Training curriculum in orthopedic surgery, dental surgery and physiatry/rehabilitation

Curriculum in brief
The WFH fellow will follow and actively participate in all hemophilia related activities at the center for 4-6 weeks and be a natural part of the hemophilia team. The teaching principle is based on autonomy under careful supervision and instruction by the team members. Feedback to the fellow will be given continuously and during small workshops. The theoretical sessions will be covered by power-point presentations and discussions based on specific books chapters and/or scientific papers.

Specifically, the curriculum for the above mentioned activities will be as follows:

Orthopedic surgery
All patients with minor or major orthopedic problems are seen by an orthopedic surgeon specialized in hemophilia at each routine comprehensive care checkup visit which takes place 1-2 days per week. The patients seen are mainly adults with severe and moderate hemophilia but also some patients with severe forms of von Willebrand disease are included. Most children are free from joint disease with the exception of those with long standing inhibitors who are also seen by the orthopedic surgeon. The fellow attends the surgeons clinic at the hemophilia center, examines patients together with the surgeon, interpret radiologic examinations, when relevant, such as plain X-ray and MRI. The fellow will also get the opportunity to perform supervised ultrasound examination of joints. Discussions and decisions are made regarding orthopedic interventions such as ankle arthrodesis, hip and knee plastic surgery, radiosynovorthesis, cortisone injections. The fellow will participate in these discussions together with the hemophilia team including hematologist and nurse.

The fellow will get the opportunity to participate in the surgical procedures and in the preoperative planning of these. This includes planning of factor replacement or, in the case of inhibitor patients, by pass therapy. In patients with mild hemophilia A and von Willebrand disease the use of desmopressin will be comprehensively discussed and trained. Our center has many decades of experience in orthopedic surgery in patients with severe hemophilia. We have used factor replacement as continuous infusion and as frequent intermittent injections. The fellow will get training in how to calculate dosing according to our respective protocols. The fellow will also get knowledge of pharmacokinetics (PK) and the use of PK for dose guiding. Treatment of inhibitor patients in connection with surgery is another important field in which the fellow will be trained both regarding hemostatic therapy but also other special precautions.

Dental surgery
Our center has a tight liaison with the Department of Dental Surgery at the hospital where a well-trained dentist is specifically devoted to take care of patients with bleeding disorders. The fellow will follow the work at this department a couple of days and specifically be trained in how to handle these patients including planning of the intervention, how to perform the procedure and most importantly
how to handle replacement therapy and local hemostatic therapy. Our center has a long standing tradition and experience in using tranexamic acid, both in connection with dental procedures but also all other kind of surgery including the above mentioned orthopedic procedures. The fellow will become well informed about the pros and cons with tranexamic acid, dosing etc.

**Physiatry (rehabilitation)**
The WFH fellow will follow our experienced physiotherapist during the hemophilia clinics and when necessary in between these. Since many years all hemophilia patients and patients with more severe forms of VWD are subjected to physical joint scoring performed by the physiotherapist. After having used the WFH score (Gilbert) we switched to the hemophilia joint health score when this became available 5-6 years ago. This score is now one of our main key parameters in the long term follow up of the entire patient cohort. Therefore it is important that scoring is done by a very trained and skilled person such as our physiotherapist. The fellow will participate in the scoring of the patients, usually 1-2 days per week, and learn how to score. After a few weeks the fellow will score independently and be checked by the physiotherapist. In this way the fellow will become capable to introduce HJHS at her/his own center, which is of outmost importance for quality assurance of the care. The physiotherapist has the responsibility (together with the orthopedic surgeon) to plan and guide postoperative rehabilitation and the fellow will participate in this activity. Some patients with musculoskeletal problems are in need of more continuous training and physical therapy which also the physiotherapist is responsible for. We have several projects with the goal to evaluate the effect of long term physical training on joint status and quality of life and the fellow will be introduced to such projects so that she/he can, if desirable, implement similar projects at the home treatment center.

**Other elements of the course**
We have started to perform ultrasound examination of elbows, knees and ankles in all patients in order to detect early joint changes especially in the soft tissue. This has a potential to improve patient and treatment follow up and to guide treatment. The fellow will be part of this activity with the goal to independently learn how to use ultrasound in hemophilia and will get necessary competence to introduce the technique at the home center. Of course further training is needed beyond the fellowship period if implemented.

**Readings and study aid**
The student will be provided a working space with a stationary computer with access to the Internet and Lund University study resources. Much of the training and discussions with specialists in the area will be based on current knowledge and available literature including "Textbook of hemophilia" which will be provided at the start of the course.