CURRICULUM VITAE

Name
Stuart K Gardiner

Position Title
Assistant Scientist, Discoveries In Sight, Devers Eye Institute, Legacy Health System, Portland, OR, 97232, USA

Education / Training

Institution And Location	Degree	Year(s)	Field Of Study
University of Cambridge, Cambridge, UK	MA (Hons –1st class)	1995-8	Mathematics & Statistics
University of Cambridge, Cambridge, UK	MMath	1998-9	Statistics
Nottingham Trent University, Nottingham, UK	PhD	2000-3	Applied Medical Statistics

Positions and Employment
2004 – 2006: Postdoctoral Research Fellow, Discoveries In Sight, Devers Eye Institute, Portland, OR, USA
2006 – 2012: Assistant Scientist, Discoveries In Sight, Devers Eye Institute, Portland, OR, USA
2007 – present: Legacy Research Statistician, Legacy Health, Portland, OR, USA.
2012 – present: Associate Scientist, Discoveries In Sight, Devers Eye Institute, Portland, OR, USA

Published Papers

1. **Gardiner SK**, Crabb DP. Frequency of testing for detecting visual field progression. *Br J Ophthalmol* 2002; 86:560-564. PMCID: PMC1771142.
2. **Gardiner SK**, Crabb DP. Examination of different pointwise linear regression methods for determining visual field progression. *Invest Ophthalmol Vis Sci* 2002; 43:1400-1407. PMID: 11980853.
3. **Gardiner SK**, Crabb DP, Fitzke FW, Hitchings R. Reducing noise in suspected glaucomatous visual fields by using a new spatial filter. *Vision Res* 2004; 44:839-848. PMID: 14967209.
4. **Gardiner SK**, Johnson CA, Cioffi GA. Evaluation of the structure-function relationship in glaucoma. *Invest Ophthalmol Vis Sci* 2005; 46:3712-7. PMID: 16186353.
5. **Gardiner SK**, Demirel S, Johnson CA. Modeling the sensitivity to variability relationship in perimetry. *Vision Res* 2006; 46:1732-45. PMID: 16412491.
6. **Gardiner SK**, Anderson DR, Fingeret M, McSoley JJ, Johnson CA. Evaluation of decision rules for Frequency Doubling Technology (FDT) screening tests. *Optom Vis Sci* 2006; 83:432-37. Optom Vis Sci. 2006. PMID: 16840859.
7. **Gardiner SK**, Johnson CA, Spry PGD. Normal age-related sensitivity loss for a variety of visual functions throughout the central visual field. *Optom Vis Sci* 2006; 83:438-43. PMID: 16840869.
8. Newkirk MR, **Gardiner SK**, Demirel S, Johnson CA. Assessment of false positives with the Humphrey Field Analyzer II perimeter with the SITA Algorithm. *Invest Ophthalmol Vis Sci* 2006; 47:4632-7. PMID: 17003461.
9. Strouthidis NG, Vinciotti V, Tucker AJ, **Gardiner SK**, Crabb DP, Garway-Heath DF. Structure and function in glaucoma; the relationship between a functional visual field map and an anatomical retinal map. *Invest Ophthalmol Vis Sci* 2006; 47:5356-62. PMID: 17122124.

