

**DEVELOPMENT OF ORTHOPAEDICS IN
SLOVENIA AND THE HISTORY OF THE
ORTHOPAEDIC DEPARTMENT OF THE
LJUBLJANA UNIVERSITY HOSPITAL**
**On the occasion of the WHO
“bone and joint decade” (2000-2010)**

RAZVOJ ORTOPEDIJE U SLOVENIJI I ORTOPEDSKE
KLINIKE U LJUBLJANI
Prigodom desetljeća (2000.–2010.) što ga je SZO
posvetio bolestima kretanja

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SUMMARY

In Slovenia, orthopaedics started to develop at the end of WWI, when the number of the handicapped increased. Dr Anton Breclj, who in 1919 laid the groundwork for the welfare of handicapped and sent a Czech doctor Franc Minař to specialise in orthopaedic surgery. When Minař returned to Ljubljana in 1923, he established an orthopaedic unit within surgery and in 1937 took over its management.

Orthopaedics developed very quickly after 1945, when Ljubljana University set up a School of Medicine, a Department of Orthopaedics and Physical Medicine within the School, and Orthopaedic Clinic of the University Hospital. Orthopaedic surgeons from Ljubljana participated in the establishment of a hospital for osteoarticular tuberculosis in Valdoltra, (which

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later became the largest orthopaedic hospital in Slovenia), specialised clinics and orthopaedic hospital departments throughout Slovenia, schools for physiotherapists in Ljubljana, the Slovenian Rehabilitation Institute – Soča, the Home for Disabled Children in Kamnik, and the spa and rehabilitation centre in Laško.

In 2011, orthopaedics in Slovenia holds 600 hospital beds and has about 75 orthopaedic surgeons who annually treat around 50,000 patients.

Key words: History of medicine, 20th century, orthopaedics, rehabilitation medicine, orthopaedic clinic, Franc Minař, Bogdan Brecl, Slovenia, Ljubljana.

INTRODUCTION

The World Health Organization dedicated the first decade of the 21st century to locomotive system disorders to warn about an increase in these diseases that may lead to disabilities, lower quality of life, and increased treatment costs. According to the WHO, degenerative and disease-associated bone and joint changes or injuries are common in the aging population of the developed world, and their prevention should include regular exercise and healthy diet. At this rate however, the health system will need more hospital beds for orthopaedic patients, their treatment and rehabilitation.

This article reviews nearly 90 years of orthopaedics in Slovenia, paying particular attention to the Orthopaedic Clinic in Ljubljana.

BRIEF WORLD HISTORY OF ORTHOPAEDICS

Orthopaedic diseases were known in the prehistoric ages. The first to give a detailed description of a hip dislocation, equinovarus foot deformity, and therapy was Hippocrates (4th century BCE). In the 2nd century CE, Galen described deformations of the spine and introduced terminology which is in use to this day. In 1545, the founder of orthopaedics Ambroise Paré described corsets, apparatuses, and prostheses to be used by orthopaedic patients and advocated prevention of congenital deformations like coxofemoral *luxation* (hip dislocation). F. Glisson gave an insight into the pathology and therapy of rickets in 1660. N. Andry introduced the term orthopaedics in 1741. P. Pott proposed treatment of chronic inflammation of joints and tuberculosis of the spine in 1779, and Giovanni Battista Palletta and Guillaume Dupuytren described treatment of a congenital hip luxation in 1812 and 1826, respectively.



Figure 1 – Iron Hand from Vransko (Slovenia) is one of the earliest prosthesis among Slovenians. (Photo Drago Arrigler).

Slika 1. Željezna roka iz Vranskog u Sloveniji – jedna od najstarijih proteza u Sloveniji. (Foto Drago Arrigler)

In 1780, Orbe founded the first orthopaedics institution and Antonius Mathijsen introduced plaster of Paris bandages in 1852. The first subcutaneous tenotomy performed by Louis Stromeyer is considered to be the beginning of orthopaedic surgery. Operations of bones and joints followed. The discovery of X-rays, asepsis, antisepsis, and anaesthesia boosted the development along with new osteosynthetic materials, transfusion, and bone transplantation [1].

HISTORY OF ORTHOPAEDICS IN SLOVENIA

Long before orthopaedics developed as a discipline, people had been making prostheses to correct limbs which were too short. The first known prosthetic doctor in Slovenia Jože Veršič (1775–1847) was self-taught. He was making prostheses, crutches, and other instruments (Figure 1) [2].

