

Institution: **King Saud University**

College/Department: **College of Medicine / Anaesthesia Department**

A. Course Identification and General Information

1. Course title and code: **045**

2. Credit hours **4 hours**
Theoretical - 1 hour
Clinical - 3 hours

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MBBS

4. Name of faculty members responsible for the course
- Dr. Jummana Baaj, Dr Fatma Al Dammas Undergraduate Committee.

5. Level/year at which this course is offered
4th Year Medical Students

6. Pre-requisites for this course (if any)
Basic Science Courses

7. Co-requisites for this course (if any)
None

8. Location if not on main campus
King Khalid University Hospital

B. Objectives (Main Outcomes)

1. Summary of the main learning outcomes for students enrolled in the course.

- 1- To know the role of anaesthetist in preoperative assessment and the implications of pre-existing disease for the patient who is to undergo anaesthesia.
- 2- To teach the basic airway and circulatory management in patients under anaesthesia including resuscitative measures as well as post-operative care.
- 3- To understand the clinical application of physiology and pharmacology in anaesthesia.
- 4- To understand the basic role of emergency room settings and how to manage common emergency room cases.
- 5- To understand some anaesthesia related problems and their management.
- 6- Students should acquire some clinical skills in patient assessments and to demonstrate competence in the performance of basic technical procedures related to anesthesia practice.

2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topics	No of Weeks	Contact hours
Please see topics listed below	2 weeks	4

Theoretical and Practical Activities in 045:

ACTIVITIES	OUTLINE
I. Theoretical Activities	<p data-bbox="483 342 987 373"><u>LECTURE CONTENTS / OUTLINE</u></p> <p data-bbox="483 422 1414 457">1-Role of anaesthetist in the preoperative care (1.30 hours)</p> <p data-bbox="483 499 1430 527">The student will learn pre-anesthetic patient evaluation and risk stratification.</p> <ol data-bbox="532 533 1453 877" style="list-style-type: none"> Obtain a full history and physical examination including allergies, current medications, past anesthetic history, family anesthetic history The medical student will understand how patient co-morbidities can affect the anesthetic plan. The medical student will be able to understand potential anesthetic options for a given surgical procedure. The medical student will be able to plan an anesthetic for a basic surgical procedure. The student will understand risk stratification of a patient undergoing anesthesia. <p data-bbox="483 884 1398 968">2-General objectives of the emergency room management (1.30 hours):</p> <ol data-bbox="532 1020 1377 1318" style="list-style-type: none"> Recognize and be aware of the basic management of common BLS and ACLS protocols. Gain experience in the evaluation and management of patients presenting to the ER for acute care. Developing proficiency with emergency procedures Expanding the knowledge in acute care medicine to include , Acute Chest pain, Trauma ,and shock management.. <p data-bbox="483 1413 1154 1449">3-General anaesthesia technique (2 hours)</p> <ol data-bbox="532 1486 1446 1808" style="list-style-type: none"> Definition of general Anaesthesia Learn about several agents used on induction of general anaesthesia including intravenous agents, inhalation agents, neuromuscular blocking agents and reversal agents. Understand basic advantages and disadvantages of these agents. Complications commonly encountered during general anaesthesia

4-Airway Management and equipment (2 hours)

- a) Learn about basic airway anatomy
- b) Conduct a preoperative airway assessment
- c) Identify a potentially difficult airway
- d) Understand the issues around aspiration and its prevention
- e) Learn about the management of airway obstruction
- f) Become familiar with airway equipment
- g) Practice airway management skills including bag and mask ventilation, laryngeal mask insertion, endotracheal intubation
- h) Learn about controlled ventilation and become familiar with ventilatory parameters
- i) Appreciate the different ways of monitoring oxygenation and ventilation

5-Regional Anaesthesia Techniques (2 hours)

- a) What are the risks and benefits of regional (epidural/spinal) anesthesia/analgesia?
- b) What are the contraindications to regional anesthesia?
- c) How do you prevent hypotension following epidural/spinal anesthesia?

