Manuscript Details

Manuscript number	OPHTHA_2019_471_R1
Title	Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I
Article type	Full Length Article

Abstract

Purpose Ophthalmologic telemedicine has the ability to provide eye care for patients remotely and many countries have utilized screening tele-ophthalmology programs for several years. One such initiative at the Veteran Affairs' (VA) Healthcare System is Technology-based Eye Care Services (TECS). TECS services are located in primary care clinics and provide basic eye care including vision, refraction, and retinal photography. Eye care providers ("readers") review the clinical data and recommend appropriate follow-up. One of the most common referrals from TECS has been for glaucoma and the current study was undertaken to identify aspects of the protocol that could be refined to enhance accuracy with regards to glaucoma detection. Design Prospective comparison between the standard TECS protocol versus a Face-To-Face (FTF) exam on 256 patients, all of whom had no known history of significant ocular disease. Participants Patients with no known ocular disease who were scheduled for an in-person eye appointment at the Atlanta VA. Intervention Patients underwent screening through the TECS protocol and also received a FTF exam on the same day ("gold standard"). The TECS readers were masked to the results of the FTF exam. Main Outcome Measures Percent agreement, kappa, sensitivity, and specificity were calculated for the TECS readers' interpretations versus the FTF exam. Results TECS readers showed substantial agreement for cataract (□ ≥0.71), diabetic retinopathy (□ ≥0.61), and moderate to substantial agreement for glaucoma/glaucoma suspect (□ ≥0.52) compared to a FTF exam. Age-related macular degeneration (AMD) showed moderate agreement (κ ≥0.34). Percent agreement with the TECS protocol was high (84.3 to 98.4%) for each of the disease categories. Overall sensitivity and specificity was ≥60% and ≥80%, respectively, for any diagnosis resulting in referral. Inter-and intra-reader agreement was substantial for most diagnoses (κ>0.61) with percent agreements ranging from 66% to 99%. Conclusions Our results indicate that the standard TECS protocol is accurate when compared to a FTF exam for the detection of common eye diseases. The inclusion of additional testing such as optical coherence tomography could further enhance diagnostic capability.

Taxonomy	Telemedicine, Telemedicine in Ophthalmology
Manuscript category	Manuscript
Corresponding Author	April Maa
Corresponding Author's Institution	Atlanta VAMC
Order of Authors	April Maa, Charles Medert, Xiaoqin Lu, Rabeea Janjua, Ashley Howell, Kelly Hunt, Sarah McCord, ANNETTE giangiacomo, Mary Lynch

Submission Files Included in this PDF

File Name [File Type]

TECS compare no OCT_cover letter.docx [Cover Letter]

TECS Compare Part 1_response to reviewers.docx [Response to Reviewers]

TECS Compare no OCT_manuscript_revision_tracked changes_no tables.doc [Revised Manuscript with Changes Marked]

TECS compare no OCT_precis.docx [Highlights]

TECS Compare no OCT_manuscript_revision_clean copy_no tables.doc [Manuscript File]

Table 1.docx [Table]

Table 2_revision_tracked changes.doc [Table]

Table 2_revision_clean.doc [Table]

Table 3.docx [Table]

Table 4.docx [Table]

Table 5_revision_tracked changes.doc [Table]

Table 5_revision_clean.doc [Table]

OPHTHA_COI_MAA.pdf [Conflict of Interest]

OPHTHA_COI_GIANGIACOMO.pdf [Conflict of Interest]

OPHTHA_COI_HOWELL.pdf [Conflict of Interest]

OPHTHA_COI_LU.pdf [Conflict of Interest]

OPHTHA_COI_Lynch.pdf [Conflict of Interest]

OPHTHA_COI_McCord.pdf [Conflict of Interest]

OPHTHA_COI_Medert.pdf [Conflict of Interest]

OPHTHA_COI_HUNT.pdf [Conflict of Interest]

OPHTHA_COI_Janjua.pdf [Conflict of Interest]

OPHTHA_Contributorship.pdf [Author Agreement]

Figure 1 Supplemental.docx [e-Component]

Two-by-two tables.docx [Supporting File]

2019-06-10_Sensitivity-Specificity_recalculations_SAS output.pdf [Supporting File]

Urken approval acknowledgement letter.pdf [Supporting File]

d-signed_7.1.19.pdf [Supporting File]

To view all the submission files, including those not included in the PDF, click on the manuscript title on your EVISE Homepage, then click 'Download zip file'.

May 2, 2019

Dear Editor:

We herewith submit our manuscript, “Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I” to Ophthalmology Journal for consideration of publication. This paper represents original work, with all authors providing substantial contribution to the gathering or analysis of data, writing the paper, and agree with the final version submitted here.

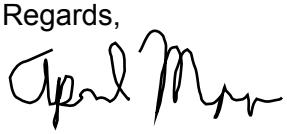
This paper has not in part or whole, been published elsewhere nor is it being considered for publication at any other journal other than what is described above.

Dr. April Maa will serve as corresponding author. None of the authors have a financial conflict of interest in the subject matter. The views expressed here are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

We have no recommendations for reviewers. We also do not have any opposition to reviewers wishing to evaluate our study.

Thank you for the opportunity to submit our work for review.

Regards,



April Maa, MD

Clinical Director of TECS
Regional Telehealth Services, VISN 7, Atlanta GA

Associate Professor
Emory Eye Center, Emory University School of Medicine
1670 Clairmont Road MC 112E
Decatur GA 30033
404-321-6111 x 1-207945
amaa@emory.edu

POINT-BY-POINT RESPONSE FORM

Please list the editor's, reviewer(s)', and editorial office's comments in the left-hand column, spacing them so that you can insert the relevant response in the center column and the respective point(s) in the text (and tables or legends, if appropriate) in the right-hand column. Adding line numbers to the manuscript file and referring to specific line numbers will be useful in determining which parts of the manuscript changed.

Manuscript #: OPHTHA_2019_471
Manuscript title: Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

Suggestion, Question, or Comment from the Editor	**Author's Response**	**Change in the Manuscript**
I am confused by table 2. If FTF is the "gold standard", then sensitivity should be the percentage of true cases (by FTF) that are correctly identified by the reader. And specificity should be the percentage of true non-cases (identified by FTF) that are identified as non-cases by the reader. I was unable to make a 2x2 table with the data presented that yielded the sensitivity and specificity figures shown (for any of the conditions). Can the authors please show the 2x2 tables for each condition and check their computation of sensitivity and specificity? (maybe not to be included in the manuscript itself, but I need to see them)	We very much appreciate the feedback from the Editor. We went back to evaluate the statistics and detected an error in the calculations – TECS was used as the gold standard in our first set of calculations by mistake. We deeply apologize for this inadvertent error. We have attached the 2x2 tables and the SAS outputs for the Editor's review. All the calculations were triple checked and the manuscript edited for accuracy. The difference did not change the overall message of the paper.	Throughout tables 2 and 5. Please see SAS files and 2x2 table outputs as well. Multiple lines of the manuscript in the results and discussion section were edited as well.

Suggestion, Question, or Comment from Reviewer #1	**Author's Response**	**Change in the Manuscript**
Specific comments: Line 73 - Statement made that glaucoma "does not have clear visual criteria for diagnosis (unlike AMD or DR)."	This was edited to be more clear that the visible findings are not sufficient alone for the diagnosis of glaucoma	Line 107-108 in tracked changes manuscript

This seems to mean clearly visible criteria. Clearly visualizable?	– one requires HVF and OCT	
Line 111 Suggest using “masked” rather than “blinded”.	Changed	Line 145 in tracked changes manuscript
Line 115. For the 150 patients randomly selected for a reread, were they reread by the original readers or randomly assigned for rereads?	Re-read by original readers. Clarified in manuscript	Line 148-150 in tracked changes manuscript
Discussion is good with regard to the lower accuracy for the more uncommon AMD cases - maybe due to low prevalence in this AA population?	Yes our prevalence of AMD is low in our patient population	Line 221-222 in tracked changes manuscript

Suggestion, Question, or Comment from Reviewer #2	**Author’s Response**	**Change in the Manuscript**
In the abstract results section, I suggest the agreement for the glaucoma/glaucoma suspect diagnoses be labelled as “moderate to substantial” since the kappa reported is ≥ 0.52. The authors have written it this way to represent the kappa for both Readers 1 and 2 but the number 0.52 is considered a moderate kappa and it is slightly misleading to label that number as substantial.	Thank you. This change has been made	Line 60 in the abstract of the tracked changes manuscript

Suggestion, Question, or Comment from the Editorial Office	**Author’s Response**	**Change in the Manuscript**
None	N/A	

Title: Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

Authors and Affiliations:

April Y Maa, MD*[1,2]; Charles M. Medert, MD[3], MD; Xiaoqin Lu, MD[1,2] ; Rabeea Janjua, MD[1]; Ashley V. Howell, MPH[4]; Kelly J Hunt, PhD[4]; Sarah McCord, MD[5]; Annette Giangiacomo, MD[1], Mary G Lynch, MD[2,6].

*Corresponding author

1 TECS Division, Regional Telehealth Services, VISN 7, Atlanta Veteran Affairs Health Care System, Atlanta GA
2 Emory University School of Medicine, Atlanta GA
3 Bascom Palmer Eye Institute, University of Miami, Miami FL
4 Charleston Health Equity and Rural Outreach Innovation Center (HEROIC), Ralph A. Johnson Department of Veterans Affairs Medical Center, Charleston SC
5 New York Eye and Ear Infirmary, New York NY
6 Ophthalmology Division, Surgical Services, Atlanta Veteran Affairs Health Care System, Atlanta GA

Meeting Presentation: None.

Financial Support: This research was partially funded by Atlanta Clinical and Translational Institute (ACTSI) Translational Research grant. The funding source had no role in the design or conduct of this study.

Conflict of Interest: None for any authors.

Running Head (Short title): Diagnostic Accuracy of the TECS Protocol

Corresponding Author:

April Maa, MD

1670 Clairmont Road MC 112E

Decatur GA 30033

amaa@emory.edu

404-321-6111 x 1-207945

Abstract:

Purpose

Ophthalmologic telemedicine has the ability to provide eye care for patients remotely and many countries have utilized screening tele-ophthalmology programs for several years. One such initiative at the Veteran Affairs' (VA) Healthcare System is Technology-based Eye Care Services (TECS). TECS services are located in primary care clinics and provide basic eye care including vision, refraction, and retinal photography. Eye care providers ("readers") review the clinical data and recommend appropriate follow-up. One of the most common referrals from TECS has been for glaucoma and this study was powered for glaucoma/glaucoma suspect detection. The current study was undertaken to identify aspects of the protocol that could be refined to enhance accuracy.

Design

Prospective comparison between the standard TECS protocol versus a Face-To-Face (FTF) exam on 256 patients, all of whom had no known history of significant ocular disease.

Participants

Patients with no known ocular disease who were scheduled for an in-person eye appointment at the Atlanta VA.

Intervention

Patients underwent screening through the TECS protocol and also received a FTF exam on the same day ("gold standard"). The TECS readers were masked to the results of the FTF exam.

Main Outcome Measures

Percent agreement, kappa, sensitivity, and specificity were calculated for the TECS readers' interpretations versus the FTF exam.

Results

TECS readers showed substantial agreement for cataract ($\kappa \geq 0.71$), diabetic retinopathy ($\kappa \geq 0.61$), and moderate to substantial agreement for glaucoma/glaucoma suspect ($\kappa \geq 0.52$)

compared to a FTF exam. Age-related macular degeneration (AMD) showed moderate agreement (κ ≥0.34). Percent agreement with the TECS protocol was high (84.3 to 98.4%) for each of the disease categories. Overall sensitivity and specificity was ≥6075% and ≥5580%, respectively, for any diagnosis resulting in referral. Inter-and intra-reader agreement was substantial for most diagnoses (κ>0.61) with percent agreements ranging from 66% to 99%.

Conclusions

Our results indicate that the standard TECS protocol is accurate when compared to a FTF exam for the detection of common eye diseases. The inclusion of additional testing such as optical coherence tomography could further enhance diagnostic capability.

Telemedicine is defined as care given to patients when the provider and the patient are separated by distance, time, or both. Ophthalmology is an ideal specialty for telemedicine as diagnoses made during face-to-face (FTF) visits are often based upon pattern recognition and the use of multiple imaging modalities. Images and clinical information such as vision and eye pressure can be collected remotely and then transmitted electronically to a physician stationed at another location for interpretation. This form of telemedicine is called 'store and forward' or 'asynchronous', and one of the most common uses of store and forward ophthalmologic telemedicine is diabetic teleretinal imaging (TRI). Teleretinal screening for diabetes is utilized worldwide to reduce blindness from diabetic retinopathy (DR).[1-3] Diabetic TRI is well validated, and many studies have illustrated that other common ocular diseases such as glaucoma, cataract, and age-related macular degeneration (AMD) can also be incidentally detected with these photographs.[2-6] This knowledge has led to the expansion of various tele-ophthalmology programs to use fundus photos to screen for other common eye conditions.

The Veterans Health Administration (VA) has a particular interest in novel telemedicine interventions because VA is one of the largest integrated healthcare systems in the United States with more than 5.5 million patients[7], many of whom live in rural communities. The VA has long been at the forefront of using telemedicine tools to decrease health disparities of the medically underserved because barriers to telemedicine such as reimbursement and licensure are mitigated in a single integrated healthcare system. Since 2006, the VA has utilized a national diabetic TRI program to screen for DR. In 2015, the Atlanta VA developed Technology-based Eye Care Services (TECS), an extension of the TRI program that provides broader eye screening and eyeglasses to all eligible Veterans regardless of diabetic status. The most common referral from TECS has been for glaucoma suspect or frank glaucoma.[8,9] The current study was undertaken to further investigate the TECS protocol and to identify aspects of the process that could be further refined to enhance accuracy.

Methods:

This project was approved by the Emory University Institutional Review Board (IRB) and the VA Research and Development Committee. This project conformed to the tenets in the Declaration of Helsinki and was HIPAA compliant. The study was registered at clinicaltrials.gov under the identifier NCT02558712. This research was partially funded by the Atlanta Clinical and Translational Science Institute (ACTSI), however, no conflict of interest exists for any of the authors.

Participants were recruited over a two-year period, from March 2015 until December 2017. Power calculations were based on the expected prevalence of glaucoma suspect/glaucoma in the Veteran population. The trial was powered for glaucoma detection because this is a common disease that is asymptomatic in its earliest stages and also presents the greatest challenge for obtaining consensus because the disease is not diagnosed based on visual criteria alone~~does not have clear visual criteria for diagnosis~~ (unlike AMD or DR).[8] A sample size of 250 produces a two-sided 95% confidence interval with widths equal to 0.127, 0.117 and 0.078 for kappa statistics of 0.5, 0.7, and 0.9, respectively.

The Atlanta VA Eye Clinic offers routine appointments in the "New Comprehensive Clinic" (NCC) for patients who have not had an exam for 2 or more years. These patients have no known ocular disease and are presenting for a baseline assessment. Recruitment letters were mailed to patients who were already scheduled into NCC informing them of the study, and patients self-selected to participate in the trial. Once patients agreed to participate, their Computerized Patient Record System (CPRS) chart was reviewed to confirm that there was no known history of macular degeneration (AMD), glaucoma, visually significant cataract, moderate-to-severe diabetic retinopathy (DR), or macular edema. Patients with "glaucoma suspect" history were excluded if they had documented visual field changes or history of therapy. On the day of their NCC visit, informed consent was obtained from eligible participants and a full TECS screening protocol was initiated. The TECS protocol included a detailed chief

complaint, ocular, medical, social, and family history. Distance vision with present correction (if available) was assessed using a Marco ARK-1S auto-refractor in both eyes. The auto-refractor was utilized to obtain an auto-refraction, and the vision re-assessed through the Marco unit with the auto-refraction in place. Then the patient was brought to a standard eye lane, and manifest refraction with a phoropter was performed using the auto-refractor's prescription as a starting point. Distance and near 'best corrected' spectacle visual acuity was recorded. Pupils, intraocular pressure (iCare tonometer), central corneal thickness (Accutome Pachpen), and anterior chamber depth (utilizing Finhoff transilluminator) were measured. The patient's eyes were dilated using 1% Tropicamide drops. Once dilated, a Canon CX-1 camera was used to collect for each eye one external and three non-stereoscopic, 45 degree field, color fundus photographs according to the VA diabetic teleretinal protocol[10] (Figure 1, supplemental). Finally, the patient received a FTF exam by a comprehensive ophthalmologist (AYM). The FTF examiner would indicate whether the patient needed a follow up visit to the Eye Clinic for further testing or initiate treatment. At the end of each patient's visit, the FTF physician completed a standardized reporting form specifically detailing whether there was a surgical cataract (defined as best corrected vision worse than 20/40, or glare vision worse than 20/40), glaucoma suspect/glaucoma, AMD, or DR if the patient was diabetic.

Study patients were assigned a code by research staff. Each patient's history, clinical data, and ocular photographs were de-identified and placed into a secure research database (REDCap).[11] The de-identified information was transmitted to two Ophthalmologists (Reader 1 = RJ, Reader 2 = XAL) who individually reviewed the information and provided interpretations in accordance with established TECS reading guidelines.[8] Neither reader knew the patient's true identity, they had never met the patient in-person, nor did they have access to the patient's CPRS medical chart. Readers were also masked~~blinded~~ to the examining physician's findings and to each other's interpretations. The Reading physicians interpreted the TECS information and documented their findings on a REDCap case report form that was identical to the FTF

physician's form. Three months after completion of enrollment, each reader had 150 patients were randomly selected for a second read. Studies were re-read by the original reader. ReadersOn the second interpretation Readers, were maskedblinded to their initial read , and repeated the same procedure above and re-documented their findings on REDCap case report forms.

Data were analyzed using SAS statistical software (Cary, NC). Five diagnostic categories were created: surgical cataracts, glaucoma suspect/glaucoma, AMD, DR, and any condition requiring referral. Each diagnosis category was recorded as present or not present. We measured concordance between diagnoses obtained from the TECS protocol with those obtained from FTF visits using percent agreement and Cohen's kappa statistics. The screening performance of the TECS protocol was assessed with sensitivity and specificity measures, using the FTF visits as the 'gold standard'. We also calculated percent agreement and kappa statistics to compare diagnostic classifications performed by the two readers (inter-reader agreement) and for the same reader 90 days apart (intra-reader agreement). All statistical tests were two-sided and considered significant at an alpha 0.05 level.

Results:

A total of 256 patients were recruited in the 2-year period. Table 1 illustrates the demographics of the study population. Most patients enrolled in the study were male (86.7%) and African American (61.3%). A quarter of the subjects had a history of eye trauma or a family history of significant eye diagnoses or blindness.

