

---

## Perspective in Ophthalmology

---

# Right services to right patients at right time in right setting in Tays Eye Centre

Anja Tuulonen,<sup>1</sup> Marko Kataja,<sup>1</sup> Ulla Syvänen,<sup>1</sup> Sirpa Miettunen<sup>1</sup> and Hannu Uusitalo<sup>1,2</sup>

<sup>1</sup>Tays Eye Centre, Tampere University Hospital, Tampere, Finland

<sup>2</sup>Research and Development Centre for Ophthalmic Innovations (SILK), Department of Ophthalmology, University of Tampere, Tampere, Finland

### ABSTRACT.

**Purpose:** The report describes the concepts behind procedures implemented in Tays Eye Centre to enable improved access to care and improved productivity.

**Methods:** The strategy was developed in 2009 after hospital district decided to construct a new eye hospital which was opened in 2012. The following principles were implemented: (i) identification of high-volume patient groups: the 'big four' eye diseases accounting for 70% of patient visits and costs: age-related macular degeneration (AMD), glaucoma, retinal diseases and cataract; (ii) stratification and prioritization of patient care based on risk of permanent visual disability; (iii) standardization of services for low-risk patients; (iv) maximization of productivity; and (v) shared care. The impact of the new strategy on access to care and productivity is reported for years 2011–2015.

**Results:** In 2011–2015, the total number of services provided increased 46% while the work contribution increased 15%. The number of referrals increased 76% and the number of outpatient appointments increased 2.5-fold. Simultaneously, the number of delayed follow-up visits decreased to zero. Age-related macular degeneration (AMD) injections increased 1.8-fold. However, after 50% yearly increase in Age-related macular degeneration (AMD) injections, a plateau was reached in 2014 with a 3% decline in 2014–2015 with no changes in treatment indications. In the beginning of 2016, the number of injections has started to increase again (+9% compared to 2015). The total number of surgical procedures increased 98%. The annual number of cataract surgeries increased 64% and bilateral surgeries from 11% to 39%.

**Conclusion:** Revised operational concepts and new facilities together with a 15% increase in work contribution led to a 46% increase in overall productivity, improved access to care and the clearance of delayed services. Efforts continue to further refine cost-effective care and to define the appropriate levels of services.

**Key words:** costs – efficiency – priority setting – segmentation – shared care – standardization

---

Acta Ophthalmol.

© 2016 Acta Ophthalmologica Scandinavica Foundation. Published by John Wiley & Sons Ltd

doi: 10.1111/aos.13168

## Introduction

The Finnish healthcare system covers the entire population, and its services are

tax-financed. The Constitution of Finland empowers public authorities to guarantee adequate social, health and

medical services equally for all citizens and to promote the health of the population (<http://www.finlex.fi/en/laki/kaannokset/1999/en19990731>). Finnish municipalities are responsible for providing public healthcare services. They can choose whether to provide healthcare services independently, join another municipality in joint municipality boards, or purchase services from the private sector.

Tampere University Hospital, the main hospital of the Pirkanmaa Hospital District, is one of five university hospitals in Finland responsible for university level specialized care for one million residents in addition to organizing specialized near eye healthcare services for 0.5 million residents. Together with Tampere University, other responsibilities (per Finnish law) include the education of medical students, co-ordination of residency programs and conducting basic, translational, clinical and health services research.

In 2007, the Pirkanmaa Hospital District initiated a project to improve eye health care in the region. The improvement was focused on quality and access to care. Over the years, the provision of eye services had been scattered around the hospital campus on 10 floors of six buildings located far from each other. In addition, the majority of the aged buildings (originally built as dormitories for nurses) suffered from severe mould problems. Another challenge was a long-standing lack of ophthalmologists in the eye department further contributing to

problems in access to care. Due to suboptimal access to services, both the municipalities (the owners of the university hospital) and Tampere University Hospital were forced to outsource segments of eye healthcare services and purchase care (e.g. cataract operations and glaucoma management) from the private sector, which further increased the incoherence within the regionally divided eye healthcare system. The ‘big picture’, that is whether the volume or costs of the provision of eye care services, or of their quality, was at the right level, was neither understood nor properly managed.

