

## Orthopedic Research Center (ORC) Strategic Roadmap

### Vision

Our vision is to continue to be the nation's leading center for orthopedic research, while also rising to the **top position in the Eastern Mediterranean** area and globally over the next five years by performing innovative, basic, and applied research in this field. To obtain comprehensive scientific communication, international cooperation is required with the surrounding nations, Europe, and United States.

### Mission

The main commitment and mission of this research institute is to restore, maintain and promote the health of patients suffering from orthopedic problems as best as possible. Our research institute, in accordance with the research policies of the university and the country, in light of the undeniable role of research in sustainable and comprehensive development, is determined to improvements in the qualitative and quantitative levels of research activities in the field of orthopedic surgery by:

- Identify and benefit from experienced principle investigators and researchers
- Identify the interested students and employees and their empowerment in the research field of orthopedic surgery
- Optimal management of resources and clarification of services and activities
- Provide a suitable platform for the emergence of creativity and discoveries

### Values

As one of its guiding principles, this center endeavors to include the following values into all of its research planning:

- Excellence in orthopedic basic and clinical research both domestically and internationally
1. Transdisciplinary communication both domestically and internationally
  2. Developing a culture of constructive collaboration among the Orthopedic Research Center's members
  3. Establishing orthopedics databases

4. Providing facilities and social media for showcasing the institute scientific skills
5. Recruitment of young, active people in orthopedic research
6. Carrying out focused research in the field of orthopedics that results in knowledge or products to benefit patients
7. Undertaking multidisciplinary research
  - Commitment to perform evidence-based research services in the field of orthopedic surgery
  - Adherence to ethical principles in research
  - Emphasis on collaboration and teamwork in research activities
  - Emphasis on knowledge-centeredness and the applicability of research findings to promote community well-being
  - Emphasis on promotion of the spirit of collaboration and teamwork
  - Emphasis on protecting and honoring human dignity
  - Emphasis on meritocracy

## Strength

S1: Presence of collaborative management and systematic thinking in the field of orthopedic surgery research

S2: Having knowledgeable and experienced principle investigators who engage in the orthopedic surgery research

S3: Potential for collaboration and connection with other research institutions nationwide

S4: Partnership with a number of prestigious academic institutions abroad

S5: Having the distinguished and scholarly Archive of Bone and Joint Surgery (ABJS) journal (indexed in PUBMED) with an international editorial board made up of members of the Iranian Orthopedic Surgeons Association, the Sports Injuries Association, the Arthroscopy Society, and the Iranian Associations for Knee Surgery, Shoulder Surgery, and Elbow Surgery.

S6: Through study abroad experiences and the international journal of the ABJS, faculty members can communicate internationally with research institutions across the world.

S7: Efficiency in reviewing and decision-making about scientific submissions to the journal and facilitating the publication of valuable scientific articles.

S8: the presence of experienced specialty councils (research councils, publishing councils, etc.)

S9: Making an organized effort to host national and international scientific seminars and congresses

S10: Employing the expertise of professionals and researchers both domestically and abroad

S11: More than 70% of specialists who received their education abroad

S12: Presence of two orthopedic surgeons from the research center who have a research PhD in addition to their clinical fellowship

S13: The potential for undertaking basic cadaveric investigations

S14: Sustainable interdisciplinary collaboration with Ferdowsi University of Mashhad (FUM)

S15: Mashhad Cohort Database in the field of orthopedics

S16: Sustainable cooperation with NIMAD Institute (three projects)

S17: Collaboration with graphic designers to develop media, create previews, and demonstrate the concept of innovative research projects

S18: Establishing a connection to industry through the knowledge-based companies Avisia and Aubadis

S19: Possessing the methodological process, science, and knowledge necessary to perform novel, innovative, and technological research

S20: Possessing the methodological process, science, and knowledge necessary to perform interdisciplinary research

S21: Possessing Bone and Joint laboratory

S22: Having a strong work relationship with various related disciplines, in particular in the fields of physiotherapy and rehabilitation

S23: Employing a research physician to manage the center's research projects

S24: Having doctoral-level educational pursuits in research

S25: Having faculty who conduct research

S26: Permission to recruit PhD by Research student in orthopedic research center

S27: Permission to recruit Research Post-doctoral student in orthopedic research center

## **Weakness**

W1: Inadequate funding for conducting research initiatives

W2: lack of appropriate physical space

W3: Financial and administrative restrictions for setting up required laboratories (biomechanics laboratory, gait analysis laboratory, etc.).

