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Opinion

Training the Brain Health Workforce of Tomorrow: The Role of Trainees in Shaping Integrated, Preventive, and Equitable Brain Care

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Abstract

The concept of Brain Health is transforming the neuroscientific landscape, promoting an integrative and preventive approach to care under a unifying vision. This position paper, developed by Swiss junior societies in neurology and psychiatry, presents a trainee perspective on how Brain Health should be addressed from the earliest stages of postgraduate training. It explores current gaps in postgraduate training, including the continued separation of neurology, psychiatry and other specialties involved in brain disorder care, limited interdisciplinary and interprofessional exposure, and gaps in leadership, public health, and advocacy skills. We highlight promising models such as Switzerland's integrated training components and the proposed "brain medicine" framework, inspired by internal medicine. Additionally, we examine innovative initiatives from trainee associations that promote collaborative learning, advocacy, and Brain Health awareness through academic and creative channels. The paper also stresses the importance of equitable global access to training, the integration of research into clinical education, and the urgent need to address burnout and working conditions among early-career professionals. By reframing trainees not as passive learners but as active agents of change, we call for systemic reforms that support their role in advancing Brain Health. Ultimately, we advocate for the development of international core competencies, adaptable curricula, and structured interdisciplinary pathways that embed Brain Health into every level of medical training. Only through this

comprehensive approach can we equip the next generation of clinicians to promote lifelong Brain Health across specialties, systems, and populations.

Keywords: brain health; education; trainees; neurology; psychiatry

1. Introduction: Redefining Brain Health and Its Implications for Future Training

The World Health Organization's 2022 definition of Brain Health marks a significant shift in the conceptual landscape of medicine. By describing Brain Health as "*the state of brain functioning across cognitive, sensory, social-emotional, behavioural and motor domains, allowing a person to realize their full potential over the life course, irrespective of the presence or absence of disorders*" [1,2], this framework departs from the long-standing biomedical tradition that equates health with the absence of disease. Instead, it proposes a more expansive and dynamic view, centered on the improvement of functioning and the promotion of human brain potential across the lifespan. For psychiatry, neurology and other specialties involved in the care of the brain (e.g., neurosurgery, neuroradiology), this redefinition is far from a semantic adjustment. This marks a fundamental and necessary shift in how health, illness, and care are understood and taught in light of the growing burden of brain disorders.

In fact, brain-related disorders are now the leading cause of disability-adjusted life years (DALYs) globally, accounting for more years of life lost to disability than cardiovascular disease or cancer combined [3,4]. These conditions impose substantial and escalating economic costs, especially on low- and middle-income countries (LMIC). For instance, dementia alone was estimated to cost US $2.8 trillion globally in 2019, with projections exceeding US $16.9 trillion annually by 2050—65% of which will be borne by LMIC—if no effective preventive measures are implemented [5]. Depression, likewise, is projected to become the single largest contributor to global economic loss from non-communicable diseases [3]. Stroke provides a compelling example of how prevention can substantially reduce both disease burden and costs. Global stroke-related expenses were estimated at US $2.05 trillion in 2019 [6], but decades of targeted interventions—such as hypertension control, smoking cessation, anticoagulation for atrial fibrillation, and rapid reperfusion therapies—have reduced stroke incidence, improved survival, and lowered long-term disability rates and in parallel healthcare expenditures [7,8]. Similar projections suggest that implementing effective primordial, primary, and secondary prevention strategies for dementia, depression and other brain disorders could yield comparable public health and economic benefits [9,10]. Without such measures, the rising prevalence of these conditions will place unsustainable pressure on healthcare systems, forcing difficult choices in resource allocation. In this context, shifting from a purely biomedical "disease/absence-of-disease" model toward a lifespan-oriented, function-centered Brain Health framework is not only conceptually progressive but also an urgent public health and economic necessity.

Trainees in psychiatry and neurology need to be prepared to contribute to public health, policy, and education, roles that extend far beyond the traditional clinical setting [11].

However, to this day, neurological and psychiatric care and training remain predominantly focused on diagnosis and treatment—thus on secondary, tertiary prevention—and, increasingly in recent years, on quaternary prevention, such as avoiding overdiagnosis and overtreatment [12]. A paradigm shift such as the one promoted by the Brain Health concept instead calls for greater involvement of Brain disorder specialists in primordial, primary prevention, which is often delegated to public health, primary care settings, and general practitioners. For example, emerging evidence links modifiable factors such as physical

inactivity, hypertension, hearing loss, low education, air pollution, and social isolation with increased risk for cognitive decline and dementia [13]. Neurologists and psychiatrists are uniquely positioned to address these factors as experts of brain functions, its development across the lifespan, and the diverse biological, psychological, and social factors that can influence it. Their expertise is instrumental for actively advocating and organizing through interdisciplinary collaborations that support early-life interventions, shape public policies and develop effective community-based programs. Concrete examples of such preventive strategies embedded in the Brain Health framework include school-based mental health initiatives aimed at preventing depression [14], cardiovascular risk management programs to reduce the incidence of stroke and vascular dementia, and the establishment of specialized Brain Health Services specifically designed for dementia prevention [15].