10. Quinn LM, **Gardiner SK**, Wheeler DT, Newkirk M, Johnson CA. Frequency Doubling Technology perimetry in normal children. *Am J Ophthalmol* 2006; 142:983-9. PMID: 17046702.
11. **Gardiner SK**, Swanson WH, Demirel S, McKendrick AM, Turpin A, Johnson CA. A two-stage neural spiking model of visual contrast detection. *Vision Research* 2008; 48:1859-69. PMCID: PMC2553713.
12. **Gardiner SK**, Demirel S, Johnson CA. Is there evidence for continued learning over multiple years in perimetry? *Optom Vis Sci* 2008; 85:1043-1048. PMCID: PMC2720782.
13. **Gardiner SK**, Demirel S. Assessment of patient opinions of different clinical tests used in the management of glaucoma. *Ophthalmology* 2008; 115:2127-2131. PMCID: PMC3704561.
14. Demirel S, Fortune B, Fan J, Levine RA, Torres R, Nguyen H, Mansberger SL, **Gardiner SK**, Cioffi GA, Johnson CA. Predicting progressive glaucomatous optic neuropathy using baseline standard automated perimetry data. *Invest Ophthalmol Vis Sci* 2009; 50:674-680. PMCID: PMC2759404.
15. Strouthidis NG, **Gardiner SK**, Sinapis C, Burgoyne CF, Garway-Heath DF. The spatial pattern of neuroretinal rim loss in ocular hypertension. *Invest Ophthalmol Vis Sci* 2009; 50:3737-3742. PMID: 19357354.
16. Strouthidis NG, Yang H, Reynaud J, Grimm J, **Gardiner SK**, Fortune B, Burgoyne CF: Comparison of clinical and spectral domain optical coherence tomography optic disc margin Anatomy. *Invest Ophthalmol Vis Sci* 2009; 50:4709-4718. PMCID: PMC2751811.
17. Asaoka R, Strouthidis NG, Kappou V, **Gardiner SK**, Garway-Heath DF. HRT-3 Moorfields reference plane: Effect on rim area repeatability and identification of progression. *Br J Ophthalmol* 2009; 93:1510-1513. PMID: 19535359.
18. Nguyen HT, Pikey KP, **Gardiner SK**, Gritz D, Krishnadas R, Cioffi GA, Mansberger SL. Intraobserver variability of confocal scanning laser ophthalmoscopy with and without stereo photographs. *Br J Ophthalmol* 2009; 93:1552-1553. PMCID: PMC3747839.
19. Strouthidis NG, **Gardiner SK**, Owen VMF, Zuniga C, Garway-Heath DF. Predicting progression to glaucoma in ocular hypertensive patients. *J Glaucoma* 2010; 19:304-9. PMID: 19730117.
20. Sklenicka S, **Gardiner SK**, Dierks EJ, Potter BE, Bell RB. Survival analysis and risk factors for recurrence in oral squamous cell carcinoma: Does surgical salvage affect outcome? *Journal of Oral and Maxillofacial Surgery* 2010; 68:1270-1275. PMID: 20347201.
21. **Gardiner SK**, Demirel S, Johnson CA. Perimetric indices as predictors of future glaucomatous functional change. *Optom Vis Sci* 2011; 88: 56-62. PMCID: PMC3746834.
22. Chen JW, Gombart ZJ, Rogers S, **Gardiner SK**, Cecil S, Bullock RM. Pupillary reactivity as an early indicator of increased intracranial pressure: The introduction of the Neurological Pupil Index. *Surg Neurol Int* 2011; 2: 82. PMCID: PMC3130361.
23. Krupin T, Liebmann JM, Greenfield DS, Ritch R, **Gardiner SK**. A randomized trial of Brimonidine versus Timolol in preserving visual function: Results from the Low-pressure Glaucoma Treatment Study. *Am J Ophthalmol* 2011; 151: 671-681. PMID: 21257146.
24. **Gardiner SK**, Demirel S, Johnson CA, Swanson WH. Assessment of linear-scale global indices for perimetry in terms of progression in early glaucoma. *Vision Research* 2011; 51: 1801-1810. PMCID: PMC3152648.
25. **Gardiner SK**, Johnson CA, Demirel S. Cup size predicts subsequent functional change in early glaucoma. *Optom Vis Sci* 2011; 88: 1470-1476. PMCID: PMC3223562.
26. Yang H, Qi J, Hardin C, **Gardiner SK**, Strouthidis NG, Fortune B, Burgoyne CF. Spectral Domain Optical Coherence Tomography Enhanced Depth Imaging of the normal and glaucomatous non-human primate optic nerve head. *Invest Ophthalmol Vis Sci* 2012; 53: 394-40. PMCID: PMC3292373.
27. Demirel S, De Moraes CG, **Gardiner SK**, Liebmann JM, Cioffi GA, Gordon MO, Kass MA for the Ocular Hypertension Treatment Study. The rate of visual field change in the Ocular Hypertension Treatment Study (OHTS). *Invest Ophthalmol Vis Sci* 2012; 53: 224-227. PMCID: PMC3292359.
28. De Moraes CG, Demirel S, **Gardiner SK**, Liebmann JM, Cioffi GA, Ritch R, Gordon MO, Kass MA for the Ocular Hypertension Treatment Study. Effect of Treatment on the Velocity of Visual

Field Progression in the Ocular Hypertension Treatment Study Observation Group. *Invest Ophthalmol Vis Sci* 2012; 53: 1704-1709. PMCID: PMC3342789.

