Supplementary Table 4: Perfusion assessment in solid organ transplantation

					Patient selection		Imaging techniques							Endpoint measures							
Ref. No. Author	Country	Journal	Year	Study design	Subject	N (cases)	Fluorogenic agent	Dose	Route	Timing	Imaging system	Quantitative measurement	Main endpoints	Imaging accuracy/success rate	Clinical impact, changes in intraoperative decision-making	Clinical impact, advantages in postoperative outcomes	Adverse effects	Learning curve	Cost analysis	Other comments	Ref. detail
1 Sekijima	Japan	Transplant Proc	2004	Retrospective	Kidney/liver transplantation	13 recipients (Kidney) 2 recipients (Liver)	ICG	25mg (10 mL)	IV	After completion of vessel anastomoses	SPY system	NA	Safety, feasibility, and image quality (patency of reconstructed artery)	100%	NA	NA	None	NA	NA		Sekijima M, Tojimbara T, Sato S, Nakamura M, Kawase T, Kai K, Urushima Y, Nakajima I, Fuchinoue S, Teraoka S. An intraoperative fluorescent imaging system in organ transplantation. Transplant Proc. 2004 Sep;36(7):2188-90
2 Kubota	Japan	J Hepatobiliary Pancreat Surg	2006	Prospective	Liver transplantation	3 recipients	ICG	3.75mg×2 times	IV	After reconstruction of portal vein and hepatic artery	SPY system	NA	Visualization of patency of reconstructed vessels	100%	NA	NA	None	NA	NA	Graft function was also estimated by confirming bile excretion using fluorescence imaging	Kubota K, Kita J, Shimoda M, Rokkaku K, Kato M, Iso Y, Sawada T. J Hepatobiliary Pancreat Surg. 2006;13(2):100-4
3 Sanchez	US	Proc (Bayl Univ Med Cent)	2008	Prospective	Pancreas transplantation	2 recipients	ICG	2.5mL	IV	After reconstruction of portal vein and hepatic artery	SPY system	NA	Visualization of patency of reconstructed vessels	100%	NA	NA	None	NA	NA		Sanchez EQ, Chinnakotla S, Khan T, Nikitin D, Vasani S, Randall HB, McKenna GJ, Ruiz R, Onaca N, Levy MF, Goldstein RM, Docherty JC, Hund DK, Klintmalm GB. Proc (Bayl Univ Med Cent). 2008 Jul;21(3):258-60.
4 Hoffmann	Germany	Transplant Proc	2010	Prospective	Kidney transplantation	10 recipients	ICG	0.3 mg/kg	IV	After completion of the arterial anastomosis	IC-VIEW	Trends of fluorescence intensity	Assessment of renal allograft perfusion, visualization of patency of reconstructed vessels	100%	10% repositioning of the graft due to large perfusion deficit	NA	None	NA	NA		Hoffmann C, Compton F, Schäfer JH, Steiner U, Fuller TF, Schostak M, Zidek W, van der Giet M, Westhoff TH. Transplant Proc. 2010 Jun;42(5):1526-30.
5 Kawaguchi	Japan	J Hepatol	2013	Prospective	Liver transplantation	18 donors 23 recipients	ICG	2.5 μg/ml of remnant liver volume	IV	After procurement of the graft (donor) After reconstruction of hepatic veins (recipient)	PDE	Trends of fluorescence intensity	Perfusion assesment of veno-occlusive hepatic regions	100%	NA	Fluorescence intensity was associated with postoperative prothrombin time	None	NA	NA	Portal uptake function in veno-occlusive regions is approximately 40% of that in non-veno-occlusive regions	Kawaguchi Y, Ishizawa T, Miyata Y, Yamashita S, Masuda K, Satou S, Tamura S, Kaneko J, Sakamoto Y, Aoki T, Hasegawa K, Sugawara Y, Kokudo N. J Hepatol. 2013 Feb;58(2):247-53.
6 Aricbi	Japan	Transplant Proc	2014	Prospective	Kidney transplantation	4 recipients	ICG	1 mL of 0.25% ICG	IV	After grafting and vascular anastomosis	HyperEye Medical System (HEMS, Mizuho Ikakogyo, Tokyo, Japan)	NA	Resolution of blood flow in real time	100%	No changes to the clinical routine following imaging	Postoperative course was unremarkable for good recovery	None	NA	NA	HEMS is feasible and safe	Aricbi N, Mitsui Y, Ogawa K, Nagami T, Nakamura S, Hiraoka T, Yasumoto H, Shima H. Transplant Proc. 2014;46(2):342-5. doi: 10.1016/j.transproceed.2013.11.129.
