



The 50th anniversary of the Italian League against epilepsy (Lega Italiana Contro l'Epilessia) [☆]



Laura Tassi ^{a,*}, Nicola Specchio ^b, Oriano Mecarelli ^c, Paolo Tinuper ^{a,d,e}, Federico Vigevano ^f, Emilio Perucca ^g

^a "Claudio Munari" Epilepsy Surgery Centre, ASST Niguarda Hospital, Milano, Italy, Member of European Reference Network EpiCARE, Italy

^b Rare and Complex Epilepsy Unit, Department of Neuroscience, Bambino Gesù' Children's Hospital, IRCCS, Member of European Reference Network EpiCARE, Rome, Italy

^c Sapienza University of Rome, Department of Human Neurosciences, Italy

^d Department of Biomedical and Neuromotor Sciences, University of Bologna, Italy

^e IRCCS Istituto delle Scienze Neurologiche, Bologna, Italy

^f Neurology Unit, Department of Neuroscience, Bambino Gesù' Children's Hospital, IRCCS, Member of European Reference Network EpiCARE, Rome, Italy

^g Department of Medicine, Austin Health, University of Melbourne and Department of Neuroscience, Monash University, Melbourne, Australia

ARTICLE INFO

Article history:

Received 31 December 2021

Revised 11 May 2022

Accepted 15 May 2022

Available online 20 May 2022

Keywords:

Epilepsy

History

Italian League Against Epilepsy

ABSTRACT

This article was prepared to outline the article collection submitted on behalf of Lega Italiana Contro l'Epilessia, or LICE, for the 50th anniversary of the founding of the ILAE Italian Chapter, and provides a brief summary of the history, with its landmark achievements and challenges. LICE is a multidisciplinary, inclusive, educational, informative and multifaceted organization. Initially in 1955 and then formally in 1972, LICE was born in Milano, with the mission to devote itself to people suffering with epilepsy and by promoting appropriate treatment and care, integration into society, to promote and pursue all kinds of activities designed to achieve those aims. The LICE is currently composed of more than 1000 members including neurologists, pediatric neurologists, neurosurgeons, neurophysiologists, and neuropsychologists who function throughout Italy dealing mainly or exclusively with the diagnosis and treatment of people with epilepsy.

© 2022 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The Italian League Against Epilepsy (LICE), a Chapter of the International League Against Epilepsy (ILAE), pursues the statutory objective of promoting the care of people with epilepsy and their integration into society at large. LICE was established originally in 1955 at a meeting in Milan organized by Mario Gozzano and Eugenio Medea, who became President and Vice-President respectively. After a temporary loss of vigor and pace, LICE was founded anew in 1972, with Elio Lugaresi as President and Raffaele Canger as Secretary. Since then, the organization developed into one of the most dynamic, close-knit scientific societies in Italy. LICE is gov-

erned by their Executive Council, renewed every three years and comprising, according to the new statute, the President, Vice-President, past-President, Secretary, Treasurer, seven Councilors, and a board of three arbitrators.

Currently LICE has 1036 members, including neurologists, pediatric neurologists, neurosurgeons, neuropsychologists, neurophysiologists, basic scientists and other professionals from all regions of Italy, most of whom are primarily involved in the diagnosis and treatment of people with epilepsy. Of these, more than 40% are under the age of 40, as part of YES-I (young epileptologists=Italy). Some members practice abroad, remaining in close contact with LICE and participating in congress efforts and research projects.

Since its foundation, LICE has been actively involved in a wide range of activities, namely (i) promoting research into the causes of epilepsy and its treatment; (ii) collecting and processing statistical data and information on a national and regional basis; (iii) stimulating and encouraging the establishment of centers for the diagnosis and treatment of people with epilepsy; (iv) establishing and maintaining relations with ILAE and with other organizations dealing with the care of people with epilepsy; (v) organizing congresses (including, annually, a national congress and a polycentric meeting devoted to case discussion), conferences and other scien-

[☆] On the behalf of the Lega Italiana Contro l'Epilessia (LICE), the Italian ILAE chapter, we describe our 50-year history, providing a brief summary, landmark and achievements. LICE is a complex, multidisciplinary, inclusive, educational and multifaceted organization, born in Milano in 1955 and again in 1972, with the mission to support people suffering from epilepsy by promoting appropriate treatment and care, integration into society, education, research into epilepsy. LICE currently has more than 1000 members, including neurologists, child neurologists, neurosurgeons, neurophysiologists, neuropsychologists and basic scientists from all regions of Italy and dedicated mostly to epilepsy care and research.