29. Reynaud J, Cull G, Wang L, Fortune B, **Gardiner SK**, Burgoyne, CF and Cioffi GA. Automated Quantification of Optic Nerve Axons in Primate Glaucomatous and Normal Eyes - Method and Comparison to Semi-automated Manual Quantification. *Invest Ophthalmol Vis Sci* 2012; 53: 2951-2959. PMCID: PMC3382379.
30. Tang K, **Gardiner SK**, Gould C, Osmundsen B, Winter III WE. Robotic surgical staging for obese patients with endometrial cancer. *Am J Obstet Gynecol* 2012; 206(6): 513.e1-6. PMID PMCID: PMC Journal – In Process.
31. **Gardiner SK**, Johnson CA, Demirel S. Factors predicting the rate of functional progression in early and suspected glaucoma. *Invest Ophthalmol Vis Sci* 2012; 53: 3598-3604. PMCID: PMC3406886.
32. Chandran R, **Gardiner SK,** Simon M, Spurgeon SE. Survival trends in Mantle cell lymphoma in the United States over sixteen years 1992-2007. *Leuk Lymphoma* 2012; 53: 1488-93. PMCID: PMC Journal – In Process.
33. Fazio M, Grytz R, Bruno L, Girard M, **Gardiner SK**, Girkin C, Downs JC. Regional Variations in Mechanical Strain in the Posterior Human Sclera. *Invest Ophthalmol Vis Sci* 2012; 53: 5326-5333. PMCID: PMC3416039.
34. **Gardiner SK**, Johnson CA, Demirel S. The effect of test variability on the structure-function relation in glaucoma. *Graefe's Arch Ophthalmol* 2012; 250(12): 1851-1861. PMCID: PMC3763816.
35. **Gardiner SK**, Fortune B, Wang L, Downs C, Burgoyne CF. Intraocular pressure magnitude and fluctuation as predictors of rates of structural change in non human primate experimental glaucoma. *Experimental Eye Research* 2012; 103: 1-8. PMCID: PMC3462301.
36. Wackym PA, Ratigan JA, Birck JD, Johnson SH, Doornink J, Bottlang M, **Gardiner SK**, Black FO. Rapid cVEMP and oVEMP responses elicited by a novel head striker and recording device. *Otol Neurotol* 2012; 33: 1392-1400. PMCID: PMC Journal – In Process.
37. De Moraes CG, Demirel S, **Gardiner SK**, Liebmann JM, Cioffi GA, Ritch R, Gordon MO, Kass MA for the Ocular Hypertension Treatment Study. The Rate of Visual Field Progression in Eyes with Optic Disc Hemorrhages in the Ocular Hypertension Treatment Study. *Arch Ophthalmol* 2012; 13: 1-6. PMCID: PMC Journal – In Process.
38. De Moraes CG, Liebmann JM, Greenfield DS, **Gardiner SK**, Ritch R, Krupin T for the Low-Pressure Glaucoma Treatment Group. Risk Factors for Visual Field Progression in the Low-pressure Glaucoma Treatment Study. *Am J Ophthalmol* 2012; 154: 702-711. PMCID: PMC Journal – In Process.
39. **Gardiner SK**, Demirel S, De Moraes CG, Liebmann JM, Cioffi GA, Ritch R, Gordon MO, Kass MA for the Ocular Hypertension Treatment Study. Series Length used during Trend Analysis Affects Sensitivity to Changes in Progression Rate in the Ocular Hypertension Treatment Study (OHTS). *Invest Ophthalmol Vis Sci* 2013; 54: 1252-1259. PMCID: PMC3597197.
40. **Gardiner SK**, Demirel S, Gordon MO, Kass MA for the Ocular Hypertension Treatment Study. Seasonal Changes in Visual Field Sensitivity and Intraocular Pressure in the Ocular Hypertension Treatment Study. *Ophthalmology* 2013; 120: 724-730. PMCID: PMC3618610.
41. Hegsted D, Gritsiouk Y, Schlesinger P, Gardiner SK, Gubler KD. Utility of the risk assessment profile for risk stratification of venous thrombotic events for trauma patients. *Am J Surgery* 2013; 205: 517-520.
42. Gritsiouk Y, Hegsted D, **Gardiner SK**, Merriman L, Gubler KD. Use of volunteer student abstractors for a retrospective cohort analysis: a study of inter-rater reliability. *Am J Surgery* 2013; 205: 552-556.
43. Lloyd MJ, Mansberger SL, Fortune BA, Nguyen H, Torres R, Demirel S, **Gardiner SK**, Johnson CA, Cioffi GA. Features of optic disc progression in patients with ocular hypertension and early glaucoma. *J Glaucoma*. 2013; 22: 343-8. PMCID: PMC Journal – In Process.
44. Pathak M, Demirel S, **Gardiner SK**. Nonlinear, Multilevel Mixed-Effects Approach for Modeling Longitudinal Standard Automated Perimetry Data in Glaucoma. *Invest Ophthalmol Vis Sci* 2013; 54: 5505-5513. PMCID: PMC3747790.

