



(RESEARCH ARTICLE)



Sports medicine market – growth factors and forecasts

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Abstract

Sports medicine bridges the gap between science, health and exercise. It involves a combination of physicians, physical therapists, athletic trainers and sports scientists to provide the best possible care for sports injuries and illnesses. The paper demonstrates the overall market review of sports medicine and its scope of expansion during the estimation timeframe. Firstly, the study centers around the key factors driving the sports medicine market over the analysis period. Secondly, with growing price competition and technological advancement in implants, the industry is projected to witness entry of new companies during the forecast period. The study also provides information about the various types of treatment systems that are accessible to treat sports-related injuries. Consequently, the growing popularity of sports and healthy lifestyle has enabled hospitals and clinics to open separate sports medicine section in the medical setting.

Keywords: Sports Medicine; Sports Medicine Specialists; Sports Injuries; Market Growth and Forecast Period

1. Introduction

1.1. Sports Medicine Market Background

Sports medicine is a branch of medicine that deals with the physical fitness, treatment, and prevention of injuries resulting from athletic activities. It is a fast-growing health care field, since healthcare personnel who specialize in sports medicine assists all kinds of people, not just athletes. Sports medicine involves the application of scientific research and practice to the optimization of health and athletic performance. Sports medicine bridges the gap between science and practice in the promotion of health, and in the scientific assessment, study and understanding of sports performance.

1.1.1. History

The world's first sports medication foundation took shape in Dresden, Germany, in 1911. The 'First Congress for the scientific investigation of sports and physical exercises' was held in 1912 (Oberhof, Germany) and the term 'sports physician' (instituted by Arthur Mallwitz) was first utilized in 1913. Thirty-three doctors from 11 nations taking an interest in the second Winter Olympic Games in St. Moritz established the 'Affiliation International Medico Sportive' (AIMS). In 1934 the name of the association was changed to the International Federation of Sports Medicine (FIMS).

In Italy, individuals playing sport sorted out by national organizations or sports advancement bodies need to attempt an intermittent restorative visit to get a confirmation of qualification to play. They are recorded in unique declarations given by the Ministry of Health, which manage competitive sport activity (1982), non-competitive sport activity (1983), competitive sport activity for disabled people (1993) and professional sport activity (1995). Since 1950, it has been compulsory for all expert and amateur athletes to get a restorative accreditation for qualification to play sport.

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1.1.2. Sports Medicine Organizations

- American Academy of Orthopedic Surgeons (AAOS)
- American College of Sports Medicine (ACSM)
- American Medical Association (AMA)
- American Medical Society for Sports Medicine (AMSSM)
- American Osteopathic Board of Orthopedic Surgery (AOBOS)
- American Orthopedic Society for Sports Medicine (AOSSM)
- Canadian Academy of Sport and Exercise Medicine (CASEM)
- Canadian Athletic Therapists' Association (CATA)

1.2. Literature Review

Benjamin Holly J. et al., Brenner Joel et al., DiFiori John P. et al., Gregory Andrew et al., Jayanthi Neeru et al., Landry Greg L. et al., Luke Anthony et al. (2014) discussed on the incidence of overuse injuries among children and adolescents during active sports participation. Immediate diagnosis is fundamental to address the underlying cause. Sports medicine specialists ought to be familiar with the specific high-risk injuries such as stress fractures of the femoral neck, front tibial, tarsal navicular cortex and physis, and exertion thrombosis.

Burns Travis C. et al., Hylden Christina M. et al., Johnson Anthony E. et al., Owens Johnny G. et al., Tennent David J. et al., Wilken Jason M. et al. (2017) proposed that Blood flow restriction (BFR) training is an effective intervention after knee arthroscopy. The utility of BFR training is further substantiated by the more prominent level of progress seen across all physical, functional, and patient-reported outcome measures.

Andrea Albergoni et al., Antonio La Torre et al., Florentina J. Hettinga et al., Francesco Sartor Matteo Bonato et al., (2019) expressed that the utilization of monitoring technology improves physical wellness and prosperity and may conceivably be useful as an assistive tool to invigorate a functioning way of life and exercise adherence in special populations.

