



## History of Neurosurgery in Jordan

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### Keywords

- Jordan
- Palestine
- History
- Arab
- Middle East
- Neurosurgery

### Abbreviations and Acronyms

**CT:** Computed tomography

**MRI:** Magnetic resonance imaging

**WFNS:** World Federation of Neurosurgical Societies

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### INTRODUCTION

Modern Jordan was founded in 1921 as the Hashemite Emirate, and it was recognized by the League of Nations under the British Mandate in 1922 as the “Emirate of Trans-jordan.” The Hashemite Kingdom of Jordan (Jordan) is a small country in the west of Asia with a population of around 7 million. Jordan hosts one of the highest percentages of immigrants in the world compared with its total population, with >40% of its residents being born in another country. This rate is continuously increasing with the influx of 1 million Iraqi and almost 1.5 million Syrian refugees (with only 1 million being registered in the United Nations High Commissioner for Refugees and another unregistered 1.5 million refugees).<sup>1</sup>

In 2010, Jordan was ranked as the 36th most globalized nation in the world,<sup>2,3</sup> making it the most globalized country in the Middle East and North Africa region, including Israel and Turkey. The literacy rate in Jordan is 97%,<sup>4</sup> which is one of the highest in the world. The education system has been significant in the shift from a predominantly agrarian country to

■ **OBJECTIVE:** To raise the level of awareness regarding the role of Jordan as one of the leading countries in the region in providing excellent general medical and neurosurgical care.

■ **METHODS:** This article is mainly a descriptive article. Data presented were collected from different sources that were available in either Arabic or English.

■ **RESULTS:** Jordan has a well structured health care system that consists of three major sectors: public, private, and donors. The physician density is 2.86 physicians/1000 population and the bed density of 17 beds/10,000 population. Jordan has 58 neurosurgeons (1 neurosurgeon per approximately 115,000 population) who cover all neurosurgical subspecialties and provide the best modern neurosurgical care.

■ **CONCLUSION:** Jordan has placed great importance on advancing the health care sector in accordance with international benchmarks yielding performance indicators that are among the best in the region. Moreover, Jordanian women are empowered to take leading roles in nursing, medicine, and surgery.

an industrialized nation. It ranks among the top 5 in the Arab world.<sup>5</sup>

The United Nations Educational, Scientific and Cultural Organization ranked Jordan's education system 18th worldwide for providing gender equality in education. Of Jordan's total government expenditures, 20.5% go to education. There are more than 75,000 Jordanian students enrolled in Jordanian universities each year.<sup>6</sup> An additional 20,000 Jordanians pursue higher education abroad, primarily in the United States and Europe. The kingdom has 10 public and 19 private universities, with more than 250,000 students (51.7% being women),<sup>6</sup> in addition to approximately 57 community colleges.

The 2010 Arab Democracy Index from the Arab Reform Initiative,<sup>7</sup> a consortium of policy analysis institutes founded in 2005, ranked Jordan second in the state of democratic reforms.<sup>8</sup> However, Jordan is not affected by the “Arab Spring,” which took the Arab world by storm (except for the refugee problem, as Jordan continues to receive refugees from Iraq, Syria, and Yemen<sup>9</sup>).

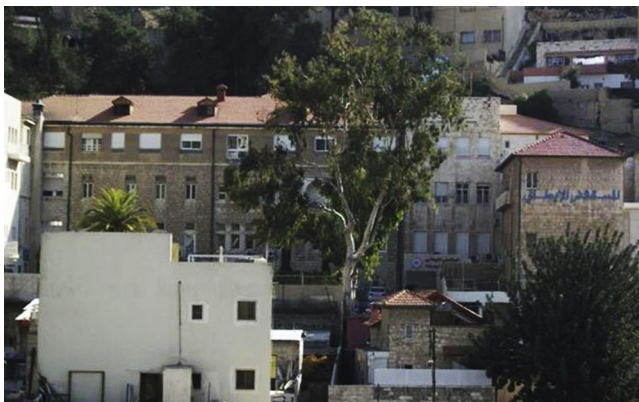
Jordan was ranked by the World Bank to be the number one health care services provider in the region and among the top 5 in the world. In 2010, 250,000 patients

sought treatment in the Kingdom, including Iraqis, Palestinians, Sudanese, Syrians, Gulf Cooperation Council citizens, Egyptians, Asians, Russians, Americans, Canadians, and others. Jordan earns almost \$1.5 billion yearly in medical tourism revenues according to the World Bank.<sup>9-11</sup>

