

Academic proposal from the Mexican Association of General Surgery for establishing a referral program for the training of the general surgeon in Mexico

Propuesta académica de la Asociación Mexicana de Cirugía General para establecer un programa de referencia para la formación del cirujano general en México

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ABSTRACT

Introduction: medical education has evolved from topically focused programs to one focused on quality outcomes and competencies. Different models and educational content have been suggested to train general surgery specialists worldwide. However, in Mexico, there is only one program for all the training centers for specialists in general surgery, which has given rise to a vast heterogeneity of educational quality levels and clinical results in our country. **Objective:** to structure an academic program that serves as a reference for all academic institutions that train specialists in general surgery in our country. **Material and methods:** the development of the proposed reference program for the training of general surgeons (PRFCG) consisted of five phases: 1) review and integration of the best structured national and international programs by a committee; 2) review and consensus by academic professors, experts, and associates of the initial program; 3) review and consensus through Delphi methodology (consensus > 75%) by working tables that worked remotely before the XVIII National Surgeon's Meeting; 4) presentation and discussion of the results of these working groups at the XVIII Meeting; and 5) presentation and dissemination of the PRFCG at the XLVI International Congress of Surgery held in the city of Merida, Yucatan, as well as to the competent authorities of the National Autonomous University of Mexico to propose its integration into the single program of medical specialties. **Results:** the final product of this process was consolidated with the support

RESUMEN

Introducción: la educación médica ha evolucionado desde programas centrados en tópicos, hasta la que se enfoca en la calidad de los resultados y competencias. Diferentes modelos y contenidos educativos han sido sugeridos para la formación de médicos especialistas en cirugía general en todo el mundo. Sin embargo, en nuestro país no existe un programa único para todas las sedes formadoras de especialistas en cirugía general, lo que ha dado pie a una amplia heterogeneidad de niveles de calidad educativa, así como de resultados clínicos en nuestro país. **Objetivo:** estructurar un programa académico que sirva como referencia para todas las instituciones académicas formadoras de médicos especialistas en cirugía general de nuestro país. **Material y métodos:** el desarrollo de la propuesta del programa de referencia para la formación de cirujanos generales (PRFCG) constó de cinco fases: 1) revisión e integración de los programas nacionales e internacionales mejor estructurados por un comité; 2) revisión y consenso hecho por profesores académicos, expertos y asociados de la propuesta del programa inicial; 3) revisión y consenso mediante la metodología Delphi (consenso > 75%) por mesas de trabajo que trabajaron a distancia previo al XVIII Encuentro Nacional del Cirujano; 4) presentación y discusión de los resultados de estas mesas en el XVIII Encuentro; y 5) presentación y difusión del PRFCG en el XLVI Congreso Internacional de Cirugía que se llevó a cabo en la ciudad de Mérida, Yucatán, así como ante las autoridades competentes de la Universidad Nacional Autónoma de México para proponer su integración en el Programa Único de Especialidades

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and participation of more than 200 professors and experts, 620 associates, 14 coordinators, and 54 experts who worked for the creation of a program with 27 cognitive units, nine transversal competencies, eight attitudinal competencies, 21 rotations, 92 surgical procedures proposed in a logbook, as well as five reliable professional activities (APROC) as part of the PRFCG. The complete program is contemplated for four-year training with a flexible academic structure. **Conclusions:** this PRFCG refers to “standardizing” the minimum academic elements necessary for training a general surgery specialist. The mission of this project is not to impose a program but to facilitate, through different means, a surgical education of the highest quality within the reach of all Mexicans with the support of the Mexican Association of General Surgery, A.C. (AMCG).

Médicas. Resultados: el producto final de este proceso se consolidó con el apoyo y participación de más de 200 profesores y expertos, 620 asociados, 14 coordinadores y 54 expertos que trabajaron para la creación de un programa con 27 unidades cognitivas, nueve competencias transversales, ocho actitudinales, 21 rotaciones, 92 procedimientos quirúrgicos propuestos en bitácora, así como cinco actividades profesionales confiables (APROC) como parte del PRFCG. El programa completo está contemplado para un entrenamiento de cuatro años con una estructura académica flexible. Conclusiones: se presenta este PRFCG como una referencia con la intención de “estandarizar” los elementos académicos mínimos necesarios para la formación del especialista en cirugía general. La misión de este proyecto no es imponer un programa, sino facilitar a través de diferentes medios una educación quirúrgica de la más alta calidad al alcance de todos los mexicanos con el apoyo de la Asociación Mexicana de Cirugía General, A.C. (AMCG).