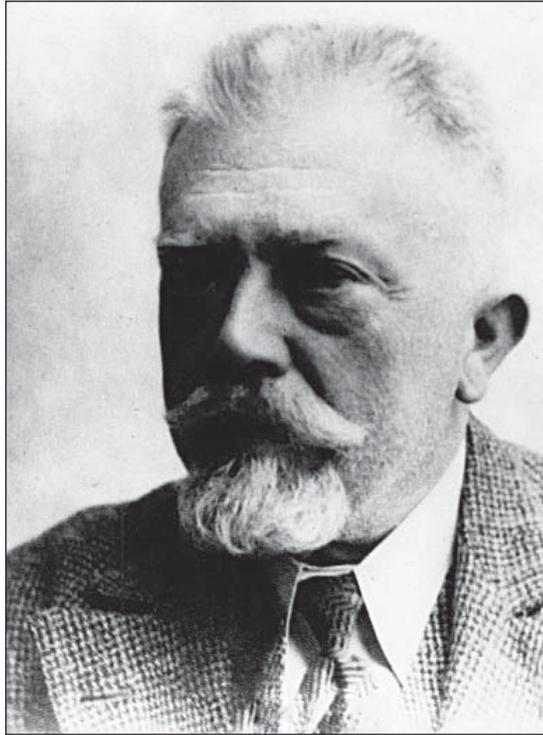


Figure 2 - Dr. Anton Breclj (1875-1943),
(Collection of the Institute of the History of
Medicine, Medical Faculty Ljubljana).

*Slika 2. Dr. Anton Breclj (1875.–1943.). (Zbirka
Instituta za povijest medicine Medicinskog fakulteta u
Ljubljani)*

The beginning of orthopaedics in Slovenia reaches back to the wake of WWI, which left behind many disabled people. They needed treatment and rehabilitation. The initiative for the foundation of an orthopaedics department came from Dr Anton Breclj (1875 – 1943), who set up a welfare for the handicapped in 1919 (Figure 2). He also founded prostheses workshops for Slovenia in Mirje, Ljubljana. These workshops were later expanded and moved in 1924 to military barracks in Šentpeter, which produced the first generation of masters in prosthetics, including Anton Jež, Polde Lampič, and Jože Ahčin. After WWII, these workshops were renamed to *Orthopaedic Enterprise Soča*, and moved to Linhart Street in Ljubljana in 1957. The enterprise then merged with the newly founded national institute for the rehabilitation of the handicapped [3].

Dr Anton Breclj wanted to introduce orthopaedic practice in Slovenia, so he encouraged a young Czech doctor Franc Minař (1889–1950), who practiced at the surgical department of Regional Hospital in Ljubljana, to specialise in orthopaedics in Bologna, and after his return in 1922, he helped him to get a new job within the same surgical department. Minař was advocating building an orthopaedic hospital in Ljubljana. He worked on its design and even found a location in Mirje, but his idea did not come to life due to a lack of finances. In 1922, he published *The History and Technology of Artificial Wooden Prostheses for the Lower Limb* and scripts about instruments and prostheses [4,5].

In 1923, he founded and chaired a unit for treating orthopaedic cases within the surgical department, which marks the beginning of orthopaedics in Slovenia. The beginnings were modest; the unit was squeezed into the area of a septic ward at the surgical department and counted only 16 beds (6 for women, 6 for men, and 4 for children) (Figure 3). The unit had



Figure 3 - The surgical general hospital building in Ljubljana, where in 1923 the first Slovenian orthopaedic department was founded. (Collection of the Institute of the History of Medicine, Medical Faculty Ljubljana)

Slika 3. Zgrada Kirurgije Opće bolnice u Ljubljani gdje je 1923. osnovan prvi odjel za ortopediju. (Zbirka Instituta za povijest medicine Medicinskog fakulteta u Ljubljani)

to share the operating room, casting room, bandage room, and the outpatient clinic with surgery and urology. Before WWII, the unit barely managed to obtain a few extra beds, even though the number of admissions rose to over 1000 in four years, and the number of surgical procedures exceeded 500. Pressured by the unit staff and patients, the hospital renovated the basement rooms of the ophthalmology department into an orthopaedic gym for outpatients, which also accommodated Zander instruments for mechanotherapy (Figure 4). Here they even held courses for masseuses. At the same time, a Mladika School women's cultural society Atena in Ljubljana founded a private outpatient orthopaedic clinic for schoolchildren with spinal deformations or incorrect posture. Professional work was performed by an orthopaedic specialist. In addition, the Regional

