

Evidence Brief: Ophthalmology plus: diabetic retinopathy; retinal detachment; cataracts; glaucoma

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1. Diabetic Retinopathy

Key publications – the big picture

Managing diabetes in primary care: how does the configuration of the workforce affect quality of care? November 2013, King's College London

This project continues a programme of work led by the NNRU that has sought to explore the relationship between workforce configuration in the health service and patient outcomes. In a nutshell we seek to address: what difference does it make who provides care and treatment to patients? The ramifications of different workforce models have been more thoroughly investigated in the acute sector, but there has been far less research undertaken to determine the impact of employing different combinations of staff in primary care.

Diabetic Retinopathy Guidelines December 2012, The Royal College of Ophthalmologists

The aim of the guidelines is to provide evidence-based, clinical guidance for the best management of different aspects of diabetic eye disease. The foundations of the guidelines are based on evidence taken from the literature and published trials of therapies as well as consensus opinion of a representative expert panel convened by the Royal College of Ophthalmologists with an interest in this condition. The scope of the guidelines is limited to management of diabetic retinopathy with special focus on sight threatening retinopathy. It offers guidance regarding service set up to facilitate delivery of optimal clinical care for patients with retinopathy. The guidelines are prepared primarily for ophthalmologists, however they are relevant to other healthcare professionals, service providers and commissioning organisations as well as patient groups. The guidelines do not cover rare, complex, complicated or

unusual cases. It is recommended that readers refer to other relevant sources of information such as summaries of product characteristics (SPCs) for pharmaceutical products as well as NICE and GMC guidance. The new guidelines incorporate established and applicable information and guidance from the previous version with revision while some chapters are extensively revised and some new chapters are added. As stated in the previous version, the guidelines are advisory and are not intended as a set of rigid rules, since individual patients require tailored treatment for their particular condition. However, it is hoped that if used appropriately, the guidelines will lead to a uniformly high standard of management of patients with diabetic retinopathy.

Published Peer Reviewed Research

COVID-19

Implementing the new normal in ophthalmology care beyond COVID-19 March 2021, European Journal of Ophthalmology *Abstract only**

The COVID-19 pandemic has altered the clinical landscape immeasurably. The need to physical distance requires rethinking how we deliver ophthalmic care. Within healthcare, we will need to focus our resources on the five T's: Utilising technology, multidisciplinary clinical teams with wide professional talents need to work efficiently to reduce patient contact time. With regular testing, this will allow us to reduce the risk further. We also must acknowledge the explosion of different modalities to train our future ophthalmologists and the global challenges and advantages that these bring. Finally, we must not forget the psychological impact that this pandemic will have on ophthalmologists and ancillary staff, and need to have

robust mechanisms for support. Copyright © The Author(s) 2020.

Supply

[Do we have enough ophthalmologists to manage vision-threatening diabetic retinopathy? A global perspective](#) July 2020, Eye (London, England)

We aimed to estimate the supply of ophthalmologists in relation to the global and regional burden of vision-threatening diabetic retinopathy (VTDR). Diabetes mellitus (DM) population data from seven world regions were obtained from the International Diabetes Federation Atlas 2017. A systematic review was performed to include population-, community-based studies that reported country-specific VTDR prevalence. Random effect meta-analysis was then performed to estimate global and regional VTDR prevalence. VTDR prevalence estimates coupled with DM population data were then used to estimate the number of VTDR cases. Global and regional number of ophthalmologists were derived from the International Council of Ophthalmology Report 2015. Fifty studies (17 from Western Pacific [WP], nine North America and Caribbean [NAC], nine Middle East and North Africa [MENA], five Europe, eight South East Asia [SEA], one South and Central America [SACA] and one from Africa) were included. Global VTDR prevalence was 7.26% (95% CI, 6.18-8.32%). Regional VTDR prevalence was 14.35% in Africa, 11.21% in MENA, 10.00% in NAC, 6.32% in Europe, 6.22% in WP, 5.83% in SACA and 2.97% in SEA. Globally, there were 7.16 ophthalmologists per 1000 VTDR patients. Europe had the highest ophthalmologist per 1000 VTDR patient ratio at 18.03 followed by SACA (17.41), while NAC, MENA and Africa had the lowest at 4.90, 4.81 and 0.91 respectively. Across regions, the ophthalmologist densities ranged from 0.91 to 18.03 per 1000 VTDR patients, with NAC,

MENA and Africa having less than 5 ophthalmologists per 1000 patients. These findings will aid global and regional policy planning and healthcare resource allocation for VTDR management.

Primary care

[Successfully implementing a diabetic retinopathy screening service in general practice: What does the evidence tell us?](#) 2017, Australian Family Physician

BACKGROUND We previously showed that general-practice based screening for diabetic retinopathy significantly improves recording of screening outcomes and follow-up for Australians with type 2 diabetes. In 2016, two Medicare Benefits Schedule item numbers were launched to support screening in general practice. However, there is little evidence-based information to guide practices in successfully implementing screening models for diabetic retinopathy. The objective of this study was to develop an evidence-based framework to guide successful general-practice based screening for diabetic retinopathy. **METHODS** Thematic analysis was used to identify and classify recurrent themes from qualitative and observational data gathered from general practices and staff undertaking successful screening for diabetic retinopathy. **RESULTS** Seven themes (a combination of enablers and potential risks) were identified as key components of successful screening for diabetic retinopathy in general practice.

[Accuracy of diabetic retinopathy screening by trained non-physician graders using non-mydratic fundus camera](#) November 2012, Singapore Medical Journal

INTRODUCTION We compared the agreement of diabetic retinopathy (DR) assessment between trained non-physician graders (NPGs) and family physicians (FPs) in a primary

healthcare setting. **METHODS** This was a cross-sectional study conducted retrospectively over a period of one month. The participants were diabetic patients from two primary healthcare clinics (polyclinics) in Singapore. Single-field digital retinal images were obtained using a non-mydratic 45-degree fundus camera. Retinal images were graded for the presence or absence of DR by FPs at the polyclinics and by NPGs at a central ocular grading centre. The FPs' and NPGs' assessments of DR were compared with readings by a single retinal specialist (reference standard). **RESULTS** A total of 367 diabetic patients (706 eyes) were included in the study. The mean age of the patients was 63 years, and the majority were Chinese (83.8%). For DR assessment, the agreement between NPGs and the retinal specialist was substantial ($\kappa = 0.66$), while the agreement between FPs and the retinal specialist was only fair ($\kappa = 0.40$). NPGs' assessment showed higher sensitivity (70% vs. 45%) and comparable specificity (94% vs. 92%) as compared to FPs' assessment. The area under the receiver operating characteristic curve of NPGs' assessment of DR was greater than that of the FPs' (0.82 vs. 0.69, $p < 0.001$). **CONCLUSION** This study has demonstrated that trained NPGs are able to provide good detection of DR and maculopathy from fundus photographs. Our findings suggest that DR screening by trained NPGs may provide a cost effective alternative to FPs.