In parallel, medical education should not be only about gaining clinical experience and theoretical knowledge to become "care providers". Its aim should be to provide society with experts capable of analytical and critical thinking, scientific rigor, flexibility and creativity to address the health of individuals and populations for the decades to come.

In addition, the historical division between psychiatric and neurological practice is also put into question by this change of paradigm. The dualism between "mind" and "brain," mirrored by the separation of the two disciplines [16], has become increasingly artificial. Clinical presentations frequently transcend disciplinary boundaries, and the distinction between neurological and psychiatric disorders often remains blurred. The Brain Health framework challenges the sustainability of such divisions by promoting a unified understanding of brain function. In performing so, it underscores the need for a more integrated model of care that reflects the reality of brain disorders as complex, multifactorial, and overlapping in nature. This shift is not merely theoretical; it has direct implications for the training of future specialists. Psychiatry and neurology trainees are now entering the profession at a time when the limitations of categorical thinking become more apparent than previously, and when the need for broader, more prevention-oriented and function-focused approaches is becoming increasingly urgent.

In the present paper, we explore how the Brain Health paradigm requires a redefinition of the physician's role, from a traditional clinician to a medical expert equipped with both clinical and non-clinical competencies. We identify key gaps in current training models and propose an evolution in both content and structure, with greater emphasis on interdisciplinary clinical education, as well as structured training in communication, biomedical ethics, and health advocacy. We advocate for more integrated approaches across specialties, equitable access to training across regions, and stronger engagement of medical trainees in research and innovation. Recognizing that Brain Health also applies to those delivering care, we call for training environments that actively protect and promote the well-being of trainees and specialists, sustaining their motivation, learning capacity, and professional development over time. Finally, we underscore the essential role of trainee and professional associations and networks in driving this transformation and conclude with a call for systemic reforms that embed these principles into every level of medical education and practice, taking into account not only regional but also global challenges.

The reflections developed in this paper were informed by specialty-specific focus groups with colleagues from the national trainee associations of the interested specialties. These discussions were anchored in the trainees' clinical and educational experience within the Swiss postgraduate training system and programs. Additionally, several authors and focus group participants have been actively involved in national and international trainee associations, enabling them to incorporate insights gained through dialog with peers across different countries. Their contributions were further informed by prior research experience in the respective fields discussed in this paper and through a targeted literature review.

Although multiple specialties contribute to the Brain Health framework, this paper primarily focuses on neurology and psychiatry (including child and adolescent psychiatry), as these disciplines together accounted in 2024 for 15.3% of all trainees and 13.2% of physicians in Switzerland, reflecting their central role in brain-related care and training [17,18].

2. Brain Health: Emerging Challenges for Trainees

2.1. Future Specialists: From Physicians to Medical Experts

In recent years, medical education curricula have increasingly incorporated training in clinical communication, particularly regarding the disclosure of diagnoses and prognoses, as well as the process of informed consent. These competencies have gradually been embedded within a broader person-centered approach, fostering theoretical and practical models—such as shared decision making—that aim to support individuals in understanding their health status and actively participating in decisions that affect their lives [19]. However, if we are to embrace the emerging paradigm shift proposed by the concept of Brain Health, it becomes evident that the physician's role must truly evolve. Beyond functioning solely as a healer and communicator, the medical expert must also assume the role of health advocate, integrating this function into their core professional identity [20].

This expanded role requires specific communication strategies and skills, especially in relation to long-term prognosis and preventive measures, which pose unique challenges in clinical dialog. Crucially, the medical experts and the whole healthcare setting must be capable of recognizing and respecting the individual's sense of dignity, agency and autonomy [21]. In performing so, they must facilitate a process of empowerment that enables individuals to comprehend the short-, medium-, and long-term consequences of their lifestyle choices and to engage meaningfully with future health scenarios. Evidence-informed shared decision making can thus become a vehicle for preserving and promoting quality of life and human dignity over time [22]. At the same time, medical professionals must steadfastly uphold personal dignity and autonomy, ensuring that each individual's own conception of dignity is not subordinated to clinical knowledge or to the caregiver's interpretation of beneficence. Care therefore entails avoiding paternalistic practices, particularly in the context of preventive interventions, where such an approach is often inappropriate and unlikely to achieve the intended therapeutic goals [23,24].