Table 2 indicates the percent agreement, kappa statistics, sensitivity, and specificity of the TECS protocol between the 2 readers and the FTF exam. According to the FTF provider, the prevalence of surgical cataracts in our study population was 3.9%, glaucoma suspect/glaucoma was 26.6%, AMD was 2.3%, DR was 3.1%, and the presence of any condition resulting in referral was 43.8%. Using the TECS protocol, readers diagnosed more

patients with cataracts (6.3% and 5.9% for Reader 1 and Reader 2, respectively) and any condition requiring referral (48.1% and 59.0% for Reader 1 and Reader 2, respectively) compared to the FTF physician, and diagnosed fewer patients with glaucoma (25.4% and 14.5% for Reader 1 and Reader 2, respectively). Percent agreement between the diagnostic classifications obtained from FTF visits and the TECS protocol ranged from 68.4% to 98.4%, with the lowest level of agreement observed in the compound variable, 'any diagnosis resulting in referral' (75.4% and 68.4% for Reader 1 and Reader 2, respectively). Diagnostic concordance with the FTF visits was higher for Reader 1 than for Reader 2, with kappa statistics between 0.51 and 0.77 for Reader 1 and between 0.34 and 0.71 for Reader 2. Specificity for the TECS protocol was ~~very~~ generally high. Specificity measures for cataracts, glaucoma, macular degeneration and diabetic retinopathy~~the diagnostic categories~~ fell between 0.~~80~~ 91 and ~~1.00~~0.99 for both readers, whereas specificity estimates for any diagnosis resulting in referral were 0.74 and 0.58 for Reader 1 and Reader 2, respectively. S~~s~~ensitivity estimates exhibited more variation with values rang~~ed~~ing from 0.~~60~~ 50 to ~~0.75~~1.00 for Reader 1 and 0.~~25~~ 47 to 0.~~87~~ 90 for Reader 2.

Tables 3 and 4 illustrate inter-reader and intra-reader variability, respectively. Inter-reader agreement was highest for cataracts (κ = 0.83), followed by glaucoma (κ = 0.62), DR (κ = 0.61), and AMD (κ = 0.46). The readers differed most often in their categorization of 'any diagnosis resulting in referral' (κ = 0.33). Reader 1 diagnosed more patients with glaucoma than Reader 2, while Reader 2 was more likely to diagnose patients with AMD compared to Reader 1. According to the intra-reader agreement calculations, Reader 2's diagnostic classifications were slightly more consistent over time. Kappa statistics for diagnoses made 90 days apart ranged from 0.59 to 0.87 for Reader 2 and 0.39 to 0.70 for Reader 1. Notably, Reader 1 diagnosed one patient with AMD at the initial TECS assessment and zero patients at the 90-day TECS assessment, so we were unable to calculate the kappa statistic for this category for Reader 1.

Discussion:

The results demonstrate that the TECS protocol had high percent agreement with moderate to substantial kappa values when compared to a FTF exam for the 4 most common causes of visual loss in the Veteran population.

For the purposes of this analysis, we used the definition of kappa in Landis and Koch: κ=0.0-0.20 none to slight agreement, κ=0.21-0.40 fair agreement, κ=0.41-0.60 moderate agreement, κ=0.61-0.80 substantial agreement, and κ>0.80 near perfect agreement.[12] Table 5 is a summary table that reports the results from the TECS trial alongside other published literature. Values that are missing indicate the authors did not publish that calculation.

Cataract

There are very few studies in the literature that directly compare photographs to a FTF exam for the diagnosis of cataract. Our study results for sensitivity and kappa are consistent with both Gupta[13] and Conlin.[14] ~~The lower sensitivity for TECS compared to Gupta might be explained by: 1) different study population/surgical cataract prevalence and 2) unlike the Gupta protocol, TECS does not use a slit lamp photo for the anterior segment.~~ The TECS protocol actually had better specificity than Gupta in the diagnosis of cataract.

Macular Degeneration

While there was very high percent agreement with the FTF exam, the lowest kappa overall in the study for both Reader 1 and 2 were for AMD. Our results are difficult to interpret because ~~of~~ there is low prevalence of AMD in our specific Veteran population, thereby a~~the~~ low number of AMD cases in the~~our~~ study, resulting in imprecise estimates of sensitivity, specificity, and kappa. Nevertheless, TECS results were similar to three other studies comparing photos to a FTF exam for AMD (Table 5).[14-16]

Diabetic Retinopathy

Several studies have compared fundus images for DR detection with a retinal examination. The TECS kappa was similar to studies comparing a retinal examination to photographs (Conlin[14] and Kerr et al[17]) with TECS having a better percent agreement than Cavallerano[18] and Gomez-Ulla.[19] One reason for the differences in the reported data might be study design or DR classification scheme. For example, Cavallerano et al performed a FTF exam about 30 days post imaging and Gomez-Ulla used a modified Airlie House classification whereas TECS uses early treatment diabetic retinopathy study (ETDRS) classification.

Glaucoma/Glaucoma Suspect

The TECS trial was powered for glaucoma and glaucoma suspect detection. Glaucoma is one of the most difficult disease entities to consistently diagnose because multiple factors are considered when making the diagnosis. Not surprisingly then, kappa values for TECS readers were slightly lower for glaucoma (compared to cataract or DR) but still reflected moderate to substantial agreement with the FTF exam. Furthermore, TECS had a higher percent agreement than Gupta[13], kappa was similar to 3 other studies, and Reader 1's estimates were comparable to the Thomas et al[20] large meta-analysis with regard to tele-glaucoma sensitivity and specificity.

Intra and Inter-observer Variability of TECS

The data demonstrates that the TECS protocol allowed for substantial to near-perfect agreement between Reader 1 and 2, with κ of 0.61 (DR and glaucoma) to 0.83 (cataract). The only value that was slightly lower was AMD at 0.46 and the κ is less reliable because of the very low number of cases. In addition, the percent agreement was very high, ranging from 87-98% between the readers. Most importantly, inter-observer agreement for glaucoma/glaucoma

suspect was substantial (0.62) and percent agreement was high (>80%). These results are consistent with previously published literature for glaucoma suspect/glaucoma (0.50 to 0.68)[21-24]; TECS was even on par with inter-reader data obtained between glaucoma specialists.[22]

Intra-reader variability was minimal as both Reader 1 and Reader 2 had substantial to near-perfect agreement when they reviewed the same information after the 90 day wash out period. Kappa statistics were in the substantial to near-perfect range, 0.70-0.87, and percent agreements from 89-99%.

Overall Assessment of TECS

Overall, TECS has good sensitivity and excellent specificity when compared to a FTF eye exam. Given that the trial was powered for glaucoma/glaucoma suspect, readers were ~~75~~47%-~~72~~87% sensitive when compared to the FTF provider in detecting cases of glaucoma/glaucoma suspect. These glaucoma detection percentages make TECS useful as a screening tool since it allows for ~~more than~~up to three quarters of asymptomatic patients to be identified and is used in a population that might not otherwise receive care and therefore go undiagnosed. ~~Limitations in sensitivity, however, suggest that patients should still receive FTF exams at some interval, supporting the TECS protocol which does not permit patients to continue telemedicine screening indefinitely.~~

The high specificity of TECS indicates that when the readers don't find a problem, there is a high chance of ~~a true abnormality being present~~the patient being truly free of abnormalities. Limitations in sensitivity, however, suggest that patients should still receive FTF exams at some interval, supporting the TECS protocol which does not permit patients to continue telemedicine screening indefinitely. The~~refore, this~~ data also emphasize~~s~~ the importance of ensuring screened patients receive follow up care~~. It also~~ and stress~~ses~~ the importance of an Eye Clinic utilizing telemedicine to appropriately plan resources to accommodate follow up patients.[25] Moreover, the high kappa and percent agreement for inter- and intra-reader variability supports

the premise that the TECS protocol promotes equal quality of care across sites, concordance between different readers, and consistency of reads over time. Finally, the TECS data shows similar kappa values, percent agreements, sensitivity and specificity as other published trials such as Sperduto[26] and Conlin[14], confirming their findings and conclusions that a "Technology Assisted Exam" like TECS, is comparable to a FTF exam for detection of cataract, glaucoma, DR, and AMD.

There were several limitations to our study. The sample size, while adequately powered for glaucoma suspect/glaucoma, did not have a high enough number of cases of the other disease entities such as AMD. This may help explain why, despite a high percent agreement, the kappa values were lower and sensitivity/specificity are more difficult to calculate reliably. In addition, the Veteran population is quite different from the greater US population[4], possibly limiting generalizability. Recruitment strategies (patients self-volunteered for the study) may have introduced selection bias. The potential to receive free additional imaging studies may have prompted sicker patients to volunteer at higher rates compared to healthy counterparts. Finally, the study was based upon the presumption that the FTF exam is 100% accurate, 100% consistent, and represents a standardized modality for the diagnosis of all diseases of interest. Having only one FTF examiner may have introduced bias related to individual practice patterns and skill level. Calculations might change if differences between the 2 readers and the FTF physician were adjudicated in order to arrive at the "truth" and both the FTF examiner and the reader were compared to the "truth". Results may also change if both TECS and the FTF examiner are compared to the patient's actual clinical outcome. Specifically, for glaucoma/glaucoma suspect, the trial data compares the initial TECS exam to the initial FTF exam, but the FTF exam may eventually reveal false positives (overcalls) where patients are found not to have glaucoma (physiologic cupping) after ancillary testing is completed.

Future studies can address some of the above issues. Adding multiple FTF examiners and adjudicating their diagnoses may reduce variation and help form a more reliable 'gold

standard'. Having the study data read by more readers, including a glaucoma or retina specialist, may change the kappa or sensitivity/specificity, especially for the glaucoma or AMD/DR diagnostic group. Finally, comparing TECS and FTF to the long term clinical outcome may allow for better assessment of the performance of TECS for the diagnosis of glaucoma/glaucoma suspect.

In summary, part I of the TECS Compare trial demonstrated high percent agreements, substantial kappa agreement, and sensitivity and specificity equal or potentially better than previously published literature for the detection of common ocular disease. The inclusion of additional, sophisticated ophthalmic testing such as ocular coherence tomography (OCT), visual fields, or contrast sensitivity may improve diagnostic agreement and sensitivity, especially for AMD or glaucoma/glaucoma suspect, and will be analyzed in part II of this trial. The current TECS protocol is accurate when compared to a FTF exam, especially with regard to glaucoma/glaucoma suspect, and allows for correct identification of abnormal patients with high precision and reliability. TECS can serve as a beneficial tool to help address the growing need for accessible eye care in the VA healthcare system and potentially in the private sector.

Acknowledgements

This work was supported partially by funding from the Atlanta Clinical and Translational Institute (ACTSI grant). This project also would not have been possible without the support of the Atlanta VA Ophthalmology Chief, Dr. Steven Urken, the Atlanta VA Eye Clinic staff, the reading physicians, the medical students, and the ophthalmic technicians. A special thanks to the project's Research Coordinator, Deirdre Dixon, whose hard work and commitment to the project were truly invaluable to the study's success.

References:

1. Nathoo N, Ng M, Rudnisky CJ, Tennant MT. The prevalence of diabetic retinopathy as identified by teleophthalmology in rural Alberta. *Can J Ophthalmol.* 2010;45(1):28-32.
2. Ng M, Nathoo N, Rudnisky CJ, Tennant MT. Improving access to eye care: teleophthalmology in Alberta, Canada. *J Diabetes Sci Technol.* 2009;3(2):289-296.
3. Boucher MC, Desroches G, Garcia-Salinas R, et al. Teleophthalmology screening for diabetic retinopathy through mobile imaging units within Canada. *Can J Ophthalmol.* 2008;43(6):658-668.
4. Ong HS, Levin S, Vafidis G. Glaucoma detection using optic disc images from the English national screening programme for diabetic retinopathy. *J Glaucoma.* 2013;22(6):496-500.
5. Paul PG, Raman R, Rani PK, Deshmukh H, Sharma T. Patient satisfaction levels during teleophthalmology consultation in rural South India. *Telemed J E Health.* 2006;12(5):571-578.
6. Rosengren D, Blackwell N, Kelly G, Lenton L, Glastonbury J. The use of telemedicine to treat ophthalmological emergencies in rural Australia. *J Telemed Telecare.* 1998;4 Suppl 1:97-99.
7. Knoblauch H. Focused Ethnography. *Qualitative Social Research, 6(3) Article 44* 2005.
8. Maa AY, Evans C, DeLaune WR, Patel PS, Lynch MG. A novel tele-eye protocol for ocular disease detection and access to eye care services. *Telemed J E Health.* 2014;20(4):318-323.
9. Maa AY, Patel S, Chasan JE, Delaune W, Lynch MG. Retrospective Evaluation of a Teleretinal Screening Program in Detecting Multiple Nondiabetic Eye Diseases. *Telemed J E Health.* 2016.
10. Cavallerano AA, Conlin PR. Teleretinal imaging to screen for diabetic retinopathy in the Veterans Health Administration. *J Diabetes Sci Technol.* 2008;2(1):33-39.
11. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377-381.
12. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics.* 1977;33(1):159-174.
13. Gupta SC, Sinha SK, Dagar AB. Evaluation of the effectiveness of diagnostic & management decision by teleophthalmology using indigenous equipment in comparison with in-clinic assessment of patients. *Indian J Med Res.* 2013;138(4):531-535.
14. Conlin PR, Asefzadeh B, Pasquale LR, Selvin G, Lamkin R, Cavallerano AA. Accuracy of a technology-assisted eye exam in evaluation of referable diabetic retinopathy and concomitant ocular diseases. *The British journal of ophthalmology.* 2015;99(12):1622-1627.
15. Pirbhai A, Sheidow T, Hooper P. Prospective evaluation of digital non-stereo color fundus photography as a screening tool in age-related macular degeneration. *American journal of ophthalmology.* 2005;139(3):455-461.
16. Duchin KS, Asefzadeh B, Poulaki V, Rett D, Marescalchi P, Cavallerano A. Teleretinal imaging for detection of referable macular degeneration. *Optom Vis Sci.* 2015;92(6):714-718.
17. Kerr D, Cavan DA, Jennings B, Dunnington C, Gold D, Crick M. Beyond retinal screening: digital imaging in the assessment and follow-up of patients with diabetic retinopathy. *Diabet Med.* 1998;15(10):878-882.
18. Cavallerano AA, Cavallerano JD, Katalinic P, et al. Use of Joslin Vision Network digital-video nonmydriatic retinal imaging to assess diabetic retinopathy in a clinical program. *Retina (Philadelphia, Pa).* 2003;23(2):215-223.
19. Gomez-Ulla F, Fernandez MI, Gonzalez F, et al. Digital retinal images and teleophthalmology for detecting and grading diabetic retinopathy. *Diabetes Care.* 2002;25(8):1384-1389.

20. Thomas SM, Jeyaraman MM, Hodge WG, Hutnik C, Costella J, Malvankar-Mehta MS. The effectiveness of teleglaucoma versus in-patient examination for glaucoma screening: a systematic review and meta-analysis. *PloS one*. 2014;9(12):e113779.
21. Breusegem C, Fieuws S, Stalmans I, Zeyen T. Agreement and accuracy of non-expert ophthalmologists in assessing glaucomatous changes in serial stereo optic disc photographs. *Ophthalmology*. 2011;118(4):742-746.
22. Varma R, Steinmann WC, Scott IU. Expert agreement in evaluating the optic disc for glaucoma. *Ophthalmology*. 1992;99(2):215-221.
23. Nicolela MT, Drance SM, Broadway DC, Chauhan BC, McCormick TA, LeBlanc RP. Agreement among clinicians in the recognition of patterns of optic disk damage in glaucoma. *Am J Ophthalmol*. 2001;132(6):836-844.
24. Abrams LS, Scott IU, Spaeth GL, Quigley HA, Varma R. Agreement among optometrists, ophthalmologists, and residents in evaluating the optic disc for glaucoma. *Ophthalmology*. 1994;101(10):1662-1667.
25. Chasan JE, Delaune B, Maa AY, Lynch MG. Effect of a teleretinal screening program on eye care use and resources. *JAMA Ophthalmol*. 2014;132(9):1045-1051.
26. Sperduto RD, Hiller R, Podgor MJ, Palmberg P, Ferris FL, 3rd, Wentworth D. Comparability of ophthalmic diagnoses by clinical and Reading Center examiners in the Visual Acuity Impairment Survey Pilot Study. *American journal of epidemiology*. 1986;124(6):994-1003.

Precis:

The Technology-based Eye Care Services (TECS) protocol is comparable to an in-person exam in terms of diagnostic accuracy and is one valid ophthalmologic telemedicine tool to provide access to eye care for patients.

Title: Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

Authors and Affiliations:

April Y Maa, MD*[1,2]; Charles M. Medert, MD[3], MD; Xiaoqin Lu, MD[1,2] ; Rabeea Janjua, MD[1]; Ashley V. Howell, MPH[4]; Kelly J Hunt, PhD[4]; Sarah McCord, MD[5]; Annette Giangiacomo, MD[1], Mary G Lynch, MD[2,6].

*Corresponding author

1 TECS Division, Regional Telehealth Services, VISN 7, Atlanta Veteran Affairs Health Care System, Atlanta GA
2 Emory University School of Medicine, Atlanta GA
3 Bascom Palmer Eye Institute, University of Miami, Miami FL
4 Charleston Health Equity and Rural Outreach Innovation Center (HEROIC), Ralph A. Johnson Department of Veterans Affairs Medical Center, Charleston SC
5 New York Eye and Ear Infirmary, New York NY
6 Ophthalmology Division, Surgical Services, Atlanta Veteran Affairs Health Care System, Atlanta GA

Meeting Presentation: None.

Financial Support: This research was partially funded by Atlanta Clinical and Translational Institute (ACTSI) Translational Research grant. The funding source had no role in the design or conduct of this study.

Conflict of Interest: None for any authors.

Running Head (Short title): Diagnostic Accuracy of the TECS Protocol

Corresponding Author:

April Maa, MD

1670 Clairmont Road MC 112E

Decatur GA 30033

amaa@emory.edu

404-321-6111 x 1-207945

Abstract:

Purpose

Ophthalmologic telemedicine has the ability to provide eye care for patients remotely and many countries have utilized screening tele-ophthalmology programs for several years. One such initiative at the Veteran Affairs' (VA) Healthcare System is Technology-based Eye Care Services (TECS). TECS services are located in primary care clinics and provide basic eye care including vision, refraction, and retinal photography. Eye care providers ("readers") review the clinical data and recommend appropriate follow-up. One of the most common referrals from TECS has been for glaucoma and this study was powered for glaucoma/glaucoma suspect detection. The current study was undertaken to identify aspects of the protocol that could be refined to enhance accuracy.

Design

Prospective comparison between the standard TECS protocol versus a Face-To-Face (FTF) exam on 256 patients, all of whom had no known history of significant ocular disease.

Participants

Patients with no known ocular disease who were scheduled for an in-person eye appointment at the Atlanta VA.

Intervention

Patients underwent screening through the TECS protocol and also received a FTF exam on the same day ("gold standard"). The TECS readers were masked to the results of the FTF exam.

Main Outcome Measures

Percent agreement, kappa, sensitivity, and specificity were calculated for the TECS readers' interpretations versus the FTF exam.

Results

TECS readers showed substantial agreement for cataract ($\kappa \geq 0.71$), diabetic retinopathy ($\kappa \geq 0.61$), and moderate to substantial agreement for glaucoma/glaucoma suspect ($\kappa \geq 0.52$)

compared to a FTF exam. Age-related macular degeneration (AMD) showed moderate agreement (κ ≥0.34). Percent agreement with the TECS protocol was high (84.3 to 98.4%) for each of the disease categories. Overall sensitivity and specificity was ≥75% and ≥55%, respectively, for any diagnosis resulting in referral. Inter-and intra-reader agreement was substantial for most diagnoses (κ>0.61) with percent agreements ranging from 66% to 99%.

