



# Redefining Physical Rehabilitation



## The CONTEXT OF PAKISTAN:

To grasp the intricacies of the disability landscape in Pakistan, we embark on a nuanced exploration of the prevalent challenges intertwined with promising opportunities for improvement. In a country where an estimated 15% of the population grapples with disabilities, translating to approximately 36.41 million individuals (as projected by the WHO (Census, 2023), the imperative for comprehensive inclusion measures becomes starkly evident. Within this staggering number, 6.91 million individuals are physically disabled.

Yet, it's widely acknowledged that these figures may fall short of reality, given the factors of rapid population growth, enhanced ageing, accidents, recurring natural disasters, congenital diseases and amputation due to diabetes. The absence of inclusive state mechanisms casts Persons with Disabilities (PwDs) into the role of passive receivers, hindering their active participation in society. The challenges are multifaceted, ranging from the lack of a centralized supply chain for high-quality assistive devices to limited state-led inclusive mechanisms. Additionally, there's a pervasive lack of awareness regarding the transformative impact of assistive devices, creating a cloud of uncertainty around the acquisition of physical rehabilitation services in Pakistan.

Presently, the majority of assistive devices in use are imported at exorbitant costs, while locally manufactured products often fall short of meeting quality and safety standards. Physical rehabilitation practitioners find themselves navigating unreliable logistics, resulting in delayed and inefficient service delivery, ultimately affecting PwDs at the receiving end. This complex situation is further compounded by a scarcity of highly skilled professional prosthetists and orthotists, coupled with the absence of advanced technology that could foster innovation and sustainability in Pakistan's physical rehabilitation sector.

A critical factor contributing to the challenges faced by PwDs in Pakistan is the prevailing lack of sensitization about their rights. This leads to approaching them with a charity mindset, relegating them to passive roles in society rather than recognizing their agency and potential for active contribution. As we navigate these challenges, we strive to uncover pathways for positive transformation, recognizing that the journey towards inclusivity demands a collective commitment and concerted efforts.



## **REHAB INITIATIVE (RI):**

**Rehab Initiative (RI)** stands as a testament to the fundamental belief that facilitating access to mobility is a pivotal stride toward fostering inclusivity. Conceived through the collaborative endeavors of prominent physical rehabilitation organizations in Pakistan, RI represents a unified response to the substantial number of individuals marginalized from essential physical rehabilitation services. Operating under the aegis of Article 42 of the Companies Ordinance 1984, registered by the Security and Exchange Commission of Pakistan, RI strategically positions itself as a local entity. It embraces a comprehensive approach, actively engaging in both local and international partnerships to foster sustainability, elevate local capabilities, and introduce cost-effective, innovative solutions within the dynamic landscape of the physical rehabilitation sector in Pakistan. All these efforts are geared towards better mobility and social inclusion. RI operates in five major areas, including supply chain, capacity building, research and development, awareness and advocacy, and specialized service provision.

### **VISION:**

The RI envisions a society where all persons with physical disabilities are given full opportunities to live their lives to the fullest.

### **MISSION:**

In synergy with our physical rehab partners, the Rehab Initiative aims to provide comprehensively sustainable solutions, and an efficient supply of low-cost high-quality physical rehab products upgrading the quality of physical rehabilitation sector in Pakistan, making it accessible to all.



Rehab initi



## FOCUS AREAS:

Supply Chain | Capacity Building | Research and Development | Advocacy & Awareness | Specialized Service Provision | Social Inclusion

## SUPPLY CHAIN INTERVENTIONS:

Rehab Initiative (RI) is committed to maintaining a robust and centralized supply chain of high-quality Prosthetic and Orthotic (P&O) components, establishing strong liaisons with all stakeholders in the physical rehabilitation sector. So far, material for 114,000 devices has been distributed to the partner organizations in Pakistan. Our interventions in the supply chain include:

