

# BMJ Open Determinants of the sustained employment of physician assistants in hospitals: a qualitative study

Marijke J C Timmermans,<sup>1,2</sup> Anneke J A H van Vught,<sup>3</sup> Irma T H M Maassen,<sup>1</sup> Lisette Draaijer,<sup>4</sup> Anton G M Hoofwijk,<sup>5</sup> Marcel Spanier,<sup>6</sup> Wijnand van Unen,<sup>7,8</sup> Michel Wensing,<sup>1,9</sup> Miranda G H Laurant<sup>1,3</sup>

**To cite:** Timmermans MJC, van Vught AJAH, Maassen ITHM, *et al.* Determinants of the sustained employment of physician assistants in hospitals: a qualitative study. *BMJ Open* 2016;**6**: e011949. doi:10.1136/bmjopen-2016-011949

► Prepublication history for this paper is available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2016-011949>).

Received 18 March 2016  
Revised 30 September 2016  
Accepted 21 October 2016

## ABSTRACT

**Objectives:** To identify determinants of the initial employment of physician assistants (PAs) for inpatient care as well as of the sustainability of their employment.

**Design:** We conducted a qualitative study with semistructured interviews with care providers. Interviews continued until data saturation was achieved. All interviews were transcribed verbatim. A framework approach was used for data analysis. Codes were sorted by the themes, bringing similar concepts together.

**Setting:** This study was conducted between June 2014 and May 2015 within 11 different hospital wards in the Netherlands. The wards varied in medical speciality, as well as in hospital type and the organisational model for inpatient care.

**Participants:** Participant included staff physicians, residents, PAs and nurses.

**Results:** The following themes emerged to be important for the initial employment of PAs and the sustainability of their employment: the innovation, individual factors, professional interactions, incentives and resources, capacity for organisational change and social, political and legal factors.

**Conclusions:** 10 years after the introduction of PAs, there was little discussion among the adopters about the added value of PAs, but organisational and financial uncertainties played an important role in the decision to employ and continue employment of PAs. Barriers to employ and continue PA employment were mostly a consequence of locally arranged restrictions by hospital management and staff physicians, as barriers regarding national laws, PA education and competencies seemed absent.

## INTRODUCTION

Hospital care is characterised by increasing demands for efficiency in healthcare, a rising prevalence of chronic diseases and ongoing specialisation in medical disciplines. In the light of these developments, many hospitals, particularly in the USA, have adopted the hospitalist model to cope with these challenges.<sup>1</sup> Hospitalists are responsible for the

## Strengths and limitations of this study

- This study increases the understanding of the barriers and facilitators in the initial employment of physician assistants (PAs) for inpatient care as well as the sustainability of this employment, and can contribute to an efficient implementation.
- The study results might be an example for other countries which face problems with continuity of inpatient care, efficient delivery of healthcare and a (local) shortage of physicians.
- This study captured a variety of care providers and hospital wards, which enhances the generalisability of the findings.
- The nature of the research may introduce recruitment bias, as care providers with favourable attitudes towards substitution of care or the PA in particular may be more likely to participate.

delivery and coordination of the general medical care of the hospitalised patients.<sup>2</sup> In the Netherlands, medical care on hospital wards is mostly provided by residents. These residents cover medical care for the admitted patients at a specific hospital department for a specific medical speciality, and are being supervised by staff physicians.

Alternative to the resident model, inpatient care has increasingly been reallocated to physician assistants (PAs). Reasons for this reallocation are an increased appreciation of continuity of care, a growing pressure to deliver healthcare efficiently and a (local) shortage of physicians.<sup>3–5</sup> A PA is a non-physician healthcare professional licensed to practice medicine in defined domains, with variable degrees of professional autonomy.<sup>6</sup> In the Netherlands, the autonomy of PA practice varies considerably with experience, training, practice setting and employer expectations. Since 2012, PAs are legally authorised to prescribe medication autonomously and to indicate and perform specific medical procedures.<sup>7</sup>



CrossMark

For numbered affiliations see end of article.

