



Introduction

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) developed the Fundamentals of Laparoscopic Surgery (FLS) program to encourage a standard set of skills in basic laparoscopic surgery. SAGES believes that learning and applying these fundamental skills will help ensure a minimal standard of care for all patients undergoing laparoscopic surgery. The FLS program content has been endorsed by the American College of Surgeons (ACS) and is now a joint educational offering. The FLS Program has also been mandated by the American Board of Surgery as a pre-requisite for eligibility for the general surgical board qualifying exam, beginning in the 2009-2010 academic year.

The FLS program is a comprehensive, educational module and assessment tool designed to teach the fundamental knowledge, clinical judgment and technical skills required in the performance of basic laparoscopic surgery. The educational module consists of a web-based multimedia presentation of didactic content and “watch & do” exercises that focus on manual skills training. The FLS assessment includes two components, a computer-based cognitive assessment and a performance-based manual skills assessment.

Those who successfully complete both the educational and assessment components will have demonstrated the basic knowledge, judgment and technical skills fundamental to the performance of laparoscopic surgery. Upon successful completion of the FLS examination, a physician is issued a certificate, and called a "certificant" of the FLS program.

Certificate Time Limit

Effective October 1, 2012, FLS no longer issues certificates that are valid indefinitely; instead, all certificates are dated and individuals must be recertified every 10 years by successful completion of the entire test (both cognitive and skills components).

- For certificates issued October 1, 2012 or later, recertification is required no later than ten years from the original certificate issue date, but recertification may be sought as early as seven years from the original certificate issue date.
- “Grandfathering” – For certificates issued prior to October 1, 2012, recertification must be completed by October 1, 2022, regardless of the original certificate issue date. Individuals may initiate the recertification process as early as seven years from the original certificate issue date (i.e. ten year time limit starts October 1, 2012).

FLS Assessment Development and Purpose

The **cognitive test** consists of multiple-choice questions, some of which include visuals. It is computer-based and designed to test the understanding and application of the basic fundamentals of laparoscopy with as much emphasis as possible on clinical judgment or intra-operative decision-making.

The **manual skills test** consists of five simulation exercises that incorporate and represent most of the psychomotor skills necessary for basic laparoscopic surgery. The manual skills exercises are non-procedure specific and may be used for training as well as for final assessment.

Both components of the test have been carefully designed and examined by experts within the field of laparoscopic surgery. Formal review sessions have ensured that the material included in the assessments is relevant to the field of laparoscopic surgery and appropriate to the stated purpose of the FLS Program. The test questions and tasks have been previously field-tested for efficacy and the FLS Test Committee continually reviews their statistical properties. An ongoing research program conducts investigations into the psychometric properties of the assessments and gathers evidence regarding the reasonableness of the decisions and inferences made from the assessment scores.

FLS Assessment Description

The cognitive testing session lasts approximately 90 minutes and consists of multiple-choice questions administered via a computer. The manual skills assessment includes the five designated skills performed on the FLS Trainer Box and lasts approximately 30-45 minutes. Both test components may only be administered by an approved FLS proctor who has undergone specialized FLS proctor training.



FLS Eligibility and Test Scheduling

Anyone can purchase the FLS program and review the FLS online didactic material and practice their skills on the FLS Trainer Box. However, only physicians (MD, DO, or MBBS or equivalent) are eligible to take the FLS test. Upon completion of the online didactic curriculum, and in possession of an FLS test voucher, participants may schedule to take the FLS Test. The cognitive and manual skills assessments must be taken in two consecutive testing sessions that may be scheduled at any designated FLS Test Center in the U.S., Canada, or at the SAGES Annual Meeting or ACS Annual Clinical Congress. Testing may also be available at your site (U.S. and Canada only) via an on-site proctored testing visit for a fee. All test vouchers, including retest vouchers, have an expiration date printed on the upper right hand corner and, tests must be completed by this date.

FLS Program Purchase Process

1. To purchase the FLS program please contact the SAGES office:
SAGES FLS Program
11300 W. Olympic Blvd. Suite 600
Los Angeles, CA 90064
Phone: 310.437.0544 ext. 137
Fax: 310.437.0585
e-mail: fls@sages.org

At the time of the exam you must present your FLS Test Voucher and present a valid form of photo identification. Testing is available by appointment only.