- **Centrally Accessible Stock:** RI is dedicated to establishing and maintaining a centrally accessible and trackable stock of high-quality P&O components. This ensures the availability of these components at economical prices for all individuals in need.
- **Distribution Cycles:** Conducting regular distribution cycles, RI ensures the delivery of high-quality, ISO certified orthotic components to rehabilitation centers across Pakistan. This approach guarantees a consistent supply to meet the demand of partner centers.
- **Polypropylene and Advanced Modular Technology:** RI procures and distributes a diverse range of materials, including Polypropylene and advanced Modular technology, providing a comprehensive selection to partner centers. This initiative reflects our commitment to staying abreast of technological advancements in the field.
- **Software Integration:** Integrating orthotic material distribution and tracking into sophisticated software such as Distribution Order Management System (DOMS), RI maintains a transparent and efficient supply chain. This digital integration enhances accuracy and facilitates real-time monitoring.
- **Local Production Collaboration:** RI collaborates with local manufacturers, promoting and strengthening local production capabilities. This collaborative effort ensures the production of high-quality orthotic components that comply with international standards, contributing to the growth of the local economy.
- **Post-Sale Product Trainings:** RI goes beyond distribution by coupling the supply of orthotic materials with post-sale product training sessions. These sessions are designed to build the capacity of professional Prosthetists and Orthotists (P&Os), ensuring the effective and informed use of distributed components.

- **Transparent Patient Material Tracking:** Utilizing the Rehab Center Management Software (RCMS), RI manages a transparent patient material tracking system. This ensures accountability and traceability between donor organizations and receiving partner centers, fostering a high level of transparency throughout the supply chain.
- **Wheel Chairs:** To enhance the mobility, RI with the support of ICRC distributed a total of 747 wheel chairs to the deserving disables through its Implementing Partners (IPs) that included PRSP (Peshawar), Chal Foundation (Balakot, Swabi, Quetta), AKI (Peshawar), MRCP (Muzaffrabad) and PRC (Bajour).
- **Crutches:** Crutches play a vital role for those disables, having minor disability and difficulty in walking. RI with the support of ICRC distributed a total of 2,395 crutches to the deserving disables (1685 adults and 710 child size) through its IPs such as MRCP (Muzaffarabad), Chal Foundation (Bagh, Swabi, Balakot), Indus Hospital (Badin, Karachi) and PRSP (Peshawar, Swat).



## CAPACITY BUILDING FOR SUSTAINABLE REHABILITATION:

At the heart of achieving sustainability in Pakistan's physical rehabilitation sector play a pivotal endeavor of building professional capacities among Prosthetists and Orthotists (P&Os). Rehab Initiative (RI) spearheads this transformative mission through dynamic collaborations with international Prosthetic and Orthotic educational institutes, infusing global best practices to elevate the standard of services provided by the workforce. So far, RI has trained a total of 296 professionals of selected Implementation Partners through the support of ICRC. The major areas covered were; technical training of P&Os, administration, store management and physiotherapy, etc. The major themes of training were as follows:

- **Enhancing Working Capacities:** RI focuses on augmenting the working capacities of professional P&Os in Pakistan. By equipping them with the latest knowledge and skills, RI empowers practitioners to deliver services that align with international standards.
- **Blended Learning Modules:** The approach involves conducting blended learning modules designed to impart best practices to professional P&Os. This innovative method ensures a comprehensive understanding of modern techniques, ultimately enhancing the quality of services delivered at rehabilitation centers.
- **Advanced Technology Integration:** RI takes a leap into the future by providing professional training for P&Os in Pakistan through the utilization of advanced technologies at the RI training lab. This high-tech environment serves as a hub for hands-on learning, allowing practitioners to engage with cutting-edge tools and methodologies.

## STRATEGIC RESEARCH AND DEVELOPMENT (R&D) INITIATIVES:

In its unwavering commitment to innovating and delivering cost-effective solutions for the advancement of physical rehabilitation services, Rehab Initiative (RI) strategically integrates Research and Development (R&D) initiatives. These initiatives are meticulously designed to:

- Introduce economical alternative solutions in assistive technology, ensuring compliance with safety standards, and promoting local production.
- Provide comprehensive support to the local industry for the production of high-quality ortho components, resulting in a significant cost reduction and an increase in the number of services delivered.
- Utilize cutting-edge software technology to enhance the efficiency of services provided in the physical rehabilitation sector.
- Leverage the state-of-the-art machinery at the RI training lab to explore improved treatment methods and device fabrication.





