

## Strengthening Orthopaedic care at national level: Output of a structured residency programme at Aga Khan University

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### Abstract

This descriptive review of the output of the orthopaedic residency programme of Aga Khan University, Karachi, comprised information regarding the number of graduated residents and their educational background which was retrieved from departmental records. Information about their work location, subspecialty, current working status, participation in medical camps and national disaster relief efforts were obtained from various sources, including fellow surgeons, and social media profiles. From 1989 to 2017, a total of 48 residents graduated from the programme, with only 2(4.2%) of them being females. Overall, 19(39.6%) residents hailed from areas outside Karachi; 28(58.3%) belonged to Karachi; 1(2%) came from Kenya; 41(85.4%) remained to serve in Pakistan working mostly in tertiary healthcare centres; and 7(14.6%) moved abroad on consultancy and teaching assignments. Subspecialty training had a general trend towards general orthopaedics and trauma 21(43.7%), followed by arthroplasty surgery 13(27%).

**Keywords:** Residency, Orthopaedics, Social accountability, Structured training, Subspecialties, Programme review.

### Introduction

The Aga Khan University (AKU), Karachi, is one of the leading training institutions in the region accredited by the College of Physicians and surgeons of Pakistan (CPSP) and the Pakistan Medical and Dental Council (PMDC) — which has since been replaced by the Pakistan Medical Commission (PMC) — for training of medical graduates in various specialties, including orthopaedics. The external bodies in collaboration with the university conduct multi-level evaluation of the residents. Every country tailors its medical training according to its own requirement<sup>1,2</sup> and in Pakistan, the selection of orthopaedic residents comprises an initial entrance exam followed by short-listing and interview. These involve evaluation of residents on multiple aspects to ensure that they are able to meet the demands of a difficult specialty and can

comply with the residency programme. During the interview process, candidates with distinct personality traits and with broad interests are targeted.<sup>3</sup> The programme entails 4 year of orthopaedic training compared to 3 years of training in other parts of the country. This is because of the recognition of the fact that the current training time is insufficient for proper training and exposure in a field which is rapidly expanding and including newer techniques and tools for the management of various conditions.<sup>4</sup> The training is divided into 3 months of rotations in each subspecialty.

The number of residents selected is decided by the Post-Graduate Medical Education (PGME) department and so a limited number of residents are selected each year. There are currently 20 trainees enrolled in the programme along with residents from other specialties/institutes rotating in orthopaedics. The majority of residents are males, with a few female graduates due to the nature of the training which requires physical endurance as well as commitment towards providing long working hours. Orthopaedic residents working at AKU rotate through a wide variety of subspecialties which helps them in dealing with a wider variety of orthopaedic pathology and in making informed career choices.<sup>5</sup> Trainees learn decision-making and the skills required to manage, treat and handle a massive load of patients. The training emphasises on the diseases and conditions pertinent to Pakistan, such as post-polio paralysis, neglected trauma, clubfoot, neglected developmental dysplasia of the hip (DDH) etc.

The assessment of the residents is a continuous process that occurs throughout the rotation as well through evaluation forms, mid-yearly evaluation, end-of-year exams and evaluation. A formal written examination in orthopaedics and clinical skills examination takes place yearly during basic training and an exit examination, including written, clinical and viva components, takes place at the completion of specialist training, resulting in the granting of CPSP fellowship.

### Selection and training of surgeons

Orthopaedics is one of the most desired surgical specialties in Pakistan which has led to selection criteria and residency

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training to become more competitive as more individuals seek positions than there are slots available. To acquire information about the cognitive skills of the applicants, they are examined for their prior education, work experience, previous research work and academics among other elements. The residency programme recognises the needs of the country and aims at producing high-standard orthopaedic surgeons who are self-sufficient and are able to carry out orthopaedic procedures and practice independently and unsupervised after graduation. Residents achieve skills and knowledge through the management of inpatients and outpatients along with working in regular elective and emergency high-tech theatres through which they are helped in developing the right personality, attitude and leadership qualities fit to work and adapt in underprivileged conditions as well as in a modern environment with latest trends and equipment.

