General Surgery and Trauma

9

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History Overview: General Surgery

In most of the Objective Structured Clinical Examination (OSCE), general surgery topics are very important. One can expect at least one scenario related to general surgery. Many times case scenarios are combined with other systems. One common example is an abdominal pain scenario, usually combined with an abdominal examination. General surgery topics such as acute appendicitis, acute cholecystitis, acute diverticulitis, and management of a trauma patient are all very important and frequently repeated in many OSCEs.

It is also important to check with your regional and local guidelines about further investigations, management plans, and hospital admission protocols. I also like to recommend to attend Basic Life Support (BLS) and Advance Trauma Life Support (ATLS). These will be required in management of a trauma patient.

See Table 9.1 for an overview of the pattern of history taking required for general surgery. The remainder of the chapter covers common general surgery presentations.

Checklist: Physical Examination of the Abdomen

See Table 9.2 for a checklist that can be used as a quick review before the exam. (See also the Gastrointestinal chapter for details of the abdominal examination.)

History and Physical Examination: Preoperative Visit

Candidate Information:
A 65-year-old female is referred to the medical outpatient clinic; she has been booked for a surgical procedure next month. She is here for a complete preoperative checkup in order to assess her readiness for surgery.

The purpose of preoperative assessment is to:
- Identify important health-related problems.
- Optimize their treatment.
- Inform the patient about the risks associated with the surgery.
- Gather further information about hospital stay and postoperative care.
- Find out the social issues and make a plan for postoperative care.

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your identification (ID).
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician. Are you…? Can you please confirm your age? How can I help you today?"

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M. H. Sherazi, E. Dixon (eds.), *The Objective Structured Clinical Examination Review*,
https://doi.org/10.1007/978-3-319-95444-8_9

Table 9.1 Pattern of history taking for general surgery stations

Introduction
Name and age
Chief complaint
In patient's own words
History of present illness
Analysis of chief complaint
Onset
Course
Duration
If **pain**
Nature
Intensity (1–10)
Location
Progression
Frequency
Quality
Radiation
Severity (1–10)
Timing
Contributing factors
Aggravating factors
Alleviating factors
Associated symptoms
Nausea, vomiting, diarrhea, constipation, change in bowel habits, reflux, appetite, blood in vomiting/feces/urine, jaundice
Predisposing factors
Aggravating and relieving factors
Red flags/risk factors
Constitutional symptoms
Anorexia, chills, night sweats, fever, and weight loss
Review of systems
Respiratory
Genitourinary
Cardiovascular
Neurology
Impact on body
Rule out differential diagnosis
Past medical history and surgical history
Medical illnesses
Any previous or recent medical issues
Cancers: breast, thyroid, prostate, kidney
History of previous surgery/operation, especially relevant to the area of concern
Any related anesthetic/surgical complication?
Hospitalization history or emergency admission history
Medications history
Current medications (prescribed, over-the-counter, and any herbal)
Allergic history/triggers
Any known allergies?
Family history
Family history of any long-term or specific medical illness
Home situation
Occupation history
What do you do for a living?
Social history
Smoking
Alcohol
Street drugs
Sexual history
If **adult female**
Menstrual history (last menstrual period [LMP])
Gynecology history
Obstetric history
If **teen**
Home
Education
Employment
Activities
Drugs
Sexual activity
If **child**
Birth history
Immunization
Nutrition
Development
Wrap-up
Describe the diagnosis
Management plan
Possible medical treatment
Duration of treatment and side effects
Red flags
Laboratory tests
Further information: websites/brochures/support groups or societies/toll-free numbers
Follow-up

Questions About the Surgery:

Patient will mention that she has been booked for (hernia repair/gall bladder removal/breast surgery/bowel resection) next month. The surgical department has referred her for a preoperative assessment.

"Is it alright if I ask you a few questions about your surgery?"

- "Who decided about the indication of surgery?"
- "How was the decision made?"
- "Any recent investigation performed? Blood tests, ultrasound scan (USS), computed tomography (CT) scans, electrocardiogram (ECG), X-rays?"
- "How are your symptoms now?"
- "Do you have any immediate concern about it? Requiring pain medication?"
- "How are you feeling about it?"
- "Has the consent being taken for surgery?"
- "Are you aware about the procedure and what to expect on the day of surgery? Where to go and whom to contact?"

Table 9.2 Checklist for the physical examination of the abdomen

Starting the station	Knock on the door
	Enter the station
	Hand-wash/alcohol rub
	Greet the examiner and the patient
	Give stickers to the examiner if required or show your ID badge
	Now sit on the chair or stand on the right side of the patient and start the interview
Opening	Introduction, greet, explain, position, and exposure/drape
	Ask for vital signs – interpret the vital signs
General physical examination	Check for alert and orientation
	Look for any abnormal findings in the hands, face, neck, and chest
Abdominal examination	**Inspection:** Observe for skin, umbilicus, contour, movements, peristalsis, pulsation, scars, masses and cough reflex
	Auscultation: Bowel sounds and bruits
	Percussion: Shifting dullness and fluid thrill
	Liver and spleen span
	Palpation
	Superficial/light palpation
	Deep palpation
	Specific signs
	Rebound tenderness
	McBurney's point
	Rovsing's sign
	Psoas sign
	Obturator's sign
	Murphy's sign
	Courvoisier's sign
	Liver palpation
	Spleen palpation
	Kidney palpation
	Costovertebral angle (CVA) tenderness
Mention	"I will next palpate for hernias and groin lymph nodes and perform a digital rectal and vaginal examination"
	"I will also do a respiratory and cardiovascular examination"
	(The examiner will provide the findings)
Wrap-up	Thank the patient and ask the patient to cover up
	Wrap up your findings with the examiner or the patient

- "Do you seek further information regarding your procedure?" (risks of procedure/anesthesia)

"I am going to ask you a few questions about your general health."

Past Medical History:
"Do you have any previous health issues?"

- **Cardiovascular:**
  - "Angina, coronary artery disease (CAD), arrhythmia, thrombolytic history, angioplasty history, coronary artery bypass grafting, congestive heart failure, peripheral vascular disease, or valvular heart disease?"
  - "Have you ever had your blood pressure checked? Hypertension?"
  - "High cholesterol?"
- **Lungs:**
  - "Do you have any health issues related to your lungs?" (asthma, chronic obstructive pulmonary disease [COPD])
  - "Sleep apnea?"
  - "Recent upper or lower respiratory tract infection?"
  - "Smoking history?"
  - "Restrictive lung disease?" (pneumoconiosis)
  - "Previous blood clots in legs or lungs?"
- **Kidney**:
  - "Renal failure, infections, stones?"
- **Nervous system**:
  - "Upper motor neuron disease, transient ischemic attack (TIA), cerebrovascular accident (CVA), seizures, migraine, headache, spinal or head injury, neuromuscular disorder?"
- **Gastrointestinal:**
  - Reflux
  - Hepatic disease
  - Jaundice
  - Peptic ulcer disease
- **Endocrine:**
  - "Have you ever been screened for diabetes?"
  - "Thyroid dysfunction?"
- **Hematologic:**
  - "Previous blood transfusion?"
  - "History of bleeding disorders?"
  - "Anemia?"
- **Musculoskeletal:**
  - Neck pain
  - Thoracic pain
  - Low back pain
- **Dental:**
  - Loose teeth
  - Use of dentures/permanent or fixed teeth
- **General:**
  - "Recent diagnosis of cancer?"
  - "Do your wounds heal slower as compared to others?"

Past Hospitalization and Surgical History:
- "Do you have any previous hospitalization?"
- "Have you ever undergone any surgery in your past?"

- "What surgery?"
- "How did it go?"
- "When was that?"
- "Any complication?" (intraoperative or postoperative)
- "Any problems related to anesthesia?"
- "Requiring prolonged hospital stay?"

Medication History:
"Are you taking any medication?" If she says no, then continue to the next question. Otherwise ask specifically for aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs), steroids, medications for hypertension/diabetes, anticoagulant, over-the-counter or herbal. Ask about any side effects of these medications.

Allergic History:
"Do you have any known allergies? Allergies to anesthetics or other drugs?"

Family History:
"Any family history of chronic medical illnesses? Problems with anesthetics?"

Social History:
- "Do you smoke or does anyone else in your home or around you at work smoke? Do you drink alcohol?" If yes, then further question: "How much? Daily? How long?"
- "Have you ever tried any recreational drugs?" If yes, "Which one? How long? When?"

Self-Care and Living Condition
- "What is your living situation like? Who lives with you? Who will look after you after the surgery? Do you have good family and friends support?"
- "Do you need any help?" (home services, meals on wheels, social worker)

Physical Examination:
(Go through the examination part. Remember to leave 1–2 min for wrap-up.)
"Now, I will start the examination."

- Comment on the vital sign findings if there are any mentionable findings; otherwise state that vitals are normal.
- Ask for patient height and weight with body mass index (BMI).
- Check level of consciousness, alertness, and orientation.

General Appearance:
- Head and neck exam:
  - Nose
  - Mouth and throat (limitations to intubation)
  - Cervical lymph nodes
- Skin:
  - Look for any rash
- Chest examination:
  - Inspection, auscultation, palpation, and percussion
- Cardiovascular examination:
  - Auscultation for heart sounds
- Abdominal examination:
  - Inspection .and palpation

Wrap-Up:
- Comment on your findings.
- Thank the patient and tell the patient to cover up.
- Ask the patient if she has any questions or concerns.

Question: What investigations will you order? (Questions may be asked by the patient or the examiner.)