### Correspondence to

Marijke J C Timmermans;  
marijke.timmermans@  
radboudumc.nl

PAs in the USA have a long history in medicine, especially in primary care. Since the year 2000, there has been a shift from primary care to hospital care, and currently, about two-thirds of all PAs are in a surgical or medical subspecialty.<sup>8</sup> In the Netherlands, PAs have been introduced in 2001, and the majority has traditionally been employed in hospitals, especially to take care of hospitalised patients within a certain surgical or medical speciality.<sup>9</sup> It is expected that within the next decades, the role of PAs in the management of hospitalised patients will increase worldwide. However, the effectiveness of delivered care by new professionals is greatly affected by its implementation.<sup>10</sup> Knowledge of the barriers and facilitators which care providers experience in the initial employment of PAs for inpatient care as well as the sustainability of this employment is important to facilitate the implementation of these roles. Although previous studies on barriers and facilitators of the implementation process have been conducted,<sup>9 11 12</sup> these studies were not focused on inpatient care or focused only on the experiences of physicians. To have a comprehensive insight into all relevant barriers and facilitators for implementation of PAs, it is important to involve relevant stakeholders.

### Study aim

In this study, barriers and facilitators for the implementation of PAs in inpatient care were explored. We identified determinants of the initial employment of PAs, as well as of the sustainability of their employment.

## METHODS

### Study design and sampling

This qualitative study was linked to a comparative evaluation examining the effectiveness of substitution of inpatient care from physicians to PAs.<sup>13</sup> Sampling of wards was performed purposively to capture a diversity of medical specialities, hospital types and inpatient care models. The study sample consisted primarily of hospital wards on which currently at least one graduated PA was employed, or on which in the past a PA was employed for medical care. In addition, we added wards on which PAs were never employed, to elaborate which factors were related to not employing a PA. On each ward, a sample of relevant providers (PAs, staff physicians, residents and nurses) were interviewed. On the wards on which PAs were never employed, only staff physicians were interviewed because in general they have the main vote in the decision to employ a PA. We initially asked the staff physician or the PA (ie, the contact person of the comparative study) by email or telephone to participate in this qualitative study. Subsequently, the staff physician or PA recruited the other professions.

### Interviews

Semistructured individual interviews were conducted by two researchers who were trained in qualitative research

methods (ITHMM and MJCT). Both researchers attended a course on individual interviewing beforehand. All interviews were framed by a topic list, which was developed in consultation with experts in substitution of hospital care and tested in a pilot study. A published framework of determinants of implementation of innovations was used to guide the interviews and their analysis.<sup>14</sup> This TICD framework specifies 57 implementation determinants in 7 domains: (1) guideline factors; (2) individual factors; (3) patient factors; (4) professional interactions; (5) incentives and resources; (6) capacity for organisational change and (7) social, political and legal factors. The framework is based on an integrative analysis of 14 previously published frameworks for the implementation of evidence-based practice. Since our research is about the implementation of revised professional roles, we rephrased the first domain into 'the innovation'. While using the framework, we encouraged open narrations to elicit information the interviewee deemed important. During all interviews, short notes were written about verbal and non-verbal features, to provide the researchers with reference data against which to analyse the interviews. The semistructured interviews were taken between June 2014 and May 2015, lasted about 30–45 min for each of the professions and were audiotaped. All but two interviews were face to face and took place in the participants' practice setting. Interviews continued until data saturation was achieved per subgroup of profession, on the basis of interim analyses after each set of five to eight interviews, as demonstrated by the absence of new themes emerging from analysis.<sup>15</sup>

### Data analysis

All interviews were transcribed verbatim. A framework approach was used for data analysis, which implies that we worked with structured topic guides in order to identify patterns within the data, but also allowed new themes to emerge from the data.<sup>16 17</sup> Initially, two researchers (ITHMM and MJCT) coded the transcript independently to improve the validity of the results. Consensus was reached by discussion, and if necessary, a third researcher (MGHL) was involved. After 10 interviews, agreement was reached about the codes. After that, each interview was coded by a single researcher, though one out of three interviews was randomly selected and analysed by the second researcher. Besides, new and doubtful codes were discussed when applicable. Next, in two data analyses workshops (MJCT, ITHMM, MGHL, AJAhvV), codes were sorted and synthesised by the themes of the TICD framework, bringing similar concepts together.<sup>14</sup> Member checking was used to confirm the credibility of the data: each participant was given a summary of the interview, to determine whether the themes were appropriately identified and matched their responses. Only minor changes were requested. Atlas.ti software was used to facilitate data management and analysis. The analyses were conducted iteratively, to

allow emerging themes and theories to be explored in subsequent interviews. Final results were discussed by an expert panel, consisting of staff physicians, PAs, PA educators and researchers in the field of task reallocation.