Conclusions

Our results indicate that the standard TECS protocol is accurate when compared to a FTF exam for the detection of common eye diseases. The inclusion of additional testing such as optical coherence tomography could further enhance diagnostic capability.

Telemedicine is defined as care given to patients when the provider and the patient are separated by distance, time, or both. Ophthalmology is an ideal specialty for telemedicine as diagnoses made during face-to-face (FTF) visits are often based upon pattern recognition and the use of multiple imaging modalities. Images and clinical information such as vision and eye pressure can be collected remotely and then transmitted electronically to a physician stationed at another location for interpretation. This form of telemedicine is called 'store and forward' or 'asynchronous', and one of the most common uses of store and forward ophthalmologic telemedicine is diabetic teleretinal imaging (TRI). Teleretinal screening for diabetes is utilized worldwide to reduce blindness from diabetic retinopathy (DR).[1-3] Diabetic TRI is well validated, and many studies have illustrated that other common ocular diseases such as glaucoma, cataract, and age-related macular degeneration (AMD) can also be incidentally detected with these photographs.[2-6] This knowledge has led to the expansion of various tele-ophthalmology programs to use fundus photos to screen for other common eye conditions.

The Veterans Health Administration (VA) has a particular interest in novel telemedicine interventions because VA is one of the largest integrated healthcare systems in the United States with more than 5.5 million patients[7], many of whom live in rural communities. The VA has long been at the forefront of using telemedicine tools to decrease health disparities of the medically underserved because barriers to telemedicine such as reimbursement and licensure are mitigated in a single integrated healthcare system. Since 2006, the VA has utilized a national diabetic TRI program to screen for DR. In 2015, the Atlanta VA developed Technology-based Eye Care Services (TECS), an extension of the TRI program that provides broader eye screening and eyeglasses to all eligible Veterans regardless of diabetic status. The most common referral from TECS has been for glaucoma suspect or frank glaucoma.[8,9] The current study was undertaken to further investigate the TECS protocol and to identify aspects of the process that could be further refined to enhance accuracy.

Methods:

This project was approved by the Emory University Institutional Review Board (IRB) and the VA Research and Development Committee. This project conformed to the tenets in the Declaration of Helsinki and was HIPAA compliant. The study was registered at clinicaltrials.gov under the identifier NCT02558712. This research was partially funded by the Atlanta Clinical and Translational Science Institute (ACTSI), however, no conflict of interest exists for any of the authors.

Participants were recruited over a two-year period, from March 2015 until December 2017. Power calculations were based on the expected prevalence of glaucoma suspect/glaucoma in the Veteran population. The trial was powered for glaucoma detection because this is a common disease that is asymptomatic in its earliest stages and also presents the greatest challenge for obtaining consensus because the disease is not diagnosed based on visual criteria alone (unlike AMD or DR).[8] A sample size of 250 produces a two-sided 95% confidence interval with widths equal to 0.127, 0.117 and 0.078 for kappa statistics of 0.5, 0.7, and 0.9, respectively.

The Atlanta VA Eye Clinic offers routine appointments in the “New Comprehensive Clinic” (NCC) for patients who have not had an exam for 2 or more years. These patients have no known ocular disease and are presenting for a baseline assessment. Recruitment letters were mailed to patients who were already scheduled into NCC informing them of the study, and patients self-selected to participate in the trial. Once patients agreed to participate, their Computerized Patient Record System (CPRS) chart was reviewed to confirm that there was no known history of macular degeneration (AMD), glaucoma, visually significant cataract, moderate-to-severe diabetic retinopathy (DR), or macular edema. Patients with “glaucoma suspect” history were excluded if they had documented visual field changes or history of therapy. On the day of their NCC visit, informed consent was obtained from eligible participants and a full TECS screening protocol was initiated. The TECS protocol included a detailed chief

complaint, ocular, medical, social, and family history. Distance vision with present correction (if available) was assessed using a Marco ARK-1S auto-refractor in both eyes. The auto-refractor was utilized to obtain an auto-refraction, and the vision re-assessed through the Marco unit with the auto-refraction in place. Then the patient was brought to a standard eye lane, and manifest refraction with a phoropter was performed using the auto-refractor's prescription as a starting point. Distance and near 'best corrected' spectacle visual acuity was recorded. Pupils, intraocular pressure (iCare tonometer), central corneal thickness (Accutome Pachpen), and anterior chamber depth (utilizing Finhoff transilluminator) were measured. The patient's eyes were dilated using 1% Tropicamide drops. Once dilated, a Canon CX-1 camera was used to collect for each eye one external and three non-stereoscopic, 45 degree field, color fundus photographs according to the VA diabetic teleretinal protocol[10] (Figure 1, supplemental). Finally, the patient received a FTF exam by a comprehensive ophthalmologist (AYM). The FTF examiner would indicate whether the patient needed a follow up visit to the Eye Clinic for further testing or initiate treatment. At the end of each patient's visit, the FTF physician completed a standardized reporting form specifically detailing whether there was a surgical cataract (defined as best corrected vision worse than 20/40, or glare vision worse than 20/40), glaucoma suspect/glaucoma, AMD, or DR if the patient was diabetic.

Study patients were assigned a code by research staff. Each patient's history, clinical data, and ocular photographs were de-identified and placed into a secure research database (REDCap).[11] The de-identified information was transmitted to two Ophthalmologists (Reader 1 = RJ, Reader 2 = XAL) who individually reviewed the information and provided interpretations in accordance with established TECS reading guidelines.[8] Neither reader knew the patient's true identity, they had never met the patient in-person, nor did they have access to the patient's CPRS medical chart. Readers were also masked to the examining physician's findings and to each other's interpretations. The Reading physicians interpreted the TECS information and documented their findings on a REDCap case report form that was identical to the FTF

physician's form. Three months after completion of enrollment, each reader had 150 patients randomly selected for a second read. Studies were re-read by the original reader. On the second interpretation Readers were masked to their initial read and repeated the same procedure above and re-documented their findings on REDCap case report forms.

Data were analyzed using SAS statistical software (Cary, NC). Five diagnostic categories were created: surgical cataracts, glaucoma suspect/glaucoma, AMD, DR, and any condition requiring referral. Each diagnosis category was recorded as present or not present. We measured concordance between diagnoses obtained from the TECS protocol with those obtained from FTF visits using percent agreement and Cohen's kappa statistics. The screening performance of the TECS protocol was assessed with sensitivity and specificity measures, using the FTF visits as the 'gold standard'. We also calculated percent agreement and kappa statistics to compare diagnostic classifications performed by the two readers (inter-reader agreement) and for the same reader 90 days apart (intra-reader agreement). All statistical tests were two-sided and considered significant at an alpha 0.05 level.

Results:

A total of 256 patients were recruited in the 2-year period. Table 1 illustrates the demographics of the study population. Most patients enrolled in the study were male (86.7%) and African American (61.3%). A quarter of the subjects had a history of eye trauma or a family history of significant eye diagnoses or blindness.

Table 2 indicates the percent agreement, kappa statistics, sensitivity, and specificity of the TECS protocol between the 2 readers and the FTF exam. According to the FTF provider, the prevalence of surgical cataracts in our study population was 3.9%, glaucoma suspect/glaucoma was 26.6%, AMD was 2.3%, DR was 3.1%, and the presence of any condition resulting in referral was 43.8%. Using the TECS protocol, readers diagnosed more patients with cataracts (6.3% and 5.9% for Reader 1 and Reader 2, respectively) and any

condition requiring referral (48.1% and 59.0% for Reader 1 and Reader 2, respectively) compared to the FTF physician, and diagnosed fewer patients with glaucoma (25.4% and 14.5% for Reader 1 and Reader 2, respectively). Percent agreement between the diagnostic classifications obtained from FTF visits and the TECS protocol ranged from 68.4% to 98.4%, with the lowest level of agreement observed in the compound variable, 'any diagnosis resulting in referral' (75.4% and 68.4% for Reader 1 and Reader 2, respectively). Diagnostic concordance with the FTF visits was higher for Reader 1 than for Reader 2, with kappa statistics between 0.51 and 0.77 for Reader 1 and between 0.34 and 0.71 for Reader 2. Specificity for the TECS protocol was generally high. Specificity measures for cataracts, glaucoma, macular degeneration and diabetic retinopathy fell between 0.91 and 0.99 for both readers, whereas specificity estimates for any diagnosis resulting in referral were 0.74 and 0.58 for Reader 1 and Reader 2, respectively. Sensitivity estimates exhibited more variation with values ranging from 0.50 to 1.00 for Reader 1 and 0.47 to 0.90 for Reader 2.

Tables 3 and 4 illustrate inter-reader and intra-reader variability, respectively. Inter-reader agreement was highest for cataracts ($\kappa = 0.83$), followed by glaucoma ($\kappa = 0.62$), DR ($\kappa = 0.61$), and AMD ($\kappa = 0.46$). The readers differed most often in their categorization of 'any diagnosis resulting in referral' ($\kappa = 0.33$). Reader 1 diagnosed more patients with glaucoma than Reader 2, while Reader 2 was more likely to diagnose patients with AMD compared to Reader 1. According to the intra-reader agreement calculations, Reader 2's diagnostic classifications were slightly more consistent over time. Kappa statistics for diagnoses made 90 days apart ranged from 0.59 to 0.87 for Reader 2 and 0.39 to 0.70 for Reader 1. Notably, Reader 1 diagnosed one patient with AMD at the initial TECS assessment and zero patients at the 90-day TECS assessment, so we were unable to calculate the kappa statistic for this category for Reader 1.

Discussion:

The results demonstrate that the TECS protocol had high percent agreement with moderate to substantial kappa values when compared to a FTF exam for the 4 most common causes of visual loss in the Veteran population.

For the purposes of this analysis, we used the definition of kappa in Landis and Koch: κ=0.0-0.20 none to slight agreement, κ=0.21-0.40 fair agreement, κ=0.41-0.60 moderate agreement, κ=0.61-0.80 substantial agreement, and κ>0.80 near perfect agreement.[12] Table 5 is a summary table that reports the results from the TECS trial alongside other published literature. Values that are missing indicate the authors did not publish that calculation.

Cataract

There are very few studies in the literature that directly compare photographs to a FTF exam for the diagnosis of cataract. Our study results for sensitivity and kappa are consistent with both Gupta[13] and Conlin.[14] The TECS protocol actually had better specificity than Gupta in the diagnosis of cataract.

Macular Degeneration

While there was very high percent agreement with the FTF exam, the lowest kappa overall in the study for both Reader 1 and 2 were for AMD. Our results are difficult to interpret because there is low prevalence of AMD in our specific Veteran population, thereby a low number of AMD cases in the study, resulting in imprecise estimates of sensitivity, specificity, and kappa. Nevertheless, TECS results were similar to three other studies comparing photos to a FTF exam for AMD (Table 5).[14-16]

Diabetic Retinopathy

Several studies have compared fundus images for DR detection with a retinal examination. The TECS kappa was similar to studies comparing a retinal examination to

photographs (Conlin[14] and Kerr et al[17]) with TECS having a better percent agreement than Cavallerano[18] and Gomez-Ulla.[19] One reason for the differences in the reported data might be study design or DR classification scheme. For example, Cavallerano et al performed a FTF exam about 30 days post imaging and Gomez-Ulla used a modified Airlie House classification whereas TECS uses early treatment diabetic retinopathy study (ETDRS) classification.

Glaucoma/Glaucoma Suspect

The TECS trial was powered for glaucoma and glaucoma suspect detection. Glaucoma is one of the most difficult disease entities to consistently diagnose because multiple factors are considered when making the diagnosis. Not surprisingly then, kappa values for TECS readers were slightly lower for glaucoma (compared to cataract or DR) but still reflected moderate to substantial agreement with the FTF exam. Furthermore, TECS had a higher percent agreement than Gupta[13], kappa was similar to 3 other studies, and Reader 1's estimates were comparable to the Thomas et al[20] large meta-analysis with regard to tele-glaucoma sensitivity and specificity.

Intra and Inter-observer Variability of TECS

The data demonstrates that the TECS protocol allowed for substantial to near-perfect agreement between Reader 1 and 2, with κ of 0.61 (DR and glaucoma) to 0.83 (cataract). The only value that was slightly lower was AMD at 0.46 and the κ is less reliable because of the very low number of cases. In addition, the percent agreement was very high, ranging from 87-98% between the readers. Most importantly, inter-observer agreement for glaucoma/glaucoma suspect was substantial (0.62) and percent agreement was high (>80%). These results are consistent with previously published literature for glaucoma suspect/glaucoma (0.50 to 0.68)[21-24]; TECS was even on par with inter-reader data obtained between glaucoma specialists.[22]

Intra-reader variability was minimal as both Reader 1 and Reader 2 had substantial to near-perfect agreement when they reviewed the same information after the 90 day wash out period. Kappa statistics were in the substantial to near-perfect range, 0.70-0.87, and percent agreements from 89-99%.

Overall Assessment of TECS

Overall, TECS has good sensitivity and excellent specificity when compared to a FTF eye exam. Given that the trial was powered for glaucoma/glaucoma suspect, readers were 47%-72% sensitive when compared to the FTF provider in detecting cases of glaucoma/glaucoma suspect. These glaucoma detection percentages make TECS useful as a screening tool since it allows for up to three quarters of asymptomatic patients to be identified and is used in a population that might not otherwise receive care and therefore go undiagnosed.

The high specificity of TECS indicates that when the readers don't find a problem, there is a high chance of the patient being truly free of abnormalities. Limitations in sensitivity, however, suggest that patients should still receive FTF exams at some interval, supporting the TECS protocol which does not permit patients to continue telemedicine screening indefinitely. These data also emphasize the importance of ensuring screened patients receive follow up care and stress the importance of an Eye Clinic utilizing telemedicine to appropriately plan resources to accommodate follow up patients.[25] Moreover, the high kappa and percent agreement for inter- and intra-reader variability supports the premise that the TECS protocol promotes equal quality of care across sites, concordance between different readers, and consistency of reads over time. Finally, the TECS data shows similar kappa values, percent agreements, sensitivity and specificity as other published trials such as Sperduto[26] and Conlin[14], confirming their findings and conclusions that a "Technology Assisted Exam" like TECS, is comparable to a FTF exam for detection of cataract, glaucoma, DR, and AMD.

There were several limitations to our study. The sample size, while adequately powered for glaucoma suspect/glaucoma, did not have a high enough number of cases of the other disease entities such as AMD. This may help explain why, despite a high percent agreement, the kappa values were lower and sensitivity/specificity are more difficult to calculate reliably. In addition, the Veteran population is quite different from the greater US population[4], possibly limiting generalizability. Recruitment strategies (patients self-volunteered for the study) may have introduced selection bias. The potential to receive free additional imaging studies may have prompted sicker patients to volunteer at higher rates compared to healthy counterparts. Finally, the study was based upon the presumption that the FTF exam is 100% accurate, 100% consistent, and represents a standardized modality for the diagnosis of all diseases of interest. Having only one FTF examiner may have introduced bias related to individual practice patterns and skill level. Calculations might change if differences between the 2 readers and the FTF physician were adjudicated in order to arrive at the "truth" and both the FTF examiner and the reader were compared to the "truth". Results may also change if both TECS and the FTF examiner are compared to the patient's actual clinical outcome. Specifically, for glaucoma/glaucoma suspect, the trial data compares the initial TECS exam to the initial FTF exam, but the FTF exam may eventually reveal false positives (overcalls) where patients are found not to have glaucoma (physiologic cupping) after ancillary testing is completed.

Future studies can address some of the above issues. Adding multiple FTF examiners and adjudicating their diagnoses may reduce variation and help form a more reliable 'gold standard'. Having the study data read by more readers, including a glaucoma or retina specialist, may change the kappa or sensitivity/specificity, especially for the glaucoma or AMD/DR diagnostic group. Finally, comparing TECS and FTF to the long term clinical outcome may allow for better assessment of the performance of TECS for the diagnosis of glaucoma/glaucoma suspect.

In summary, part I of the TECS Compare trial demonstrated high percent agreements, substantial kappa agreement, and sensitivity and specificity equal or potentially better than previously published literature for the detection of common ocular disease. The inclusion of additional, sophisticated ophthalmic testing such as ocular coherence tomography (OCT), visual fields, or contrast sensitivity may improve diagnostic agreement and sensitivity, especially for AMD or glaucoma/glaucoma suspect, and will be analyzed in part II of this trial. The current TECS protocol is accurate when compared to a FTF exam, especially with regard to glaucoma/glaucoma suspect, and allows for correct identification of abnormal patients with high precision and reliability. TECS can serve as a beneficial tool to help address the growing need for accessible eye care in the VA healthcare system and potentially in the private sector.

Acknowledgements

This work was supported partially by funding from the Atlanta Clinical and Translational Institute (ACTSI grant). This project also would not have been possible without the support of the Atlanta VA Ophthalmology Chief, Dr. Steven Urken, the Atlanta VA Eye Clinic staff, the reading physicians, the medical students, and the ophthalmic technicians. A special thanks to the project's Research Coordinator, Deirdre Dixon, whose hard work and commitment to the project were truly invaluable to the study's success.

References:

1. Nathoo N, Ng M, Rudnisky CJ, Tennant MT. The prevalence of diabetic retinopathy as identified by teleophthalmology in rural Alberta. *Can J Ophthalmol.* 2010;45(1):28-32.
2. Ng M, Nathoo N, Rudnisky CJ, Tennant MT. Improving access to eye care: teleophthalmology in Alberta, Canada. *J Diabetes Sci Technol.* 2009;3(2):289-296.
3. Boucher MC, Desroches G, Garcia-Salinas R, et al. Teleophthalmology screening for diabetic retinopathy through mobile imaging units within Canada. *Can J Ophthalmol.* 2008;43(6):658-668.
4. Ong HS, Levin S, Vafidis G. Glaucoma detection using optic disc images from the English national screening programme for diabetic retinopathy. *J Glaucoma.* 2013;22(6):496-500.
5. Paul PG, Raman R, Rani PK, Deshmukh H, Sharma T. Patient satisfaction levels during teleophthalmology consultation in rural South India. *Telemed J E Health.* 2006;12(5):571-578.
6. Rosengren D, Blackwell N, Kelly G, Lenton L, Glastonbury J. The use of telemedicine to treat ophthalmological emergencies in rural Australia. *J Telemed Telecare.* 1998;4 Suppl 1:97-99.
7. Knoblauch H. Focused Ethnography. *Qualitative Social Research, 6(3) Article 44* 2005.
8. Maa AY, Evans C, DeLaune WR, Patel PS, Lynch MG. A novel tele-eye protocol for ocular disease detection and access to eye care services. *Telemed J E Health.* 2014;20(4):318-323.
9. Maa AY, Patel S, Chasan JE, Delaune W, Lynch MG. Retrospective Evaluation of a Teleretinal Screening Program in Detecting Multiple Nondiabetic Eye Diseases. *Telemed J E Health.* 2016.
10. Cavallerano AA, Conlin PR. Teleretinal imaging to screen for diabetic retinopathy in the Veterans Health Administration. *J Diabetes Sci Technol.* 2008;2(1):33-39.
11. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377-381.
12. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics.* 1977;33(1):159-174.
13. Gupta SC, Sinha SK, Dagar AB. Evaluation of the effectiveness of diagnostic & management decision by teleophthalmology using indigenous equipment in comparison with in-clinic assessment of patients. *Indian J Med Res.* 2013;138(4):531-535.
14. Conlin PR, Asefzadeh B, Pasquale LR, Selvin G, Lamkin R, Cavallerano AA. Accuracy of a technology-assisted eye exam in evaluation of referable diabetic retinopathy and concomitant ocular diseases. *The British journal of ophthalmology.* 2015;99(12):1622-1627.
15. Pirbhai A, Sheidow T, Hooper P. Prospective evaluation of digital non-stereo color fundus photography as a screening tool in age-related macular degeneration. *American journal of ophthalmology.* 2005;139(3):455-461.
16. Duchin KS, Asefzadeh B, Poulaki V, Rett D, Marescalchi P, Cavallerano A. Teleretinal imaging for detection of referable macular degeneration. *Optom Vis Sci.* 2015;92(6):714-718.
17. Kerr D, Cavan DA, Jennings B, Dunnington C, Gold D, Crick M. Beyond retinal screening: digital imaging in the assessment and follow-up of patients with diabetic retinopathy. *Diabet Med.* 1998;15(10):878-882.
18. Cavallerano AA, Cavallerano JD, Katalinic P, et al. Use of Joslin Vision Network digital-video nonmydriatic retinal imaging to assess diabetic retinopathy in a clinical program. *Retina (Philadelphia, Pa).* 2003;23(2):215-223.
19. Gomez-Ulla F, Fernandez MI, Gonzalez F, et al. Digital retinal images and teleophthalmology for detecting and grading diabetic retinopathy. *Diabetes Care.* 2002;25(8):1384-1389.