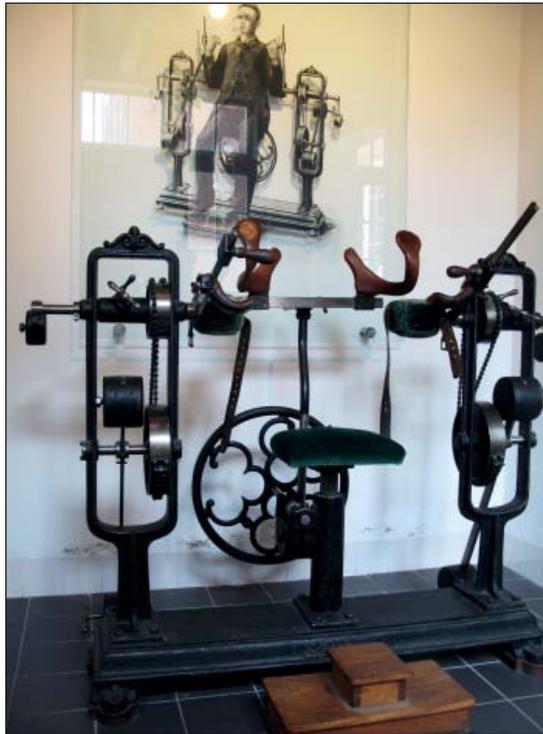


Figure 4 - Zanders' Mechano-therapy appliances.
(From Boerhaave Museum in Leiden in the Netherlands, photo Duša Fischinger).

*Slika 4. Zanderove mehanoterapijske sprave.
(Boerhasaveov Muzej u Leidenu u Nizozemskoj.
Foto Duša Fischinger)*



Figure 5 - Academician Bogdan Breclj (1906-1986), (Collection of the Institute of the History of Medicine, Medical Faculty Ljubljana)

*Slika 5. Akademik Bogdan Breclj (1906.–1986.).
(Zbirka Instituta za povijest medicine Medicinskog
fakulteta u Ljubljani)*

Office for the Protection of Workers in Ljubljana set up an orthopaedic clinic, which performed more than 3000 examinations per year. Examinations of schoolchildren held by the Mladika School clinic showed an increasing number of congenital and acquired orthopaedic deformities and bad posture. There were not enough experts and institutions for their systematic treatment. In 1931, A PT teacher Jože Kozak introduced preventive orthopaedic gymnastics to schoolchildren and encouraged the Mladika School clinic to add an orthopaedic gym in 1940 [6].

Dr Bogdan Breclj (1906-1986) joined the Surgical Department of the Ljubljana Hospital in 1932. First he passed a specialist exam in surgery and then took a training in orthopaedics in Germany, Austria, and Italy. As soon as he came back to Ljubljana, he took the chair of the Department of Orthopaedics (Figure 5) and introduced new practices and surgical



Figure 6 - Šlajmer's sanatorium in Ljubljana. (Collection of the Institute of the History of Medicine, Medical Faculty Ljubljana)

Slika 6. Šlajmerjev sanatorij u Ljubljani. (Zbirka Instituta za povijest medicine Medicinskog fakulteta u Ljubljani)

procedures. As workload increased, in 1941, Dr Herbert Hawlina (1914-1988) joined the department. Dr Bogdan Breclj remained the chair until 1942 when he joined partisans, and Dr Oton Bajc took over until the end of WWII (1903-1993) [7].

The newly founded Ljubljana University School of Medicine (formal title: Faculty of Medicine) in 1945 included the Orthopaedics Department and Orthopaedic Clinic. Doctor Breclj was appointed the head of the clinic and chair of medical studies. Orthopaedics became obligatory subject. Right after the foundation, the clinic got 35 beds on the ground floor of an extension to the surgical clinic, and in 1946 the number of beds increased to 42. Later on, Dr France Debevec (1915–2002) and Dr Franc Derganc jr. (1911–1973) joined Breclj and Hawlina. In 1947, additional rooms were given to the Orthopaedic Clinic in a nationalised sanatorium Šlajmer, which had been built in 1932 and had been a part of the Patients Trade Insurance Company [8]. The clinic was given the ground floor of

the old building and the second floor of the new part of the Šlajmer sanatorium. The number of beds grew to 87. In addition, the clinic got two operating rooms, a casting room, an outpatient room, and an x-ray room (Figure 6). This is when Dr Radivoj Bobič (1917), Dr Edvard Pohar (1912–1997), paediatrician Dr Zvezda Zadnik (1909–2003), and x-ray specialist Dr Ciril Cirman (1892–1981) joined the clinic (Figure 7).