Promoting Brain Health in this broader sense also entails sensitivity to stigma, structural discrimination, and the social determinants of health, along with the capacity to implement compensatory actions that reduce inequities. While recognizing and addressing these dimensions within clinical care is fundamental, the role of the medical expert must also encompass structural advocacy [25]. Indeed, multiple factors may prevent those receiving care from maintaining or regaining their full level of agency, fulfillment, and health. Among these, specific risk factors such as sociocultural conditions and lack of health literacy often exceed both the individual's will and the capacities of healthcare professionals and require support and empowerment at a societal level. In this context, medical professionals not only empower those who are able to act for their own health and help limit the functional and psychosocial consequences of illness but also exercise their advocacy role on behalf of the most fragile and vulnerable individuals, who may lack the necessary resources and capacities [26,27].

Ultimately, in a context marked by a shortage of specialized personnel, the effective and equitable use of healthcare services and resources requires strategic planning and optimization. While improving the overall Brain Health of the population through primary prevention—which implies including individuals who are not clinically ill within preventive services—is a central objective, it is also essential not to neglect those with complex

and comorbid conditions. In this regard, assessment tools for priority setting, fair resource allocation, and ethical frameworks rooted in the principle of justice are indispensable to ensure that care delivery is both efficient and morally sound [28].

Therefore, to truly shape future specialists into competent medical experts, the biomedical ethics competencies outlined above must be meaningfully integrated into both undergraduate and postgraduate medical education as well as in day-to-day clinical practice.

2.2. Needs, Gaps, and Barriers in Brain Health Education

To reorient medical education in line with this paradigm shift, reforms should first focus on the content and structure of training. Despite increasing awareness of the complexity and global relevance of brain-related disorders, current educational models in neurology and psychiatry remain misaligned with evolving societal and clinical needs [12]. Training pathways still appear to reflect a longstanding reactive tradition in medicine, emphasizing the treatment of acute conditions rather than the promotion of Brain Health or the multidimensional and integrated multidisciplinary prevention of disease.

In this regard, historically, neurology and psychiatry, together with fields such as neurosurgery and neuroradiology, emerged under a shared conceptual umbrella aimed at understanding and treating disorders of the brain. However, over time, these disciplines evolved into distinct specialties, taught and practiced in separate environments with differing clinical languages and organizational cultures [16,29]. The growing volume of specialized medical knowledge has further constrained the curricular space available for broader, integrative content. At the European level, training guidelines encourage optional rotations across neurology and psychiatry [29,30]. In fact, the European Union of Medical Specialists (UEMS) "European Training Requirements for Neurology" recommend that neurology trainees undertake an additional year of psychiatry training to enhance the recognition and management of neuropsychiatric comorbidities, alongside opportunities for exposure to other brain-related specialties such as neurosurgery, neuropediatrics, and neuropathology [29]. Similarly, the UEMS European Framework for Competencies in Psychiatry recommends that psychiatry trainees undertake rotations in neurology to deepen their understanding of the neurological underpinnings of psychiatric conditions [30]. Such cross-specialty exposure is intended to cultivate shared competencies in interface domains, including cognitive disorders, movement disorders with psychiatric manifestations, epilepsy, and functional neurological disorders. While associations like the UESM provide valuable, consensus-based guidelines for specialty training, they often lack the direct authority to influence local training cultures or policies. The implementation of such measures is frequently constrained by broader structural local factors—including limited financial resources, trainee workforce capacity, and available infrastructure. In fact, in the approximately 20 European countries where opportunities for interdisciplinary training exist, they are typically optional, brief in duration (often limited to a few weeks), and insufficiently embedded within core curricula. Consequently, their potential impact on sustained skill acquisition and genuine interdisciplinary collaboration remains limited, leaving many trainees without the depth of exposure needed to effectively bridge not only neurology and psychiatry but also other brain-related specialties [16].

These needs and gaps are not unique to Europe. In other regions, including LMIC, where the burden of neurological and psychiatric disorders is rising sharply, these challenges are often exacerbated by critical shortages of trained specialists, limited infrastructure, and uneven access to accredited postgraduate training programs [31–33].

In addition, this structural separation not only hinders interdisciplinary learning, but it also perpetuates fragmented models of care. Such is the separation between child and adolescent medicine, adult medicine, and geriatric care that further undermines continuity

of care across the life course. In the current system, significant barriers to continuity and transition of care are evident, not only at the clinical and ethical-deontological levels, but also within care structures and in the involvement of family and social networks [34,35].

Lifelong brain health is shaped across the life course. It begins with early development in pediatrics, is sustained through preventive care and chronic disease management in internal and family medicine, and is further supported during periods of recovery or functional decline through the expertise of rehabilitation professionals, nurses, and social workers [36–38]. A truly comprehensive approach to brain health must acknowledge its inherently cross-sectoral nature, extending beyond the traditional domains of neurology and psychiatry to encompass fields such as pediatrics, internal medicine, family medicine, rehabilitation, nursing, and social work. This broader perspective underscores the importance of integrated education, care models and interdisciplinary research that bridge conventional clinical boundaries. Embracing this holistic, collaborative framework is essential for advancing brain health as a core element of lifelong well-being [39].