Answer: "I will order routine blood work-up, ECG, chest X-ray. Routine tests should include complete blood count (CBC), electrolytes, liver panel, kidney function test, and urine analysis."

Counsel the patient about case-specific risk factors such as:

- **Recent myocardial infarction (MI):** Higher chances of heart-related complications during surgery, such as another heart attack, low blood pressure, and death
- **Coagulation problems:** Higher risk of bleeding
- **Diabetes and hypertension:** Intraoperative and postoperative complications
- **Smoking:** Should be stopped around 8 weeks before surgery
- **Deep vein thrombosis (DVT) prophylaxis:** According to nature of surgery
- **Preoperative medication to stop or adjust:** Insulin, oral diabetic medications, warfarin, and other anticoagulants

Follow-Up:
- Tell the patient that she will need to come back once all results will be with you.
- Ask if there are any concerns or questions.

History and Physical Examination: Postoperative Fever

Candidate Information:
You are working in a general surgery unit. The unit nurse called you to attend a 45-year-old female with **fever** who had a laparoscopic incisional hernia repair 2 days ago.

Please attend the patient. Please do not perform rectal, genitourinary, or breast examinations.

Differentials:
- **Postoperative days 0–2:**
  - Atelectasis
  - Aspiration pneumonia
  - Wound infection
  - Intra-abdominal surgical complications; i.e., bowel perforation
- **Postoperative day 3 or more:**
  - Urinary tract infection (UTI)
  - Wound infection
  - Intravenous (IV) site infection
  - Deep venous thrombosis (DVT)
  - Pulmonary embolism
  - Abscess

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening

Ask for a set of vitals. Comment on temperature.

Introduce yourself to the patient. "Good morning/good afternoon. I am Dr…. I am your attending physician. I was told by your nurse that you have a fever. I need to ask you a few questions and then I will do a relevant examination to find out the source of fever. Are you happy for me to begin?"

Questions About the Surgery:
- Ask about the surgery. *Abdominal incisional hernia repair*
- "Any operative complication?" (related to anesthesia, intraoperative or postoperative phase – in the recovery room)
- "How is your pain control? (0–10)"
- "Were you able to mobilize out of bed or to the toilet?"

Review of Systems
- **Pulmonary:**
  - Shortness of breath (Sitting/lying flat)
  - Chest pain
  - Cough (sputum/without sputum)
  - Hemoptysis
- **Wound:**
  - Pain
  - Redness around wound margins
  - Bleeding
  - Discharge
  - Stitch line hot and tender
- **Urinary:**
  - Catheterization? When was the catheter inserted/removed?
  - Change in frequency of urine
  - Pain while passing urine
  - Cloudy urine
  - Blood in urine
  - Suprapubic discomfort
  - Previous history of urinary tract infection
- **Deep Venous Thrombosis:**
  - Calf pain and tenderness
  - History of DVT

"I am going to ask a few questions about your general health."

Past Medical History:

"Do you have any previous health issues?"

Past Hospitalization and Surgical History:

"Do you have any previous hospitalization?"

Medication History:

"Are you taking any medication?" If she says no, then continue to the next question.

Allergic History:

"Do you have any known allergies? Allergies to anesthetics?"

Family History:

"Any family history of chronic medical illnesses?"

Social History:
- "Do you smoke? Do you drink alcohol?" If yes, then ask further questions: "About how much? Daily? How long?"
- "Have you ever tried any recreational drugs?" If yes, "Which one? How long? When?"

Physical Examination:

(Go through the examination part. Remember to leave 1–2 min for wrap-up.)

"Now, I will start the examination." Comment on the vital sign findings: Mention the high temperature if not done at the start of the interview. Comment on the rest if any other finding such as tachycardia or hypotension.

- Check level of consciousness, alertness, and orientation.
- General appearance: a very quick look at head and neck:

  - Nose
  - Mouth and throat
  - Cervical lymph nodes
- Chest examination:
  - Inspection, auscultation, palpation, and percussion
- Cardiovascular examination:
  - Auscultation for heart sounds
- Abdominal examination:
  - Inspection, palpation, and auscultation for bowel sounds
  - Wound and stitch examination

Wrap-Up:
- Comment on your findings.
- Thank the patient and tell her to cover up.
- Ask the patient if she has any questions.

Question: What will you do first?

Answer: If there are no contraindications, I will ask the nurse to give her paracetamol (acetaminophen).

Question: What investigations you will order?

Answer: "I will check if any recent blood tests have been done. If not done in the postoperative phase, then I will order CBC, electrolytes, liver panel, kidney function test, blood cultures, urine analysis, and a chest X-ray."

Question: On postoperative day 1, if the patient was found agitated and with decreased concentration, what will be your impression?

Answer: Delirium.

Question: What if the patient has a persistent spiking fever, diarrhea, and pelvic pain at around days 5–7, what will be your impression?

Answer: Pelvic abscess.

Question: How will you diagnose an abdominal or pelvic abscess?

Answer: CT scan.

Question: What is the treatment of pelvic abscess?

Answer: "Antibiotics and according to the size and location of the abscess possibly a percutaneous CT/US-guided aspiration and placement of drainage catheter."

Question: What if the patient wants to go home as they were told before the surgery that they will likely go home on day 2?

Answer: Tell the patient about your finding and that you would like to keep the patient in the unit while you are trying to find out the cause of her fever.

Ask if she has any questions or concerns.

History and Physical Examination: Pain Right Lower Quadrant of the Abdomen – Acute Appendicitis

Candidate Information:
A 22-year-old female presents in your clinic with right-sided lower abdominal pain for 24 h. She is nauseated and has vomited once.

Vital Signs: Temp, 37.9 °C; HR, 100; BP, 120/70; RR, 18; O2 saturation, 98% on RA.

Please take a detailed history and perform a relevant physical examination. Please do not perform rectal, genito-urinary, or breast examination.

Differential Diagnosis:
- Adults
  - Acute appendicitis
  - Urinary tract infection
  - Pyelonephritis
  - Inflammatory bowel disease
  - Pelvic inflammatory disease
  - Bowel obstruction
  - Diverticulitis
  - Malignancy
  - Cholecystitis
- Adult females
  - Ectopic pregnancy
  - Ovarian torsion/cyst rupture
- Children
  - Intussusceptions
  - Meckel's diverticulitis
  - Gastroenteritis
  - Mesenteric lymphadenitis
  - Constipation

Starting the Interview:
- Knock on the door.
- Enter the station.

- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician. Are you Miss…? Are you 22 years old?"

History of Present Illness:
"I understand you are here because you have abdominal pain. I am going to ask you a few questions to find out what is going on. Should we start?"

- "When did this pain start?" *It started yesterday afternoon.*
- "Where did the pain start?" *Around the belly button.*
- "Has the pain radiated/changed in severity or location?" *Worsened and migrated to the right lower quadrant.*
- "What is the pain like?" *Dull pain.*
- "How did it come on?" *Started suddenly and progressively increased.*
- "Does the pain go anywhere?" *It started around the belly button and has moved to mostly right lower part of abdomen.*
- "How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *Now it is 7–8.*
- "Does anything aggravate the pain?" *Exacerbated by movement and breathing.*
- "Anything that relieves the pain?" *Sitting and lying flat.*
- "Have you ever had this pain before?" *No.*
- "Have you had any nausea, vomiting, or loss of appetite?" *Yes, vomited once.*
- "Are you passing gas?" *Yes.*
- "Have you noticed any changes in your bowel habits (blood in stool, diarrhea)?" *No.*
- "Any fevers, chills, or night sweats?" *Fever.*
- "Recent contact with sick people": *No such contact.*
- "Recent travel?" *No.*

Past Medical History:
"Do you have any previous health issues?" *None.*

Past Hospitalization and Surgical History:
"Have you ever been hospitalized? Have you ever undergone any surgery? Any complications?" *None*.

Medication History:
"Are you taking any medication?" *No regular medication.*

Allergic History:
"Do you have any known allergies?" *No known allergies.*

Family History:
Noncontributory.

Social History:
Nonsmoker, does not drink, and no drug use.

Gynecology History:
- Last menstrual period (LMP): *2 weeks back*
- Vaginal discharge/bleeding: *None*

Sexually Active:
No.

Travel History:
None.

Physical Examination:
- Review vital signs with the examiner.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner), "Miss… I am starting my examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Moist tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
Inform the patient: "Now I am going to examine your abdomen."

- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.
- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then inform the patient, "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation.

- **Palpation:** Warm up your hands. Then remember to examine the tender area at the end. (Keep a look at the patient's facial expressions while you are palpating.)
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.
  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or a lump/mass. Start from area of least tenderness. Examine for areas of tenderness or guarding, paying particular attention to McBurney's point (located one-third of the distance along a line drawn from the anterior superior iliac spine to the umbilicus).
  - **Rebound tenderness:** Check for rebound tenderness in right lower quadrant (RLQ) – present in acute appendicitis
  - **Rovsing's sign:** Pain elicited in RLQ with palpation to left lower quadrant (LLQ) – may present in acute appendicitis
  - **Psoas sign:** Pain on extension of the right hip (retrocecal appendix) – may present in acute appendicitis
  - **Obturator sign**: Pain on internal rotation of hip (pelvic appendix) – may present in acute appendicitis
  - **Murphy's sign:** Not present
  - Feel for **costovertebral angle** tenderness

Inform the examiner that, "I will complete my examination by performing an examination for groin hernias, pelvic, digital rectal, cardiovascular, and respiratory system examinations."

