Conclusions: To our knowledge this is the first educational social media campaign performed of this magnitude in medicine. The campaign was successful in drawing many people to interact and learn about nephrology. Traffic to the originating blog was the highest in it's history by a wide margin. Use of interactive campaigns are possible and deserve formal study. Such interactive games could spark interest in nephrology, at a time when interest in declining.

FR-OR084

Two Novel Educational Interventions to Navigate the Challenges of CKD Care Stacey Jolly, Sankar D. Navaneethan, Jesse D. Schold, Susana Arrigain, Victoria Konig, Yvette K. Burrucker, Barbara H. Tucky, John W. Sharp, Joseph V. Nally. *Cleveland Clinic.*

Background: There is a scarcity of translational research in CKD that incorporates educational tools. We are 1 of 5 NIDDK R34 grants whose focus is improving outcomes for CKD patients through T2 research. We describe the development of two interventions, a CKD Patient Navigator program and a CKD specific enhanced personal health record (PHR).

Methods: To accomplish our specific aims, we assembled key members from our multidisciplinary CKD Team and enlisted new members from information technology and data management. Creation of the CKD Navigator Program encompassed three phases: hiring, training, and implementing. We hired a navigator who could provide "individual guidance, support, education, coordination of care, and other assistance to patients". For training, there were three key areas a) Harold Freeman Patient Navigator Institute b) CKD education and c) electronic health record (EHR) training. For implementation, we defined barriers of care, ensured randomization, and created EHR templates for which pertinent study data could be extracted. Enhanced PHR creation was a multi-step process. We selected educational materials specific to CKD Stage 3b/4 patients, developed a user guide for potential participants who may not be familiar with our PHR, and pilot tested including verifying our ability to collect PHR use data among participants.

Results: We created a CKD Patient Navigator program adapting the use of patient navigators successfully employed in other fields with the well-established chronic care model. We developed an EHR-based enhanced PHR that allows for CKD stage-specific education disseminated electronically and utilized many publicly available NKDEP and NKF education materials. We're performing an RCT to determine the effect of these interventions alone and in combination on CKD outcomes. Recruitment is underway and we have enrolled over half of our target population (n=208) and await future analyses.

Conclusions: CKD research that uses novel educational approaches is pressing and will require technology, stakeholders, and a multidisciplinary team to translate frameworks into adaptable interventions.

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FR-OR085

Changes in Endothelial and Smooth Muscle Cells Morphology by Patient-Specific Disturbed Flow Patterns Derived from Autologous Arteriovenous Fistulae Andrea Remuzzi,[1,2] Bogdan Ene-Iordache,[1] Marco Franzoni,[1] Irene Cattaneo.[1] *[1]IRCCS - Mario Negri Institute, Bergamo, Italy; [2]Univ of Bergamo, Dalmine, Italy.*

Background: Radial-cephalic arteriovenous fistula (AVF) is the first choice for haemodialysis ascular access. AVF surgery has significant early failure rates due to vessel stenosis in the draining vein. It has been proposed that oscillating wall shear stress (WSS) acting on endothelial cells (EC), is a trigger of intimal hyperplasia (IH), vessel stenosis and AVF failure. We investigated whether WSS acting on EC in regions of disturbed flow, that develop in AVF, may influence EC function.

Methods: We used magnetic resonance images obtained in two patients, 40 d post-surgery, to reconstruct 3D models of AVF and to estimate the blood flow field by computational fluid dynamics. We localized areas of disturbed flow using oscillatory shear index [He, 1996], and we derived time changes in WSS in these regions, and in regions exposed to pulsatile flow far from the anastomosis. We then exposed human umbilical EC (HUVEC) in vitro to oscillating and pulsatile WSS, using a cone-and-plate device, and exposed vascular smooth muscle cells (SMC) to culture media conditioned by HUVEC under different flow conditions.

Results: HUVEC exposed to pulsatile WSS (1.24 to 2.23 Pa, n=4) for 48 hrs elongated and aligned in the flow direction, while HUVEC exposed to oscillating WSS (1.28 to -1.62 Pa, n=4) did not align nor elongate. Morphology of SMC was importantly affected by medium pre-conditioned by oscillating WSS on HUVEC, while medium conditioned by HUVEC under pulsatile flow did not affect SMC phenotype.

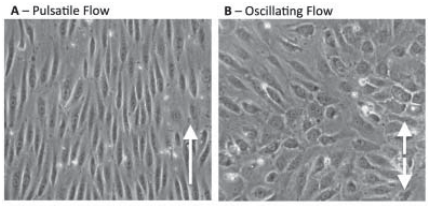

Figure 1 – HUVEC after in vitro exposure to fluid flow for 48 hrs.

