Summary and Conclusion

New developments in ocular imaging technology provide objective, quantitative, reproducible structural measurements of optic disc topography and RNFL thickness. Current imaging modalities can discriminate between normal eyes and eyes with early to moderate glaucomatous damage. Depending on sample size, definition of glaucoma, and severity of glaucomatous damage reported sensitivity and specificity values range from 70% to 90%.

Because of the wide variability in optic disc and retinal nerve fiber layer topography between normal and glaucomatous eyes, any given technique will be limited in its ability to diagnose glaucoma in isolation. However, the use of these instruments in conjunction with clinical examination and visual field testing will considerably enhance the diagnosis and management of glaucoma.

At the present time, there is no consensus regarding the best method for the evaluation of glaucomatous structural damage. Moreover, the best summary measures for any given instrument have yet to be determined. The parameter or technique most useful in the detection of glaucomatous damage for one individual may differ from the next and may vary from those most useful for detection of glaucomatous damage at different stages. Available imaging technologies show considerable promise for the detection of glaucomatous progression over time.

Analytic strategies for detection of change exist but have not yet been prospectively validated in large populations. Furthermore, new methods for

detection of progression need to be compared to the current gold standard for both structural and psychophysical change. Statistical units of change probability are critical to differentiate true pathological change from test-retest variability. Constant improvements in available imaging instruments make it difficult to follow subjects longitudinally, as changes in software and hardware may alter baseline measurements.

In summary, each quantitative imaging technique of the optic nerve has its own advantages and disadvantages. Different instruments and various analysis strategies may be more effective in different situations. Each technique shows promise for the detection of glaucomatous progression given their high measurement reproducibility. It is not recommended that clinical decisions be based on the results of any single imaging test, as with visual field testing. Clinical correlation is essential and management must be tailored to each individual patient.