Appendix D. Teaching aids: research and projects

Appendix D provides a number of model projects and a teaching story. These are meant to help to teach blood management.

**Student projects**

**Project 1**

Aim: Familiarize the student with methods to reduce blood loss and manage anemia and bleeding without the use of donor blood. Provide an overview over the possibilities available at the student’s hospital.

Task: List all specialties and subspecialties offered in the hospital. Then approach each of them and ask for methods how to manage patients without donor blood or how to reduce the probability of allogeneic blood encounter. List all drugs and methods available, and describe the rationale for their use. Note whether the methods are used routinely, occasionally, or never.

**Project 2**

Aim: Encourage the students to reflect on current patient’s rights and ethics.

Task:

1. Find out about the right patients have to determine whether they want to have a transfusion or not. Please, give the paragraphs of your current law, not your personal opinion.
   - Can patients express their wishes concerning blood products?
   - Are patients allowed to have a valid advance directive?
   - Are you as physician bound to accept the refusal of a treatment, even if it seems to be contrary to what you think is good for them?
   - Can minors express their wishes and do you have to accept it?
   - Can parents say what they want for their baby and can you overrate them in an ethical manner?
2. Give your personal view of the questions mentioned under (1)

   Survey your fellow workers about their opinion about the following questions. Analyze their answers in the light of what you learned during your study of current law and ethics.

   1. Would you accept blood transfusion if you were patient?
   2. At which hemoglobin level would you like to be transfused?
   3. Would you transfuse a mature patient, if he refuses transfusion?
   4. Would you use therapies that can reduce the likelihood of transfusions even if they were more expensive than blood transfusions?
   5. What is the most important reason for you to reduce patient’s exposure to donor blood?

**Project 3**

Aim: Students get to know available blood products.

Task: List all ways how blood is used for therapy in the hospital. (Do not include diagnostic procedures.) List all means of donor-blood-use and all possible ways how to use patient’s own blood. Describe each product, its production, indication, contraindication, risks, costs for one unit/one vial, and how often it is used in the hospital (e.g., 10,000 units of erythrocyte concentrates per year), and how much of the produced products have to be discarded.

**Project 4**

Aim: Broaden the horizon of your students.

Task: Research traditional medicine of the country. Find out which methods are used in traditional medicine to
treat anemia, coagulation disorders, reduce blood loss, etc. List as many possibilities as you can find (herbs, venoms, acupuncture, diet, etc.), describe them, and relate how it is explained to work. Note whether the method is accepted in hospital treatment or only used by traditional healers.

Project 5

Aim: Practice to integrate newly gained knowledge into a plan of care.

Task: Develop a plan of care for a severely anemic patient heavily bleeding from the upper gastrointestinal tract and for whom no donor blood is available. Please, follow the algorithms you have learned and develop a systematic plan. Explain every step you plan and discuss therapeutic options, if available. Write the management plan for 1 week, one day after another. Provide the rationale for every step.

The following questions are meant to be a guide only.

What information would you obtain by history taking and physical examination?

What diagnostic procedures do you order?

What laboratory diagnostics do you order?

What diagnostic procedures do you order?

What therapeutic measures do you take? (immediately and tomorrow and next week)

Which treatments are urgent and which ones can wait?

Prescribe with timing and dose regimen.

What do you do if the patient is allergic to the prescribed drugs? (give a hint for every prescribed drug)

Whom do you involve in the care of the patient?

Teaching with stories

While reading the hospital fairy tale, think about your own hospital and its potentials to use existing features for a blood management program. Analyze the story and answer the questions below. Think about how you would answer the same questions using the hospital you work in.

How is the patient identified?

What is done to comply with legal requirements?

Which steps are taken to ensure the patient’s wishes are heeded?

What direct support does the patient receive?

A Hospital Fairy Tale

Once upon a time, in a distant land, there was a smart medical student named Tony. One day, he got a bad cough, so he went to see a doctor. Happily, it was not pneumonia. But there was something about his heartbeat that made his family doctor listen a little longer than normal. After he had completed his examination, the doctor explained that there is a heart murmur that needed further evaluation and Tony was sent to a heart specialist. The specialist concluded that Tony’s heart needed surgery. This came to him quite unexpectedly. He never had been seriously sick, and now he suddenly had to undergo surgery. A million things went through his mind.