New models of care

[Evaluation of a New Model of Care for People with Complications of Diabetic Retinopathy: The EMERALD Study](#)
April 2021, Ophthalmology

PURPOSE The increasing diabetes prevalence and advent of new treatments for its major visual-threatening complications (diabetic macular edema [DME] and proliferative diabetic retinopathy [PDR]), which require frequent life-long follow-up,

have increased hospital demands markedly. Subsequent delays in patient's evaluation and treatment are causing sight loss. Strategies to increase capacity are needed urgently. The retinopathy (EMERALD) study tested diagnostic accuracy, acceptability, and costs of a new health care pathway for people with previously treated DME or PDR. **DESIGN** Prospective, multicenter, case-referent, cross-sectional, diagnostic accuracy study undertaken in 13 hospitals in the United Kingdom. **PARTICIPANTS** Adults with type 1 or 2 diabetes previously successfully treated DME or PDR who, at the time of enrollment, had active or inactive disease. **METHODS** A new health care pathway entailing multimodal imaging (spectral-domain OCT for DME, and 7-field Early Treatment Diabetic Retinopathy Study [ETDRS] and ultra-widefield [UWF] fundus images for PDR) interpreted by trained nonmedical staff (ophthalmic graders) to detect reactivation of disease was compared with the current standard care (face-to-face examination by ophthalmologists). **MAIN OUTCOME MEASURES** Primary outcome: sensitivity of the new pathway. **SECONDARY OUTCOMES** specificity; agreement between pathways; costs; acceptability; proportions requiring subsequent ophthalmologist assessment, unable to undergo imaging, and with inadequate images or indeterminate findings. **RESULTS** The new pathway showed sensitivity of 97% (95% confidence interval [CI], 92%-99%) and specificity of 31% (95% CI, 23%-40%) to detect DME. For PDR, sensitivity and specificity using 7-field ETDRS images (85% [95% CI, 77%-91%] and 48% [95% CI, 41%-56%], respectively) or UWF images (83% [95% CI, 75%-89%] and 54% [95% CI, 46%-61%], respectively) were comparable. For detection of high-risk PDR, sensitivity and specificity were higher when using UWF images (87% [95% CI, 78%-93%] and 49% [95% CI, 42%-56%], respectively, for UWF versus 80% [95% CI, 69-88%] and 40% [95% CI, 34%-47%], respectively, for 7-field ETDRS images). Participants preferred ophthalmologists' assessments;

in their absence, they preferred immediate feedback by graders, maintaining periodic ophthalmologist evaluations. When compared with the current standard of care, the new pathway could save £1390 per 100 DME visits and between £461 and £1189 per 100 PDR visits. CONCLUSIONS The new pathway has acceptable sensitivity and would release resources. Users' suggestions should guide implementation.

Upskilling

Knowledge of Primary Prevention of Diabetic Retinopathy among General Ophthalmologists, Mid Level Eye Care Personnel and General Physicians in Oman July 2011, Middle East African Journal of Ophthalmology

OBJECTIVE We present the outcomes of knowledge of diabetes and associated ocular complications among personnel comprising the eye care team in Oman. **MATERIALS AND METHODS** A closed ended questionnaire was administered during November 2008 and November 2009 to eye care team members in six regions of Oman, where trainings were held. All participants of these trainings were included in our study. The questionnaire comprised 15 questions that tested the knowledge of the diagnosis and treatment of diabetes and its ocular complications. They circled the most suitable reply for a list of choices. The replies were compared with the gold standard (answers from a medical retina specialist, a diabetologist's and general ophthalmologists answers). The participants were divided into two groups; acceptable (more than 50% score compared to gold standard) and less than desired (less than 50% score compared to gold standard.) We estimated the areas of acceptable level of knowledge in different subgroups. **RESULTS** All 87 (100%) of eye care team members participated. Of the 42 general ophthalmologists, 30 (71.4%) had an acceptable level of knowledge about primary prevention, ideal blood sugar and blood pressure levels and

complication of diabetes. The acceptable level of knowledge among mid level eye care providers and general physicians was found in 15 (54.5%) and 4 (33.3%) respondents respectively. **CONCLUSION** Less than the desired number of participants of the eye care team had an acceptable level of knowledge about primary prevention, ideal blood sugar and blood pressure levels and complications of diabetes. The training of eye care personnel need to enhance knowledge in the weak areas is identified in this study.

Training and education

Conference Abstract: International students undertaking UK university-validated distance-learning courses in diabetic retinopathy screening (DRS) 2020, European Journal of Ophthalmology See p. 14

DESIGN. Web-based University-awarded distance learning courses **PURPOSE.** Providing international staff with access to formalised education and validated qualifications in DR screening concepts, methods and practice to enhance patient care and ultimately reduce visual loss from complications of diabetes **METHODS.** One main plus two subsidiary on-line webbased distance-learning courses provided to staff located outside the United Kingdom. The full 'Certificate of Higher Education in DR Screening' (Cert-HE) award comprises 5 modules, each of 8-weeks' duration: 1. Introduction to the study of diabetic retinopathy; 2. Diabetic eye screening: programmes, processes and protocols; 3. Preparing the patient for Diabetic Eye Screening; 4. Performing Retinal Screening; 5. Assessing retinal images. Learners undertaking the subsidiary 'University Certificate in Imaging for DR Screening' take modules 1 to 4. Learners on the 'University Certificate in Grading for DR Screening' complete modules 1, 2 and 5 **RESULTS.** Since the first course in 2015, 270 learners from 26 non-UK countries have registered on a qualification: 140 taking the full Cert-HE;

109 to take the Univ. Cert. in Grading and 21 on the Univ. Cert. in Imaging. There are 18 current learners (17 on Cert-HE and 1 on Imaging) who only commenced during 2019. Of the 252 learners who could have qualified by end of December 2019, 118 were awarded the full Cert-HE, 107 completed the Grading qualification and 20 completing the Imaging qualification plus 7 learners unfortunately leaving before qualification. Four of the 7 left due to leaving workplace or profession, only one person cited competing work pressures, one had funding difficulties and one who returned to Medical School. Three of the 7 were from Jamaica with one each from Malawi, Nigeria, Philippines and Saudi Arabia. Seventy-six successful learners were from China, 50 from the Republic of Ireland, 23 from Jamaica, 17 from St. Lucia and 10 each from Italy and Tanzania. The remaining 20 countries each provided 1 to 9 successful learners

CONCLUSIONS. Staff working in diabetic retinopathy screening services in 26 non-UK countries had little problem accessing and taking on-line distance-learning courses with fewer than 3% failing to qualify.

Technology

[Tele-ophthalmology and artificial intelligence for diabetic retinopathy screening](#) February 2021, The Lancet Global Health Commission on Global Eye Health

The International Diabetes Federation estimates that currently there are approximately 463 million people living with diabetes worldwide, requiring regular diabetic eye care, preferably by imaging the retina, in order to provide timely treatment to those with sight threatening disease.¹ Since 2000, in many parts of the world teleophthalmology using mobile fundus cameras have enabled a large proportion of those requiring retinal photography to be imaged.^{2,3} However, the human workforce skilled in analysing these images is insufficient in size, with

marked distributional imbalances between populations in need and practioners.^{2,4}

[Blind spots in telemedicine: a qualitative study of staff workarounds to resolve gaps in diabetes management](#) August 2018, BMC Health Services Research