To cover the full scope of orthopaedics, the residents are rotated every 3 months in a structured manner to the various subspecialties, like trauma, orthopaedic oncology, reconstructive orthopaedics, foot and ankle surgery, hand and micro-vascular surgery, arthroplasty and spine surgery. The level of skills acquired is assessed by various assessment tools such as directly observed procedural skills (DOPS), objective structured assessment of technical skills (OSATS)

and mini-clinical evaluation exercise (MINI-CEX), and the ability of the trainees to perform various orthopaedic procedures is determined. Numerous other factors influence this training, including attributes that are looked for during the induction process which are governed by the programme director and supervisors. Research activities are regularly monitored through monthly research cell meetings, and weekly academic meetings are kept along with various skill workshops, city-wide orthopaedic meetings and faculty lectures. Thus, the residents are provided with a structured training programme containing both educational and training elements.

### Graduates across the years

Since the start of the induction of residents into the programme in 1989, there has been a gradual increase in the the number of residents inducted per year. This is in part due to the increase in the gradual departmental workload and to meet the requirements of patient-care. The numbers of consultants and supervisors have also increased in the department and more trainees were therefore inducted to meet the demand as the years progressed (Figure-1).

From 1989 to 2017, a total of 48 residents graduated from the programme, with only 2(4.2%) of them being females.

