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Residents about residency: educational integrity and skill assessment

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Summary

In the last few years, as the COVID-19 pandemic put in the spotlight the flaws of the Italian National Health System (INHS), the Italian National Residency Program (NRP) has aroused more and more interest among several stakeholders. The persistent burden on the Welfare System, caused by the systemic shortage of Specialized Practitioners, inevitably influenced the recent major reforms of the NRP, eventually affecting its quality. Within this emergency scenario, the urge to critically analyze the post-graduate educational program and its methods, became impellent. As the Orthopedics and Traumatology Italian Residents Association (AISOT) showed, despite the newly introduced DL Calabria, in 2020, almost 50% of the Orthopedic Residents would not feel comfortable to be challenged as independent specialists. However, the lack of methodological involvement of Residents in daily practice activities, from their Mentors, if matched with the positive feedback provided from residents who, conversely, experienced the DL Calabria conveniences, raised some concerns about the standard of quality of future Orthopedics. Modern times and technologies may allow a more efficient redesign and less nebulous educational methods and goals, and eventually guarantee a Nationwide equality among each Orthopedic School. A shared future with exhaustive objectives and fair opportunities between all Italian Orthopedic Residents is the key to build a righteous collective intelligentsia and harmony between practitioners of a glorious discipline, with ancient roots, such as Italian Orthopedics.

Key words: education, training, postgraduate school, residency, mentorship

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Introduction

The National post-graduate Residency Program (NRP) in Italy has constantly been a subject of great interest among several stakeholders, particularly in the last two years when the COVID-19 pandemic revealed loopholes and weaknesses of the Italian National Health System (INHS) and NRP. NRPs have undergone substantial changes throughout the past decades, which have led to a drastic reshaping of the modern Italian post-graduate scenario and environment. Nevertheless, not all these developments resulted in improvements aligned with historical times and modern needs. Furthermore, the qualitative future of NRPs is still uncertain and several

questions arise from its admission test and from the search for the most qualitatively efficient educational pathway.

How residency program works

There are more than a 1000 postgraduate medical schools in Italy, located within 40 Universities, which each trainee is assigned to. The NRP is regulated by Legislative Decree 368/99 [1], which describes the work/training employment contract of Medical Residents, the role of the Ministry of University and Research and the Ministry of Health in regulating the program. Under this specific type of contract, signed by the medical resident together with the University and the Region of the chosen postgraduate school, the medical specialist in training has to perform training in a single or several facilities, and may never perform duties as a substitute for NHS employees. This framework provides a strong safeguard, preventing the use of trainees to cover staff shortages. Additionally, it is a challenge to define areas of responsibility that is suitable for a trainee to work autonomously or execute specific tasks. Some recent noteworthy NRP reforms represented a boost to innovation. As an example, both the national admission test and the introduction of the *Accreditation System* (InterMinisterial Decree D.I.M. 402/2017 [2]) have aimed at reducing the heterogeneity that exists within medical residency programs. They have done so by accurately defining structural requirements of universities, minimum disciplinary needs and standards of care, for each specialty and for each specific program (e.g.: number of surgical procedures in the year; number of admissions in the year and specific outpatient attendance such as emergency department or delivery room).
This recent reform represented a great breakthrough for the NRP since it put pressure on institutions to set the necessary norms in order to work efficiently, adhere to standards to run their activities, and to provide the required educational status. Although the accreditation system's enforcement is still difficult and non-linear, it represents a significant quality assurance tool, allowing identification of postgraduate schools that do not fulfill specific standards. It also provides for the possible adjustment of existing problems, or, on the other hand, establishes the closure of the program in schools where the resolution of these problems is not feasible.
Accreditation is carried out by the *Osservatorio Nazionale per la formazione Sanitaria Specialistica*, supposedly on an annual basis, although the pandemic has had an impact on this process. Moreover, the self-assessment provided by Directors of the postgraduate schools is often hard to verify.Above all, the standards and requirements assessed are purely quantitative: there is no feedback on the quality of the training provided. Only recently within the accreditation process was an evaluation questionnaire introduced to medical residents, allowing them to state their own opinion about the educational quality of their school [3]. However, this has still not been integrated into the accreditation process and is not yet undertaken in each single institution. Conversely, most of the recent changes in the NRP have been driven by compulsory requirements quite far from the goal of improving the training process.
Thus, other subsequent decrees have been driven firstly by a chronic and systemic shortage of specialized healthcare practitioners and secondly by an actual and urgent deficiency in the welfare system.
In this trembling atmosphere, a law commonly known as DL Calabria [4] has been developed. In short, this allows to recover trainees in order to reinforce the crisis-stricken INHS service, resulting in a controversial expiration of the conventional residency period and authorizing/guaranteeing trainees to be prematurely hired, while finishing their NRP.
As could be expected, under emergency conditions the NRP and each post-graduate school have revealed flaws worthy of radical and essential remarks. In fact, progressive and guaranteed development of each trainee's autonomy and skill assessment [5] so far have only been inspiring theoretical tools hardly to be applied in daily practice.

