SHEng
SMART HEALTHCARE ENGINEERING
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GENERAL SAFETY RULES FOR STUDENT VISITS TO HOSPITAL UNITS

Class content material

This document is part of a training materials collection developed within the Erasmus+ project “Smart healthcare engineering”, SHEng, project No. 2023-1-RO01-KA220-HED-000159985.

The collection is intended for engineering students and professionals working in the healthcare sector. It covers technical subjects relevant to hospital infrastructure, equipment, materials and support services, helping readers understand how engineering contributes to safe patient care and the reliable operation of healthcare facilities.

These materials support classroom teaching and independent study. They should be used alongside the project handbook and the presentations, courses and other learning resources available on the project website. Each document addresses a specific subject, while the collection provides a broader understanding of the responsibilities and practical challenges of healthcare engineering.

The content is educational. Its application in practice requires consideration of the conditions of each healthcare facility, the applicable standards and the instructions provided by equipment manufacturers.

Project website: www.smarthealtheng.com

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General safety rules for student visits to hospital units

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Purpose and use

Hospital visits allow students to understand how engineering, clinical work and daily maintenance support patient care, but the learning activity must fit around the work of the hospital.

This guide is intended for supervised educational visits by engineering students and their teachers and it covers preparation, conduct in clinical and technical areas, protection of patients and the response to an incident, and should be read before arrival and kept available during the visit.

The document provides only general visit rules for adaptation by the host hospital, as the regulations are different in Spain, Romania and Turkey. The host hospital must confirm the permitted areas, protective equipment and emergency arrangements before the visit, with any more restrictive local instruction taking priority.

Students attend as observers and must not handle specimens, operate medical devices or carry out maintenance as part of an ordinary visit. A practical activity requires a separate arrangement with suitable training, supervision and authorisation.

Permission to enter a room does not provide permission to use the equipment inside it.

Finding the information you need

Before entering the unit, every student should know who is leading the group, where they may go, how to raise a concern and where to meet if the visit is interrupted. When an instruction is unclear, ask the group coordinator before proceeding, even if other members of the group have already entered.

1. Planning the visit and assigning responsibility

The university organizer should agree the learning objectives, date, duration and proposed route with the hospital contact, allowing enough time for the hospital to review access to busy or sensitive areas. The agreement should identify the units included, any areas that are excluded and whether the visit can continue during a change in clinical activity or infection precautions.

Group size should reflect the available space, the number of coordinators and the needs of the unit, rather than simply the number of students who wish to attend. Where the group is too large, divide it into smaller groups with a named leader for each, and arrange waiting areas that do not obstruct patients or staff.

No fixed group size is suitable for every hospital.

Responsibilities during the visit

The hospital escort controls access to the units and explains local hazards, while the academic leader keeps the group together, checks attendance and makes sure that instructions are understood. Each student remains responsible for following the route and reporting a problem promptly. If the escort has to leave, the group should wait in the agreed safe area until supervision resumes.

The visit may be shortened or cancelled because of an emergency, an outbreak or pressure on the clinical service.

2. Health clothing and personal preparation

Check that you are fit to attend

Do not attend an educational hospital visit while you have **symptoms** that may indicate an infectious illness, such as fever, a new respiratory illness, vomiting or diarrhoea; inform the organiser and follow the host's advice about returning. A mask does not automatically make attendance acceptable when you are unwell. If symptoms begin during the visit, tell the escort, move away from the group as directed and arrange a safe departure.

Report a relevant recent infectious exposure through the confidential route provided by the hospital, since restrictions may depend on the disease and the units being visited. Vaccination records, screening or occupational health clearance may be required for some

visits, especially where vulnerable patients are present, but the organiser should obtain the actual requirements rather than apply a general list without checking.

Anyone who is pregnant, immunocompromised or concerned about a particular exposure should be able to seek confidential advice before the visit and use an alternative route where needed. This does not automatically exclude the person from all hospital areas; the decision should follow the relevant assessment.

Suitable clothing

Wear clean clothing and closed, stable shoes with soles suitable for walking on smooth floors, avoiding loose items that could catch on equipment or brush against patients and work surfaces. Long hair should be secured, and jewellery, watches and sleeve requirements should follow the rules of the unit, particularly where hand hygiene or protective clothing would be affected.