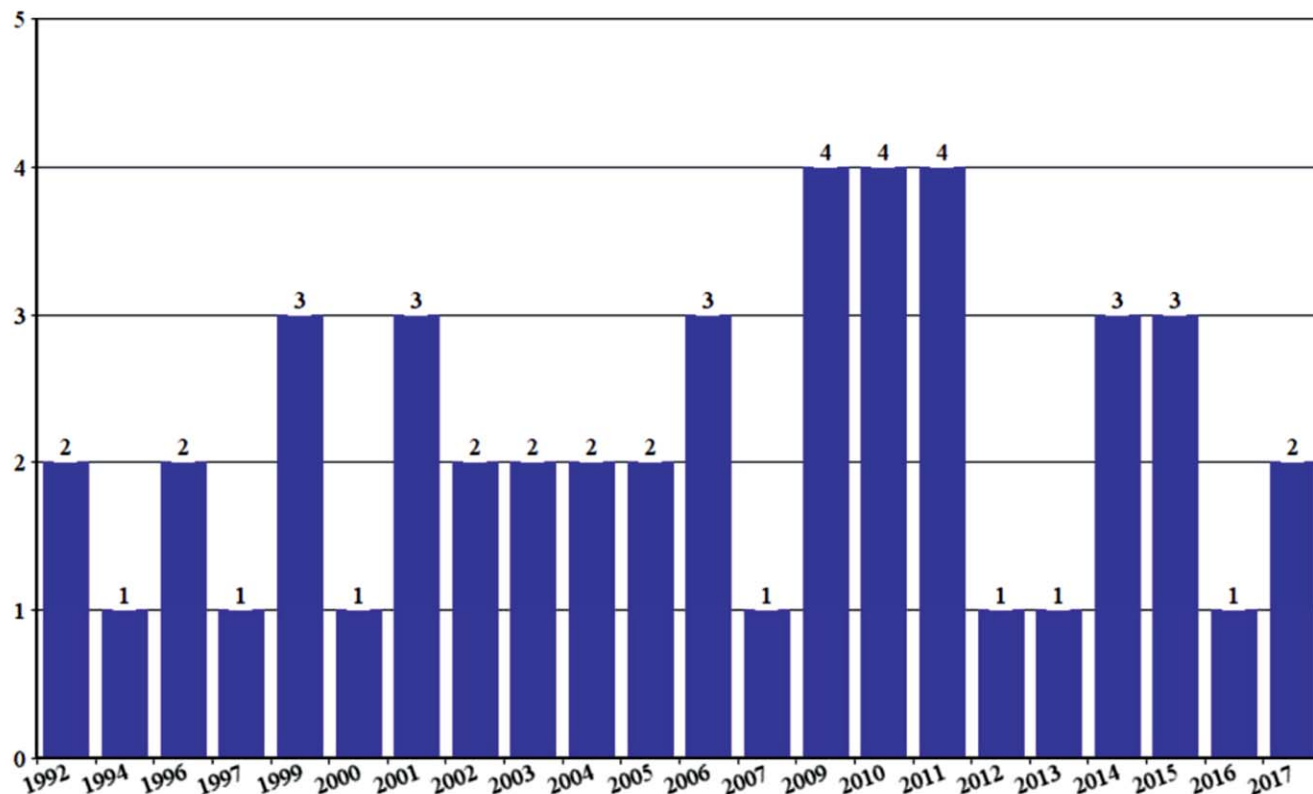


Figure-1: Number of residents graduating from across the years.

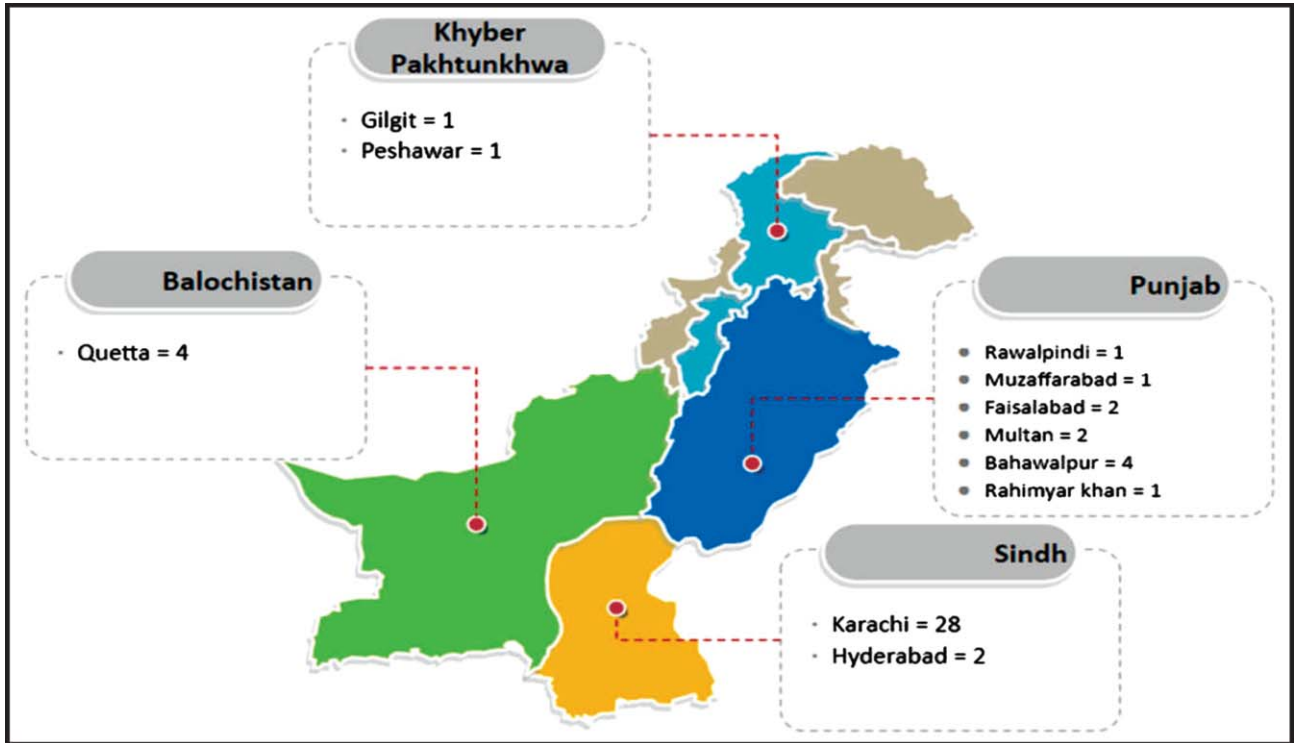


Figure-2: Native cities of the residents graduating from the institute. One graduate hailed from Kenya.