## FOUR-PHASED STRATEGY IMPLEMENTATION:

**Initiate:** During the initiation phase, innovative ideas and concepts come to life. The following items have been set in motion for thorough research and development:

- Elastic bandage
- Modular Transtibial socket adapter for thermoplastic
- Modular Trans-femoral socket adapter for thermoplastic
- SANDING SLEEVE, grit 80, for 064075 – 200
- SANDING SLEEVE, grit 50, for 064075 - 201

**Research, Review, Trial:** In the second stage, the emphasis is on comprehensive research, detailed reviews, and rigorous trials of the proposed ideas. Currently, the following items are actively under research and review:

- Suspension Sleeve for modular AK prosthesis
- SACH Foot
- Modular BK Prosthetic Kit
- DB shoes

**Finalization:** The third stage is dedicated to the finalization of items and products. Currently, the focus is on finalizing the following:

- Anchor-1
- Ortho-Droplock
- Cosmetic foam cover for Modular BK prosthesis

**Approval:** The fourth stage involves obtaining approval for the items earmarked for production and utilization in Pakistan. Successfully approved items for production are Poly-urethane Block, Leather Strap, Stockinet's, and Abduction bar.



**PRACTICAL SESSION  
OF BLENDED  
LEARNING MODULE  
ON CORRECTIVE  
SPINAL BRACING -  
SCOLIOSIS**

**SPECIALIZED COURSE IN  
ORTHODONTICS AND PROSTHETICS**  
Riyadh, Saudi Arabia, Training Unit, International  
11-19 June, 2018



# AWARENESS AND ADVOCACY

The RI garners state support to further the cause of physical rehabilitation and integration of Persons with Disabilities (PwDs) into mainstream healthcare. Engaging with multiple government stakeholders, and promotes facilitation of rehabilitation, inclusion, and accessibility, while imparting knowledge on the basics of physical rehabilitation and its life-changing impact, by:

- **Government Engagement:** Sensitizing state authorities to reduce duties on imports, subsequently lowering device costs and enhancing accessibility for PwDs.
- **Rights Advocacy:** Championing the rights of PwDs and emphasizing the importance of data collection, potentially boosting the physical rehabilitation market.
- **Information Portal:** Providing PwDs with an accessible information portal on managing physical disabilities.
- **Value to Health Sector:** Contributing to the health sector's advancement through RI's state-of-the-art training and research lab.
- **Collaboration Exploration:** Exploring collaborative opportunities with national and international organizations in the physical rehabilitation health sector.
- **Healthcare Equity:** Addressing healthcare disparities and societal barriers faced by individuals with disabilities, enhancing access to healthcare services, and training professionals to meet unique needs.
- **Policy Advocacy:** Engaging in advocacy for transformative policies, encompassing comprehensive legislation, robust implementation, and oversight to ensure the rights and inclusion of persons with disabilities.
- **Breaking Societal Barriers:** Striving to dismantle societal barriers that perpetuate a compassionate rather than empowering perspective on individuals with disabilities.
- **Crisis Response:** Developing response and preparedness plans to cater to the specific needs of persons with disabilities during natural disasters or emergencies.
- **Mental Health Support:** Acknowledging the mental health challenges faced by PwDs and implementing interventions for psychological support, counseling, and mental health awareness.
- **Advocacy and Modeling of PWDs Structures:** Ensuring accessibility at all levels to services and facilities in public places, buildings, public services, and washrooms.



## SPACILIEZED SERVICES PROVISION:

### ADVANCING SPECIALIZED SERVICES IN PHYSICAL REHABILITATION

The Rehab Initiative (RI) stands at the forefront of specialized service provision, leveraging its cutting-edge training facility equipped with advanced machinery. This strategic approach enables RI to spearhead projects focused on technological innovation, contribute to research and development, and broaden the reach of high-quality physical rehabilitation services in Pakistan.