Clugston James R. et al., Dec Katherine et al., Hainline Brian et al., Harmon Kimberly G. et al., Herring Stanley A. et al., Kane Shawn et al., Kontos Anthony P. et al., Leddy, John J. et al., McCrea Michael A. et al., Poddar Sourav K. et al., Putukian Margot et al., Roberts William O. et al., Wilson Julie C. et al., (2019) detailed that sports-related concussion (SRC) is perplexing, heterogeneous brain injury that is common among athletes and a common reason for medical encounters with sports medicine physicians. Sports medicine physicians and others who diagnose concussion ought to be familiar with the psychometric properties of the sideline and office assessment tools they are utilizing. There are numerous valuable perspectives to participation in sport and exercise that should be balanced against the concern for concussion.

Collin LaPorte et al., Gabrielle K. Steini et al., Michael D. Rahl et al., Michaela O'Connor et al., T. Sean Lynch et al., Travis J. Menge et al., (2019) stated that Arthroscopic hip labral reconstruction is an evolving technique in the field of sports medicine that fundamentally improves the patient outcome by diminishing hip pain and reestablish the capacity. The study additionally showed that there are no critical contrasts in outcomes based on graft type alone.

Andrew W. Hasebroock et al., Joseph Brinkman et al., Joseph P. Bowens et al., Lukas Foster et al., (2019) recommended that long-term conservative management is required for primary anterior shoulder dislocations that is common among active sport participants. Additionally, they expressed that surgical approaches have an increasingly unsurprising course of recovery however, carry larger risks. Initial management must include physical therapy and a series of exercises for a period of 3 months as the preferred time course.

1.3. Sports Medicine Market Report Coverage

Table 1 Showing Market Report Coverage

Report Coverage	Details
Base Year	2018
Historical Data For	2013 to 2018
Forecast Period	2019 to 2025
Segments Covered	Product, Injury Type, End-use, Region
Companies Covered (21)	Arthrex, Inc., Bauerfeind AG, Breg, Inc., CONMED Corporation, Cramer Products, Inc., DJO Global, GE Healthcare, Japan MDM Inc., Johnson & Johnson, KARL STORZ, Medtronic, Mueller Sports Inc., Ossur Corporate, Otto Bock Healthcare, Performance Health International Limited, RTI Surgical, Smith & Nephew Plc, Stryker Corporation, Tornier N.V., Wright Medical Technology, Zimmer Biomet,

1.4. Objectives

- To study the market estimation of sports medicine and its extension for development during the forecast timeframe (2018-2025)
- To discover the key factors driving the development of sports medicine market over the estimation period
- To study the internal and external factors that influence the sports medicine market

2. Sports Medicine Industry Insights

2.1. Market Dynamics

2.1.1. Market Driver Analysis

- Increasing number of sports injuries globally
- Technological advancements in implants
- Growing demand for minimal invasive surgeries and rising number of sports medical centers
- Increasing awareness regarding physical fitness and sports activities

Increasing number of sports injuries globally

Professional athlete's often risking their lives to attain the greatest heights during their career in the hope of achieving better results. This may lead to the number of sports injuries involving permanent damage. Rising incidence of sports injuries will boost sports medicines market growth in the foreseeable period. As per the National Safety Council (NSC) statistics, reported in the year 2017, exercise and use of exercise equipment resulted in around 5,26,000 injuries in the U.S. Also, in accordance with the "Stanford children health" sports injury data, approximately 30 million adolescents and children participate in some form of organized sports, and over 3.5 million injuries occur annually in the U.S. Nearly one-third of all injuries incurred in childhood are sports-related injuries. Henceforth, increasing cases of sports injuries due to rising adoption of sports activities will fuel the sports medicine business growth over the forecast period.