Abbreviations:

AMCG = Mexican Association of General Surgery, A.C.
 APROC = reliable professional activities.
 ATLS = life support to the polytraumatized patient.
 CMCG = Mexican Council of General Surgery, A.C.
 EPA = entrustable professional activities.
 FES = Fundamentals of Endoscopic Surgery.
 FLS = Fundamentals of Laparoscopic Surgery.
 IMSS = Mexican Social Security Institute.
 ISSSTE = *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*.
 PEMEX = *Petróleos Mexicanos*.
 PRFCG = reference program for the training of general surgeons.
 PUEM = unique program of medical specialties.
 SEDENA = Secretary of National Defense.
 ICU = Intensive Care Unit.
 UNAM = National Autonomous University of Mexico.

INTRODUCTION

The programs for the training of resident physicians in general surgery have evolved over the years as they have been impacted by pedagogical and didactic trends that have also been changing.¹⁻³ These models have migrated from one centered on student learning or knowledge to models focused on quality patient care and reliable, high-quality professional activities.⁴⁻⁸ Medicine has shifted from being exclusively focused on diagnosis and treatment to being focused on the clinical outcomes of the patients that this professional practice impacts.^{9,10}

In recent years, with the advent of the competency-based education model,^{10,11} training programs have been integrated in different parts of the world,^{12,13} as the USA,^{14,15} Canada,⁹ Europe,¹⁶ and Australia.^{17,18} The components of this model, which aims not only a significant learning in the cognitive area but also practical, emotional, motor, and disciplinary skills that integrate an optimal and pragmatic professional behavior of the specialist in general surgery.

A surgeon's competence to obtain good results is not only an educational element but a fundamental and moral commitment in the surgeon's relationship with his/her patient.¹⁹ Moreover, these competencies can be operationalized and evaluated objectively when linked to the results, quality of the procedure, as well as the professional activities of each surgeon.^{20,21}

This program presents a flexible model based on competencies. It is structured based on the unique medical specialties (PUEM) program issued by the National Autonomous University of Mexico (UNAM) and 27 high-quality national and international programs for training specialists in General Surgery. This flexible model is based on four core competencies that every general surgeon should ideally have upon residency completion, in addition to a professional portfolio of evidence to support these competencies. The

competencies and portfolio that make up this program are detailed below:

1. **Disciplinary competencies** (specific to the specialty or area of knowledge such as rotations in other services, hospitals, and areas of medical or biomedical specialty).
 - a. **Cognitive or theoretical competencies** (or introductory and advanced knowledge that previously structured the academic programs of the residency).
 - b. **Motor or procedural competencies** (which characterize the general surgeon when contrasted with other medical specialties and should be evaluated similarly to the cognitive level).
 - c. **Rotations** (some rotations in different areas are suggested to acquire additional competencies).
 - d. **Attitudinal competencies** (cognitive and motor skills specific to this specialty and other branches of medical sciences recommended to be included in general surgery resident training, such as ATLS, FLS, FES, and others).
2. **Transversal competencies** (which are not exclusive to the surgical specialty, but any physician or citizen should have, such as ethics, professionalism, and collaboration).
3. **The professional portfolio** should contain the evidence that proves the above competencies and periodic evaluations.

According to all the professionals who participated in structuring this program, these competencies are specific functions of the general surgeon. All the opinions were integrated into five phases within the collaboration between the *Asociación Mexicana de Cirugía General, A.C.* (AMCG) and the *Consejo Mexicano de Cirugía General, A.C.* (CMCG).

Objectives

1. To structure an academic program that serves as a reference to “standardize” the minimum educational elements necessary for all academic institutions that train medical specialists in general surgery in our country.

2. To reach a consensus among all the experts and professors associated with the AMCG (and some external advisors) on the areas of knowledge, disciplines, and competencies that a general surgeon should learn and master.

MATERIAL AND METHODS

The development of this proposal for the PRFCG had five phases:

Phase 1. In this phase, a committee composed of the presidents and coordinators conducted a careful, thorough, and extensive review of all the existing curricular programs for the training of resident physicians in the specialty of general surgery in Mexico ($n = 15$), USA, Canada,²¹ Australia, Europe, and other countries.^{6,13} These programs were contrasted with our country’s most commonly used program, the PUEM, for general surgery, which served as a starting point and baseline reference. The programs were edited to eliminate redundancies, repeated topics, or topics that are no longer current.