#### KEY INITIATIVES:

- **Research and Innovation Deployment:** RI actively tests and deploys the products of its research and innovation endeavors. The state-of-the-art training facility serves as a hub for translating groundbreaking ideas into tangible solutions that positively impact individuals with disabilities.
- **Specialized Projects Execution:** Taking on specialized projects, RI plays a crucial role in areas such as spinal orthosis. The utilization of the RODIN 4D setup for digital fabrication of assistive devices enhances precision and efficiency, contributing to the creation of relevant orthotic devices tailored to the unique needs of beneficiaries.
- **Expansion of High-Quality Services:** By embracing Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) technologies, RI pioneers innovation in prosthetics and orthotics. The goal is to increase the number of Persons with Disabilities (PwDs) receiving high-quality physical rehabilitation services delivered by a cadre of highly trained professional Prosthetists and Orthotists (P&Os).



## **Technological Innovation:**

CAD-CAM systems have been widely used in the industry since 1970s (Zeid 1991). The RI revolutionizes the field by integrating CAD-CAM technologies first time in Pakistan, including 3D scanners, visualization software, CAD software, slicing software, 3D carvers, and 3D printers. This comprehensive technological approach allows for the production of a diverse range of diagnostic and definitive devices, such as lower and upper limb prostheses, orthoses, scoliosis braces, and cranial remolding orthoses.

CADCAM provides more precision, accuracy and reduces fabrication & patient time as compared to the conventional methods. This technology is being used for spinal cord braces with highest accuracy. The complete setup includes M4D scanner, I-pad with structure sensor, neo rectification software with license, milling machine and raw materials include different designs and sizes of PU blocks.

CAD-CAM is being used for orthotics, which includes cranial helmets, upper limb Orthoses, spinal Orthoses and lower limb Orthoses. Furthermore, this technology can also be used for prostheses including upper limb and lower limb prostheses. The benefits of CAD-CAM include reduced time of manual work, intelligent rectification software, simplified production procedure, increased time for patient care, it compares shape with X-ray film, increase efficacy by accurate force application and data and design comparison. Furthermore, individual scan can be stored in library in the form of templates, there is a possibility for outcome measures, and evidence based practice and evaluation of treatment protocol.

## **Key Achievements:**

- Successful implementation of CAD/CAM technologies in prosthetic and orthotic device production.
- Pioneering the use of advanced 3D scanning and printing techniques.
- Servicing 24 rehab centers and collaborating with nine partners across Pakistan.
- Adoption of CAD/CAM in the creation of lower and upper limb prostheses, orthoses, and other specialized devices.
- Implementation of shape capture, rectification, and fabrication processes using CAD/CAM, ensuring precise and customized solutions.
- Ongoing commitment to expanding the utilization of CAD/CAM technologies in Pakistan to enhance accessibility for individuals with disabilities, particularly those lacking access to such facilities.