After earlier unsuccessful attempts to solve these challenges, in December 2008, the Hospital Administration made a decision to plan for a new eye hospital and recruited an external expert to lead the project and the Eye Centre (Kokkinen & Lehto 2011). After creating a functional action plan including initiation of an architectural design for the new premises, in August 2009, the Board of Directors of the Pirkanmaa Hospital District approved the construction of a new facility. A private company managed the construction project, and the Pirkanmaa Hospital District signed a 20-year rental agreement with this company. Tays Eye Centre was established as an independent economic unit within the Tampere University Hospital in 2011 and the new Tays Eye Centre opened its doors in January 2012.

Since the opening of the new building (Fig. 1) and the implementation of the revised operation plan based on new strategies and principles, over 1500 visitors from 30 different countries have visited Tays Eye Centre. The purpose of this case report was to describe the main principles of actions at the Tays Eye Centre – based on the implementation of published systems dynamics models in Finland (Tuulonen 2005; Tuulonen et al. 2009) – and their impact on access to care and productivity in daily practice.

## Definition of Strategy and Success Factors

The main objective of the Tays Eye Centre is to allocate limited healthcare resources in the most cost-effective way to promote the well-being of the



Fig. 1. Pictures from Tays Eye Centre.

citizens in the Pirkanmaa Hospital District. That is, the available resources budgeted yearly by the municipalities available to the Tays Eye Centre would be invested to produce appropriate (as enacted in the Finnish Constitution) and necessary care by agreeing to prioritize the care for eye diseases causing permanent visual disability. Accordingly, the key factors for success were defined as recognizing, developing and implementing cost-effective methods in providing eye health care as well as supporting education and research.

## The Main Operational Principals

The need to understand and accept the reality of the growing discrepancy between demand for and availability of resources for healthcare services was defined as Step One. That is, despite our sincere intentions and goodwill (regardless as to how healthcare services are financed), it is not possible to guarantee all possible services to every person, neither currently nor in the future (EXPH 2015). Step One also includes a deep understanding that we, as healthcare providers are both part of the problem and also of the solution (Culyer & Maynard 1997; Fisher & Welch 1999; Tuulonen 2005; Tuulonen et al. 2009): (i) healthcare systems tend to expand their own demand (Keskimäki 2003), (ii) universities strive to invent new interventions in spite of a lack of resources adequate for all current interventions, and (iii) citizens do not want to pay more taxes. There is also long-standing evidence indicating that simply spending more money and more resources does not improve access nor the outcomes of care, nor patient satisfaction (Fisher et al. 2003a,b). This is also true for ophthalmology, and spending more resources may even counter-intuitively result in worse health-related quality of life (Fisher & Welch 1999; Hagman 2013).

Instead of agonising and complaining, or trying to escape this reality (which results in lesser likelihoods of both finding appropriate solutions as well as improving the wellbeing of both patients and healthcare personnel), in Step Two, the Tays Eye Centre accepted to take the responsibility of the advantages and disadvantages of the decision-making, including the costs, and keeping

in mind the goal of developing sustainable eye care together with the patients, the citizens, the municipalities, the national authorities and all other parties involved.

### Main principles for achieving services with appropriate quality, high volume and low costs (Table 1):

1. *Identification of high-volume patient groups.* Exudative age-related macular degeneration (AMD) (the main cause of permanent visual impairment in the elderly), glaucoma (the number two cause for visual impairment in the aged), retinal diseases (including diabetic eye disease, the leading cause of visual impairment in the working age) and cataract accounted for two-thirds of patients, visits and costs at the Tays Eye Centre in 2011–2015 (the ‘big four’ eye diseases).