Thank the patient and describe your findings to the examiner.

Wrap-Up:
Question: What would you like to do now?

Answer: "I will order:

- Some blood tests (CBC, electrolytes, creatinine, liver enzymes, C-reactive protein [CRP])
- Urinalysis dip, urine beta-human chorionic gonadotropin (B-hCG) for pregnancy test (very important to rule out pregnancy).
- CT scan or ultrasound (in children)"

Question: What is the diagnosis?

Answer: "Acute appendicitis."

Question: What is the appendix?

Answer: "The appendix is a small, worm-shaped pouch 90 mm long that hangs off the first part of the large bowel called the cecum. In our ancestors it was quite large and helped digest cellulose. However, in modern humans it has no particular use; but it can become diseased."

Question: What is appendicitis?

Answer: "Appendicitis is inflammation of the appendix. If it comes on suddenly and is very painful, it is called 'acute appendicitis.' If it develops slowly and simply hangs around, it is referred to as chronic appendicitis." I will draw a picture like this (Fig. 9.1) for patient ease.

Question: What is the cause?

Answer: "The inflammation is caused by an infection by bacteria that are normally present in the intestine and the appendix. It is believed to follow a blockage in the appendix such as from a lump of firm feces. The infected appendix gradually swells and becomes filled with pus."

Question: How common is the problem and who gets it?

Answer: "Each year about 1 in 500 people has an attack of appendicitis. It is the most common form of abdominal pain in young people requiring emergency surgery. It affects people of all ages but is rare in children under 2 years and in older people. It is most common between the ages of 15 and 25; with teenagers being the most commonly affected group" [1].

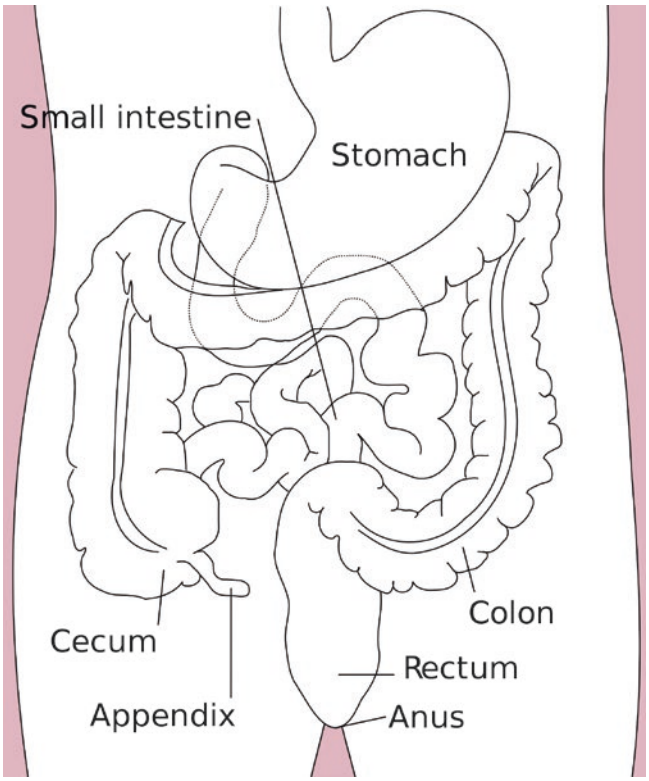

Fig. 9.1 Location of the appendix relative to other organs of the gastrointestinal system. (William Crochot (US PD picture.) [Public domain], via Wikimedia Commons)

Question: What is the treatment?

Answer: "Once we diagnose someone with acute appendicitis, we need to arrange early treatment. Because delaying the treatment may lead to a perforated appendix, which can make you very sick. I need to send you to the local hospital and a general surgeon needs to see you. You need to be admitted and your appendix needs to be surgically removed. The operation is called an appendicectomy (or appendectomy). It is done as a laparoscopic procedure and is usually a straightforward surgery with little risk of complications. Antibiotics will usually be given for more severe cases with complications."

History and Physical Examination: Pain Right Upper Abdomen – Acute Cholecystitis

Candidate Information:
A 42-year-old female presents in your clinic with right-sided upper abdominal pain for 4 h. She is nauseated and has vomited once.

Vital Signs: Temp, 38.1 °C; HR, 100; BP, 130/80; RR, 18; O2 saturation, 98% RA.

Please take a detailed history and perform a relevant physical examination. Please do not perform rectal, genitourinary, or breast examination.

Differential Diagnosis:
- Acute cholecystitis
- Biliary colic
- Perforation of peptic ulcer
- Pancreatitis
- Appendicitis
- Pneumonia
- Acute hepatitis
- Rupture of aortic aneurysm
- Acute pyelonephritis
- Bowel obstruction
- Trauma to chest (rib fracture)

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician. Are you Miss…? Are you 42 years old?"

History of Present Illness:
"I understand you are here because you have abdominal pain. I am going to ask you few questions to find out what is going on. Should we start?"

- "When did this pain start?" *It started about 4 h back.*
- "Where did the pain start?" *Right side of upper abdomen, just below the ribs.*
- "What is the pain like?" *Sharp, stabbing type of pain and localized.*
- "How did it come on?" *Started suddenly and progressively increased. I came back from a party where I had a big meal.*
- "Does the pain radiate anywhere?" *To the back along the ribs and tip of right shoulder blade.*
- "How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *7–8.*
- "Does anything aggravate the pain?" *Exacerbated by movement and breathing.*
- "Does anything relieve the pain?" *Lying flat.*
- "Have you ever had this pain before?" *Yes, a few months back.*
- "What did you do at that time?" *I took pain medication and the pain settled.*
- "Have you had any nausea, vomiting, or loss of appetite?" *Yes, vomited twice – no blood.*
- "Are you passing gas?" *Yes.*
- "How are your bowel movements?" *Normal as usual. Last one was today in the morning.*
- "Any fevers, chills, or night sweats?" *I felt I had a fever but did not check.*
- "Did you notice any change in the color of your skin/eyes?" *No.*
- "Any cough/shortness of breath/urinary problems?" *None.*
- "Any other associated symptoms?" *None.*
- "Recent contact with sick people?" *No such contact.*

Past Medical History:
"Do you have any previous health issues?" *Yes, acid peptic disease – treated few years back. Gall stones diagnosed 5 months back.*

Past Hospitalization and Surgical History:
"Have you ever been hospitalized? Have you ever undergone any surgery? Any complications?" *No.*

Medication History:
"Are you taking any medication?" *No regular medication.*

Allergic History:
"Do you have any known allergies?" *No known allergies.*

Family History: *Noncontributory.*

Social History: *Nonsmoker, does not drink. No drug use. LMP was 2 weeks ago.*

Sexual History: *Active with husband. No previous history of sexually transmitted disease.*

Travel History: *None.*

Physical Examination:
- Review vital signs with the examiner. Vital Signs: T 38.1, HR 100, BP 130/80, RR 18, O2 saturation 98% RA.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner) "Miss… I am starting my examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Moist tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
Inform the patient: "Now I am going to examine your abdomen."

- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.
- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then say, "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation.
- **Palpation:** Warm up your hands. Then remember to examine the tender area at the end. (Keep an eye on the patient's facial expressions while palpating.)
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.
  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or a lump/mass. Start from area of least tenderness. Examine for areas of tenderness or guarding, paying particular attention to the right upper quadrant.
  - **Murphy's sign:** It is performed by asking the patient to breathe out and then gently palpate the right subcostal area and then ask the patient to inspire deeply. If the patient feels pain upon this maneuver and catches her breath, the sign is positive and is a sign of cholecystitis – *present*.
  - **Boas' sign:** Gall bladder pain radiates to the tip of the scapula; there may be an area of skin below the scapula, which is hypothetical. This is Boas' sign – *may be present* [2].
  - **Rebound tenderness:** Check for rebound tenderness in right upper quadrant (RUQ) – *none*.
  - **Rovsing's sign:** Pain elicited in RLQ with palpation to LLQ – *none*.
  - **Psoas sign:** Pain on extension of the right hip (retrocecal appendix) – *none*.
  - **Percuss** for liver span.
- Auscultate the lungs.

Inform the examiner that "I will complete my examination by performing examination for hernias, pelvic, digital rectal, cardiovascular, and respiratory system examination."

Thank the patient and describe your findings to the examiner.

Wrap-Up:
Question: What would you like to do now?

Answer: "I will order:
- Some blood tests (CBC, electrolytes, creatinine, liver enzymes, and lipase)
- Urinalysis dip, urine B-hCG for pregnancy test (very important to rule out pregnancy)
- Ultrasound abdomen"

Question: What is the diagnosis?

Answer: "Acute cholecystitis."

Question: What is the function of the gallbladder?

Answer: "The gallbladder functions to store and concentrate bile made by the liver during periods of fasting. In response to food, the gallbladder contracts and releases bile into the duodenum."

Question: What is the difference between biliary colic and cholecystitis?

Answer: "Biliary colic is the transient obstruction of the cystic duct by gallstones leading to pain lasting for several hours. Cholecystitis is dilation and inflammation of the gallbladder that results from gallstones being impacted at the neck of the gallbladder, obstructing the cystic duct."

Question: How common are gallstones?

Answer: "Gallstones are present in 10–40% of the general population. The majority of patients with gallstones remain

asymptomatic over their lifetime. Risk factors for gallstones include female sex, obesity, pregnancy, terminal ileal resection, gastric surgery, and Crohn's disease."

Question: What are signs of cholecystitis on ultrasound?