Spinal Anaesthesia

- a) Describe the technique of spinal anesthesia.
- b) At what level does the adult spinal cord end?
- c) Name some of the surgical procedures that can be done with a spinal anesthetic.
- d) What are the contraindications to spinal anesthesia?
- e) What are the complications?
- f) Describe the patient's perception as spinal anesthetic takes effect.
- g) What are the expected cardiovascular changes associated with sensory level at T10? T1?
- h) What are the characteristics of post-lumbar puncture headache?
- i) How do the size and tip design of a spinal needle influence the incidence of post-puncture headache?
- j) How do you treat post-lumbar puncture headache?

Epidural Anaesthesia

- a) Discuss the differences between spinal and epidural anesthesia.
- b) What are the advantages and disadvantages of epidural compared to spinal anesthesia?
- c) Study the size and tip of the epidural needle.
- d) Name some of the surgical procedures that can be done with an epidural

anesthetic.

e) Compare and contrast lumbar and thoracic epidural anesthesia.

f) What role does epidural has for post-operative pain control?

g) Local Anesthetics Pharmacology and toxicity (Lidocaine, Bupivacaine)

6-Intravenous Fluid Resuscitation and Blood Transfusion(2 hours)

A. Fluid Requirements and Fluid Therapy

1. What perioperative factors affect the patient's fluid requirements?
2. How do you estimate maintenance fluid requirements?
3. What are some common conditions associated with preoperative fluid deficits?
4. List the potential physical and laboratory findings seen in a patient with a volume deficit.
5. How do you calculate the patient's preoperative fluid deficits?

B. Intravenous Fluids

• Crystalloids

1. What is the difference between normal saline, and Ringer's lactate?
2. What are the advantages and disadvantages of crystalloids?

• Colloids

1. What colloid preparations are available for clinical use?
2. What are some advantages and potential side effects of hetastarch?
3. When to use 5% or 25% albumin preparation in volume resuscitation?
4. When is plasma indicated?

C. Blood Products

1. What is the minimal acceptable hemoglobin? What factors affect the minimal acceptable hemoglobin level?
2. How do you calculate the acceptable blood loss during surgery?
3. What is the difference between autologous and banked blood?
4. What are the routine screening tests of banked blood?
5. What administration set do you use for red blood cell, plasma and platelet transfusion?
6. How much increase in Hb level do you expect from transfusing one unit of RBCs?
7. What side effects can occur with the transfusion of blood products?
8. What are the side-effects (potential complications) of massive or rapid blood transfusion?
9. What is the indication for the transfusion of fresh frozen plasma, cryoprecipitate, and platelets?

7- Monitoring During anaesthesia (2 hours)

Monitors : non-invasive blood pressure , ECG , pulse oximetry
capnography (CO2 monitor) and oxygen analyzer , temperature probe
nerve stimulator Specialized monitors :

arterial line (invasive blood pressure)

central venous line (cvp monitoring)

pulmonary artery flotation catheter (monitors function of right and left
side of the heart)

BIS monitor (depth of anesthesia)

8-Vascular Access (2 hours)

- a) Examine the construction of the commonly used venous catheters.
- b) Anatomical considerations regarding peripheral and central venous access.
- c) Discuss the choice of catheter size.
- d) Prepare and set-up an IV infusion set. Why do you need a gas-fluid level in the drip chamber?
- e) Discuss the choice of sites for placement of IV catheters.
- f) What are the different sites suitable for central venous catheter placement?
- g) Discuss universal precautions.
- h) Indications and complications of central venous access

9- Postoperative management (2hours)

- a. Learn a common approach to emergency medical problems encountered in the postoperative period.
- b. Study post-operative respiratory and hemodynamic problems and understand how to manage these problems.
- c. Learn about the predisposing factors, differential diagnosis and management of PONV.
- d. Understand the causes and treatments of post-operative agitation and delirium.