* Corresponding author.

E-mail address: laura.tassi@ospedaleniguarda.it (L. Tassi).

tific events to advance knowledge on the medical and social aspects of epilepsy; (vi) establishing and maintaining relations with national and regional bodies to promote legislation and other initiatives to improve the lives of people with epilepsy; and (vii) collecting contributions and donations, and organizing fundraising activities for the purpose of achieving its statutory objectives.

The contribution of Italian researchers to scientific knowledge in epileptology has been substantial over the years. As discussed subsequently, Italian epilepsy professionals also contribute actively to many international activities, including ILAE Commissions and Task Forces, and the European Reference Network (ERN) EpiCARE.

Overview of LICE activities

Commissions and Study Groups

Many LICE activities are conducted through topic-oriented Commissions and Study Groups. Commissions and study groups are renewed every three years together with the Executive Council. They are all engaged in knowledge dissemination and training and they are often organized into multidisciplinary groups. For a complete list of Commissions and Study Groups, please refer to the LICE website (www.lice.it).

Guidelines and consensus papers

LICE Commissions and Study Groups have produced several guidelines and consensus papers. In 2006, 2009 and 2013, some of these documents were published in *Epilepsia* as supplements that were entirely dedicated to LICE activities [1–12]. These documents can be accessed in the LICE website (www.lice.it).

Scientific meetings

Several scientific events and meetings at local, regional, and national level are organized annually under the LICE auspices. The LICE annual “Congresso Nazionale” is usually held in June, and is attended by more than 500 delegates, with extensive participation of the younger generation of epileptologists (YES-Italy). The national congresses address different topics every year and offer the opportunity to discuss the work of Commissions and Study Groups. The annual “Riunione Policentrica” is held in January, usually in Rome, and is attended by about 400 mostly young epileptologists (less than 40 years of age). The “Riunione Policentrica” consists in the presentation and discussion of over 50 clinical cases that are especially challenging from the diagnostic or therapeutic viewpoint. The discussions are typically organized into specific sessions, addressing issues such as genetic aspects, controversies in pediatric and adult epileptology, special topics related to neurophysiology and neuroimaging, and epilepsy surgery.

Regional activities

Many LICE activities are organized according to a regional and/or supraregional structure. Every three years, LICE members in each LICE region elect a regional coordinator and three to five council members, who are responsible for organizing local meetings and a variety of educational activities. On an annual basis, each regional coordinator submits to the Executive Council a report of the activities organized in the relevant region. Some regions contain most of the members (Lazio, Emilia Romagna, Lombardia), while the regions in which they are less numerous are grouped into macro-areas.

LICE-recognized centers

Epilepsy centers in Italy may request formal LICE recognition to the LICE Executive Council. Recognition is based on compliance with a range of predefined criteria (among the major criteria the number of afferent patients, the type of available diagnostic technologies, the presence of drug trials, the collaborations with other centers). Recognized centers specialized in the diagnosis and medical or surgical treatment of epilepsy (for children, adults or both) are categorized into three levels, according to available personnel and facilities, and the level of care provided. Currently LICE recognizes over 50 centers that fulfil the required criteria.

Other educational activities

The LICE Commission for Promotional and Educational Activities organizes annually national campaigns aimed at raising awareness about the medical and social aspects of epilepsy. These campaigns may target the general population or specific groups, such as school teachers. Some of these activities are organized to coincide with the National Epilepsy Day, which since 2016 has been aligned with the date of the International Epilepsy Day (second Monday in February).

LICE has produced the Guide to Epilepsy in Italian, which is available in a printed format and in electronic form in the LICE website. In 2012, LICE has also published a storybook with articles written by people with epilepsy and their caregivers, which target both a pediatric and adult readership. The purpose of the storybook is to improve knowledge about epilepsy in the general population.

The LICE website (www.lice.it) hosts all main LICE publications, and a description of the various activities of the society [13–16]. The website also hosts the results of several nationwide surveys organized by LICE.

