

Ophthalmology PAs in the Netherlands: A national survey

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ABSTRACT

Purpose: To describe the educational background, practiced clinical disciplines and procedures, efficacy, and responsibility distribution of Dutch physician assistants (PAs) working in ophthalmology.

Methods: An online survey was sent to and collected from PAs working in ophthalmology and ophthalmologists collaborating with PAs.

Results: Of 85 ophthalmology PA and 15 ophthalmologist recipients, 36 PAs and 9 ophthalmologists completed the survey. The mean age of respondents was 39 years (range, 27-54), and 23 (63.9%) were female. Most PAs (97%) had a Bachelor of Science in optometry or orthoptics. All PAs (N = 36) were involved in managing patients with common ophthalmic conditions. On average, PAs worked 32.6 hours (range, 23-36) per week and added on average 77 full-time equivalents to the Dutch ophthalmology workforce. Ophthalmologists collaborating with PAs assessed PA autonomy with a mean score of 3.9 (on a scale from 0 to 5, with 0 being a low level of autonomy and 5 being a high level of autonomy).

Conclusion: In the Netherlands, ophthalmology PAs may be considered a good partial solution for the shortage in eyecare professionals.

Keywords: ophthalmology PAs, the Netherlands, education, efficacy, responsibility distribution, ageing population

Since the mid-1960s, physician assistants or associates (PAs) have successfully worked in primary care and various specialties in the United States.¹ Currently, 189 907 certified PAs cover all medical and surgical specialties throughout the nation.² After this successful introduction, PAs started working in several other countries globally. In Europe, PAs are working in Bulgaria, Germany, Ireland, the Netherlands, and the United Kingdom.³⁻⁵ Of these countries, only the Netherlands recognizes PAs as

medical professionals formally in legislation, and the United Kingdom regulates the role.³⁻⁵

The *physician assistant* role was introduced in the Netherlands in 2001.⁶ Inclusion in the Dutch legislation as an independent profession followed in 2018. With this legal recognition, every PA working in patient care in the Netherlands is personally responsible and accountable by law for their actions in patient care.⁷ In 2023, approximately 2000 PAs were employed in the Dutch health care system.⁸ This number is expected to increase: annually, approximately 250 students start their training in the Netherlands to become PAs.⁹

Dutch PA students are professionals with a bachelor's degree in health care and have at least 2 years of clinical work experience. Dutch PAs are trained in a dual manner, which means that students are deployed within their medical specialty from the start of the PA program. This clinical specialty immersion differs from PA education in other countries. Along with specialty-bound education, students undertake didactic and clinical education within the major medical disciplines from the beginning until the end of the curriculum.^{10,11} Dutch PAs are educated through entrustable professional activities (EPAs), in which training and assessment are focused on concrete clinical tasks and directed toward competence with gradual growth toward independence.

PAs in the Netherlands are generally employed in one of the 50 most common specialties, which is comparable with the distribution of PAs among different specialties in the United States. A notable exception is the ophthalmology PA. In the Netherlands, 104 ophthalmology PAs (15%) are currently active out of a population of about 679 ophthalmologists, whereas in the United States, out of a population of approximately 18 948 active ophthalmologists, only 136 (0.72%) PAs are employed in ophthalmology.^{12,13}

Due to an increase in the demand for eyecare, alternative methods of increasing the ophthalmology workforce are being sought. This growing demand is related to the changing distribution of the population in the Western world, with a disproportionate increase in those of an older age due to rising life expectancies and expanding treatment options. This effect is amplified by an outflow of ophthalmologists reaching retirement age and by changes in composition of the workforce.¹⁴ In addition, younger physicians have different priorities regarding work-life

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balance and generally prefer to work fewer hours compared with their predecessors.¹⁵

In the Netherlands, most ophthalmologists work together with a team of professionals that includes technical assistants, nurses, optometrists, orthoptists, and PAs. Additionally, almost all the ophthalmology PAs are previously educated as optometrists or orthoptists. The organization of eyecare in the Netherlands is therefore different from that in the United States, particularly in relation to the independent and autonomous position of the optometrist.