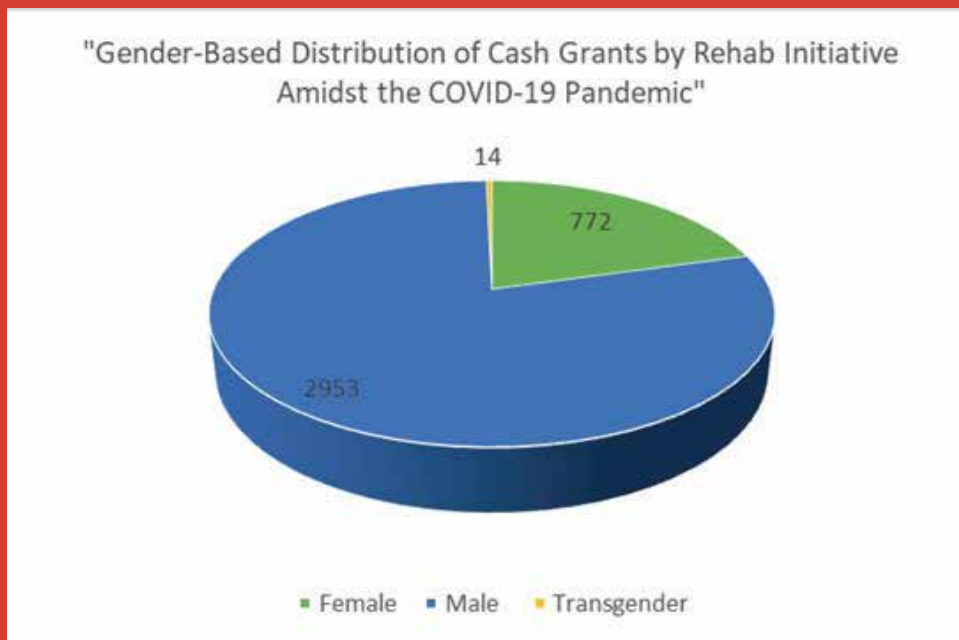




## CASH BASED ASSISTANCE:

In the face of disrupted operations and challenges posed by the COVID-19 pandemic in 2020, RI demonstrated unwavering commitment with the support of ICRC by providing crucial assistance to Persons with Disabilities (PwDs) and economically disadvantaged individuals. Overcoming obstacles, RI's outreach extended to 10,000 families, inclusive of men, women, and children, offering essential support during that time when all services were disrupted.

The gender-based distribution of cash grants by Rehab Initiative during the pandemic is a testament to its inclusive approach. A total of 3,739 beneficiaries received cash assistance, with 2,953 males, 772 females, and 14 transgender individuals benefiting from this initiative. This inclusive model reflects RI's dedication to addressing the diverse needs of the community.





Furthermore, the demographic distribution of cash assistance beneficiaries based on medical conditions highlights RI's targeted support to various groups. Prosthetic users, orthotic device users, clubfoot patients, walking aid recipients, individuals with neurological diseases (such as CP), post-polio paralysis survivors, individuals with spinal cord injuries, and wheelchair users collectively accounted for a total of 3,739 beneficiaries

Collaboration with implementing partners, such as Chal Foundation, CHEF Islamabad, PRC (PIPOS), Fauji Foundation, Friends Paraplegic (Peshawar), Lady Reading Hospital (Peshawar), MPRC (Muzaffarabad), Pakistan Disabled Cricket Association, PIPOS, and Paraplegic (Peshawar).

## Social Inclusion

Rehab Initiative (RI) stands resolute in its dedication to fostering inclusivity, an integral aspect of our mission. Through collaborative endeavors with government bodies, NGOs, and national/international partners, RI actively implements

inclusive practices to seamlessly integrate Persons with Disabilities (PwDs) into mainstream society. Our work dismantles

societal barriers, championing the rights of individuals with disabilities and ensuring equitable access to physical

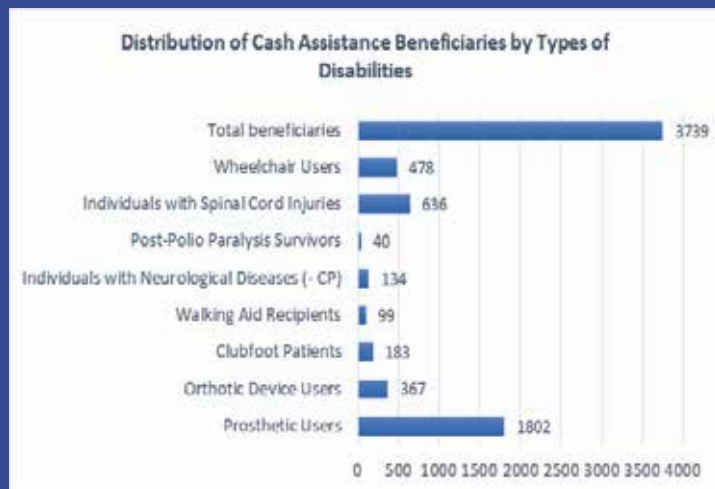
rehabilitation, healthcare, education, and employment opportunities for diverse communities. Inclusion at RI is not merely a

goal; it's a fundamental aspect of our identity, as we tirelessly work towards a world where every individual, regardless of abilities, is embraced and empowered for full participation. At RI, our approach encompasses Social Mobilization, advocacy, and awareness, targeting not only communities but also decision/policy makers. We advocate for budgetary allocations and engage with academia, legislators at both provincial and federal levels, along with government community activists and indigenous leaders.