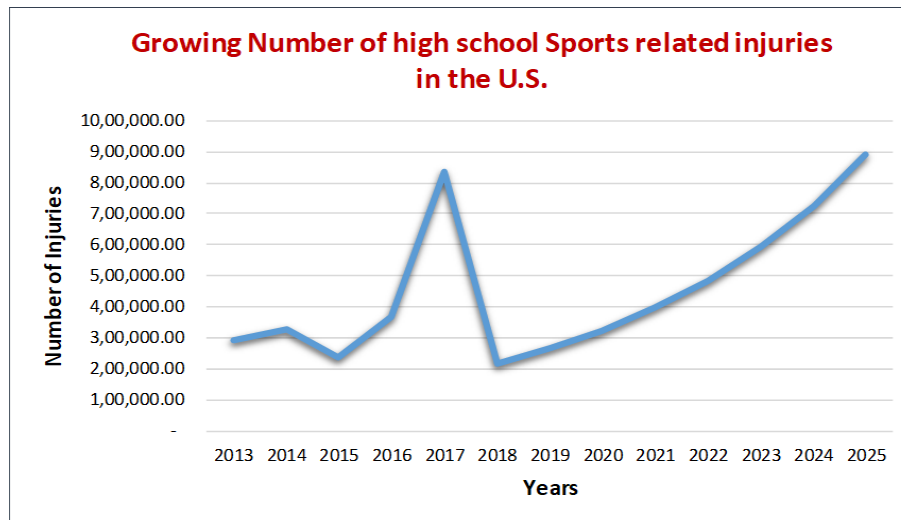


Figure 1 Showing rising number of sports injuries, 2013 to 2025

Technological advancements in implants

Technology is improving sports injury prevention and recovery by the implementation of the sports medicine market worldwide. The key focus driving the growth of this market are technological advancements such as 3-D printed implants, being built by layers of a specific material implemented by a computer-aided design program (CAD). 3-D printing is generating a way to speed up recovery and reconstruct broken bones. 3-D printed prosthetics can be generated for arms, hands, legs, and even ears. Safety products printed using 3-D process include casts to settle broken bones faster, footwear, shin guards, and helmets to help prevent concussions. Thus, technological factor plays a very significant role to augment the sports medicine market over the projected timeframe.

Growing demand for minimal invasive surgeries and rising number of sports medical centers

Elevation in the demand for minimally invasive surgeries and growing number of sports medical centers will shape the growth and development of sports medicine market in the coming years. High growth is attributed to increasing adoption of computer-assisted robotic surgeries to reduce hospital stay, recovery time, as well as a quicker return to normal activities in case of sports injuries, will supplement the market growth. Also, the University of California San Francisco (UCSF) Sports Medicine Center cares for all levels of athletes and strives to get each patient back to the highest level of physical activity possible. Aforementioned factors will offer lucrative growth opportunities for sports medicine market in the upcoming years.

Increasing awareness regarding physical fitness and sports activities

Active participation in sports has a major positive influence on people's health and well-being. Besides, team sports foster player's communication skills and build self-confidence and team spirit. Increasing awareness regarding physical fitness and sports activities will drive the sports medicine market over the forecast timeframe. For instance, according to the Physical Activity Council, about 66.0% of individuals participated in fitness sports in 2018, whereas in 2013 it was about 60.1%. Also, according to the study that is published in "The Journal of Educational Research", in 2015, it was concluded that active student participation exerts a positive influence on people's health and well-being. Thus, the growing number of people choosing sports as a career as well as rising trend towards healthy lifestyle will act as a high impacting factor for sports medicine business growth in the estimation period.

