



White Book

Core Surgical Curriculum



**Swiss College
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1 INTRODUCTION

1.1 Background

In August 2017, several surgical societies founded the *Swiss College of Surgeons* (SCS). One of the main goals of the SCS is the creation of a *Core Surgical Curriculum* (CSC) with the intent to harmonize the training of the first two years of residency for all participating surgical specialties in Switzerland in order to ensure high quality patient care.

This need for harmonization came from several observations. Firstly, there are systematically one or two compulsory years of general surgery in the post-graduate training programs of the surgical specialties that are members of the SCS. Secondly, junior residents starting their first year of postgraduate training have a good theoretical background but the application of this knowledge in clinical practice often remains problematic. They are drowning in the midst of the daily tasks and administrative burden they face. Finally, the current training allows some residents to progress in the surgical field despite major shortcomings in the knowledge of basic pathophysiology of surgical diseases.

Thus, these different reflections have led to the development of the CSC. The CSC covers the initial period of postgraduate training necessary to acquire the knowledge and skills underlying the general bases of safe surgical practice on the ward and in the operating room. This new core syllabus will prepare young surgeons for their subsequent specialization, defined by the different surgical societies of the SCS.

In March 2017, the introduction of the new PROFILES (Principal Relevant Objectives and Framework for Integrated Learning and Education in Switzerland)¹ changed the vision of pre-graduate medical training: In addition to the skills defined by the CanMEDS reference framework², the PROFILES requirements are based on two new concepts that will have important implications for the CSC: the EPAs (Entrustable Professional Activities)³ and the SSP (situations as starting point)¹. Indeed, basic sciences and basic medical knowledge are no longer explicitly mentioned, with the intent to stimulate intellectual autonomy and foster a holistic view of medical practice. Because PROFILES are in English, the CSC was also written in English.

The CSC has been developed with a similar philosophy in mind in order to meet future challenges.

Providing excellent care to surgical patients focused on both the surgical and medical aspects, with empathy and kindness, as well as ensuring patient safety are at the heart of the CSC.

1.2 Goals of the CSC

At the end of the two years of the CSC, the junior resident must have acquired the theoretical knowledge as well as the clinical and technical skills to manage a surgical patient in the pre-, peri- and postoperative periods. The resident must also demonstrate the ability to manage frequent medical and surgical complications as well as to manage a patient in an emergency department with a surgical condition. The objectives are defined within the CSC.

It should be emphasized that the CSC requires a professional approach from the junior residents. They are expected to develop a critical and inquisitive mind. The different courses provide basic concepts. Reading current surgical literature, privileging evidence-based medicine and good practice, is recommended to complete their knowledge. The responsibility for training and completion of the CSC program lies with the resident.

1.3 Structure and courses of the CSC

In order to achieve these objectives, the CSC will provide residents with a series of theoretical and practical courses. The aim is not to repeat topics previously taught in the pre-graduated period, but to build upon these theoretical bases and integrate them into the resolution of daily practice cases.

The concept is that physiopathology, anatomy and the ability to make a differential diagnosis are already acquired. The CSC focuses on clinical reasoning, on the ability to initiate an assessment (biological, paraclinical and radiological) as well as the initial management of the surgical patient.

A list of preoperative, perioperative and postoperative objectives as well as a section of legal, administrative and communication aspects were developed.

The curriculum will be organized as follows:

a. In hospitals-courses (numbering highlighted yellow)

Some courses (small-group work or practical skills) will be taught directly at the hospital/surgical department where the resident works. A precise description of the content will be provided to the local doctors in charge of the course in order to standardize practices.

b. Centralized day-courses (numbering highlighted blue)

Most of the courses will take place during congresses or dedicated days. The specialty courses (basic internal medicine, anesthesia, intensive care and "hot topics" of surgery) will be given in the form of theoretical courses / clinical cases / small-group work. To cope with the complexity of resident's schedule and available training days, these courses will be given twice a year to allow everyone to attend. The head of department

will be notified and asked to release their 1st and / or 2nd year residents from clinical duties so they can complete the full program during these two years.

c. **Computer supported courses.** (numbering highlighted green)

Mainly E-Learning.

Swiss doctors of varied level of expertise (resident, consultant and department head) and from various Swiss hospital (different cantons and different sizes) formed the support group. The different specialties of the founding members of the SCS were equally represented. This support group and the SCS committee validated the content of the CSC.