"Inclusive Horizons: RI's Transformative Initiatives and Future Pathways for Disability Empowerment" signify our strategic advancements. We introduced cash grants during COVID-19, supporting individuals with disabilities and ensuring financial inclusivity. Our plan is to expand this program, reaching a broader audience. Prioritizing psychosocial support, we enhance programs for mental health, recognizing its crucial role in overall well-being. Gender inclusion is a focal point, addressing challenges faced by women with disabilities, striving for their full participation in society.

Our Technical and Vocational Education and Training (TVET) initiatives empower individuals with disabilities through skill development. Building on successful models, we aim to establish TVET programs, providing opportunities for PwDs to acquire essential skills, enhance employability, and contribute meaningfully. Advocating for accessible washrooms and infrastructure improvements, RI ensures public spaces are inclusive. Facilitating the issuance of Computerized National Identity Cards (CNICs) for PwDs remains a significant milestone, essential for full civic participation

Reflecting on past achievements, RI remains committed to a holistic approach, envisioning a society where every individual thrives, regardless of abilities, in an environment valuing diversity and ensuring equal opportunities.

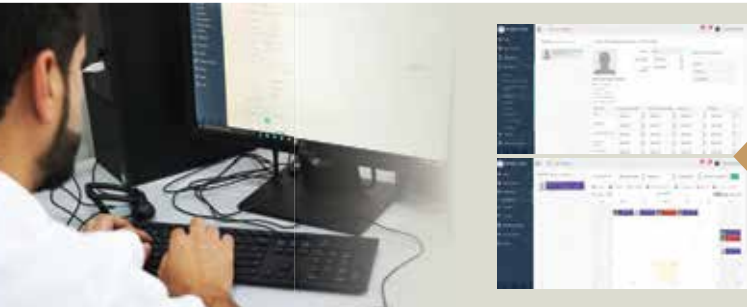




# HIGHLIGHTS

## DISTRIBUTION ORDER MANAGEMENT SYSTEM

RI has integrated its supply chain management to an in-house designed Distribution Order Management System, coupled with barcode scanning and a standard device list, which allows easy material forecast, pre-ordering, shipping and material tracking, providing transparency for rehab centers and donors.



## REHAB CENTRE MANAGEMENT SOFTWARE

The RI under its research and development has designed and deployed a unique patient data management software called the Rehab Center Management Software, which develops a detailed patient profile and progress track of relevant device fabrication. It generates an automated patient-report along with providing P&Os and technical staff with an interactive platform to manage responsibilities under senior supervision making services more efficient and reliable.

## RODIN 4D FOR DIGITAL FABRICATION OF P&O DEVICES

The RI's training lab is unique due to a RODIN 4D CAD/CAM (Computer aided Design and Manufacturing set-up, which has replaced conventional methods of screening, casting and device fabrication. It consists of the following:

- M4D scanner to scan patient's body segment which needs correction/support.
- A specialized software to generate a digital scan file of the patient's segment.
- A milling machine which uses polyurethane blocks to create a replica of the patient's body segment which was initially scanned.

Through the RODIN 4D set-up, the RI aims to extend partnerships with organizations in the rehabilitation healthcare to take up device fabrication for specialized projects such as spinal orthotics and for cases in which distance comes in between adequate treatment and rehabilitation of patients.



# HIGHLIGHTS

## PROMOTION OF LOCAL PRODUCTION

To strengthen Pakistan-based industry, the RI has collaborated with local manufacturers and approved and verified designs for carbon fiber prosthetic feet, ortho-drop lock joints and Trans-tibial kits by investing R&D resources into testing the international standard compliance of the aforementioned products with technical assistance from RI staff.