2.1.2. Industry restraints & challenges

- Dearth of trained healthcare professional in developing countries
- High cost of sports medicine

2.2. Industry Segmentation

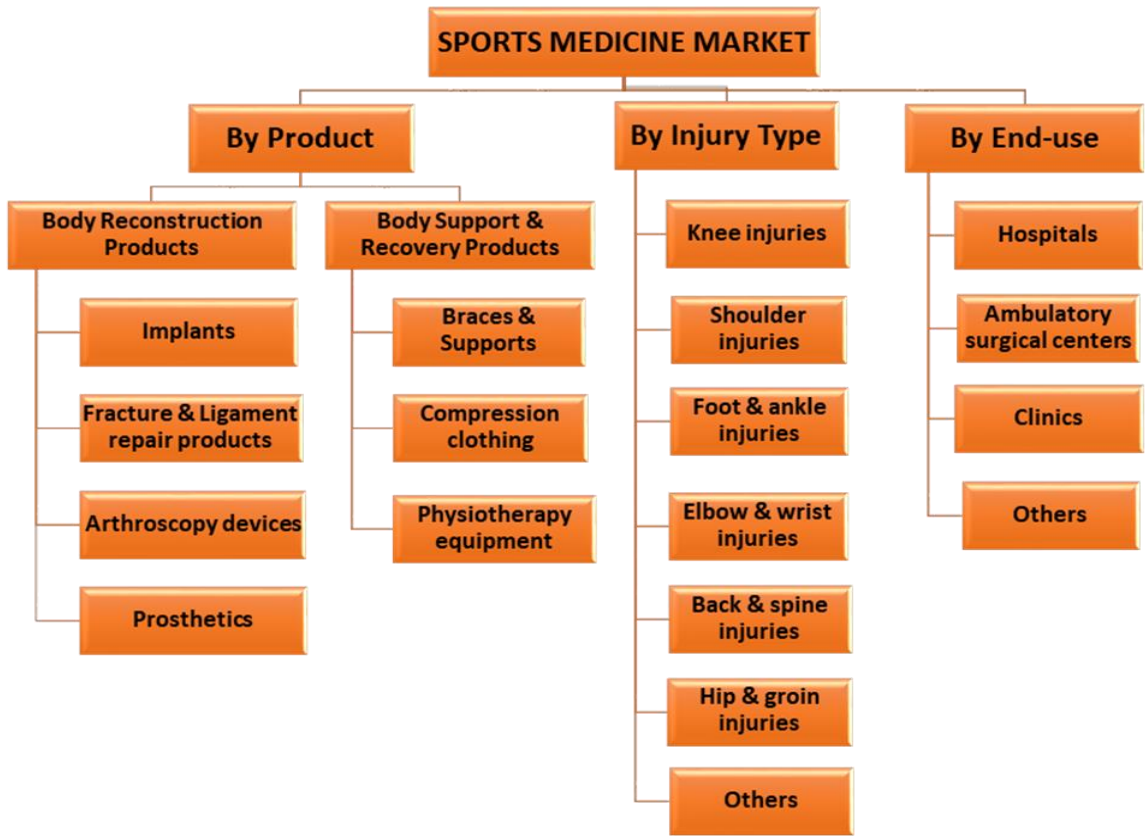


Figure 1 Sports Medicine market- Industry Segmentation

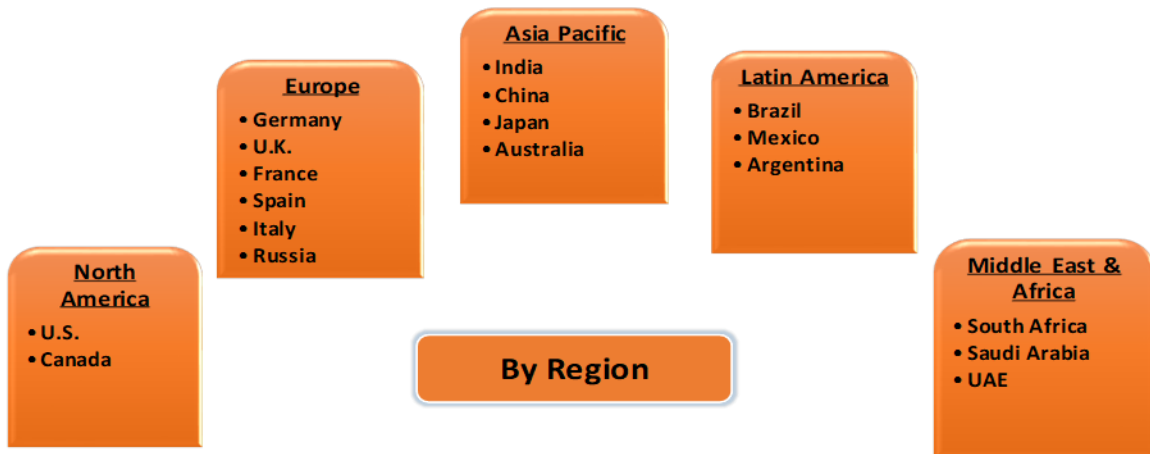


Figure 2 Sports Medicine market- Regional Segmentation

2.3. Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of Sports Medicine Market

2.3.1. Strengths

- Continuous scientific and medical excellence in the area of sports medicine market leading to discovery, development, and expansion of product portfolio assists the industry to grow and flourish.
- Innovative technological products at low and reasonable prices attract more customers, this will escalate the customer base for the market and will aid in revenue generation.

2.3.2. Weaknesses

- Significant market share by the existing major players can considerably limit the entry of new players into the market.

2.3.3. Opportunities

- Rising arthroscopic surgeries has led to the continuous surge in procedure demand of knee implants, thereby providing an opportunity for the sports medicine market expansion
- Rapid technological advancements can open up new opportunities for the market growth

2.3.4. Threats

- Strict approvals from regulatory authorities may hamper the commercialization process of the sports medicine market
- Rising raw material costs is the key factor that may impede the overall market growth

2.4. Porter Five Force Model on Sports Medicine Market



Figure 3 PESTEL Analysis on Sports Medicine Market

2.5. Competitive Landscape

Smith & Nephew, Stryker Corporation, Tornier N.V., DJO Global, Otto Bock Healthcare, Bauerfeind AG, GE Healthcare, Wright Medical Technology, Ossur Corporate, Zimmer Holdings, Breg, Mueller Sports, Medtronic, Arthrex, RTI Surgical, Cramer Products, Performance Health International Limited, KARL STORZ, Johnson & Johnson, Conmed Corporation, Japan MDM, are some of the companies functioning in the sports medicine industry.