### MEDICINE IN JORDAN

The history of medicine in Jordan dates back to the era of Ibn al-Quff, who lived in the region of Karak in the south of Jordan (1233–1286 AD).<sup>12</sup> He was a pioneer in medicine, famous for his book “Al-Umda” on the art of surgery.<sup>13</sup>

The first hospital in Jordan was built in Karak, south of Jordan, in 1886. Following this and coinciding with the establishment of the Hejaz Railroad between Istanbul-Turkey and Aqaba-Jordan in the era of the Ottoman Empire, another hospital was built in 1900 in the desert of Irbid in the north of Jordan, which was used to treat tuberculosis. Many other hospitals were subsequently established by the different missionary groups that visited Jordan. The first hospital in the modern era was the Italian Hospital (Figure 1), which was built



**Figure 1.** The Italian Hospital, built in 1927 in Amman-Jordan.

in Amman in 1927 and is still functioning to date.

The Jordanian Medical Association<sup>14</sup> was established in 1954 with 213 physicians as its founding members. The number of registered practicing physicians in Jordan in 2014 was approximately 22,000. There are 30 subspecialty committees within the Jordanian Medical Association.

Jordan has one of the most modern health care infrastructures in the Middle East. Life expectancy in Jordan is approximately 74.6 years (the second highest in the region, after Israel).<sup>15</sup> The health expenditure is 4.5% of the gross domestic product,<sup>6</sup> with the physician density of 2.86 physicians/1000 population and a total hospital bed capacity of approximately 12,000 beds in 103 hospitals with a density of 17 beds/10,000 population.<sup>16</sup> Jordan's health system is a complex amalgam of 3 major sectors: public, private, and donors. However, the influx of Syrian refugees has caused dramatic pressure on Jordan's medical services, and the health system is being stretched to its limits.<sup>1</sup>

The public sector consists of two major public programs, the Ministry of Health and Royal Medical Services. Other public programs include several university-based programs, such as Jordan University Hospital in Amman and King Abdullah Hospital in Irbid in the north of Jordan.

### Ministry of Health

The Ministry of Health, financed by the government, provides primary, secondary and tertiary health care services, delivered through 1135 health care centers and 31

hospitals containing 4600 beds in 11 governorates, accounting for 38% of total hospital beds in Jordan.<sup>16</sup>

### Military Royal Medical Services

The Royal Medical Services of the military provides primary, secondary, and tertiary medical care services (Figure 2) through its 12 hospitals containing 2500 beds (representing 20% of hospital beds in Jordan).<sup>16</sup> It contributes to and enhances the humanitarian and political role of Jordan in the region and the world by sending field hospitals and medical teams to disaster and conflict areas as Croatia, Sierra Leone, Eritrea, and West Bank. It provides Afghani and Iraqi citizens with modern health care, which they lacked for decades. To date, 4 million Iraqi citizens and 0.5 million Afghani citizens have been treated at the

Jordanian military hospitals in both countries, which treat wounded patients and move more critical patients to Jordan. The Jordanian military opened its ranks to women in 1950, when they were brought in as teachers for the military schools. In 1962, Princess Muna College of Nursing was established, and the first group of women consisting of eight Cades graduated from this college in 1965. Since then, the directorate of military women's affairs was established with the total number of women in the military exceeding 7000. The highest rank reached by a woman in the Royal Medical Services was major general.

### Jordan University Hospital

The Jordan University Hospital<sup>17</sup> is part of the University of Jordan (Figure 3) and was established in 1962 in Amman. At the present time, there are 38,000 students from Jordan and other world countries (60% are women) enrolled in the 18 different faculties, which provide 78 undergraduate programs and 143 postgraduate programs (109 master's and 34 doctoral degrees).<sup>18</sup>

The University of Jordan's faculty of medicine was established in 1971 as the first medical school in Jordan. It is one of the leading medical faculties in the region in terms of medical education, scientific research, and community service. There are more than 1300 students enrolled in the 6-year medical education program (divided into an initial 3-year preclinical stage followed by another 3 years of clerkship rotations).<sup>19</sup> There are more than



**Figure 2.** King Hussein Medical Center.

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