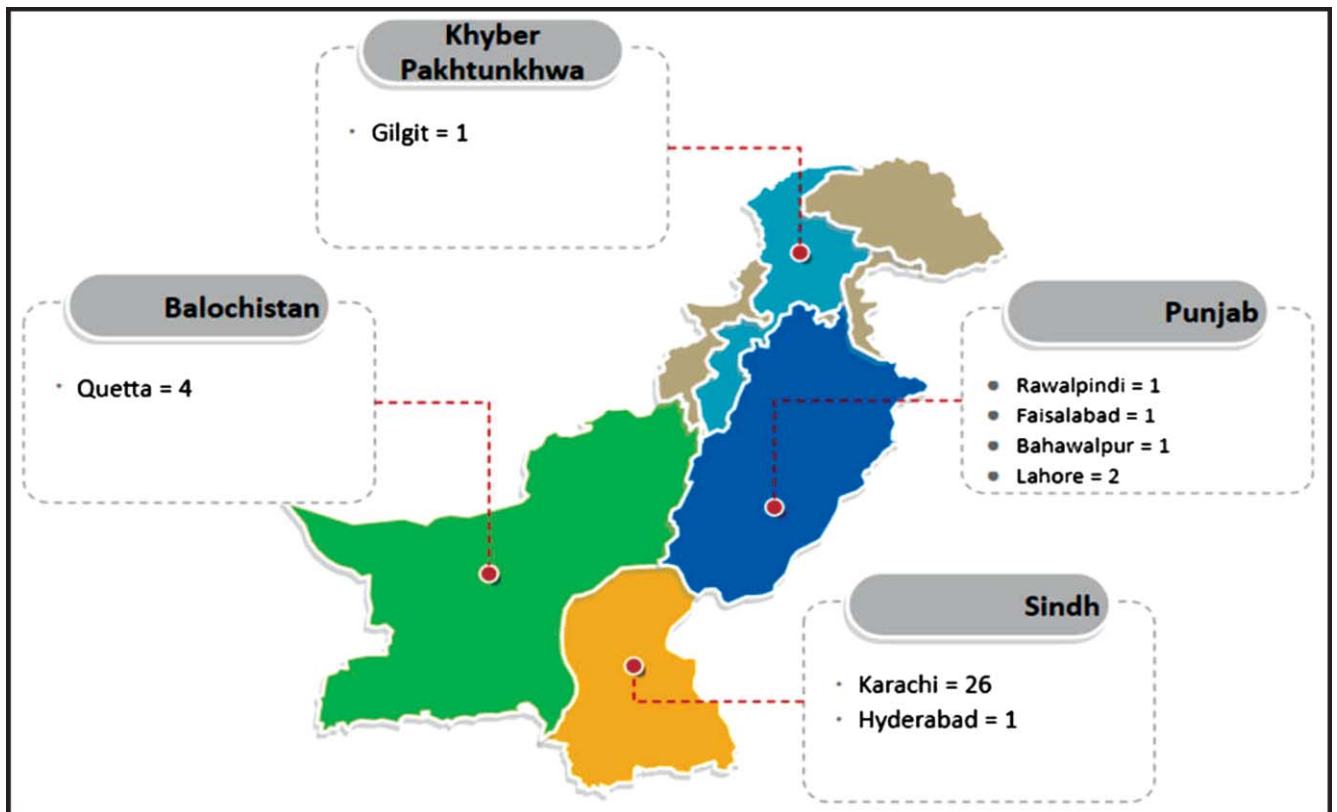


Figure-3: Current working locations of orthopaedic graduates within Pakistan.

Overall, 19(39.6%) residents hailed from areas outside Karachi, 28(58.3%) belonged to Karachi, and 1(2%) came from Kenya (Figure-2).