Major players operating in the sports medicine market include Smith and Nephew, Arthrex, Inc., Conmed Corporation, DePuy Synthes, and Stryker Corporation among other players. These industry players are resorting on various strategic initiatives such as innovative product launches, mergers & acquisitions, accreditations, strategic collaborations, and partnerships to enhance their financial stability and gain competitive edge over other industry players. As the sports medicine market is consolidated, major players holds the significant revenue share. Players in the market compete based on pricing, quality, and product diversification.

Smith and Nephew is one of the leading companies providing business portfolio in medical technology. Its research and development programs are highly efficient and have optimum expenditure on research and development that focus on the advancements of Sports Medicine Products. Smith and Nephew is currently focused on business expansion, innovating products and new product launches for the healthcare with primary focus on surgical field. The company in May 2019, launched Werewolf Flow 90 Wand with FLOW-IQ technology.

Arthrex Inc., is a global medical device company focused on new product developments. Company is focused on research and development and product innovation. It offers more than 1,000 innovative products in the field of arthroscopy and other orthopedic areas. In October 2016, Arthrex entered into partnership with NBC Sports providing education platform for orthopedic injuries. This program provides education about use of Arthrex products that has resulted in commercialization of firm's product portfolio.

2.5.1. Company Share Analysis

A company's market share is its sales measured as a percentage of an industry's total revenues. In this method of analysis, the major company's revenues of the sports medicine business segment are taken into consideration and individual company share is calculated. After that individual company revenues are added to form a Global revenue share of sports medicine market.

A Year on Year (YOY) growth percentage of sports medicine market can be found (from the annual reports of individual companies). In order to calculate the future trend i.e., to find the revenue share of forecast period from 2019 to 2025, Trend Analysis is used. Trend Analysis is a statistical technique that attempts to determine future movements of a given variable by analyzing historical trends.