Phase 2. The final proposal of the first phase was initially exposed to all invited professors, chiefs of teaching, and academic surgeons (who are known as opinion leaders in surgical education) from all academic units that train specialists in general surgery and from all over the country, to criticize and provide feedback on the survey. In an initial approach, these guests were selected by the university, faculty, or hospital, trying to seek federal and regional representativeness. Subsequently, the same survey was launched to all the associates of the AMCG, again seeking federal representativeness and representation of the private and public health sectors (Mexican Social Security Institute [IMSS], Ministry of Health, Institute of Security and Social Services for State Workers [ISSSTE], Ministry of National Defense [SEDENA] and *Petróleos Mexicanos* [PEMEX]). The database was cleaned with these experts’ suggestions, comments, and corrections.

Phase 3. The program was divided into the different competencies proposed in the PRFCG, and seven working groups were formed, which

met online or in person for three months to discuss each of the program sections to modify or correct it. The Delphi methodology was used as a strategy until a consensus of at least 75% of the experts invited to each working table was reached as a condition for the plan to be integrated.

Phase 4. The program proposed in phase three was reviewed by each of the coordinators of the working tables, four with the final decisions of each of the sections of the PRFCG in the XVIII National Meeting of the Surgeon, on May 11, 2022, within the facilities of the AMCG in Mexico City. The final observations were integrated into a definitive document.

Phase 5. The final edition of the document as a product of the XVIII National Meeting of Surgeons 2022, where the observations of all the participants in this meeting were integrated. The PRFCG was presented during the activities of the XLVI International Congress of Surgery held in the city of Merida, Yucatan, as well as to the competent authorities of the UNAM, to propose its integration into the PUEM for the teaching of general surgery in our country.

To collect the opinion of all associates and professors, we used online surveys through the Survey Monkey platform[®]. Each table worked on the different competencies and portfolio of pieces of evidence using the Delphi methodology, and included in the final program were only those elements voted by more than 75% of the members. The final consensus was presented by the coordinators of each working table at the XVIII National Meeting of Surgeons.

Each competency was structured according to a list of units, modules, topics, subtopics, and subtopic categories, for the four-year duration of the general surgery residency.

RESULTS

In **phase 1**, four core competencies (cognitive/theoretical knowledge; disciplinary/rotations; motor/procedural; transversal and attitudinal) and a professional portfolio (containing evidence of competencies acquired at different levels of mastery) were integrated into a school-based academic program on a four-year calendar. *Figure 1* shows the general distribution

of a standard three-year program and “flexible” in the last fourth year. Both cognitive and procedural or motor competencies were classified according to Bloom’s degree of difficulty or category for the digital age.

In **phase 2**, 204 teachers and teaching managers responded to the survey. In this same phase, the survey was also sent to all associates; approximately 770 responded to the study. The federal representativeness and by health care sector that responded to the survey is shown in *Figure 2*. This national representative consisted of 619 individuals (80.38%) who did respond to this question. As can be seen in *Figure 2*, most of the surgeons surveyed who responded were from Mexico City, followed by the State of Mexico, Jalisco, Nuevo Leon, and Guanajuato. The remaining states were represented by 5% or less of the total. As can also be seen in this figure, all the major health sectors of the country were represented in the survey.

In **phases 3 and 4**, the product of the working tables before and during the XVIII National Meeting of the Surgeon 2022 resulted in significant changes in the program. Approximately 60 experts were invited to this meeting, organized in seven working tables with an average of six surgeon educators, professors, or experts, plus two coordinators per table and nine general event coordinators. The complete list of participants in the event is in the acknowledgments at the end of the article.

Phase 5. The final edition of the document resulting from the XVIII National Meeting of Surgeons 2022 was completed, integrating all the observations of all the participants of this meeting. The PRFCG was presented during the activities of the XLVI International Congress of Surgery held in the city of Merida, Yucatan, as well as to the competent authorities of the UNAM to propose its integration in the PUEM for the teaching of general surgery in our country.

The general concept of this program includes standard competencies (previously considered mandatory) and “flexible” competencies (previously optional and now depending on the scope of each program and host hospital) that the residents themselves

can select according to their plans for professional development after obtaining the degree of specialist in general surgery. This way, the residents will be able to adapt to the program depending on whether they want to conclude as general surgeons or enter some other sub or high specialty, in which they will not necessarily need to acquire all the available skills but the particular ones for the following academic degree. In general, they can be classified in the next final items in two professional competencies whose evidence is integrated into a portfolio:

1. Disciplinary competencies (which are subdivided into three competencies specific to the specialty or area of knowledge):
 - a. **Cognitive** competencies.
 - a.1. Systemic response to surgical trauma.
 - a.2. Liquids and electrolytes.
 - a.3. Hemostasis, bleeding, and transfusion medicine.
 - a.4. The surgical wound.
 - a.5. Surgical infectious diseases.
 - a.6. General aspects of surgery and the surgical patient.
 - a.7. Surgical nutrition.