45. Gordon S, **Gardiner SK**. Central Line Infections in Repaired Catheters: A Retrospective Review. *J Vasc Access* 2013; 18: 164-166.
46. **Gardiner SK**, Fortune B, Demirel S. Signal-to-Noise Ratios for Structural and Functional Tests in Glaucoma. *Trans Vis Sci Tech* 2013; 2: 3. PMCID: PMC3812901.
47. Goren D, Demirel S, Fortune B, **Gardiner SK**. Correlating perimetric indices with 3 nerve fiber layer thickness measures. *Optom Vis Sci* 2013; 90: 1353-1360. PMCID: PMC Journal – In Process.
48. Chandran R, **Gardiner SK**, Smith SD, Spurgeon SE. Improved Survival in Hairy Cell Leukemia Over Three Decades: A SEER Database Analysis of Prognostic Factors. *Br J Haematology* 2013; 163: 407-9. PMCID: PMC Journal – In Process.
49. Mansberger SL, Gleitsmann K, **Gardiner SK**, Sheppler C, Demirel S, Wooten K, Becker TM. Comparing the Effectiveness of Telemedicine and Traditional Surveillance in Providing Diabetic Retinopathy Screening Examinations: A Randomized Controlled Trial. *Telemed J E Health* 2013; 19: 942-8. PMCID: PMC Journal – In Process.
50. Grytz R, Fazio M, Girard M, Libertiaux V, Bruno L, **Gardiner SK**, Girkin C, Downs JC. Material Properties of the Posterior Human Sclera. *J Mech Behav Biomed Mate.* 2014; 29: 602-17. PMCID: PMC3778040.
51. He L, Yang H, **Gardiner SK**, Williams G, Hardin C, Strouthidis NG, Fortune B, Burgoyne CF. Longitudinal Detection of Optic Nerve Head Changes by Spectral Domain Optical Coherence Tomography in Early Experimental Glaucoma. *Invest Ophthalmol Vis Sci* 2014; 55: 574-586. PMCID: PMC Journal – In Process.
52. Fazio MA, Grytz RG, Morris JS, Bruno L, **Gardiner SK**, Girkin CA, Downs JC. Age-related Changes in Human Peripapillary Scleral Strain. *Biomech and Model Mechanobiol* 2014; In Press. PMCID: PMC Journal – In Process.
53. **Gardiner SK**, Ren R, Yang H, Fortune B, Burgoyne CF, Demirel S. A Method to Estimate the Amount of Neuroretinal Rim Tissue in Glaucoma: Comparison with Current Methods for Measuring Rim Area. *Am J Ophthalmol* 2014; In Press. NIHMS 540854.
54. Sheppler CR, Lambert WE, **Gardiner SK**, Becker TM, Mansberger SL. Predicting Adherence with Diabetic Eye Exams: Development of the Compliance with Annual Diabetic Eye Exams Survey. *Ophthalmology* 2014; In Press.
55. Huston RK, Markell AM, McCulley EA, Pathak M, Rogers SP, Sweeney SL, Dolphin NG, **Gardiner SK**. Decreasing Necrotizing Enterocolitis and Gastrointestinal Bleeding in the Neonatal Intensive Care Unit: the Role of Donor Human Milk and Exclusive Human Milk Diets in Infants < 1500 Grams Birth Weight. *Infant Child Adolesc Nutr* 2014; In Press.
56. Ren R, Yang H, **Gardiner SK**, Fortune B, Hardin C, Demirel S, Burgoyne CF. Anterior Lamina Cribrosa Surface Depth, Age and Visual Field Sensitivity in the Portland Progression Project. *Invest Ophthalmol Vis Sci* 2014; In Press.
57. **Gardiner SK**, Swanson WH, Goren D, Mansberger SL, Demirel S. Assessment of the reliability of standard automated perimetry in regions of glaucomatous damage. *Ophthalmology* 2014; In Press.