The LICE Epilepsy foundation

The LICE Epilepsy Foundation was established in 2011 within the framework of LICE as a non-profit fund-raising organization aimed at supporting epilepsy research. During the last nine years, the Foundation had provided research grants for 11 projects for a total amount of € 280,000. Financial support has been provided every year to 3 biennial projects.

Relationship with the International League Against Epilepsy

The link between Italian epileptology and the ILAE dates back to the very creation of the ILAE. Augusto Tamburini, a Rome-based psychiatrist who cultivated an interest in the relationship between epilepsy and psychosis, was among the founding fathers of the ILAE when the organization was established in 1909 in Budapest [17]. Tamburini may even be considered the first President of ILAE, as he chaired the first International Committee (equivalent to the current Executive Committee) during the period 1909–1912. Interestingly, at the time the ILAE was established, national committees were also set up to pursue the organization's interests at local level, and the Italian committee appointed at that time might well be considered the first embryo of the Italian League.

The 9th International Meeting of ILAE in 1961 also had an Italian connection. The meeting took place in Rome, and marked another milestone in the history of ILAE because on that occasion the General Assembly approved the creation of the International Bureau of Epilepsy (IBE) as a sister organization in charge of addressing the social aspects of epilepsy. Both ILAE and the Italian League were small organizations at that time, and the scientific program of the Rome meeting included only 9 lectures, one of

which was delivered by Raffaello Vizioli. The four years that followed the Rome congress saw a flurry of activities in international epileptology which culminated in the finalization of the first proposed ILAE Classification of Epileptic Seizures under the leadership of Henry Gastaut [2]. The classification was largely drafted at an ILAE workshop held in Marseille on April 1–2, 1964, and presented by Gastaut, Landolt, Pond, Subirana and Vizioli ‘in the names of the French, German, Swiss, English, Spanish and Italian branches of the ILAE’ [18]. Thus, the publication acknowledges the existence and contribution of the Italian branch which, as mentioned earlier, had been established in 1955 and underwent restructuring and formal re-foundation in 1972.

Over the subsequent decades, many LICE members played active roles in subsequent revisions of the classification of seizures and epilepsy, as well as the production of a large number of ILAE reports, guidelines, and position papers. As an indication of their contribution to ILAE, 14 LICE members have been awarded the Ambassador for Epilepsy Award to date [19]. Several LICE members also held officer positions in the Executive Committee of ILAE. These include Carlo Alberto Tassinari (1981–1985), Francesco Castellano (ex-officio IBE, 1981–1985), Giuliano Avanzini (1993–2009) and Emilio Perucca (2005–2021). Avanzini and Perucca held the position of ILAE President during the 2001–2005 and the 2013–2017 terms, respectively.

The LICE hosted the ILAE-IBE International Epilepsy Congress in 1961 (Rome), 1979 (Florence) and 2011 (Rome), and the European Congress of Epileptology in 2000 (Florence). Over the years, LICE and its members have promoted and co-organized many joint meetings with other ILAE Chapters, including regular events such as the joint meetings of the French, Italian, Spanish and Portuguese Leagues, and the Mediterranean Epilepsy Conferences. The LICE and its members have also contributed regularly to the organization of ILAE educational activities, including among others the Advanced San Servolo Epilepsy Courses, and the Tagliacozzo International Residential Courses on Drug Resistant Epilepsies. Over a three-year term, LICE also organizes migrating courses on topics such as genetics, video-EEG and neurophysiology.

LICE and the development of epilepsy surgery in Italy

Of the approximately 600,000 people with epilepsy in Italy, about 22,000 with drug-resistant focal epilepsies are estimated to be candidates to epilepsy surgery. Most patients are treated at tertiary level referral centers. However, despite the presence of several specialized centers, about half of these patients are managed by general neurologists, neuropsychiatrists, pediatricians or general practitioners, and many who are likely to benefit from epilepsy surgery are not referred timely to presurgical evaluation.

The early history of epilepsy surgery in Italy: 1955 to 1994

Following up on early initiatives that date back to the beginning of the 1940s, in the late 1950s two main groups led by Franco Marossero and Carlo Alberto Pagni in Milan and by Victor Aldo Fasano in Turin developed the first specific epilepsy surgery programs in Italy. These programs included the refinement of invasive presurgical techniques, such as “electroencephalographic” and “stereoelectroencephalographic” recordings [20].