2. *Segmenting and priority setting on the basis of patients’ risk for permanent visual disability.* In 2013, the Tays Eye Centre and the municipalities in the Pirkanmaa District agreed on prioritizing eye diseases causing permanent visual disability. This strategy was specifically chosen as an extremely important complementary addition to the national criteria of access to care within ophthalmology decreed in 2005 (Tuulonen et al. 2009). In 2015, the Finnish ophthalmology department, chairing at the public eye hospitals, expressed an intention to

introduce the same prioritization principles to the Council of Choices for Health Care in Finland (COHERE Finland) in the Ministry of Social Affairs and Health (Kauppila & Tuulonen 2016). To date, the National Institute of Welfare and Health (NIWH) only keeps track of waiting times for cataract surgery in spite of the fact that cataract, among ‘the big four’ eye diseases, is the only one which does not cause *permanent* visual disability. Regarding outpatients, NIWH presently only documents access to care of newly referred patients while the majority of ophthalmic patients have chronic disease requiring lifelong surveillance.

In the Tays Eye Centre, the care processes of eye diseases are planned to guarantee an early first contact thus enabling recognition and segmentation of high-risk patients from less urgent patients. Ophthalmologists evaluate patients’ risk status regarding their risk of permanent visual impairment using referrals and monitoring the results of patient examinations. Depending on the estimated risk, the process follows standardized or individualized paths of care.

For a low-risk patient, the ophthalmologist can create an action plan for care and follow-up based on various imaging and visual field examinations as well as estimating the individual need for face-to-face visits. In several patients groups, the follow-up visits of these low-risk patients are provided by

**Table 1.** Summary of the main concepts behind procedures implemented in Tays Eye Centre to enable improved access to care and improved productivity.

|   |   |
|---|---|
| 1. Identification of high-volume patient groups   | The ‘big four’ eye diseases account 70% of patients, visits and costs:  |
|   | a. AMD: The main course for permanent visual disability in the elderly  |
|   | b. Glaucoma: The number two cause for visual disability in the aged   |
|   | c. Retinal diseases (including diabetic eye disease as the leading cause of visual disability at working-age)   |
|   | d. Cataract (does not cause permanent visual disability)  |
| 2. Segmentation and priority setting patients based on their risk for permanent visual disability | Most resources are allocated to eye diseases causing permanent visual disability (1a-c)   |
| 3. Standardization of high-volume services  | Different paths for high- and low-risk patients   |
| 4. Efficient production of services   | For example, two visual field examinations simultaneously, virtual clinics, bilateral cataract surgery.   |
| 5. Shared care  | Physicians’ time allocated to high-risk patients, decision-making and coordination of processes<br>Nurses injecting AMD drugs, running their own clinics and prepreparing virtual patients<br>Optometrists performing pre-operative cataract measurements<br>Secretaries adopting tasks previously performed by nurses<br>Technicians taking automated tests, for example autorefractometry and visual acuity, rebound tonometry, and visual fields |

other healthcare professionals (optometrists and nurses) under the supervision of the ophthalmic physician. Thus, the ophthalmologist may be 'virtual' to the patient. However, ophthalmologist 'sees' the patient through the test results and designs the care procedures and defines thresholds as to when the patient must contact the physician.

**3. Standardization of high-volume care.** The care processes for high-volume 'usual' patients are standardized by multidisciplinary teams in order (i) to minimize unnecessary variations in care, (ii) to maximize the use of nurses' and optometrists' knowhow and input by diligently following specified care protocols, (iii) to allocate physicians' time to decision-making (diagnostics, definition of care processes and ensuring enough face time for patients requiring individualized care) and (iv) to allow evaluation and implementation of evidence-based care. For example, the standardization of glaucoma processes follows the national Current Care guideline updated in 2014 (Tuulonen et al. 2015). The national current care guideline for AMD was published in 2016 (Tuuminen et al. 2016).

**4. Efficient care protocols.** Individual decisions must agree with the goals of the entire healthcare system and its legislation. There is a need to construct an explicit model for decision-making as to how the *adequate* eye care services, enacted in the Finnish Constitution, are defined in eye health care and by which parties, as well as how the services can be provided equally, equitably and cost-effectively (Kauppila & Tuulonen 2016).