BACKGROUND Novel telemedicine platforms have expanded access to critical retinal screening into primary care settings. This increased access has contributed to improved retinal screening uptake for diabetic patients, particularly those treated in Federally Qualified Health Centers ('safety net' clinics). The aim of this study was to understand how the implementation of telemedical screening for diabetic retinopathy within primary care settings is improving the delivery of critical preventative services, while also introducing changes into clinic workflows and creating additional tasks and responsibilities within resource-constrained clinics. **METHODS** A qualitative approach was employed to track workflows and perspectives from a range of medical personnel involved in the telemedicine platform for diabetic retinopathy screening and subsequent follow-up treatment. Data were collected through semi-structured interviews and participant observation at three geographically-dispersed Federally Qualified Health Centers in California. Qualitative analysis was performed using standard thematic analytic approaches within a qualitative data analysis software program. **RESULTS** The introduction of telemedicine platforms, such as diabetic retinopathy screening, into primary care settings is creating additional strain on medical personnel across the diabetes eye care management spectrum. Central issues are related to scheduling patients, issuing referrals for follow-up care and treatment, and challenges to improving adherence to treatment and diabetes management. These issues are overcome in many cases through workarounds, or when medical staff work outside of their job descriptions, purview, and permission to move patients through the diabetes

management continuum. **CONCLUSIONS** This study demonstrates how the implementation of a novel telemedical platform for diabetic retinopathy screening contributes to the phenomenon of workarounds that account for additional tasks and patient volume. These workarounds should not be considered a sustainable model of health care delivery, but rather as an initial step to understanding where issues are and how clinics can adapt to the inclusion of telemedicine and ultimately increase access to care. The presence of workarounds suggests that as telemedicine is expanded, adequate resources, as well as collaborative, cross-sectoral co-design of new workflows must be simultaneously provided. Systematic bolstering of resources would contribute to more consistent success of telemedicine screening platforms and improved treatment and prevention of disease-related complications.

Staff perceptions, experiences, and views

[Attitudes, access and anguish: a qualitative interview study of staff and patients' experiences of diabetic retinopathy screening](#)
December 2014, BMJ Open

OBJECTIVE To examine the experiences of patients, health professionals and screeners; their interactions with and understandings of diabetic retinopathy screening (DRS); and how these influence uptake. **DESIGN** Purposive, qualitative design using multi-perspectival, semi-structured interviews and thematic analysis. **SETTING** Three UK Screening Programme regions with different service-delivery modes, minority ethnic and deprivation levels across rural, urban and inner-city areas, in general practitioner practices and patients' homes. **PARTICIPANTS** 62 including 38 patients (22 regular-screening attenders, 16 non-regular attenders) and 24 professionals (15 primary care professionals and 9 screeners). **RESULTS** Antecedents to attendance included knowledge

about diabetic retinopathy and screening; antecedents to non-attendance included psychological, pragmatic and social factors. Confusion between photographs taken at routine eye tests and DRS photographs was identified. The differing regional invitation methods and screening locations were discussed, with convenience and transport safety being overriding considerations for patients. Some patients mentioned significant pain and visual disturbance from mydriasis drops as a deterrent to attendance. **CONCLUSIONS** In this, the first study to consider multiperspectival experiential accounts, we identified that proactive coordination of care involving patients, primary care and screening programmes, prior to, during and after screening is required. Multiple factors, prior to, during and after screening, are involved in the attendance and non-attendance for DRS. Further research is needed to establish whether patient self-management educational interventions and the pharmacological reformulation of shorter acting mydriasis drops, may improve uptake of DRS. This might, in turn, reduce preventable vision loss and its associated costs to individuals and their families, and to health and social care providers, reducing current inequalities.

[Pharmacy staff opinions regarding diabetic retinopathy screenings in the community setting: findings from a brief survey](#)
November 2013, America Health and Drug Benefits

BACKGROUND Diabetic retinopathy is a retinal vascular disorder that affects more than 4.1 million people in the United States. New methods of detecting and ensuring adequate follow-up of this life-altering disease are vital to improving patient outcomes. Wills Eye Hospital and the Centers for Disease Control and Prevention are conducting a collaborative study to initiate a novel diabetic retinopathy screening in the community setting. **OBJECTIVE** To evaluate the feasibility of a more widespread, large-scale implementation of this novel

model of care for diabetic retinopathy screening in the community setting. **METHODS** A simple, self-administered survey was distributed to pharmacists, pharmacy technicians, student pharmacists, and Wills Eye Hospital interns. The survey consisted of open-ended questions and responders were given 1 week to respond. A total of 22 surveys were distributed and 16 were completed. The responses were culled and analyzed to assess the feasibility of implementing this novel screening model in the pharmacy. **RESULTS** The response rate to this pilot survey was 72%. The majority of the responding pharmacy staff members indicated that diabetic retinopathy screening in community pharmacies would greatly benefit patients and could improve patient care. However, they also noted barriers to implementing the screening, such as concerns about the cost of carrying out the screenings, the cost of the equipment needed to be purchased, and the lack of time and shortage of pharmacy staff. **CONCLUSION** The potential exists for pharmacists to positively influence diabetes care by implementing retinopathy care through the early detection of the disease and reinforcement of the need for follow-up; however, real-world barriers must be addressed before widespread adoption of such a novel model of care becomes feasible.

New ways of working

[Conference abstract: The use of quality improvement continuing medical education to improve the evaluation of diabetic retinopathy](#) July 2018, Diabetes

Rationale: Diabetic Retinopathy (DR) is a leading cause of vision loss worldwide. While regular screening can lead to earlier interventions, reduce vision loss, and improve patient outcomes, baseline screening in patients at risk for DR has traditionally been low. **Method(s):** To improve screening rates for DR, Vindico Medical Education and staff from the Cole Eye Institute at the Cleveland Clinic (CC) developed and executed a

quality improvement CME (QI-CME) initiative within a closed network of endocrinologists and primary care physicians (PCPs) who see patients with diabetes. Interventions included a series of live, print, and web-based CME activities focused on the timely referral of patients with diabetes for ophthalmic evaluation. **Result(s):** At baseline, 95.5% and 71% of endocrinologists and PCPs, respectively, asked their patients about ophthalmologic signs and symptoms, though there was significant delay in the time between initial patient visit and follow-up with ophthalmology among the providers (173.2 days for endocrinologists and 184.8 days for PCPs). After delivery of the QI-CME within the closed system, there were significant gains in knowledge and competence as well as a 125-day and 130-day reduction in time between initial patient visit and ophthalmology follow-up, among endocrinologists and PCPs, respectively. **Conclusion(s):** This program demonstrated that the sequential delivery of targeted CME coupled with patient chart reviews within a closed health system is a relatively simplistic, yet powerful model to address this practice gap toward improved patient outcomes by avoided vision loss. Notably, this model may be easily adopted to engage additional pertinent audiences, such as ophthalmologists, or to different therapeutic areas that rely on timely referral to a specialist for appropriate care.

[Task sharing in the eye care workforce: Screening, detection, and management of diabetic retinopathy in Pakistan. A case study](#) March 2018, The International Journal of Health Planning and Management *Abstract only**

PURPOSE Diabetic retinopathy (DR) is a preventable cause of vision loss. Reducing vision loss due to DR and providing access to eye care services for people with diabetes have been severely constrained by a shortage in the number of ophthalmologists. This study aimed to explore the potential for task sharing in the eye care workforce for screening, detection,

and management of DR. **METHODS** Using purposive sampling, 24 participants were recruited from four selected hospitals in 2 provinces in Pakistan. Face-to-face interviews were conducted to explore the potential for task sharing in DR management. **RESULTS** Amongst 24 participants recruited, 22 (91.7%) including administrators (n = 3), ophthalmologists (n = 10), optometrists (n = 3), mid-level eye care workers (n = 4), and endocrinologist (2) participated in the study. All participants indicated the need for an organised screening program for DR detection through task sharing. Participants suggested that people with diabetes can be sent directly to an optometrist for initial eye exams, rather than making them wait to be examined by an ophthalmologist. Factors favouring task sharing included the name task sharing rather than task shifting and a high demand for eye care services. Major barriers to implementation of task sharing included the lack of a trained eye care workforce in the healthcare system and the lack of coordination amongst health professionals and policy makers. **CONCLUSION** Participants were accepting task sharing approach and believed that task sharing could improve access to eye care services for people with diabetes and better utilise the services of eye and healthcare providers.