	<p>e. Learn about the causes of delayed emergence and know how to deal with this problem.</p> <p>f. Learn about different approaches of post-Operative pain management</p>
2. Practical Activities	<p>Operation Room:</p> <p><u>Enabling Objectives in the operative room</u></p> <p>General Anesthesia</p> <ul style="list-style-type: none"> • Anesthetic Machine: Identify the sources of oxygen, nitrous oxide and volatile agents; safety features • Be aware of the options for airway management in the anesthetized patient, Rapid Sequence Induction, and monitoring: • Recognize and be able to list a differential diagnosis of hypoxaemia and hypercarbia and the basic management of these problems. <p>Regional Anesthesia</p> <ul style="list-style-type: none"> • Be able to identify indications of regional anaesthesia , and patients for whom it is unsuitable. Be able to list advantages and disadvantages of regional versus general anaesthesia. • Know the difference between epidural and spinal anaesthesia. Know the contraindications and complications of these types of regional anaesthesia. • Be aware of regional techniques for limb block (including IV regional) and some hazards of these. • Pharmacology of local anesthetics, Know in detail the signs and symptoms of local anesthetics toxicity, and its management.
	<p>(2) <u>Enabling Objectives in the SICU</u></p> <ul style="list-style-type: none"> • Know the indications for mechanical ventilation using signs, symptoms, respiratory measurements, and arterial blood gases. • Prescribe appropriate parameters for mechanical ventilation and be aware of indications for PEEP. • Know the different devices available for administering supplemental oxygen: nasal prongs, masks - Be aware of the significant features of the self-inflating resuscitation bag (laerdal, Ambu) and be familiar with its use.

	<ul style="list-style-type: none"> Pharmacology of resuscitation drugs.
II. Practical Activities (page 11)	<p>(3) <u>Enabling Objectives in the Emergency room</u></p> <p><u>Resuscitation</u></p> <p>Recognize and be aware of ABC approach and management : Perform an appropriate Physical Examination including the assessment of the patient's:</p> <ol style="list-style-type: none"> General Condition Level of Consciousness Vitals Airway Respiratory system Cardiovascular system, Other pertinent systems <ul style="list-style-type: none"> Identify signs and symptoms of an anaphylactic reaction. Know in detail the initial emergency management including drugs and supportive measures. Know the initial management of Trauma patients. Know the signs and symptoms and differential diagnosis of hypovolaemia. Develop an approach to fluid management in acute blood loss. Be aware of the variety of blood products and substitutes, their indications and hazards.
	<p>(4) <u>Enabling Objectives in the Airway Skills</u></p> <ul style="list-style-type: none"> <u>Bag & Mask Ventilation</u> <ol style="list-style-type: none"> Practice bag and mask ventilation What are some common problems encountered when trying to ventilate patients using a bag and mask? <u>Laryngoscopy & Endotracheal Intubation</u> <ol style="list-style-type: none"> Describe the appropriate patient position for laryngoscopy and intubation.

	<ol style="list-style-type: none"> Practice the skill of laryngoscopy during your rotation. Why do we administer oxygen prior to laryngoscopy and endotracheal intubation? Discuss the laryngeal grading system. How can the correct placement of the endotracheal tube be confirmed? List the indications for an endotracheal intubation. What are some potential complications of endotracheal intubation. Understand criteria for endotracheal extubation. <ul style="list-style-type: none"> <u>Laryngeal Mask (LMA) Insertion</u> <ol style="list-style-type: none"> Which patients are suitable for a general anesthetic with an LMA? What are the advantages of the LMA over an endotracheal tube? Does the LMA protect against aspiration? Learn how to insert an LMA.
	<p>(5) <u>Enabling Objectives in the Vascular Access Skills</u></p> <ol style="list-style-type: none"> Examine the construction of the commonly used venous catheters. Discuss the choice of catheter size. Prepare and set-up an IV infusion set. Discuss the choice of sites for placement of IV catheters. What are the different sites suitable for central venous catheter placement? Discuss universal precautions. What are the risk and complications of inserting a central venous catheter? Learn the skill and sites of intravenous catheter insertion central and peripheral.