In years to come the clinic gradually occupied the entire Šlajmer home. Orthopaedists also helped to establish the Slovenian Rehabilitation Institute Soča in 1954. With extensive healthcare services, training, and scientific research, treatment of outpatients soon became too much for the Šlajmer clinic, and it had to move to a building of the new Ljubljana Polyclinic. From 1958 to 1964, the Polyclinic examined 25,000 orthopaedic patients annually.

Orthopaedic outpatient clinic and the physiotherapy and rehabilitation department soon joined a new Orthopaedic Clinic (Figure 8). In the early 1970s, the clinic had its own independent physiotherapy for the outpatient and hospital part and an independent x-ray department [9].



Figure 7 - Employees of Orthopaedic Department of Ljubljana University Hospital and physiotherapy students in 1957. (Collection of the Orthopaedic Clinic in Ljubljana).

Slika 7. Zaposlenici Ortopedskega oddelka Sveučilišne bolnice u Ljubljani i studenti fizijatrijskega studija, 1957. (Zbirka Ortopedske klinike u Ljubljani)



Figure 8 - Slovene Doyens of orthopaedics in 1974. From left: Professors Franc Debevec, Bogdan Breclj, Edvard Pohar, Herbert Hawlina and Radivoj Bobič. (Collection of the Orthopaedic Clinic in Ljubljana).

Slika 8. Doajeni slovenske ortopedije 1974. Slijeva: profesori Franc Debevec, Bogdan Breclj, Edvard Pohar, Herbert Hawlina i Radivoj Bobič. (Zbirka Ortopedske klinike u Ljubljani)

Long-lasting hospital treatments of children with orthopaedic diseases raised the issue of in-hospital school education. Academician Bogdan Breclj recommended in 1959 that the teaching is taken over by the primary school Ledina from Ljubljana. The school followed the same programme as other primary schools. In March 1978, the school was donated TV sets for educational purposes. A few years later teachers of preschool children joined the team. In the beginning, they worked with the primary school Ledina and later as a unit within the University Medical Centre Ljubljana. In 1983, the outpatient clinic of the Polyclinic extended to three outpatient clinics for adults and one for children, another casting room, another x-ray room, and an operating room for minor procedures [10]. In years to come the clinic would continue to grow; in 1983, there were 20 specialists and 170 other staff, three operating rooms, and 141 beds. Annually, they admitted 2,200 patients and performed 1,800 operations [11]. In comparison, in 2004 the clinic had 176 employees, admitted

3314 patients, and 2416 received surgical treatment. In 2010, the clinic had 190 employees of whom 16 were non-medical professions [12].

DEVELOPMENT OF ORTHOPAEDICS AND REHABILITATION SPECIALITIES

Orthopaedists were not only active in the development of the Orthopaedic Clinic in Ljubljana and orthopaedics as a specialised profession; they also contributed to the development of physiotherapy and rehabilitation. They encouraged the founding of the High School for Physiotherapists, Rehabilitation Institute of Slovenia - Soča Home for Disabled Children in Kamnik, Home for Disabled Children in Stara Gora, Institute of Vipava, Orthopaedic Hospital for Bone Tuberculosis in Valdoltra, Orthopaedic Department of the General Hospital in Šempeter near Nova Gorica, orthopaedic practice in Maribor and Celje, and orthopaedic sections within surgery departments of the general hospitals of Jesenice, Novo Mesto, and Murska Sobota [13].

In 1945 began a renovation of a health resort for treating osteoarticular tuberculosis in Valdoltra, which was devastated during WWII. That same year the resort received 300 patients. In 1946, it became the first specialised hospital for osteoarticular tuberculosis and was professionally connected to the Orthopaedic Clinic. After two years, the hospital already counted 400 beds and advanced to the extent that it was renamed Federal Institute for Bone Tuberculosis. In 1956, as the number of patients with bone tuberculosis decreased, the hospital slowly reorganised and became Valdoltra Orthopaedic Hospital, which is active to this day [14] (Figure 9).