[An Innovative Australian Outreach Model of Diabetic Retinopathy Screening in Remote Communities](#) 2016, Journal of Diabetes Research

Background. Up to 98% of visual loss secondary to diabetic retinopathy (DR) can be prevented with early detection and treatment. Despite this, less than 50% of Australian and American diabetics receive appropriate screening. Diabetic patients living in rural and remote communities are further disadvantaged by limited access to ophthalmology services. **Research Design and Methods.** DR screening using a nonmydriatic fundal camera was performed as part of a multidisciplinary diabetes service already visiting remote

communities. Images were onforwarded to a distant general practitioner who identified and graded retinopathy, with screen-positive patients referred to ophthalmology. This retrospective, descriptive study aims to compare the proportion of remote diabetic patients receiving appropriate DR screening prior to and following implementation of the service. **Results.** Of the 141 patients in 11 communities who underwent DR screening, 16.3% had received appropriate DR screening prior to the implementation of the service. In addition, 36.2% of patients had never been screened. Following the introduction of the service, 66.3% of patients underwent appropriate DR screening ($p = 0.00025$). **Conclusion.** This innovative model has greatly improved accessibility to DR screening in remote communities, thereby reducing preventable blindness. It provides a holistic, locally appropriate diabetes service and utilises existing infrastructure and health workforce more efficiently.

eLearning

[Diabetic eye screening: education and training](#) May 2018, Public Health England
Training and continuing professional development (CPD) for people working in the diabetic eye screening (DES) programme in England.

[NHS population screening: education and training](#) February 2021, Public Health England
Resources to support screening professionals in their initial training and continuing professional development (CPD).

Competency Frameworks

An Integrated Career and Competency Framework for Diabetes

Nursing 5th edition 2019, TREND UK

See section 23 p. 32 “Retinopathy”

The framework can be used in a number of ways to develop and promote nurses’ knowledge and skills. For example, to provide:

- Help for individual nurses to plan their professional development in diabetes care.
- Guidance for employers on assessing the competence required at various levels of diabetes nursing.
- A reference for planning educational programmes.
- Information for commissioners to identify appropriate staff required to deliver diabetes services to meet local need

2. Retinal detachment

Published Peer Reviewed Research

Early impact of COVID-19 outbreak on eye care: Insights from EUROCOVCAT group January 2021, European Journal of Ophthalmology

The recent outbreak of coronavirus disease 2019 (COVID-19) has been declared a public health emergency worldwide. The scientific community has put in much effort and published studies that described COVID-19's biology, transmission, clinical diagnosis, candidate therapeutics, and vaccines. However, to date, only a few data are available on the impact of COVID-19 pandemic on ophthalmological care in different health care systems, its future consequences in terms of disability, and access to sight-saving cures for many patients. To reduce human-to-human transmission of the virus and also ensure supply of infrastructures, human resources, and disposable medical devices to many regions, it is crucial to assess risks and postpone non-essential outpatient visits and elective surgical procedures, especially in older patients and those with comorbidities. This delay or suspension in essential eye procedures may cause significant and rapid vision impairment to irreversible blindness. Determining the risk-benefit profile of treating these ocular pathologies is a public health issue of supreme priority, even though many patients benefiting from therapeutic treatments are elderly, who are more vulnerable to COVID-19. If not reversible, this process could lead to a dramatic increase in disability and unsustainable social costs for many Governments. Copyright © The Author(s) 2020.

Non-Physician delivered intravitreal injection service is feasible and safe - A systematic review May 2016, Danish Medical Journal

Introduction: Non-physicians such as nurses are trained to give injections into the vitreous body of the eye to meet the increasing demand for intravitreal therapy with vascular endothelial growth factor inhibitors against common eye diseases, e.g. age-related macular degeneration and diabetic retinopathy. We systematically reviewed the existing literature to provide an overview of the experiences in this transformational process. Method(s): We searched for literature on 22 September 2015 using PubMed, Embase, the Cochrane Library, CINAHL and the Web of Science. Eligible studies had to address any outcome based on non-physician delivered intravitreal therapy regardless of the study design. Being non-physician was defined as the injecting personnel not being a physician, but no further restrictions were made. Result(s): Five studies were included with a total of 31,303 injections having been performed by 16 nurses. The studies found that having nurses perform the intravitreal injections produced to a short-term capacity improvement and liberated physicians for other clinical work. Training was provided through courses and direct supervision. The rates of endophthalmitis were 0-0.40, which is comparable to reported rates when the intravitreal therapy is given by physicians. Conclusion(s): Non-physician delivered intravitreal therapy seems feasible and safe. Copyright © 2016, Danish Medical Association. All rights reserved.

Transformational change: Nurses substituting for ophthalmologists for intravitreal injections - A quality-improvement report April 2014, Clinical Ophthalmology

Background: The dramatic increase in need for anti-vascular endothelial growth factor (anti-VEGF) intravitreal therapy in the treatment of retinal disease and the absence of an equivalent

increase in ophthalmologists to undertake such intravitreal injections created a patient-safety risk. Timing of intravitreal therapy (IVT) is critical to prevent vision loss and local clinics lacked capacity to treat patients appropriately. We aimed to improve capacity for IVT by nurse injections. Material(s) and Method(s): A multidisciplinary prospective service-improvement process was undertaken at two adjacent general hospitals in the northwest of England. IVT injections by nurses were a principal component of solution development. After we had obtained appropriate institutional approval, experienced ophthalmic nurses were trained, supervised, and assessed to undertake IVT. Ophthalmologists directly supervised the first 200 injections, and a retina specialist was always on site. Result(s): Nurses undertook 3,355 intravitreal injections between June 2012 and November 2013, with minor adverse events (0.3% subconjunctival hemorrhage and corneal abrasion). There were no patient complaints at either hospital. Conclusion(s): Experienced ophthalmic nurses quickly learned how to perform such injections safely. IVT by nurses was well accepted by patients and staff. Hospital A trained three nurses sequentially for improved flexibility in scheduling. Novel use of appropriately trained nonmedical staff can improve efficiency and access in an overburdened service with time-sensitive disease. Retinal assessment was undertaken by ophthalmologists only. Improved access to IVT is important, as treatment with anti-VEGF therapy reduces blindness at population levels. © 2014 Michelotti et al.

3. Cataracts

Key publications – the big picture

[Workforce Guidance: Cataract Services and Workforce](#)

[Calculator Tool](#) March 2021, The Royal College of

Ophthalmologists

Working with primary and secondary partners and patients, the guidance includes a workforce calculator tool to support workforce planning to meet demand. Cataract surgery is the UK's most common elective operation. Approximately half a million operations are performed each year and demand is set to increase 25% over the next decade, as the population ages. Cataract services around the UK are being redesigned to increase their capacity, through streamlining pathways and integration with primary care optometry, as described in the [GIRFT report](#). Significant work is being done to improve referrals, optimise surgical throughput and implement post-operative review by primary care optometrists.