What changed with COVID-19

After the outbreak of the COVID-19 pandemic in 2020, Italian medical residents as well as all healthcare workers had to battle the spread of SARS-CoV-2 on the front line. As the state of emergency worsened, the structural weaknesses of the INHS quickly led to a full-blown crisis resulting in an urgent need to recruit additional healthcare staff and resources. This meant interrupting some residents' practical training routines and being recruited on short-term contracts or as volunteers. Others, mainly surgical residents, suffered from an emergency-related suspension of elective activities resulting in a sudden interruption of hands-on training in operating room activities, arguably the main feature of their NRP.
Under this critical scenario, all our pre-pandemic assumptions have changed. This latest INHS and NRP weakness made us rethink the post-graduate medical education in order to be able to promptly respond to healthcare needs, and also to appropriately train tomorrow's specialists in terms of culture, motivation, wisdom, skills, and professional ethics. The Learning Objectives set out in InterMinisterial Decree D.I.M. 68/2015 [6] unfolded an incomplete and unpractical guideline for a more ambitious NRP in terms of national coherence and equality. Redefining what makes a specialist and specifically, as far as we are concerned, what makes an orthopedic surgeon, has become urgent. The Authors have also struggled for years questioning the minimum threshold standards for being an independent surgeon and asking ourselves "*When exactly is a trainee ready to be fully independent in practical activities?*".

Orthopedic & trauma residency

An exhaustive and equitable NRP is still missing throughout

Italy. A proper and uniform National Curriculum for Training in Orthopedics should clearly articulate the objectives that each trainee must achieve in terms of specific theoretical competencies, practical skills, and behavioral and ethical standards. Currently, only vague training objectives are described in D.I.M. 68/2015, which sets out mere recommendations that are difficult to applied to real-world hospital life and consequently often questioned[6].

The Orthopedics and Traumatology Italian Residents Association (AISOT) [7] together with FederSpecializzandi – Italian Association of Medical residents [8], recently carried out a national qualitative survey among trainees in orthopedics. The survey was firstly presented at AISOT National Congress in September 2021 [9], and subsequently at SIOT National Congress, November 2021. A total of 755 residents related to 37 postgraduate schools answered 18 questions with a sample population distributed as follows: 227 from the first year (r1), 187 r2, 126 r3, 121 r4, 94 r5.

The findings showed that almost 50% of fellows would not feel comfortable and ready to take on responsibilities as independent orthopedic specialists before the end of their 5-year training program (30% from year 5, 18% from year 4 and 3% from year 3). Their answers also revealed a lack of involvement by their mentors in routine specialty care activities and hands-on training.

Mentorship not only means active and formative supervision during surgery, ideally involving the resident as first surgeon progressively as part of a sapient skills program and most importantly, means a shared involvement and participation in developing and reviewing indication analyses along by active participation in surgical case planning.

This process shows the need for trainees to be coached not only on practice, but also on ethical and conceptual frameworks as outlined by international guidelines [10].

Nevertheless, through the same survey we noticed an increase in the number of surgical procedures, contributions to scientific research, and involvement including meetings, courses, and conventions, for residents from the 3rd year onwards. Additionally, the survey reported that 85% of responders felt that the pandemic had a negative or very negative impact on their education.