7 Garcia-Roca	US	Am J Transplant	2014	Retrospective	Pancreas transplantation	1 recipient	ICG	3 mL	IV	Following reperfusion after grafting	SPY system	Trends of fluorescence intensity	Confirm suspected duodenal ischemia	100%	The duodenum was anastomosed to the bowel following ICG-VA	Postoperative course was unremarkable for good recovery	None	NA	NA	ICG-VA can yield information that is crucial for intraoperative decision-making	Garcia-Roca R, Walczak D, Tzvetanov I, Khan A, Oberholzer J. Am J Transplant. 2014 Jan;14(1):226-8. doi: 10.1111/ajt.12542.
8 Boni	Italy	Surg Endosc	2015	Prospective	Laparoscopic kidney auto-transplantation and living-donor nephrectomies	8 donors 1 recipient	ICG	0.4-0.5 mg/ml/kg	IV	At least 15 min before surgery	Karl Storz GmbH	NA	Preoast experience of different laparoscopic procedures using ICG fluorescence imaging.	100%	NA	No postoperative complications	None	NA	NA		Boni L, David G, Mangano A, Dionigi G, Rausei S, Spampatti S, Cassinotti E, Fingerhut A. Surg Endosc. 2015 Jul;29(7):2046-55. doi: 10.1007/s00464-014-3895-x
9 Rother	Germany	Microcirculation	2017	Retrospective	Kidney transplantation	57 recipients	ICG	0.01–0.25 mg/kg	IV	Five minutes after reperfusion	SPY system	Trends of fluorescence intensity	Assess ICG dosing in kidney transplantation	NA	NA	NA	None	NA	NA	A dose of 0.02 mg/kg is recommended	Rother U, Gerken ALH, Karampinis I, Klumpp M, Regus S, Meyer A, Apel H, Krämer BK, Hilgers K, Lang W, Nowak K. Microcirculation. 2017 Nov;24(8). doi: 10.1111/micc.12392.
10 Panaro	France	Hepatobiliary Surg Nutr	2018	Prospective	Liver and pancreas transplantation	6 liver recipents and 5 pancreas recipients	ICG	0.5 mg/kg	IV	After transplantation and revascularization	VITOM (Karl Storz GmbH)	NA	Identify appropriate level of anastomosis and perfusion of the duodenal stump (pancreas transplantation) or bile duct (liver transplantation)	NA	Liver procedures: ICG-VA changed the intraoperative strategy in two of the six patients. Pancreas procedures: stump resection was re-performed in one of the five cases following ICG-VA	No postoperative complications	None	NA	NA		Panaro F, Benedetti E, Pineton de Chambrun G, Habibeh H, Leon P, Bouyabrine H, Herrero A, Navarro F. Hepatobiliary Surg Nutr. 2018 Jun;7(3):161-166. doi: 10.21037/hbsn.2017.07.02.
11 Rother	Germany	Microcirculation	2019	Prospective	Kidney transplantation	77 recipients	ICG	0.02 mg/kg	IV	Five minutes after vascular anastomosis	SPY system	Trends of fluorescence intensity	Compare microperfusion in the allograft with pre-surgery renal chronicity score	NA	NA	NA	None	NA	NA		Rother U, Amann K, Adler W, Nasvroth N, Karampinis I, Kezse M, Mumap S, Regus S, Meyer A, Porubsky S, Hilgers K, Krämer BK, Lang W, Nowak K, Gerken ALH. Microcirculation. 2019 Apr;26(3):e12529. doi: 10.1111/micc.12529.
12 Vignolini	Italy	Minerva Urol Nefrol	2019	Prospective	Kidney transplantation	6 recipients	ICG	0.3 mg/kg in 5% glucose (2 mg/mL)	IV	After vascular anastomosis	NA	Trends of fluorescence intensity	Assess reperfusion during robot-assisted kidney transplantation	100%	NA	Two postoperative surgical complications (one case of asymptomatic pelvic lymphocele and one case of postoperative blood transfusion)	NA	NA	NA		Vignolini G, Sessa F, Greco I, Cito G, Vanncere D, Cocci A, Sessa M, Grandi V, Pili A, Giancane S, Gacci M, Sebastianelli A, Li Marzi V, Breda A, Carrgi R, Serni S. Minerva Urol Nefrol. 2019 Feb;71(1):79-84. doi: 10.23736/S0393-2249.18.03278-2.
13 Figueroa	France	HPB (Oxford)	2019	Retrospective	Liver transplantation	72 recipients	ICG	5 or 10 mg	IV	After vascular anastomosis	Fluobeam (Fluoptics SAS)	NA	Assess graft perfusion	NA	NA	No rejection	NA	NA	NA	ICG-VA is helpful in preventing primary graft dysfunction	Figueroa R, Gelaz N, Alvarez FA, Ciscio O, Pittau G, Sa Cunha A, Cherqui D, Adam R, Vibert E. HPB (Oxford). 2019 Apr;21(4):387-392. doi: 10.1016/j.hpb.2018.09.001.

NA, not available or not assessed