In this article, we describe the implementation and experiences of ophthalmology PAs in the Netherlands. More specifically, we report on these professionals' educational background, practiced clinical disciplines and procedures, efficacy, and responsibility distribution within ophthalmology, based on the results of a survey of ophthalmology PAs and ophthalmologists.

METHODS

Data for this cross-sectional study were collected via two surveys, one for PAs and one for the ophthalmologists collaborating with the same PAs. Only one author (GS) had access to the online survey data. According to the Dutch Central Committee on Research Involving Human Subjects, institutional review board approval was not required for this survey. This study was performed in accordance with the tenets of the Declaration of Helsinki.¹⁶

PA survey All 104 ophthalmology PAs registered with the Dutch Association of Physician Assistants (NAPA) were selected as the target group for the first online survey (Google Forms; Appendix 1). Graduated PAs who met the quality requirements of the Dutch health care system and who were active in ophthalmology were included in the analysis. PAs working in another medical discipline outside ophthalmology or without patient contact were excluded. PAs in training were also excluded.

An email describing and requesting response to the survey was sent in the first week of May 2023. In this email, the survey was described as intended for graduate PAs working in ophthalmology. By clicking a hyperlink in this email, potential respondents were given access to the first question of the survey. The survey was active at this URL for 3 weeks. By answering this first question affirmatively, the respondent gave consent to the use of the generated data in compliance with applicable laws and regulations for research and privacy and was granted access to the remainder of the survey.

The survey for PAs consisted of 21 questions total. The first question, as described, sought consent for participation; only those answering affirmatively were able to complete the rest of the survey. The last question asked for permission to contact the ophthalmologist with whom the responding PA was currently collaborating by email. All other questions collected demographic information and explored task and responsibility distribution, efficiency, and organization of care in ophthalmology at the PAs'

current institutions. The rest of the survey included 7 descriptive and 12 forced-choice questions (Appendix 1 at <http://links.lww.com/JAAPA/A46>). The 7 descriptive questions were used to collect information on PA demographics, educational background, and work experience (eg, age, hours worked per week, and so on). The 12 forced-choice questions consisted of 9 multiple-choice and 3 multiresponse questions. The survey included 2 open-ended questions to capture more nuanced responses and explore participants' perspectives in greater depth.

In the questions examining the topics of task and responsibility distribution and efficiency in organization of care, the terms *autonomous competence*, *shared responsibility*, and *supervision* were used. *Autonomous competence* in the context of this survey means that diagnosis and treatment are initiated by the PA without the intervention or supervision of an ophthalmologist and are based on the individual PA's level of competence, within agreed lines of responsibility and in the job description. *Shared responsibility* in the context of this survey means that the procedure is performed independently by the PA but that the indication for the procedure has been set by the ophthalmologist. *Supervision* was divided into *direct supervision* and *indirect supervision*, in which *direct supervision* means that the PA co-assesses the patient with the ophthalmologist and *indirect supervision* means that the PA performs the patient assessment and consults the ophthalmologist, without the ophthalmologist being directly involved in patient assessment. The term *supervision* is used within the Dutch health care landscape to describe the shared responsibility in the collaboration between the ophthalmologist and the PA in patient care.¹⁷

The frequency of the need for supervision was measured by four possible selections: 1, rarely (<10% of cases); 2, sometimes (10%-25% of cases); 3, frequently (25%-40% of cases); and 4, often (>40% of cases). The added full-time equivalent (FTE) to the ophthalmic workforce for PAs was calculated by dividing the reported average number of working hours per week by the 36-hour working week, the result of which was multiplied by the current number (N = 85) of qualified and employed ophthalmic PAs in the Netherlands.

Ophthalmologist survey A request to complete a short survey consisting of 7 questions was sent to the ophthalmologists who were identified in question 21 of the PA survey. In the same manner as the PA survey, the first question sought consent for participation, with an affirmative response allowing for completion of the survey. The questions pertained to the ophthalmologist's perceptions of the ophthalmology PAs in their practice specifically and the overall role of ophthalmology PAs in general, mainly focusing on the PA level of functioning, degree of autonomy, and level of required supervision. The degree of autonomy of the PA in their practice and the value of the addition of the PA to the ophthalmic workforce was scored on a scale from 0 to 5, where 5 was regarded as providing great added value and a high level of autonomy.