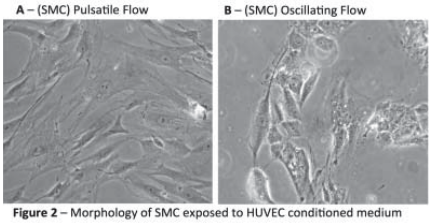

Figure 2 – Morphology of SMC exposed to HUVEC conditioned medium

Conclusions: Our data demonstrate that exposure of EC to oscillating WSS that develop in the venous site in side-to-end AVF importantly affect EC and SMC function. These results confirm that disturbed flow conditions acting on EC may be responsible for IH and AVF stenosis.

FR-OR086

Pancreatic Elastase (PRT-201) Improves Radiocephalic Arteriovenous Fistula (AVF) Maturation and Patency Bradley S. Dixon,[1] Robert J. Hye,[2] Michael R. Jaff,[4] Pamela Gustafson,[5] Francesca Lindow,[5] Marco D. Wong,[5] Laura M. Dember,[3] Steven K. Burke.[5] *[1]U Iowa; [2]Kaiser Permanente; [3]UPenn; [4]Mass General; [5]Proteon Therapeutics.*

Background: Over 50% of AVFs lose primary unassisted patency within one year of creation. A pilot study suggested PRT-201 is safe and may prolong AVF patency.

Methods: We conducted a randomized double-blind, placebo controlled trial of PRT-201 on primary unassisted patency (time from AVF creation to thrombosis or an intervention to maintain patency) of a new AVF. Secondary outcomes included secondary patency (time from AVF creation to fistula abandonment), and unassisted maturation assessed by duplex ultrasound (blood flow ≥ 500 mL/min and vein lumen diameter ≥ 4 mm).

Results: 169 patients were randomized and 151 patients treated with PRT-201 (10 µg, n=51 or 30 µg, n=49) or placebo (n=51) applied topically to the exposed artery and vein immediately following surgery. Primary unassisted patency at one year was 47% in placebo compared to 59% for PRT-201 (10 µg and 30 µg dose groups combined; p=0.11). In a Cox model adjusting for baseline covariates, the hazard ratio for time to primary unassisted patency loss was 0.76 (95% CI 0.43-1.35; p=0.35) for 10 µg and 0.59 (95% CI 0.32-1.10; p=0.10) for 30 µg. Unassisted maturation at 12 weeks was 67% for placebo compared to 87% (p=0.03) for 10 µg and 92% (p<0.01) for 30 µg. Stratifying by AVF location (Table 1), 30 µg PRT-201 significantly improved primary unassisted patency and unassisted maturation in radiocephalic but not brachiocephalic AVFs.

Table 1	Radiocephalic AVF (n=67)			Brachiocephalic AVF (n=84)		
	Placebo	10 µg	30µg	Placebo	10µg	30µg
Primary Unassisted Patency (%)	33	52	65*	59	64	55
Unassisted Maturation (%)	47	74	93**	80	83	77
Secondary Patency (%)	67	83	90†	89	82	79
*p=0.03; **p=0.009; †p=0.08						

Conclusions: PRT-201 improved primary unassisted patency and unassisted maturation in radiocephalic AVFs.

Funding: Pharmaceutical Company Support - Proteon Therapeutics

FR-OR087

Genotype Polymorphisms of Dimethylarginine Dmethyl Aminohydrolase 1 (DDAH1) Predict Restenosis of Vascular Access after Angioplasty in Hemodialysis Patients Chih-Ching Lin. *Div of Nephrology, Dept of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan.*

Background: Elevated plasma asymmetric dimethylarginine (ADMA) has been reported to be associated with restenosis after percutaneous transluminal angioplasty (PTA) of AVF in hemodialysis (HD) patients. Dimethylarginine dimethylaminohydrolase 1 (DDAH1) is the major enzyme eliminating ADMA, but the effect of genetic variations in DDAH1 on the outcome of vascular access after PTA in HD patients remained unknown.

Methods: We assessed the association between polymorphisms in DDAH1 and vascular access outcome in 473 maintenance HD patients, who were prospectively followed up for one year after PTA for vascular access dysfunction. Eleven single nucleotide polymorphisms (SNPs) in endothelial function related genes were analyzed and plasma ADMA levels were determined at baseline.

Results: After adjustment of demographic, access, and risk factors, individuals with high baseline plasma ADMA (>0.9µM) levels had higher rates of re-intervention at 3 and 6 months after PTA (three months, 56% vs. 36%, p=0.08; six months:74% vs. 53%, p=0.05). DDAH1 rs233112 was significantly associated with increased levels of plasma ADMA levels. Compared with individuals with rs233112 AA genotypes, individuals with rs233112 GA or GG genotypes had higher risks for re-intervention (58% vs. 45%, p=0.003) after