A laboratory coat, scrub suit or visitor gown should be worn only when the host requires it and in the areas specified. Bringing a coat from a university laboratory does not make it suitable for use in a clinical area. Cover small cuts with a secure waterproof dressing and report any wound that cannot be adequately covered.

Bring only what you need

Carry the identification requested by the hospital and keep personal belongings small enough to store in the designated place, leaving bulky bags, unnecessary tools and valuable items outside clinical areas. Phones should be silent and used only where permitted, while food and drinks belong in the areas approved for breaks.

Arrive in time for the briefing, because a student who misses the access or emergency instructions should not join the group inside a unit without receiving them. If long periods of standing are difficult, tell the leader early so that a seat or a shorter route can be arranged.

3. Arrival and safe movement through the hospital

Report to the named reception or meeting point, complete registration and wear the visitor identification as instructed, keeping it visible where this does not conflict with unit safety requirements. Wait for the escort rather than following staff through a controlled door, even when the door has been left open or another person offers to let the group in.

Use only the approved route and keep close enough to hear instructions without crowding doorways, lifts or nursing stations. Patient transport and emergency teams have priority, so move to the position indicated by staff and allow beds, wheelchairs and trolleys to pass without trying to help move them.

Keep circulation routes clear

Walk at a normal pace, use handrails where available and watch for wet floors, trailing leads and changes in level, reporting any hazard instead of moving equipment to clear the route. Do not sit on patient beds, equipment trolleys or window ledges, and keep bags away from escape routes and access to clinical equipment.

If separated from the group, return to the agreed meeting point where it is safe to do so or ask reception to contact the leader. Do not search through wards or enter another restricted area to catch up. Tell the leader before leaving for a break so that the attendance record remains accurate.

4. Hand hygiene and everyday infection prevention

Clean hands at the relevant moments

Clean your hands when entering and leaving clinical areas and whenever directed by staff, including after touching shared surfaces or removing gloves. Hand hygiene is also needed before eating and after using the toilet, coughing, sneezing or blowing your nose, because a visit involves repeated contact with doors, handrails and personal items.

Use the hospital's alcohol hand rub when appropriate, applying enough to cover the palms, backs of the hands, fingertips, thumbs and spaces between the fingers, then rub until dry. Use soap and water when hands are visibly dirty, after using the toilet and before eating, and follow any additional washing instructions during outbreaks or special precautions.

Avoid unnecessary contact

Keep your hands away from dressings, tubing, bed controls and bedside equipment and avoid placing notebooks or phones on patient surfaces. Gloves do not replace hand hygiene and should not be worn throughout the hospital as if they remain clean; an observer normally needs gloves only when the host identifies a specific reason.

Cover a cough or sneeze with a tissue or your elbow, dispose of the tissue in the indicated bin and clean your hands afterwards. If a dispenser is empty or a sink cannot be used, tell the escort and use the alternative provided rather than continuing without cleaning your hands.

5. Protective equipment and isolation areas

Use protection for the actual setting

The hospital will decide whether masks, gowns, gloves, eye protection or other personal protective equipment are required for the visit, taking account of the area and current precautions. Students should receive a demonstration when unfamiliar equipment is required, with an opportunity to check that it fits and can be removed without contaminating clothing or hands.

Wear the items in the way demonstrated and report damage, poor fit or discomfort before entering the area. A mask worn below the nose does not provide the intended coverage, while touching its front and then touching a phone can transfer contamination. Replace or remove items only in the location and manner specified by staff, followed by hand hygiene.

Do not enter an isolation room without approval

Read the sign at the entrance and wait for the group leader to explain whether entry is permitted, because contact, droplet and airborne precautions involve different measures. For a general educational visit, observation from an approved location outside the room or a later explanation is usually a suitable alternative when entry would add risk or interrupt care.

Where respiratory protection is required, an ordinary medical mask may not be sufficient, and a tight-fitting respirator requires the fit testing, training and checks specified by the hospital. Students who have not met those conditions should remain outside the restricted area rather than assume that any available mask provides equivalent protection.

6. Patient dignity, confidentiality and professional conduct

Respect the patient's choice

Keep a reasonable distance from the bedside and avoid gathering around a patient during personal care, examination or difficult conversations. Speak quietly, use respectful language and ask technical questions away from the patient when the discussion could cause worry or reveal private information. A person receiving care should not feel that they have become an exhibit for the visit.