Furthermore, interprofessional training is essential to bridge the above-mentioned gaps, equipping psychiatry, neurology trainees and other trainees involved in management of brain disorders, to collaborate effectively not only with each other but also with public health specialists, policymakers, general practitioners and other health professionals [16]. Such collaboration is crucial to ensuring that Brain Health strategies are both clinically effective and contextually relevant, addressing the needs of patients across the continuum of care. Exposure to these different professional perspectives during training fosters a shared understanding of patient pathways, enhances continuity of care, and promotes the development of coordinated, preventive, and community-based solutions that are vital for sustainable Brain Health promotion.

Furthermore, the involvement of patient organizations and those with lived experience is equally essential. Their inclusion in training can help shift the clinical gaze from disease to person, embedding the values of empathy, inclusion, and co-production in future practice.

Beyond those adjustments in clinical training, future specialists must be equipped with analytical, ethical, and communication skills that enable them to engage with healthcare policy, organizational decision making, and interdisciplinary collaboration. As the field shifts toward a more preventive, person-centered, and socially responsive model, there is a growing need for structured training in public and global health, biomedical ethics and advocacy [40,41]. Despite their importance, these domains remain largely underrepresented in most European postgraduate curricula [40]. Leadership and advocacy, though formally included in some training objectives, are often relegated to optional postgraduate programs or short-format workshops with limited reach. These competencies are not ancillary: they are crucial to promoting a just, inclusive, and sustainable health system that upholds the dignity and rights of all individuals.

Future specialist from all regions of the world should be equipped with the above-mentioned soft skills and with the tools to promote Brain Health at the individual and populational level. Flexible frameworks will be required to implement those changes in the curricula and adapt them to the local needs, infrastructures and cultural expectations.

3. Brain Health: The Training of Tomorrow and the Role of Trainees

3.1. Proposals and Pathways Toward Integrated Brain Health Education

To better prepare neurology and psychiatry trainees for the future of brain care, there is an urgent need to initiate international conversations focused on improving training models. These discussions should address how to integrate neurology, psychiatry and other specialties involved in brain disorders care more effectively, promote continuity of care across the lifespan, and embed interprofessional and interdisciplinary approaches into

Brain Health education. Structured education in bioethics, leadership, and communication is also fundamental to ensure that future professionals can bridge clinical excellence with social responsibility, ultimately helping shape healthcare environments that promote Brain Health at both the individual and population levels.

These discussions should aim to identify existing models of integration, highlight best practices, and expose gaps that call for the development of new training frameworks.

An initial proposal to facilitate interdisciplinary training was a unified "brain medicine" model [42], which combines neurology and psychiatry training into a single, holistic curriculum. This approach draws inspiration from internal medicine, where trainees first build a broad foundation before specializing. A proposed structure for such a model includes a four-year residency program: the first two years are dedicated to developing core competencies through traditional inpatient rotations across both neurology and psychiatry. The final two years allow trainees to pursue focused tracks in specific areas—such as addiction medicine, epilepsy, movement disorders, or interventional psychiatry—or to follow a more generalized or cross-disciplinary path within brain medicine [42]. However, this model has not yet been integrated into existing training programs and no formal pilot initiatives have been launched to date. Furthermore, it faces practical challenges, particularly regarding duration, institutional readiness and curricular structure. Moreover, implementation would require overcoming logistical barriers such as harmonizing rotation schedules, aligning interdepartmental goals, ensuring the availability of dual-trained faculty, and developing integrated evaluation and accreditation systems. Existing neuropsychiatry training programs—developed primarily in Anglo-Saxon contexts such as the United Kingdom, Australia, and the United States—though narrower in scope, provide valuable lessons about the challenges such integration can pose [43–46]. Even though early evidence suggests that neuropsychiatry-focused training improves resident satisfaction, knowledge retention, and interdisciplinary performance [47,48], it has faced and currently faces several challenges. These include the lack of standardized curricular definitions across countries, fragmented or absent accreditation pathways, and limited faculty support [49]. For instance, both the definition of neuropsychiatry and the scope of its curriculum vary considerably—not only between countries but sometimes even within the same national context [49]. In the US, program directors have reported difficulty integrating neuropsychiatric teaching due to a shortage of trained faculty members and misalignment with existing curricular priorities [50]. Moreover, cultural and epistemological differences between the two disciplines continue to limit the establishment of shared educational frameworks, even within the same institutions. In addition, knowledge in both neurology and psychiatry evolves rapidly and, as the diagnostic and therapeutic landscape becomes increasingly complex, keeping training curricula up to date with current evidence is demanding, given the growing complexity and depth of knowledge required in both specialties today. The introduction of a unified, interdisciplinary "brain medicine" training model would further intensify this challenge, requiring careful curricular design to avoid overburdening trainees while still ensuring comprehensive, high-quality education.