Excessive autonomy and individualization could lead to disastrous results at a system level (Maynard 2001). For example, over use of diagnostics and over-treatment cause unnecessary worry and harm to patients who do not have manifest disease (Hagman 2013), while simultaneously, patients with sight threatening disease may become blind due to delayed control visits (Tuulonen 2012). Political and professional choices have been claimed to be far more important in explaining the increase in spending than, for example, to ageing (Tuulonen 2005). Health care has a supply-led nature: the more the services are produced, the larger is the demand. The increase in physician services in Finland has been

reported to be associated more with supply than demand factors (Keskimäki 2003). By making it seem as if cost increases are inevitable for any *external* forces which are regarded as being beyond 'our' responsibility (e.g. ageing and developing technology), attention is diverted from the real and difficult choices that we *must* make to produce services equitably, equally, effectively and efficiently (Getzen 1992; Kauppila & Tuulonen 2016).

To improve efficiency, for example, at the Tays Eye Centre, guidance is given to groups rather than individual glaucoma and cataract patients. Visual fields from two patients are examined simultaneously (preferably by a technician rather than by a nurse), patients are prepared in a surgical chair outside the operating theatre to speed up patient flow, and the proportion of bilateral cataract surgeries is increased. The criteria for approved AMD drugs are defined together with the Kuopio University Hospital with close monitoring of their effectiveness. In 2014, the approved AMD drugs accounted for 4% of the total number of injections but 50% of the drugs costs at the Tays Eye Centre. In spite of a decrease in the number of injections by 3% in 2014–2015 for the first time since 2008, the AMD medication costs have simultaneously increased 18%. This is due to use of approved drugs which accounted for 7% of the number of injections but 63% of medication costs in 2015. In the beginning of 2016, the percentages are 11% of number of injections and 75% of costs. When bench-marked with the Mikkeli and Hämeenlinna central hospitals, their percentages of number of injections using approved drugs in 2014 were 16% and 13% and the corresponding percentages of total drug costs 89% and 80%, respectively. In December 2015, the Council of Choices for Health Care in Finland (COHERE Finland, [http://stm.fi/neuvottelukunnat/terveydenhuollon\\_palveluvalikoimaneuvosto](http://stm.fi/neuvottelukunnat/terveydenhuollon_palveluvalikoimaneuvosto)) approved 'off label' use of bevacizumab for the treatment of AMD in Finland.

**5. Shared care – Who is doing what and how?** The 15 multidisciplinary teams (together with the director and service manager who facilitate all teams) are responsible for planning the care processes and access to care for each different eye disease. First, the multidisciplinary team evaluates whether any task under consideration is, on the whole, necessary, that is does it

improve patients' well-being and/or care. If not, it should be abandoned. If the task is considered essential, the next step is to consider who (which professional) should perform the task in question. The key philosophy is to make the best use of the education and expertise of each healthcare professional.

When adoption of any new intervention (medical, process, administrative, etc.) is under consideration (especially without simultaneous increase in resources), it is necessary to evaluate whether some other tasks or processes can be abandoned or modified. For example, since 2010, nurses rather than physicians have given all intra-ocular injections for AMD patients. This distribution of work has enabled allocation of ophthalmologists' time to more demanding decisions in diagnostics and care and to better enable face-to-face examinations for those patients requiring and benefiting the most from their time.

The teams agree on how to share care in clinics run by nurses/optometrists, for example AMD, glaucoma, dry eye, strabismus and corneal patients. After nurses adopt tasks formerly performed by physicians, clerical and entry tasks (formerly performed by nurses) are now performed by secretaries. Technicians have been trained to perform automated tests, for example refractions, visual acuity, rebound tonometry, visual fields and imaging.

When trained expert nurses pre-evaluate the examination results of the patients, the decision-making time of ophthalmologists can be minimized and their utility maximized, for example physicians can readily evaluate 30–50 virtual patients per day, or even up to 25 patients per hour by the most experienced specialists. This policy ensures a more appropriate allocation of each doctor's time for more demanding patients.