### Current work status

Graduates from the institution are working across Pakistan in different areas and hospitals. Of the 48 graduates, 41(85.4%) remained to serve in Pakistan. Of them, 21(51%) residents continued to serve in tertiary hospitals in Karachi, including 12(29%) who continued to work at the AKU Hospital after going through various subspecialties. Besides, 7(14.6%) residents acquired various consultancy and teaching posts in foreign countries, including the United States, the United Kingdom, Canada, Australia, Ireland Saudi Arabia and the United Arab Emirates (Figure-3).

### Subspecialty training

Orthopaedic training at the institute exposes trainees to all aspects of orthopaedic surgery and prepares them for general orthopaedic practice. The general demand for increased subspecialisation, work-hour restrictions and greater supervision requirements has led to a change in clinical experience. International trends have now made graduates more inclined towards further fellowships in different subspecialties.<sup>6</sup> Following this trend, graduates

from this institute have progressed to attain specialised subspecialty training and fellowships from different centres and institutes around the world, contributing to the diversity of orthopaedic subspecialties in Pakistan. Some have attained and are working across multiple specialties. Technical applications and orthopaedic knowledge continues to grow and it has been realised that the standard 3-4 years of orthopaedic training is not enough for preparing residents for the future. Thus, fellowship training is considered an educational necessity at the institute to help address the needs of society. More residents are inclined towards choosing specialties that are more of financial benefit and, for a country which has witnessed war and catastrophes, emphasis should be given to specialties like trauma and reconstruction.

To address the growing rate of residents acquiring fellowship training postgraduation and help them in career selection, the programme shifted from the standard practice of residency training towards a more subspecialty-based approach, with residents now being rotated across all specialties before graduating from the institute. Subspecialty training had a general trend towards general orthopaedics and trauma 21(43.7%), followed by arthroplasty surgery 13(27%) (Figure-4).