W4: the incapacity to employ the minimum of staff on an employment basis

W5: A number of orthopedic academics who are currently on the move abroad

W6: Lack of knowledge and assistance on the center's research activities from the university's responsible authorities

W7: No credible webpage

W8: Lack of a full-time, dedicated biostatistics specialist in the research center

W9: Student emigration who participated in research center activities

W10: Lack of resources for holding conferences and seminars

W11: Insufficient full-time research faculty

W12: Knowledge-based companies' high operating expenses and collapse

W13: Extensive national sanctions and less opportunities for communication with other countries, especially with the United States of America

W14: Lack of a structured system for collecting statistics and registering disease information

## **Opportunities**

O1: Governmental support for research institutions and knowledge-based companies, particularly in year 2022

O2: The supportive attitude that university officials have toward the production of science

O3: External credits

O4: Access to the most credible and updated scientific publications and internet resources available worldwide

O5: Significant number of research centers both inside and outside of the university

O6: Presence of multiple specialist and sub-specialized treatment facilities at university affiliated hospitals

O7: Experience and knowledge of organizing research abroad

O8: Availability of independent, non-governmental research organizations (NGOs)

O9: Available functional publishing and printing infrastructure in the province

O10: At Mashhad University of Medical Sciences, 1% of all scientists' worldwide research in some specialized fields

O11: Mashhad University of Medical Sciences' and the Ministry of Health's Deputy of Research and Technology's particular focus on the development of research centers

## Threats

- T1: Improper allocation of governmental funds and resources
- T2: Researchers' under appreciation of undertaking applied researches
- T3: Slower progress in science and technology production compared to the international community's rapid movement
- T4: Lack of an organized method for tracking disease registry
- T5: Lack of interest among medical students in orthopedics research, particularly women
- T6: Inability to effectively apply the findings of the research by concerned organizations and society
- T7: Industries' lack of confidence in research institutes' ability to solve their problems through scientific research
- T8: Limitations on the employment of foreign researchers and research facilities are imposed by regulations and laws.
- T9: Restrictions on inclusion and use of the private sector's potential power in various research activities
- T10: Several research centers are working in parallel
- T11: Challenging competition between some research institutions and faculties

## General Goals

- G1: Establishing the required framework to advance and strengthen the Orthopedic Research Center's capability for basic science research (laboratory, basic science human resources, communication with other basic science center, inside or outside the university)
- G2: Establishing the required framework to advance and strengthen the orthopedic research center's research capacity in the area of orthopedic clinical sciences (creating a cohort and registry database, recruiting medical students, recruiting physical therapy students)
- G3: Enhancing the quantity and quality of research in the fields of technology, basic and clinical orthopedic sciences, and the establishment of a formal network connecting universities, industry, and companies in the nation's orthopedic research area (research physician employment, theses development, protocols development, statistical staff)
- G4: Extending interdisciplinary research and communication with other research institutions in order to advance technological research
- G5: Securing internal and external funding for research grants through well-defined proposals (within the university, the ministry, abroad institutes and charity)

G6: Increasing regional, international, and national university research partnerships (through seminars, journal, website)

G7: Developing connections abroad (maintaining previous connections, creating new connections, journal)

G8: Being seen in the social media (website)

G9: Maintaining the center's standing as one of the nation's top research institutions and promoting it in the Middle East

## **Strategies (SO)**

SO1: ABJS International Journal of Orthopedic Research Center's scientific standing and profile will be upgraded by having access to the most credible and updated electronic and printed scientific resources available worldwide and the necessary publication and printing infrastructure in the province.