Formula to calculate Trend Analysis:

$$= \text{Net Revenue/sales of base year} + (\text{Net Revenue/sales of base year} * \text{YOY})$$

Table 2 Showing Global Revenue share of Sports Medicine Market, 2015-2025

Years	Global Revenue share of Sports Medicine Market (USD million)	YOY (%)
2015	2,634.78	-
2016	2,668.18	1
2017	2,850.00	7
2018	3,049.50	7
2019	3,269.06	7
2020	3,510.97	7
2021	3,777.81	8
2022	4,072.48	8
2023	4,398.28	8
2024	4,758.93	8
2025	5,158.69	8

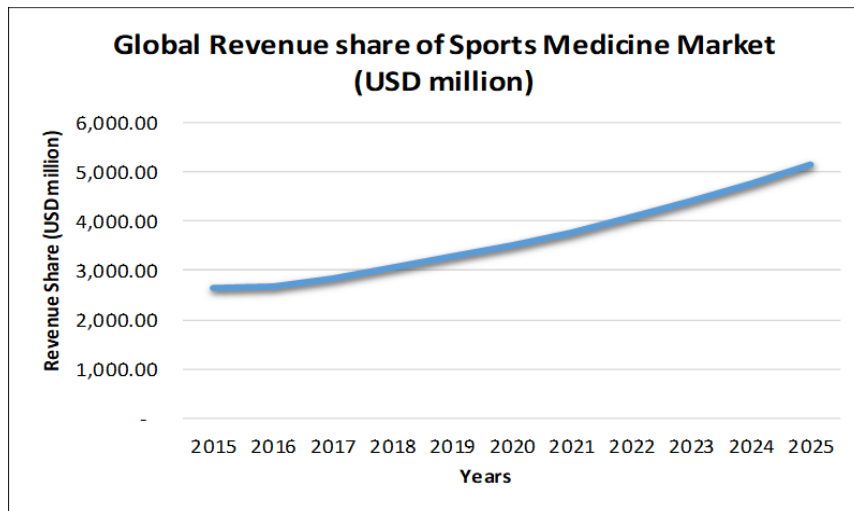


Figure 4 Showing Graphical representation of Global Revenue Share of Sports Medicine Market, 2015-2025

CAGR (compound annual growth rate) is a useful measure of growth over numerous time frames. It is defined as the average returns an investor has earned on the investments after a given interval of time.

Formula to calculate CAGR = Average of YOY

Calculations of CAGR of Sports Medicine Market:

CAGR = Average of YOY

$$= (1+7+7+7+7+8+8+8+8)/10$$

$$= 7\%$$

Hence, Sports Medicine Market is expected to witness 7% CAGR from 2019 to 2025.

2.5.2. Strategy Dashboard

Table 3 Showing Major Company Profiles

Parameter	Smith Nephew	& Zimmer Biomet	Conmed	Depuy Synthes	Arthrex
Revenue (USD Mn), 2018	4,904	7,932.9	859.6	1,882.6	422.5
Regional Presence	NA ROW	NA ROW	NA ROW	NA ROW	NA ROW
Product Portfolio	Werewolf Coblation, REGENETEN, Accu-pass, Acufex director, Acufex Pinpoint, Biceptor, Cargel, Healicoil PK, LED3000 Light Source, Meniscal Preservation	Rotator Cuff Repair, Shoulder Labral Repair, AC Joint Repair, ToggleLoc Device with ZipLoop Technology, WasherLoc Tibial Fixation System	Spectrum Autopass, Spectrum MVP, GraftMax Button, XO Button, TenoLok, BioScrew, CrossPin, SmartPin, SmartNail	Hip Access Kit, Hip in a Box Model, Hip Straight Blade, RIGIDFEX Cross Pin System, RIGIDLOOP Cortical Fixation System	Autograft Distal Extremity OATS, Autograft OATS, Stromal Vascular Fraction, T RIM-IT Spin Pin, T RIM-IT Pins,