In 1946, a special hospital for osteoarticular tuberculosis was founded in Šempeter near Nova Gorica, headed by Dr Franc Derganc Jr. until 1952, and operated by doctors from the Ljubljana Orthopaedic Clinic. As osteoarticular tuberculosis incidence dropped, the hospital reorganised into an orthopaedic department and was treating children with cerebral palsy.

The Home for Disabled Children Stara Gora was founded in 1952 to treat children who needed long-term hospital care. In 1956, when Valdoltra was fully renovated, Šempeter hospital cancelled the osteoarticular tuberculosis treatment programme and Stara Gora expanded its long-term programme for children. The home was renamed to Institute for Disabled Preschool Children and treated children with diseases of the hip and spastic cerebral palsy. In 1977, it merged with the General

Hospital Dr Franc Derganc in Šempeter near Nova Gorica. Later the orthopaedic department and the hospital for disabled children were reorganised. Orthopaedic practice moved to Šempeter and rehabilitation of spastics remained in Stara Gora.

In 1965, Institute of Vipava was founded for children with cerebral palsy, who had special needs. It was intended as a place to continue treatment and rehabilitation for children who had been treated in Stara Gora or elsewhere as pre-schoolers.

In April 1947, Home for Disabled Children was founded in Kamnik to provide medical rehabilitation, schooling and vocational training to disabled young people. Since its foundation, consulting physicians were orthopaedic doctors, Professors France Debevec and Fedor Pečak, and physicians Zvezda Zadnik and Herbert Hawlina [15].

In 1954 in Maribor, Dr Marjan Koršič started an outpatient orthopaedic department, which in 1956 got two hospital rooms in the trauma department. When the Institute for Medical Rehabilitation was founded in 1960, orthopaedic patients got 18 beds for adults and 6 beds for chil-



Figure 9 - Osteoarticular tuberculosis Hospital in Valdoltra. (Collection of the Institute of the History of Medicine, Medical Faculty Ljubljana)

Slika 9. Bolnica za koštano-zglobnu tuberkulozu u Valdoltri. (Zbirka Instituta za povijest medicine Medicinskog fakulteta u Ljubljani)

dren. In 1965, an independent orthopaedic department was founded in General Hospital Maribor.

Outpatient orthopaedic treatment in Celje began in 1959. In the beginning, it was headed by Dr Franc Rebevšek and from 1964 by a Ljubljana professor Franc Srakar. At first the orthopaedic department was one with the trauma department, but after it grew in 1974, it became more independent [16].

Orthopaedists from Ljubljana also helped to reorganise the health centre of Laško into a modern rehabilitation facility. Orthopaedic departments were later set up in other Slovenian hospitals in Murska Sobota and Novo Mesto, and outpatient clinics in the hospitals of Jesenice.

PROFESSIONAL DEVELOPMENT OF THE LJUBLJANA ORTHOPAEDIC CLINIC

Modern methods of conservative and surgical treatment of deformations were introduced into Slovenian orthopaedics early by Dr Franc Minař. Another step forward was made when Dr Bogdan Breclj became department head in 1937. Orthopaedic practice was in full swing after WWII. Physicians studied current literature, and went abroad or had foreign experts over on visit to learn new diagnostic and therapeutic methods. In 1946, they were the first to perform Pauwel's osteotomy in femoral neck pseudarthrosis. They were also performing many surgeries that today are done by other specialists such as plastic surgeons. One such procedure was the arthroplasty of ankylosing joints with *fascia lata* and fatty tissue. In 1947, they introduced fixation of bone fragments after osteotomy with vitallium plates and screws. The same year saw the first arthroplasty using the Smiths-Petersen vitallium cap, which was the first time to use foreign materials. They were using autotransplants of tibia (shinbone) in operations of pseudoarthrosis. In December 1949, disc hernia surgeries became routine. In the summer of 1950, the first hip arthroplasty was performed with Judet partial osteoacrylic endoprosthesis.