## ADVOCACY FOR PERSONS WITH PHYSICAL DISABILITIES

The RI has conducted important meetings with key government officials from ministries of Commerce and Industry, health and Foreign Affairs to advocate the inclusion of physical rehabilitation into mainstream healthcare.

## P&O BLENDED LEARNING MODULES

The RI, in collaboration with a German P&O training institute "Human Study" has co-organized with the International Committee of the Red Cross (ICRC), three different trainings, building working capacities of a total of 30 P&Os in Pakistan. The RI organizes blended learning modules which are a mix of online sessions and one week practical training exercises for professional P&Os to strengthen their professional abilities.



## DISTRIBUTION OF ORTHO ITEMS

The RI's has been conducting quarterly distribution cycles of ortho components procured from Geneva, China and local manufacturers to its partner rehab centers all across Pakistan.

# AUTHORIZATIONS ACQUIRED BY THE RI

The RI has attained around 13 accreditations from government regulators to work as a not-for-profit social enterprise with ease of mobility.



# RI PARTNERS

Through local implementing partners, the RI's aims to achieve true sustainability in the physical rehabilitation sector in Pakistan by protecting each other's work interests, at the same time joining hands and increasing the number of beneficiaries of high quality rehab services and creating an inclusive environment for them. The following are our partner rehab centres.





# THE BOARD

## DR. BAKHT SARWAR

Chairman Rehab Initiative  
Chief Executive at Chal Foundation

## SOHAIL AYAZ

Director at Rehab Initiative  
Chief Executive at the Comprehensive Health and Education Forum  
(CHEF) International

## GEN. AKHTAR WAHEED

Director at Rehab Initiative  
HOD Rehabilitation Medicine and Artificial Limb Centre,  
Fauji Foundation Hospital Rawalpindi

## IHTISHAM AHMED

Chief Executive at the Rehab Initiative

## IMRAN LATIF KHAN

Director at Rehab Initiative  
Team Leader, Physical Rehabilitation Program, ICRC Pakistan





## **ICRC'S SECTOR DEVELOPMENT: APPROACH-ESTABLISHMENT OF THE REHAB INITIATIVE (RI):**

Since 1984, the Physical Rehabilitation Program (PRP) of the ICRC has devoted its relentless efforts for the rehabilitation of physically disabled persons in Pakistan. Through collaborations with major service providers in the sector, the ICRC has supported high- quality service delivery, particularly the production of prosthetic and orthotic devices through a network of 9 partner organizations, managing 24 rehab centers across Pakistan. Through these local partner organizations, the ICRC is able to produce more than 22,000 devices annually, reaching out to almost 114,000 persons in need of physical rehabilitation services in the year 2023.

To promote sustainability, the ICRC has established a local non-profit Rehab Initiative (RI), registered under section 42 of the security and exchange commission of Pakistan(SECP) with the aim of bringing together a consortium of major physical rehabilitation service providers in Pakistan. The Rehab Initiative furthers the PRP's objectives of accessibility, delivery of high-quality services, inclusion of persons with disabilities into mainstream life and bringing people-driven sustainability in the sector. The RI aims to do this by becoming a catalyst for accessibility towards physical rehabilitation services through research and development into providing cost-effective solutions and conducting awareness and advocacy.

Working in close association with the ICRC, RI extends support by providing supply chain services to partner organizations and organizing capacity development activities for prosthetists and orthotists and championing the rights of PwDs and the life-changing impact of assistive devices. The RI advocates at the state-level the significance of a state-led initiative to rehabilitate vulnerable people and promotes accessibility through local production of high-quality ortho material through rigorous research and development, to ensure physically disabled persons are given a full and fair chance at life.

### **REHAB INITIATIVE**

Registered under the article 42 of Companies Ordinance, 1984  
Plot # 18, Main Faqir Aipee Road,  
I-11/2, Islamabad. Pakistan