## Results of Implementing The Main Principles in 2011–2015

The number of referrals increased 76% in 2011–2015. In 2015, the number of referrals within ophthalmology was the highest (n = 9300) in Tampere University Hospital, followed by otorhino-laryngology (n = 7982) and

gynaecology (n = 7842). This high number can be also interpreted as a sign of trust by the municipalities towards the Tays Centre Eye in taking responsibility for organizing all eye services in the Pirkanmaa District, similar to their decision made in 2013 of purchasing all cataract operations from the Tays Eye Centre. The total number of outpatient visits in 2015 was 41 414. Although the number of patients on appointment list in outpatient clinic in 2015 (n = 6880) was 2.5-fold compared to 2011, concurrently the number of delayed control visits has been reduced from a maximum of nearly 2000 in 2011 to zero by the end of 2015.

Although there was a 1.8-fold increase in the number of injections for wet macular degeneration in 2011–2015 (from 2128 to 5967) and fivefold increase in imaging in 5 years (14 213 in 2015), all patients have received care in the Tays Eye Centre in spite of the lack of additional resources. After about a 50% annual increase in injections since 2009, a plateau was temporarily reached for the first time in 2014 with 6172 injections. In 2014–2015, there was a 3% decline. There was no change in indications for treatment and no barriers for access to care indicating that the backlog of demand for services (delayed visits) seemed to have been cleared. However, in the beginning of 2016, the number of injections has started to increase again (+9% compared with 2015).

The yearly number of cataract surgeries in 2011–2015 increased 46% from 3618 to 5281, and bilateral surgeries have increased from 11% in 2011 to 39% in 2015. Due to financial constraints, the municipalities requested that the provision of services in December 2014 should be slowed down to the level of July. Despite the postponing, for example cataract surgeries for 1 month, the same previous level of access to care was reached by the end of 2015.

The annual number of retinal surgeries has increased from 418 to 480 in 2011–2015 (15% in spite of discontinuing extra-cost after-hours operations in 2012). The number of glaucoma operations has increased 26% in 2011–2015 from 175 to 220. The profile of glaucoma surgeries was strategically modified increasing the use of tubes and deep sclerectomies. This change was enabled by having inviting three

international gurus to visit the Tays Eye Center to train the young glaucoma surgeons and surgical team in 2014–2015 in the newly opened surgical cadaver training centre next to the Eye Centre ([http://www.pshp.fi/en-US/Research\\_and\\_training/Education/Surgical\\_Education\\_Centre](http://www.pshp.fi/en-US/Research_and_training/Education/Surgical_Education_Centre)).

The total number of services provided increased 46% from 30 379 in 2011 to 44 631 in 2015. The total number of all surgical procedures (excluding AMD injections) has increased 99% from 3460 to 6882 in 2011–2015. The productivity has increased to a greater extent than the work force which increased 15% (25% increase in number of ophthalmologists) during the same time period. In 2015, work force of Tays Eye Centre consisted of thirteen specialist ophthalmologists, seven residents and 69 non-physician staff.

## Personnel – Together We Will See Farther

Compared to the starting point, the reputation of the Tays Eye Centre among ophthalmologists has significantly improved. There are currently not enough positions available for all the specialists and residents interested in working at the Tays Eye Centre. In addition, the staff turnover is minimal. The personnel have been motivated by the shared care concept. Nurse performed injections have now been initiated in several other eye clinics in Finland (e.g. Helsinki and Turku University Hospitals) and in one eye clinic in Sweden after their having visited the Tays Eye Centre.

In a 2014 staff survey, the nurses in the outpatient unit ranked their work experiences at 3.4 (scale: 1 unsatisfactory, 5 excellent) in a 26-question survey of their experiences at work. The highest ranked questions with 75–80% with scores 4–5 were collaboration within different professionals, feeling of autonomy and understanding the significance of own work as part of the university hospital. No one responded to these questions with scores of 1–2. In eight questions (31%), the mean score was >3.5. In 2013–2014, the number of outpatient visits increased 9% without additional resources.

