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## Editorial

### Feature Issue: The Ageing Visual System

The population is ageing. Globally, the number of older adults (aged 60 years or over) is expected to more than double, from 841 million people in 2013 to more than 2 billion in 2050.<sup>1</sup> In light of the increasing size of the older adult population, there is a pressing need to better identify the nature of, and mechanisms underlying, age-related vision impairment and the functional impact it has on the performance of everyday activities in older adults. The content of this feature issue reflects the diversity of research currently being undertaken on the topic of the ageing visual system and the important visual challenges that this presents for our ageing patient population. The scope is broad and includes topics relating to three main related themes: 1) The treatment of age-related ocular disorders and diseases and their consequences, including presbyopia and AMD; 2) The impact of age-related visual changes on everyday activities in older people, including mobility, driving and falls; and 3) The interaction of age-related visual impairments and other age-related impairments including hearing and cognitive changes.

Four papers focus on theme 1, which relates to the treatment of age-related ocular disorders and diseases, of which three are reviews of relevant topics. Charman<sup>2</sup> summarises current surgical approaches for the correction of the perennial problem of presbyopia and reports that while there is a significant amount of activity in this area, there is no surgical silver bullet currently available. Lawrenson and Evans<sup>3</sup> in their review of dietary interventions for the prevention or slowing of AMD progression, find no high quality evidence suggesting nutritional supplementation is beneficial for the prevention of AMD, with some limited evidence that those with AMD may benefit from supplementation. Adaptive strategies such as eccentric viewing for AMD have also been advocated, however, Gaffney et al<sup>4</sup> fail to find conclusive evidence that a particular model of eccentric viewing training is superior to another. Intravitreal injections represent an emerging treatment of a wide range of retinal diseases including AMD; Fuest et al<sup>5</sup> in their experimental study explore potential side-effects of such treatments.

Four papers focus on theme 2, and consider the impact that age-related vision changes have on the performance of everyday activities in older people including walking, falls and driving. Considerable evidence suggests that for older adults maintaining their mobility is critical for maintaining independence, and driving cessation, for example, is strongly associated with depression and reduced quality of life. A key challenge in this area is to develop reliable and valid metrics for measuring the ability to complete everyday tasks as was outlined in many of the articles in a previous Feature Issue “The role of vision in everyday activities”. It is therefore pleasing to see Stanley & Hollands<sup>6</sup> and Black et al<sup>7</sup> rising to this challenge, outlining methodologies which allow exploration of the link between walking and gaze patterns and the potential link with the risk of falls which are a major cause of mortality in older adults. Lacherez et al<sup>8</sup> and Wood et al<sup>9</sup> focus on the functional impact of age-related vision changes on indices of driving safety. Both papers demonstrate that age-related changes in motion perception are an important contributing factor to the problems experienced by older adults, including impaired hazard perception and night-time recognition of pedestrians.

Finally, there are two papers that deal with theme 3 that highlights that vision impairment among older adults often does not occur in isolation, but rather interacts with other age-

related impairments. Piers et al<sup>10</sup> highlight the problems of dual sensory impairments in vision and hearing, with papers in previous OPO issues (Schneck et al<sup>11</sup> and Wittich et al<sup>12</sup>) also focusing on the impact of the interactions between these impairments in older adults. The negative impact of visual impairment on psychological well-being is also well established. The paper by Riazi et al<sup>14</sup> outlines a cognitive training intervention that focuses on problem-solving aimed at improving the psychological well-being of those recently diagnosed with visual impairment.

Overall, the papers in this feature issue highlight the diversity of research in this area of the ageing visual system, the multidisciplinary nature of the problems faced by our ageing population and the potential for exciting and novel research in this area. We hope that the papers provide food for thought and stimulate more research in this area, which will become so much more relevant in our ageing population.

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## References

1. United Nations, Department of Economic and Social Affairs, Population Division (2013). *World Population Ageing 2013*. ST/ESA/SER.A/348.
2. Charman: Invited review: Developments in the correction of presbyopia II: Surgical approaches.
3. Lawrenson & Evans: A review of the evidence for dietary interventions in preventing or slowing the progression of age-related macular degeneration.
4. Gaffney, Allannah: How effective is eccentric viewing training? A systematic literature review.
5. Fuest, Matthias: Monitoring intraocular pressure changes after intravitreal Ranibizumab injection using rebound tonometry.
6. Stanley & Hollands: A novel paradigm to study the mechanisms underlying age- and falls risk- related differences in gaze behaviour during walking.
7. Black et al: Stepping accuracy and visuomotor control among older adults: Effect of target contrast and refractive blur.
8. Lacherez et al: Age-related changes in perception of movement in driving scenes.
9. Wood et al: Seeing pedestrians at night: effect of driver age and visual abilities.
10. Piers et al: Vision impairment and dual sensory problems in middle age.
11. Schneck ME, Lott LA, Haegerstrom-Portnoy G, Brabyn JA. Association between hearing and vision impairments in older adults. *Ophthalmic Physiol Opt* 2012, 32: 45–52.
12. Wittich W, Watanabe DH, Gagné JP. Sensory and demographic characteristics of deafblindness rehabilitation clients in Montréal Canada. *Ophthalmic Physiol Opt* 2012, 32: 242–251.
13. Riazi et al: A pilot randomised controlled trial of Problem-Solving Treatment for Visual Impairment (POSITIVE): protocol paper.