SO2: Utilizing the publication system to release previews and media made from the innovative projects of the center

SO3: Strengthening research center's industrial links and the two knowledge-based companies Avisa and Aubadis in light of the government's support of research institutions and knowledge-based companies, particularly this year.

SO4: Improving connection with other clinical disciplines by utilizing the capabilities of numerous specialized and sub-specialized treatment facilities in university-affiliated hospitals

SO5: Utilizing Mashhad University officials' cooperation to promote science

SO6: Application of external credits as a result of faculty members' research credit and expertise in registering grant proposals for creative projects

SO7: Collaboration with a variety of research institutions both inside and outside the university owing to faculty members' research credit

SO8: Developing a strong research protocol and process by utilizing the foreign experiences of officials in organization

SO9: Collaboration with independent non-governmental research organizations (NGOs) using faculty members' credentials in research

SO10: Interaction with authorities who have a pro-science and pro-technology stance in order to apply the procedures created to carry out innovative, creative, and technological research

SO11: Interaction with authorities who have a pro-science and pro-technology stance in order to apply the procedures created to carry out interdisciplinary research

SO12: Securing the support from the Ministry of Health and Mashhad University of Medical Sciences to promote research center, due to prior expertise and cooperation of the faculty

SO13: Recruitment of international PhD and postdoctoral students

## **Strategies (ST)**

ST1: Utilizing faculty members' experiences to design and implement a system for tracking data and information on orthopedic illnesses in the research center

ST2: Organizing the funding for conducting research projects based on prior experiences, the center's positive relationship with NIMAD, and the knowledge of how to get research funds

ST3: Optimizing the center's equipment and financial resource through the expertise of the professors and the research center's director

ST4: Changing the attitude of researchers towards applied research through the publication of successful results of this type of research studies

ST5: Bringing the beneficial outcomes of the Orthopedic Research Center's applied research to the notice of relevant communities, to persuade them to use the results of applied research

ST6: Collaboration with research facilities abroad to advance science and technology production more quickly thanks to faculty members' international experiences

ST7: Gaining the trust of industries in the ability of research centers to address their challenges through research by leveraging faculty members' prior collaborations with industry and creating knowledge-based companies

ST8: Correspondence with ministry and Mashhad University of Medical Sciences representatives to modify some prohibitive regulations on employing foreign researchers and research facilities

ST9: Correspondence with ministry and Mashhad University of Medical Sciences representatives to modify some prohibitive regulations on the utilization of the private sector's potential in various research projects

ST10: Pique the interest of medical students in orthopedic research, particularly among female students, through close interactions between faculty members and students and by hosting motivating presentations in this subject

ST11: Strengthening the media and publishing the activities of the orthopedic research center in order to inform and win the support of the appropriate university officials about the center's activities

## **Strategies (WO)**

WO1: Utilization of numerous specialist and sub-specialized treatment facilities in university-affiliated hospitals to collect data on orthopedic disorders and organize a statistics system

WO2: Correspondence with Mashhad University of Medical Sciences administrators to get an appropriate physical space

WO3: Securing the support of Mashhad University of Medical Sciences administrators to raise funds for establishing the necessary laboratories

WO4: Using the Ministry of Health and Mashhad University of Medical Sciences' Research and Technology Deputy's special attention to attract full-time research professors and research personnel

WO5: Launching a credible and international website for the research center based on experiences with conducting research internationally

WO6: Trying to set up a student exchange program with research centers abroad in order to keep in touch and cooperate with fellow research students who are participating in the center's research activities but who want to emigrate

WO7: Securing the support of basic science faculty for full-time collaboration on research at the center

### **Strategies (WT)**

WT1: Improving the physical space and optimizing the research center's financial and welfare resources to make greater use of the research skills of experienced university professors and international and domestic experts in the field of orthopedic surgery

WT2: Optimization of the center's research project monitoring procedures

WT3: Enhancing and simplifying the access to scientific databases and sources of disease knowledge to conduct orthopedic applied research