What now?

Tony was a smart student and he thought about what could happen to him during surgery. What bothered him was not so much the surgery. He would be fast asleep. But what about afterwards? During his studies he had joined physicians when they explained heart surgery to other patients. No problem! Everything was routine. But now he was the patient, and he had a strange feeling in his belly. No, of course he wasn’t afraid. But time and again he thought about the blood he would receive. Would it be safe enough? Deep inside he had some doubts.

Tony had heard about many successful heart surgeries performed without the use of donor blood. After a night of discussing the pros and cons with his parents, he decided to give it a try. There was a blood management program in a nearby town. Without further delay, he called to make an appointment. A friendly voice on the telephone invited him for the next day and asked him to bring along a copy of his medical records.

The next morning, Tony got up early to be at the hospital on time. He had never been there before. While on the bus Tony tried to imagine the kind of hospital would be. Most probably it would be one of the huge glass buildings he had seen on TV. High-Tech equipment was what he expected and much more. Then again, maybe not. He just knew this hospital must be something very special. To his surprise, he found that the hospital was not the shining glass building he had expected. Rather, he found himself standing in front of one of those hospitals built years ago. The building was made of red bricks. Flowers were planted along the pavement toward the main hospital entrance.
Hesitantly, Tony followed the path to the hospital reception. A poster right in the hallway caught his attention. Big letters said: “No Blood? No Problem.” Never before had Tony seen anything like this. It was so different from the posters he was used to seeing: “Give blood, save lives.” Tony looked around. Nothing was as he had imagined. The atmosphere in the hospital was rather familiar, almost cozy. Tony relaxed. The smile of the old lady at the reception was contagious. He smiled back and followed the signs to the blood management coordinator’s office.

Another smiling face welcomed Tony. A young lady offered him a seat. Mr Dam, the lady said, was still with another patient but he would be with him soon. The lady brought him a cup of jasmine tea and chocolate chip cookies and left him alone in Mr Dam’s office. Tony let his eyes wander. His attention was caught by a huge pin board full of cards and photos. Obviously, many patients had expressed their thanks by dropping a line.

It was not before long that the door opened and a man entered the room. The coordinator introduced himself: “Laban Dam,” and gave Tony a hand a good shake. Taking some papers from a shelf, Mr Dam took a seat.

Tony told him about his heart murmur and his concerns about receiving someone else’s blood. The coordinator listened carefully, nodding occasionally. When Tony had finished, Mr Dam said: “No problem! I will refer you to a heart surgeon who is experienced in doing the procedure without the use of donor blood. Let’s discuss some details. Here I have a form for an advance directive. We will go over every point and I will explain all you need to know.” The coordinator took the patient education material and went over it with Tony. Tony had so many questions. Using the pictures and charts in the education material, Mr Dam patiently explained everything. By the end, Tony knew all about the use of his own blood in a cell saver, about hemodilution, the heart-lung-machine, plasma expanders, human and recombinant clotting factors, and even about artificial oxygen carriers. Tony was relieved. He could easily fill in his advance directive and the consent form, allowing the physician to use the methods he chose. He felt that he was in competent hands.

What followed seemed to be mere routine for the coordinator. He had a look in his computer and gave Tony the name and the telephone number of his surgeon, Dr Lucas. A short message informed Dr Lucas about Tony’s upcoming visit, and an e-mail to the blood bank ensured that the blood bank would be informed about Tony’s decision regarding the use of his own and donor blood. Mr Dam asked to see the copies of Tony’s medical records. A short glimpse at Tony’s blood count told him that everything was all right. Otherwise, the coordinator would have alerted Dr Lucas right from the start. Tony was amazed. So much professionalism!

