

Magellan and Copernicus: Arthroscopy Association of North America Seeking Excellence in Education



One of the most important missions of the Arthroscopy Association of North America (AANA) is the education of its membership. In July 2009, the President's Council of AANA met and discussed potential methods and strategies to upgrade the society's educational programming. In the past, this has been accomplished primarily using a "bottom-up" approach, that is asking, "what are our most effective and highest rated programs?" and "how can we then improve on our current offerings?" Tasked by the President's Council, a group of thought leaders from AANA chose to use a distinctly unique methodology using a different approach, or "top-down strategy." They proposed to go out into the world and examine other businesses, industries, and professions that train highly skilled individuals and examine the best practice strategies that those other entities use. In May 2010, AANA president, Felix (Buddy) Savoie III, M.D., appointed a task force with First Vice President Richard Angelo, M.D., as its chair. The mandate for that task force was to "sail around the entire world" across different disciplines, seeking answers to the question, "What are the most effective methods being used to educate and train those individuals working in highly-skilled technical professions?" This effort to "sail the world" in search of educational pearls became known as the AANA Magellan Project (although Ferdinand Magellan did not complete the journey himself, his expedition was credited with being the first to circumnavigate the globe, or sail around the world). As promising educational strategies were discovered, the intent was for AANA to apply those educational methods to training surgeons in the principles and best practice of arthroscopic surgery.

The Magellan Project included 6 subcommittees: Didactic, Surgical Skills, Electronic Media, Simulation, Outcomes/Metrics, and Health Policy/Advocacy. Within the focus of each of the subcommittees, the members conducted extensive research into potential concepts and ideas that AANA might employ to enhance surgeon education. For example, Dr. Savoie was able to provide the Outcomes/Metrics subcommittee with several contacts at the National Aeronautics

and Space Administration (NASA). The subcommittee posed the following questions to those responsible for astronaut education: "How do you determine which astronauts to train to perform highly skilled maneuvers such as docking the lunar landing module?" and "How do you assess whether the necessary skills were mastered or not?" An exhaustive document was returned entitled "Development and Implementation of an Extravehicular Activity Skills Program for Astronauts." This document was used as a template to develop an Arthroscopic Bankart Skills Assessment Tool. This pilot program sought to evaluate the learner's skill development using an Alex Shoulder Model as a "simulator." An arthroscopic Bankart procedure was selected because it is a relatively common shoulder procedure using a standard 3-suture anchor technique to correct unidirectional anterior instability.

From a different Magellan subcommittee, Surgical Skills, the question was posed, "Is there a better way to train surgical skills?" Predominantly through "sailing" the Internet, they became aware of proficiency-based progression (PBP) training for surgical skills as an alternative to the apprenticeship model. The PBP training protocol dictates that the trainee must master and be able to demonstrate increasingly more complex skill sets before being able to progress in training. The principles and validation of PBP concepts have been evolving over the past 20 years, predominantly in the laparoscopic and general surgery realms. At approximately the same time, I was serving on an advisory board for the first World Congress on Surgical Skills Training to be held in Göteborg, Sweden. We submitted an abstract for the meeting, detailing the Magellan Project efforts. Dr. Anthony Gallagher (whom I did not know) was also serving on the advisory board and read the abstract of the Magellan Project. He emailed 3 related articles that I "might find of interest." Unbeknownst to me, he is likely the world's authority on PBP training for procedural skills. After several months of communication, I indicated to him that AANA was interested in studying PBP training to determine whether it was a methodology that should be considered by AANA in optimizing its educational programs. I asked whether he would be interested in serving as a consultant. He accepted the invitation. Based in part on the information gained from the pilot project using the National Aeronautics and Space Administration evaluation methods, we elected to use

an arthroscopic Bankart repair as the template to study the paradigm shift from the apprenticeship model to PBP training in order to determine the latter's effectiveness. Thus, the effort became known as the AANA "Copernicus Initiative" (Nicolaus Copernicus is credited with being the major influence in the paradigm shift from the earth to the sun being the center of our solar system). Dr. Gallagher guided the primary investigators, Richard Ryu, M.D., Robert Pedowitz, M.D., Ph.D., and myself, along the path of study design and implementation. In order to accurately study PBP training, 3 tools needed to be developed and rigorously validated: a metrics tool, a training tool, and an assessment tool. The metrics tool was needed to accurately and objectively evaluate the performance of an arthroscopic Bankart repair. A training tool, or simulator, was needed both to enable trainees to practice the necessary steps and skills for the Bankart procedure and to serve as an intermediate evaluation tool to verify that the necessary skills had been mastered before progressing in training. The model simulator afforded the trainee the opportunity to commit errors in a clinically consequence-free environment and to learn from them. Finally, an assessment tool was needed to be able to accurately and objectively evaluate the performance of an arthroscopic Bankart repair in a cadaver shoulder. This final tool provided the ability to compare fourth- and fifth-year orthopedic residents who participated in one of 3 different surgical training protocols and the ability to determine their relative effectiveness. The development and validation of the 3 essential tools is reported in the first 3 articles on the Copernicus Initiative: "Metric Development for an Arthroscopic Bankart Procedure: Assessment of Face and Content Validity," published in this issue of *Arthroscopy*, "The Bankart Performance Metrics Combined With a Shoulder Model Simulator Create a Precise and Accurate Training Tool for Measuring Surgeon Skill," and "The Bankart Performance Metrics Combined With a Cadaver Shoulder Create a Precise and Accurate

Assessment Tool for Measuring Surgeon Skill," to be published in September.

The fourth article, "Proficiency-Based Progression Training Plus Simulation Results in Superior Arthroscopic Bankart Repair Skills," in the October issue, will report the findings of a prospective, randomized, blinded study comparing (1) AANA's traditional method of training residents to acquire arthroscopic skills, (2) simulator-enhanced training, and (3) PBP training coupled with the use of the shoulder model simulator. The results of the investigation are unambiguous and reveal that PBP training is substantially more effective for training the skills involved in performing an arthroscopic Bankart repair than either of the other methods. AANA is currently in the process of adding additional procedures to the PBP portfolio and include anterior cruciate ligament reconstruction, rotator cuff repair, and hip labral repair.

The Magellan Project and Copernicus Initiative represent the best of AANA as a society. The ingenuity, passion, and selflessness of the volunteer members (in excess of 2,100 hours spent on the Copernicus Initiative alone) will result in valuable new programs to ensure that those in AANA will be provided the best in educational opportunities to enhance their skills. In addition to the monumental efforts of Drs. Ryu, Pedowitz, and Gallagher over the 4-year duration of the related studies, the individuals serving on the metrics development and video review panel are to be thanked and congratulated for their tireless and painstaking contributions: Drs. Bill Beach, Joe Burns, Julie Dodds, Larry Fields, Mark Getelman, Rhett Hobgood, and Louis McIntyre. Countless other members have also participated in various aspects of this research initiative. Finally, the assistance from AANA staff members Susan Carlson, Christine Di Giovanni, Holly Albert, and OLC Director Pat Cichlar was invaluable.

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