These examples and reflections suggest that while the concept of "brain medicine" holds promise, a full-scale integration during residency may currently be impractical in many contexts.

As a more feasible alternative, interdisciplinary fellowships or modular programs could offer a flexible and focused approach. Such models would allow interested trainees to build cross-disciplinary competencies without requiring a fundamental overhaul of existing postgraduate training structures.

One of such examples can be found in Switzerland's postgraduate programs in Child and Adolescent Psychiatry (CAP) and General Adult Psychiatry (GAP) and Neurology.

CAP trainees are required to complete a year of GAP training, while GAP trainees may optionally include up to one year of CAP. Both curricula mandate theoretical and clinical exposure to subspecialties such as addiction, geriatric, forensic, and psychosomatic psychiatry, with formal recognition of up to one year (GAP) or two years (CAP, only forensic) in those tracks. Additionally, both specialties require a one-year rotation in somatic disciplines, where neurology is only one of several possible options; however, only some trainees pursue neurological training. In neurology, training in CAP or GAP can be credited for up to one year, though this remains optional. While these cross-recognitions promote a life-course perspective and represent a promising model of interdisciplinary collaboration, they remain limited to the training phase. Structural barriers to clinical integration persist, including the segregation—both spatial and organizational—of health facilities and training centers, and the lack of coordination across specialties involved in brain care. This fragmented landscape is particularly evident in the Swiss context, where psychiatry, neurology, and other relevant disciplines are often trained and practiced in entirely separate institutional and geographic settings.

A third alternative would be additional, or integrated, subspecialty training in neuropsychiatry or Brain Health. In Switzerland, a unique international Certificate of Advanced Studies (CAS) in Brain Health was launched in 2024 by the University of Bern. This program was developed in alignment with the Swiss Brain Health Plan (SBHP), taught by leading experts, including professors affiliated with SBHP board and supported by the European Academy of Neurology (EAN) [51,52]. The CAS in Brain Health is open to healthcare professionals from all backgrounds who wish to further their expertise in this area. The international faculty provides training in neuroscience, health policy, behavioral science, and intervention design.

Another notable international initiative is the Atlantic Fellows for Equity in Brain Health program, hosted by the Global Brain Health Institute (GBHI) at Trinity College Dublin and the University of California, San Francisco [53]. This highly interdisciplinary fellowship supports international participants—across fields such as medicine, public policy, the arts, economics, journalism, and community-based care—who are dedicated to reducing the global impact of dementia and promoting Brain Health equity. Such postgraduate programs will be essential in disseminating the concepts and practices embedded in the Brain Health model in the academic and clinical settings.

Although some initiatives have pioneered Brain Health–oriented and more integrated training programs, as outlined above, there is currently no global framework that defines minimum training standards or core competencies in these areas. Insights gathered from the abovementioned projects could inform the development of harmonized, interdisciplinary curricula, not only at the postgraduate level but also earlier in medical and non-medical education pathways.

Regarding training in non-clinical skills, including advocacy, leadership, bioethics and communication, some postgraduate programs offered by large (academic) training centers offer education on those topics, often at very high costs. National and international trainee associations as well as professional societies are emerging as important stakeholders to provide more accessible training opportunities in these fields. Notable examples include the advocacy and leadership training programs offered at an affordable price to junior members of the European Academy of Neurology (EAN) and the European Psychiatric Association's (EPA) Leadership Academy [54–56].

Furthermore, integrating trainees directly into the processes that shape educational policies at the European and global levels—such as the UEMS Section of Neurology's recent inclusion of a representative from the European Academy of Neurology's Resident and Research Fellow Section—can enhance the relevance and adaptability of training frame-

works to evolving population and workforce needs, while fostering active engagement and ownership among the next generation of specialists.

3.2. Global Perspective on Brain Health: Proposals for Equitable Training

Another key aspect of advancing Brain Health education is ensuring that training opportunities are accessible across all regions, including high-, middle-, and low-income countries, and that they are adapted to the local challenges faced by diverse populations and healthcare systems [57].

Despite important challenges in terms of scalability and access to equitable care, several regions including LMIC have also developed innovative responses that offer valuable insights for broader educational reform. In Africa, the African Academy of Neurology (AfAN) has supported the development of regional training and mentorship networks to address the continent's severe neurologist workforce shortage and to include neurological care and prevention in general practice [58,59]. In India, a tighter collaboration between psychiatry and general practice in medical education has been implemented to overcome disparities in access to mental health training, particularly through programs led by the National Institute of Mental Health and Neurosciences (NIMHANS) [60,61]. In Latin America, regional initiatives such as the Congreso Latinoamericano de Epilepsia y Neurología Pediátrica (CLAPEM) and community-/regional-based models have delivered cost-effective, structured environments for exchanges and training among different specialties with an emphasis on local relevance and long-term public health impact [62,63].