Protect information that you may see or hear

Do not read patient records, inspect computer screens or copy names, identification numbers, diagnoses or other details that could identify a person. If confidential information

is visible by chance, turn away and tell the group leader when appropriate, rather than pointing it out to other students.

Notes for the course should describe the equipment, process or general learning point without identifying a patient, and discussions after the visit must follow the same rule. Removing a name alone may not be enough if a photograph, room number or unusual personal detail still makes the person recognisable.

Keep recording under hospital control

Do not take photographs, videos, audio recordings or screenshots during the visit unless the hospital has expressly approved the activity and any required consent has been arranged. This includes **smart glasses**, video calls and background recording by personal devices, since a picture of equipment may also capture patients, staff, labels or computer screens.

Permission to take an image does not automatically include permission to publish it in a report, presentation or social media post. Use only the approved subject, location and purpose, and have the host check the image before it leaves the agreed process. If an accidental recording occurs, stop recording and report it immediately, following the hospital's instructions for handling the file.

If a patient asks for clinical advice, treatment or help with equipment, explain that you are visiting as a student and call a member of staff. Do not offer an opinion beyond your role or promise that a technical change will improve the person's care.

7. Access to clinical and support units

Adapt the visit to the unit

Entry to a general ward does not provide access to intensive care, neonatal care, operating rooms or other controlled units, even when these are included in the same building. The group leader should confirm permission at each boundary and explain where the group may stand, what may be observed and when questions can be asked.

In intensive care and neonatal areas, space is limited and patients may depend on several connected devices, so students should keep away from lines, pumps and monitors and leave immediately if clinical care requires the space. Avoid leaning on beds or equipment, even when trying to make room for another person.

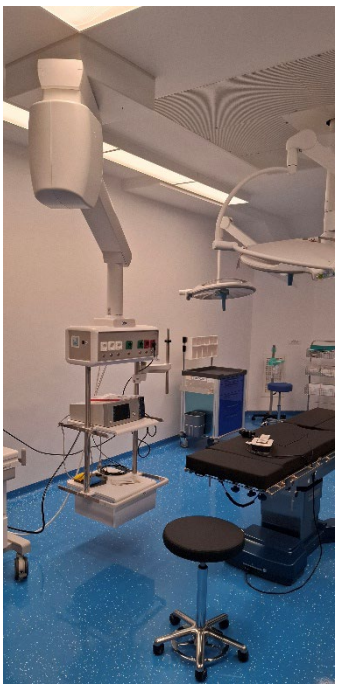
In operating and procedure rooms, follow the changing requirements and the route shown by staff, remaining outside any sterile field and keeping personal items away from prepared instruments. Do not touch a drape, tray or wrapped item because it appears unused, and report accidental contact immediately rather than trying to correct it yourself.

In sterilisation and decontamination departments, dirty and clean areas have different functions, and the visit should follow the permitted route without carrying objects across the boundary. A demonstration of the process should use arrangements approved by staff, with visitors kept clear of hot equipment, chemicals and moving loads.

Respect specimen and medicine controls

Laboratories, pharmacies and medicine preparation areas require specific permission, and visitors must not open containers, touch specimens, handle medicines or use work benches. Labels and sample packaging may contain patient information as well as hazard details, so these areas also require attention to confidentiality.

Emergency departments and busy outpatient units may need to interrupt the visit with little notice. Move away from triage and treatment spaces when asked, and do not follow a clinical team to see what is happening. Waiting for an explanation afterwards protects both access to care and the dignity of the patient.



Area	Condition before entry
Intensive or neonatal care	Unit approval, suitable group size and clear standing position
Operating or procedure room	Permission, required clothing and explanation of sterile boundaries
Laboratory or pharmacy	Specific group leader and no handling of samples or medicines
Decontamination department	Approved route and separation of dirty and clean areas

8 Medical equipment imaging and electrical safety

Observe equipment without changing its condition

Do not press controls, silence alarms, disconnect leads or move a medical device, even when it appears unused. An alarm should be brought to the attention of staff, while any demonstration should be led by the authorised person using equipment that has been made available for teaching. Personal chargers and USB devices must not be connected to hospital equipment or clinical computers.