Read the [Cataract Services Workforce Guidance March 2021](#) and download the [RCOphth cataract workforce calculator tool Mar2021](#) (A video instruction on how to use the calculator tool document is embedded in the file)

Read the [Cataract Services Workforce Guidance Stakeholder Feedback and Changes Mar2021](#)

See also the [Cataract Hubs and High Flow Cataract Lists](#) document

Published Peer Reviewed Research

New ways of working

[Cataract Surgery Redesign: Meeting Increasing Demand, Training, Audit and Patient-Centered Care 2021](#), Clinical Ophthalmology

Objective The demand for cataract surgery in Fife (a well-defined region in southeast Scotland) was steadily increasing over 15 years. Cataract surgery was therefore being outsourced to meet demand with consequences on list mix, training needs, patient experience and staff morale. We aimed to redesign our services to meet local demand, retain a patient-centered service and continue to fulfil training needs. **Methods** We quantified cataract surgery delivery over an 18-month period: before, during and after redesign of services. We studied numbers of operations, trainee cases and number of outsourced cases. We also considered the economic implications of the redesign. **Results** We studied three periods (each of six months duration): before redesign (BR), redesign period (RP) and post-redesign (PR). Data were collected on total operation numbers, number of cases performed by trainees, and numbers performed out with normal working hours (weekend lists) and external providers. An economic analysis examined the cost of outsourcing cataracts during BR and RP and the costs of the redesign, including building, equipment and additional nursing staff. **Conclusion** Regional fulfilment of cataract surgery provision remains a continuous challenge within the NHS. We show that with minimal investment, smart redesign process and collaborative working, increased local provision is possible while fulfilling trainee needs and achieving the necessary clinical audits and national standards.

Conference abstract: A realist evaluation of collaborative care models July 2019, Investigative Ophthalmology and Visual Science

Purpose: Chronic eye diseases place high demand on eye care services. To improve access, some health systems use 'collaborative' care involving multidisciplinary teams of nurses, optometrists and ophthalmologists to deliver standardised care. This study aims to understand factors for successful implementation and scalability of collaborative care. **Method(s):** Semi-structured interviews were conducted in Finland and UK from Sep-Oct 2018; with 13 health system stakeholders, including clinicians, managers and administrators. Qualitative data were analysed using a realist framework to identify contexts, mechanisms, and outcomes of implementation. **Result(s):** Context: Collaborative care covered glaucoma, DR, AMD, and cataract. National policy and targets often pre-empted the introduction of such models. It was unanimously reported as a necessity to improve access and equity under limited resources. Mechanisms: System change was always clinician-led and relied on using existing resources to gain support of hospitals. Task-shifting meant better skill use across teams. Some felt clinicians also needed courage and motivation. Often monetary incentives were used. Training enhanced optometrist and nurse skills; and regular feedback fostered confidence in decision making. Ophthalmologists also felt that these mechanisms built the trust needed to shift clinical responsibility. Models relied on centralised IT systems for communication and sharing patient records-this was integral to success or failure. Audits were used to measure and benchmark success. However, many felt that current IT systems did not adequately support all aspects of the model. **Outcome(s):** Success was primarily measured by patient volume and staff productivity. Other success measures were cost, wait-time, hospital capacity, or maintaining clinical care. Indirect benefits included staff satisfaction from

upskilling/opportunities and improved understanding of care pathways. However, staff reported stress when the system failed. Models were suited for patients of all ages with low level disease; and patients were mostly satisfied. Clinicians suggested the models were less suited to patients with comorbidities, rapid changes, or mobility and cognitive issues. **Conclusion(s):** A range of factors lead to the success of collaborative care models, and learning from these can inform adoption and scalability in other settings.

Time and motion studies of National Health Service cataract theatre lists to determine strategies to improve efficiency

September 2018, The British Journal of Ophthalmology

AIM To provide a quantitative assessment of cataract theatre lists focusing on productivity and staffing levels/tasks using time and motion studies. **METHODS** National Health Service (NHS) cataract theatre lists were prospectively observed in five different institutions (four NHS hospitals and one private hospital). Individual tasks and their timings of every member of staff were recorded. Multiple linear regression analyses were performed to investigate possible associations between individual timings and tasks. **RESULTS** 140 operations were studied over 18 theatre sessions. The median number of scheduled cataract operations was 7 (range: 5-14). The average duration of an operation was 10.3 min \pm (SD 4.11 min). The average time to complete one case including patient turnaround was 19.97 min (SD 8.77 min). The proportion of the surgeons' time occupied on total duties or operating ranged from 65.2% to 76.1% and from 42.4% to 56.7%, respectively. The correlations of the surgical time to patient time in theatre was $R^2=0.95$. A multiple linear regression model found a significant association ($F(3,111)=32.86$, $P<0.001$) with $R^2=0.47$ between the duration of one operation and the number of allied healthcare professionals (AHPs), the number of AHP key tasks and the time taken to perform these key tasks by the AHPs.

CONCLUSIONS Significant variability in the number of cases performed and the efficiency of patient flow were found between different institutions. Time and motion studies identified requirements for high-volume models and factors relating to performance. Supporting the surgeon with sufficient AHPs and tasks performed by AHPs could improve surgical efficiency up to approximately double productivity over conventional theatre models.

[Re-configuring the Model of Eye Care in Ireland - integrating community and hospital care](#) October 2017, International Journal of Integrated Care

Introduction: Ireland continues to experience significant population growth with the greatest increases in the over 65 years age group. Increasing patient numbers and the growing incidence of chronic diseases are placing an enormous strain on the current model of eye care delivery. Even with the current population, waiting lists for ophthalmology outpatient appointments and inpatient procedures are among the longest and most numerous in the health service. The diagnosis and treatment of many chronic eye conditions is currently delivered in acute hospitals, whereas much of these interventions could be delivered in the primary care setting in a decentralised model. **Description of policy context and objective:** The National Clinical Programme (NCP) for Ophthalmology has determined that in line with Government policies such as Future Health, the majority of services should be provided within the primary care setting. As such, integration of acute and primary care services is essential in order to allow for rebalancing of access and delivery of eye care services from acute hospitals to primary care. The aim is to provide high-quality, consistent, efficient and effective care. **Targeted population:** The NCP takes a whole population approach with particular emphasis on the paediatric and geriatric population **Highlights:** The key recommendations

of the Model of Eye Care are: 1. Development of multidisciplinary primary eye care teams with all team members working in the same location. This will require investment in community clinics, both in staff numbers and in equipment, and better integration between community and hospital care. 2. Investment in information technology, including standardised equipment and electronic health records, to enable a hub-and-spoke regional delivery of care and an integrated system. 3. Expansion of theatre access and establishment of stand-alone high-volume consultant-led cataract theatres with a full complement of support staff in order to facilitate a timelier response from the surgical centres, thereby keeping waiting times to a minimum. 4. Establishment of clear and concise clinical referral pathways in order to minimise unnecessary referrals. This will include a focus on effectiveness and efficiency of eye care services delivery. **Conclusions:** The NCP has developed a Model of Eye Care based on the key recommendations and is working towards its implementation which will require engagement across the HSE Divisions as appropriate in order to ensure that diagnosis, treatment and management are integrated across the service, underpinned by an electronic health record which will allow ease of audit and collection of data. This will in turn allow standardisation of quality of care and assessment of effectiveness of the Programme. Aspects of the programme such as the MDTs will be progressed through the Primary Care Division, while other aspects such as expanded theatre access will be progressed through the Acute Division. Close cooperation and regular sharing of information will be necessary across both the Primary Care and Acute Divisions. A close relationship will identify any gaps in service and allow development of business cases for proposals to fill those gaps as well as informing ongoing service planning and delivery.