2. Retest Policy – If you fail one or both parts of the assessment, you only need to retake the portion of the exam that was not completed successfully (manual skills or cognitive), as long as it has been less than 18 months since your original exam date. Any participant who fails one or both of the assessments must pay a fee to SAGES by purchasing a retest voucher. You must wait at least 30 days following the original test date before scheduling a re-test. If one or both are still not passed after the first retake, then you must wait at least 6 months for the next retake (hopefully devoting this time to increased study and experience). After three retakes a whole new registration process is required and both assessments must be purchased and completed anew even if one had been passed previously. Likewise, if one or both parts of the exam are not retaken successfully within 18 months of the original exam date, you must purchase a new voucher in order to seek FLS certification. All retest vouchers expire 18 months from the test-taker's original exam date regardless of when they were purchased. If you pass the assessment you are not allowed to retest simply to attempt a higher passing score.

At the time of the re-test exam you must present your FLS Re-test Voucher and present a valid form of photo identification. Re-testing is available by appointment only.

3. Recertification – Individuals wanting to maintain FLS certification should purchase an FLS Individual Package or an FLS Educational Package at the full price. The same testing scheduling and test administration procedure is followed for those seeking recertification as those taking the exam the very first time. Both components of the test must be completed with the same passing score as those taking the exam the very first time. Individuals who successfully pass the exam will be issued a new certificate, with a new effective date. Individuals who allow their certificate to expire will be classified in the same category as those who never attempted the FLS test, and those who have attempted the test but have not achieved a passing score.

At the time of the exam you must present your FLS Test Voucher and present a valid form of photo identification. Testing is available by appointment only.



Responsibilities of Assessment Participants

Assessment participants must not subvert or attempt to subvert the assessment process. The assessment materials are the property of SAGES and no reproduction or distribution of the materials is permitted. Participants must not engage in or encourage irregular test behavior such as, but not limited to, copying, printing, memorizing, reproducing and/or distributing assessment materials, possessing unauthorized communication devices or seeking unauthorized help from others during the assessment and/or falsifying information on registration forms. Participants must follow directions given at the administration site and refrain from interfering with the performance of other participants. If there is evidence that irregular behavior has occurred, the reporting of scores may be delayed or retracted pending further investigation.

Preparation for the Assessments

The FLS educational modules are an excellent resource for the material included in the assessments as they comprehensively cover the basic fundamental knowledge, judgment and technical skills required in laparoscopic surgery. The modules cover these topics:

Module 1: Preoperative Considerations

- Laparoscopic Equipment
- Energy Sources
- Room Setup
- Patient Selection & Preoperative Assessment

Module 2: Intraoperative Considerations

- Anesthesia and Patient Positioning
- Pneumoperitoneum Establishment &
- Trocar Placement
- Physiology of Pneumoperitoneum
- Exiting the Abdomen

Module 3: Basic Laparoscopic Procedures

- Current Laparoscopic Procedures
- Diagnostic Laparoscopy
- Biopsy
- Laparoscopic Suturing
- Hemorrhage and Hemostasis

Module 4: Postoperative Care and Complications

- Postoperative Care
- Postoperative Complications

Module 5: Manual Skills Instruction & Practice

- Training Exercises & Data Analysis

Module 6: Final Review

References and recommended readings are listed as part of the online educational material for those wishing to study further. Additionally, reviewing *The SAGES Manual Volume 1: Basic Laparoscopy and Endoscopy* is suggested for additional preparation (available from www.springer.com). In addition to the online didactic content, studies have indicated that increased performance on the assessments is associated with the amount of practice and experience with actual laparoscopic cases. The didactic curriculum describes in detail the tasks included in the manual skills assessment. It is highly recommended that all test candidates review and follow the Manual Skills and Proficiency-Based Skills Guidelines provided with the FLS course materials and online at www.flsprogram.org. *Extensive practice time is not available at the time of the testing session.*



The Cognitive Assessment

Content. The questions for the cognitive assessment are based on the following major subject areas deemed applicable to the practice of laparoscopy:

1. Equipment: Tools of the Trade
2. Energy Sources: Electrosurgery, Ultrasound, and Laser
3. Patient Considerations: Patient Selection, Contraindications, Preparation
4. Anesthesia: Types, Complications
5. Patient Positioning
6. Establishment and Physiology of Pneumoperitoneum: Gas Biologic Characteristics, Pressure and Flow Characteristics
7. Abdominal Access and Trocar Placement: Techniques, Complications
8. Tissue Handling, Exposure and Examination of Abdomen and Pelvis
9. Biopsy Technique
10. Hemorrhage and Hemostasis
11. Tissue Approximation: Indications, Techniques
12. Exiting the Abdomen: Drains, Site Closures
13. Postoperative Care

While the content outline shown above is parallel to that used for the educational module, the two are considered to be independent of each other. The assessment will include questions related to the content outline that are deemed important for the practice of laparoscopic surgery whether or not they have been thoroughly covered in the didactic educational program.