As the use of bone transplants increased, the need for a bone bank arose. The Department of Biochemistry, Department of Microbiology, and Department of Pathology of the Ljubljana University School of Medicine joined forces to set up a bone bank which preserved bone marrow with merthiosal. Two year later, conservation switched to deep freezing. The bone bank was the first of the kind in the federal state of Yugoslavia and amongst the first in Europe. It provided bone transplants not only for the

Orthopaedic Clinic, but also for other Slovenian hospitals. As osteosynthetic materials were in short supply, the bank found a way to make them at home. In collaboration with Ironworks Jesenice and the Department of Biochemistry of the Ljubljana University School of Medicine, the bank selected appropriate stainless steel material and, using Professor Franc Debevec's design, constructed different kinds and shapes of plates with screws. National osteosynthetic materials had been in use for the next 15 years, until Swiss-made AO plates and screws replaced them [17].

The first arthritic hip replacement with vitallium endoprosthesis, type Austine-Moore, was performed in 1955. The first modern total hip endoprosthesis was done at the Orthopaedic Clinic in 1968. Later in 1975, the Clinic introduced knee endoprosthesis, in the 1980s non-cemented hip endoprosthesis, and in the 1990s even shoulder and elbow endoprosthesis.

After WWII, congenital hip luxation and subsequent hip dysplasia were a big issue. Professor Breclj and his team developed modern methods of prevention and early treatment, which involved health education, lectures, and seminars for health workers and mothers. They abandoned the old practice of swaddling babies in buns (with leg adduction) and wrapped them in a physiological leg position in abduction and partial flexion. They did a research with 5,000 newborns, and the results set course for new daily routines. With examination immediately after birth, regular checkups, and other preventive measures, hip dysplasia has practically been eradicated in Slovenia. Today, the diagnostics also relies on ultrasound.

Skeletal and joint X-ray diagnostics started with radiologist Ciril Cirman and was further perfected by Professor Lujó Tabor (1924–1997). In 1958, the first electromyography laboratory (EMG) in Slovenia started to operate.

The Clinic also addressed the short leg syndrome, using orthotic methods at first and gradually introducing surgical correction. The first procedure was performed in 1946 on a patient with a severe shortening because of a crookedly healed femur (thighbone) fracture. After the crooked bone was cut, the surgeons were able to extend it for 6 cm and heal the fracture. Mechanic extensions became a standard procedure in 1963. They started with tibia after modifying the Anderson lengthening device and later involved other long bones. The bone would gain 1 mm in length per day. Nine years later, Dr Srakar designed an external fixator to lengthen limbs.



Figure 10 - Course of osteosynthesis that took place at the Orthopaedic department of Ljubljana University Hospital in 1995. On the left Professor Srečko Herman. (Collection of the Orthopaedic Clinic Ljubljana).

Slika 10. Tečaj o osteosintezi na Ortopedskom odjelu Sveučilišne bolnice u Ljubljani 1995. Lijevo je profesor Srečko Herman. (Zbirka Ortopedske klinike u Ljubljani)

Introducing techniques and instruments used by the Association for the Study of Internal Fixation (*Arbeitsgemeinschaft für Osteosynthesefragen*, abbrev. AO) boosted the development of orthopaedic surgery. Inner fixation of fractures or osteotomies with special plates and stainless steel screws was first introduced by Swiss orthopaedists. Professors Breclj and Debevec attended the first AO course in Switzerland in 1962 and brought the practice back to Ljubljana. Ljubljana acquired the first set of AO instruments exported from Switzerland. This was also a sign of recognition of Slovenian orthopaedics by the Swiss makers. Osteosynthesis became more stable, corrective osteotomies more reliable and precise, treatment of pseudoarthrosis became easier and quicker (Figure 10). The first AO course in Yugoslavia was organised in 1968 at the Ljubljana Orthopaedic Clinic.

With the surgery section completely renovated in 1975, the Clinic introduced laminar flow as a way to improve asepsis and was mainly used in implantation of artificial joints.



Figure 11 - The 1st Yugoslav Arthroscopic symposium at Brdo pri Kranju, Slovenia in 1987. From left: Dr. Stadler (Germany), Dr. Lah (Croatia), Professor Pavlovčič (Ljubljana, the main organizer), Dr. Hench (Germany), Professor Herman (Ljubljana) (From the collection of Orthopaedic Clinic in Ljubljana).

Slika 11. Prvi jugoslavenski simpozij o artroskopiji u Brdu kod Kranja, 1987. Slijeva: dr. Stadler, dr. Lah, prof. Pavlovčič, dr. Hench, prof. Herman. (Zbirka Ortopedske klinike u Ljubljani)

1978 was the beginning of knee arthroscopies, followed by arthroscopic knee surgeries a few years later. It did not take long before arthroscopies of other joints followed. Today, it is impossible to imagine orthopaedics without arthroscopy and arthroscopic surgery (Figure 11).

