



Twenty Years of SPARTAN: From Inception to Impact (SPARTAN 2023 Annual Meeting Proceedings)

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Accepted: 28 December 2023 / Published online: 12 January 2024

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Abstract

Purpose of Review This review takes a look at the past, present, and future of SPARTAN, the Spondyloarthritis Research and Treatment Network, an organization of North American healthcare professionals dedicated to advancing research, education, and patient care in spondyloarthritis.

Recent Findings In 2022, SPARTAN completed the Classification of Axial Spondyloarthritis Inception Cohort (CLASSIC) study, a collaboration with the Assessment in SpondyloArthritis International Society (ASAS). CLASSIC aimed to validate the 2009 ASAS classification criteria for axial spondyloarthritis. Other ongoing SPARTAN endeavors include the development of US referral recommendations for axial spondyloarthritis, an update of the 2019 ACR/SAA/SPARTAN treatment recommendations for axial spondyloarthritis and multiple educational initiatives.

Summary Twenty years after its inception, SPARTAN continues to grow and broaden its impact, guided by the SPARTAN vision of “a world free of spondyloarthritis through leadership in research and education.”

Keywords Spondyloarthritis · Ankylosing spondylitis · Research · Therapy · Education

Introduction

The year 2023 marks the 20th anniversary of SPARTAN, the Spondyloarthritis Research and Treatment Network, a North American organization dedicated to research, education, and patient care in spondyloarthritis (SpA). In this review, we will trace the history of the organization and take a glimpse into the future.

This manuscript is published thanks to the collaboration with the SPARTAN group.

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Foundation in 2003

SPARTAN was inspired by the International Assessment in Ankylosing Spondylitis Working Group, later renamed the Assessment in SpondyloArthritis International Society (ASAS). In January 2003, during a workshop in Berlin, ASAS discussed the first guidelines for anti-TNF therapy in ankylosing spondylitis (AS) [1], and participants were encouraged to disseminate these guidelines through national SpA societies adapting them for use in their countries. Notably, such an organization did not exist in North America. Discussions among a group of US rheumatologists including Daniel Clegg, John Davis, Muhammad Asim Khan, Paul Peloso, John Reveille, and Michael Weisman paved the way to the inaugural meeting of SPARTAN in Salt Lake City in August 2003, hosted by Daniel Clegg and the Spondylitis Association of America (SAA). The name SPARTAN, proposed by Jack Cush, was adopted along with the distinctive logo featuring a Spartan warrior helmet and an “S” shaped like a curved spine (Fig. 1). John Davis and John Reveille were elected to lead the newly formed organization as co-chairs.



Fig. 1 SPARTAN logo. **A** First SPARTAN logo (2013 version). **B** Current design (since 2018)

Incorporation as a 501(c)(3) Organization

Initially under the auspices of the SAA, SPARTAN eventually realized the need for organizational autonomy. In 2014, SPARTAN incorporated as a 501(c)(3) organization in the State of California. Despite the formal separation from the SAA, the close collaboration between the two organizations has continued until now. Many members of the SAA Medical and Scientific Advisory Board are active in SPARTAN, and SPARTAN members are pivotal to SAA's educational activities for patients with SpA, their family members, and friends.

Structured by its bylaws and the rules regulating 501(c)(3) organizations, SPARTAN governance resides with its board of directors, who serve a 3-year term, extendable for another 3 years. The board appoints its chair, vice chair, treasurer, and secretary. Together with the *ex officio* immediate past chair, they comprise the executive committee which gets elected every 2 years. In addition, SPARTAN has a number of standing committees, including the governance committee, education committee, research committee, and communications committee.

SPARTAN is a North American organization with members hailing from the USA, Canada, and Mexico. Most of its members are rheumatologists, but SPARTAN welcomes other medical professionals involved in the care of patients with SpA as well as non-clinician researchers. Membership tiers include full, associate, and trainee. Based on the 2020 membership policy, full membership mandates a proven track record in SpA research, education, or expert patient care. Active engagement with the organization including attendance at annual meetings is expected. Only full members are eligible for serving on

the board or committee leadership. Associate and trainee membership requires a professed interest in SpA. Medical students, rheumatology fellows, other physicians in training, and postdoctoral research fellows may apply for trainee membership in SPARTAN. Trainee membership automatically ends 1 year after completion of the last training position unless the trainee member applies for full or associate membership.

