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Dear SCTC members,

Thank you for supporting my visit to the University Medical Centre in Groningen (UMCG) for the SCTC visiting fellowship which took place from September 18-October 18, 2022 in Groningen, the Netherlands. My experience at UMCG under the guidance of Dr. Udo Mulder was fruitful and resulted in direct impacts which I hope to integrate in the systemic sclerosis (SSc) and microvascular clinics I lead at the University of Alberta, and in my translational research program.

One of the challenges that I face in the microvascular clinic is the inability to access nailfold video capillaroscopy (NVC). I conduct NVC on a weekly basis at the University of Alberta Hospital which has a catchment area of nearly 3.5 million Canadians. The NVC device I use is relatively expensive, and training is limited – both of which has made it challenging for patients to access. As a result, all my colleagues in various subspecialties (Rheumatology, Respirology, Dermatology) have utilized my expertise to evaluate their patients with suspected SSc using NVC which has created long delays for patients (nearly 1 year). During my visit at UMCG, I was introduced to a more cost-effective device (Dino-Lite) which Dr. Mulder and his team have been utilizing for several years. I carefully evaluated some of the video capture images obtained and I was remarkably impressed with their quality. Further to that, I completed a systematic review of the literature comparing the various digital devices used to evaluate nailfold video capillaroscopy and we compiled this into a manuscript (with Dr. Mulder) which is currently in the final stages prior to submission for publication. We have also started using Dino-Lite in my centre, and I will soon be training my colleagues in dermatology, and respirology how to utilize the device, which I hope will improve access to NVC in my centre and reduce their delays.

A unique experience that I had the pleasure of learning about was the use of laser photo-electric plethysmography (in the presence or absence of a stepwise cooling protocol). During my visit to UMCG, I personally experienced this powerful clinical point-of-care tool multiple times. One notable example is with a 68-year-old female with a new diagnosis of Raynaud's phenomenon who had a normal NVC examination but had an anti-nuclear antibody. This patient had a very abnormal cooling response. The combination of laser photo-electric plethysmography with the regimented cooling protocol allowed me to realize its value especially when combined with serological, clinical assessments and NVC. Furthermore, this patient served as an added example for the potential role for high frequency vascular ultrasound as an added point-of-care tool, as the sonographic examination was clearly abnormal. The utility of vascular digital ultrasound in patients with SSc was further reinforced for me when I was able to appreciate the gross luminal abnormalities present in a patient who was being actively treated for SSc-related Raynaud's crisis at UMCG. I aim to integrate high frequency vascular digital ultrasound at the University of Alberta as an added area of clinical expertise; and I am trying to secure funding for the ultrasound device at this time. Other relevant learning experiences at UMCG with Dr. Mulder that I aim to integrate in my clinical practice include using ultrasound for evaluating patients with SSc with associated early interstitial lung disease in clinic.

An exciting result of my visit to UMCG was the development of strong collaborations in translational research with my research group. My team is interested in studying the effects of DNA damage in the pathogenesis of SSc. It was clear to me that there are many parallels that Dr. Mulder's group also shares with my research – such as the role of reactive oxygen species (ROS) in the pathogenesis of SSc in general, and potentially in disease progression and fatigue. Further to that, my team has obtained a research protocol from Dr. H. Van Goor (UMCG) for measuring free thiol levels in sera from patients with various forms of SSc. Importantly, I have successfully received a grant application from Scleroderma Canada since my return. This proposal is aimed at evaluating dysregulated pathways related to DNA damage and ROS in patients with SSc and chronic fatigue syndrome. Dr. Mulder as an essential collaborator for this proposal, who will validate our findings in his SSc cohort at UMCG. Other examples of ongoing collaborations include my continued participation in Dr. Mulder's monthly SSc research rounds (via online interfaces) and other grants we are applying for

together. Finally, I am excited to be hosting Dr. Mulder's PhD student this summer at the University of Alberta to further reinforce our ongoing strong collaborations.

I am very excited to have been given the opportunity to visit UMCG as part of my SCTC visiting fellowship. There are also many other valuable clinical tools and scholarly experiences that I was a part of. These include learning more about how to utilize intralesional sodium thiosulphate injections for calcinosis cutis, better understanding tilt table and autonomic testing in the clinic or attending a senescence two-day symposium at UMCG. I am also very gracious for Dr. Mulder and his team who have welcomed me and provided me with all the needed resources that ensured a successful visit and ongoing collaborations.

Thank you for your support. I look forward to contributing to the SCTC as a member for many years to come.

Sincerely,

Mohammed