In the future, it will be essential to bridge the current geographic disparity in the availability of postgraduate education in neurology and psychiatry [37,38]. By expanding access to Brain Health education, we can ensure that healthcare professionals everywhere are equipped to tackle the growing burden of brain disorders and promote Brain Health in diverse contexts.

Looking ahead, global frameworks for Brain Health education will be vital to reduce disparities; yet these frameworks must be flexible enough to adapt to local needs. Furthermore, aligning postgraduate training with the World Health Organization's (WHO) recommendations on the promotion of Brain Health and the prevention of brain disorders should be an additional central objective [1]. International organizations such as the UEMS, the World Federation of Neurology, and the World Psychiatric Association are well-positioned to spearhead efforts to establish international guidelines that integrate Brain Health education into medical training worldwide.

By focusing on international collaboration, standardization of core competencies, and flexible, region-specific curricula, the global community can build a future of Brain Health education that is both inclusive and transformative. With the right training, we can equip future healthcare professionals with the tools they need to address the complex, multifactorial challenges posed by brain disorders and how to prevent them, ensuring that promoting Brain Health at all stages of life becomes an integral part of global healthcare systems.

3.3. Research Integration in Training Programs as Part of the Solution

Trainees should not be viewed merely as future specialists in training, but as active agents of innovation and change [64]. To adequately prepare future Brain Health specialists, it is imperative to intentionally engage trainees in research and healthcare program development, rather than relegating them to peripheral roles. Their direct, often multilingual and multicultural engagement with patients places them in a unique position to identify gaps in care and suggest context-sensitive enhancements. Empirical evidence highlights that trainees are not only eager to research but that structured participation enhances both knowledge acquisition and clinical engagement [65,66]. Similarly, translational programs

demonstrate that mentored research projects, featuring training in study design, ethics, and dissemination, develop trainee capacity and foster academic identity [67]. Enhancing access to academic activities and dedicating protected time enables emerging professionals to confront local and global Brain Health challenges substantively, integrating epidemiological insights and novel evidence into future practice.

Moreover, advancing research engagement among trainees accelerates critical innovation, especially in high-potential domains. For example, Artificial Intelligence (AI) tools for mental health are increasingly validated, yet they require clinician–researchers who can both comprehend algorithmic limitations and advocate for ethical implementation [68]. Educational frameworks incorporating AI literacy and ethics should be developed to equip trainees with the competencies needed to responsibly integrate these technologies into clinical workflows [69].

Critically, the aim is not to utilize trainees as research labor. Rather, they must become active agents: co-creators, promoters, and disseminators of findings. Positioning trainees as stakeholders and advocates ensures that research is aligned with clinical needs and social justice objectives. It also empowers them to engage with service planning and policymaking, addressing structural determinants of Brain Health, combating stigma, and promoting equitable access to emerging services. This formative engagement lays the groundwork for specialists who are not only technically proficient but also ethically responsible, research-engaged, and ready-to-shape systems that serve all populations equitably.

Despite growing awareness of its importance, several systemic barriers continue to hinder the integration of research into the core of medical training and practice. At the undergraduate level, limited exposure to research methodology and statistics results in clinicians entering postgraduate training without the foundational tools necessary to engage in, or critically interpret, research, missing a crucial window in the formation of the clinical mindset [70]. In clinical settings, well-documented obstacles include the lack of protected time for research, frequent rotation changes that disrupt continuity and mentorship, the scarcity of research-active supervisors and mentors, and limited opportunities for transdisciplinary exchange of research expertise. These challenges undermine the establishment of a research-oriented learning environment [71].

Addressing this topic requires a cultural and structural shift: research literacy must be embedded within the core identity of physicians, beginning in undergraduate education and continuing through postgraduate training. All training institutions should ensure access to academic research networks, allocate structural investments, grant protected time for learning and research, and incorporate these reflections into rotation planning [72]. Regular mentorship from qualified research supervisors is essential, not only to ensure project quality, but also to sustain trainee motivation [71]. While not all trainees may wish to pursue academic careers, fostering research competencies more broadly cultivates critical thinking and enhances the ability to navigate an increasingly data-driven clinical landscape. It also enables those with research aspirations to contribute meaningfully as clinician-scientists and knowledge brokers, even within non-academic institutions.

4. The Brain Health of Trainees

Promoting Brain Health should focus not only on patients and the general population but also on the well-being and career sustainability of neurology and psychiatry trainees and specialists. As the demand for healthcare professionals continues to rise, particularly in the face of an anticipated shortage, the ability of healthcare systems to adequately address brain disorders and meet the needs of underprivileged populations is increasingly in question.