20. Thomas SM, Jeyaraman MM, Hodge WG, Hutnik C, Costella J, Malvankar-Mehta MS. The effectiveness of teleglaucoma versus in-patient examination for glaucoma screening: a systematic review and meta-analysis. *PloS one*. 2014;9(12):e113779.
21. Breusegem C, Fieuws S, Stalmans I, Zeyen T. Agreement and accuracy of non-expert ophthalmologists in assessing glaucomatous changes in serial stereo optic disc photographs. *Ophthalmology*. 2011;118(4):742-746.
22. Varma R, Steinmann WC, Scott IU. Expert agreement in evaluating the optic disc for glaucoma. *Ophthalmology*. 1992;99(2):215-221.
23. Nicolela MT, Drance SM, Broadway DC, Chauhan BC, McCormick TA, LeBlanc RP. Agreement among clinicians in the recognition of patterns of optic disk damage in glaucoma. *Am J Ophthalmol*. 2001;132(6):836-844.
24. Abrams LS, Scott IU, Spaeth GL, Quigley HA, Varma R. Agreement among optometrists, ophthalmologists, and residents in evaluating the optic disc for glaucoma. *Ophthalmology*. 1994;101(10):1662-1667.
25. Chasan JE, Delaune B, Maa AY, Lynch MG. Effect of a teleretinal screening program on eye care use and resources. *JAMA Ophthalmol*. 2014;132(9):1045-1051.
26. Sperduto RD, Hiller R, Podgor MJ, Palmberg P, Ferris FL, 3rd, Wentworth D. Comparability of ophthalmic diagnoses by clinical and Reading Center examiners in the Visual Acuity Impairment Survey Pilot Study. *American journal of epidemiology*. 1986;124(6):994-1003.

Table 1: Characteristics of study participants (N=256)

Participant Characteristics	Statistic
Age, mean ± SD	60.0 ± 11.6
Males, n (%)	222 (86.7)
Race-ethnicity, n (%)	
White	98 (38.3)
Black	157 (61.3)
Asian	1 (0.4)
Eye trauma, n (%)*	69 (27.6)
Family history of eye diagnoses or blindness, n (%)*	63 (25.2)
Smoking history, n (%)*	
Never	100 (41.7)
Former	71 (29.6)
Current	69 (28.8)

*Missing: Eye trauma (n=6); Family eye history (n=6); Smoking history (n=16)

Table 2: Prevalence of ophthalmologic diagnoses among study participants and agreement, sensitivity and specificity for diagnoses obtained from FTF exams compared to those obtained using the TECS protocol (N=256)

Diagnosis	FTF* n (%)	TECS n (%)	Percent Agreement	Kappa (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
	FTF	*Reader 1*	*Reader 1 compared to Face to Face*			
Cataracts referred for surgery	10 (3.9)	16 (6.3)	97.7	0.77 (0.57, 0.94)	1.000.64 (0.69,35, 1.000.86)	1.000.98 (0.9599, 0.9991.00)
Glaucoma and glaucoma suspect	68 (26.6)	65 (25.4)	86.3	0.65 (0.54, 0.75)	0.725 (0.603, 0.825)	0.910 (0.875, 0.954)
Macular degeneration	6 (2.3)	5 (2.0)	98.1	0.54 (0.18, 0.90)	0.5060 (0.125, 0.8895)	0.99 (0.97, 1.00)
Diabetic retinopathy (any)	8 (3.1)	8 (3.1)	98.4	0.74 (0.50, 0.99)	0.75 (0.35, 0.97)	0.99 (0.97, 1.00)
Any diagnosis resulting in referral	112 (43.8)	123 (48.1)	75.4	0.51 (0.40, 0.61)	0.770 (0.681, 0.8478)	0.7481 (0.6673, 0.817)
	FTF	*Reader 2*	*Reader 2 compared to Face to Face*			
Cataracts referred for surgery	10 (3.9)	15 (5.9)	97.3	0.71 (0.50, 0.91)	0.960 (0.5632, 01.00.84)	1.000.98 (0.958, 0.9991.00)
Glaucoma and glaucoma suspect	68 (26.6)	37 (14.5)	84.03	0.52 (0.40, 0.64)	0.4787 (0.3571, 0.6096)	0.9784 (0.9478, 0.9988)
Macular degeneration	6 (2.3)	16 (6.3)	94.5	0.34 (0.08, 0.60)	0.6725 (0.2207, 0.9652)	0.959 (0.927, 0.9981.00)
Diabetic retinopathy (any)	8 (3.1)	8 (3.1)	97.7	0.61 (0.33, 0.90)	0.63 (0.25, 0.92)	0.99 (0.97, 1.00)
Any diagnosis resulting in referral	112 (43.8)	151 (59.0)	68.4	0.38 (0.27, 0.49)	0.8160 (0.7352, 0.8868)	0.5880 (0.5071, 0.6687)

* A single Face to Face (FTF) exam was done with TECS Reader 1 and TECS Reader 2 being compared to the single FTF exam.

Table 2: Prevalence of ophthalmologic diagnoses among study participants and agreement, sensitivity and specificity for diagnoses obtained from FTF exams compared to those obtained using the TECS protocol (N=256)

Diagnosis	**FTF* n (%)**	**TECS n (%)**	**Percent Agreement**	**Kappa (95% CI)**	**Sensitivity (95% CI)**	**Specificity (95% CI)**
	FTF	*Reader 1*	*Reader 1 compared to Face to Face*			
Cataracts referred for surgery	10 (3.9)	16 (6.3)	97.7	0.77 (0.57, 0.94)	1.00 (0.69, 1.00)	0.98 (0.95, 0.99)
Glaucoma and glaucoma suspect	68 (26.6)	65 (25.4)	86.3	0.65 (0.54, 0.75)	0.72 (0.60, 0.82)	0.91 (0.87, 0.95)
Macular degeneration	6 (2.3)	5 (2.0)	98.1	0.54 (0.18, 0.90)	0.50 (0.12, 0.88)	0.99 (0.97, 1.00)
Diabetic retinopathy (any)	8 (3.1)	8 (3.1)	98.4	0.74 (0.50, 0.99)	0.75 (0.35, 0.97)	0.99 (0.97, 1.00)
Any diagnosis resulting in referral	112 (43.8)	123 (48.1)	75.4	0.51 (0.40, 0.61)	0.77 (0.68, 0.84)	0.74 (0.66, 0.81)
	FTF	*Reader 2*	*Reader 2 compared to Face to Face*			
Cataracts referred for surgery	10 (3.9)	15 (5.9)	97.3	0.71 (0.50, 0.91)	0.90 (0.56, 1.00)	0.98 (0.95, 0.99)
Glaucoma and glaucoma suspect	68 (26.6)	37 (14.5)	84.0	0.52 (0.40, 0.64)	0.47 (0.35, 0.60)	0.97 (0.94, 0.99)
Macular degeneration	6 (2.3)	16 (6.3)	94.5	0.34 (0.08, 0.60)	0.67 (0.22, 0.96)	0.95 (0.92, 0.98)
Diabetic retinopathy (any)	8 (3.1)	8 (3.1)	97.7	0.61 (0.33, 0.90)	0.63 (0.25, 0.92)	0.99 (0.97, 1.00)
Any diagnosis resulting in referral	112 (43.8)	151 (59.0)	68.4	0.38 (0.27, 0.49)	0.81 (0.73, 0.88)	0.58 (0.50, 0.66)

* A single Face to Face (FTF) exam was done with TECS Reader 1 and TECS Reader 2 being compared to the single FTF exam.

Table 3: Inter-reader Agreement between Reader 1 versus Reader 2 using the TECS protocol (N=256)

Diagnosis	**Reader 1 n (%)**	**Reader 2 n (%)**	**Percent Agreement**	**Kappa (95% CI)**
Cataracts referred for surgery	16 (6.3)	15 (5.9)	98.1	0.83 (0.68, 0.98)
Glaucoma and glaucoma suspect	65 (25.4)	37 (14.5)	87.5	0.62 (0.50, 0.73)
Macular degeneration	5 (2.0)	16 (6.3)	95.7	0.46 (0.20, 0.72)
Diabetic retinopathy	8 (3.1)	8 (3.1)	97.7	0.61 (0.33, 0.90)
Any diagnosis resulting in referral	123 (48.1)	151 (59.0)	66.4	0.33 (0.22, 0.45)

Table 4: Intra-reader agreement of diagnoses obtained 90 days apart using the TECS protocol (N=150)

Diagnosis	Day 0 TECS n (%)	Day 90 TECS n (%)	Percent Agreement	Kappa (95% CI)
Reader 1				
Cataracts referred for surgery	9 (6.0)	5 (3.3)	97.3	0.70 (0.43, 0.98)
Glaucoma and glaucoma suspect	40 (26.7)	28 (18.7)	89.3	0.70 (0.56, 0.83)
Macular degeneration	1 (0.7)	0 (0.0)	99.3	*
Diabetic retinopathy	4 (2.7)	3 (2.0)	98.0	0.56 (0.12, 1.00)
Any diagnosis resulting in referral	71 (47.3)	58 (38.7)	70.0	0.39 (0.25, 0.54)
Reader 2				
Cataracts referred for surgery	8 (5.3)	8 (5.3)	98.7	0.87 (0.69, 1.00)
Glaucoma and glaucoma suspect	21 (14.0)	34 (22.7)	90.0	0.67 (0.52, 0.82)
Macular degeneration	6 (4.0)	4 (2.7)	97.3	0.59 (0.22, 0.95)
Diabetic retinopathy	3 (2.0)	3 (2.0)	98.7	0.66 (0.22, 1.00)
Any diagnosis resulting in referral	84 (56.0)	89 (59.3)	84.7	0.69 (0.57, 0.80)

**Kappa statistic not calculated because of zero cells*

Table 5: Comparison of TECS Protocol with other Telehealth Studies

Diagnosis	Percent Agreement	Kappa (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Cataract				
TECS (Reader 1 and Reader 2)	97.7 97.3	0.77 (0.57, 0.94) 0.71 (0.50, 0.91)	0.641.00 (0.6935, 1.000.86) 0.9060 (0.5632, 0.841.00)	0.98 (0.95, 0.99)1.00 (0.99, 1.00) 0.98 (0.95, 0.99)1.00 (0.98, 1.00)
Gupta[13]	93.0	0.68	0.98 (0.89, 0.99)	0.63 (0.26, 0.90)
Conlin[14]	99.0	0.71		
Macular Degeneration				
TECS (Reader 1 and Reader 2)	98.1 94.5	0.54 (0.18, 0.90) 0.34 (0.08, 0.60)	0.50 (0.12, 0.88)0.60 (0.15, 0.95) 0.67 (0.22, 0.96)0.25 (0.07, 0.52)	0.99 (0.97, 1.00) 0.95 (0.92, 0.98)0.99 (0.97, 1.00)
Pirbhai[15]	80.0	0.59 (0.49, 0.70)	0.82 (0.72, 0.90)	0.79 (0.71, 0.86)
Duchin[16]			0.84	0.94
Conlin[14]	97.0	0.59	0.67 (0.31, 0.91)	0.98 (0.96, 0.99)
Diabetic Retinopathy				
TECS (Reader 1 and Reader 2)	98.4 97.7	0.74 (0.50, 0.99) 0.61 (0.33, 0.90)	0.75 (0.35, 0.97) 0.63 (0.25, 0.92)	0.99 (0.97, 1.00) 0.99 (0.97, 1.00)
Cavallerano[18]	89.3			
Gomez-Ulla[19]	94.0	0.92 (0.90, 0.95)		
Kerr[17]	82.0-94.0	0.64		
Conlin[14]	97.0	0.68	0.75 (0.42, 0.93)	0.98 (0.96, 0.99)
Glaucoma and glaucoma suspect				
TECS (Reader 1 and Reader 2)	86.3 84.3	0.65 (0.54, 0.75) 0.52 (0.40, 0.64)	0.72 (0.60, 0.82)0.75 (0.63, 0.85)	0.91 (0.87, 0.95)0.90 (0.85, 0.94)

			0.47 (0.35, 0.60)~~0.87 (0.71, 0.96)~~	0.97 (0.94, 0.99)~~0.84 (0.78, 0.88)~~
Thomas[20]			0.83	0.79
Conlin[14]	94.0	0.80	0.83 (0.71, 0.91)	0.96 (0.92, 0.98)
Gupta[13]	67.0	0.52	0.72 (0.57, 0.83)	0.81 (0.47, 0.97)
Any Disease				
TECS (Reader 1 and Reader 2)	75.0 6.4	0.51 (0.40, 0.61) 0.38 (0.27, 0.49)	0.77 (0.68, 0.84) 0.81 (0.73, 0.88)~~0.70 (0.61, 0.78)~~ ~~0.60 (0.52, 0.68)~~	0.74 (0.66, 0.81)~~0.81 (0.73, 0.87)~~ 0.58 (0.50, 0.66)~~0.80 (0.71, 0.87)~~
Sperduto[26]	71.0	0.61 (0.43, 0.78)		
Conlin[14]	84.0	0.67	0.86 (0.77, 0.92)	0.84 (0.78, 0.88)

Table 5: Comparison of TECS Protocol with other Telehealth Studies

Diagnosis	Percent Agreement	Kappa (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Cataract				
TECS (Reader 1 and Reader 2)	97.7 97.3	0.77 (0.57, 0.94) 0.71 (0.50, 0.91)	1.00 (0.69, 1.00) 0.90 (0.56, 1.00)	0.98 (0.95, 0.99) 0.98 (0.95, 0.99)
Gupta[13]	93.0	0.68	0.98 (0.89, 0.99)	0.63 (0.26, 0.90)
Conlin[14]	99.0	0.71		
Macular Degeneration				
TECS (Reader 1 and Reader 2)	98.1 94.5	0.54 (0.18, 0.90) 0.34 (0.08, 0.60)	0.50 (0.12, 0.88) 0.67 (0.22, 0.96)	0.99 (0.97, 1.00) 0.95 (0.92, 0.98)
Pirbhai[15]	80.0	0.59 (0.49, 0.70)	0.82 (0.72, 0.90)	0.79 (0.71, 0.86)
Duchin[16]			0.84	0.94
Conlin[14]	97.0	0.59	0.67 (0.31, 0.91)	0.98 (0.96, 0.99)
Diabetic Retinopathy				
TECS (Reader 1 and Reader 2)	98.4 97.7	0.74 (0.50, 0.99) 0.61 (0.33, 0.90)	0.75 (0.35, 0.97) 0.63 (0.25, 0.92)	0.99 (0.97, 1.00) 0.99 (0.97, 1.00)
Cavallerano[18]	89.3			
Gomez-Ulla[19]	94.0	0.92 (0.90, 0.95)		
Kerr[17]	82.0-94.0	0.64		
Conlin[14]	97.0	0.68	0.75 (0.42, 0.93)	0.98 (0.96, 0.99)
Glaucoma and glaucoma suspect				
TECS (Reader 1 and Reader 2)	86.3 84.3	0.65 (0.54, 0.75) 0.52 (0.40, 0.64)	0.72 (0.60, 0.82) 0.47 (0.35, 0.60)	0.91 (0.87, 0.95) 0.97 (0.94, 0.99)
Thomas[20]			0.83	0.79
Conlin[14]	94.0	0.80	0.83 (0.71, 0.91)	0.96 (0.92, 0.98)
Gupta[13]	67.0	0.52	0.72 (0.57, 0.83)	0.81 (0.47, 0.97)
Any Disease				
TECS (Reader 1 and Reader 2)	75.0 6.4	0.51 (0.40, 0.61) 0.38 (0.27, 0.49)	0.77 (0.68, 0.84) 0.81 (0.73, 0.88)	0.74 (0.66, 0.81) 0.58 (0.50, 0.66)

Sperduto[26]	71.0	0.61 (0.43, 0.78)		
Conlin[14]	84.0	0.67	0.86 (0.77, 0.92)	0.84 (0.78, 0.88)

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

April | Maa | 6/13/2010

4. Are you the corresponding author? ☑ Yes ☐ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS-Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name): ANNETTE
2. Surname (Last Name): GIANGIACOMO
3. Date: 6/14/2019

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS-Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2019-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name): Ashley
2. Surname (Last Name): Howell
3. Date: 6/14/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Xiaogin | Lu | 6/14/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS-Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Mary | Lynch | 6/14/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Sarah | McCord | 6/13/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Charles | Medert | 6/13/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS-Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Kelly | Hunt | 6/21/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS-Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose [illegible] influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

Identifying information.

The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes"

1.

2.

Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

3.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

Intellectual Property.

This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

4.

5.

Entity: government agency, foundation, commercial sponsor, academic institution, etc.
Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.

Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

ICMJE INTERNATIONAL COMMITTEE of MEDICAL JOURNAL EDITORS

SAVE

ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) | 2. Surname (Last Name) | 3. Date

Rabeea | Janjua | 6/28/2010

4. Are you the corresponding author? ☐ Yes ☑ No

5. Manuscript Title

Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I

6. Manuscript Identifying Number (if you know it)

OPHTH-2010-471

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

☐ Yes, the following relationships/conditions/circumstances are present (explain below):

☑ No other relationships/conditions/circumstances that present a potential conflict of interest

ICMJE Form for Disclosure of Potential Conflicts of Interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

Generate Disclosure Statement

Evaluation and Feedback

Please visit http://www.icmje.org/cgi-bin/feedback to provide feedback on your experience with completing this form.

AMERICAN ACADEMY™
OF OPHTHALMOLOGY

Ophthalmology®, *Ophthalmology® Retina*, and *Ophthalmology® Glaucoma*
Author Contributorship Statement

The journal adheres to the Uniform Requirements set by the International Committee of Medical Journal Editors (http://www.icmje.org/) for authorship. To qualify for authorship, authors must make substantial contributions to the intellectual content of the paper in *each of the four* following categories:

1. Substantial contributions to conception and design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

It is the responsibility of the corresponding author, prior to submitting the manuscript, to confirm that each coauthor meets the requirements for authorship. Please list all authors of the manuscript on the Contributorship Statement form below. The form need not be uploaded at the time of original manuscript submission but rather if/when the Editorial Board invites revision.