- a.8. Professional profile and competencies of the general surgeon.
- a.9. Trauma surgery.
- a.10. Skin and subcutaneous adipose tissue surgery.
- a.11. Oncology surgery.
- a.12. Gastrointestinal surgery (upper gastrointestinal tract).
- a.13. Colorectal surgery (lower gastrointestinal tract).
- a.14. BPH (benign prostate hypertrophy) surgery.
- a.15. Endocrine surgery.
- a.16. Head and neck surgery.
- a.17. Spleen.
- a.18. Breast surgery.
- a.19. Urology.
- a.20. Bariatric surgery.
- a.21. Obstetrics and gynecology.
- a.22. Plastic and reconstructive surgery.
- a.23. Vascular surgery.
- a.24. Thoracic surgery.
- a.25. Neurosurgery.
- a.26. Transplant surgery.
- a.27. Pediatric surgery.
- b. **Procedural or motor** skills (92 procedures).

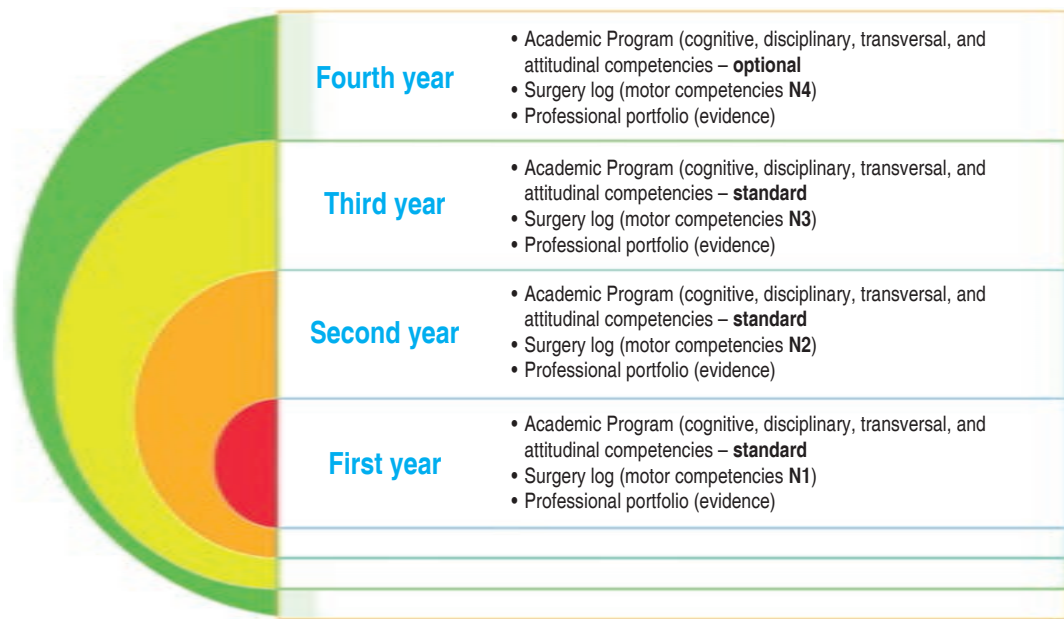


Figure 1:
Calendarized structure of the PRFCG with standard competencies in the first three years and optional competencies in the fourth year.