Key strategies	Company is focused on business expansion by new product launch and product promotion in the market. In May 2019, Smith launched WEREWOLF flow 90 Wand with FLOW-IQ technology to expand its existing portfolio.	Zimmer is focused on entering into strategic collaboration to enhance its facilitation of connection between patients and surgical teams. In October 2018, Zimmer collaborated with Apple.	Conmed focused on entering into strategic agreements to expand its existing product portfolio. In July 2017, MedShape, Inc., made a conclusive agreement with Conmed	Depuy Synthes is focused on geographic expansion of the firm by acquisition strategy in the market. In February 2015, DePuy acquired Olive Medical Corporation	Arthrex is focused on strategic agreements by entering into partnerships. In October 2016, Arthrex partnered with NBC Sports providing education platform for orthopaedic injuries.
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2.6. Political, Economic, Social, Technological, Environmental, Legal (PESTEL) Analysis on Sports Medicine Market

2.6.1. Political

Sports Authority of India is the premier sports body of the country that is in charge of implementing the sports schemes and to promote sports culture in India and sporting excellence. Several government schemes undertaken for development of sports are Khelo India, a national program for mass participation of youth in annual sports competitions that have been introduced to resuscitate the sports culture in India.

2.6.2. Economic

In economic terms, sports medicine consists of two main categories such as medical costs and non-medical costs. Medical costs include the costs that are occurring directly due to the injury. Non-medical costs include transportation or health insurance. Thus, economic factors may affect the rate of participation in sports activities by most of the low and middle-class income population.

However, central spending on sports has been steadily increasing throughout the twenty-first century providing new opportunities for improvements to existing sports facilities.

2.6.3. Social

Team sports enhances the player's communication skills, build self-confidence, and team spirit. Several public awareness campaigns and events such as the Physical Activity Awareness Campaign and Sports and Public Health Campaign can help in spreading positive messages on the importance of active participation in sports among the young population. Regardless of the fitness benefits of sports activities, fear of injury and sports injury are important obstacles to participation in sport.

2.6.4. Technological

Technological advancements such as new Formfit Pro line of 3Dimensional compressive knit solutions that are designed to treat musculoskeletal ailments or conditions. Emerging technologies such as the stem cells, gene therapy, and tissue engineering in the field of sports medicine are mostly at the preclinical stage.

However, new computer guidance with robotic technology is currently involved in joint replacement surgeries including hip and knee thus, technological factor plays a significant role in the sports medicine market.

2.6.5. Environmental

Norms for disposal of generated waste during the manufacturing of sports medicine devices are needed to be followed as per the country guidelines.

2.6.6. Legal

According to the amendment of the sports act, enacted on 1st January 2017, legislative regulation in Hungary included legal protection for athletes to prevent sports-related injuries. Implementation of these guidelines will decrease the occurrence of sports injuries in the future.

FDA is responsible for the approval of adult stem cell therapies that are used in sports medicine. Moreover, stringent regulatory approvals may restrict the market development and entry of new players in the U.S.

3. Results and discussion

From the company share analysis, it is shown that the global sports medicine market is expected to expand at a CAGR of 7.0% over the forecast period (2019-2025).

From the Segment analysis, Region- it is found that the North America segment holds the largest market share and Asia-Pacific region holds the fastest growing share in the sports medicine market over the estimation period.

From the Segment Analysis, Injury Type- It is found that the Knee injuries segment will witness significant market share over the forecast timeframe (2019-2025).