The assessment's focus is on subjects considered unique to laparoscopy rather than on subjects normally encountered during open surgical training. Questions are designed to test the understanding and application of the basic fundamentals of laparoscopy with as much emphasis as possible on clinical judgment and/or intraoperative decision-making.

Format. The cognitive assessment consists of objectively scored single multiple-choice questions and sets of related multiple-choice questions called clinical scenarios. For each question you are to select the one best alternative response based on the information given. There may be more than one response that fits the question but each question has only **one** best answer. The cognitive assessment is administered by computer in designated testing centers or at your site by an FLS test proctor.

Time Considerations. You will have 90 minutes to complete the cognitive test, allowing most examinees to answer all the questions without running out of time.

Scoring Procedures. Answers to each question are scored as correct or incorrect by the computer and results for the total test are transmitted to the SAGES office for evaluation. The passing score is based upon obtaining a recommended level of proficiency on the assessment. The required level of proficiency is determined by the FLS committee based on psychometric evaluation of the assessment and on data from prescribed standard-setting studies. As several forms of the cognitive assessment may be used, statistical procedures ensure that the level of performance needed to pass the different forms are equivalent.

Inclusion of Non-Scored Questions. Some questions may be included in the cognitive assessment to improve the assessment process and to provide data for verifying the measurement properties of the assessments. Such questions are not counted in determining scores.



Manual Skills Assessment

Content. The manual skills assessment consists of the five simulation exercises presented in the FLS online educational module. These exercises are non-procedure specific and have been documented to reflect the type of basic skills uniquely required in laparoscopic surgery. Such skills as ambidexterity, depth perception, hand-eye coordination and controlled movement of instruments are involved in all the exercises and others such as dissection, cutting, suturing, traction-countertraction are limited to one or more of the exercises.

Format. The exercises are performed using a physical simulator that includes an optical system and instrumentation similar to those used in the operating room. The simulator models, instructions and instrumentation are standardized across the testing sites. Familiarity with the exercises can be obtained by watching the online didactic curriculum and reviewing the Manual Skills Written Instructions and Performance Guidelines.

Time Considerations. The five exercises are timed individually. While the actual time required for each exercise varies according to its difficulty, a maximum time limit is instituted for each exercise. Given this maximum limit and the set-up time required between exercises, the manual skills assessment will take approximately a maximum of 30-45 minutes.

Scoring. For all exercises, both time and accuracy are considered important for performance and high scores result from exercises performed efficiently and without error. Each exercise is scored by a combination of time and accuracy measures that are adjusted so that each exercise contributes equally to the summed total score. FLS test proctors are trained in the scoring procedure, and scores and disposables are sent to the SAGES Office to ensure scoring accuracy. The test proctor administrator is not able to answer questions regarding content. If you have a question on content a formal report can be filled out by the administrator and forwarded to SAGES along with the assessment data.

Score Reporting

Typically, score reports will be mailed approximately two to three weeks after of the testing date. For privacy reasons, scores will not be transmitted by telephone or facsimile. The FLS score report indicates your cognitive and manual skills scores, states the passing scores for each assessment and indicates which assessments you passed and/or failed. Both assessments must be successfully passed prior to receiving the FLS Certificate of Completion.

Review of Scores. The computer scores the cognitive assessment and the information is reviewed when sent to the SAGES office. Scoring for the manual skills assessment is performed by trained personnel and has been carefully researched. For both assessments, the records of failed assessments are automatically reviewed prior to notification. Normal handling provides for several scoring checks and inaccuracy is extremely remote. Assessment appeals must be filed with the FLS office in writing within six months of receiving the score.

FLS Testing and FLS Test Centers

Because FLS is a standardized and validated high-stakes exam a trained FLS proctor must be present to administer the exam and it must be given on the FLS Trainer Box. For a list of current FLS Test Centers please visit www.flsprogram.org.

FLS Public Registry

Upon successful completion of the FLS test, SAGES will publish your name, year of FLS completion and NPI number if applicable on a Public Registry. The FLS Registry will not list FLS exam scores, if one or more attempts were needed to successfully complete the exam, any test takers who have purchased the FLS program but have not yet taken the exam, or the names of anyone who has taken the exam but not yet achieved a passing score. If you do NOT wish to be listed on the FLS Registry, you will need to make sure you make that selection on your FLS Voucher.

If you want to learn more about the NPI, visit https://www.cms.gov/nationalprovidentstand/01_overview.asp. If you want to locate your NPI or apply for a NPI, visit <https://nppes.cms.hhs.gov/nppes/npiregistryhome.do>. If you do not have an NPI, the FLS Registry will still list your name as having completed the FLS exam and show "NPI not applicable". Any test taker, after making the original decision to opt in or opt out of the FLS Registry, may contact our office to change their decision, to take effect in the next periodic update of the FLS Registry.