Medical doctors trained and specialized in medical education were involved in order to identify the appropriate pedagogical tools for each type of training. The courses are based on a similar frame: short theoretical reminder including the fundamentals followed by a series of clinical cases and finally multiple choice questions that the junior residents can answer anonymously and live via a smartphone application. These courses have the advantage of stimulating interaction and reflection. Sessions will also be dedicated to clinical cases only, which will integrate different pathologies and knowledge.

EPAs will be integrated as well. Currently it is evaluated if EPAs are integrated in post-graduate training by the SWIF (Schweizerische Institut für ärztliche Weiter- und Fortbildung; L'Institut suisse pour la formation médicale postgraduée et continue (ISFM); L'Istituto svizzero per la formazione medica (ISFM)). A working group has been set up for this purpose.

1.4 Validation

Courses, whether given during a congress or in-hospital, will be validated by a system of credits. In order to validate the CSC, the resident must have obtained all necessary credits from the courses and must have successfully passed the basic examination of surgery (www.basisexamen.ch). It is recommended to take the basic examination at the end of the CSC, e.g. after two years of residency.

2 LEARNING OBJECTIVES / SECTIONS

The acquisition of the principles and objectives included in PROFILES are a prerequisite for starting the CSC. As a reminder, the purpose of PROFILES is to describe what is expected of a doctor holding a federal degree on the first day of residency. The CSC builds upon this.

The learning objectives are organized in several modules. The sections cover the pre-, peri- and postoperative care of the surgical patient.

Blue: courses

Green: e-learning

Yellow: Hospital

2.1 Preoperative care of the surgical patient

This section includes objectives related to the entire pre-operative approach. From patient information about surgical techniques and their risks to management of patients' medications through global surgical evaluation of the patient.

	2.1 Preoperative care of the surgical patient
Objective	2.1.1 To obtain informed consent 2.1.2 To assess the surgical patient 2.1.3 To know and apply the different prophylaxis principles
Knowledge	<p>Informed consent:</p> <p>2.1.4 To know the legal basis of an informed consent (elective surgery, emergencies, and advance directives)</p> <p>2.1.5 To know and explain the most common risks of a surgical procedure</p> <p>2.1.6 To evaluate a patient's capacity for discernment</p> <p>Assessment of patient:</p> <p>2.1.7 To assess patient's level of fitness and exclude contraindications for surgery (e.g. ASA score)</p> <p>2.1.8 To assess surgical risk</p> <p>2.1.9 To request the correct blood test</p> <p>2.1.10 To request the correct imaging modality</p> <p>Prophylaxis:</p> <p>2.1.11 Thromboembolism</p> <p>2.1.12 Antibiotic</p> <p>2.1.13 Vaccination (tetanus, S.pneumonia, N. meningitides)</p> <p>2.1.14 Protective measures against transmissible pathogens (hepatitis, HIV, MRSA/ESBL/VRE, TB, ...)</p>

Clinical skills	2.1.15 To obtain informed consent for surgery 2.1.16 To obtain accurate history and perform clinical examination of a patient from a medical and surgical standpoint 2.1.17 To interpret pre-operative investigations 2.1.18 To manage comorbidities 2.1.19 To safely prescribe medications used for the treatment of chronic diseases and modify them appropriately for the perioperative period
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2.2 Perioperative care of the surgical patient

This section focuses on perioperative management including local anesthesia and principles of general anesthesia. Quality control and security tools are also part of this section.

	2.2 Perioperative care of the surgical patient
Objective	2.2.1 To know the ground principles of anesthesia, analgesia and sedation 2.2.2 To evaluate and choose the best surgical approach (e.g. open or laparoscopically; anterior or posterior to the femur,...) 2.2.3 To understand patient's security and quality control
Knowledge	Principles of anesthesia, analgesia and sedation: 2.2.4 To know the main local anesthetic agents, their indications and contraindications, their administration 2.2.5 To know the basic principles of general anesthesia 2.2.6 To know the principles of sedation, its indications and contraindications 2.2.7 To anticipate the adverse events related to the use of anesthetic agents Surgical site approach: 2.2.8 To know the different surgical approaches and their relevant anatomical considerations Patient's security and quality control: 2.2.9 To know the available tools (WHO checklists, CIRS, morbidity & mortality)
Clinical skills	2.2.10 To safely administrate the appropriate local anesthetic agents 2.2.11 To choose the best surgical approach 2.2.12 To use the available tools for patient's security and for quality control 2.2.13 Filling in of WHO checklist (time out and sign out)

2.3 Postoperative care of the surgical patient

All the principles of postoperative pain management, wound management and nutrition are part of this section. There are also basic elements of intermediate and intensive care.