Due to lack of strong collaboration between neurosurgeons, neurologists and neurophysiologists specifically trained in epilepsy surgery, clinical outcomes were often poor, with a high frequency of surgical complications. Several patients underwent temporal lobectomy without prior accurate ascertainment of anatomoelectroclinical correlations, leading to discouraging results. As a result, epilepsy surgery became quickly discredited, and confined

to a marginal role. No dedicated centers were created, and patients with epilepsy were treated by neurosurgeons within general neurosurgery departments. Against this background, pioneering work in sensitizing Italian epileptologists to the opportunities offered by epilepsy surgery, and to existing guidelines in the field, was conducted first in Genoa and then in Roma by Gianfranco Rossi and his group. In addition, palliative surgery and lesionectomies, particularly in tumor-related epilepsies, were carried out by Isacco Papo in Ancona and Giovanni Broggi in Milano. Disconnective techniques and hemispherectomies were also performed in subsequent years [21].

Claudio Munari and his legacy: 1994 to 2000

After obtaining his post-graduate certification in Neurosurgery and in Neurology in Bologna and completing a training period in Marseille, Claudio Munari moved to Paris in 1977 and worked in close association with Jean Bancaud and Jean Talairach at the St. Anne Hospital. In 1994, 17 years after his departure from Italy, he moved back to his home country with a strong motivation to set up an effective epilepsy surgery program [22].

Claudio Munari highlighted the differences between the European, and particularly the French school and the United States approach. He was a strong advocate of the concept of ‘uniqueness’ of each patient and of each epilepsy, and contributed to demonstrate how correlations between ictal semiology, anatomical data and neurophysiological recordings permit to define the ‘epileptogenic zone’ in each individual and to carefully plan the site and extent of surgical resection. He transformed the stereo-EEG investigation, inherited from Bancaud and Talairach, into a systematic methodological approach. Claudio Munari was one of the founders of LICE, and became President of LICE in 1996. He was an active member of several Commissions and Task Forces of the ILAE. Soon after his untimely death on October 2, 1999, the epilepsy surgery center at the Niguarda Hospital in Milan was named after him. By then, thanks to his organizational skills, achievements and dedication to teaching, epilepsy surgery in Italy had become well established, and on course to develop further.

The last two decades

Since 2000, the rapid development of centers dedicated to epilepsy surgery in Italy became unstoppable, involving several regions in perfect integration with LICE activities. The Epilepsy Surgery Commission of LICE became soon one of the most active within the LICE membership and worked in close relationship with other Commissions and Study Groups [23–25].

Invasive recordings are currently available in several centers for adult and pediatric patients. Integration with neuroimaging, genetics, neuropathological, neuropsychology and neurophysiology, makes clinical and scientific activities multifaceted and in continuous evolution. Stereo-EEG is used in most centers, inherited from the French experience and Munari’s own contribution to the field. Thermocoagulation, like other minimally invasive techniques, is used in several centers. Multidisciplinary meetings to discuss surgical cases are commonplace and steadily increasing, permitting continuous refinement of the patient work-up.

Regional second- and third-level centers of excellence for the care of adults and children with epilepsy have developed in all Italian regions. LICE and its Epilepsy Surgery Commission promote and encourage the scientific and professional training of epileptologists, and support the development of epilepsy surgery centers. Services offered at each center vary from routine diagnostic, monitoring, and follow-up care to intensive monitoring. Access of patients to epilepsy surgery centers is through referral by neurologists, neurophysiologists, and neuropsychiatrists. Despite these

advances, awareness of the value of surgical treatment is still sub-optimal, and too often patients are referred to epilepsy surgery with unacceptable delay. To date, less than 250 patients are operated on every year in Italy.

LICE and the Epilepsy Surgery Commission work side by side to improve education on the role of epilepsy surgery and to promote development of new centers, strengthen existing ones, and support professional growth and research in this area. Network of epilepsy care centers have been created to improve identification of surgical candidates, as well as their management and follow-up.