By submitting this form, the corresponding author acknowledges that each author has read the statement on authorship responsibility and contribution to authorship. In the table below, please designate the contributions of each author. Any relevant contribution not described in the four columns can be added under "Other contributions." Please note that the list of contributions will publish with the manuscript should it be accepted. Thank you.

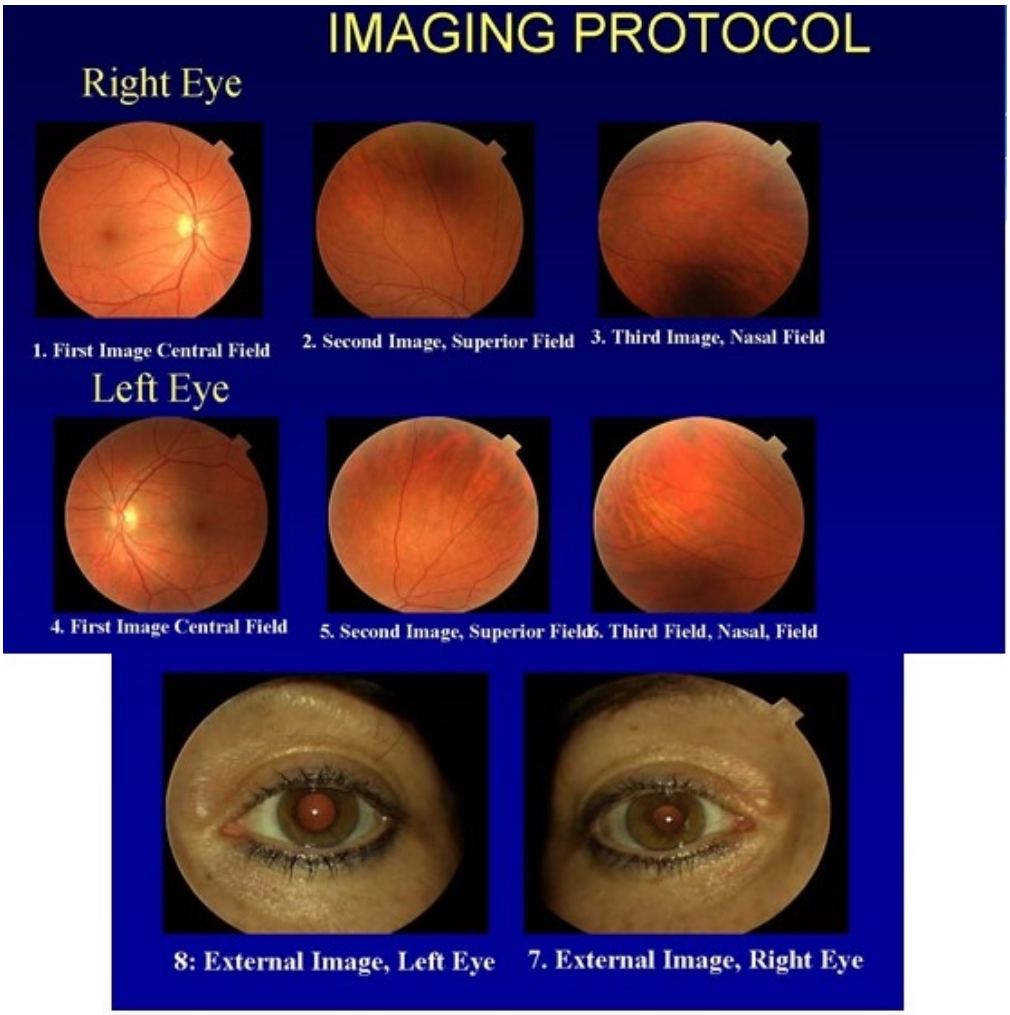
TITLE OF ARTICLE: Diagnostic Accuracy of Technology-based Eye Care Services (TECS): Th

AUTHORS: April Y Maa, MD; Charles M. Medert, MD, Xiaoqin Lu, MD; Rabeea Janjua, M

AUTHOR NAME	RESEARCH DESIGN	DATA ACQUISITION AND/OR RESEARCH EXECUTION	DATA ANALYSIS AND/OR INTERPRETATION	MANUSCRIPT PREPARATION
April Maa	✔	✔	✔	✔
Charles Medert		✔		
Xiaoqin Lu		✔		✔
Rabeea Janja		✔		✔
Ashley Howell			✔	✔
Kelly Hunt	✔		✔	✔
Sarah McCord		✔		
Mary Lynch	✔		✔	✔

OTHER CONTRIBUTIONS: Annette Giangiacomo - manuscript preparation

Figure 1 Supplemental: TECS Imaging protocol.



Cataracts (SAS output pages 5 and 9)

		TECS R1		
		No cataracts	Cataracts	Total
FTF	No cataracts	240	6	246
	Cataracts	0	10	10
	Total	240	16	256

		TECS R2		
		No cataracts	Cataracts	Total
FTF	No cataracts	240	6	246
	Cataracts	1	9	10
	Total	241	15	256

Glaucoma (SAS output pages 13 and 17)

		TECS R1		
		No glaucoma	Glaucoma	Total
FTF	No glaucoma	172	16	188
	Glaucoma	19	49	68
	Total	191	65	256

		TECS R2		
		No glaucoma	Glaucoma	Total
FTF	No glaucoma	183	5	188
	Glaucoma	36	32	68
	Total	219	37	256

Macular degeneration (SAS output pages 21 and 25)

		TECS R1		
		No AMD	AMD	Total
FTF	No AMD	248	2	250
	AMD	3	3	6
	Total	251	5	256

		TECS R2		
		No AMD	AMD	Total
FTF	No AMD	238	12	250
	AMD	2	4	6
	Total	240	16	256

Diabetic retinopathy (SAS output pages 29 and 33)

		TECS R1		
		No DM ret	DM ret	Total
FTF	No DM ret	246	2	248
	DM ret	2	6	8
	Total	248	8	256

		TECS R2		
		No DM ret	DM ret	Total
FTF	No DM ret	245	3	248
	DM ret	3	5	8
	Total	248	8	256

Any diagnosis requiring referral (SAS output pages 37 and 41)

		TECS R1		
		No referral	Referral	Total
FTF	No referral	107	37	144
	Referral	26	86	112
	Total	133	123	256

		TECS R2		
		No referral	Referral	Total
FTF	No referral	84	60	144
	Referral	21	91	112
	Total	105	151	256

DEMOGRAPHICS

The MEANS Procedure

Analysis Variable : age				
N	**Mean**	**Std Dev**	**Minimum**	**Maximum**
256	59.9921875	11.6315973	28.0000000	90.0000000

DEMOGRAPHICS

The FREQ Procedure

gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
female	34	13.28	34	13.28
male	222	86.72	256	100.00

race_ethnicity	Frequency	Percent	Cumulative Frequency	Cumulative Percent
asian	1	0.39	1	0.39
black	157	61.33	158	61.72
white	98	38.28	256	100.00

eyedx_hx	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	96	37.80	96	37.80
1	158	62.20	254	100.00

Frequency Missing = 2

eyetrauma	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	181	72.40	181	72.40
1	69	27.60	250	100.00

Frequency Missing = 6

fam_eyehx	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	187	74.80	187	74.80
1	63	25.20	250	100.00

Frequency Missing = 6

DEMOGRAPHICS

The FREQ Procedure

smoke_hx	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	100	41.67	100	41.67
1	71	29.58	171	71.25
2	69	28.75	240	100.00

Frequency Missing = 16

IN-PERSON VS READER 1 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

FCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	96.09	246	96.09
1	10	3.91	256	100.00

S1ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

FVR1PRE_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

IN-PERSON VS READER 1 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of FCATR by S1ACATR			
FCATR	**S1ACATR**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	240 93.75 97.56 100.00	6 2.34 2.44 37.50	246 96.09
1	0 0.00 0.00 0.00	10 3.91 100.00 62.50	10 3.91
Total	240 93.75	16 6.25	256 100.00

Statistics for Table of FCATR by S1ACATR

McNemar's Test	
Statistic (S)	6.0000
DF	1
Pr > S	0.0143

Simple Kappa Coefficient	
Kappa	0.7576
ASE	0.0949
95% Lower Conf Limit	0.5716
95% Upper Conf Limit	0.9435

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON CATARACT DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	10	100.00	10	100.00

Binomial Proportion for S1ACATR = 1	
Proportion (P)	1.0000
ASE	0.0000
95% Lower Conf Limit	1.0000
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.6915
95% Upper Conf Limit	1.0000

Test of H0: Proportion = 0.5	
ASE under H0	0.1581
Z	3.1623
One-sided Pr > Z	0.0008
Two-sided Pr > |Z|	0.0016
Exact Test	
One-sided Pr >= P	9.766E-04
Two-sided = 2 * One-sided	0.0020

Sample Size = 10

SPECIFICITY FOR READER 1 VS IN-PERSON CATARACT DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	97.56	240	97.56
1	6	2.44	246	100.00

Binomial Proportion for S1ACATR = 0	
Proportion (P)	0.9756
ASE	0.0098
95% Lower Conf Limit	0.9563
95% Upper Conf Limit	0.9949
Exact Conf Limits	
95% Lower Conf Limit	0.9477
95% Upper Conf Limit	0.9910

Test of H0: Proportion = 0.5	
ASE under H0	0.0319
Z	14.9193
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	6.151E-14
Two-sided = 2 * One-sided	1.230E-13

Sample Size = 246

IN-PERSON VS READER 2 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

FCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	96.09	246	96.09
1	10	3.91	256	100.00

S2ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	241	94.14	241	94.14
1	15	5.86	256	100.00

FVR2PRE_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7	2.73	7	2.73
1	249	97.27	256	100.00

IN-PERSON VS READER 2 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of FCATR by S2ACATR			
FCATR	**S2ACATR**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	240 93.75 97.56 99.59	6 2.34 2.44 40.00	246 96.09
1	1 0.39 10.00 0.41	9 3.52 90.00 60.00	10 3.91
Total	241 94.14	15 5.86	256 100.00

Statistics for Table of FCATR by S2ACATR

McNemar's Test	
Statistic (S)	3.5714
DF	1
Pr > S	0.0588

Simple Kappa Coefficient	
Kappa	0.7062
ASE	0.1051
95% Lower Conf Limit	0.5003
95% Upper Conf Limit	0.9122

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON CATARACT DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	10.00	1	10.00
1	9	90.00	10	100.00

Binomial Proportion for S2ACATR = 1	
Proportion (P)	0.9000
ASE	0.0949
95% Lower Conf Limit	0.7141
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.5550
95% Upper Conf Limit	0.9975

Test of H0: Proportion = 0.5	
ASE under H0	0.1581
Z	2.5298
One-sided Pr > Z	0.0057
Two-sided Pr > |Z|	0.0114
Exact Test	
One-sided Pr >= P	0.0107
Two-sided = 2 * One-sided	0.0215

Sample Size = 10

SPECIFICITY FOR READER 2 VS IN-PERSON CATARACT DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	97.56	240	97.56
1	6	2.44	246	100.00

Binomial Proportion for S2ACATR = 0	
Proportion (P)	0.9756
ASE	0.0098
95% Lower Conf Limit	0.9563
95% Upper Conf Limit	0.9949
Exact Conf Limits	
95% Lower Conf Limit	0.9477
95% Upper Conf Limit	0.9910

Test of H0: Proportion = 0.5	
ASE under H0	0.0319
Z	14.9193
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	6.151E-14
Two-sided = 2 * One-sided	1.230E-13

Sample Size = 246

IN-PERSON VS READER 1 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

FGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	188	73.44	188	73.44
1	68	26.56	256	100.00

S1AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	191	74.61	191	74.61
1	65	25.39	256	100.00

FVR1PRE_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	35	13.67	35	13.67
1	221	86.33	256	100.00

IN-PERSON VS READER 1 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of FGLAU by S1AGLAU			
FGLAU	**S1AGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	172 67.19 91.49 90.05	16 6.25 8.51 24.62	188 73.44
1	19 7.42 27.94 9.95	49 19.14 72.06 75.38	68 26.56
Total	191 74.61	65 25.39	256 100.00

Statistics for Table of FGLAU by S1AGLAU

McNemar's Test	
Statistic (S)	0.2571
DF	1
Pr > S	0.6121

Simple Kappa Coefficient	
Kappa	0.6446
ASE	0.0549
95% Lower Conf Limit	0.5370
95% Upper Conf Limit	0.7521

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON GLAUCOMA DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	19	27.94	19	27.94
1	49	72.06	68	100.00

Binomial Proportion for S1AGLAU = 1	
Proportion (P)	0.7206
ASE	0.0544
95% Lower Conf Limit	0.6139
95% Upper Conf Limit	0.8272
Exact Conf Limits	
95% Lower Conf Limit	0.5985
95% Upper Conf Limit	0.8227

Test of H0: Proportion = 0.5	
ASE under H0	0.0606
Z	3.6380
One-sided Pr > Z	0.0001
Two-sided Pr > |Z|	0.0003
Exact Test	
One-sided Pr >= P	1.790E-04
Two-sided = 2 * One-sided	3.580E-04

Sample Size = 68

SPECIFICITY FOR READER 1 VS IN-PERSON GLAUCOMA DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	172	91.49	172	91.49
1	16	8.51	188	100.00

Binomial Proportion for S1AGLAU = 0	
Proportion (P)	0.9149
ASE	0.0204
95% Lower Conf Limit	0.8750
95% Upper Conf Limit	0.9548
Exact Conf Limits	
95% Lower Conf Limit	0.8655
95% Upper Conf Limit	0.9506

Test of H0: Proportion = 0.5	
ASE under H0	0.0365
Z	11.3775
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 188

IN-PERSON VS READER 2 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

FGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	188	73.44	188	73.44
1	68	26.56	256	100.00

S2AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	219	85.55	219	85.55
1	37	14.45	256	100.00

FVR2PRE_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	41	16.02	41	16.02
1	215	83.98	256	100.00

IN-PERSON VS READER 2 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of FGLAU by S2AGLAU			
FGLAU	**S2AGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	183 71.48 97.34 83.56	5 1.95 2.66 13.51	188 73.44
1	36 14.06 52.94 16.44	32 12.50 47.06 86.49	68 26.56
Total	219 85.55	37 14.45	256 100.00

Statistics for Table of FGLAU by S2AGLAU

McNemar's Test	
Statistic (S)	23.4390
DF	1
Pr > S	<.0001

Simple Kappa Coefficient	
Kappa	0.5196
ASE	0.0626
95% Lower Conf Limit	0.3969
95% Upper Conf Limit	0.6423

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON GLAUCOMA DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	36	52.94	36	52.94
1	32	47.06	68	100.00

Binomial Proportion for S2AGLAU = 1	
Proportion (P)	0.4706
ASE	0.0605
95% Lower Conf Limit	0.3520
95% Upper Conf Limit	0.5892
Exact Conf Limits	
95% Lower Conf Limit	0.3483
95% Upper Conf Limit	0.5955

Test of H0: Proportion = 0.5	
ASE under H0	0.0606
Z	-0.4851
One-sided Pr < Z	0.3138
Two-sided Pr > |Z|	0.6276
Exact Test	
One-sided Pr <= P	0.3582
Two-sided = 2 * One-sided	0.7163

Sample Size = 68

SPECIFICITY FOR READER 2 VS IN-PERSON GLAUCOMA DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	183	97.34	183	97.34
1	5	2.66	188	100.00

Binomial Proportion for S2AGLAU = 0	
Proportion (P)	0.9734
ASE	0.0117
95% Lower Conf Limit	0.9504
95% Upper Conf Limit	0.9964
Exact Conf Limits	
95% Lower Conf Limit	0.9390
95% Upper Conf Limit	0.9913

Test of H0: Proportion = 0.5	
ASE under H0	0.0365
Z	12.9820
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 188

IN-PERSON VS READER 1 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

FMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	250	97.66	250	97.66
1	6	2.34	256	100.00

S1AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	251	98.05	251	98.05
1	5	1.95	256	100.00

FVR1PRE_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	1.95	5	1.95
1	251	98.05	256	100.00

IN-PERSON VS READER 1 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of FMD by S1AMD			
FMD	**S1AMD**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	248 96.88 99.20 98.80	2 0.78 0.80 40.00	250 97.66
1	3 1.17 50.00 1.20	3 1.17 50.00 60.00	6 2.34
Total	251 98.05	5 1.95	256 100.00

Statistics for Table of FMD by S1AMD

McNemar's Test	
Statistic (S)	0.2000
DF	1
Pr > S	0.6547

Simple Kappa Coefficient	
Kappa	0.5356
ASE	0.1837
95% Lower Conf Limit	0.1755
95% Upper Conf Limit	0.8956

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	50.00	3	50.00
1	3	50.00	6	100.00

Binomial Proportion for S1AMD = 1	
Proportion (P)	0.5000
ASE	0.2041
95% Lower Conf Limit	0.0999
95% Upper Conf Limit	0.9001
Exact Conf Limits	
95% Lower Conf Limit	0.1181
95% Upper Conf Limit	0.8819

Test of H0: Proportion = 0.5	
ASE under H0	0.2041
Z	0.0000
One-sided Pr < Z	0.5000
Two-sided Pr > |Z|	1.0000
Exact Test	
One-sided Pr >= P	0.6563
Two-sided = 2 * One-sided	1.0000

Sample Size = 6

SPECIFICITY FOR READER 1 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	99.20	248	99.20
1	2	0.80	250	100.00

Binomial Proportion for S1AMD = 0	
Proportion (P)	0.9920
ASE	0.0056
95% Lower Conf Limit	0.9810
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9714
95% Upper Conf Limit	0.9990

Test of H0: Proportion = 0.5	
ASE under H0	0.0316
Z	15.5584
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 250

IN-PERSON VS READER 2 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

FMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	250	97.66	250	97.66
1	6	2.34	256	100.00

S2AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

FVR2PRE_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	14	5.47	14	5.47
1	242	94.53	256	100.00

IN-PERSON VS READER 2 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of FMD by S2AMD			
FMD	**S2AMD**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	238 92.97 95.20 99.17	12 4.69 4.80 75.00	250 97.66
1	2 0.78 33.33 0.83	4 1.56 66.67 25.00	6 2.34
Total	240 93.75	16 6.25	256 100.00

Statistics for Table of FMD by S2AMD

McNemar's Test	
Statistic (S)	7.1429
DF	1
Pr > S	0.0075

Simple Kappa Coefficient	
Kappa	0.3412
ASE	0.1316
95% Lower Conf Limit	0.0832
95% Upper Conf Limit	0.5991

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	33.33	2	33.33
1	4	66.67	6	100.00

Binomial Proportion for S2AMD = 1	
Proportion (P)	0.6667
ASE	0.1925
95% Lower Conf Limit	0.2895
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.2228
95% Upper Conf Limit	0.9567

Test of H0: Proportion = 0.5	
ASE under H0	0.2041
Z	0.8165
One-sided Pr > Z	0.2071
Two-sided Pr > |Z|	0.4142
Exact Test	
One-sided Pr >= P	0.3437
Two-sided = 2 * One-sided	0.6875