	2.3 Postoperative care of the surgical patient
Objective	<p>2.3.1 To know the principles of pain management</p> <p>2.3.2 To understand the repair and healing process of surgical wounds</p> <p>2.3.3 To demonstrate the relevant knowledge regarding intensive or intermediate care</p> <p>2.3.4 To assess and plan perioperative nutritional management</p> <p>2.3.5 To plan and advise patient at hospital discharge</p>
Knowledge	<p>Pain management:</p> <p>2.3.6 To understand the pathophysiology of pain and the types of pain</p> <p>2.3.7 To know the common analgesics</p> <p>2.3.8 To understand the indication for and the execution of (loco-) regional analgesia, including epidural</p> <p>Wound healing knowledge:</p> <p>2.3.9 Classifications of surgical wounds. Pathophysiology of wound healing</p> <p>2.3.10 Factors influencing wound healing</p> <p>2.3.11 Principles of wound management</p> <p>2.3.12 Scars and contractures</p> <p>2.3.13 Surgical site infection (superficial or deep)</p> <p>2.3.14 Empiric antibiotic management</p> <p>2.3.15 Burns</p> <p>2.3.16 Pressure sores (pressure ulcers)</p> <p>2.3.17 Management of loss of substance</p> <p>2.3.17.1 Plasty and skin flaps</p> <p>2.3.17.2 Skin grafts</p> <p>Intensive and intermediate cares-related knowledge:</p> <p>2.3.18 Shock and its management</p> <p>2.3.18.1 Distributive (septic, anaphylactic, spinal)</p> <p>2.3.18.2 Cardiogenic (ischemic, rhythmic, valvular)</p> <p>2.3.18.3 Volemic (hemorrhagic, burn patient)</p> <p>2.3.18.4 Obstructive (tamponade, tension pneumothorax)</p> <p>2.3.19 Fluid resuscitation</p> <p>2.3.20 Noninvasive ventilation</p> <p>Nutrition:</p> <p>2.3.21 Methods of screening and assessment of nutritional status (NRS score, Kondrup,..)</p> <p>2.3.22 Options for preoperative renutrition</p> <p>2.3.23 Caloric (proteins and fat), fluid and micronutrient needs</p> <p>2.3.24 Metabolic responses (catabolic response, use of metabolic support, endocrine changes, ...)</p> <p>2.3.25 Refeeding syndrome. Effects of malnutrition</p> <p>2.3.26 Methods of enteral and parenteral nutrition</p> <p>2.3.27 Stoma and stool regulation after surgery</p> <p>Discharge:</p> <p>2.3.28 To properly instruct patient at discharge</p> <p>2.3.29 To know the legal implications of work certificate</p>

Clinical skills	2.3.30	To prescribe post-operative analgesia appropriately and effectively
	2.3.31	To recognize and manage surgical site infections (superficial and deep)
	2.3.32	To detect impending organ failure
	2.3.33	To initiate management of organ failure
	2.3.34	To initiate suitable artificial nutritional support (vascular access, consultation with nutritionist, etc)

2.4 Medical and surgical postoperative complications

This section includes the post-operative management of patients with medical complications and their treatment.