Answer: "Pericholecystic fluid, gallbladder wall thickening, stone impaction, gallbladder distension, sonographic Murphy's sign."

Question: What is the treatment?

Answer: "Once we diagnose someone with cholecystitis, IV antibiotics covering gram-negative aerobes and anaerobic bacteria should be started. Patient needs to be referred to general surgery for a laparoscopic cholecystectomy. It should be performed within 2–3 days of diagnosis."

History and Counseling: Pain Left Lower Quadrant – Acute Diverticulitis

Candidate Information:
A 65-year-old female presents to the emergency department with a history of left lower quadrant pain for 2 days. The pain is now getting worse. She feels nauseous but is not vomiting. She has had a fever and abdominal distension.

Vital Signs: Temp, 38.9 °C; HR, 105; BP, 150/85; RR, 18; O2 saturation, 99%.

Please take a detailed history and perform a relevant physical examination. Please do not perform rectal, genitourinary, or breast examination.

Differential Diagnosis
- Diverticulitis
- Diverticular abscess
- Constipation with obstruction
- Perforated bowel
- Bowel obstruction (adhesion/volvulus/incarcerated hernia)
- Bowel cancer with obstruction/perforation
- Inflammatory bowel disease (Crohn's disease or ulcerative colitis)
- Mesenteric ischemia
- Aortic dissection
- Musculoskeletal injury
- Pelvic inflammatory disease
- Ovarian torsion/mass
- Uterine mass
- Renal colic

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician. Are you …? Are you 65 years old?"

History of Present Illness:
"I understand you are here because you have abdominal pain. I am going to ask you a few questions to find out what is going on. Should we start?"

"When did this pain start?" *It started about 2 days back.*

"Where did the pain start?" *Left side of lower abdomen.*

"Has the pain changed in severity or location?" *Worsened and progressively increasing in intensity.*

"What is the pain like?" *Sharp pain.*

"How did it come on?" *Started suddenly and progressively increasing.*

"Does the pain go anywhere?" *The pain is mostly in the left lower abdomen but it is going to all of the lower abdomen.*

"How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *Now it is 9.*

"Does anything aggravate the pain?" *Exacerbated by movements.*

"Any relationship with food?" *None.*

"Does anything relieve the pain?" *Lying flat.*

"Have you ever had this pain before?" *No.*

"Have you had any nausea, vomiting, or loss of appetite?" *I have nausea but no vomiting.*

"Are you passing gas?" *Yes.*

"Have you noticed any changes in your bowel habits (blood in stool, diarrhea)?" *None but the abdomen felt distended.*

"Appetite?" *Poor.*

"Any fevers, chills, or night sweats?" *Fever, 39.2 yesterday. Today felt hot, feverish and sweaty.*

"Recent contact with sick people?" *No such contact.*

"Recent travel?" *No.*

"Any recent trauma?" *None.*

Past Medical History: "Do you have any previous health issues?" *None*

Past Hospitalization and Surgical History:
"Have you ever been hospitalized? Have you ever undergone any surgery? Any complication?" *None.*

Medication History:
"Are you taking any medication?" *No regular medication.*

Allergic History
"Do you have any known allergies?" *No known allergies.*

Family History:
Noncontributory.

Social History:
Nonsmoker, nondrinker, and no drug use.

Gynecology History:
- *Menopausal for 15 years. All Pap smears normal. Two children born* via *normal vaginal deliveries.*
- Vaginal discharge/bleeding: *None.*

Sexually Active: *Yes, with husband. Married for 35 years.*

Travel History: *None.*

Physical Examination:
- Review vital signs with the examiner. Mention patient has a fever of 38.9 °C and tachycardia 105.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner), "Miss… I am starting my examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Moist tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
Inform the patient: "Now I am going to examine your abdomen."

- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.
- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then say, "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation.
- **Palpation:** Warm up your hands. Then remember to examine the tender area at the end. Keep an eye on the patient's facial expressions as you palpate the abdomen.
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.
  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or lump/mass. Start from area of least tenderness (right side in this station). Examine for areas of tenderness or guarding, paying particular attention to the left lower abdomen.
  - **Tenderness, guarding, and rigidity** – *present in LLQ.*
  - **Rebound tenderness:** *Check for rebound tenderness in LLQ – present in acute diverticulitis*
  - In some patients, on a careful palpation, a palpable tender **sausage-shaped mass** in the left iliac fossa may be felt.
  - **Murphy's sign:** *Not present*

Inform the examiner that "I will complete my examination by performing examination for hernias, pelvic, digital rectal, cardiovascular, and respiratory system examination."

Thank the patient and describe your findings to the examiner.

Wrap-Up:
Question: What would you like to do now?

Answer: "I will order some blood tests (CBC, electrolytes, creatinine, liver enzymes, blood cultures, CRP) and urinalysis. CT scan abdomen and pelvis."

Question: CT reported as acute diverticulitis, what is your next step of management?

Answer: "I will explain to the patient about the findings. I will place IV lines and will start IV antibiotics. I will call general surgery to come and review the patient for further management."

Question: What is the difference between diverticulosis and diverticulitis?

Answer: "Diverticuli are fingerlike outpouching from the wall of the bowel—usually multiple. The etiology is unknown but most likely due to chronic constipation and low-fiber diet. Because of constipation, hard stools put pressure on the wall weakening it and leading to outpouching known as diverticuli. Mostly, they are asymptomatic, but sometimes the stools can get blocked in the pouches and become a good media for the bacteria leading to inflammation called diverticulitis. The symptoms are fever, abdominal pain, and rectal bleeding."

Question: What are the complications of diverticulitis?

Answer: "There can be some complications like abscess, perforation, peritonitis, and fistula formation."

Question: Can it cause cancer?

Answer: "Let me reassure you that it is not a pre-malignant condition."

Question: What is the management plan for diverticulosis?

Answer:
- Pain medication and sometimes antispasmodics are used.
- Stool softeners for constipation.
- High-fiber diet is recommended: fruits, vegetables, fluids, cereals, and bran.
- "You may experience bloating and discomfort, but your body will get used to it."
- Screening colonoscopy after acute episode.

Question: Does the patient require surgery for diverticulosis?

Answer: "No. Surgery is only recommended when a patient presents with complications of diverticulitis such as bleeding, abscess (if not responding well to drainage and antibiotics), perforation, or severe bleeding."

Management: Epigastric Pain (Perforated Peptic Ulcer/Pancreatitis)

Candidate Information:
You are working in a busy emergency department. Your next patient is a middle-aged man who came in with sudden-onset severe epigastric pain for 3 h. He has been in good health apart from the history of taking ibuprofen 400 mg BD for back pain.

Please manage this patient. There will be a **nurse** at bedside to help you with any orders. The examiner will give you any findings if required during the management.

Differentials:
- Esophagitis
- Acute/chronic gastritis
- Peptic ulcer disease
- ***Perforated peptic ulcer**
- Gastroesophageal reflux disease
- ***Acute pancreatitis**
- Acute cholangitis
- Biliary colic
- ***Acute cholecystitis**
- Cholelithiasis
- Inflammatory bowel disease
- Viral hepatitis
- Acute coronary syndrome

**Important for this station.*

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician for today. Are you Mr…? How old are you? What brings you here today?"

History of Present Illness:
The patient will briefly tell you about his sudden onset of severe epigastric pain and will be moaning with pain. It is extremely important to address the patient's pain at this point. "I can see that you are in pain. I need to ask you a few questions to find out why you have this severe pain. It will also help me to give you appropriate pain medication. We have a nurse here; she will help me with your management. Is it alright if we start?"

- "When did this pain start?" *It started about 3 h back.*
- "Where did the pain start?" *Midline in the stomach area.*
- "Has the pain changed in severity or location?" *Worsened and progressively increasing in intensity.*
- "What is the pain like?" *Sharp pain.*
- "How did it come on?" *Started suddenly and it is progressively increasing.*
- "Does the pain go anywhere?" *It was going to my spine and now it has spread all over the abdomen.*
- "How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *Now it is 9.*
- "Does anything aggravate the pain?" *Exacerbated by movements.*
- "Any relationship with food?" *None.*
- "Does anything relieve the pain?" *Lying flat.*
- "Have you ever had this pain before?" *No.*
- "Have you had any nausea, vomiting, or loss of appetite?" *I have nausea, but no vomiting.*
- "Are you passing gas?" *Yes.*
- "Have you noticed any changes in your bowel habits (blood in stool, diarrhea)?" *None.*
- "Appetite?" *Poor.*
- "Any fevers, chills, or night sweats?" *None. Feel sweaty now.*
- "Any recent trauma?" *None.*

Questions to Rule Out Differentials:
- "Nausea and vomiting?"

- "Change in bowel habits?"
- "Have you lost weight recently?"
- "Melena (sticky, black, dark, tarry stools)? When was your last bowel movement? Color?"
- Explore about liver problems.
- Use of NSAIDs (ibuprofen): "How much? How long? Why? Who prescribed?"
- "Any blood thinners?"
- "Any long-term disease?"

Past Medical History:
"Peptic ulcer disease? Ever had a scope? Pancreatitis?"

Past Hospitalization and Surgical History:
"Have you had any previous hospitalization or previous surgery?"

Medication History:
"Are you taking any medication, over-the-counter or herbal, and are there any side effects?"

Allergic History:
"Do you have any known allergies?"

Family History:
"Any family history of significant health problems?"

Social History:
- "Do you smoke or does anyone else in your home or close proximity at work smoke? Do you drink alcohol?" If yes then ask further questions: "How much? Daily? How long?"
- "Have you ever tried any recreational drugs?" If yes, "Which one? How long? When?"