NHANES Study 2009/2010

The first major SPARTAN research study, led by John Reville and Michael Weisman, used the National Health and Nutrition Examination Survey (NHANES) in 2009/2010 to clarify the epidemiology of SpA in the USA which had been a major topic at the 4th SPARTAN annual meeting in San Francisco in 2006 [2]. NHANES collected data on 5103 subjects, carefully selected to represent the US population. The study pegged the prevalence of axial SpA (axSpA) in the USA at 0.9 to 1.4%. It confirmed the high prevalence of chronic back pain with 19.4% of study participants reporting a history of one or more episodes of neck, back, or buttock pain lasting at least 3 months. Interestingly, 5 to 6% reported a history of chronic back pain with characteristics of inflammatory back pain (IBP), with no differences between age groups and regardless of the IBP instrument used [3]. NHANES also produced population-based data on the prevalence of HLA-B27. It showed that 6.1% of the US population was HLA-B27 positive, with a higher percentage in Whites and lower percentages in other ethnic groups [4].

ACR/SAA/SPARTAN Treatment Recommendations

In 2011, SPARTAN embarked on the ambitious project of generating treatment recommendations for AS in collaboration with the American College of Rheumatology (ACR) and with financial support from SAA. This project followed the GRADE methodology adopted by the ACR as the method of choice for clinical guideline development [5]. The GRADE methodology provides a framework for the development of clinical practice guidelines that includes the formulation of PICO questions, systematic literature review and data extraction, data analysis, and finally formulation of recommendations and voting. Each recommendation is characterized by its strength as either strong or conditional in favor or against [6]. The project was carried out under the leadership of Michael Ward and Liron Caplan, and the ACR/SAA/SPARTAN treatment recommendations were published in 2016, followed by a first update in 2019 [7, 8]. Work on

the next version of the ACR/SAA/SPARTAN axSpA treatment recommendations is underway.

axSpA Classification Criteria and the CLASSIC Study

In 2009, ASAS published classification criteria for axSpA, introducing the concept of axSpA as a new disease entity and distinguishing non-radiographic axSpA (nr-axSpA) from radiographic axSpA (r-axSpA), the latter being equivalent to AS [9]. The ASAS criteria apply to patients with chronic back pain (for more than 3 months) that started before 45 years of age. Patients can be classified as having axSpA if there is imaging evidence for sacroiliitis plus at least one clinical feature of SpA (the “imaging arm”) or if they are HLA-B27 positive with two or more clinical features of SpA (the “clinical arm”). The official recognition of nr-axSpA, first reported in 1985 as “spondylitic disease without radiological evidence of sacroiliitis” [10], enabled patients with axSpA to be diagnosed earlier and to gain access to effective therapies. The 2009 ASAS criteria led to clinical trials including patients with nr-axSpA followed by approval of several TNF inhibitors for an nr-axSpA indication by the European Medicine Agency (EMA). In the USA, a Food and Drug Administration (FDA) advisory panel convened in July 2013 to discuss applications for FDA approval of adalimumab and certolizumab for an nr-axSpA indication. During that FDA meeting, multiple concerns were raised regarding the sub-optimal specificity; hence, the validity of the axSpA criteria and the FDA rejected both applications. Subsequently, a number of discussions occurred both within SPARTAN and internationally whether the 2009 ASAS criteria should be revised, leading to a joint meeting between the ASAS and SPARTAN executive committees in January 2014, where it was agreed that the ASAS classification criteria should undergo further validation [11]. This led to the Classification of Axial Spondyloarthritis Inception Cohort (CLASSIC) study that was carried out between 2019 and 2022 under the leadership of study principal investigators Walter Maksymowych for SPARTAN and Martin Rudwaleit for ASAS.