### **Tables of goals and related tasks in the one-year operational plan and the five-year midterm plan**

G1: Establishing the required framework to advance and strengthen the Orthopedic Research Center's capability for basic science research (laboratory, basic science human resources, communication with other basic science center, inside or outside the university)

Goal	Corresponding tasks	Time for accomplishment	Index for monitoring and evaluation	The extent of achievement
G101	the development of the laboratory's personnel and resources	2 years	1. Purchasing of materials 2. Exoskeleton, coating, and gate analysis  3. There are five new basic science projects each year.	
G102	strengthening human resources for basic science (full-time basic science faculty, postdoctoral students)	2 years	1. Two faculty members in the faculty of basic sciences  2. Three postdoctoral students  3. the permanent laboratory's manager  4. One research physician	
G103	partnerships with other basic research centers, both inside and outside of the university	2 years	Number of 5 collaborative projects with other institutions in basic science	

G2: Establishing the required framework to advance and strengthen the orthopedic research center's research capacity in the area of orthopedic clinical sciences (creating a cohort and registry database, recruiting medical students, recruiting physical therapy students)

Goal	Corresponding tasks	Time for accomplishment	Index for monitoring and evaluation	The extent of achievement
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G2O1	Cohort database and registry setup	2 years	<ol style="list-style-type: none"> <li>1. The number of 10 proposals based on the cohort and registry data</li> <li>2. The number of three proposals based on orthopedic patients' data available from the registry.</li> <li>3. Establish two new registries</li> </ol>	
G2O2	Medical student recruitment	2 years	<ol style="list-style-type: none"> <li>1. The annual participation of 10 medical students in the research center</li> <li>2. The annual average of 5 medical students' theses in the orthopedic department</li> </ol>	
G2O3	Physiotherapy student recruitment	2 years	<ol style="list-style-type: none"> <li>1. The annual participation of 3 physiotherapy students in the research center</li> <li>2. The annual average of 3 physiotherapy students' theses in the orthopedic department</li> </ol>	

G3: Enhancing the quantity and quality of research in the fields of technology, basic and clinical orthopedic sciences, and the establishment of a formal network connecting universities, industry,

and companies in the nation's orthopedic research area (research physician employment, theses development, protocols development, statistical staff)

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G3O1	Research physician recruitment	2 years	1. The number of one ORC faculty member that participate in the research doctor program on an annual basis  2. The number of one PhD-holding faculty member on an annual basis	
G3O2	Student thesis development	2 years	1. The annual average of 5 medical students' theses in the orthopedic department  2. The annual average of 3 physiotherapy students' theses in the orthopedic department	
G3O3	Developing protocols for clinical research	1 year	1. The inclusion of 5 clinical videos to educate clinical research management and proposal writing	

			2. Preparing 5 research protocols	
G3O4	The employment of biostatistics personnel	2 years	1. Number of one biostatistics expert in ORC	

G4: Extending interdisciplinary research and communication with other research institutions in order to advance technological research

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G4O1	Applied research support	2 years	The allocated resource	
G4O2	Expansion of communication with other research centers	2 years	1. Five cooperative projects with other research institutions.  2. The number of associate students recruited from other research institutions	
G4O3	Interdisciplinary research development	2 years	1. A number of two cooperative projects with the engineering faculty's robotics lab  2. The number of five joint initiatives including basic and clinical sciences	
G4O4	Holding technological conferences	2 years	1. One conference annually	

G5: Securing internal and external funding for research grants through well-defined proposals (within the university, the ministry, abroad institutes and charity)

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G5O1	Research proposals submission within the university	2 years	1. Number of 30 research projects registered in Pazhoohan, system of university research	
G5O2	Research proposals submission in other universities	2 years	1. The number of 5 proposals that ORC members have submitted to other universities' research systems	
G5O3	Research proposal submission to the ministry (institutions inside the country, including NIMAD and INSF)	2 years	1. The number of 2 projects submitted by ORC members to the Ministry of Home Affairs' research system	
G5O4	Research proposal submission to the foreign institutes	2 years	1. The number of 1 project submitted to foreign research grant systems by ORC members	

G6: Increasing regional, international, and national university research partnerships (through seminars, journal, website)