Physical Examination:
- Ask the nurse to give you a set of vitals. Blood pressure lying and standing to check for orthostatic changes. Review vital signs with the examiner. Vital Signs: T 38.1, HR 107, BP 100/70, RR 18, O2 saturation 98%.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner), "Mr… I am starting your examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.
- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then say. "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation. *Bowel sounds absent or decreased.*
- **Palpation:** Warm up your hands. Then remember to examine the tender area at the end. Keep an eye on the patient's facial expressions while you palpate.
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.
  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or lump/mass. Start from area of LLQ, examine for areas of tenderness or guarding. Patient will be tender all over abdomen. There will be muscle guarding. *Patient may not let you elicit any abdominal examination signs due to generalized pain.*
- Examiner may give the findings: *Abdomen is distended, tender all over, and resonant note on percussion.*

"Mr… I am suspecting that you might have perforated an ulcer from your stomach. I am going to start the management now."

- **Ask the nurse to put 2 × IV line and draw blood for:**
  - CBC
  - Urea and creatinine
  - Lipase
  - Electrolytes
  - Blood sugar
  - Cardiac enzymes
  - Venous blood gas
  - Blood for group and hold
- **Attach monitors**
- **Nothing to eat and drink**
- **Start IV fluids (normal saline 0.9%)**
- **IV morphine or fentanyl for pain**
- **?IV Pantoprazole infusion**

Order: X-ray erect abdomen/X-ray left lateral decubitus abdominal or CT abdomen if readily available.

Question: What will you be looking for in the X-ray?

Answer: "I shall be looking for air under the diaphragm."

Question: Examiner may show an X-ray showing air under the diaphragm or verbally tell the findings. What will be your next step in management?

Answer: "I will inform the patient about my findings":

"In my opinion, you have a condition called acute abdomen, which is most likely due to a perforated peptic ulcer due to a history of taking ibuprofen. The perforation occurs when the ulcer erodes through the wall of the stomach or duodenum. Gastric or duodenal contents spill out into the peritoneum and that can cause complications such as infection and peritonitis. I am going to consult general surgery. They will come and assess you. It looks like you are requiring an urgent surgery. The surgeon will decide whether to perform an open or keyhole (laparoscopic) surgery. Usually they use an omental patch to fix the perforation; they will give you more information. Do you want me to inform anyone on your behalf?"

Question: What if there is no air under the diaphragm and the serum lipase levels are high?

Answer: "Then my diagnosis will likely be acute pancreatitis."

Question: What is the pancreas?

Answer: "The pancreas is an important organ that lies just behind the stomach and intestines in the abdomen. It produces digestive juices that digest carbohydrates, fats, and proteins in food. This process helps in absorption of food through the intestine. It also produces hormones such as insulin and glucagon, which regulate blood sugar in our bodies. A deficiency of insulin leads to diabetes."

Question: What is acute pancreatitis?

Answer: "Pancreatitis is inflammation of the pancreas. Acute pancreatitis develops rapidly, and the patient presents with sudden onset of severe upper abdominal pain, radiating to the back, that is eased by sitting forward; it may be associated with repeated vomiting or retching. The patient may have a low-grade fever and tachycardia with hypotension. On examination the patient will have epigastric tenderness, guarding, and decreased or absent bowel sounds."

Question: You just diagnosed your patient with acute pancreatitis, what will be your next steps in management?

Answer: I will ask about the **risk factors** including alcohol, gallstones, viruses (mumps), trauma, or recent ERCP (endoscopic retrograde cholangiopancreatography).

Initial management will be:

- IV lines, routine blood tests, blood gas analysis
- Fluid resuscitation
- Pain medication
- Nothing to eat and drink/NG tube in severe cases
- CT scan of the abdomen
- General surgery consultation and admission to hospital

"If secondary to gallstones, then removal of gallbladder once pancreatitis has settled down. Usually settles with no permanent pancreatic tissue damage."

"At times it can make the patient very sick. If the inflammation persists, it may develop into **chronic pancreatitis** in which the patient will likely have recurrent episodes of pancreatitis and the pancreas will be scarred and damaged."

"The patient may present with abdominal or back pain, often associated with meals. The pain is aching or dull. Some patients may not even have any pain. Other symptoms will be nausea and vomiting, mild jaundice, weight loss, and typical greasy bulky stools, which is called steatorrhea. Once the pancreas is unable to make insulin, diabetes develops. Treatment will be insulin by injection and oral pancreatic enzymes replacements."

Management: Severe Abdominal Pain (Mesenteric Infarction)

Candidate Information:
You are working in an emergency department and are attending a 68-year-old man who came in with a sudden onset of severe generalized abdominal pain for 3 h. He has been having bloody diarrhea, nausea, and vomited a few times. He has a history of atrial fibrillation.

Please manage this patient. There will be a nurse at the bedside to help you with any orders. The examiner will give you any findings if required during the management.

Differentials:
- Mesenteric infarction/ischemia
- Small bowel obstruction (adhesions)
- Volvulus
- Acute diverticulitis
- Perforated peptic ulcer
- Acute pancreatitis
- Acute cholecystitis
- Inflammatory bowel disease
- Acute coronary syndrome

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.

- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician for today. Are you Mr…? Can you please confirm your age? What brings you here today?"

History of Present Illness:
The patient will briefly tell you about his sudden onset of severe generalized abdominal pain and will ask for pain medication. It is extremely important to address the patient's pain here. "I can see that you are in pain, I need to ask you a few questions to find out why you have this severe pain. It will also help me to give you the appropriate pain medication. We have a nurse here; she will help me with your management. Is that alright?"

"When did this pain start?" *It started about 3 h back.*

"Where did the pain start?" *Midline around the belly button, but now all over the abdomen.*

"Has the pain changed in severity or location?" *Worsened and progressively increasing in intensity.*

"What is the pain like?" *Sharp cutting pain like a knife cutting through.*

"How did it come on?" *Started suddenly and is progressively increasing.*

"Does the pain go anywhere?" *It was going to my spine and now it has spread all over the abdomen.*

"How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *Now it is 9.*

"Does anything aggravate the pain?" *Exacerbated by movements.*

"Any relationship with food?" *None.*

"Does anything relieve the pain?" *Nothing, it is the same.*

"Have you ever had this pain before?" *No.*

"Have you had any nausea, vomiting, or loss of appetite?" *I had nausea and vomited three times, (just food contents, no blood).*

"Please tell me about your diarrhea." *Three to four times, loose and with crampy abdominal pain. Fresh blood – about 50 ml in quantity. No black tarry, sticky stool.*

"Are you passing gas?" *Yes.*

"Have you noticed any changes in your bowel habits (blood in stool, diarrhea)?" *Fresh blood in stool.*

"Appetite?" *Poor.*

"Any fevers, chills, or night sweats?" *None. Feel sweaty now.*

"Any recent trauma?" *None.*

Questions to Rule Out Differentials:
- "Change in bowel habits?"
- "Have you lost weight recently?"
- Explore about liver problems.
- "Use of NSAIDs?"
- "Any long-term disease?"

Past Medical History:
"I understand that you have atrial fibrillation? How long have you been having AF? What medications are you taking for the AF? Have you been followed up by your family physician or the community coagulation clinic? Do you have any other condition apart from the AF?" *AF for 6–7 years.*

Past Hospitalization and Surgical History:
"Do you have any previous hospitalization or previous surgery?"

Medication History:
"Are you taking any medication, over-the-counter or herbal, and any side effects?" *Aspirin and digoxin.*

Allergic History:
"Do you have any known allergies?"

Family History:
"Any family history of significant health problems?"

Social History:
- "Do you smoke or does anyone else in your home or close proximity at work smoke? Do you drink alcohol?" If yes then ask further questions: "How much? Daily? How long?" *Smoker: ten cigarettes per day for 10 years.*
- "Have you ever tried any recreational drugs?" If yes, "Which one? How long? When?"

Physical Examination:
- Ask the nurse to give you a set of vitals. Blood pressure lying and standing to check for orthostatic changes. Review vital signs with the examiner. Vital Signs: Temp 37.3, HR 107, BP 120/70, RR 18, O2 saturation 98%.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner) "Mr…, I am starting your examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.

- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then say, "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation. *(Absent or decreased)*
- **Palpation:** Warm up your hands. Keep an eye on your patient's facial expressions as you palpate the abdomen.
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.
  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or lump/mass. Start from area of LLQ, examine for areas of tenderness or guarding. *Abdomen will be distended. There will be tenderness all over the abdomen more in the central abdomen. There will be muscle guarding. Patient may not let you elicit any abdominal test due to generalized tenderness*.
- Examiner may give the findings: *Abdomen is distended, tender all over. Absent bowel sounds. Fresh blood on digital rectal examination.*

"Mr…, I am suspecting that you might have a condition called mesenteric infarction. I am going to start the management now."

Ask the nurse to put 2 × IV line and draw bloods for
- CBC
- Urea and creatinine
- S. lipase
- Electrolytes
- Blood sugar
- Cardiac enzymes
- Venous blood gas (check for lactate level)
- Blood for group and hold
- Attach monitors.
- Nothing to eat and drink
- Start IV fluids (normal saline 0.9%)
- IV morphine or fentanyl for pain
- X-ray erect abdomen (look for thumbprint sign)

Question: How will you counsel your patient about mesenteric infarction? What will be your next step in management?