There is growing evidence and awareness of high rates of burnout among psychiatry and neurology trainees, with factors like the number of night shifts, compassion fatigue, and job dissatisfaction associated with increased burnout levels [73–75]. Furthermore, burnout affects physicians in both high- and middle-and-low-income countries and across all stages of their careers [76,77], making its contrast a global and persistent challenge. Meta-analyses and longitudinal reviews further indicate that, despite increased awareness and targeted interventions, burnout levels among medical trainees have remained largely unchanged over the past two decades [78].

As the focus on Brain Health continues to grow, it is critical to recognize that the mental and physical health of neurology and psychiatry professionals is integral to achieving the broader goals of Brain Health promotion. By focusing on empowerment, curricular reform, and well-being, training programs can nurture a generation of resilient, ethically grounded, and socially responsive specialists in Brain Health. Learning to set boundaries, recognize personal limits, and practice self-care are vital steps toward maintaining emotional balance and emotional well-being. Equally important is encouraging trainees to build and maintain active peer support networks, often found within trainees' associations, where they can openly share experiences, provide mutual encouragement, and collaboratively develop coping strategies. These resources help trainees recognize early warning signs of distress and seek timely support. Cultivating psychological resilience in medical training is not optional: it is foundational to building a sustainable and compassionate healthcare system.

However, focusing solely on individual resilience without addressing the broader system risks placing undue responsibility on the trainee. Structural and institutional factors, such as overly frequent shift schedules, high patient loads, excessive reliance on quantitative performance metrics, and a lack of consistent mentoring, can significantly erode well-being and contribute to chronic fatigue and disillusionment. These systemic issues are often deeply embedded in training structures and require deliberate reform [79,80]. Indeed, although individual-level interventions such as mindfulness and resilience training have shown some benefit, the most promising evidence to date points toward institutional and structural reforms. Notably, structural changes have proven more effective than individual coping strategies alone, especially when working conditions remain suboptimal [81]. In this regard, the presence of personal hobbies or a balanced lifestyle outside work has not been shown to mitigate burnout when workplace demands are excessive, or support systems are lacking. Effective measures include managing shift schedules evaluated for sustainability and fairness to allow sufficient rest and recovery, ensuring adequate sleep time, guaranteeing consistent supervision, and implementing regular, meaningful debriefing sessions. Assessment systems must prioritize meaningful, formative feedback over purely quantitative evaluations. Structured mentorship programs should be systematically adopted to support both professional development and emotional well-being. These approaches have been shown to improve psychological well-being, reduce burnout symptoms, and enhance learning environments.

By explicitly combining both individual efforts and institutional support, we can create a more sustainable and supportive framework that allows healthcare professionals to thrive, thus reducing burnout and ensuring a healthier and more effective workforce in neurology, psychiatry, and beyond.

5. The Role of Trainee Associations in Advancing Brain Health

In recent years, both neurology and psychiatry trainees are increasingly coming together to address gaps in training, start initiatives around the promotion of Brain Health, and provide nurturing support for trainees. Associations of young professionals in both

fields can play a key role in advancing education and advocacy, not only through international collaboration but also within their respective countries [82–84].

Swiss local organizations, namely the Swiss Society of Young Neurologists (SAYN) [85] and the Swiss Association of Psychiatric Trainees (SVPA-ASMAP-ASAP) [86], are aiming to address the trainees' needs, by offering peer-to-peer solutions. These include specialized teaching courses, educational sessions at national conferences, career development programs that support both the professional and personal growth of young professionals and engage in active advocacy regarding trainees' training requirements and well-being.

In addition to their national influence, junior societies often participate in international networks, providing their members with access to global expertise, collaborative opportunities, and platforms for recognition. For example, the Resident and Research Fellow Section of the EAN established a network in 2016 to strengthen connections among European junior societies, facilitate the exchange of information, and support professional development [87]. Furthermore, the EAN has established a task force to promote neurologists' well-being and prevent burnout, in collaboration with the European Psychiatric Association, following a proposal from and with the support of its Resident and Research Fellow Section [88]. In parallel, the European Federation of Psychiatric Trainees (EFPT) [89] fosters international collaboration between trainees and experts across Europe, promoting a unified approach to psychiatric training, overcoming educational disparities, and providing targeted workshops and courses focused on both clinical competencies and leadership development. Through these international collaborations, young neurologists and psychiatrists can share resources, discuss best practices, and promote the advancement of Brain Health on a global scale.