Sample Size = 6

SPECIFICITY FOR READER 2 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	238	95.20	238	95.20
1	12	4.80	250	100.00

Binomial Proportion for S2AMD = 0	
Proportion (P)	0.9520
ASE	0.0135
95% Lower Conf Limit	0.9255
95% Upper Conf Limit	0.9785
Exact Conf Limits	
95% Lower Conf Limit	0.9177
95% Upper Conf Limit	0.9750

Test of H0: Proportion = 0.5	
ASE under H0	0.0316
Z	14.2935
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 250

IN-PERSON VS READER 1 PRE-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

FRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

S1ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

FVR1PRE_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	1.56	4	1.56
1	252	98.44	256	100.00

IN-PERSON VS READER 1 PRE-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of FRET by S1ARET			
FRET	**S1ARET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	246 96.09 99.19 99.19	2 0.78 0.81 25.00	248 96.88
1	2 0.78 25.00 0.81	6 2.34 75.00 75.00	8 3.13
Total	248 96.88	8 3.13	256 100.00

Statistics for Table of FRET by S1ARET

McNemar's Test	
Statistic (S)	0.0000
DF	1
Pr > S	1.0000

Simple Kappa Coefficient	
Kappa	0.7419
ASE	0.1242
95% Lower Conf Limit	0.4986
95% Upper Conf Limit	0.9853

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON RETINOPATHY DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	25.00	2	25.00
1	6	75.00	8	100.00

Binomial Proportion for S1ARET = 1	
Proportion (P)	0.7500
ASE	0.1531
95% Lower Conf Limit	0.4499
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.3491
95% Upper Conf Limit	0.9681

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	1.4142
One-sided Pr > Z	0.0786
Two-sided Pr > |Z|	0.1573
Exact Test	
One-sided Pr >= P	0.1445
Two-sided = 2 * One-sided	0.2891

Sample Size = 8

SPECIFICITY FOR READER 1 VS IN-PERSON RETINOPATHY DIAGNOSES (PRE-OCT)

The FREQ Procedure

S1ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	99.19	246	99.19
1	2	0.81	248	100.00

Binomial Proportion for S1ARET = 0	
Proportion (P)	0.9919
ASE	0.0057
95% Lower Conf Limit	0.9808
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9712
95% Upper Conf Limit	0.9990

Test of H0: Proportion = 0.5	
ASE under H0	0.0318
Z	15.4940
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 248

IN-PERSON VS READER 2 PRE-OCT RETINOPATHY DIAGNOSES

The FREQ Procedure

FRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

S2ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

FVR2PRE_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

IN-PERSON VS READER 2 PRE-OCT RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of FRET by S2ARET			
FRET	**S2ARET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	245 95.70 98.79 98.79	3 1.17 1.21 37.50	248 96.88
1	3 1.17 37.50 1.21	5 1.95 62.50 62.50	8 3.13
Total	248 96.88	8 3.13	256 100.00

Statistics for Table of FRET by S2ARET

McNemar's Test	
Statistic (S)	0.0000
DF	1
Pr > S	1.0000

Simple Kappa Coefficient	
Kappa	0.6129
ASE	0.1453
95% Lower Conf Limit	0.3282
95% Upper Conf Limit	0.8976

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON RETINOPATHY DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	37.50	3	37.50
1	5	62.50	8	100.00

Binomial Proportion for S2ARET = 1	
Proportion (P)	0.6250
ASE	0.1712
95% Lower Conf Limit	0.2895
95% Upper Conf Limit	0.9605
Exact Conf Limits	
95% Lower Conf Limit	0.2449
95% Upper Conf Limit	0.9148

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	0.7071
One-sided Pr > Z	0.2398
Two-sided Pr > |Z|	0.4795
Exact Test	
One-sided Pr >= P	0.3633
Two-sided = 2 * One-sided	0.7266

Sample Size = 8

SPECIFICITY FOR READER 2 VS IN-PERSON RETINOPATHY DIAGNOSES (PRE-OCT)

The FREQ Procedure

S2ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	245	98.79	245	98.79
1	3	1.21	248	100.00

Binomial Proportion for S2ARET = 0	
Proportion (P)	0.9879
ASE	0.0069
95% Lower Conf Limit	0.9743
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9651
95% Upper Conf Limit	0.9975

Test of H0: Proportion = 0.5	
ASE under H0	0.0318
Z	15.3670
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 248

IN-PERSON VS READER 1 PRE-OCT DIAGNOSIS REQUIRING REFERRAL

The FREQ Procedure

FREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	56.25	144	56.25
1	112	43.75	256	100.00

S1AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	133	51.95	133	51.95
1	123	48.05	256	100.00

FVR1PRE_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	63	24.61	63	24.61
1	193	75.39	256	100.00

IN-PERSON VS READER 1 PRE-OCT DIAGNOSIS REQUIRING REFERRAL

The FREQ Procedure

Table of FREF by S1AREF			
FREF	**S1AREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	107 41.80 74.31 80.45	37 14.45 25.69 30.08	144 56.25
1	26 10.16 23.21 19.55	86 33.59 76.79 69.92	112 43.75
Total	133 51.95	123 48.05	256 100.00

Statistics for Table of FREF by S1AREF

McNemar's Test	
Statistic (S)	1.9206
DF	1
Pr > S	0.1658

Simple Kappa Coefficient	
Kappa	0.5054
ASE	0.0539
95% Lower Conf Limit	0.3998
95% Upper Conf Limit	0.6110

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (PRE-OCT)

The FREQ Procedure

S1AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	26	23.21	26	23.21
1	86	76.79	112	100.00

Binomial Proportion for S1AREF = 1	
Proportion (P)	0.7679
ASE	0.0399
95% Lower Conf Limit	0.6897
95% Upper Conf Limit	0.8460
Exact Conf Limits	
95% Lower Conf Limit	0.6786
95% Upper Conf Limit	0.8424

Test of H0: Proportion = 0.5	
ASE under H0	0.0472
Z	5.6695
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	5.505E-09
Two-sided = 2 * One-sided	1.101E-08

Sample Size = 112

SPECIFICITY FOR READER 1 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL(PRE-OCT)

The FREQ Procedure

S1AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	107	74.31	107	74.31
1	37	25.69	144	100.00

Binomial Proportion for S1AREF = 0	
Proportion (P)	0.7431
ASE	0.0364
95% Lower Conf Limit	0.6717
95% Upper Conf Limit	0.8144
Exact Conf Limits	
95% Lower Conf Limit	0.6636
95% Upper Conf Limit	0.8122

Test of H0: Proportion = 0.5	
ASE under H0	0.0417
Z	5.8333
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	2.222E-09
Two-sided = 2 * One-sided	4.444E-09

Sample Size = 144

IN-PERSON VS READER 2 PRE-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

FREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	56.25	144	56.25
1	112	43.75	256	100.00

S2AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	105	41.02	105	41.02
1	151	58.98	256	100.00

FVR2PRE_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	81	31.64	81	31.64
1	175	68.36	256	100.00

IN-PERSON VS READER 2 PRE-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of FREF by S2AREF			
FREF	**S2AREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	84 32.81 58.33 80.00	60 23.44 41.67 39.74	144 56.25
1	21 8.20 18.75 20.00	91 35.55 81.25 60.26	112 43.75
Total	105 41.02	151 58.98	256 100.00

Statistics for Table of FREF by S2AREF

McNemar's Test	
Statistic (S)	18.7778
DF	1
Pr > S	<.0001

Simple Kappa Coefficient	
Kappa	0.3811
ASE	0.0546
95% Lower Conf Limit	0.2742
95% Upper Conf Limit	0.4880

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (PRE-OCT)

The FREQ Procedure

S2AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	21	18.75	21	18.75
1	91	81.25	112	100.00

Binomial Proportion for S2AREF = 1	
Proportion (P)	0.8125
ASE	0.0369
95% Lower Conf Limit	0.7402
95% Upper Conf Limit	0.8848
Exact Conf Limits	
95% Lower Conf Limit	0.7278
95% Upper Conf Limit	0.8800

Test of H0: Proportion = 0.5	
ASE under H0	0.0472
Z	6.6144
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	7.060E-12
Two-sided = 2 * One-sided	1.412E-11

Sample Size = 112

SPECIFICITY FOR READER 2 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (PRE-OCT)

The FREQ Procedure

S2AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	84	58.33	84	58.33
1	60	41.67	144	100.00

Binomial Proportion for S2AREF = 0	
Proportion (P)	0.5833
ASE	0.0411
95% Lower Conf Limit	0.5028
95% Upper Conf Limit	0.6639
Exact Conf Limits	
95% Lower Conf Limit	0.4983
95% Upper Conf Limit	0.6648

Test of H0: Proportion = 0.5	
ASE under H0	0.0417
Z	2.0000
One-sided Pr > Z	0.0228
Two-sided Pr > |Z|	0.0455
Exact Test	
One-sided Pr >= P	0.0275
Two-sided = 2 * One-sided	0.0549

Sample Size = 144

IN-PERSON VS READER 1 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

FCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	96.09	246	96.09
1	10	3.91	256	100.00

S1BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

FVR1POST_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

IN-PERSON VS READER 1 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of FCATR by S1BCATR			
FCATR	**S1BCATR**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	240 93.75 97.56 100.00	6 2.34 2.44 37.50	246 96.09
1	0 0.00 0.00 0.00	10 3.91 100.00 62.50	10 3.91
Total	240 93.75	16 6.25	256 100.00

Statistics for Table of FCATR by S1BCATR

McNemar's Test	
Statistic (S)	6.0000
DF	1
Pr > S	0.0143

Simple Kappa Coefficient	
Kappa	0.7576
ASE	0.0949
95% Lower Conf Limit	0.5716
95% Upper Conf Limit	0.9435

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	10	100.00	10	100.00

Binomial Proportion for S1BCATR = 1	
Proportion (P)	1.0000
ASE	0.0000
95% Lower Conf Limit	1.0000
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.6915
95% Upper Conf Limit	1.0000

Test of H0: Proportion = 0.5	
ASE under H0	0.1581
Z	3.1623
One-sided Pr > Z	0.0008
Two-sided Pr > |Z|	0.0016
Exact Test	
One-sided Pr >= P	9.766E-04
Two-sided = 2 * One-sided	0.0020

Sample Size = 10

SPECIFICITY FOR READER 1 VS IN-PERSON CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	97.56	240	97.56
1	6	2.44	246	100.00

Binomial Proportion for S1BCATR = 0	
Proportion (P)	0.9756
ASE	0.0098
95% Lower Conf Limit	0.9563
95% Upper Conf Limit	0.9949
Exact Conf Limits	
95% Lower Conf Limit	0.9477
95% Upper Conf Limit	0.9910

Test of H0: Proportion = 0.5	
ASE under H0	0.0319
Z	14.9193
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	6.151E-14
Two-sided = 2 * One-sided	1.230E-13

Sample Size = 246

IN-PERSON VS READER 2 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

FCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	96.09	246	96.09
1	10	3.91	256	100.00

S2BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	242	94.53	242	94.53
1	14	5.47	256	100.00

FVR2POST_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

IN-PERSON VS READER 2 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of FCATR by S2BCATR			
FCATR	**S2BCATR**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	241 94.14 97.97 99.59	5 1.95 2.03 35.71	246 96.09
1	1 0.39 10.00 0.41	9 3.52 90.00 64.29	10 3.91
Total	242 94.53	14 5.47	256 100.00

Statistics for Table of FCATR by S2BCATR

McNemar's Test	
Statistic (S)	2.6667
DF	1
Pr > S	0.1025

Simple Kappa Coefficient	
Kappa	0.7381
ASE	0.1023
95% Lower Conf Limit	0.5375
95% Upper Conf Limit	0.9386

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	10.00	1	10.00
1	9	90.00	10	100.00

Binomial Proportion for S2BCATR = 1	
Proportion (P)	0.9000
ASE	0.0949
95% Lower Conf Limit	0.7141
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.5550
95% Upper Conf Limit	0.9975

Test of H0: Proportion = 0.5	
ASE under H0	0.1581
Z	2.5298
One-sided Pr > Z	0.0057
Two-sided Pr > |Z|	0.0114
Exact Test	
One-sided Pr >= P	0.0107
Two-sided = 2 * One-sided	0.0215

Sample Size = 10

SPECIFICITY FOR READER 1 VS IN-PERSON CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	241	97.97	241	97.97
1	5	2.03	246	100.00

Binomial Proportion for S2BCATR = 0	
Proportion (P)	0.9797
ASE	0.0090
95% Lower Conf Limit	0.9620
95% Upper Conf Limit	0.9973
Exact Conf Limits	
95% Lower Conf Limit	0.9532
95% Upper Conf Limit	0.9934

Test of H0: Proportion = 0.5	
ASE under H0	0.0319
Z	15.0468
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	6.151E-14
Two-sided = 2 * One-sided	1.230E-13

Sample Size = 246

IN-PERSON VS READER 1 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

FGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	188	73.44	188	73.44
1	68	26.56	256	100.00

S1BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	175	68.36	175	68.36
1	81	31.64	256	100.00

FVR1POST_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	49	19.14	49	19.14
1	207	80.86	256	100.00

IN-PERSON VS READER 1 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of FGLAU by S1BGLAU			
FGLAU	**S1BGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	157 61.33 83.51 89.71	31 12.11 16.49 38.27	188 73.44
1	18 7.03 26.47 10.29	50 19.53 73.53 61.73	68 26.56
Total	175 68.36	81 31.64	256 100.00

Statistics for Table of FGLAU by S1BGLAU

McNemar's Test	
Statistic (S)	3.4490
DF	1
Pr > S	0.0633

Simple Kappa Coefficient	
Kappa	0.5376
ASE	0.0577
95% Lower Conf Limit	0.4246
95% Upper Conf Limit	0.6506

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	18	26.47	18	26.47
1	50	73.53	68	100.00

Binomial Proportion for S1BGLAU = 1	
Proportion (P)	0.7353
ASE	0.0535
95% Lower Conf Limit	0.6304
95% Upper Conf Limit	0.8402
Exact Conf Limits	
95% Lower Conf Limit	0.6143
95% Upper Conf Limit	0.8350

Test of H0: Proportion = 0.5	
ASE under H0	0.0606
Z	3.8806
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	0.0001
Exact Test	
One-sided Pr >= P	6.542E-05
Two-sided = 2 * One-sided	1.308E-04

Sample Size = 68

SPECIFICITY FOR READER 1 VS IN-PERSON GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	157	83.51	157	83.51
1	31	16.49	188	100.00

Binomial Proportion for S1BGLAU = 0	
Proportion (P)	0.8351
ASE	0.0271
95% Lower Conf Limit	0.7821
95% Upper Conf Limit	0.8882
Exact Conf Limits	
95% Lower Conf Limit	0.7742
95% Upper Conf Limit	0.8851

Test of H0: Proportion = 0.5	
ASE under H0	0.0365
Z	9.1895
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 188

IN-PERSON VS READER 2 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

FGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	188	73.44	188	73.44
1	68	26.56	256	100.00

S2BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	198	77.34	198	77.34
1	58	22.66	256	100.00

FVR2POST_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	76	29.69	76	29.69
1	180	70.31	256	100.00

IN-PERSON VS READER 2 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of FGLAU by S2BGLAU			
FGLAU	**S2BGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	155 60.55 82.45 78.28	33 12.89 17.55 56.90	188 73.44
1	43 16.80 63.24 21.72	25 9.77 36.76 43.10	68 26.56
Total	198 77.34	58 22.66	256 100.00

Statistics for Table of FGLAU by S2BGLAU

McNemar's Test	
Statistic (S)	1.3158
DF	1
Pr > S	0.2513

Simple Kappa Coefficient	
Kappa	0.2016
ASE	0.0670
95% Lower Conf Limit	0.0703
95% Upper Conf Limit	0.3328

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	43	63.24	43	63.24
1	25	36.76	68	100.00

Binomial Proportion for S2BGLAU = 1	
Proportion (P)	0.3676
ASE	0.0585
95% Lower Conf Limit	0.2530
95% Upper Conf Limit	0.4822
Exact Conf Limits	
95% Lower Conf Limit	0.2539
95% Upper Conf Limit	0.4933

Test of H0: Proportion = 0.5	
ASE under H0	0.0606
Z	-2.1828
One-sided Pr < Z	0.0145
Two-sided Pr > |Z|	0.0290
Exact Test	
One-sided Pr <= P	0.0192
Two-sided = 2 * One-sided	0.0385

Sample Size = 68

SPECIFICITY FOR READER 2 VS IN-PERSON GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	155	82.45	155	82.45
1	33	17.55	188	100.00

Binomial Proportion for S2BGLAU = 0	
Proportion (P)	0.8245
ASE	0.0277
95% Lower Conf Limit	0.7701
95% Upper Conf Limit	0.8788
Exact Conf Limits	
95% Lower Conf Limit	0.7624
95% Upper Conf Limit	0.8760

Test of H0: Proportion = 0.5	
ASE under H0	0.0365
Z	8.8978
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 188

IN-PERSON VS READER 1 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

FMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	250	97.66	250	97.66
1	6	2.34	256	100.00

S1BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	251	98.05	251	98.05
1	5	1.95	256	100.00

FVR1POST_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	1.95	5	1.95
1	251	98.05	256	100.00

IN-PERSON VS READER 1 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of FMD by S1BMD			
FMD	**S1BMD**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	248 96.88 99.20 98.80	2 0.78 0.80 40.00	250 97.66
1	3 1.17 50.00 1.20	3 1.17 50.00 60.00	6 2.34
Total	251 98.05	5 1.95	256 100.00

Statistics for Table of FMD by S1BMD

McNemar's Test	
Statistic (S)	0.2000
DF	1
Pr > S	0.6547

Simple Kappa Coefficient	
Kappa	0.5356
ASE	0.1837
95% Lower Conf Limit	0.1755
95% Upper Conf Limit	0.8956

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	50.00	3	50.00
1	3	50.00	6	100.00

Binomial Proportion for S1BMD = 1	
Proportion (P)	0.5000
ASE	0.2041
95% Lower Conf Limit	0.0999
95% Upper Conf Limit	0.9001
Exact Conf Limits	
95% Lower Conf Limit	0.1181
95% Upper Conf Limit	0.8819

Test of H0: Proportion = 0.5	
ASE under H0	0.2041
Z	0.0000
One-sided Pr < Z	0.5000
Two-sided Pr > |Z|	1.0000
Exact Test	
One-sided Pr >= P	0.6563
Two-sided = 2 * One-sided	1.0000

Sample Size = 6

SPECIFICITY FOR READER 1 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	99.20	248	99.20
1	2	0.80	250	100.00

Binomial Proportion for S1BMD = 0	
Proportion (P)	0.9920
ASE	0.0056
95% Lower Conf Limit	0.9810
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9714
95% Upper Conf Limit	0.9990

Test of H0: Proportion = 0.5	
ASE under H0	0.0316
Z	15.5584
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 250

IN-PERSON VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

FMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	250	97.66	250	97.66
1	6	2.34	256	100.00

S2BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	239	93.36	239	93.36
1	17	6.64	256	100.00

FVR2POST_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	5.86	15	5.86
1	241	94.14	256	100.00

