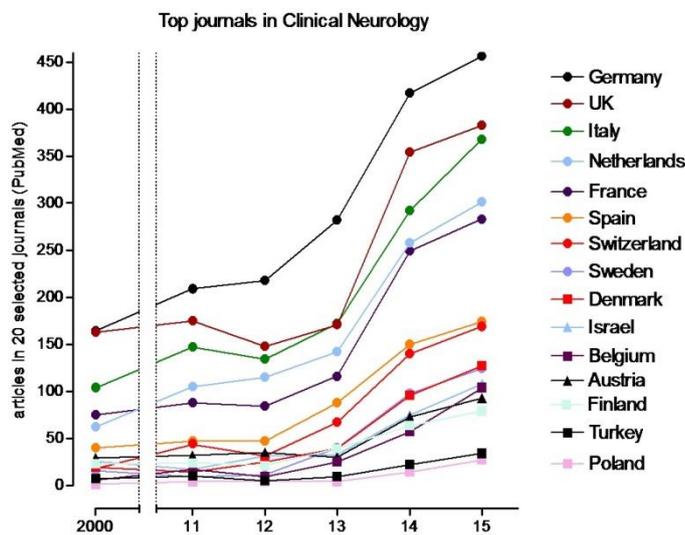


Fig 15 – The scientific production in the top Clinical Neurologic Journal in Europe (Cruccu et al, Europ. J. Neurol. 2017)

In recognition of the activity of the Italian Neurology, at national and international level, and of the reputation of their leaders but also of all Italian neurologists, the 2021 World Federation of Neurology Congress will be held in Rome, 60 years after the last WFN congress in Italy, where we invite all of you (fig 16).



Fig 16 – Welcome to Rome for the 2021 World Congress of Neurology