Supply

[Adequacy of the ophthalmology workforce under Ontario's Local Health Integration Networks](#) June 2016, Canadian Journal of Ophthalmology *Abstract only**

OBJECTIVE To determine the current distribution of ophthalmologists across Ontario's Local Health Integration Networks (LHINs) and the influence on LHIN-specific cataract surgery wait times. **DESIGN** Cross-sectional study. **PARTICIPANTS** Ophthalmologists listed in the College of Physicians and Surgeons (CPSO) database and the Canadian population. **METHODS** A list of ophthalmologists and their practice locations were obtained from the CPSO website. The total population count for Ontario was obtained from the Statistics Canada census. The population counts for the population aged 65 years and older were generated using the Canadian Socioeconomic Information Management System (CANSIM) table 109-5425. Cataract surgery wait times were obtained from the Ontario Ministry of Health. Statistical analysis was completed using Microsoft Excel using StatPlus software. **RESULTS** There are currently 3.28 ophthalmologists per 100 000 total population in Ontario. LHIN-specific ratios ranged from 8.87 (Toronto Central) to 1.67 (Central West), with 3 out of 14 LHINs having met the previously recommended ratio of 3.37. Median cataract surgery wait times ranged from 30 to 72 days. Although the number of cataract surgeries performed was positively correlated with the population aged 65 years and older ($p < 0.001$), there was no statistically significant association between wait times and number of cataract cases per 1000 population ($p = 0.41$). **CONCLUSIONS** Although Ontario appears to have a sufficient number of ophthalmologists overall, there is significant variation in the distribution of the ophthalmology workforce at the LHIN level.

This variation did not appear to significantly influence LHIN-specific cataract surgery wait times.

Demographics

[Gender gap and declining surgical activity among new graduates: cataract surgery in Ontario](#) June 2016, Canadian Journal of Ophthalmology *Abstract only**

OBJECTIVE To investigate the proportion of ophthalmologists performing cataract surgery; the volume performed; and the influence of career stage, sex, and trends over time. **DESIGN** Population-based study of cataract surgical practice patterns among all ophthalmologists in Ontario, Canada, from April 1999 to March 2013. **PARTICIPANTS** All active ophthalmologists in Ontario, Canada, providing government health care for the provincial population of approximately 13 million. **METHODS** The IntelliHealth database operated by the Ministry of Health and Long Term Care, which has excellent accuracy for procedure performance, was used to obtain anonymized physician services. **RESULTS** The percentage of ophthalmologists performing cataract surgery decreased (68% to 64%), but the yearly mean number of cataract surgeries performed per person increased 1.5 times (307.7 to 470.2). The percentage of early-career ophthalmologists performing cataract surgery declined from 85% to 62%, and this was accompanied by a decline in the median number of cases performed per early-career surgeon (from 243.0 to 169.5). This decline in surgical activity among new graduates was accompanied by growth in the percentage of high-volume and late-career surgeons. In each of the years studied, males performed more surgeries per person than their female counterparts, and this gap grew from 1.4 times to 1.7 times more cataract surgery from 2000 to 2013. **CONCLUSIONS** Early-career ophthalmologists are becoming less active with cataract surgery, which may be

explained by the increasing surgical activity among late-career and high-volume ophthalmologists. A large sex and volume gap exists among cataract surgeons, which continues to increase.

Competency Frameworks

The Common Clinical Competency Framework for Non-medical Ophthalmic Healthcare Professionals in Secondary Care: Cataract November 2016, The Royal College of Ophthalmologists

The basic skill set of an ophthalmic non-medical health care professional (qualified optometrist, orthoptist, ophthalmic nurse or ophthalmic clinical scientist) is to:

- Perform basic clinical ophthalmic assessment
- Follow protocols within their scope of practice under appropriate supervision
- Detect abnormalities through assessment and act on these findings
- Not make a diagnosis or treat

This level of skills and competences is essential before undertaking further training and education for a Level 1 expanded role; and some HCPs may need additional ophthalmic training (basic ophthalmic training courses) to obtain these skills. Possession of a competence indicates demonstration of an understanding of the underlying principles, limitations and benefits of the skill, as well as being able to elicit the appropriate information accurately

4. Glaucoma

Published Peer Reviewed Research

COVID-19

Glaucoma care during the coronavirus disease 2019 pandemic

March 2021, Current Opinion in Ophthalmology *Abstract only**

PURPOSE OF REVIEW The current article reviews the impact of the coronavirus disease 2019 (COVID-19) pandemic on the delivery of ophthalmic, and specifically, glaucoma care.

RECENT FINDINGS Literature from the review period includes case series demonstrating the presence of severe acute respiratory syndrome coronavirus 2 RNA in the conjunctival secretions of patients with laboratory-confirmed COVID-19. The global ophthalmology community published reports outlining the enhanced infection control measures undertaken by different institutions around the world to mitigate transmission of the novel coronavirus. Telemedicine has been increasingly implemented in glaucoma practices to reduce in-office patient volume. New data regarding the efficacy and feasibility of tools for home monitoring of intraocular pressure, virtual visual field testing, and remote disc photography are reviewed.**SUMMARY** COVID-19 has posed a global public health threat due to the severity of its contagion and associated morbidity and mortality. Glaucoma specialists have responded to the pandemic with innovative modifications to reduce viral transmission and optimize patient and staff safety in the office and operating room. The role of teleglaucoma has expanded and will continue to evolve as remote diagnostic devices undergo further refinement and validation.

[Drive-through Intraocular Pressure Checks during the COVID-19 Pandemic](#) March 2021, Journal of Glaucoma *Abstract only**

Precis:A drive-through clinic was created to obtain intraocular pressure measurements before a virtual visit with their provider, in order to provide care for patients in the Kellogg Glaucoma Clinic while minimizing risk of COVID-19 transmission.

Purpose(s):The aim of this study was to establish a drive-through clinic model to provide glaucoma care for patients while minimizing the risk of COVID-19 transmission.

Methods:A drive-through clinic was created by adapting a 1-lane, 1-way driveway adjacent to the Kellogg Eye Center building entrance. Patients were physicians selected from the Glaucoma Clinic at Kellogg Eye Center as existing patients who required intraocular pressure (IOP) checks and therapeutic management and were chosen based on their ability to be managed with an IOP measurement primarily. The entrance was otherwise closed to the public, allowing staff to utilize an adjacent vestibule with glass walls and sliding doors as a staffroom. Patients were instructed to arrive within a 15-minute time window at which time they would drive through the lane and stop their cars under an awning over the driveway.

Ophthalmic technicians wearing appropriate personal protective equipment then approached each car, confirmed patient information, and measured IOP. Once the data were recorded using a mobile workstation, the physician was able to complete each visit by discussing the findings and therapeutic plan with the patient, either in-person in real time or virtually by phone or video visit at a later time. **Result(s):**A total of 241 visits were completed over 14 half day clinic sessions, with number of drive-through visits ranging from 5 to 45 per session.

Conclusion(s):It is possible to institute a drive-through model of IOP checks for glaucoma patients which is efficient and minimizes the risk of exposure to COVID-19 for patients and staff. Copyright © 2021 Lippincott Williams and Wilkins. All rights reserved.

[Letter: Emerging from the first COVID-19 wave: Archetyping the new NHS ophthalmic waiting room](#) January 2021, BMJ

Innovations

The COVID-19 global pandemic has brought the world to a relative standstill, dampening the fervour of eye care specialists hoping to make 2020 the year of championing ocular health. Even so, the seemingly insurmountable challenges we find ourselves facing as a specialty in this dark period have the potential to bring about long-term solutions to age-old problems. Enter the ophthalmic waiting room. In the UK, NHS Digital's 2019 report on outpatient attendances placed ophthalmology as the busiest outpatient specialty, seeing 7.9million patients a year.¹ This translated to nearly 10% of all outpatient visits coming through the ophthalmic waiting room. Additionally, alongside our ageing population, the improving community detection of eye conditions contributes to an increased need for ophthalmic outpatient care year on year.