Although the fairness of shared care was felt to have improved compared to

previous years, some nurses felt that the speed of these changes was challenging. Several projects and processes have been implemented to support the staff to better cope with organizational and economic changes within the society reflecting also to the functions of the Eye Centre. In addition to team meetings, the leaders meet the entire staff on a monthly basis reporting statistics of operations and economics and information about timely matters.

## Research and Development

Related to the development of clinical care processes, eye services and leadership, health services research, health economics and secondary research (systematic reviews) continue to be important part of the research profile in the Tays Eye Centre (Tuulonen 2011, 2016; Hagman 2013; Saarela et al. 2013; Tuulonen et al. 2015).

In addition at the University of Tampere, Research and Development Centre for Ophthalmic Innovations (SILK) concentrates on translational and clinical research in ophthalmology. SILK is based on multidisciplinary co-operation extending the research network to several national and international collaborations (<http://www.silkresearch.fi/en/research/the-silk-research-network/>). The research group has, for example *in vitro* and *in vivo* disease models for AMD, diabetic retinopathy and glaucoma as well as for deviant retinal angiogenesis and also performs Phase I-IV clinical trials. The Centre for Proteomics and Personalized Medicine is discovering biomarkers for glaucoma, dry eye and ophthalmic surgery.

## Conclusions and Future Steps

Although the statistics indicate that the new operational principles and premises together with a 15% increase in work contribution has led to a 46% increase in productivity, improved access to care and the clearance of service backlogs (delayed visits), efforts continue to further develop and refine our improved cost-effective care. As the benchmarking project which was kicked off in 2012 for comparing productivity and outcomes at a national level did not reveal meaningful and

comparable data, this process will be further refined in 2016. In 2015, the Tays Eye Centre was accepted into World Association of Eye Hospitals (WAEH) as an associate member (<http://www.waeh.org/en/>). The Tays Eye Center statistics have been shared with the WAEH to gain international bench-marking data.

Other developmental projects include, for example, piloting speech recognition and developing a multi-eye disease model of care for patients suffering from several chronic eye diseases. The main long-term goals include the electronic collection and analysis of 'big data' in all patients to better enable the evaluation of the effectiveness and outcome of their care, that is visual acuity and refraction measured using automated refractometer, rebound tonometry, visual field indices and measurements of general health-related quality-of-life<sup>1</sup> measurements. These efforts for enabling improved well-being with less money are an ongoing process. Our records to date confirm that such efforts can improve access to care and productivity.

## References

Culyer AJ & Maynard A (eds) (1997): *Being Reasonable About the Economics of Health: Selected Essays by Alan Williams*. Cheltenham: Edward Elgar Pub. ISBN-13: 978-1858986487, ISBN-10: 1858986486.

Expert Panel on Effective Ways of Investing in Health (EXPH) (2015): Summary of the Preliminary Report on Access to Health Services in the European Union, 25 September 2015. Available at: [http://ec.europa.eu/health/expert\\_panel/opinions/docs/010\\_summary\\_access\\_healthcare\\_en.pdf](http://ec.europa.eu/health/expert_panel/opinions/docs/010_summary_access_healthcare_en.pdf) (Accessed on 5 Nov 2015).

Fisher ES & Welch HG (1999): Avoiding the unintended consequences of growth in

medical care. How might more be worse? *JAMA* **281**: 446–453.

Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL & Pinder EL (2003a): The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. *Ann Intern Med* **138**: 273–287.

Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL & Pinder E (2003b): The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. *Ann Intern Med* **138**: 288–298.

Getzen TE (1992): Population aging and the growth of health expenditures. *J Gerontol* **47**: 98–104.

Hagman J (2013): Comparison of resource utilization in the treatment of open angle glaucoma in two cities Finland: is more better? Thesis. *Acta Ophthalmol* **91**: 1–47.