2 Course components (total contact hours per semester):

Lecture: <u>17 hours</u>	Tutorial: <u>30hours</u>	Practical/Fieldwork/Internship 5 days a week,3 hours per day, For 2 weeks.	Other:
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3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week).

Encouraging students to attend anaesthesia courses, symposiums, and workshops.

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Knowledge to be acquired

- identify peri-operative assessment and optimization for anaesthesia and surgery
- describe Basic general and regional anaesthesia techniques
- List of monitoring techniques during anesthesia
- Outline management of acute medical care issues including resuscitation,
- Mention Postoperative care and acute pain managements,
- Mention application of basic science to clinical problems encountered during anaesthesia,
- Describe theoretical basic airway management, and experience in more advanced airway management techniques.
- Define Anatomical applications of peripheral and central intravenous access

(ii) Teaching strategies to be used to develop that knowledge

- Didactic lectures and tutorials.
- Clinical and practical activities.

<p>(iii) Methods of assessment of knowledge acquired</p> <p>a. Feedback and discussion during lectures, tutorials, and clinical activities (Formal evaluation).</p> <p>b. Continuous Assessment Examination (Multiple Choice Questions).</p> <p>c. Objective Structures Clinical Examination (OSCE).</p>
<p>b. Cognitive Skills: (explain;discuss;interpret,distinguish;appraise;solve;differentiate;investigate;design;plan,evaluate)</p> <p>(i) Description of cognitive skills to be developed</p> <p>a1- Plan important preoperative evaluation and investigations (laboratory test, ECG, X ray ...etc..).</p> <p>b2- Integrate the data obtained from the symptoms, signs and investigations he/she collected into a meaningful diagnosis and construct appropriate preoperative management and anesthetic strategies and plan.</p> <p>b3- Explain different management strategies provided for anaesthesia resuscitation and emergencies management.</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <p>a. Lectures</p> <p>b. Tutorials</p> <p>c. Clinical Activities – Attendance in:</p> <ol style="list-style-type: none"> 1. Operating Room: observing intra- and postoperative surgical patients received anesthesia. 2. Skill lab simulations for airway and vascular access in medical education center. 4. Anesthesia and acute pain management round, Surgical intensive care rounds. 5. Emergency room round and initial resuscitation management.
<p>(iii) Methods of assessment of students cognitive skills</p> <p>a. Feedback and discussion during lectures, tutorials, and clinical activities (Formal evaluation).</p> <p>b. Continuous Assessment Examination (Multiple Choice Questions).</p> <p>c. Objective Structures Clinical Examination (OSCE).</p>
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <p>c1. Work constructively in a group, cooperating with their student group leaders.</p> <p>c2. Use means to find new information data or technique analysis, for the best utilization of their lectures and tutorials.</p> <p>c3- Be able to report to their colleagues a comprehensive information about patients in an oral or written manner.</p> <p>c4- Communicate properly and ethically with the patients in a serious and respectable</p>