Answer: "Mesenteric ischemia occurs when the blood supply of your bowel has been cut off due to the blockage of one of its arteries. This might have resulted from a clot that has traveled from the heart because of your atrial fibrillation. This is a medical emergency.

We need to admit you."

"I will call general surgery to come and assess you. They may decide to do CT angiography of the mesenteric artery if they think they have enough time, but if they believe it is urgent, they might do surgery to open up the blockage as soon as possible to avoid infarction of the affected tissue. During the surgery, if they find that the part of the gut has been affected and no longer viable, they might remove that part."

"Do you want me to inform anyone on your behalf?"

Management: Bowel Obstruction

Candidate Information:
You are working in a busy emergency department. The nurse has asked you to see a new patient who is a 68-year-old man. He has had generalized abdominal pain for 2 days. He has been having nausea and vomiting. He has not passed any bowel movement for 3 days.

Please manage this patient. The examiner may give you required information such as blood results.

Differentials:
- Small bowel obstruction
  - Adhesions
  - Hernias
  - Stricture
  - Small or large bowel tumors
  - Gallstone ileus
  - Volvulus
- Mesenteric infarction/ischemia
- Acute diverticulitis
- Perforated peptic ulcer
- Ogilvie's syndrome
- Intussusception
- Acute pancreatitis
- Acute cholecystitis
- In female patients only: Endometriosis, ovarian or uterine tumors

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
"Good morning/good afternoon. I am Dr…. I am your attending physician for today. Are you Mr…? Can you confirm your age please? What brings you here today?"

History of Present Illness:
The patient will briefly tell you about his gradual onset generalized abdominal pain, nausea, and vomiting.

Please try to cover all three presenting symptoms (abdominal pain/vomiting/no bowel movement) with a minimum set of questions:

- "When did this pain start?" *It started about 2 days back.*
- "Where did the pain start?" *Midline around the belly button but now all over the abdomen.*
- "Has the pain changed in severity or location?" *Worsened and progressively increasing in intensity.*
- "What is the pain like?" *Dull and diffuse pain. Comes and goes and is burning in nature.*
- "How did it come on?" *Started gradually and is progressively increasing.*
- "Does the pain go anywhere?" *It was mostly in umbilical area. No particular radiation.*
- "How severe is the pain from 1 to 10? 1 being mild pain and 10 most severe." *Now it is 7.*
- "Does anything aggravate the pain?" *Exacerbated by movements.*
- "Any relationship with food?" *None.*
- "Does anything relieve the pain?" *Nothing, it is the same.*
- "Have you ever had this pain before?" *No.*
- "Have you had any nausea, vomiting, or loss of appetite?" *I had nausea and vomited six times (last two vomit contain just bile – no blood).*
- "When was your last bowel movement?" *About 3 days back. Bowel moments were regular before that. No black tarry, sticky stool*
- "Are you passing gas?" *None* (and felt that he was bloated).
- "Appetite?" *Poor.*
- "Any fevers, chills, or night sweats?" *None. (May have low-grade fever)*
- "Any recent trauma?" *None.*

Questions to Rule Out Differentials:
- "Change in bowel habits?"
  - Constipation/obstipation
  - Change in frequency
  - Tenesmus
  - Caliber of stool
  - Flatulence
  - Melena
- "Have you lost weight recently?"
- "Any long-term disease?"

Past Medical History:
"Do you have any previous health issues?" *None.*

Past Hospitalization and Surgical History:
"Have you ever been hospitalized? Have you ever undergone any surgery?" *Yes, laparotomy and resection of bowel due to a tumor in the small intestine 2 years back. He was doing quite well since his surgery.*

Medication History:
"Are you taking any medication?" *No regular medication.*

Allergic History:
"Do you have any known allergies?" *No known allergies.*

Family History: *Noncontributory.*

Social History: *Nonsmoker, nondrinker, and no drug use.*

Physical Examination:
- Ask the examiner for a set of vitals. Blood pressure lying and standing to check for orthostatic changes. Review vital signs with the examiner. Vital Signs: T 37.3, HR 107, BP 120/70, RR 18, O2 saturation 98%.
- **Exposure:** Stand on the right side of the bed, and tell the patient (indirectly to the examiner), "I am starting your examination now. During the examination if you feel uncomfortable at any point, please do let me know."
- **Position:** Supine, arms on the side, legs uncrossed.
- **Observe:** Is the patient moving around comfortably? Look for posture, distress, and sweating.
- **Face:** Color of the face, pallor, jaundice, plethora, central cyanosis.
- **Mouth:** Tongue, ulcers, thrush, central cyanosis.

Abdominal Examination:
- **Inspection:** "Is it alright if I expose your abdomen from the ribs to the waist?" (Please do not expose the breasts or the inguinal area). Drape the patient appropriately for abdominal examination.
- **Observe for** contour, umbilicus, abdominal skin, surgical scars, obvious masses, hernias, movements with respiration, peristalsis, visible pulsation. Comment if any abnormal finding; otherwise move on.
- **Auscultation:** Then say "I am going to listen to your bowel sounds with my stethoscope." Auscultate in at least two quadrants but do not spend too much time on it. Comment on your finding and move on to palpation. *(Absent or decreased)*
- **Palpation:** Warm up your hands. Keep an eye on the patient's facial expressions while palpating.
  - **Superficial/light palpation:** Gently palpate each quadrant. Make sure to go through all the areas.

  - **Deep palpation:** Again palpate for all four quadrants but this time with deeper palpation. Feel for any tenderness or lump/mass. Start from area of LLQ, examine for areas of tenderness or guarding. *Abdomen will be distended. There will be mild tenderness all over the abdomen more in the central abdomen. There will be muscle guarding. Patient may not let you elicit any abdominal test due to generalized tenderness.*
  - *Tell the examiner what you will look for.*
- Examiner may give the findings: *Abdomen is distended, tender all over. Absent bowel sounds.*

"Mr…, I am suspecting that you might have a condition called a bowel obstruction. I am going to start the management now."

- **Ask the nurse to put 2 × IV line and draw blood for:**
  - CBC
  - CRP
  - Urea and creatinine
  - S. lipase
  - Electrolytes
  - Blood sugar
  - Cardiac enzymes
  - Venous blood gas (check for lactate level)
  - Blood for group and hold
- Attach monitors.
- Nothing to eat and drink.
- Nasogastric tube
- Start IV fluids (normal saline 0.9%) and correct fluids/electrolyte balances.
- IV morphine or fentanyl for pain
- X-ray erect abdomen (dilated loops of small and or large bowel with air fluid levels sign)

Question: How will you counsel your patient about bowel obstruction? What will be your next step in management?

Answer: "This is a surgical emergency. We need to admit you. I will call general surgery to come and assess you. They may decide to do a CT scan of your abdomen and pelvis, and they might do surgery to open up the blockage as soon as possible to avoid infarction of the affected tissue. During the surgery, if they find that the part of the gut has been affected and no longer viable, they might remove that part."

"Do you want me to inform anyone on your behalf?"

History and Examination: Breast Lump

Candidate Information:
A 45-year-old female comes in to your clinic. She noticed a small lump in her right breast a few days back while taking a shower. Please take a focused history and perform a relevant physical examination.

Differentials:
- Fibroadenoma of the breast
- Intraductal papilloma
- Mammary dysplasia
- Fat necrosis
- Fibrocystic disease
- Breast abscess
- Breast cancer

Starting the Interview:
- Knock on the door.
- Enter the station.
- Hand-wash/alcohol rub.
- Greet the examiner and the patient.
- Give stickers to the examiner (if required) and/or show your ID.
- Sit on the chair or stand on the right side of the patient and start the interview.

Opening:
Good morning/good afternoon. I am Dr…. I am your attending physician for today. Are you…? Can you please confirm your age? What brings you here today?

History of Present Illness:
- "When did you notice the lump?"
- "How did you notice it the first time?"
- "How many lumps?"
- "Was it present before that?"
- "Which part of breast is it?" (Quadrant, distance from nipple)
- Physical features: "What is the shape of lump?" (Round, oval)
- Consistency: "What does it feel like?" (Soft, rubbery, or hard)
- Border: "Does it have well-defined edges or ill defined?"
- Mobility: "Can you move it under the skin or is it fixed?"
- Delineation: "Discrete or fixed?"
- Relation to menstrual cycle: "Did you notice any change in size or shape of the lump during menstrual cycle? Any pain during menstrual cycle?"

- Pain and tenderness: "Was there any pain in the lump or breast? One breast or both breasts?"
- "Any history of breast trauma?"
- Nipple discharge: "Did you notice any nipple discharge?" (amount, color, smell)
- Nipple retraction: "Did you notice any nipple retraction?"
- Breast skin changes:
  - "Did you notice any change in skin over the swelling or in the breast?" (discoloration, induration, erythema, or dimpling)
  - Change in texture (peau d'orange)
  - Signs of inflammation on skin of breast (redness, pain, hot)
- "Any recent change in size of breast?"
- "Did you notice any lump or swelling in the axilla?"
- "Any swelling in the arms?"
- Constitutional symptoms: fatigue and malaise, night sweat, fever, and weight loss

Risk Factors:
- "Past history of breast cancer?"
- "Family history of breast cancer/ovarian cyst?"
- "Previous breast biopsy?"
- "Age of menarche?"
- "Last menstrual cycle?"
- "Nulliparity?"
- "Children?"
- "Age of firstborn?"
- "Radiation exposure?"