RESULTS

Of the 85 PAs who were invited to participate, 37 (44%) completed the corresponding survey. Of the 37 PA respondents, 36 had graduated and 1 was in training; the PA in training was excluded from the study and its results. Among PAs, the average age was 39 years (range, 27-54), and the majority (63.9%) was female. The PAs had an average of 4 years (range, 0-13) of work experience. They were largely previously trained as optometrists (63.9%), with 8 (22.8%) formerly trained both as optometrists and orthoptists. Most of the PAs worked in general hospitals (38.9%) or top clinical hospitals (33.3%), approximately evenly distributed throughout the Netherlands. General characteristics for the PAs are summarized in **Table 1**.

In **Tables 2** and **3**, the most common subspecialties and the most frequent procedures carried out by the PAs are summarized. The majority of PAs were involved in managing patients with general ophthalmic conditions such as macular-related diseases, glaucoma, and diabetic retinopathy; they also worked emergency consulting hours (**Table 2**). Some PAs were involved in the management of rarer ocular diseases, often in academic hospitals or major general hospitals and usually as members of a multidisciplinary team. Examples of these conditions or subspecialties are vitreoretinal disease (n = 10), pediatric ophthalmology (n = 9), neuro-ophthalmology (n = 8), orbital disease (n = 4), refractive surgery (n = 4), and ocular oncology (n = 2).

Of the 15 invited ophthalmologists, 9 (60%) completed the survey. When asked which subspecialties could fit within the range of tasks delegated to an ophthalmology PA, only the subspecialty of corneal disease was not mentioned by the ophthalmologists. All other ophthalmologic subspecialties as mentioned in **Table 2** were unanimously confirmed by the ophthalmologists.

As shown in **Table 3**, which summarizes procedures performed by the PAs, almost all PAs reported performing intravitreal injections, punctal plug insertion, extra-ocular foreign body removal, YAG laser (capsulotomy and iridotomy), chalazion surgery, and surgical removal of benign skin lesions. Fewer performed epithelial debridement of the cornea (n = 21) and selective laser trabeculoplasty (n = 20). The majority of these procedures were indicated and executed autonomously by most of the PAs. Procedures performed less often by the PA on indication by the ophthalmologist included retinal Argon-laser treatments (n = 6), diagnostic anterior chamber paracentesis (n = 6), and corneal cross-linking in corneal ectatic disease (n = 5).

All PAs prescribed medication within their specialty including antibiotics, antihistamines, antiviral drugs, anti-inflammatory drugs (NSAIDs/corticosteroids), angiogenesis inhibitors (anti-VEGF), glaucoma medication, and—in a few cases—systemic immunosuppression. The limits for independent indication and prescribing are based on national regulations and laws, national ophthalmic guidelines, and local working conventions.

Ophthalmology PAs worked on average 32.6 hours (range, 23-36) per week. By doing so, they added on average 77 FTEs (range, 54–85) to the ophthalmology workforce in the Netherlands. Most PAs (n = 26; 72.2%) saw an average of 20 to 30 patients per day during regular consultation hours. A far smaller number (n = 2; 5.6%) saw fewer than 20 patients per day, and 8 PAs (22.2%) saw 30 to 40 patients per day. Alongside working in direct patient care, PAs were also active in quality assurance (n = 9), research (n = 2), teaching (n = 18), and management tasks (n = 3).

The degree of autonomy of the PAs was assessed by 9 ophthalmologists to be a mean score of 3.9, where

TABLE 1. General characteristics of ophthalmology PA respondents (N = 36)

Female, n (%)	23 (63.9)
Age in years, mean (range)	39 (27-54)
Weekly hours worked, mean (range)	32.6 (23-36)
Years of work experience, mean (range)	4 (0-13)
Educational background	
Optometry	23 (63.9%)
Orthoptics	4 (11.1%)
Optometry and orthoptics combined	8 (22.8%)
Other ^a	1 (2.8%)
Type of health care institution	
University medical center ^b	1 (2.8%)
Top clinical hospital ^c	12 (33.3%)
General hospital ^d	14 (38.9%)
Private hospital ^e	9 (25%)

^aSurgical assistant in ophthalmology. ^bAcademic hospitals are connected to Dutch universities, they are able to provide more specialized care and are responsible for the training and education of medical specialist. ^cA teaching hospital that works with academic hospitals to train interns and medical professionals and aims to deliver more specialized care which is not delivered in the general hospital or private hospital. ^dGeneral hospitals deliver basic care and are focused on the more common types of care. ^eA private hospital is a commercial institution and is not subsidized by the government. It often specializes in particular treatments within a medical specialty.