### Ethical considerations

Ethical approval was sought from the Research Ethics Committee of the Radboud university medical centre (registration number: 2012/306); the committee judged that ethical approval was not required under Dutch National Law. All participants received information on the interviewer, background and aims of the research project before the interview. Written informed consent was obtained from all participants.

### RESULTS

In total, 32 participants were interviewed, spread over 11 wards across 10 hospitals. Three participants who were contacted declined participation due to lack of time or lack of interest. The characteristics of the wards and interviewees are summarised in [table 1](#). The participating wards represented a diversity of hospital wards in the Netherlands. There was variation in medical speciality, as well as in hospital type and the organisational model for inpatient care. On each hospital ward, at least one staff physician was interviewed.

### Determinants of the decision to employ PAs for inpatient care

The following themes from the TICD framework showed to be relevant for the decision to employ PAs in inpatient care: (1) the innovation; (2) professional interactions; (3) incentives and resources; (4) capacity for organisational change; and (5) social, political and legal factors. The perceived determinants are summarised per theme in [table 2](#).

#### The innovation

The desired continuity of care appeared to be a main deciding factor for the employment of PAs in inpatient care. Residents and fellows traditionally have rotational cycles which cause them to stay only a limited time on each department. Therefore, the turnover of doctors at these wards is rather fast (often between 1 and 14 weeks). PAs generally do not rotate and can be a more stable factor in the continually changing medical workforce, which is thought to lead to advantages in quality of care.

Another important determinant related to this theme was the expectation that involvement of PAs should disburden the physicians. Since the PA is the constant factor for inpatient care, the staff physicians and residents can be employed in, for example, providing outpatient care or perform medical procedures. Besides, fellows have more time to focus on the needs for their own education to become a medical specialist. PAs also disburden the physicians by performing additional tasks,

**Table 1** Characteristics of participating wards and care providers

<i>Characteristics of wards (n=11)</i>	
<i>Medical speciality, n (%)</i>	
Cardiology	1 (9%)
Surgery	3 (27%)
ENT, head and neck oncology surgery	2 (18%)
Orthopaedics	2 (18%)
Gastroenterology	2 (18%)
Pulmonology	1 (9%)
<i>Hospital type, n (%)</i>	
Teaching	
Academic	2 (18%)
Non-academic	4 (36%)
Non-teaching	5 (45%)
<i>Organisational model for inpatient care, n (%)</i>	
Mixed PA/MR*	4 (36%)
100% PA†	1 (9%)
PA not employed anymore	1 (9%)
Never employed a PA	5 (45%)
Number of beds, <i>mean (SD)</i>	22 (8)
Years of employment of PA, <i>mean (SD)</i>	6.0 (3.2)
<i>Characteristics of care providers (n=32)</i>	
Age, years, <i>mean (SD)</i>	40.5 (11.1)
Gender, male, <i>n (%)</i>	16 (50%)
<i>Profession, n (%)</i>	
Staff physician	12 (38%)
Physician assistant	8 (25%)
Medical resident/junior doctor	6 (19%)
Nurses, including heads of department	6 (19%)
Years working on the hospital ward, <i>mean (SD)</i>	9.6 (8.1)
Still working with PA, <i>n (%)‡</i>	17 (71%)

\*MRs and PAs are in charge of admitted patients, with supervision of staff physicians.

†Only PAs are in charge of admitted patients, with supervision of staff physicians.

‡PAs (n=8) were excluded for this calculation.

MR, medical resident; PA, physician assistant.

for example, integrating newly employed doctors, performing specific (complex) medical procedures, providing education or conducting quality projects.