Virtual clinics

[Virtual clinics for glaucoma care - Patients' and clinicians' experiences and perceptions: a qualitative evaluation](#) March 2021, Eye (London, England)

BACKGROUND The role of glaucoma virtual clinics has developed to help meet demand for capacity within busy glaucoma services. There is limited research of patient and clinician experiences and perceptions of these clinics and the aim of this study is to provide further information to help improve patient experience and guide service delivery.

METHODS A mixed methods research design was employed comprising of a patient satisfaction survey, and patient and clinician interviews. Consultant ophthalmologists were recruited from throughout the UK, and patients and data gathering clinical staff recruited from the Manchester Royal Eye Hospital and

Bristol Eye Hospital. RESULTS We received a total of 148 patient satisfaction questionnaires with an overall response rate of 55.4%. Most respondents were diagnosed with primary open angle glaucoma (33.9%) at Manchester and glaucoma suspect status at Bristol (50.6%). Patients had high levels of confidence in the person conducting the tests (94.8% Manchester, 98.8% Bristol), and most were likely to recommend the service to family or friends (94.8% Manchester, 92.6% Bristol). We interviewed 10 consultant ophthalmologists, 10 data gathering staff and 20 patients. A number of key themes emerged from the transcribed interviews including: patient experience, clinician perception of patient experience, service delivery, staffing and staff experience, and patient safety. CONCLUSIONS Glaucoma virtual clinics can be acceptable to both clinicians and patients, including those with a varied complexity of glaucoma and glaucoma-related disease. Dissatisfaction seemed to relate to poor communication or processes and systems within the service rather than complexity of disease.

[Acceptability and use of glaucoma virtual clinics in the UK: a national survey of clinical leads](#) 2018, BMJ Open
Ophthalmology

Objective The purpose of this paper is to describe the findings of a national survey that aimed to estimate the proportion of Hospital Eye Service (HES) units using glaucoma virtual clinics, to determine how these services differ and to gauge clinicians' views and opinions on the safety and acceptability of this model of care compared with usual care. Methods and analysis This 12-question survey was disseminated nationally to 92 clinical lead consultant ophthalmologists using SurveyMonkey. Results The response rate was 45.7%. There were 21 out of the total 42 respondents (50.0%) who were based at an NHS Trust where glaucoma virtual clinics were already being used and a further 9

(21.4%) were planning to establish one. Clinical leads largely rated efficiency and patient safety to be at least equivalent to usual care (92.9%) and 81.0% perceived glaucoma virtual clinics to be acceptable to patients. The main reasons for not running glaucoma virtual clinics were insufficient staff (71.4%) and inadequate space (47.6%). The majority of those running virtual clinics used this model of care for 'lower risk' patients such as ocular hypertensives (90.5%) and glaucoma suspects. Conclusion Glaucoma virtual clinics are employed by a large proportion of HES units, with many seeking to develop such services. Clinical leads largely rate efficiency, patient safety and the perception of patient acceptability to be at least equivalent to usual care.

[A technician-delivered 'virtual clinic' for triaging low-risk glaucoma referrals](#) June 2017, Eye (London, England)

Purpose The purpose of this study is to describe the outcomes of a technician-delivered glaucoma referral triaging service with 'virtual review' of resultant data by a consultant ophthalmologist. Patients and methods The Glaucoma Screening Clinic reviewed new optometrist or GP-initiated glaucoma suspect referrals into a specialist ophthalmic hospital. Patients underwent testing by three ophthalmic technicians in a dedicated clinical facility. Data were reviewed at a different time and date by a consultant glaucoma ophthalmologist. Approximately 10% of discharged patients were reviewed in a face-to-face consultant-led clinic to examine the false-negative rate of the service. Results Between 1 March 2014 and 31 March 2016, 1380 patients were seen in the clinic. The number of patients discharged following consultant virtual review was 855 (62%). The positive predictive value of onward referrals was 84%. Three of the 82 patients brought back for face-to-face review were deemed to require treatment, equating to negative predictive value of 96%. Conclusions Our technician-delivered glaucoma referral

triaging clinic incorporates consultant 'virtual review' to provide a service model that significantly reduces the number of onward referrals into the glaucoma outpatient department. This model may be an alternative to departments where there are difficulties in implementing optometrist-led community-based referral.

Training and education

Barriers to glaucoma case finding as perceived by optometrists in Ireland January 2018, Clinical & Experimental Optometry

BACKGROUND This research was designed to provide an in-depth exploration of the perceptions of optometrists relating to the challenges of glaucoma case finding in the Irish health-care system. **METHODS** A survey was developed, piloted and distributed for anonymous completion by optometrists registered to practise in Ireland. The survey included 10 five-level Likert items exploring potential barriers to glaucoma detection and a free-text box for participants to comment more broadly. **RESULTS** One hundred and ninety-nine optometrists (27 per cent of registrants) responded to the survey. Among the barriers identified, there was notable agreement (71 per cent) with the need for extra training on glaucoma detection. Logistic regression showed that optometrists without postgraduate qualifications were more likely to agree with the need for extra training (OR 3.2, 95 per cent CI 1.3-8.1). Respondents largely agreed (61 per cent) that patient unwillingness to pay additional fees for supplementary glaucoma-specific tests was also a barrier. Appointment times of less than 30 minutes were significantly associated with six of the 10 proposed barriers to glaucoma detection. A logistic regression analysis ($n = 179$) confirmed that the time allotted per appointment was a significant predictor of the agreement time of optometrists as a barrier ($\chi^2 [1] = 13.52, p < 0.001$). Multiple linear regression

showed that optometrists with less experience, charging lower fees, and working in large multiples or franchised practices have the shortest appointment times. **CONCLUSION** The strong link found between postgraduate education and the confidence of optometrists in detecting glaucoma indicates that optometrists wishing to increase their scope of practice in the new legislative environment in Ireland may more actively seek training in areas of interest. The responses also indicate a lack of funding for the level of diagnostic testing required for accurate glaucoma diagnosis. Recent increases in the state's eye examination fees look likely to address the identified time and financial barriers to glaucoma detection in Ireland. Future work should look to analyse the effects of increased funding on optometric case finding for glaucoma.

Expanding the traditional role of optometry: Current practice patterns and attitudes to enhanced glaucoma services in Ireland October-December 2018, Journal of Optometry

Purpose: To investigate current diagnostic equipment availability and usage for glaucoma case-finding within community optometric practice, and to explore optometrists' attitudes towards an enhanced scope of clinical practice. **Methods:** An anonymous survey was developed, validated, and distributed to all optometrists in Ireland. **Results:** 199 optometrists (27% of registrants) responded to the survey. 87% had access to the traditional triad of tests necessary to conduct adequate glaucoma case finding. Standard automated perimetry was the most commonly absent (13%) of the three essential screening tests. 64% of respondents indicated that monocular direct ophthalmoscopy was their first choice technique for fundus examination. 47% of respondents had access to contact applanation tonometry, though just 14% used it as first choice during routine eye examinations. Among the 73 participants with access to both contact and non-contact tonometry (NCT), 80.8%, used NCT preferentially. The

significant majority (98%) indicated an interest in enhanced glaucoma services with 57% agreeing that postgraduate training was an essential prerequisite to any increase in scope of practice. Conclusion: Irish optometrists are well equipped with the traditional tests used in glaucoma detection. However, implementation of enhanced referral schemes or glaucoma monitoring or management services would require equipment upgrades and associated training in at least half of the surveyed practices. There is strong interest in furthering optometric professional development and expanding the traditional role boundaries of optometrists, incorporating further education as an essential prerequisite to an enhanced scope of practice.