A new paradigm: future perspectives

From our analysis, we found a clear consensus on the need to re-design and introduce a new training and learning plan for all, and specifically for orthopedic trainees, in accordance with modern technological advances, in order to meet the pressing demand of the INHS for well-trained independent specialists. A new NRP should focus on building skills and knowledge in a progressive and steady way, enhancing responsibility and thereby achieving safer and wiser independence.

Modern technology may represent an essential tool for better teaching/learning methods. In current practice it is only used occasionally, but the smart and systematic use of simulation, augmented reality and 3D reconstructions [11], may both accelerate and optimize the learning process, minimizing ethical or patient risks.

Moreover, technology is a powerful way to expand regional boundaries by providing the possibility to support and develop connections between universities and learning outcomes nationwide, also improving the conventional learning process, e.g. through online nationally designated courses or lectures. Furthermore, as the worldwide literature grows alongside its availability, the conventional learning method should also be rethought by matching the availability of each university library with a national minimum threshold of certified, critical and mature analytical expertise in evidence-based medicine in Orthopedics.

In fact, in order to ensure such essential elements as proper training, safety, and professional integrity, merely applying the curricula claimed by each postgraduate school should theoretically be sufficient, if reviewed and applied without prejudice [12]. Nevertheless, it should be remarked that each Italian trainee should be allowed, with no geographical discrimination, to gain practical skills, theoretical knowledge, and behavioral and ethical competence. Therefore, we strongly believe the NRP should be built starting with a clearly stated definition of learning objectives.

Certifying teaching and learning methods and assessing acquired skills must be a priority: shaping a specialized physician means more than a mere quantitative measurement of number of procedures performed, scientific articles published, or clinical records compiled. The teaching process must consider use of validated tools and standardized pedagogical evaluation methodologies, which are needed in this critical national context.

Hence, certifying competences must also involve professional figures responsible for closely educating, on a day-to-day basis, each Resident's growth. As we stated before, this is the clinical mentor's role, who guides and assesses the Resident's level of autonomy. Therefore, evaluation of the Mentor role cannot be ignored. This constitutes the only way to define precisely and uniformly the degrees of autonomy progressively acquired by each resident. In accordance with the scientific method, only once a condition has been delineated can the treatment algorithm be applied. Therefore, in order to assess the achievement of certified competencies, it first and foremost becomes imperative to unambiguously objectify the meaning of complex and less complex or minimally invasive surgery in orthopedic practice.

Thereafter, standardization of the minimum skills to be achieved in each individual orthopedic field becomes essential, taking advantage of the training network: major trauma, hand, foot, prosthesis, arthroscopy, pediatrics, oncology, and spine.

The survey of the *Osservatorio Nazionale per la Formazione sanitaria specialistica* [3] showed that less than 80% of orthopedic residents had the opportunity to move across the training

network (while less than 20% were outside the network), giving a satisfactory assessment of the overall experience (average 7.2 of 10), but in the end the assessment of the training adequacy was borderline sufficient (5.8 of 10).
It can therefore be deduced that the relationship between Polyclinics, General Public Hospitals, Teaching Hospitals, Primacy Care Trust, University, and Territory should be improved to guarantee and enhance the variability of training and therefore of healthcare assistance.
While training tools are now mandatory, professional networking is the future answer to INHS needs.
Being aware of the limitation of some postgraduate schools in having all the disciplines in each geographical area, the greatest effort should be directed at wisely and programmatically implementing each training network portfolio by promoting, standardizing, and simplifying, on a national basis, regional intercultural links and conventions and possibly international fellowships.
In summary, we firmly believe that only by re-defining the NRP's objective parameters and by implementing them that the high educational standard guaranteed by postgraduate schools can be achieved, thereby counteracting the potential harmful emerging of parallel non-standardized educational channels, which would inevitably lead to a double class of future specialists, A Team and B Team.
In such a scenario, the price will be paid by patients. Resident training is not secondary, and the COVID-19 pandemic has taught us that trivializing it and not making it accountable would be a mistake for the entire INHS.

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AF, FV: conceptualization; AF, MG, FR: data curation; AF, FV, AG, MG: writing-original draft preparation; MGM, FR: writing-review and editing; supervision FV. All Authors have read and agreed to the published version of the manuscript.

Ethical consideration
The Ethical Approval by an appropriate Committee is not required for current work.

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