A look into the future

Thanks to the comprehensive approach taken since its creation, LICE can count on the contribution of a significant number of young members, who make up about 40% of the current membership. Future activities will remain focused on improvement in quality of care, education, and promotion of high-quality research. The vision of LICE, like the vision of ILAE, is a world where the life of people will not be limited by epilepsy. To fulfil this vision, LICE will continue to advocate with all relevant stakeholders, including public health authorities, to improve access to high quality care for all people with epilepsy.

Education has the highest priority among the activities promoted by LICE. National congresses, local meetings, and courses will especially aim at improving epilepsy knowledge among young neurologists and enhance their skills in the diagnosis and management using state-of-the-art technologies. A curriculum for epileptologists is being developed and will soon be available.

LICE is also encouraging the involvement of young neurologists and basic scientists into clinical and translational research. This research is currently being supported with a limited number of grants, which LICE intends to extend through an expansion of its fundraising activities.

Acknowledgments

We would like to thank Maura Stella for her skills and dedication in coordinating the LICE Secretariat since 2006, and for her continuous support to the activities of the Executive Council, Commissions and Study Groups.

Disclosures

LT has served on scientific advisory boards for Eisai, UCB, Arvelle.

NS has served on scientific advisory boards for GW Pharma, BiMarin, Arvelle, Marinus and Takeda; has received speaker honoraria from Eisai, BiMarin, Livanova, Sanofi; has served as an investigator for Zogenix, Marinus, BiMarin, UCB, Roche.

OM received speaker and/or consultancy fees from Angelini, Arvelle, Eisai, GW Pharma, UCB Pharma, and royalties from Wolters Kluwers and Springer.

PT received speaker's or consultancy fees from Arvelle, Eisai, GW Pharma, LivaNova, UCB Pharma, Angelini, Xenon Pharma, Zogenix.

EP received speaker and/or consultancy fees from Angelini, Arvelle, Biogen, Biopas, Eisai, GW Pharma, Sanofi group of companies, SK Life Science, Takeda, UCB Pharma, Xenon Pharma and Zogenix, and royalties from Wiley, Elsevier, and Wolters Kluwers.