IN-PERSON VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of FMD by S2BMD			
FMD	**S2BMD**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	237 92.58 94.80 99.16	13 5.08 5.20 76.47	250 97.66
1	2 0.78 33.33 0.84	4 1.56 66.67 23.53	6 2.34
Total	239 93.36	17 6.64	256 100.00

Statistics for Table of FMD by S2BMD

McNemar's Test	
Statistic (S)	8.0667
DF	1
Pr > S	0.0045

Simple Kappa Coefficient	
Kappa	0.3244
ASE	0.1277
95% Lower Conf Limit	0.0741
95% Upper Conf Limit	0.5747

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	33.33	2	33.33
1	4	66.67	6	100.00

Binomial Proportion for S2BMD = 1	
Proportion (P)	0.6667
ASE	0.1925
95% Lower Conf Limit	0.2895
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.2228
95% Upper Conf Limit	0.9567

Test of H0: Proportion = 0.5	
ASE under H0	0.2041
Z	0.8165
One-sided Pr > Z	0.2071
Two-sided Pr > |Z|	0.4142
Exact Test	
One-sided Pr >= P	0.3437
Two-sided = 2 * One-sided	0.6875

Sample Size = 6

SPECIFICITY FOR READER 2 VS IN-PERSON MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	237	94.80	237	94.80
1	13	5.20	250	100.00

Binomial Proportion for S2BMD = 0	
Proportion (P)	0.9480
ASE	0.0140
95% Lower Conf Limit	0.9205
95% Upper Conf Limit	0.9755
Exact Conf Limits	
95% Lower Conf Limit	0.9127
95% Upper Conf Limit	0.9720

Test of H0: Proportion = 0.5	
ASE under H0	0.0316
Z	14.1670
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 250

IN-PERSON VS READER 1 POST-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

FRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

S1BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	247	96.48	247	96.48
1	9	3.52	256	100.00

FVR1POST_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	1.95	5	1.95
1	251	98.05	256	100.00

IN-PERSON VS READER 1 POST-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of FRET by S1BRET			
FRET	**S1BRET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	245 95.70 98.79 99.19	3 1.17 1.21 33.33	248 96.88
1	2 0.78 25.00 0.81	6 2.34 75.00 66.67	8 3.13
Total	247 96.48	9 3.52	256 100.00

Statistics for Table of FRET by S1BRET

McNemar's Test	
Statistic (S)	0.2000
DF	1
Pr > S	0.6547

Simple Kappa Coefficient	
Kappa	0.6958
ASE	0.1290
95% Lower Conf Limit	0.4430
95% Upper Conf Limit	0.9487

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	25.00	2	25.00
1	6	75.00	8	100.00

Binomial Proportion for S1BRET = 1	
Proportion (P)	0.7500
ASE	0.1531
95% Lower Conf Limit	0.4499
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.3491
95% Upper Conf Limit	0.9681

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	1.4142
One-sided Pr > Z	0.0786
Two-sided Pr > |Z|	0.1573
Exact Test	
One-sided Pr >= P	0.1445
Two-sided = 2 * One-sided	0.2891

Sample Size = 8

SPECIFICITY FOR READER 1 VS IN-PERSON RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	245	98.79	245	98.79
1	3	1.21	248	100.00

Binomial Proportion for S1BRET = 0	
Proportion (P)	0.9879
ASE	0.0069
95% Lower Conf Limit	0.9743
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9651
95% Upper Conf Limit	0.9975

Test of H0: Proportion = 0.5	
ASE under H0	0.0318
Z	15.3670
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 248

IN-PERSON VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

FRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

S2BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	249	97.27	249	97.27
1	7	2.73	256	100.00

FVR2POST_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	1.95	5	1.95
1	251	98.05	256	100.00

IN-PERSON VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of FRET by S2BRET			
FRET	**S2BRET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	246 96.09 99.19 98.80	2 0.78 0.81 28.57	248 96.88
1	3 1.17 37.50 1.20	5 1.95 62.50 71.43	8 3.13
Total	249 97.27	7 2.73	256 100.00

Statistics for Table of FRET by S2BRET

McNemar's Test	
Statistic (S)	0.2000
DF	1
Pr > S	0.6547

Simple Kappa Coefficient	
Kappa	0.6567
ASE	0.1437
95% Lower Conf Limit	0.3750
95% Upper Conf Limit	0.9383

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	37.50	3	37.50
1	5	62.50	8	100.00

Binomial Proportion for S2BRET = 1	
Proportion (P)	0.6250
ASE	0.1712
95% Lower Conf Limit	0.2895
95% Upper Conf Limit	0.9605
Exact Conf Limits	
95% Lower Conf Limit	0.2449
95% Upper Conf Limit	0.9148

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	0.7071
One-sided Pr > Z	0.2398
Two-sided Pr > |Z|	0.4795
Exact Test	
One-sided Pr >= P	0.3633
Two-sided = 2 * One-sided	0.7266

Sample Size = 8

SPECIFICITY FOR READER 2 VS IN-PERSON RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	99.19	246	99.19
1	2	0.81	248	100.00

Binomial Proportion for S2BRET = 0	
Proportion (P)	0.9919
ASE	0.0057
95% Lower Conf Limit	0.9808
95% Upper Conf Limit	1.0000
Exact Conf Limits	
95% Lower Conf Limit	0.9712
95% Upper Conf Limit	0.9990

Test of H0: Proportion = 0.5	
ASE under H0	0.0318
Z	15.4940
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	0.0000
Two-sided = 2 * One-sided	0.0000

Sample Size = 248

IN-PERSON VS READER 1 POST-OCT DIAGNOSIS REQUIRING REFERRAL

The FREQ Procedure

FREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	56.25	144	56.25
1	112	43.75	256	100.00

S1BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	125	48.83	125	48.83
1	131	51.17	256	100.00

FVR1POST_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	69	26.95	69	26.95
1	187	73.05	256	100.00

IN-PERSON VS READER 1 POST-OCT DIAGNOSIS REQUIRING REFERRAL

The FREQ Procedure

Table of FREF by S1BREF			
FREF	**S1BREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	100 39.06 69.44 80.00	44 17.19 30.56 33.59	144 56.25
1	25 9.77 22.32 20.00	87 33.98 77.68 66.41	112 43.75
Total	125 48.83	131 51.17	256 100.00

Statistics for Table of FREF by S1BREF

McNemar's Test	
Statistic (S)	5.2319
DF	1
Pr > S	0.0222

Simple Kappa Coefficient	
Kappa	0.4625
ASE	0.0547
95% Lower Conf Limit	0.3553
95% Upper Conf Limit	0.5698

Sample Size = 256

SENSITIVITY FOR READER 1 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

S1BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	25	22.32	25	22.32
1	87	77.68	112	100.00

Binomial Proportion for S1BREF = 1	
Proportion (P)	0.7768
ASE	0.0393
95% Lower Conf Limit	0.6997
95% Upper Conf Limit	0.8539
Exact Conf Limits	
95% Lower Conf Limit	0.6884
95% Upper Conf Limit	0.8500

Test of H0: Proportion = 0.5	
ASE under H0	0.0472
Z	5.8584
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	1.613E-09
Two-sided = 2 * One-sided	3.225E-09

Sample Size = 112

SPECIFICITY FOR READER 1 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL(POST-OCT)

The FREQ Procedure

S1BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	100	69.44	100	69.44
1	44	30.56	144	100.00

Binomial Proportion for S1BREF = 0	
Proportion (P)	0.6944
ASE	0.0384
95% Lower Conf Limit	0.6192
95% Upper Conf Limit	0.7697
Exact Conf Limits	
95% Lower Conf Limit	0.6123
95% Upper Conf Limit	0.7684

Test of H0: Proportion = 0.5	
ASE under H0	0.0417
Z	4.6667
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	1.747E-06
Two-sided = 2 * One-sided	3.494E-06

Sample Size = 144

IN-PERSON VS READER 2 POST-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

FREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	56.25	144	56.25
1	112	43.75	256	100.00

S2BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	93	36.33	93	36.33
1	163	63.67	256	100.00

FVR2POST_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	89	34.77	89	34.77
1	167	65.23	256	100.00

IN-PERSON VS READER 2 POST-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of FREF by S2BREF			
FREF	**S2BREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	74 28.91 51.39 79.57	70 27.34 48.61 42.94	144 56.25
1	19 7.42 16.96 20.43	93 36.33 83.04 57.06	112 43.75
Total	93 36.33	163 63.67	256 100.00

Statistics for Table of FREF by S2BREF

McNemar's Test	
Statistic (S)	29.2247
DF	1
Pr > S	<.0001

Simple Kappa Coefficient	
Kappa	0.3277
ASE	0.0536
95% Lower Conf Limit	0.2226
95% Upper Conf Limit	0.4327

Sample Size = 256

SENSITIVITY FOR READER 2 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

S2BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	19	16.96	19	16.96
1	93	83.04	112	100.00

Binomial Proportion for S2BREF = 1	
Proportion (P)	0.8304
ASE	0.0355
95% Lower Conf Limit	0.7608
95% Upper Conf Limit	0.8999
Exact Conf Limits	
95% Lower Conf Limit	0.7478
95% Upper Conf Limit	0.8947

Test of H0: Proportion = 0.5	
ASE under H0	0.0472
Z	6.9923
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001
Exact Test	
One-sided Pr >= P	2.984E-13
Two-sided = 2 * One-sided	5.969E-13

Sample Size = 112

SPECIFICITY FOR READER 2 VS IN-PERSON DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

S2BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	74	51.39	74	51.39
1	70	48.61	144	100.00

Binomial Proportion for S2BREF = 0	
Proportion (P)	0.5139
ASE	0.0417
95% Lower Conf Limit	0.4323
95% Upper Conf Limit	0.5955
Exact Conf Limits	
95% Lower Conf Limit	0.4292
95% Upper Conf Limit	0.5980

Test of H0: Proportion = 0.5	
ASE under H0	0.0417
Z	0.3333
One-sided Pr > Z	0.3694
Two-sided Pr > |Z|	0.7389
Exact Test	
One-sided Pr >= P	0.4013
Two-sided = 2 * One-sided	0.8027

Sample Size = 144

READER 1 VS READER 2 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

S1ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

S2ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	241	94.14	241	94.14
1	15	5.86	256	100.00

R1VR2PRE_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	1.95	5	1.95
1	251	98.05	256	100.00

READER 1 VS READER 2 PRE-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of S1ACATR by S2ACATR			
S1ACATR	**S2ACATR**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	238 92.97 99.17 98.76	2 0.78 0.83 13.33	240 93.75
1	3 1.17 18.75 1.24	13 5.08 81.25 86.67	16 6.25
Total	241 94.14	15 5.86	256 100.00

Statistics for Table of S1ACATR by S2ACATR

McNemar's Test	
Statistic (S)	0.2000
DF	1
Pr > S	0.6547

Simple Kappa Coefficient	
Kappa	0.8283
ASE	0.0751
95% Lower Conf Limit	0.6811
95% Upper Conf Limit	0.9756

Sample Size = 256

READER 1 VS READER 2 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

S1BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

S2BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	242	94.53	242	94.53
1	14	5.47	256	100.00

R1VR2POST_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	1.56	4	1.56
1	252	98.44	256	100.00

READER 1 VS READER 2 POST-OCT CATARACT DIAGNOSES

The FREQ Procedure

Table of S1BCATR by S2BCATR			
S1BCATR	**S2BCATR**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	239 93.36 99.58 98.76	1 0.39 0.42 7.14	240 93.75
1	3 1.17 18.75 1.24	13 5.08 81.25 92.86	16 6.25
Total	242 94.53	14 5.47	256 100.00

Statistics for Table of S1BCATR by S2BCATR

McNemar's Test	
Statistic (S)	1.0000
DF	1
Pr > S	0.3173

Simple Kappa Coefficient	
Kappa	0.8584
ASE	0.0696
95% Lower Conf Limit	0.7219
95% Upper Conf Limit	0.9949

Sample Size = 256

READER 1 VS READER 2 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

S1AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	191	74.61	191	74.61
1	65	25.39	256	100.00

S2AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	219	85.55	219	85.55
1	37	14.45	256	100.00

R1VR2PRE_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	32	12.50	32	12.50
1	224	87.50	256	100.00

READER 1 VS READER 2 PRE-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of S1AGLAU by S2AGLAU			
S1AGLAU	**S2AGLAU**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	189 73.83 98.95 86.30	2 0.78 1.05 5.41	191 74.61
1	30 11.72 46.15 13.70	35 13.67 53.85 94.59	65 25.39
Total	219 85.55	37 14.45	256 100.00

Statistics for Table of S1AGLAU by S2AGLAU

McNemar's Test	
Statistic (S)	24.5000
DF	1
Pr > S	<.0001

Simple Kappa Coefficient	
Kappa	0.6154
ASE	0.0594
95% Lower Conf Limit	0.4990
95% Upper Conf Limit	0.7319

Sample Size = 256

READER 1 VS READER 2 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

S1BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	175	68.36	175	68.36
1	81	31.64	256	100.00

S2BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	198	77.34	198	77.34
1	58	22.66	256	100.00

R1VR2POST_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	59	23.05	59	23.05
1	197	76.95	256	100.00

READER 1 VS READER 2 POST-OCT GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of S1BGLAU by S2BGLAU			
S1BGLAU	**S2BGLAU**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	157 61.33 89.71 79.29	18 7.03 10.29 31.03	175 68.36
1	41 16.02 50.62 20.71	40 15.63 49.38 68.97	81 31.64
Total	198 77.34	58 22.66	256 100.00

Statistics for Table of S1BGLAU by S2BGLAU

McNemar's Test	
Statistic (S)	8.9661
DF	1
Pr > S	0.0028

Simple Kappa Coefficient	
Kappa	0.4232
ASE	0.0616
95% Lower Conf Limit	0.3024
95% Upper Conf Limit	0.5441

Sample Size = 256

READER 1 VS READER 2 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

S1AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	251	98.05	251	98.05
1	5	1.95	256	100.00

S2AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	240	93.75	240	93.75
1	16	6.25	256	100.00

R1VR2PRE_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	4.30	11	4.30
1	245	95.70	256	100.00

READER 1 VS READER 2 PRE-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of S1AMD by S2AMD			
S1AMD	**S2AMD**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	240 93.75 95.62 100.00	11 4.30 4.38 68.75	251 98.05
1	0 0.00 0.00 0.00	5 1.95 100.00 31.25	5 1.95
Total	240 93.75	16 6.25	256 100.00

Statistics for Table of S1AMD by S2AMD

McNemar's Test	
Statistic (S)	11.0000
DF	1
Pr > S	0.0009

Simple Kappa Coefficient	
Kappa	0.4601
ASE	0.1340
95% Lower Conf Limit	0.1974
95% Upper Conf Limit	0.7228

Sample Size = 256

READER 1 VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

S1BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	251	98.05	251	98.05
1	5	1.95	256	100.00

S2BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	239	93.36	239	93.36
1	17	6.64	256	100.00

R1VR2POST_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	4.69	12	4.69
1	244	95.31	256	100.00

READER 1 VS READER 2 POST-OCT MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of S1BMD by S2BMD			
S1BMD	**S2BMD**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	239 93.36 95.22 100.00	12 4.69 4.78 70.59	251 98.05
1	0 0.00 0.00 0.00	5 1.95 100.00 29.41	5 1.95
Total	239 93.36	17 6.64	256 100.00

Statistics for Table of S1BMD by S2BMD

McNemar's Test	
Statistic (S)	12.0000
DF	1
Pr > S	0.0005

Simple Kappa Coefficient	
Kappa	0.4376
ASE	0.1311
95% Lower Conf Limit	0.1807
95% Upper Conf Limit	0.6944

Sample Size = 256

READER 1 VS READER 2 PRE-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

S1ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

S2ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	248	96.88	248	96.88
1	8	3.13	256	100.00

R1VR2PRE_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

READER 1 VS READER 2 PRE-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of S1ARET by S2ARET			
S1ARET	**S2ARET**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	245 95.70 98.79 98.79	3 1.17 1.21 37.50	248 96.88
1	3 1.17 37.50 1.21	5 1.95 62.50 62.50	8 3.13
Total	248 96.88	8 3.13	256 100.00

Statistics for Table of S1ARET by S2ARET

McNemar's Test	
Statistic (S)	0.0000
DF	1
Pr > S	1.0000

Simple Kappa Coefficient	
Kappa	0.6129
ASE	0.1453
95% Lower Conf Limit	0.3282
95% Upper Conf Limit	0.8976

Sample Size = 256

READER 1 VS READER 2 POST-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

S1BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	247	96.48	247	96.48
1	9	3.52	256	100.00

S2BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	249	97.27	249	97.27
1	7	2.73	256	100.00

R1VR2POST_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	2.34	6	2.34
1	250	97.66	256	100.00

READER 1 VS READER 2 POST-OCT DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of S1BRET by S2BRET			
S1BRET	**S2BRET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	245 95.70 99.19 98.39	2 0.78 0.81 28.57	247 96.48
1	4 1.56 44.44 1.61	5 1.95 55.56 71.43	9 3.52
Total	249 97.27	7 2.73	256 100.00

Statistics for Table of S1BRET by S2BRET

McNemar's Test	
Statistic (S)	0.6667
DF	1
Pr > S	0.4142

Simple Kappa Coefficient	
Kappa	0.6131
ASE	0.1451
95% Lower Conf Limit	0.3288
95% Upper Conf Limit	0.8974

Sample Size = 256

READER 1 VS READER 2 PRE-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

S1AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	133	51.95	133	51.95
1	123	48.05	256	100.00

S2AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	105	41.02	105	41.02
1	151	58.98	256	100.00

R1VR2PRE_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	86	33.59	86	33.59
1	170	66.41	256	100.00

READER 1 VS READER 2 PRE-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of S1AREF by S2AREF			
S1AREF	**S2AREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	76 29.69 57.14 72.38	57 22.27 42.86 37.75	133 51.95
1	29 11.33 23.58 27.62	94 36.72 76.42 62.25	123 48.05
Total	105 41.02	151 58.98	256 100.00

Statistics for Table of S1AREF by S2AREF

McNemar's Test	
Statistic (S)	9.1163
DF	1
Pr > S	0.0025

Simple Kappa Coefficient	
Kappa	0.3328
ASE	0.0574
95% Lower Conf Limit	0.2204
95% Upper Conf Limit	0.4452

Sample Size = 256

READER 1 VS READER 2 POST-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

S1BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	125	48.83	125	48.83
1	131	51.17	256	100.00

S2BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	93	36.33	93	36.33
1	163	63.67	256	100.00

R1VR2POST_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	82	32.03	82	32.03
1	174	67.97	256	100.00

READER 1 VS READER 2 POST-OCT DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of S1BREF by S2BREF			
S1BREF	**S2BREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	68 26.56 54.40 73.12	57 22.27 45.60 34.97	125 48.83
1	25 9.77 19.08 26.88	106 41.41 80.92 65.03	131 51.17
Total	93 36.33	163 63.67	256 100.00

Statistics for Table of S1BREF by S2BREF

McNemar's Test	
Statistic (S)	12.4878
DF	1
Pr > S	0.0004

Simple Kappa Coefficient	
Kappa	0.3552
ASE	0.0567
95% Lower Conf Limit	0.2441
95% Upper Conf Limit	0.4664

Sample Size = 256

READER 1: TIME 1 VS TIME 2 CATARACT DIAGNOSES

The FREQ Procedure

S1ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	141	94.00	141	94.00
1	9	6.00	150	100.00