Validity and reliability of eye healthcare professionals in the assessment of glaucoma - a systematic review June 2015, International Journal of Clinical Practice *Abstract only**

OBJECTIVE(S)To explore the validity and reliability of eye healthcare professionals with different levels of training in diagnosing and/or identifying glaucomatous progression.
CLINICAL RELEVANCE Substantial pressure is being placed on our current eye healthcare workforce by chronic diseases such as glaucoma. Shared care schemes and role expansion of professionals other than ophthalmologists are being proposed to alleviate this pressure. A sound evidence base is imperative to determine whether other allied health professionals are skilled and clinically competent, when it comes to taking on these new roles in glaucoma management.
METHODS A systematic review of research articles identified in MEDLINE, CINAHL, Embase, Scopus and Cochrane Library was performed. Studies which investigated rater reliability of various health professionals in diagnosing and/or identifying glaucoma progression against a reference standard were included.
RESULTS Of the 4088 publications identified by the initial database search, 32 met the inclusion criteria. The majority of studies demonstrated positive results, with most finding

moderate to substantial agreement for inter- and intra-rater reliability across all testing modalities. The eye health professionals with ophthalmology training consistently attained the greatest agreement. When allied health professionals with different levels of training were compared, those who had completed residency training were significantly better than those who had not. **CONCLUSION** The studies included in this review show promising results, including those raters without ophthalmology training. A lack of power calculations, unequal sample sizes in some studies and the diversity of the testing procedures used make it difficult to make sound inferences.

Diversity, Inclusion and Participation

Improving Racial Diversity in the Ophthalmology Workforce: A Call to Action for Leaders in Ophthalmology March 2021, American Journal of Ophthalmology

RACIAL INJUSTICE AND DISPARITIES HAVE BEEN AT the forefront of discussions in the United States during recent months. The tragic incidents of police brutality and the ravishing effects of COVID-19 on underrepresented minorities (URMs)—Black/African American, Hispanic/Latinx, and Native American—have highlighted the consequences of systemic racism that have been embedded in our country's history.¹ URMs are hospitalized owing to COVID-19 at 4 to 5 times the rate of White people.² Social determinants of health, such as employment, insurance, income, environmental exposures, and healthcare access, are underlying contributors, among others, to this health disparity.¹ Yet, numerous studies have demonstrated that racial and ethnic disparities in both health and healthcare persist after controlling for these social factors—a concerning finding that demonstrates the consequences of systemic racism and implicit bias.

New ways of working

Ophthalmic nurse practitioner assessment of glaucoma: evaluating agreement within an initiative to enhance capacity in glaucoma clinics January 2021, Eye (London, England)

Aims: A local service evaluation was conducted in order to compare clinical assessment measures and management decisions between an ophthalmic nurse practitioner and a reference standard glaucoma consultant, for patients referred into secondary care with suspected Chronic Open Angle Glaucoma or Ocular Hypertension. Methods: One hundred patients were selected. A clinical pathway incorporating the assessment methods recommended by National Institute for Health and Care Excellence (NICE) Glaucoma update 2017 (NG81) was delivered by a single ophthalmic nurse practitioner and the reference standard glaucoma consultant. Clinical findings and outcomes were recorded, with both practitioners being masked to each other's findings. Agreement was determined employing Cohen's kappa, measuring inter-rater agreement allowing for chance agreement. Results: Agreement was observed as follows: Visual field assessment (kappa $k = 0.806$, 95% CI 0.661-0.951); Optical Coherence Tomography evaluation (kappa $k = 0.648$, 95% CI 0.507-0.798); C:D Ratio assessment (Cronbach's alpha $\alpha = 0.96$, 95% CI 0.88-0.94); Diagnosis (kappa $k = 0.874$, 95% CI 0.818-0.914); and Treatment planning (kappa $\kappa = 0.844$, 95% CI 0.733-0.955). In three cases the nurse practitioner judged the optic nerve to appear normal, where the reference standard examiner detected glaucoma and commenced treatment. Conclusion: This service evaluation demonstrates how an ophthalmic nurse practitioner with appropriate theoretical knowledge and practical training, can develop skills to reach a high level of agreement in patient assessment and management for those patients with suspected glaucoma. Within the limitations of a single centre and single practitioner evaluation, our findings provide evidence

that this model of capacity expansion ought to merit wider consideration in secondary care glaucoma services.

Competency Frameworks

The Common Clinical Competency Framework for Non-medical Ophthalmic Healthcare Professionals in Secondary Care: Glaucoma November 2016, Royal College of Ophthalmologists

The basic skill set of an ophthalmic non-medical health care professional (qualified optometrist, orthoptist, ophthalmic nurse or ophthalmic clinical scientist) is to:

- Perform basic clinical ophthalmic assessment
- Follow protocols within their scope of practice under appropriate supervision
- Detect abnormalities through assessment and act on these findings
- Not make a diagnosis or treat

This level of skills and competences is essential before undertaking further training and education for a Level 1 expanded role; and some HCPs may need additional ophthalmic training (basic ophthalmic training courses) to obtain these skills. Possession of a competence indicates demonstration of an understanding of the underlying principles, limitations and benefits of the skill, as well as being able to elicit the appropriate information accurately.

Primary Eye Care Framework for first contact care June 2016 (Revision February 2018), Clinical Council for Eye Health Commissioning, College of Optometrists

This document has been developed using the best evidence available (NICE guidance, NICE Quality Standards, NHS Evidence, ophthalmic research literature, case studies and service audit) and relates solely to the commissioning of NHS Primary Eye Care Services in England beyond the NHS sight testing service. Most primary eye care is already delivered in optical practices. However, in many areas, there is no effective primary and community services to free up Hospital Eye

Service (HES) capacity. To tackle this problem, in line with recommendations of The Five Year Forward View (5YFV)¹, the Clinical Council for Eye Health Commissioning (CCEHC) has already developed a framework for Community Ophthalmology². Appropriate risk stratification of patients, more consistent pathways of care and use of the framework models will together lead to better value eye health care, better patient experience and better outcomes. As a result, HES clinics can focus on those patients who really need consultant expertise. This framework outlines the broad components of the Primary Eye Care Service in England. This is needed to support the clinical decision-making of primary eye care practitioners up to the point of referral. This document is not relevant to Scotland or Wales, where Primary Eye Care is contracted as a national service. What can be managed within the Primary Eye Care Service depends on skills and equipment, and on the risk of deterioration of the patient's condition but will typically include the ability to:

- manage a wide range of low-risk primary eye conditions
- address the needs of a patient presenting with an acute eye condition (first contact)
- conduct re-checks to confirm abnormal test results (detected by a NHS eye test/ eye examination) as outlined in NICE Glaucoma guidance (NG81)³ and Standard (QS7)^{4,5}
- further refine the decision to refer e.g. where risks and benefits are discussed with the patient prior to referral for cataract surgery (NICE Cataract guidance 1.2 (NG77))

HEE National Data Programme

HEE staff can look at the [National Data Warehouse \(NDL\)](#) SharePoint site to find out more about datasets and Tableau products.

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