References

- [1] Beghi E, De Maria G, Gobbi G, Veneselli E. Diagnosis and treatment of the first epileptic seizure: Guidelines of the Italian League against Epilepsy. *Epilepsia* 2006;47(Suppl 5):2–8.
- [2] Minicucci F, Muscas G, Perucca E, Capovilla G, Vigeveno F, Tinuper P. Treatment of status epilepticus in adults: Guidelines of the Italian League Against Epilepsy. *Epilepsia* 2006;47(s5):9–15.
- [3] Perucca E, Albani F, Capovilla G, Bernardina BD, Michelucci R, Zaccara G. Recommendations of the Italian League against Epilepsy working group on generic products of antiepileptic drugs. *Epilepsia* 2006;47(Suppl 5):16–20.
- [4] Aguglia U, Barboni G, Battino D, Cavazzuti GB, Citernesani A, Corosu R et al. Italian consensus conference on epilepsy and pregnancy, labor and puerperium. *Epilepsia* 2009 Jan;50Suppl1:7–23.
- [5] Capovilla G, Mastrangelo M, Romeo A, Vigeveno F. Recommendations for the management of "febrile seizures": Ad hoc Task Force of LICE Guidelines Commission. *Epilepsia* 2009 Jan;50Suppl1:2–6.
- [6] Pruna D, Balestri P, Zamponi N, Grosso S, Gobbi G, Romeo A, et al. Epilepsy and vaccinations: Italian guidelines. *Epilepsia* 2013;54:13–22.
- [7] Capovilla G, Beccaria F, Beghi E, Minicucci F, Sartori S, Vecchi M. Treatment of convulsive status epilepticus in childhood: recommendations of the Italian League Against Epilepsy. *Epilepsia* 2013;54:23–34.
- [8] Beghi E, Giussani G, Grosso S, Iudice A, Neve AL, Pisani F, et al. Withdrawal of antiepileptic drugs: guidelines of the Italian League Against Epilepsy. *Epilepsia* 2013;54:2–12.
- [9] Marras CE, Canevini MP, Colicchio G, Guerrini R, Rubboli G, Scerrati M, et al. Health Technology Assessment report on the presurgical evaluation and surgical treatment of drug-resistant epilepsy. *Epilepsia* 2013;54:49–58.
- [10] Guerrini R, Scerrati M, Rubboli G, Esposito V, Colicchio G, Cossu M, et al. Commission for Epilepsy Surgery of the Italian League Against Epilepsy. Overview of presurgical assessment and surgical treatment of epilepsy from the Italian League Against Epilepsy. *Epilepsia* 2013;54:35–48.
- [11] Minicucci F, Ferlisi M, Brigo F, Mecarelli O, Meletti S, Aguglia U, et al. Management of Status Epilepticus in adults. Position paper of the Italian League Against Epilepsy. *Epil Behav* 2020;102:106675.
- [12] Roberti R, Casarella A, Iudice A, La Neve A, Beghi E, Capovilla G, et al. Antiseizure Medications Commission of the Italian League against Epilepsy LICE Appropriate use of generic and branded antiseizure medications in epilepsy: updated recommendations from the Italian League Against Epilepsy (LICE). *Epil Behav* 2021;116:107804.
- [13] Mecarelli O, Capovilla G, Romeo A, Rubboli G, Tinuper P, Beghi E. Past and present public knowledge and attitudes toward epilepsy in Italy. *Epilepsy Behav* 2010;18(1–2):110–5.
- [14] Mecarelli O, Capovilla G, Romeo A, Rubboli G, Tinuper P, Beghi E. Knowledge and attitudes toward epilepsy among primary and secondary schoolteachers in Italy. *Epilepsy Behav* 2011;22(2):285–92.
- [15] Mecarelli O, Messina P, Capovilla G, Michelucci R, Romeo A, Beghi E, et al. An educational campaign toward epilepsy among Italian primary school teachers. *Epilepsy Behav* 2014;32:84–91.
- [16] Mecarelli O, Messina P, Capovilla G, Michelucci R, Romeo A, Beghi E. Epischolar Collaborative Group of the Lega Italiana contro l'Epilessia (LICE), et al. An educational campaign toward epilepsy among Italian primary school teachers: 2. The results of a focused training program. *Epilepsy Behav* 2015;42:93–7.
- [17] Shorvon S, Avanzini G, Meinardi H, Reynolds H, Weiss G, Engel J. International League Against Epilepsy: 1909–2009. A Centenary History. *International League Against Epilepsy*. Available at: <https://www.ilae.org/about-ilae/history-and-archives/ilae-centenary-book/amp/amp%3B> (accessed November 18, 2021).
- [18] Gastaut H, Caveness WF, Landolt H, Lorentz de Haas AM, McNaughton FL, Magnus O, et al. A proposed International Classification of Epileptic Seizures. *Epilepsia* 1964;5:297–306.
- [19] ILAE-IBE Ambassador for Epilepsy recipients. Available at: <https://www.ilae.org/files/dmfile/Ambassadors-for-Epilepsy-to-2021.pdf> (accessed November 18, 2021)
- [20] Pagni CA, Marosero F, Migliore A. The value of electroencephalographic registration in the study of epilepsy. *Acta Neurochir* 1962;28:277–300.
- [21] Rossi GF. Why, when and how surgery of epilepsy? *Acta Neurochir Suppl* 1980;30:7–11.
- [22] Munari C, Broggi G, Scerrati M, Study Group of Functional Neurosurgery of the Italian Society of Neurosurgery. Epilepsy surgery: guidelines for minimum standard equipment and organization. *J Neurosurg Sci* 2000;44(4):173–6.
- [23] Barba C, Cossu M, Guerrini R, Di Gennaro G, Villani F, De Palma L, et al. Temporal lobe epilepsy surgery in children and adults: A multicenter study. *Epilepsia* 2021;62(1):128–42.
- [24] de Palma L, Pietrafusa N, Gozzo F, Barba C, Carfi-Pavia G, Cossu M, et al. Outcome after hemispherotomy in patients with intractable epilepsy: comparison of techniques in the Italian experience. *Epilepsy Behav* 2019;93:22–8.
- [25] Consales A, Casciato S, Asioli S, Barba C, Caulo M, Colicchio G, et al. The surgical treatment of epilepsy. *Neurol Sci* 2021;42(6):2249–60.