Harrington's set of instruments was introduced in 1982 to perform spinal surgery of fractures and for corrections. Two years later, the Clinic introduces repositions and fixations for transpedicular osteosynthesis with an internal fixator and plates.

In 2001, the Orthopaedic Clinic performed many difficult procedures, including entire paediatric orthopaedics (*genus varus* and *valgus*, *hip luxation*), spinal surgery, oncologic skeletal surgery, and more demanding cases of knee and shoulder surgery. New clinical practices included biomechanics, inorganic microanalysis and histological techniques to remove loose endoprostheses, radionuclide synoviorthesis with haemophilic arthropathy, insertion of an artificial disc in lumbago patients, and transplantation

of cartilage into joints. In 2005, new methods of insertion of intervertebral discs were introduced.

In 1997, the Clinic started using a new method to implant intervertebral disc, the so called prosthetic *disc nucleus* (PDN), then growing chondrocytes, and using osteochondral grafting in mosaicplasty. It also continued with mathematical modelling of hip forces before and after the operation. In 2004, new original methods of treatment were implemented such as revision endoprosthesis (type KAR) and treatment of the club foot after Ponseti. Together with the Jožef Stefan Institute in Ljubljana, the Clinic developed its own method of assessing barium parts with loose endoprostheses and a method to figure out impact on *acetabulum* in hip endoprosthesis [19].

The clinic organised a number of national and international professional gatherings alone and in collaboration with other institutions such as Orthopaedic Days, AO course on surgical treatment of spinal injuries and diseases, Orthopaedic Days in Celje, a symposium about sport injuries, Cartilage Weekend, and Alpe-Adria Congress [20].



Figure 12 - Orthopaedic surgeons from Orthopaedic Department of Ljubljana University Hospital in 2002. (From the collection of Orthopaedic Clinic in Ljubljana).

Slika 12. Kirurški ortopedi Ortopedskega oddelka Sveučilišne bolnice u Ljubljani 2002. (Zbirka Ortopedske klinike u Ljubljani)

CONCLUSION

The incidence of orthopaedic diseases is rising in Slovenia and all over the world. Their treatment has to some extent been taken over by traumatology, physiatry, plastic surgery, and rheumatology. As Slovenian population ages, degenerative diseases and injuries will become more frequent and orthopaedic health services will be in high demand, including hospital beds and equipment. We will also need more specialists in orthopaedics, but also of other profiles, including internists, sociologists, and psychologists.

Data from 1991 show that 23% of all money spent for health care goes to treating musculoskeletal diseases [21]. The World Health Organization (WHO) was at first focused on preventing deadly diseases, but now it has shifted the focus to orthopaedic diseases that cause disability and lower the quality of life. It has therefore proclaimed the decade 2000-2010 the bone and joint decade and has been promoting regular physical activity and healthy diet as effective prevention (Figure 12).

REFERENCES

1. Gjanković H. Kirurgija – Ortopedija. (Surgery – Orthopaedics). Medicinska enciklopedija, zv. 5. Zagreb: Leksikografski zavod FNRJ, 1961: 588.
2. Marinček Č. Veršič, Jože. Enciklopedija Slovenije, zv. 14. Ljubljana: Mladinska knjiga, 2000: 201.
3. Marinček Č. Ortopedska tehnika. (Orthopaedic technique). In: Enciklopedija Slovenije, zv. 8. Ljubljana: Mladinska knjiga, 1994: 174.
4. Herman S. Minař, Franc. In: Enciklopedija Slovenije, zv. 7. Ljubljana: Mladinska knjiga, 1993: 146.
5. Marinček Č. Protetika in ortotika. (Prosthetics and orthotics).. In: Enciklopedija Slovenije, zv. 8. Ljubljana: Mladinska knjiga, 1994: 174.
6. Breclj B. Razvoj ortopedije na Slovenskem. (Development of orthopaedics in Slovenia). In: Smerdu F ed. Poslanstvo slovenskega zdravnika. (Mission of a Slovenian doctor). Ljubljana: Slovenska matica, 1965: 180-2.
7. Hawlina H. Breclj, Bogdan. In: Enciklopedija Slovenije, zv. 1. Ljubljana: Mladinska knjiga, 1987: 362-3.
8. Zupanič Slavec Z. Sanatorij. (Sanatorium). In: Enciklopedija Slovenije, zv. 10. Ljubljana: Mladinska knjiga, 1996: 396.
9. See reference 6: 184-8