Kauppila T & Tuulonen A (2016): Report of Ministry of Social Affairs and Health 2016:3 (in Finnish). Ministry of Social Affairs and Health, Helsinki, Finland. English press release 10/2016. Available at: [http://valtioneuvosto.fi/en/article/-/asset\\_publisher/sosiaali-ja-terveydenhuollossa-vahvistettava-yhteisvastausta-javaltion-ohjausta?\\_101\\_INSTANCE\\_3qmUeJgIxZEK\\_groupId=1271139](http://valtioneuvosto.fi/en/article/-/asset_publisher/sosiaali-ja-terveydenhuollossa-vahvistettava-yhteisvastausta-javaltion-ohjausta?_101_INSTANCE_3qmUeJgIxZEK_groupId=1271139). (Accessed on 1 February 2016).

Keskimäki I (2003): How did Finland's economic recession in the early 1990s affect socio-economic equity in the use of hospital care? *Soc Sci Med* **56**: 1517–1530.

Kokkinen L & Lehto J (2011): Changing health care from inside out: policy entrepreneur questioning ophthalmology service production in Finland. *IJPPHME* **1**: 16–27.

Maynard A (2001): Ethics and health care 'underfunding'. *J Med Ethics* **27**: 223–231.

Saarela V, Karvonen E, Stoor K et al. (2013): The Northern Finland Birth Cohort Eye Study: design and baseline characteristics. *BMC Ophthalmol* **13**: 51.

Tuulonen A (2005): The effects of structures on decision making policies in health care. Perspectives in Ophthalmology. *Acta Ophthalmol Scand* **83**: 611–617.

Tuulonen A (2011): Economic considerations of the diagnosis and management for

glaucoma in the developed world. *Curr Opin Ophthalmol* **22**: 102–109.

Tuulonen A (2012): An overview and evaluation of the eye health care in Scania [Översyn av den offentligt drivna ögonsjukvården i Region Skåne. An over-view and evaluation of the eye health care in Scania]. Available at: <http://docslide.us/documents/oerversyn-av-den-offentligt-drivna-oegonsjukvarden-i-region-skane-avdelningen.html>. (Accessed on 21 August 2012).

Tuulonen A (2016): Treatment of ocular hypertension – is it cost-effective? *Curr Opin* **27**: 89–93.

Tuulonen A, Salminen H & Perkola M (2009): The need and total costs of Finnish Eye Care services: a simulation model for 2005–2040. *Acta Ophthalmol* **87**: 820–829.

Tuulonen A, Forsman E, Hagman J et al. (2015): How to interpret evidence in everyday practice: The Finnish Current Care Guideline for open-angle glaucoma' Available at: <http://www.kaypahoito.fi/web/english/guidelines>. (In Finnish: Glaukooman Käypä Hoito –Suositus. Duodecim 13:356–8.) (Accessed on 24 October 2014).

Tuuminen R, Uusitalo-Järvinen H, Aaltonen V et al. (2016): The Guideline Published online in Finnish May 11, 2016. English Evidence Summaries published online May 30, 2016. Available at: <http://www.kaypahoito.fi/web/kh/suosituksset/suositus?id=hoi50107#nakit>. (Accessed on 31 May 2016)

Received on November 6th, 2015.  
Accepted on May 16th, 2016.

*Correspondence:*  
Anja Tuulonen  
PO BOX 2000  
Tays Eye Centre  
Tampere University Hospital  
FIN-33521  
Tampere  
Tel.: +358 3 311 66066  
Email: [Anja.Tuulonen@pshp.fi](mailto:Anja.Tuulonen@pshp.fi)

This work was financially supported by the Competitive Research Funding of the Tampere University Hospital Grant 9P055, Tampere, Finland.

<sup>1</sup>Tays Eye Centre is promoting Finland to adopt a policy to request every citizen to fill in HRQoL questionnaire once a year into national data base regardless their disease status. This would give valuable data not only about impact of interventions on HRQoL but also control data and influence of aging on well-being (Kauppila & Tuulonen 2016).