Goal	Corresponding tasks	Time for accomplishment	Index for monitoring and evaluation	The extent of achievement
G6O1	Holding international seminars and conferences	2 years	1. Number of 2 specialized international seminars and conferences.	
G6O2	Attracting international researchers to submit to the ABJS journal	2 years	1. Number of 100 international articles published in the journal  2. The number of 20 international editorial boards of the journal	
G6O3	Launching the Orthopedic Research Center international website	1 year	1. Purchasing a server host, name, and a logo before actually starting an English website	
G6O4	Targeted research participation to congress, both internal and external	2 years	1. The number of 5 congress annually	
G6O5	Invite Iranians specialists who live abroad or foreigners orthopedic surgery professionals to boost scientific collaboration	2 years	1. The number of 4 specialists annually	

G7: Developing connections abroad (maintaining previous connections, creating new connections, journal)

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G7O1	Joint research project with professors of international academic centers	2 years	1. Number of 2 specialized international seminars and conferences.	
G7O2	Launching the Orthopedic Research Center international website	1 year	1. Purchasing a server host, name, and a logo before actually starting an English website	

G8: Being seen in the social media (website)

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G8O1	Launching the Orthopedic Research Center international website	1 year	1. Purchasing a server host, name, and a logo before actually starting an English website	
G8O2	Improving the internal website of the research center (Persian)	1 year	1. Update the webpage and add new material	
G8O3	Creating ORC account on different platforms (such as YouTube) and uploading media	1 year	1. Creating YouTube and Aparat accounts	

G9: Maintaining the center's standing as one of the nation's top research institutions and promoting it in the Middle East

<b>Goal</b>	<b>Corresponding tasks</b>	<b>Time for accomplishment</b>	<b>Index for monitoring and evaluation</b>	<b>The extent of achievement</b>
G9O1	Advancing clinical research (creating registries and the department dedicated to clinical research)	2 years	1. Establishing two new registers  2. Establishing two research centers	
G9O2	Advancing technological research	2 years	1. Number of 5 technological research project	
G9O3	Advancing basic science research	2 years	1. Staff recruitment  2. Laboratory development	
G9O4	Promotion of clinical and specialized doctoral programs	2 years	1. The number of 1 faculty member participating in the research doctor program	
G9O5	Holding national and international scientific conferences	2 years	1. A minimum of two national conferences every 6 months and one international conference every two years	
G9O6	Promote the standing and profile of ABJS's Scientific International journal		1. Adding more articles on the board screen  2. Uniform identical English writing	

			3. A consultant in statistics	
G9O7	Increasing the number of books published in print and electronic		1. Number of two books annually	

## Practical Strategies (PS)

PS1: Launching the Orthopedic Research Center's credible, international website

PS2: Providing research protocols and educational materials for multiple research areas

PS3: Setting up persistent research meetings once a month, and inviting scholars from the center and outside

PS4: Establishing an orthopedic patient registry and enhancing the HIS system to record patient data, and define research projects and theses based on the information provided.

PS5: Designing collaborative research projects and attempting to establish a joint research center with the department of physiotherapy, and recruiting physiotherapy students.

PS6: Organizing the funds for conducting research projects thanks to the center's robust partnership with NIMAD and its previous success in securing national research grants

PS7: Meetings in person with the young academic staff of the orthopedics department, providing them with further encouragement and step-by-step guidance

PS8: Advancing applied and technology research by enhancing collaboration with research centers in other disciplines (such as engineering) and conceiving interdisciplinary research with the intention of establishing research cores.

PS9: Strengthening the relationship between the center's research and the expansion of two knowledge-based companies, Avisia and Aubadis

PS10: Recruiting the staff required for the advancement of the center's research (research doctor, medical and physiotherapy students, full-time research faculty, full-time statistician, postdoctoral students)

PS11: Targeted research participation to congress, both internal and external

PS12: Enhancing international and collaborative research initiatives with foreign scholars

PS13: Trying to end sexism in the orthopedic residency program at Mashhad University of Medical Sciences