Signs of Metastasis:
- Brain: headache, vision changes, nausea, or vomiting
- Liver: jaundice
- Bone: pain
- Lungs: shortness of breath, cough, blood in sputum

"Did you ever have a mammogram? When was the last mammogram performed?"

Past Medical History:
"Do you have any previous health issues?"

Past Hospitalization and Surgical History:
"Have you ever been hospitalized? Have you ever undergone any surgery?"

Medication History:
"Are you taking any medication?"

Allergic History:
"Do you have any known allergies?"

Family History:
"Cancer (breast, colon, ovary)?"

Social History:
Smoking, alcohol intake, and illicit drug history

Menstrual, Gynecology, and Obstetric History:
- "When did you start your sexual activity?"
- "Are you sexually active now?"
- "Any Pap smears at all? Was it a normal smear last time?"
- "Any bleeding, itching, pain, discharge, previous sexually transmitted disease (STD), warts, ulcers, lumps, bumps?"
- "Have you ever been pregnant? How many times?"
- "Did you breast feed your children?"
- "When was your LMP?"
- "Was it regular? Period, cycle?"
- "Do you think that you are pregnant right now?"

Physical Examination:
Review vital signs with the examiner. Vital Signs: T 36.3, HR 75, BP 130/70, RR 16, O2 saturation 98%.

Stand on the right side of the bed, and tell the patient (indirectly to the examiner), "I am starting your examination now. During the examination if you feel uncomfortable at any point, please do let me know."

- **General:**
  - Pallor, jaundice, cyanosis
  - Hair, skin, and tongue changes
  - Neck examination, lymph nodes, swellings, thyroid exam
  - Hand and lower limb edema
- **Exposure:** Lower the shirt from the neck to the waist.
- **Position:** Examine in four positions: (1) patient sitting with her arms at her sides, (2) in lap, (3) hands pressing over the waist/hips, and (4) leaning forward and hand over the head.
- **Inspection:** Inspect the entire breast including the periphery, nipple, areola, tail, and axilla:
  - Size
  - Symmetry
  - Color
  - Visible masses
  - Shape change
  - Skin retraction, dimpling, flattening, inversion
  - Skin ulceration
  - Erythema
  - Peau d'orange
  - Increased vascularity
  - Nipple discharge (serous, bloody, milky, clear)
  - Supernumerary nipple

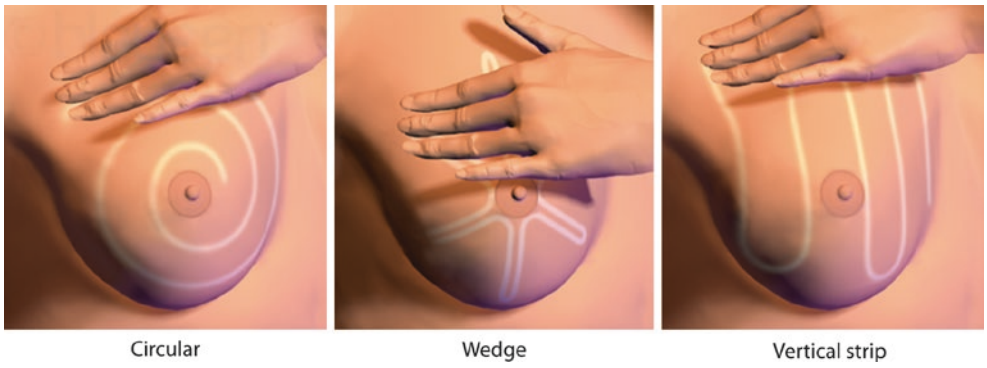

Fig. 9.2 Breast examination patterns. (Source: Blausen Medical Communications, Inc. licensed under the Creative Commons Attribution 3.0 Unported license. https://creativecommons.org/licenses/by/3.0/deed.en)

- **Palpation:**
  - Light palpation and deep palpation.
  - Palpate entire breast including periphery, nipple, areola, and tail.
  - Use vertical or radial strip method (Fig. 9.2).
  - Keep fingers on the breast all the time.
  - Feel for tenderness
  - Feel for lump and look for its:
    - Location
    - Size
    - Shape
    - Consistency
    - Mobility
  - Feel axilla for axillary lymph nodes (anterior, posterior, medical, lateral and apical groups) and then supraclavicular lymph nodes.

Wrap-Up:
- Mention that you will complete your examination by doing a respiratory, cardiovascular, and abdominal examination.
- Comment on your findings.
- Thank the patient and tell the patient to cover up.
- Ask the patient if she has any questions.

Question: What are the signs and symptoms of breast cancer?

Answer:
- Palpable mass
- Breast pain and swelling
- Skin dimpling, retraction, or ulceration
- Edema (arm or breast)
- Erythema
- Nipple retraction
- Prominent veins
- Palpable axillary or supraclavicular lymph nodes

Question: What are the risk factors for breast cancer?

Answer:
- Increasing age (over 40 years)
- Heredity – a strong family history
- Caucasian race
- Previous history of breast cancer
- Hormone replacement therapy, especially longer than 5 years
- Using the oral contraceptive pill
- Increased alcohol intake
- Obesity including heavy postmenopausal weight gain
- Early age of first period
- Later age of menopause (55 years or older)
- Childlessness or having children after 30
- Ionizing radiation exposure [3]

Question: What if it turns out to be a breast cancer, what will be the treatment?

Answer: "The treatment depends on various factors, which include the size, type, and nature of the cancer. The patient's age, health, and her personal preference are also an important consideration. The usual treatment includes surgery, chemotherapy, radiotherapy, and hormone treatment. Most of the time, it will be a combination of two or more of these."

"The first step in the treatment is surgery in order to remove the cancer and surrounding breast tissue as well as adjacent lymph glands. If the lump is small, the preferred method of surgery is a breast-conserving surgery in which either only the lump is removed or part of the breast with the lump is removed. For larger lumps the whole breast with lymph nodes in the axilla needs to be removed. Later, radiotherapy is given to this area. In most of the breast cancers, surgery and radiotherapy are combined with chemotherapy or antihormone therapy such as tamoxifen."

Question: Can you please tell me more about fibrocystic disease of the breast?

Answer: "It is a very common breast condition. It is also known as mammary dysplasia, fibroadenosis, and cystic hyperplasia. It is hormone related. It can occur anytime between the first period to the last period. It is most commonly seen between 30 and 50 years of age. The patient's main complaint will be breast pain and swelling. The breast may have a nodular feeling and sometimes an obvious lump is palpable. Breasts will be tender to touch. The symptoms tend to increase just before menstruation and resolve or improve after the period. The patients also notice some change in size of mass during each menstrual cycle. Treatment is usually according to the symptoms and clinical findings. For diffuse lumps a mammography is advised. For a small lump, a needle biopsy, and for cysts a needle aspiration is recommended. Pain medications are given. Surgery is not required and reserved for removal of undiagnosed lumps only."

Question: The patient is diagnosed to have a fibroadenoma. How will you counsel your patient?

Answer: "A fibroadenoma is a smooth, discrete lump within breast tissue. The name implies that it has a fibrous component and an adenomatous part that consists of glandular tissue. The cause is unknown. These are seen in younger females – usually in their 20s. It is common from 15 to 35 years of age. It is a firm, mobile, smooth, and round lump. It is usually not painful. It appears to change its position; sometimes it is also called a 'breast mouse.' It will rarely change to cancer. The treatment includes an ultrasound and fine needle aspiration. Surgery is reserved if the lump enlarges or the woman wants to get rid of it."

Question: How will you counsel your patient about a mammogram?

Answer: "A mammogram is a screening test for the early detection of breast cancer. Breast cancer is one of the leading causes of cancer mortality in women. There is significant reduction in deaths from breast cancer among women who are regularly screened. Mammograms can usually find lumps 2 or 3 years before a woman or her healthcare provider can feel them."

"A mammogram is a special X-ray of the breast with low dose of radiation to see the breast from inside. There are two types of mammogram: screening and diagnostic.

Diagnostic mammogram is done in cases of breast mass or suspicion of breast cancer. Before the mammogram, you will be asked to undress from the waist up and change to a hospital gown. Each breast is X-rayed separately. The breast is flattened between two mammogram panels. This might be a bit uncomfortable, but it will only take a few seconds. If possible, try to avoid scheduling your mammogram just before or during your menstrual period, when the breasts are more sensitive. Also, do not use underarm deodorant on the day of your test."

"A radiologist will interpret the mammogram. Some women will need to have more images taken. Needing more images is common and does not usually mean that you have cancer. These extra images help the radiologist to have the most accurate and clear view of your breast tissue."

"In general, screening mammograms are less effective in younger women because they tend to have denser breast tissue. Mammograms may lead to additional testing. I will provide you with brochures about mammograms."

Question: What mammographic findings are suggestive of malignancy?

Answer:
- Microcalcification
- Irregular satellite or speculated mass
- Architectural distortion
- Increased vascularity
- Interval mammographic changes

Question: If the patient asks: Can you teach me how to self-examine the breast?

Answer: "Self-examination is not recommended and will increase the number of visits to the doctor's office and may increase the number of unwanted biopsies. A physician will do your breast examination periodically."

Checklist Assessment: Trauma Patient

Please read the regional protocols and guidelines for emergency management; there are often changes made to these guidelines. It is highly recommended to attend and keep your *Basic Life Support*, *Advance Cardiac Life Support*, *Pediatric Advance Life Support*, and *Advance Trauma Life Support* certificates updated.

Candidate Information:
While working in a peripheral hospital emergency department, a 28-year-old male was brought in by ambulance. He was hit by a truck while crossing the road.

