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Stereo nonmydriatic digital-video color retinal imaging compared with Early Treatment Diabetic Retinopathy Study seven standard field 35-mm stereo color photos for determining level of diabetic retinopathy.

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OBJECTIVE: To evaluate the ability to determine clinical levels of diabetic retinopathy, timing of next appropriate retinal evaluation, and necessity of referral to ophthalmology specialists using stereoscopic nonmydriatic digital-video color retinal images as compared with Early Treatment Diabetic Retinopathy Study (ETDRS) seven standard field 35-mm stereoscopic color fundus photographs. **DESIGN:** Prospective, clinic-based, comparative instrument validation study. **PARTICIPANTS:** Fifty-four patients (108 eyes) with type 1 or type 2 diabetes mellitus selected after chart review from a single center to include the full spectrum of diabetic retinopathy. **METHODS:** Nonsimultaneous 45 degrees -field stereoscopic digital-video color images (JVN images) were obtained from three fields with the Joslin Vision Network (JVN) system before pupil dilation. Following pupil dilation, ETDRS seven standard field 35-mm stereoscopic color 30 degrees fundus photographs (ETDRS photos) were obtained. Joslin Vision Network images and ETDRS photos were graded on a lesion-by-lesion basis by two independent, masked readers to assess ETDRS clinical level of diabetic retinopathy. An independent ophthalmology retina specialist adjudicated interreader disagreements in a masked fashion. **MAIN OUTCOME MEASURES:** Determination of ETDRS clinical level of diabetic retinopathy, timing of next ophthalmic evaluation of diabetic retinopathy, and need for prompt referral to ophthalmology specialist. **RESULTS:** There was substantial agreement ($\kappa = 0.65$) between the clinical level of diabetic retinopathy assessed from the undilated JVN images and the dilated ETDRS photos. Agreement was excellent ($\kappa = 0.87$) for suggested referral to ophthalmology specialists for eye examinations. Comparison of individual lesions between the JVN images and the ETDRS photos and for interreader comparisons were comparable to the prior ETDRS study. **CONCLUSIONS:** Undilated digital-video images using the JVN system were comparable photographs for the determination of diabetic retinopathy level. The results validate the agreement between nonmydriatic JVN images and dilated ETDRS photographs and suggest that this digital technique may be an effective telemedicine tool for remotely determining the level of diabetic retinopathy, suggesting timing of next retinal evaluation and identifying the need for prompt referral to ophthalmology specialists. Thus, the JVN system would be an appropriate tool for facilitating increased access of diabetic patients into recommended eye evaluations, but should not be construed as a paradigm that would replace the need for comprehensive eye examinations.

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