10. Juras S. Otvoritev prenovljenih ambulantnih prostorov. (Opening of renewed outpatient clinics). Bilten KC 1983; 4: 19-20.
11. Herman S, Srakar F. Zgodovinski oris ortopedije na Slovenskem. (Historical outline of orthopaedics in Slovenia). Zdrav Vestn 1983; 52: 429-30.
12. Annual report UKC Ljubljana for 2009. Ljubljana: UKC, 2010: 9. Available at: <http://www4.kclj.si/index.php?m=6&s=0>. Date: 19.7.2010.
13. Herman S, Srakar F. Ortopedija. (Orthopaedics). In: Enciklopedija Slovenije, zv. 8. Ljubljana: Mladinska knjiga, 1994: 173-4.
14. Mezeg C. Specialna bolnišnica (Special hospital) – Ortopedska bolnišnica Valdoltra v Ankaranu. In: Enciklopedija Slovenije, zv. 12. Ljubljana: Mladinska knjiga, 1998: 188.
15. Sarnavsky A. Ob 50-letnici Zavoda za usposabljanje invalidne mladine. (50th Anniversary of Institute for rehabilitation of disabled children) In: Kamniški zbornik 1998: 220-4.
16. See reference 14: 173.
17. See reference 5.
18. Pavlovčič V. Strokovno poročilo Ortopedske klinike za leto 2002. (Expert report of Orthopaedic Clinic Ljubljana for 2002). Ljubljana: KC, 2003.
19. Pavlovčič V. Strokovno poročilo Ortopedske klinike za leto 2004. (Expert report of Orthopaedic Clinic Ljubljana for 2004). Ljubljana: KC, 2005.
20. Pavlovčič V. Strokovno poročilo Ortopedske klinike za leto 2001. (Expert report of Orthopaedic Clinic Ljubljana for 2001). Ljubljana: KC, 2002.
21. Antolič V. Katedra za ortopedijo. (The chair of orthopaedics). In: 90 let Medicinske fakultete Univerze v Ljubljani (In: 90 years of Faculty of Medicine at the University of Ljubljana) (ed. Ribarič S).. Ljubljana: Medicinska fakulteta Ljubljana, 2009: 227-9.
22. Herman S. Desetletje 2000–2010, posvečeno boleznim kosti in sklepov. (A Decade 2000-2010 dedicated to diseases of bones and joints). Zdrav Vestn 1999; 68: 719-20.

SAŽETAK

Ortopedija se u Sloveniji počela razvijati nakon Prvoga svjetskog rata s pojavom velikog broja ratnih invalida. Dr. Anton Breclj, koji je 1919. postavio temelje invalidskoj skrbi, motivirao je češkog liječnika dr. Franca Minařa da specializira ortopediju te je po povratku sa specijalizacije 1923., u okviru Kirurškog odjela ljubljanske bolnice otvorio ortopedski pododjel. Poslije mu se pridružio dr. Breclj koji je 1937. preuzeo vodstvo odjela. Nakon 1945., kada je bio ostvaren kompletan Medicinski fakultet u Ljubljani, ortopedija je postala samostalna specijalizacija. Osnovane su Katedra za ortopediju i fizikalnu medicinu te Ortopedska klinika. Uz razvoj struke i klinike, liječnici Ortopedske klinike sudjelovali su i u otvaranju drugih slovenskih ortopedskih ustanova: Bolnice za kořtanu tuberkulozu u Valdoltri 1946., koja će postati najveća ortopedska bolnica u Sloveniji, te brojnih specijaliziranih ambulanti i ortopedskih odjela u drugim slovenskim gradovima. Uz to, nastali su i Škola za fizioterapeute i Zavod za rehabilitaciju invalida u Ljubljani, Dom za invalidnu mladež u Kamniku te Lječilište i rehabilitacijski centar u Laškem.

Godine 2011. ortopedija u Sloveniji raspolaže s oko 600 postelja i brojnim ambulantomama. Ortopedijom se bavi oko 75 specijalista koji godišnje liječe oko 50.000 pacijenata..

Ključne riječi: povijest medicine, XX. stoljeće, ortopedija, rehabilitacijska medicina, ortopedska klinika, Franc Minař, Bogdan Breclj, Slovenija, Ljubljana