TABLE 2. Most common subspecialties of ophthalmology PA respondents (N = 36)

Outpatient consultation	n (%)
General ophthalmology	35 (97.2%)
Macular-related pathology	32 (88.9%)
Diabetic retinopathy	31 (86.1%)
Glaucoma	31 (86.1%)
Dry eye disease	26 (72.2%)
Emergency consultation	23 (63.9%)
Uveitis	18 (50.0%)
Corneal disease	18 (50.0%)

Respondents could select all applicable options; percentages therefore do not sum to 100%.

TABLE 3. Most common procedures performed by ophthalmology PA respondents (N = 36)

Procedures	Total, n	Autonomous competence, n (%)	Shared responsibility, n (%)
Intravitreal injections	35	31 (88.6%)	4 (11.4%)
Extra-ocular foreign body removal	33	25 (75.8%)	8 (24.2%)
Punctal plug insertion	33	30 (90.9%)	3 (9.1%)
YAG laser capsulotomy	32	31 (96.7%)	1 (3.1%)
Chalazion surgery	29	28 (96.6%)	1 (3.4%)
Surgical removal of benign skin lesions	26	23 (88.5%)	3 (11.5%)
Subconjunctival injection	26	16 (61.5%)	10 (38.5%)
YAG laser iridotomy	23	21 (91.3%)	2 (8.7%)
Corneal epithelial debridement	21	16 (76.2%)	5 (23.9%)
Selective laser trabeculoplasty	20	15 (75.0%)	5 (25.0%)
Ultrasonography	19	11 (57.9%)	8 (42.1%)
Skin biopsies	18	11 (61.1%)	7 (38.9%)
3 or 4 snip punctoplasty	15	11 (73.3%)	4 (26.7%)
Electrical ablation of eyelashes	13	13 (100%)	0 (0%)

5 (representing complete independence) was the highest possible score. In addition, the PA was considered to enrich the ophthalmological workforce, with the ophthalmologists providing a mean score of 4.6 on a scale from 0 (*no added value*) to 5 (*great added value*).

The PAs were asked to compare their level of functioning in different subspecialty areas for which they received

education to that of ophthalmology residents during their 5 years of training. One PA (3.6%) said they functioned at the level of a first-year resident, seven (25%) at the level of a second-year resident, five (17.8%) at the level of a third-year resident, and 15 (53.6%) said they functioned at a level between that of the last year of residency and that of the ophthalmologist.

These self-reported levels of functioning by the PAs were in reasonable accordance with the assessment of the involved ophthalmologists. The ophthalmologist respondents most commonly assessed PA function to be at the level of a third-year resident (n = 4; 44.4%) or at a level between that of a resident during the last year of residency and that of the ophthalmologist (n = 4; 44.4%). One (11.1%) ophthalmologist reported PA functioning to be at the level of a first-year resident, with the comment that these groups cannot be properly compared because the PA works in some areas similarly to the ophthalmologist but in other areas more as a first-year resident.

Figure 1 presents the reported need for direct supervision. One ophthalmologist reported that frequent (for between 25% and 40% of patients seen by the PA) direct supervision was needed. The other eight ophthalmologists reported lower supervision needs. Twenty-six PAs reported a need for direct supervision for less than 10% of patients seen, nine PAs reported a need for supervision for between 10% and 25% of patients seen, and one PA reported a need for supervision on a regular basis (ie, for between 25% and 40% of patients seen).