An important factor for not employing a PA is that there is no need for change because of satisfaction with the current quality of care and the availability of appropriate residents. Another hindering factor that was mentioned was that PAs work only on regular base during daytime office, and not at nightshifts or weekend shift. This has, according to the interviewees, a negative impact on the number of irregular shifts that physicians should work. Besides, substituting residents by PAs could limit the education possibilities of residents, since providing inpatient care is perceived to be very important for their training.

### Professional interactions

Positive experiences with PAs seem to positively stimulate the employment of PAs, while negative experience

**Table 2** Determinants for the employment of physician assistants for inpatient care

Theme	Perceived facilitators	Perceived barriers
The innovation	<ul style="list-style-type: none"> <li>▶ Need for continuity of care</li> <li>▶ Need for quality improvement</li> <li>▶ High workload MRs</li> <li>▶ More effective employment of MRs for other tasks</li> <li>▶ Employee of the ward initiated the idea</li> </ul>	<ul style="list-style-type: none"> <li>▶ No need for change</li> <li>▶ Time and cost investment for the education of a PA</li> <li>▶ Risk that the PA resigns shortly after finishing education</li> <li>▶ PA does not work at irregular shifts</li> <li>▶ Limit the education possibilities of MRs</li> <li>▶ Lack of scientific evidence on outcomes</li> <li>▶ Diversity of different professionals who can be employed for inpatient care</li> </ul>
Professional interactions	<ul style="list-style-type: none"> <li>▶ Positive experiences with PAs in inpatient care elsewhere</li> </ul>	<ul style="list-style-type: none"> <li>▶ Negative experiences with PAs in inpatient care elsewhere</li> <li>▶ Resistance from professional associations of medical specialists</li> </ul>
Incentives and resources	<ul style="list-style-type: none"> <li>▶ Shortage of MRs for inpatient care</li> <li>▶ Relatively low salary of PA</li> <li>▶ Standardisation of medical care</li> </ul>	<ul style="list-style-type: none"> <li>▶ Shortage of appropriate PA for inpatient care</li> <li>▶ Discussion about payment of salary PA</li> </ul>
Capacity for organisational change	<ul style="list-style-type: none"> <li>▶ Support of the management</li> <li>▶ Staff physicians are employed by the hospital</li> </ul>	<ul style="list-style-type: none"> <li>▶ Uncertainty because of approaching take-over of hospitals</li> <li>▶ Uncertainty because of changes of high impact within the organisation of the staff physicians</li> </ul>
Social, political and legal factors	<ul style="list-style-type: none"> <li>▶ Improved legislation to prescribe medication and indicate and perform medical procedures</li> </ul>	<ul style="list-style-type: none"> <li>▶ Less authorised to prescribe medication and take decisions in comparison to MRs</li> </ul>

MR, medical resident; PA, physician assistant.

elsewhere was mentioned as a hindering factor. Resistance from professional associations of medical specialists was mentioned as a factor which influences the decision to not employ a PA.

### Incentives and resources

From the theme incentives and resources, a main motive for employing a PA for inpatient care was a shortage of residents because of an unfavourable geographical location or a less attractive hospital because of the non-teaching status. A main determinant for not employing a PA was unclearness or disagreement about the payment of the PA.

It is more a case of there being no structural funding with which the salary of a PA can be paid. So if you are running a partnership and next to that the hospital, then it is unclear who is going to pay the PA, because you are providing quality of care, of which the partnership says: 'the hospital ought to share in these costs', but the hospital states: 'you are supporting the pulmonologist, so the partnership should pay for this'. So there are as yet no fixed rules about who has to pay for that in the hospital. (P25, Staff physician)

### Capacity for organisational change

Support of the management of the hospital emerged as a facilitating factor for the employment of a PA. An important factor on organisational level for not employing a PA was uncertainty felt by the staff physicians

due to changes of high impact within the organisation of the hospital or the organisation of the staff physicians. A mentioned example was uncertainty because of approaching take-over of hospitals.

### Social, political and legal factors

The enacted legislation was mentioned as an important facilitating factor, allowing PAs to prescribe medication and to indicate and perform specific medical procedures autonomously. No determinants for *not* hiring a PA were mentioned.