	2.4. Medical and surgical postoperative complications	
Objective	2.4.1	To demonstrate understanding of the medical principles for each of the medical conditions described below
	2.4.2	To demonstrate relevant knowledge, skills and attitude in assessing patients in the postoperative period including assessment of common medical and surgical complications
	2.4.3	To manage postoperative patient care and initiate the relevant treatments
Knowledge	Cardiac:	
	2.4.4	Arrhythmias
	2.4.5	Ischemia
	2.4.6	High blood pressure
	2.4.7	Basic hemodynamics
	2.4.7.1	Assessment of volume status and volume management
	2.4.7.2	Crystalloids versus blood products
	2.4.7.3	Use of diuretics
	2.4.8	Cardiac decompensation
	Pulmonary:	
	2.4.9	Respiratory failure
	2.4.9.1	Pleural effusion
	2.4.9.2	Atelectasis
	2.4.10	Pneumonia (community-acquired, nosocomial or aspiration).Pneumothorax
	2.4.11	Restrictive and obstructive syndromes
	Digestive:	
	2.4.12	Postoperative gastroparesis
	2.4.13	Postoperative ileus
	2.4.14	Postoperative hemorrhage
	2.4.15	High output stoma. Early post-operative stoma complications
	2.4.16	Abdominal compartment syndrome, anastomotic leakage
	Renal:	
	2.4.17	Renal failure (KIDGO or AKIN score)

	<p>2.4.18 Oliguria, anuria</p> <p>2.4.19 Urinary retention</p> <p>2.4.20 Electrolyte balance disorders</p> <p>2.4.21 Homeostasis of the intracellular environment</p> <p>2.4.22 Renal toxicity of drugs and contrast product</p> <p>Infectious:</p> <p>2.4.23 SIRS, Bacteremia, sepsis and septic shock, initiation of empiric antibiotic therapy and its adaptation</p> <p>Hematological:</p> <p>2.4.24 Coagulation disorders</p> <p>2.4.25 Thrombopenia (spoliation, sequestration, HIT)</p> <p>2.4.26 Anemia (spoliation, inflammation, hemolytic)</p> <p>2.4.27 Antiaggregants and anticoagulants and their reversal</p> <p>2.4.28 Deep venous thrombosis and pulmonary embolism</p> <p>2.4.29 Transfusions of blood products: indications, management of complications</p> <p>Diabetology/endocrinology:</p> <p>2.4.30 Diabetic decompensation</p> <p>2.4.31 Oral antidiabetic and insulin</p> <p>2.4.32 Corticosteroid insufficiency and management of corticosteroid therapy</p> <p>2.4.33 Dysthyroidism</p> <p>Neurologic:</p> <p>2.4.34 Acute confusional state (hyper- or hypoactive)</p> <p>2.4.35 Alcohol withdrawal/ delirium tremens</p> <p>2.4.36 Prevention of nerve damage by malposition</p> <p>2.4.37 Reactive depression</p>
Clinical skills	2.4.38 To promptly recognize a medical and surgical postoperative complication and initiate the appropriate treatment

2.5 Common acute surgical conditions

The most common surgical complications to be known are included in this section.

2.5 Common acute surgical conditions	
Objective	<p>2.5.1 To understand the basic medical principles for each of the medical conditions described below</p> <p>2.5.2 To demonstrate the relevant knowledge, skills and attitudes in assessing the patient in the postoperative period including the assessment of common surgical complications</p> <p>2.5.3 To be able to establish a differential diagnosis when facing one of the conditions described below</p>
Knowledge	2.5.4 Abdominal pain/acute abdomen

	<p>2.5.5 Respiratory failure / dyspnea</p> <p>2.5.6 Acute swelling of a limb (including septic arthritis and deep infection)</p> <p>2.5.7 Ischemia of a limb or a finger</p> <p>2.5.8 Fracture, articular dislocation or wound with neuro deficit</p> <p>2.5.9 Postoperative bleeding</p> <p>2.5.10 Compartment syndrome (limb, hand)</p>
Clinical skills	2.5.11 To recognize a common acute surgical situation, establish a differential diagnosis and initiate the relevant treatment

2.6 Management of the dying patient

This module includes objectives about end of life and the importance of the resuscitation status.

2.6. Management of the dying patient	
Objective	<p>2.6.1 To be able to explain medico-surgical situation to the patient and his/her next of kin and address resuscitation status (cardio-respiratory resuscitation, transfer to ICU, use of invasive devices like mechanical ventilation, kidney replacement therapy, ECMO) and the limitations and possible complications of those treatments</p> <p>2.6.2 To demonstrate adequate knowledge and clinical skills to manage the transition from life to death including palliation of symptoms, certification of death and discussion of organ donation</p>
Knowledge	<p>2.6.3 To be aware of the public debate around resuscitation and palliative care, and organ donation</p> <p>2.6.4 Management of palliative drugs</p> <p>2.6.5 The role of death certificate (legal implications)</p>
Clinical skills	<p>2.6.6 To assess and control distress in the dying patient and his/her next of kin in collaboration with experts</p> <p>2.6.7 Diagnose death following irreversible cessation of brain-stem function</p> <p>2.6.8 Declare death and complete proper forms</p>

2.7 Communication and cognitive skills

Communicating with peers or families is not always an easy task. In this module, the theoretical bases will be described.