<p>manner to have relevant data to their complaints in preoperative anaesthesia assessment</p> <p>c5- Counsel the patients and their families about different management strategies and methods of anaesthesia suitable for surgery plus obtaining patient consent..</p>
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <p>Discussions during tutorial and practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical intensive care Unit, and Emergency Room Rounds).</p>
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <p>Discussion and feedback during tutorial and practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical intensive care Unit, and Emergency Room Rounds).</p>
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <p>d1. Use modes of modern communication.</p> <p>d2. Access all the information of the scientific activities posted in the Department's web site e.g. seminars, courses, and conferences.</p> <p>d3. Communicate in English.</p>
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>Discussion and feedback during the lectures, tutorial and practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical Intensive Care Unit Rounds, and Emergency Room Rounds).</p>
<p>(iii) Methods of assessment of students numerical and communication skills</p> <p>Discussion and feedback during the lectures, tutorial and practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical intensive care Unit, and Emergency Room Rounds).</p>
<p>e. Psychomotor and Professional Skills</p>
<p>(i) Description of the psychomotor skills to be developed and the level of performance required</p> <p>e1- Obtain proper history from patients for preanesthesia evaluation .</p> <p>e2- Correctly handle and use the anesthesia equipments e.g. Laryngeal mask airway, laryngoscope, venous canulaeetc</p> <p>e3- Practice a skills of airway management and vascular access using manikins and simulators</p> <p>e4- Elicit different simple bedside tests</p> <p>e5- Request for a specific investigation for a particular disease</p>

(ii) Teaching strategies to be used to develop these skills

Training and observation during practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical intensive care Unit, and Emergency Room Rounds).

(iii) Methods of assessment of students psychomotor skills

Assessment and observation during practical activities (Operating Room, Bed Side pre-anesthesia Assessment, Acute pain management Rounds, Surgical intensive care Unit, and Emergency Room Rounds).

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	MCQ	2nd week	40 %
2	OSCE	2nd week	30 %
3	Attendance	1 st &2 nd week	20%
4	Logbook	1 st &2 nd week	10%

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

a. The undergraduate director and course organizer is available 2 sessions per week for any students' inquiry or comments.

b. All teaching staff of the Department are available during their office hours for any inquiry and support for the students.

c. The undergraduate unit and its secretary are available daily during working hours for any inquiry and support for the students.

E. Learning Resources

1. Required Text(s)

Anesthesia and Resuscitation ,Dr H.Braden

2. Essential References

a. Lee's Synopsis Of Anaesthesia

Nicholas J. H. Davies(Author),Jeremy N. Cashman (Author), N. J. H. Davies (Other)

3~ Recommended texts and reference materials

a-Textbook of Anaesthesia)by Alan R. Aitkenhead Bsc Md Frca Graham Smith Bsc(hon) Md Frca David J. Rowbotham Md

b-Clinical **Anesthesiology**, 4e. G. Edward Morgan, Jr., Maged S. Mikhail, Michael J.

4-Electronic Materials, Web Sites etc

- a. Department internet website.
- b. Department's teaching staff personal websites on University site.
- c. University and KKHU Library.
- d. Library in anaesthesia Department.

5- Other learning material such as computer-based programs/CD, professional standards/regulations

CD's and materials prepared by seminar, workshops and conferences conducted by anesthesia department, which are available in anesthesia Department.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

- a. 2 Lecture halls for males (80 seats each).
- b. 1 Main Auditorium for females (80 seats).
- c. 2 Skill station Rooms in medical education centre (25 seats)
- d. OR rooms.

2. Computing resources

All lectures and tutorials are presented using computers with their amenities, projectors and laptops.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Communication and Swallowing Disorders Unit.
- Audiology Unit.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Evaluations and Questionnaire regarding:
 - . Lectures and tutorials (at the end of every lecture/tutorial)
 - . Course as a whole (at the end of the course).

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- a. Discussion and feedback during lectures, tutorials and clinical activities.
- b. A personal interview.
- c. Random visit to the on-going lectures.
- d. Cumulative comments and/or assessment by the colleagues for a specific Staff.

3 Processes for Improvement of Teaching

- a) Arranging lecture/tutorials for the Teaching Staff to improve their teaching abilities.
- b) Encouraging teaching staff to attend workshops on medical education.
- c) To have an Internal /External Evaluator.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

None

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

a. To form an ADHOC Committee to discuss certain matters in relation to the improvement of the Undergraduates.

b. To have an External Evaluator