Please perform a primary and secondary survey (Table 9.3a, 9.3b) [4]. Please do not perform rectal, genitourinary, or breast examination.

Table 9.3a Primary survey for trauma

Goals of primary assessment	Examine and identify life-threatening conditions
	Initiate supportive treatment and stabilize the patient
	Plan/provide definitive treatments and/or organize transfer for definitive treatments
Starting the station	Knock on the door
	Enter the station
	Hand-wash/alcohol rub
	Greet the examiner, nurse, and the patient
	Give stickers to the examiner if required or show your ID badge
	Take a seat or stand on the right side of the patient and start the interview
Opening	Introduction, greet, drape
	Ask for vital signs. Interpret the vital signs
Primary survey (mnemonic ABCDE)	
A: Airway maintenance with cervical spine protection	Mention "First of all I want to make sure my patient's airway is patent"
	Check response: Ask the patient: "Hi, what is your name? What happened?" or "How are you?"
	Assess ability to speak
	Assess ability to breath
	Are there any signs or symptoms of airway obstruction? Look for
	Apnea
	Noisy breathing
	Respiratory distress
	Failure to speak
	Foreign bodies
	(Facial or neck trauma) facial, mandibular, or laryngeal fractures
	Agitation
	Confusion
	Choking signs
	Assume C spine injury (immobilize with collar and sand bags)
	If you find airway compromise, mention that you need to secure the airway first:
	Simple suction and secretion control
	Chin lift or jaw thrust
	Nasopharyngeal airway
	Oropharyngeal airway
	Bag valve mask ventilation
	Intubation
	Surgical airway
	If patient presents with Glaucoma Coma Score (GCS) of less than 8, consider endotracheal intubation as the next step
	Appropriate response will confirm
	Patent airway
	Sufficient airway reserves to permit speech
	Adequate perfusion
	Clear sensorium
	Mention here that the airway is clear but you will reassess it again
B: Breathing and ventilation	Assess respiratory rate
	Put pulse oximetry probe and check O_2 saturation
	Examine chest with adequate exposure and evaluate breathing:
	Look for chest movements, use of accessory muscles and color (cyanosis/pale)
	Auscultate for breath sounds, airway obstruction (stridor), and air entry symmetry
	Feel the chest. Palpate the trachea for its position or shift, chest wall crepitus, subcutaneous emphysema, flail segment, and sucking chest wall wounds
	Percuss: Both sides from the front and compare. Mention the findings
	Try to detect: tension pneumothorax, hemothorax, pneumothorax, and flail chest
	For further information on tension pneumothorax and hemothorax, see details in respiration system chapter
	If there is any breathing compromise or findings that the examiner provides, then manage accordingly. Assess for the need of immediate needle chest decompression or chest drain insertion. Also mention you may use nasal prongs, venturi mask, and bag-valve mask or can provide high-flow oxygen through a rebreather mask if not intubated and ventilated

(continued)

Table 9.3a (continued)

C: Circulation with hemorrhage control	Assess pulse rate
	Assess pulse quality (strength)
	Put cardiac monitors and blood pressure cuff
	Ask for BP and pulse pressure
	Assess capillary refill
	Assess skin color
	Look for any external obvious bleeding and take measures to stop it (pressure bandage):
	Direct manual pressure should be applied in trying to stop visible bleeding. Tourniquets are not used because of the risk of distal ischemia except for traumatic amputation. Transparent pneumatic splinting devices may control the bleeding and allow visual monitoring
	Surgery may be necessary if these measures fail to control hemorrhage
	Occult bleeding into the abdominal cavity, chest, retroperitoneum, or pelvis/long-bone fractures are all problematic. These should be suspected in a patient not responding to initial fluid resuscitation
	Insert two large-bore peripheral IV lines, or consider central venous catheterization if there is difficulty in getting peripheral lines
	Get blood samples for baseline tests and for cross match with a group and hold
	IV fluids need to be given rapidly, usually as 250–500 ml warmed boluses (10–20 ml/kg in children). Often a total of 2–3 L of IV fluids is necessary (40 ml/kg in children), which will then need to be followed by a blood transfusion (O negative to begin with, if typed blood is not available). Ringer's lactate is the preferred initial crystalloid solution
D: Disability and neurological status	Rapid neurological assessment should be done next. During the primary survey a basic neurological assessment is made, known by the mnemonic **AVPU:**
	Alert
	Verbal stimuli response
	Painful stimuli response
	Unresponsive
	Or by using **GCS**
	Pupils:
	Size, symmetry, and reaction
	Any lateralizing signs
	Level of any spinal cord injury (limb movements, spontaneous respiratory effort)
	Ask for a **blood glucose level** (finger prick)
	Observe for **causes** that may affect level of consciousness; oxygenation, ventilation, drugs, alcohol, and hypoglycemia may all also affect the level of consciousness. If these are excluded, changes in the level of consciousness should be considered to be due to traumatic brain injury until proven otherwise
	Patients should be reassessed frequently as patients may deteriorate rapidly. Sometimes patients may be lucid after suffering from a head trauma, and these patients deteriorate very quickly. Observe for signs such as pupil asymmetry or dilation, absent light reflexes, and weakness/paralysis in limbs that may suggest an expanding intracranial hematoma or diffuse edema. These may require IV mannitol, ventilation, and an urgent neurosurgical referral
E: Exposure/ environmental control	Clothes may need to be cut off for proper exposure, but one needs to keep in mind the prevention of hypothermia
	After a quick examination, cover up the patient and prevent heat loss with warming devices, such as warmed blankets
Additional measures need to be done simultaneously while initial assessment and resuscitation are being performed	**Continuous vital signs monitoring:** Pulse oximetry should be attached on finger or ear lobe. Blood pressure cuff should be attached on arm. Pulse rate, blood pressure, respiratory rate, and body temperature should be continuously monitored
	Electrocardiograph (ECG) monitoring: This can guide resuscitation by diagnosing cardiac arrhythmia and ischemia
	Blood tests: Full blood count, Chem20, troponin, arterial blood gases/venous blood gases, group and hold, and coagulation screening (if required)
	X-rays: Portable if required on the bedside in the resuscitation room. If the patient is initially stable, they may be transferred to the radiology department for X-rays and or computed tomography (CT)
	X-ray chest
	Pelvic X-ray. It has been suggested that CT scans may be used in some stable patients
	Lateral cervical spine X-ray
	FAST scan (focused assessment with sonography for trauma): Very quick and useful tool to look for abdominal injuries; and/or **CT scanning** to detect occult bleeding
	Urinary output: May require insertion of a urinary catheter to measure urine output. Adequate output is 0.5–1 ml/kg/h. Urine output will determine fluid replacement. It is essential to rule out urethral injury before attempting catheterization. One must suspect urethral injury if there is blood at the meatus, pelvic fracture, scrotal blood, or perineal bruising. A digital rectal and genital examination are mandatory prior to catheter insertion
	Gastric catheter is inserted to reduce aspiration risk. Suction should be applied

Table 9.3b Secondary survey for trauma [4]

Secondary survey	
Once life-threatening conditions have been dealt with and ABCDE completed, then a secondary survey should be started. It includes a brief history, a head-to-toe examination, and a reassessment of progress	
History	**Allergy:** "Do you have any known allergies?"
	Medication: "Do you take any regular or prescribed medications?"
	Previous medical history: "Do you have any known medical conditions?"
	Last meal: "When was the last time you ate or drank something?"
	Event history: "What happened?"
	Try to get as much details as possible about how they feel
	Ask questions about pain. Can they feel any pain? If yes, then explore pain
Head-to-toe examination	**Check for vital signs again**
	Bleeding: Check the body from head-to-toe for any signs of bleeding
	Head and neck: Is there any bleeding, swelling, or dent in the scalp or on the face?
	Eyes: What size are their pupils? Response to light? Equal?
	Nose: Is there any blood or clear fluid coming from the nostrils?
	Mouth: Look for mouth injuries or burns in their mouth, loose dentures, and any foreign bodies
	Ears: Observe for an appropriate response when talking to patient. Do an ear examination. Is there any blood or clear fluid coming from either ear?
	Skin: Note the color and temperature of their skin
	Neck: Feel for trachea, neck, and cervical spine tenderness
	Chest: Observe the chest for rise and fall. Feel the rib cage to check for any deformity or sensitivity
	Collar bone, arms, and fingers: Feel all the way along the collar bones to the fingers for any swelling, sensitivity, or deformity. Check that they can move their elbows, wrists, and fingers. Look for any needle marks on the forearms
	Spine: Log roll: Need minimum of four people to complete it. One stabilizing the neck, two log rolling, and one palpating the spine. Palpate the entirety of the spine. Look at the back of the chest and back for any injuries. Also do a rectal exam
	Abdomen: Gently feel their abdomen to check for any signs of internal bleeding
	Hips and pelvis: Feel both hips and the pelvis for signs of a fracture. Check their clothing for any signs of incontinence, which may suggest a spinal injury or bladder injury
	Legs: Check the legs for any bleeding, swelling, deformity, or soreness. Ask them to raise one leg and then the other and to move their ankles and knees
	Toes: Check their movement and feeling in their toes. Compare both feet and note the color of the skin
Additional investigations with secondary survey	CT scans
	Ultrasound
	Contrast X-rays
	Angiography
Wrap-up	Thank the patient and ask the patient to cover up
	Wrap up your findings with the examiner or the patient

Vital Signs: Temp, 36.8 °C; HR, 100; BP, 130/80; RR, 18; O2 saturation, 98% on RA.

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