### Determinants of sustained employment of PAs for inpatient care

The following themes showed to be relevant for the decision to employ PAs: (1) the innovation; (2) patient factors; (3) professional interactions; and (4) social, political and legal factors. Besides, 'organisational factors' emerged as a new theme. In this theme, we categorised all factors regarding the organisation which were recommended to facilitate the implementation process. In table 3, perceived determinants are summarised per theme.

### The innovation

Experiencing positive outcomes of PAs positively influence the sustainability of the implementation of PAs in inpatient care. Relative advantages that were mentioned were improved continuity, quality and effectiveness of

**Table 3** Determinants for the sustainability of physician assistants in inpatient care

Theme	Perceived facilitators	Perceived barriers
The innovation	<ul style="list-style-type: none"> <li>▶ Dual character of the education</li> <li>▶ Clinical work experience within similar speciality</li> <li>▶ Knowing own limits</li> <li>▶ Experiencing relative advantages: efficiency of care, bridging role, communication with patients</li> <li>▶ The PA can fulfil different roles depending on team needs</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stagnation of care processes because of less autonomy</li> <li>▶ Limited employable within the broadness of the medical speciality</li> </ul>
Patient factors	<ul style="list-style-type: none"> <li>▶ Satisfied patients</li> <li>▶ Accessibility of the PA</li> <li>▶ Informing patients about the roles and responsibilities on the ward</li> </ul>	<ul style="list-style-type: none"> <li>▶ Patients are not familiar with PA position</li> <li>▶ Patients do not know whether they saw a physician or PA</li> </ul>
Professional interactions	<ul style="list-style-type: none"> <li>▶ Mutual trust</li> <li>▶ Broad support of the medical staff</li> <li>▶ Support of the ward care team</li> <li>▶ Equal treatment of PAs and MRs</li> <li>▶ Satisfied nurses</li> <li>▶ Improved job satisfaction of staff physicians</li> <li>▶ Physician is known with PA profession</li> <li>▶ Adequate interaction between physician and PA</li> </ul>	<ul style="list-style-type: none"> <li>▶ Physician wants to consult a physician instead of a PA</li> <li>▶ Resistance from individual physicians or professional associations</li> <li>▶ Difficult positioning of PAs: not a doctor, not a nurse</li> <li>▶ PA pretends to be a physician</li> <li>▶ MRs see PAs as a threat because of less jobs or less education possibilities</li> <li>▶ Imaging that PAs may not make mistakes</li> </ul>
Capacity for organisational change	<ul style="list-style-type: none"> <li>▶ Long-term planning and vision by the management</li> </ul>	
Social, political and legal factors	<ul style="list-style-type: none"> <li>▶ Improved legislation</li> <li>▶ Frameworks from professional associations of medical specialists</li> </ul>	<ul style="list-style-type: none"> <li>▶ Not authorised to prescribe medication</li> <li>▶ Frameworks from professional associations</li> </ul>
Organisational factors	<ul style="list-style-type: none"> <li>▶ Accessible staff physicians for supervision</li> <li>▶ A written clear description of job responsibilities/job specifications</li> <li>▶ Sufficient attention for the job satisfaction of PA/opportunities for personal development</li> <li>▶ Adequate supervision, including extra attention for clinical reasoning skills during education period</li> </ul>	<ul style="list-style-type: none"> <li>▶ Part-time job extent</li> </ul>

MR, medical resident; PA, physician assistant.

care. Besides, efficiency was mentioned as an important facilitating factor. A PA is expected to work more efficiently than a resident. Since the PA works for a longer time at the hospital ward, they are more familiar with the clinical protocols and the procedures to, for example, request diagnostics tests and consult other physicians. As a consequence, they need less time for indirect care. Besides, PAs are thought to be more familiar with the routines of other individual professionals.