A few days later, Tony met with Dr Lucas. He was a tall man in his fifties. His calm personality was really reassuring. After reading through Tony’s documents, taking his history and a physical examination, the surgeon explained the procedure. Tony’s curiosity was satisfied by Dr Lucas friendly explanations. Dr Lucas had especially emphasized what measures he would take to reduce any unnecessary blood loss. As a future physician, Tony was fascinated and for a while he nearly forgot that he was the patient and not the physician. Since Tony’s condition and especially his blood count were excellent, there was no reason to wait with the surgery. Had that not been the case, his surgery would have been postponed until erythropoietin and hematins had done their part. Tony was scheduled for next Monday at 2 p.m.

On Monday morning, Tony traveled alone to the hospital again. His parents couldn’t make it, since both had caught a cold. Admittedly, Tony was nervous. But as soon as he entered the corridor and saw the smiling lady at the reception again he felt an inner calm. He was convinced Dr Lucas and his team would know what to do.

Tony went to the admissions office. The clerk entered Tony’s personal data into the computer. She asked if he is a participant of the blood management program and entered Tony’s positive response into the computer. Now, every print-out on any form would not only state Tony’s name and date of birth but also his status in the blood management program. When all required papers were printed, Tony was handed a folder with his new medical documents. The clerk took him to the office of the coordinator again. When he entered he felt quite at home. The same friendly faces welcomed him. Mr Dam checked Tony’s folder. Everything was all right. A sticker was attached to his folder indicating his participation in the program. Copies of his advance directive and his signed consent form were also put into the folder. Now every physician—no matter what specialty—would be informed about his decision regarding the use of blood. After a little small-talk, Mr Dam took Tony to the ward and introduced him to Ms Florence Shiphrah, one of the nurses in the pre-op holding area.

Right away, Florence started with her work. She attached a wrist band to Tony’s arm. The bracelet had a distinct color that indicated his blood management status. Florence was well informed. She didn’t take as much blood as Tony was used to from his home hospital. Also, the nurses seemed to participate in saving every drop of blood. It was real team work!

As Tony was wheeled to the operating room he had the impression that everything was ready for him. He saw the cell saver already set up. And while he wondered why a weighing scale was needed in an operating room, he drifted off to sleep.
Tony tried to remember what had happened. His mind was so cloudy that it took quite a while until he realized that he was in a bed. The surroundings didn’t look familiar at all. He felt drowsy. Didn’t he have surgery? Yes, he remembered remotely. His eyes scanned his surrounding. Suddenly he shuddered. Blood! Three bags were hanging on a pole over his head. Tony felt a flush of adrenaline working through his body. It nearly made him sit up! But then he felt a warm hand resting reassuringly on his shoulder. Tony turned his head and saw the brown eyes of Florence. She seemed to have noticed his startled glance at the blood above his head and said: “It is your own.” Phew! Tony relaxed. Mr Dam had told him before that there might be blood remaining from cell salvage and hemodilution. This would be given back to him after surgery. Tony again felt his drowsiness. Calmly he gave in to his medication.

Tony didn’t know how long he had been asleep. He heard a noise as if someone was turning pages and opened his eyes. This time, his mind was much clearer. Mr Dam was about to check his chart. Tony’s hoarse “hello” made Mr Dam turn his attention towards him. “Everything went well. There was some blood loss during surgery but not too much. And the blood coming from your drains is only minimal. You can rest assured. It’s all right.” Tony nodded and leaned back in his pillow. Florence approached Mr Dam and reported her findings about Tony. There was no reason to assume complications would develop. Even if they did—there would be several pairs of eyes ready to register any change in his condition. Help would be available immediately to prevent further blood loss. Before Mr Dam left the room he offered to keep Tony’s parents informed about the progress he was making.

Three days had passed since Tony’s surgery. He had recovered well and was ready to go home. Florence came in the room to give him last instructions. He was told what to do to speed up his recovery, which food to eat, how to take his iron tablets, and when to come back. Tony’s parents had sent friends to give him a ride home. Before he finally went home, he stopped by Mr Dam’s office to thank him for his extraordinary service. Tony’s eyes again rested on the pin board with the many cards and pictures. Tony was sure the card he would send would soon join the collection on the board.