The primary goal of CLASSIC was to validate the performance of the 2009 ASAS classification criteria in a prospective cohort of patients presenting to a rheumatologist with undiagnosed current back pain of ≥ 3 months duration with onset ≤ 45 years of age. Study subjects underwent a series of diagnostic investigations including clinical history, physical examination, CRP and HLA-B27 testing, pelvic radiography, and MRI of the sacroiliac joints. If a specificity of $\geq 90\%$ and a sensitivity $\geq 75\%$ were found, the ASAS criteria would be considered validated. If the primary objective was not met, refinements of the criteria would need to be made

and tested. Despite the COVID-19 pandemic, enrollment for the CLASSIC study was completed in August 2022 with 501 subjects enrolled by SPARTAN in 25 centers in the USA, Canada, and Mexico. ASAS enrolled 514 subjects in the rest of the world. The results of the primary analysis were presented at the EULAR meeting in June 2023 showing that the 2009 ASAS criteria using the final physician diagnosis (after central review of all imaging studies) as gold standard had a specificity of 84.3% and sensitivity of 73.8%; i.e., the primary goal was not met. The revision of the classification criteria is currently ongoing.

SPARTAN Referral Recommendations

It is well known that the lack of timely referral of suspected axSpA patients to rheumatologists contributes to misdiagnosis, delayed treatment, and poor outcomes. However, there are no formal guidelines in the USA to guide healthcare providers seeing patients with chronic back pain as to who should be referred to rheumatology for evaluation of axSpA. In 2020, SPARTAN commissioned a referral recommendations study under the leadership of Abhijeet Danve, Maureen Dubreuil, and Atul Deodhar that led to a systematic literature review (SLR) and meta-analysis to calculate predictive values of different SpA features. Test characteristics of 28 examined individual SpA features showed likelihood ratios ranging from 0.5 to 10. Based on these data, draft referral recommendations were developed and presented to SPARTAN members at the 2023 annual meeting. The SPARTAN referral recommendation project conducted using a data-driven process is the first such effort in North America and is undergoing final touches for publication.

SPARTAN Annual Meetings

The SPARTAN annual meetings have been pivotal events in the life of the organization (Table 1), providing a venue to deliberate recent advancements in SpA, showcase research by SPARTAN members, and discuss future research projects. Annual meetings deserving special mention include the 2009 meeting in Houston, organized in conjunction with the Pan-American League Against Rheumatism (PANLAR), the International Genetics of AS (IGAS) consortium, and an R15-funded international basic science meeting, led by Joel Taurog, that was devoted to HLA-B27, and the 2014 meeting in New York City, organized in conjunction with the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA). The 2020 and 2021 meetings, originally scheduled to take place in Madison, were switched to a virtual format due to the COVID-19 pandemic. The SPARTAN annual meeting returned to Madison in 2022 but as our

Table 1 SPARTAN annual meetings

Year	City	Meeting host
2003	Salt Lake City	Daniel Clegg
2004	Los Angeles	Michael Weisman
2005, 2006	San Francisco [2, 12]	John Davis
2007, 2008	Cleveland [13, 14]	Muhammad Asim Khan
2009	Houston (joint meeting with PANLAR and IGAS) [15]	John Reveille
2010	Houston [16]	John Reveille
2011, 2012	Portland	Atul Deodhar
2013	San Francisco [17]	Lianne Gensler
2014	New York (joint meeting with GRAPPA) [18]	Atul Deodhar
2015, 2016	Denver [19]	Liron Caplan
2017, 2018	Boston	Joerg Ermann
2019	Madison	Judith Smith
2020, 2021	Virtual (due to COVID-19 pandemic)	
2022	Madison (hybrid)	Judith Smith
2023	Cleveland (hybrid)	Marina Magrey

first hybrid meeting, a trend that was continued at the 2023 annual meeting in Cleveland. Several of the annual meetings included a social event at a museum combining the opportunity for networking and discussing science with an appreciation for the finer things in life. A memorable example was the 2022 evening at the Madison Museum of Contemporary Art that featured a talk by James Louie on famous artists with rheumatic diseases. The annual meeting is also the time when the SPARTAN Research Career Achievement Award is presented to a SPARTAN member (and sometimes non-member) for major contributions to SpA research. Esteemed awardees include Daniel Clegg, Luis Espinoza, Muhammad Asim Khan, Michael Weisman, David Yu, Robert Colbert, Maxime Dougados, John Reveille, Joel Taurog, and James Rosenbaum, with Robert Inman receiving the honor in 2023.