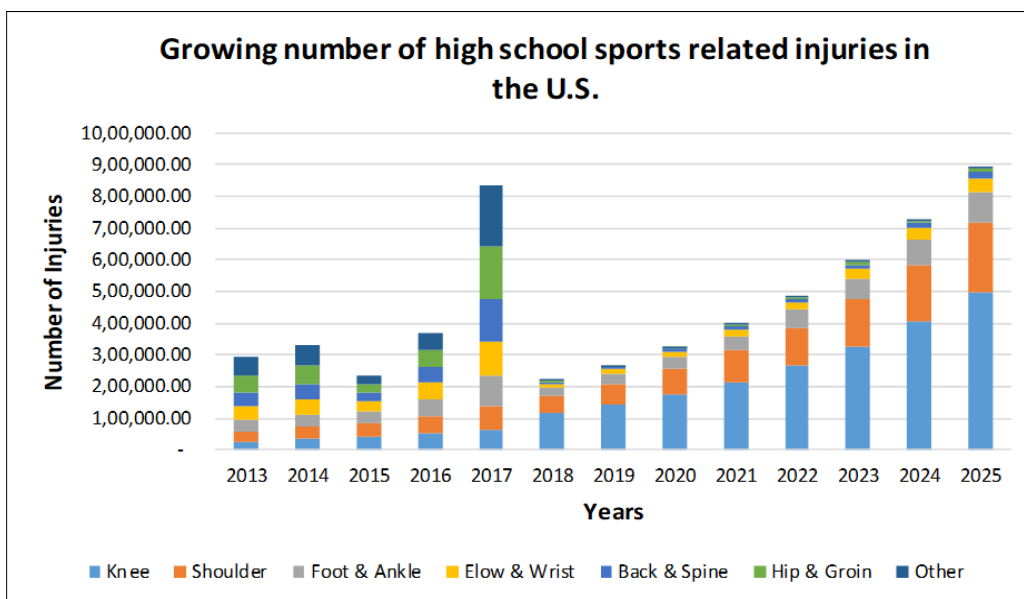
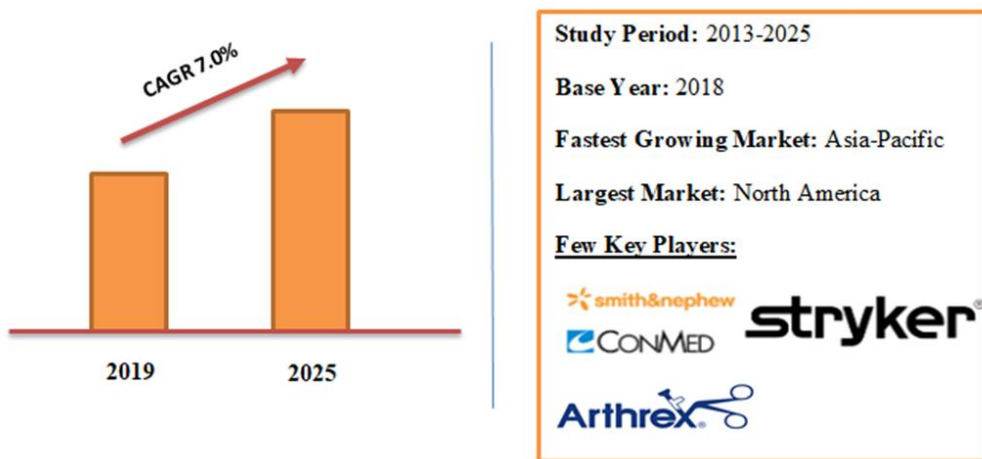


Figure 5 Showing Comparison of high school Sports related injuries in the U.S., 2013-2025

The above graph depicts that incidence of high school Knee injuries is expected to grow at a significant rate compared to other sports related injuries. Hence, knee arthroscopy surgeries, knee implants will witness robust growth rate in the sports medicine market over the forthcoming period.

4. Conclusion

Sports medicine is widely utilized for the prevention of sports injuries as well as for the cure, recovery, and rehabilitation of athletes. Certain factors that are fueling the market include the growing burden of sports injuries, consistent innovation of new products and treatment modalities, growing awareness regarding physical fitness, rising demand for minimally invasive surgeries and sports medical centers.

Compliance with ethical standards

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Disclosure of conflict of interest

Sravani Nariseti declares that she has no conflict of interest.

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