Figure 2 presents the reported need for indirect supervision. Five ophthalmologists reported a need for indirect supervision of the PA in 10% to 25% of patients seen by the PA. Two ophthalmologists indicated that indirect supervision was rarely (for <10% of patients seen by the PA) needed for the PA with whom they collaborate. One ophthalmologist indicated that the PA with whom they

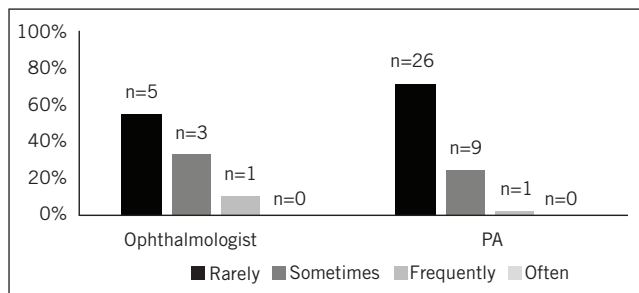


FIGURE 1. Required direct supervision of the ophthalmology PA: Ophthalmologist versus PA responses

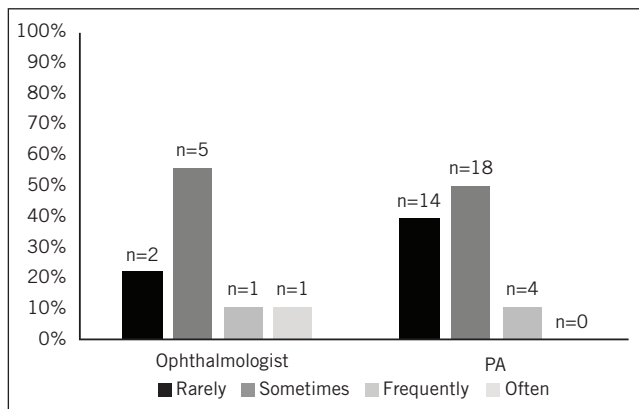


FIGURE 2. Required indirect supervision of the ophthalmology PA: Ophthalmologist versus PA responses

work with frequently needs indirect supervision (for 25%-40% of the patients seen), and one ophthalmologist reported a high need (for >40% of patients seen by the PA) for indirect supervision of the PA.

DISCUSSION

In the Netherlands, a relatively high number of PAs are employed in ophthalmology. Most of the Dutch ophthalmology PAs who responded to this survey were previously educated as an optometrist or orthoptist. Dutch PAs are particularly involved in the care for patients with common chronic ophthalmic conditions. They regularly perform high-volume low-complex ophthalmic procedures and are allowed by law to prescribe medication commonly used in ophthalmology. In the Netherlands, PAs are adding an average of 77 FTEs to the ophthalmic workforce. They are appreciated by collaborating ophthalmologists as an expansion to the workforce in ophthalmology with a high level of autonomy.

In 2023 in the Netherlands, 104 PAs (15% of the total PA workforce) were employed in ophthalmology.¹⁸ The only other country for which data are available on PAs working in ophthalmology is the United States.¹⁹⁻²⁴ In the United States in 2023, 136 PAs (.08%) were employed in ophthalmology of a total of 178 708 employed PAs.^{2,19-24} Due to the large differences in geography and population size between the United States and the Netherlands, it is difficult to pinpoint an explanation for the difference in the distribution of PAs in both countries. A possible partial explanation lies in the differences in the organization of eyecare and, in particular, in the more autonomous position of the 37 824 optometrists in the United States.²⁵

In the Netherlands, 65% of the 1350 optometrists in the country are primarily engaged in the prescribing of glasses and contact lenses in a commercial eyewear shop.²⁶ The ophthalmic care that these optometrists provide may therefore be influenced by commercial interests. Nevertheless, optometrists play a role in the eyecare system in the Netherlands, as general practitioners may refer patients to them due to the eyecare professional shortages. The other 35% of optometrists are working in ophthalmology departments in hospitals, usually under the supervision of an ophthalmologist. In most cases, ophthalmology PAs in the Netherlands are recruited from this group.

The Dutch PA program incorporates a dual learning model of in-practice and on-campus learning, which means that students are employed within a particular medical specialty from the first day of their enrollment in the program. From the beginning to the end of the program, students receive didactic and clinical education on general medical topics while at the same time engaging in a parallel specialty-specific curriculum.^{10,11} Additionally, to be admitted to the PA program, 2 years of clinical experience within the chosen specialty is required. For ophthalmology PAs, previous work-experience combined with prior optometry or orthoptics education increases PA employability earlier in the program.