Career Development of SpA Investigators

At 20 years of age, SPARTAN has been around for one full human generation. Several of the founders of the organization have retired from their academic positions, and one of them—Luis Espinoza—has passed away. Many of the current members were too young to even know what AS is when the organization was founded. There is no doubt that SPARTAN has shaped the careers of many of its members. SPARTAN remains steadfast in its objective to draw early-career investigators towards SpA research. Integral to every annual meeting is a poster session dedicated to trainee research, and the best abstracts are chosen for plenary presentation. Increasingly, SPARTAN is supporting talented junior researchers with grant funding. The 2023/2024 SPARTAN grants program includes an Early Career Investigator Award (\$25,000 per year for 2 years) and a Mentored Fellowship

Award for rheumatology fellows and their mentors (\$10,000 for 1 year).

SpA Education

Education has been a cornerstone of SPARTAN's mission from the very beginning. Many SPARTAN members are engaged in teaching SpA-related topics to rheumatologists and other healthcare providers as well as patients. Since 2005, SPARTAN has organized didactic trainee symposia for rheumatology fellows preceding the SPARTAN annual meetings [12]. This format has been highly successful in educating a generation of SpA specialists and was the first contact with the organization for several of the current SPARTAN leaders. In 2023, the title was changed to “Spondyloarthritis Review Course” reflecting the intention to reach a broader target audience beyond rheumatology fellows. The 2023 course attracted more than 100 learners, over 50% of them tuning in virtually from around the world.

Since 2013, SPARTAN working together with ASAS and GRAPPA has hosted an educational symposium adjacent to the annual ACR scientific meeting. From 2012 until the COVID-19 pandemic, SPARTAN and GRAPPA ran a series of educational symposia on axSpA and PsA across the country. The COVID-19 pandemic put a temporary end to these programs while forcing us to explore new opportunities for virtual medical education. Together with GRAPPA, SPARTAN ran a series of virtual global education seminars in 2021 targeting rheumatologists and dermatologists across the globe and teaching them about axSpA and psoriatic disease. This was followed by the CAPES (Clinician and Patient Education Series) program in 2022, jointly organized by the SAA, National Psoriasis Foundation (NPF),

GRAPPA, and SPARTAN. This series of live webinars and podcasts was designed for patients as well as healthcare providers. Another currently ongoing educational initiative is the EIDA (Early Identification and Diagnosis of Axial Spondyloarthritis) project. The goal of this program is to educate non-rheumatology healthcare providers who take care of patients with chronic back pain about axSpA. To this end, SPARTAN is partnering with professional organizations (national and regional) of primary care providers, physical therapists, physician assistants, chiropractors, and pain specialists to inform their members about clinical features suggestive of axSpA that should trigger referral to rheumatology.

Looking Ahead

From the beginning, the mission of SPARTAN has been to promote research, education, and treatment of SpA. SPARTAN has now well over 100 members. Recently admitted members include two gastroenterologists, a radiologist, and two rheumatology-advanced practice providers. We hope that SPARTAN will continue to attract a wide spectrum of researchers and clinicians dedicated to improving the lives of patients with axSpA. The SPARTAN journey started with the introduction of TNF inhibitors as therapies for AS. The 2 decades since then have seen the development of additional classes of drugs as well as an enormous growth of our understanding of axSpA genetics and the advent of powerful new technologies to interrogate disease pathogenesis. On the other hand, the diagnostic delay in axSpA remains unacceptably long, and we are nowhere near a cure. SPARTAN is poised to contribute to solving these problems. As noted above, the group developing SPARTAN referral recommendations for axSpA presented their work at the 2023 annual meeting in Cleveland. The publication of this document is expected within the next year and will provide a boost to SPARTAN efforts to diagnose axSpA earlier. A major research effort over the next few years will be the Biomarkers in Axial Spondyloarthritis Investigative Study (BASIS) initiative, which will utilize the research network of SPARTAN members formed during the CLASSIC study. The primary goal of BASIS is to establish a biobank of specimens from well-characterized axSpA patients and controls and identify a diagnostic biomarker for axSpA. Currently, this study is being submitted to various funding agencies. An update of the ACR/SAA/SPARTAN treatment recommendations is also due. We are confident that SPARTAN will continue to grow and thrive in order to realize its vision of “a world free of SpA through leadership in research and education.”

Author Contributions J. E.: Writing—original draft, review, and editing

A. D., M. A. K., M. H. W., J. D. R.: Writing—review and editing

Data Availability Not applicable

Compliance with Ethical Standards

Ethics Approval Not applicable

Conflict of Interest The authors declare no competing interests.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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