Funding

NEI R01 EY 020922 7/1/11 – 6/30/16
Role: Principal Investigator
Functional Testing for Glaucoma
Major Goals: This project aims to explain and reduce the variability observed in functional testing of the visual field in patients with glaucoma. This will allow earlier and more accurate assessment of a patient's current status and response to treatment. It will improve the ability to design an appropriate and cost-efficient personalized management strategy to preserve vision, with the aim of maintaining a patient's quality of life.

NEI R01 EY 019674 (PI: Demirel, S) 9/30/09 – 9/29/14
Role: Co-investigator
Predicting the Rate of Progression in Glaucoma

Major Goals: This project seeks to predict the future rate of vision loss in patients with glaucoma, both earlier and more accurately than is currently possible. If a patient is at risk of rapid disease progression, possibly resulting eventual visual disability or blindness, this may warrant more frequent monitoring and/or more aggressive therapy. The project will also provide new information about glaucomatous pathophysiology, which can be used to direct future developments in diagnostic testing and treatment strategies.

NEI R01 EY021281 (PI: Burgoyne, CF) 12/1/10 – 11/30/14
Role: Consultant
Optic Nerve Head SDOCT Imaging in Glaucoma

Major Goals: The clinical detection of the onset and progression of glaucomatous damage to the optic nerve head (ONH) is central to the care of every glaucoma patient. This study uses 870 nm and 1060 nm Heidelberg Spectralis Spectral Domain Optical Coherence Tomography (SDOCT) to characterize the onset and progression of ONH structural change within pre and post- laser SDOCT ONH data sets from both eyes of 70 unilateral experimental glaucoma (EG) monkeys and 250 ocular hypertensive and early glaucoma patients. 11 years of NIH-funded, post-mortem monkey work is translated to an in-vivo imaging modality, with important and novel clinical care applications in humans.

NEI R01 EY011610 (PI: Burgoyne, CF) 8/1/12 – 6/30/16
Role: Consultant
IOP-Related Force and Failure in the Optic Nerve Head

Major Goals: The goal of this project is to identify clinical targets that predict eye-specific optic nerve head (ONH) behavior (depth of cupping and remodeling) and retinal ganglion cell (RGC) axon susceptibility within the monkey unilateral experimental glaucoma model so as to translate this knowledge to human patients in future research. To do so we will first test the hypothesis that the behavior and susceptibility of individual eyes to glaucomatous damage can be predicted from the results of in vivo spectral domain optical coherence tomography (SDOCT) ONH compliance testing, post-mortem 3D reconstruction of the ONH connective tissues and stress/strain outputs of engineering finite element (FE) models. We will then test the hypothesis that ONH connective tissue deformation and remodeling are linked to RGC axon susceptibility in an age-related manner by being both more robust and more protective of axons in compliant and/or young ONHs.

Completed Funding

NEI R21 EY18698 (PI: Levine, RA) 7/1/09 – 6/30/11
Role: Co-Investigator.
Measuring and Predicting Visual Field Progression with Longitudinal-Survival CART

Major Goals: The goals of this project are to develop classification and regression tree methods for longitudinal survival data that assist in prediction of which eyes with glaucoma or high-risk ocular hypertension are likely to undergo progression.

NEI R01 EY018926 (PIs: Downs, JC and Girkin, CA) 4/1/10 – 3/31/12
Role: Consultant
Age-related Changes in Optic Nerve Head Structure and Biomechanics

Major Goals: The major goals of this project are to build 3D reconstructions of the optic nerve heads (ONH) from human donor eyes, perform 3D histomorphometric quantification of their ONH anatomy, perform biomechanical testing of their posterior scleral shells, and construct finite element models to predict IOP-related stress and strain within their load bearing tissues. From these data,

we will determine age-related changes in human ONH anatomy, ONH biomechanics, and scleral material properties.

CDC U48 DP002673 (PI: Becker, TM) 7/14/10 – 7/13/12
Role: Consultant
The Comparative Effectiveness of Telemedicine to Detect Diabetic Retinopathy
Major goals: Diabetic retinopathy is the leading cause of blindness in working-age adults, and both the disease and ensuing blindness disproportionately affect American Indians and Alaskan Natives (AI/AN). Less than 50% of AI/AN diabetic patients receive annual eye exams. This proposal will address three critical gaps in knowledge: 1) the efficacy for detecting diabetic retinopathy with telemedicine and traditional surveillance methods; 2) the health behavior factors related to receiving annual diabetic eye examinations with telemedicine and traditional surveillance methods; and 3) the cost-effectiveness of telemedicine and traditional surveillance methods.

Updated: 3 February 2014