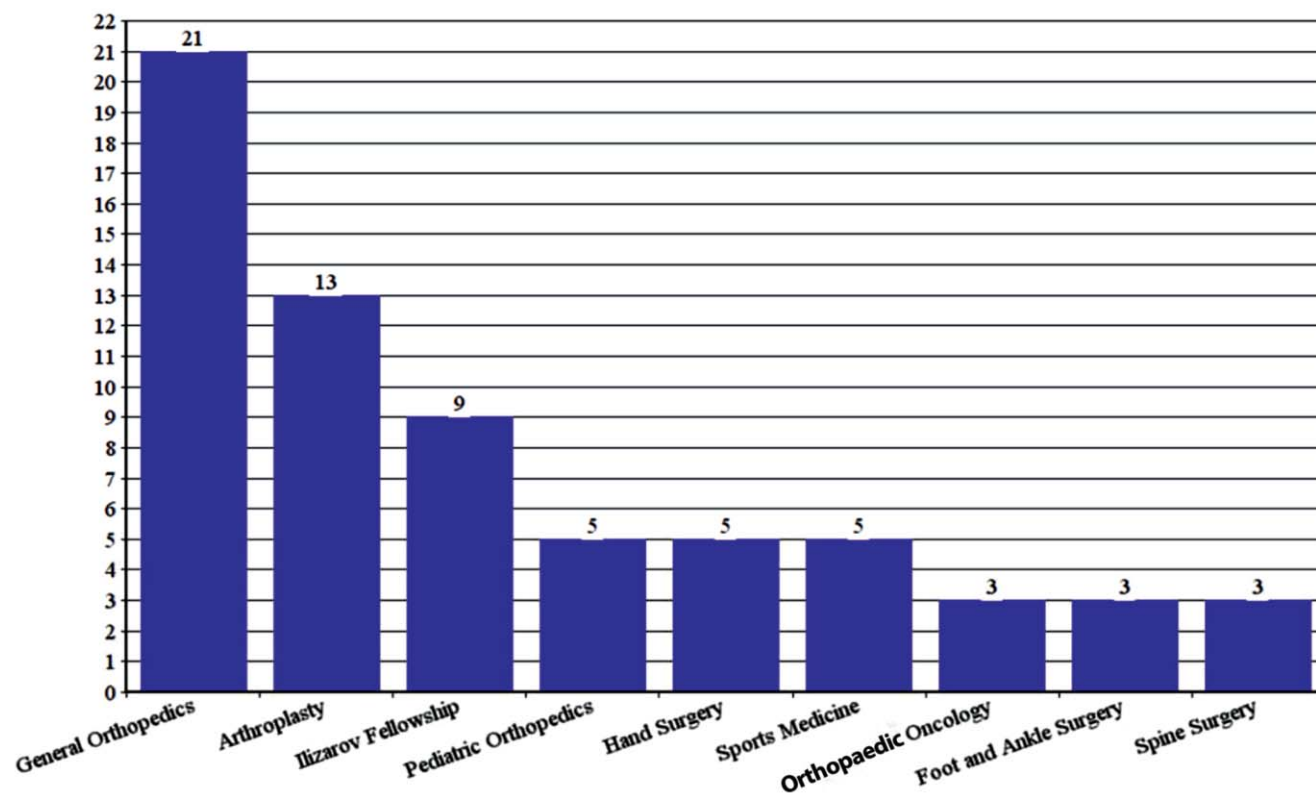


Figure-4: Trend of subspecialties picked up by the orthopaedic graduates.

## Progress towards rural development

Majority of Pakistan's population resides in its rural areas where medical services are scarce, including the provision of orthopaedic services. Some communities lack trained orthopaedic surgeons due to the reluctance to work in underprivileged areas and lack of medical equipment and structure.<sup>7</sup> This lack of services leads to most orthopaedic injuries and pathologies to be treated by bone-settlers, quacks and medical personnel not specialised in dealing with orthopaedic and related conditions.<sup>8</sup> The consequences of this deficiency include neglected trauma, chronic osteomyelitis, deformity and a variety of other conditions due to mismanagement. This is a great burden on patients and their families as most of their expenses and time is consumed on travelling to attain better elective and emergency orthopaedic facilities and treatment.<sup>9</sup> It remains a challenge to provide orthopaedic facilities in rural areas of Pakistan. One of the methods of improving care in the rural areas is through education and awareness through mass medical camps.<sup>10</sup> AKU graduates and trainees, recognising their role in the provision of services for the underdeveloped and underprivileged areas of Pakistan, have moved to provide orthopaedic and related healthcare services to these areas. Between 2015 and 2018, the orthopaedic department conducted 10 medical camps in underdeveloped areas which catered to 4,298 patients with various orthopaedic conditions who were managed and seen free of cost. Most of them who needed surgical procedures were helped through the AKU welfare services.

## Attrition rates

Applicants who accept positions for the residency programme either change their mind after the commencement of the programme during the first few weeks or in between the years of training. While there are those who are unable to cope with the increased working hours, stress levels and dedication that the specialty requires, some drop out due to personal issues. Between 2014 and 2018, 9 orthopaedic residents quit the programme at the institute and continued their training at some other institutes in the country. The drop-outs were replaced in the following years from among the increased number of residents willing to get enlisted.

## Recommendations

For the last couple of years, there have been new rules and restrictions placed on medical training, and the training algorithms of the past are no longer useful in today's world. In our experience, training in developing countries should increase the number of training years to cope with this field

that has a regular increase in the number of procedures and the involvement of new technology for the treatment of various pathologies. Also, with the revision of the national curriculum for orthopaedics is needed while adjusting it with training timeframe.

## Conclusion

The role of a structured orthopaedic training programme is to select, train and produce graduates that not only excel in the field of orthopaedics, but who are comparable to the best of international graduates in terms of skill and knowledge. Not only has this proven to be beneficial to the local population to which AKU surgical graduates cater to, but has set standards of practice in the area. Through the AKU training programme, selected trainees from underdeveloped regions of Pakistan have been trained in orthopaedics, with many of them specialising in various fields of orthopaedics before effectively relocating to different areas of Pakistan. The graduates have been involved in various camps and disaster relief efforts, providing services where needed and strengthening surgical services at the national level.

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