



Travel Grant Report Form

Name and origin of applicants

Carl Jorns, Transplant surgeon, Karolinska University Hospital, Stockholm, Sweden

Purpose granted

The Liver Unit at Queen Elizabeth Hospital (QEH) is among the largest in Europe for both adult and pediatric liver transplantation. It has unparalleled expertise in liver transplantation utilizing controlled donation after circulatory death (DCD) donors and is a pioneer in expanding and enhancing this donor pool. This includes advancing techniques such as normothermic regional perfusion (NRP). The unit is also a leader in research on machine liver perfusion, having performed the highest number of liver transplants following normothermic machine perfusion in Europe.

Unlike the Scandiatransplant system, organ donation and allocation in the UK are centrally managed by the National Health Service (NHS) Blood and Transplant.

The primary goal of my visit was to deepen my knowledge in both adult and pediatric liver transplantation. Norway has already implemented DCD organ donation, while Sweden is in the process of introducing it, with pilot programs planned for 2018. A key focus of my visit was to gain hands-on experience and insights into DCD donation and transplantation. Additionally, I sought to enhance my understanding and practical skills in both normothermic and hypothermic machine liver perfusion technologies anticipated to revolutionize organ preservation.

Lastly, I aimed to explore the workings of a different healthcare system known for delivering high-quality organ transplantation services and to establish collaborative relationships with colleagues at NHS Blood and Transplant and Queen Elizabeth Hospital Birmingham.

Amount granted

42 000DKK

Time and place of visit

Report

I had the possibility to visit the Liver Unit at Queen Elizabeth Hospital (QEH) as visiting surgeon.

The Liver Unit is one of the largest liver transplantation centers in Europe performing approximately 250 liver transplantations per year including 35-45 pediatric liver transplantations. Outcomes are excellent with a risk adjusted one year patient survival of 92% for adult elective patients¹. The unit includes a total of 8 consultants of which five are specialized in liver transplantation (Professor Paolo Muiesan, Professor Darius Mirza, Dr. Thamara Perera, Dr. Hynek Mergental, and Dr. John Isaac). Further, 8 fellows including international fellows, visiting consultants and registrars work as surgeons at the unit.

Great Britain and especially the Liver Unit at QEH have a large experience in organ donation and liver transplantation from controlled donation after circulatory death (DCD) donors, Maastricht category III. 20 - 30% of liver transplantations are performed with organs from DCD donors². Currently, organs from DCD donors are procured by rapid retrieval and cold perfusion. However, current research performed at the Liver Unit QEH is evaluating if normothermic regional perfusion (NRP) before and during retrieval can improve outcome and decrease morbidity especially ischemic cholangiopathy after transplantation^{3,4}.

Furthermore, the Liver Unit has a large experience and ongoing research in normo- and hypothermic machine liver perfusion. The Liver Unit at QEH were one of the first to transplant a liver after normothermic machine liver perfusion^{5,6}. They also reported a first series using normothermic machine perfusion to evaluate declined livers of which a proportion could be transplanted successfully after up to 20h of preservation time⁷. The liver unit contributed half of the patients for the multicenter COPE trial (Consortium for Organ Preservation in Europe), a randomized trial comparing traditional cold storage to normothermic machine liver perfusion^{8,9}. Currently, the Liver Unit at QEH is conducting a clinical trial evaluating Normothermic Machine Liver Perfusion (NMLP) to Test Viability and Transplantation of Marginal Livers (VITTAL trial)¹⁰

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2. Neuberger J. Liver transplantation in the United Kingdom. *Liver Transpl* 2016; **22**(8): 1129-35.
3. Oniscu GC, Randle LV, Muiesan P, et al. In situ normothermic regional perfusion for controlled donation after circulatory death--the United Kingdom experience. *Am J Transplant* 2014; **14**(12): 2846-54.
4. Perera MT, Clutton-Brock T, Muiesan P. One donor, two types of preservation: first description of a donation after circulatory death donor with normothermic abdominal perfusion and simultaneous cold perfusion of lungs. *Liver Transpl* 2014; **20**(8): 1012-5.
5. Perera T, Mergental H, Stephenson B, et al. First human liver transplantation using a marginal allograft resuscitated by normothermic machine perfusion. *Liver Transpl* 2016; **22**(1): 120-4.
6. Angelico R, Perera TPR, Ravikumar R, et al. Normothermic Machine Perfusion of Deceased Donor Liver Grafts Is Associated With Improved Postreperfusion Hemodynamics. *Transplant Direct* 2016; **2**(9).
7. Mergental H, Perera MT, Laing RW, et al. Transplantation of Declined Liver Allografts Following Normothermic Ex-Situ Evaluation. *Am J Transplant* 2016; **16**(11): 3235-45.
8. Ravikumar R, Jassem W, Mergental H, et al. Liver Transplantation After Ex Vivo Normothermic Machine Preservation: A Phase 1 (First-in-Man) Clinical Trial. *Am J Transplant* 2016; **16**(6): 1779-87.
9. Europe CFOPi. http://cope-eu.com/patients/liver_trial.html.
10. <https://clinicaltrials.gov/ct2/show/NCT02740608>.

Evaluation

My stay at QEH was incredibly valuable for both my personal and professional development. Visiting a transplant center in a different healthcare system and country broadens your perspective, exposing you to

diverse approaches in transplantation: from subtle variations in surgical techniques to differences at the organizational level. Such experiences highlight that transplant practices can be effectively carried out in multiple ways. Some of these differences inspire you to implement positive changes in your own country or center, while others help you appreciate the high standards of transplant surgery and healthcare back home.

Professionally, the most significant aspect of my visit was gaining expertise in DCD procurement surgery, DCD donor evaluation, and DCD liver transplantation. These insights were directly applicable to Sweden's introduction of DCD practices, enabling me to contribute meaningfully to this advancement. Additionally, I had the opportunity to receive hands-on training in normothermic liver machine perfusion at one of the leading centers pioneering this technique with the aim to improve and extend preservation and evaluating extended-criteria livers. A technique that holds transformative potential for the future of organ transplantation.