S3ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	145	96.67	145	96.67
1	5	3.33	150	100.00

R1T1VT2PRE_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	2.67	4	2.67
1	146	97.33	150	100.00

READER 1: TIME 1 VS TIME 2 CATARACT DIAGNOSES

The FREQ Procedure

Table of S1ACATR by S3ACATR			
S1ACATR	**S3ACATR**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	141 94.00 100.00 97.24	0 0.00 0.00 0.00	141 94.00
1	4 2.67 44.44 2.76	5 3.33 55.56 100.00	9 6.00
Total	145 96.67	5 3.33	150 100.00

Statistics for Table of S1ACATR by S3ACATR

McNemar's Test	
Statistic (S)	4.0000
DF	1
Pr > S	0.0455

Simple Kappa Coefficient	
Kappa	0.7015
ASE	0.1405
95% Lower Conf Limit	0.4260
95% Upper Conf Limit	0.9769

Sample Size = 150

READER 2: TIME 1 VS TIME 2 CATARACT DIAGNOSES

The FREQ Procedure

S2ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	142	94.67	142	94.67
1	8	5.33	150	100.00

S4ACATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	142	94.67	142	94.67
1	8	5.33	150	100.00

R2T1VT2PRE_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	1.33	2	1.33
1	148	98.67	150	100.00

READER 2: TIME 1 VS TIME 2 CATARACT DIAGNOSES

The FREQ Procedure

Table of S2ACATR by S4ACATR			
S2ACATR	**S4ACATR**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	141 94.00 99.30 99.30	1 0.67 0.70 12.50	142 94.67
1	1 0.67 12.50 0.70	7 4.67 87.50 87.50	8 5.33
Total	142 94.67	8 5.33	150 100.00

Statistics for Table of S2ACATR by S4ACATR

McNemar's Test	
Statistic (S)	0.0000
DF	1
Pr > S	1.0000

Simple Kappa Coefficient	
Kappa	0.8680
ASE	0.0921
95% Lower Conf Limit	0.6875
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 1: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES

The FREQ Procedure

S1AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	110	73.33	110	73.33
1	40	26.67	150	100.00

S3AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	122	81.33	122	81.33
1	28	18.67	150	100.00

R1T1VT2PRE_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	10.67	16	10.67
1	134	89.33	150	100.00

READER 1: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of S1AGLAU by S3AGLAU			
S1AGLAU	**S3AGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	108 72.00 98.18 88.52	2 1.33 1.82 7.14	110 73.33
1	14 9.33 35.00 11.48	26 17.33 65.00 92.86	40 26.67
Total	122 81.33	28 18.67	150 100.00

Statistics for Table of S1AGLAU by S3AGLAU

McNemar's Test	
Statistic (S)	9.0000
DF	1
Pr > S	0.0027

Simple Kappa Coefficient	
Kappa	0.6985
ASE	0.0689
95% Lower Conf Limit	0.5634
95% Upper Conf Limit	0.8336

Sample Size = 150

READER 2: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES

The FREQ Procedure

S2AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	129	86.00	129	86.00
1	21	14.00	150	100.00

S4AGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	116	77.33	116	77.33
1	34	22.67	150	100.00

R2T1VT2PRE_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	10.00	15	10.00
1	135	90.00	150	100.00

READER 2: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES

The FREQ Procedure

Table of S2AGLAU by S4AGLAU			
S2AGLAU	**S4AGLAU**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	115 76.67 89.15 99.14	14 9.33 10.85 41.18	129 86.00
1	1 0.67 4.76 0.86	20 13.33 95.24 58.82	21 14.00
Total	116 77.33	34 22.67	150 100.00

Statistics for Table of S2AGLAU by S4AGLAU

McNemar's Test	
Statistic (S)	11.2667
DF	1
Pr > S	0.0008

Simple Kappa Coefficient	
Kappa	0.6702
ASE	0.0769
95% Lower Conf Limit	0.5194
95% Upper Conf Limit	0.8209

Sample Size = 150

READER 1: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

S1AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	149	99.33	149	99.33
1	1	0.67	150	100.00

S3AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	150	100.00	150	100.00

R1T1VT2PRE_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.67	1	0.67
1	149	99.33	150	100.00

READER 1: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of S1AMD by S3AMD		
S1AMD	**S3AMD**	
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**Total**
0	149 99.33 100.00 99.33	149 99.33
1	1 0.67 100.00 0.67	1 0.67
Total	150 100.00	150 100.00

READER 2: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

S2AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	96.00	144	96.00
1	6	4.00	150	100.00

S4AMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	146	97.33	146	97.33
1	4	2.67	150	100.00

R2T1VT2PRE_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	2.67	4	2.67
1	146	97.33	150	100.00

READER 2: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES

The FREQ Procedure

Table of S2AMD by S4AMD			
S2AMD	**S4AMD**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	143 95.33 99.31 97.95	1 0.67 0.69 25.00	144 96.00
1	3 2.00 50.00 2.05	3 2.00 50.00 75.00	6 4.00
Total	146 97.33	4 2.67	150 100.00

Statistics for Table of S2AMD by S4AMD

McNemar's Test	
Statistic (S)	1.0000
DF	1
Pr > S	0.3173

Simple Kappa Coefficient	
Kappa	0.5868
ASE	0.1871
95% Lower Conf Limit	0.2200
95% Upper Conf Limit	0.9535

Sample Size = 150

READER 1: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

S1ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	146	97.33	146	97.33
1	4	2.67	150	100.00

S3ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	147	98.00	147	98.00
1	3	2.00	150	100.00

R1T1VT2PRE_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	2.00	3	2.00
1	147	98.00	150	100.00

READER 1: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of S1ARET by S3ARET			
S1ARET	**S3ARET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	145 96.67 99.32 98.64	1 0.67 0.68 33.33	146 97.33
1	2 1.33 50.00 1.36	2 1.33 50.00 66.67	4 2.67
Total	147 98.00	3 2.00	150 100.00

Statistics for Table of S1ARET by S3ARET

McNemar's Test	
Statistic (S)	0.3333
DF	1
Pr > S	0.5637

Simple Kappa Coefficient	
Kappa	0.5614
ASE	0.2270
95% Lower Conf Limit	0.1165
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 2: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

S2ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	147	98.00	147	98.00
1	3	2.00	150	100.00

S4ARET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	147	98.00	147	98.00
1	3	2.00	150	100.00

R2T1VT2PRE_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	1.33	2	1.33
1	148	98.67	150	100.00

READER 2: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES

The FREQ Procedure

Table of S2ARET by S4ARET			
S2ARET	**S4ARET**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	146 97.33 99.32 99.32	1 0.67 0.68 33.33	147 98.00
1	1 0.67 33.33 0.68	2 1.33 66.67 66.67	3 2.00
Total	147 98.00	3 2.00	150 100.00

Statistics for Table of S2ARET by S4ARET

McNemar's Test	
Statistic (S)	0.0000
DF	1
Pr > S	1.0000

Simple Kappa Coefficient	
Kappa	0.6599
ASE	0.2256
95% Lower Conf Limit	0.2176
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 1: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

S1AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	79	52.67	79	52.67
1	71	47.33	150	100.00

S3AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	92	61.33	92	61.33
1	58	38.67	150	100.00

R1T1VT2PRE_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	45	30.00	45	30.00
1	105	70.00	150	100.00

READER 1: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of S1AREF by S3AREF			
S1AREF	**S3AREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	63 42.00 79.75 68.48	16 10.67 20.25 27.59	79 52.67
1	29 19.33 40.85 31.52	42 28.00 59.15 72.41	71 47.33
Total	92 61.33	58 38.67	150 100.00

Statistics for Table of S1AREF by S3AREF

McNemar's Test	
Statistic (S)	3.7556
DF	1
Pr > S	0.0526

Simple Kappa Coefficient	
Kappa	0.3927
ASE	0.0743
95% Lower Conf Limit	0.2469
95% Upper Conf Limit	0.5384

Sample Size = 150

READER 2: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

S2AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	66	44.00	66	44.00
1	84	56.00	150	100.00

S4AREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	61	40.67	61	40.67
1	89	59.33	150	100.00

R2T1VT2PRE_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	23	15.33	23	15.33
1	127	84.67	150	100.00

READER 2: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL

The FREQ Procedure

Table of S2AREF by S4AREF			
S2AREF	**S4AREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	52 34.67 78.79 85.25	14 9.33 21.21 15.73	66 44.00
1	9 6.00 10.71 14.75	75 50.00 89.29 84.27	84 56.00
Total	61 40.67	89 59.33	150 100.00

Statistics for Table of S2AREF by S4AREF

McNemar's Test	
Statistic (S)	1.0870
DF	1
Pr > S	0.2971

Simple Kappa Coefficient	
Kappa	0.6863
ASE	0.0600
95% Lower Conf Limit	0.5688
95% Upper Conf Limit	0.8038

Sample Size = 150

READER 1: TIME 1 VS TIME 2 CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	141	94.00	141	94.00
1	9	6.00	150	100.00

S3BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	146	97.33	146	97.33
1	4	2.67	150	100.00

R1T1VT2POST_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	3.33	5	3.33
1	145	96.67	150	100.00

READER 1: TIME 1 VS TIME 2 CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S1BCATR by S3BCATR			
S1BCATR	**S3BCATR**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	141 94.00 100.00 96.58	0 0.00 0.00 0.00	141 94.00
1	5 3.33 55.56 3.42	4 2.67 44.44 100.00	9 6.00
Total	146 97.33	4 2.67	150 100.00

Statistics for Table of S1BCATR by S3BCATR

McNemar's Test	
Statistic (S)	5.0000
DF	1
Pr > S	0.0253

Simple Kappa Coefficient	
Kappa	0.6006
ASE	0.1610
95% Lower Conf Limit	0.2851
95% Upper Conf Limit	0.9162

Sample Size = 150

READER 2: TIME 1 VS TIME 2 CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	143	95.33	143	95.33
1	7	4.67	150	100.00

S4BCATR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	142	94.67	142	94.67
1	8	5.33	150	100.00

R2T1VT2POST_MATCH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.67	1	0.67
1	149	99.33	150	100.00

READER 2: TIME 1 VS TIME 2 CATARACT DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S2BCATR by S4BCATR			
S2BCATR	**S4BCATR**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	142 94.67 99.30 100.00	1 0.67 0.70 12.50	143 95.33
1	0 0.00 0.00 0.00	7 4.67 100.00 87.50	7 4.67
Total	142 94.67	8 5.33	150 100.00

Statistics for Table of S2BCATR by S4BCATR

McNemar's Test	
Statistic (S)	1.0000
DF	1
Pr > S	0.3173

Simple Kappa Coefficient	
Kappa	0.9298
ASE	0.0698
95% Lower Conf Limit	0.7931
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 1: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	100	66.67	100	66.67
1	50	33.33	150	100.00

S3BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	110	73.33	110	73.33
1	40	26.67	150	100.00

R1T1VT2POST_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	18	12.00	18	12.00
1	132	88.00	150	100.00

READER 1: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S1BGLAU by S3BGLAU			
S1BGLAU	**S3BGLAU**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	96 64.00 96.00 87.27	4 2.67 4.00 10.00	100 66.67
1	14 9.33 28.00 12.73	36 24.00 72.00 90.00	50 33.33
Total	110 73.33	40 26.67	150 100.00

Statistics for Table of S1BGLAU by S3BGLAU

McNemar's Test	
Statistic (S)	5.5556
DF	1
Pr > S	0.0184

Simple Kappa Coefficient	
Kappa	0.7158
ASE	0.0617
95% Lower Conf Limit	0.5948
95% Upper Conf Limit	0.8368

Sample Size = 150

READER 2: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	118	78.67	118	78.67
1	32	21.33	150	100.00

S4BGLAU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	112	74.67	112	74.67
1	38	25.33	150	100.00

R2T1VT2POST_MATCH_GL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	18	12.00	18	12.00
1	132	88.00	150	100.00

READER 2: TIME 1 VS TIME 2 GLAUCOMA DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S2BGLAU by S4BGLAU			
S2BGLAU	**S4BGLAU**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	106 70.67 89.83 94.64	12 8.00 10.17 31.58	118 78.67
1	6 4.00 18.75 5.36	26 17.33 81.25 68.42	32 21.33
Total	112 74.67	38 25.33	150 100.00

Statistics for Table of S2BGLAU by S4BGLAU

McNemar's Test	
Statistic (S)	2.0000
DF	1
Pr > S	0.1573

Simple Kappa Coefficient	
Kappa	0.6653
ASE	0.0723
95% Lower Conf Limit	0.5236
95% Upper Conf Limit	0.8071

Sample Size = 150

READER 1: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	149	99.33	149	99.33
1	1	0.67	150	100.00

S3BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	150	100.00	150	100.00

R1T1VT2POST_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.67	1	0.67
1	149	99.33	150	100.00

READER 1: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S1BMD by S3BMD		
S1BMD	**S3BMD**	
Frequency Percent Row Pct Col Pct	**0**	**Total**
0	149 99.33 100.00 99.33	149 99.33
1	1 0.67 100.00 0.67	1 0.67
Total	150 100.00	150 100.00

READER 2: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	96.00	144	96.00
1	6	4.00	150	100.00

S4BMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	145	96.67	145	96.67
1	5	3.33	150	100.00

R2T1VT2POST_MATCH_MD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	2.00	3	2.00
1	147	98.00	150	100.00

READER 2: TIME 1 VS TIME 2 MACULAR DEGENERATION DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S2BMD by S4BMD			
S2BMD	**S4BMD**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	143 95.33 99.31 98.62	1 0.67 0.69 20.00	144 96.00
1	2 1.33 33.33 1.38	4 2.67 66.67 80.00	6 4.00
Total	145 96.67	5 3.33	150 100.00

Statistics for Table of S2BMD by S4BMD

McNemar's Test	
Statistic (S)	0.3333
DF	1
Pr > S	0.5637

Simple Kappa Coefficient	
Kappa	0.7170
ASE	0.1559
95% Lower Conf Limit	0.4114
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 1: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S1BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	145	96.67	145	96.67
1	5	3.33	150	100.00

S3BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	147	98.00	147	98.00
1	3	2.00	150	100.00

R1T1VT2POST_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	2.67	4	2.67
1	146	97.33	150	100.00

READER 1: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S1BRET by S3BRET			
S1BRET	**S3BRET**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	144 96.00 99.31 97.96	1 0.67 0.69 33.33	145 96.67
1	3 2.00 60.00 2.04	2 1.33 40.00 66.67	5 3.33
Total	147 98.00	3 2.00	150 100.00

Statistics for Table of S1BRET by S3BRET

McNemar's Test	
Statistic (S)	1.0000
DF	1
Pr > S	0.3173

Simple Kappa Coefficient	
Kappa	0.4872
ASE	0.2195
95% Lower Conf Limit	0.0570
95% Upper Conf Limit	0.9173

Sample Size = 150

READER 2: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

S2BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	148	98.67	148	98.67
1	2	1.33	150	100.00

S4BRET	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	147	98.00	147	98.00
1	3	2.00	150	100.00

R2T1VT2POST_MATCH_RT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.67	1	0.67
1	149	99.33	150	100.00

READER 2: TIME 1 VS TIME 2 DIABETIC RETINOPATHY DIAGNOSES (POST-OCT)

The FREQ Procedure

Table of S2BRET by S4BRET			
S2BRET	**S4BRET**		
Frequency Percent Row Pct Col Pct	**0**	**1**	**Total**
0	147 98.00 99.32 100.00	1 0.67 0.68 33.33	148 98.67
1	0 0.00 0.00 0.00	2 1.33 100.00 66.67	2 1.33
Total	147 98.00	3 2.00	150 100.00

Statistics for Table of S2BRET by S4BRET

McNemar's Test	
Statistic (S)	1.0000
DF	1
Pr > S	0.3173

Simple Kappa Coefficient	
Kappa	0.7967
ASE	0.1983
95% Lower Conf Limit	0.4080
95% Upper Conf Limit	1.0000

Sample Size = 150

READER 1: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

S1BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	70	46.67	70	46.67
1	80	53.33	150	100.00

S3BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	82	54.67	82	54.67
1	68	45.33	150	100.00

R1T1VT2POST_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	40	26.67	40	26.67
1	110	73.33	150	100.00

READER 1: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

Table of S1BREF by S3BREF			
S1BREF	**S3BREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	56 37.33 80.00 68.29	14 9.33 20.00 20.59	70 46.67
1	26 17.33 32.50 31.71	54 36.00 67.50 79.41	80 53.33
Total	82 54.67	68 45.33	150 100.00

Statistics for Table of S1BREF by S3BREF

McNemar's Test	
Statistic (S)	3.6000
DF	1
Pr > S	0.0578

Simple Kappa Coefficient	
Kappa	0.4700
ASE	0.0709
95% Lower Conf Limit	0.3309
95% Upper Conf Limit	0.6090

Sample Size = 150

READER 2: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

S2BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	54	36.00	54	36.00
1	96	64.00	150	100.00

S4BREF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	36.67	55	36.67
1	95	63.33	150	100.00

R2T1VT2POST_MATCH_RF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	33	22.00	33	22.00
1	117	78.00	150	100.00

READER 2: TIME 1 VS TIME 2 DIAGNOSES REQUIRING REFERRAL (POST-OCT)

The FREQ Procedure

Table of S2BREF by S4BREF			
S2BREF	**S4BREF**		
Frequency **Percent** **Row Pct** **Col Pct**	**0**	**1**	**Total**
0	38 25.33 70.37 69.09	16 10.67 29.63 16.84	54 36.00
1	17 11.33 17.71 30.91	79 52.67 82.29 83.16	96 64.00
Total	55 36.67	95 63.33	150 100.00

Statistics for Table of S2BREF by S4BREF

McNemar's Test	
Statistic (S)	0.0303
DF	1
Pr > S	0.8618

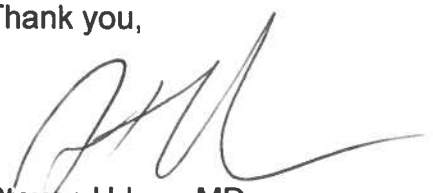
Simple Kappa Coefficient	
Kappa	0.5245
ASE	0.0723
95% Lower Conf Limit	0.3828
95% Upper Conf Limit	0.6662

Sample Size = 150

Dear Editor of Ophthalmology:

I, Steven Urken MD, hereby provide permission and approval for Dr. April Maa and her co-authors to mention me by name in the Acknowledgement Section of her manuscript titled, "Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I" Manuscript # OPHTH 2019_471.

Thank you,



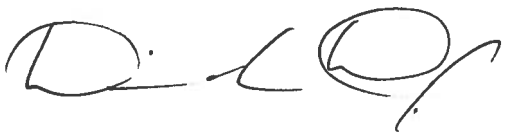
Steven Urken, MD

Ophthalmology Chief
Atlanta VA Healthcare System

Dear Editor of Ophthalmology:

I, Deirdre Dixon, hereby provide permission and approval for Dr. April Maa and her co-authors to mention me by name in the Acknowledgement Section of her manuscript titled, "Diagnostic Accuracy of Technology-based Eye Care Services (TECS): The TECS Compare Trial Part I" Manuscript # OPHTH 2019_471.

Thank you,



Deirdre Dixon, CCRC

Research Coordinator
Regional Telehealth Services, VISN 7