In X-ray, CT, nuclear medicine and radiotherapy areas, remain outside controlled spaces until the responsible staff member confirms that entry is permitted. Follow the radiation protection instructions, and raise any relevant personal concern privately before entry; a routine visit does not justify unnecessary exposure.

MRI needs separate screening

MRI uses a strong magnetic field and the absence of scanning noise does not mean that the magnet is off. Everyone entering the controlled MRI area must complete the screening required by the MRI team and disclose implants, devices or possible metal fragments through that process, including fragments associated with previous metalworking injuries.

Keep phones, keys, tools and other objects outside the area until staff have confirmed what is permitted, because a familiar item may be unsafe near the magnet. Do not take equipment through the doorway or enter to assist someone without authorisation from the MRI team; emergency arrangements must also respect the magnetic hazard.

9. Engineering rooms medical gases and other hazards

Technical access is controlled access

Plant rooms, electrical rooms, roof areas and service passages should be visited only when included in the approved route and accompanied by an authorised technical representative. Remain within the indicated viewing area and do not open panels, cross barriers, climb access ladders or step into work zones, since equipment may start automatically or remain live despite appearing quiet.

Students must not operate valves, circuit breakers, isolation switches or emergency stops during an observational visit. If a demonstration is planned, the responsible engineer should explain which system is being shown and how its condition has been made suitable for teaching, without affecting services to patients.

Keep clear of gases and hazardous materials

Medical gas outlets and cylinders are part of the clinical supply, so visitors must not test connections, turn valves or move cylinders. Oxygen supports combustion and can make materials burn more readily, although it is not itself

a fuel; smoking, vaping and ignition sources must be kept away from oxygen equipment. Do not touch chemical containers, waste bags, sharps bins or unidentified residues, and never attempt to clean a spill as part of a visit. Report leaks, unusual smells, damaged cables or unsafe storage from a safe position, then follow the group leader's instruction to leave or use another route. Waste colours and labels vary, so use only the bins identified for ordinary visitor waste.

10. Emergencies incidents and immediate reporting

Raise the alarm and keep access clear

If someone collapses or appears seriously unwell, call nearby hospital staff immediately and use the local emergency contact given in the briefing, providing the unit, floor and exact location. Do not assume that the internal emergency number is the same in every hospital. If help cannot be reached, call the public emergency service applicable to the country and follow the dispatcher's instructions.

Provide first aid within your training and the instructions received, while avoiding electrical, chemical or other hazards and leaving access for the clinical team. Students should not crowd around the person, take photographs or continue the visit through the incident area. A person who feels faint should tell the group leader and sit in a safe place before attempting to continue walking.

Respond to fire and evacuation instructions

If you discover smoke or fire, move away from immediate danger, warn staff and activate the alarm according to the local briefing when it is safe to do so. Follow the hospital's evacuation or shelter instructions, since the route may lead to a protected area within the building before an external assembly point. Do not enter smoke, return for belongings or attempt to fight a fire as a visiting student.

Keep fire doors and escape routes clear and do not use lifts unless a designated evacuation lift is being used under staff control. At the safe meeting point, the academic leader should account for every participant and report anyone missing, including their last known location, without sending students back to search. Re-entry requires permission from the responsible hospital staff.

Treat an exposure as an urgent incident

If a used sharp punctures the skin, wash the area with running water and soap, avoid scrubbing or sucking the wound, cover it and obtain urgent medical assessment. Tell the group leader immediately and use the hospital's exposure pathway, because some preventive treatment is time sensitive; do not wait until the visit ends.

For blood or body fluid splashes to the eyes or mouth, rinse promptly with clean water and seek immediate advice through the same pathway, while chemical splashes require the local emergency washing instructions for the substance. Report what happened and where, but do not pick up a needle or carry a contaminated object to show the assessor.

Report falls, near misses, accidental damage and privacy incidents even when no injury is obvious. The organiser should record the facts through the agreed university and hospital processes, keeping personal health details out of general course reports and arranging any follow-up required.

11. Final briefing and reference sources

Before departure, check that everyone is present, return badges and reusable items as instructed, remove protective clothing in the designated area and clean hands. Report unresolved incidents before leaving, then hold the academic discussion in a suitable location using notes that do not identify patients. Any illness developing later that may relate to the visit should be reported promptly through the confidential contact route.

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