While trainee associations play an increasingly visible role in advancing education, advocacy, and professional development, the scope of these initiatives often remains limited. Many activities rely on the voluntary engagement of personally motivated individuals, frequently without formal recognition, protected time, or curricular integration. Mentoring and institutional support to help trainees navigate these responsibilities and develop the necessary leadership competencies are frequently lacking. Nevertheless, engagement in such initiatives offers a unique opportunity for early-career professionals to acquire essential skills for future leadership and systemic change. As highlighted by the UEMS [90] and others [91], leadership should be considered a core component of medical education. Fostering these capacities in a structured and supported framework may ultimately strengthen both individual professional development and the broader capacity of healthcare systems to advance Brain Health.

Furthermore, many of these initiatives continue to operate within the traditional separation of psychiatry and neurology, limiting opportunities for cross-specialty collaboration. To truly reflect the integrative nature of brain health, emerging networks should aim to foster closer cooperation—not only between psychiatric and neurological trainees but also with peers from all brain-related disciplines. A promising example of such an interdisciplinary approach is the Young Clinical Neuroscientists (YouCliN) Network within the Swiss Federation of Clinical Neuro-Societies (SFCNS) [92], which brings together early-career physician-scientists across all clinical neuroscience societies. Within YouCliN-SFCNS, recent work has focused on Brain Health and the potential for implementing a common trunk curriculum for brain-related clinical programs, which would address the current gaps and emphasize multidisciplinary training and research [52].

Beyond structured activities led by academic bodies or trainee associations, informal and innovative initiatives have also emerged directly from trainees themselves. These efforts illustrate how the Brain Health paradigm can be embraced and promoted at the grassroots level. One example in Switzerland is the *#BrainHealthChallenge*, an initiative developed by a cohort of students of the CAS in Brain Health [93]. With the aim of providing

more insight into our everyday lives, this challenge encourages professionals to share a picture or short video on social media showing humorous ways in which brain protection can be incorporated into our daily lives. Their website also provides scientific material and more accessible information on brain health and concrete measures to prevent brain disorders. Although the campaign has only recently been launched, its early diffusion aligns with similar awareness initiatives, which typically reach thousands of mentions within the first months, generate high engagement through user-generated content, and spread virally through trainee and specialist networks. By making Brain Health protection relatable and fun, this campaign highlights the power of creativity and social media in advocacy efforts. It shows how trainees can both benefit from conventional academic training and from peer collaboration to engage the public, promote Brain Health awareness, and contribute to a more accessible, inclusive dialog around Brain Health.

6. Conclusions and Future Perspectives

The redefinition of Brain Health as a lifelong, multidimensional state of functioning—rather than the absence of disease—demands a fundamental shift in how we train future neurologists and psychiatrists. Embracing this paradigm means moving beyond fragmented, specialty-specific models of care toward integrated, prevention-oriented, and socially responsive training frameworks.

To meet the growing global burden of brain disorders and promote Brain Health across the life course, medical education must undergo bold reforms. Curricula should prioritize interdisciplinary knowledge, public and global health, biomedical ethics, advocacy, and leadership, while providing concrete opportunities for trainees to engage in research, clinical innovation, and policy dialog. These efforts must be accompanied by structural support—from academic institutions, trainers and specialists in teaching positions, professional societies, and health systems—to create the necessary space, mentorship, and recognition for this expanded vision of training.

Stakeholders must recognize trainees not as passive recipients of education but as active contributors and agents of change, within a postgraduate training system that should be understood not merely as a means to supply a cost-efficient workforce for present needs but as a long-term investment in professionals equipped to meet the evolving challenges of society. Their involvement in shaping new educational models, advancing interdisciplinary collaboration, and promoting Brain Health advocacy is not only desirable—it is essential. Initiatives like interdisciplinary exchange programs, trainee-led campaigns (e.g., the *#BrainHealthChallenge*), and structured mentorship in leadership and research provide concrete models for what this future can look like.

We acknowledge that the proposals and recommendations presented in this paper primarily reflect perspectives rooted in the Swiss and broader European healthcare contexts. As such, the suggestions for reforming postgraduate training in neurology and psychiatry may require substantial adaptation to align with the economic, cultural, and structural realities of other healthcare systems, particularly in LMICs. At the same time, it is essential to recognize that LMICs are often at the forefront of context-sensitive, community-based, and resource-efficient solutions—many of which offer valuable models that can inspire and inform reforms also in high-income settings. Global Brain Health education must therefore be a two-way exchange, grounded in mutual learning, respect, and co-creation, rather than unidirectional transfer. Furthermore, while this paper centers the trainee perspective, we fully acknowledge that medical education reform must involve a diversity of voices, including patients, educators, policymakers, and community stakeholders, to ensure that the promotion of Brain Health is inclusive, equitable, and globally relevant.

Looking ahead, international alignment on core competencies, the expansion of accessible and regionally adaptable training models, and the integration of Brain Health promotion into all stages of education and clinical care will be key. Making these investments in the near future can ensure that the next generation of clinicians will not only be equipped to treat brain disorders but also empowered to prevent them and promote lifelong Brain Health across specialties, systems, and societies.

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