2.7 Communication and cognitive skills

Objective and knowledge	<p>Communication with colleagues, nursing staff and administration:</p> <p>2.7.1 To understand patient and relatives emotional distress and use empathy</p> <p>2.7.2 To benefit from multidisciplinary work (nurse, others medical domains) to improve Communication with patients and family</p> <p>2.7.3 To transmit a respectful and positive attitude</p> <p>Cognitive</p> <p>2.7.4 Imagination training / mental rehearsal</p> <p>2.7.5 Attention and emotion regulation</p> <p>2.7.6 Systemic / networked thinking (including also reflection and metacognition, problem solving)</p> <p>2.7.7 Verbalisation</p>
Clinical skills	<p>2.7.8 To establish a pleasant work-atmosphere for the benefit of healthcare workers and patients</p> <p>2.7.9 To respect others competencies and learn from them</p> <p>2.7.10 To create a team spirit (trust and mutual assistance)</p>

2.8 Legal and administrative aspects

Today, the legal and administrative aspects have an important place in daily clinical practice. Key points are included in this section.

	2.8 Legal and administrative aspects
Objective and knowledge	<p>2.8.1 Insurances</p> <p>2.8.2 TARMED pricing and ambulatory billing</p> <p>2.8.3 Principles of DRG</p> <p>2.8.4 Writing a prescription</p>
Clinical skills	2.8.5 To write a prescription correctly

2.9 Clinical Research

Clinical research is part of the work of a junior resident in a hospital, and conducting a proper literature search is useful for all who aim to practice evidence-based surgery. The key elements to familiarize the residents with this type of search are included in this module.

	2.9 Clinical research
Objective	<p>2.9.1 To be familiar with literature research, where to look for information, the various type of studies and their level of evidence</p> <p>2.9.2 To systematically and critically appraise a simple article</p>

2.10 Technical skills

This last module includes the practical part of the curriculum. A list of important skills that junior resident must be able to achieve has been developed.

	2.10 Technical skills
Technical skills	<p>2.10.1 Principles of electrocoagulation</p> <p>2.10.2 Use of staplers and other devices</p> <p>2.10.3 Principles of laparoscopic and endoscopic surgery</p> <p>2.10.3.1 Eye-hand coordination</p> <p>2.10.3.2 Camera navigation</p> <p>2.10.4 Closed reduction of fractures, plaster and dislocated joints reduction</p> <p>2.10.5 Incision of skin and subcutaneous tissue:</p> <p>2.10.5.1 Ability to use scalpel, cutting diathermy and scissors</p> <p>2.10.5.2 Control of superficial bleeding using diathermy and ligation</p> <p>2.10.6 Closure of skin, subcutaneous tissue and fascia</p> <p>2.10.6.1. Accurate and tension free apposition of wound edges</p> <p>2.10.6.2 Knot tying by hand and with instrument</p> <p>2.10.6.3 Proper fascia closure (laparoscopy and laparotomy)</p> <p>2.10.7 Wounds management (How to make a VAC, PICO)</p> <p>2.10.8 Local anesthesia (also for fingers)</p> <p>2.10.9 Use of drains: Indications, types, insertion, fixation and removal</p> <p>2.10.10 Surgical drainage of an abscess (any location)</p> <p>2.10.11 Urinary catheter and suprapubic catheter</p> <p>2.10.12 Chest tube</p> <p>2.10.13 Nomenclature of basic surgical instruments</p> <p>2.10.14 Range and choice of material for suture and ligation</p> <p>2.10.15 Effective hand washing, gloving and gowning</p> <p>2.10.16 Preparation of a patient for surgery</p> <p>2.10.16.1 Creation of a sterile field</p> <p>2.10.16.2 Antisepsis</p> <p>2.10.16.3 Safe positioning and draping</p>

3 References

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