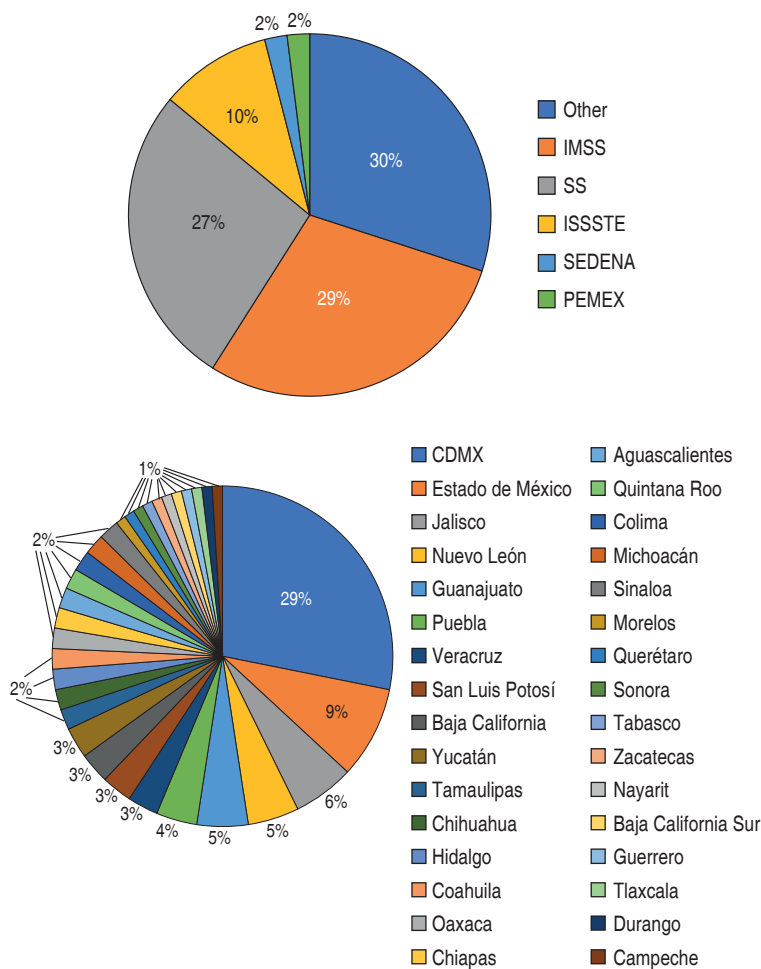


Figure 2: Federal representativeness and according to the health care sector of the surgeons associated with the AMCG who answered the survey.

- b.1. Recommended procedure log at a minimum (P_{25}).
- b.2. Recommended log of procedures as satisfactory (P_{50}).
- b.3. Recommended procedure log as ideal (P_{95}).
- b.4. Recommended procedure log as a total (P_{100}).
- c. **Attitudinal** competencies.
 - c.1. Priority decision-making in the polytraumatized patient (ATLS).
 - c.2. Safety systems in surgical environments.
 - c.3. Performance and care of ostomies in the Intensive Care Unit (ICU), emergency department, and hospitalization.
- d.4. Laparoscopic skills (FLS or analogous).
- d. Basic.
- e. Advanced.
 - e.1. Basic skills of microsurgery.
 - e.2. Patient safety in complex situations in different surgical environments.
 - e.3. Basic and advanced endoscopic skills (FES or analogous).
 - e.4. Effective interactions with other clinical and surgical healthcare team members.
2. **Transversal** competencies (not exclusive to the specialty or area of knowledge, but essential for the practice of the discipline).
 - a. Surgical epidemiology and public health.
 - b. Surgical research.
 - c. Surgical ethics.
 - d. Medical education and teaching.
 - e. Professionalism and communication.
 - f. Systems-based learning.
 - g. Legal aspects of surgical practice.
 - h. Economics and financial aspects for the surgeon general.
 - i. Basic concepts of hospital and equipment management.
3. Professional portfolio (evidence that proves the acquisition of the different competencies that integrate the program).
 - a. Cognitive or theoretical competencies.
 - b. Transversal competencies.
 - c. Attitudinal competencies.
 - d. Motor or procedural competencies.
 - e. Disciplinary competencies or rotations.
 - f. Entrustable Professional Activities (APROC) or Entrustable Professional Activities (EPA).
 - f.1. Inguinal hernia.
 - f.2. Appendicitis.
 - f.3. Cholecystitis.
 - f.4. Trauma.
 - f.5. General surgery consultation.

The complete details and contents of each of the competencies (cognitive, transversal, attitudinal, motor, and disciplinary), as well as the resident's professional portfolio, can be requested from the general coordinator of the meeting.

The authors authorize the unrestricted use of this information for academic purposes only.

CONCLUSIONS

The purpose of the XVIII National Meeting of the Surgeon AMCG 2022 was to structure and generate a curricular program that will serve as a reference for all the programs and centers that train specialists in general surgery in our country. The product of the working groups can be summarized in four competencies (cognitive, procedural, or motor, attitudinal, and transversal), as well as a professional portfolio of evidence of these integrated competencies. This academic program can be adjusted to educational and hospital levels and infrastructures. The primary intention is to try to “standardize” the minimum theoretical elements necessary for any medical specialist who wants to train in the specialty of general surgery by serving as a “reference” of the plans that must be covered before graduation to have an equitable national competitiveness in all the federal entities and academic centers. The mission of this work was not to impose a program, but to facilitate, through different means and programs, a surgical education of the highest quality for all Mexicans with the support of the AMCG.

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Ethical considerations and responsibility: data privacy. According to the protocols established in our work center, we declare that we have followed the protocols on patient data privacy and preserved their anonymity.

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