The collaborative model used in ophthalmology in the Netherlands requires clear definitions of each role's responsibilities and areas of expertise, particularly given the relatively high number of ophthalmologists and ophthalmology PAs in the country. Therefore, the boards of the Netherlands Ophthalmological Society and NAPA have provided guidelines for ophthalmologist and PA collaboration, responsibility distribution, and education requirements with the aim of ensuring the quality and safety of eyecare.²⁷ These guidelines are based on legislation, medical guidelines, and other factors and are updated every 4 years.

Most ophthalmology PAs in the Netherlands examine and treat patients in outpatient clinics. PAs working in university centers or in top clinical hospitals are sometimes engaged in care for patients with rarer conditions that require a specific field of expertise such as pediatric ophthalmology, neuro-ophthalmology, ocular oncology, and orbital disease. The scope of practice therefore varies among PAs and is subject to change and develop, as in any medical profession. A good example of this ongoing development is the performance of retinal Argon-laser treatment. This treatment is only performed by PAs who have demonstrated competence and expertise in it through EPAs. A basic set of EPAs that an ophthalmology PA must meet at a minimum is used to delineate the PA's position in relation to that of other professionals within the ophthalmic workforce.

In the Netherlands, 75% of ophthalmology PAs work between 32 and 36 hours per week. The majority (n = 26; 72.2%) examine on average 20 to 30 patients per day during regular consultation hours. This is well above the 8 to 12 patients per day needed to achieve cost neutrality at one US academic institution, for example, illustrated in a study by Lee and colleagues.²² A comparison of the number of patients seen in the ophthalmic outpatient clinic with other types of institutions or specialties is of limited interest because of the high turnover in patients and the number of other professionals involved in the workflow in the former. When comparing the addition of 77 FTEs (range, 54-85) by the ophthalmology PAs with the available 570 FTEs (range, 563.1-577.0) of ophthalmologists, an average expansion of 13.5% (range, 9.7%-14.9%) to the ophthalmic workforce is generated.

In our survey, the ophthalmology PA was positively evaluated by nine collaborating ophthalmologists and regarded as having a high level of autonomy. PAs and ophthalmologists in general agreed that the PA functioned, at minimum, at the level of a third- or fourth-year resident in ophthalmology. The reported perceptions of the required need for supervision of the PA by the ophthalmologist were consistent with perceived level of functioning: both collaborating ophthalmologists and PAs reported that direct supervision was rarely needed, whereas indirect supervision was reported as being required slightly more often. More than half of the ophthalmologists and PAs indicated that PAs sometimes request indirect supervision, and nearly

40% of PAs indicated that they rarely asked for indirect supervision. About half of the ophthalmologists and PAs reported that the need for supervision is higher due to collaboration requirements, recommendations, or conventions at both the national level—as set forth by the Board of Dutch Ophthalmologists—and at a more local or institutional level.²⁷ Nevertheless, indirect supervision is useful and efficient, as it allows for education or effective sharing of responsibility as needed.

Limitations of the study The strengths of this study lie in its attempt to survey all PAs and ophthalmologists regarding the ophthalmology PA's level of functioning, scope of practice, and shared responsibilities with ophthalmologists in ophthalmic patient care in the Netherlands. We performed this study as a cross-sectional survey among all ophthalmology PAs and ophthalmologists collaborating with PAs in the nation. About half of those surveyed completed the questionnaire. Therefore, this study is based on a convenience sample and does not reflect information from all PAs and ophthalmologists. In addition, due to the cross-sectional design, the data are already considered outdated at the time of publication. Furthermore, reported results regarding the level of functioning and autonomy are subjective in nature, reflective of individual respondents' personal preferences and perceptions. Because of these shortcomings, the results and the conclusions should be interpreted with caution.

CONCLUSION

In the Netherlands, a relatively high number of PAs are employed in ophthalmology. Most Dutch ophthalmology PAs were previously educated as an optometrist or orthoptist. Dutch PAs are particularly involved in the care of patients with common chronic ophthalmic conditions. They regularly perform high-volume low-complex ophthalmic procedures and are allowed by law to prescribe medication commonly used in ophthalmology. In the Netherlands, PAs are adding an average of 77 FTEs to the ophthalmic workforce. They are valued by collaborating ophthalmologists as an expansion to the workforce in ophthalmology with a high level of autonomy. **JAAPA**

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