The fact that she has been working on the ward for years, that she knows exactly how the ward functions, how everything works, what to do when there is a threat of overcapacity, what to do when tasks have been given to the nursing staff that are not executed in the right way, how to report incidents locally, she knows it all. She knows all the ins and outs of the ward, knows how everything works, so she is able to act quickly the moment she realises that something is not going well. (P7, Staff physician)

As a consequence of the efficiency, it was mentioned that PAs can spend more time on direct contact with the patient, or perform additionally tasks like quality projects, education or medical procedures. In this way, they disburden the staff physicians. In the perspective of nurses, working with a PA is efficient because they have a more attained and approachable contact person for medical questions. Questions are answered faster, which is efficient for the treatment of the patient. The only mentioned disadvantage regarding efficiency was that a nurse experienced delay in the treatment of patients because the PA in her opinion is not allowed to make rigorous choices in the medical treatment of patients, while the residents are. However, this was contradicted by nurses from other hospitals, who experienced higher autonomy of PAs in comparison with residents.

Another mentioned important determinant for the sustainability of PAs is that, because of the broad medical background and continuity, PAs can fulfil different roles depending on team needs. As a stable element

in a continually changing medical workforce, PAs who are involved in inpatient care often have additional tasks like quality projects, education, medical procedures or outpatient care. Based on the team needs, these tasks can be adjusted. Another mentioned relative advantage was the bridging role of PAs between the nurses and physicians.

The PA does not have a background in medicine but often in nursing or physiotherapy, and has by nature often just a little more feeling with the nursing staff where we, we are of course a team, and both groups depend on each other. Nurses cannot do without us, and we cannot do without nurses, so you do need to have a certain cooperation in that and a PA can have a very useful role as an intermediary, because not every resident has the kind of sense for the nursing staff to fulfil that role. (P24, Staff physician)

Also the communication skills of PAs were mentioned as a relative advantage. It is thought that, since Dutch PAs have at least 2 years of clinical work experience in the healthcare domain as, for example, a nurse or physiotherapist, they are more experienced with simplifying difficult medical concepts into a language which is understandable for patients.

#### Patient factors

A mentioned determinant by the interviewees from the patient perspective was that many patients are not familiar with the PA professional in general, and that they often do not know whether they saw a physician or a PA. Sometimes, the patient or relatives persist to see the physician in addition to the PA.

#### Professional interactions

Mutual trust emerged as a main determinant from the theme professional interactions. Besides, a broad support of the medical staff and ward care team is perceived a very important factor for the implementation. An equal treatment of PAs and residents is perceived to facilitate the implementation process.

Whenever we go to a meeting, then all of us go together. So if there is a multidisciplinary vascular meeting or a dialysis meeting or some such thing, then the PAs come along too and they just as easily take part in the discussion as the physicians. That is why we stated right from the beginning: we want the PAs to be able to work in the same atmosphere, without barriers in relation to us and within the group. Therefore they need to be fully included in the way the residents are trained and we have succeeded in that. (P11, Staff physician)

A hindering factor which was mentioned is that it regularly happens that physicians from other medical specialities demand to consult a physician instead of a PA about a patient. Related to this, the positioning of their profession was mentioned by PAs as an influencing determinant. PAs are no doctors, although they perform

similar medical tasks. It is considered a difficult process to find the right position within a medical team. Not all PAs experienced this positioning problem. Mentioned factors which positively influenced this are an increasing number of PAs in the same hospital, increasing familiarity of other care providers with the PA profession, guidance of the staff physicians and personal characteristics of the PA such as assertiveness.

Another item from the theme individual factors which was mentioned by PAs was that some residents experience less job possibilities or less education possibilities for themselves. In contrast, the interviewed residents who worked with PAs in inpatient care experienced more education possibilities, since they need less time for inpatient care and have more time left over for specific education purposes. Besides, some residents told that they learn important things from PAs, such as communication skills, performing specific medical procedures and the logistic procedures at the ward. All professionals however agreed that inpatient care is a very important part of the education of residents, and that it is critical to facilitate this.

#### Social, political and legal factors

The improved legislation in which PAs are since 2012 authorised to prescribe medication autonomously was mentioned as a facilitating factor. On the other hand, locally arranged restrictions, that is, a lack of authorisation for prescribing medication and taking decisions in comparison with residents, were mentioned as a determinant for *not* hiring a PA.

#### DISCUSSION

This study identified determinants of the decision to employ PAs for inpatient care, as well as of the sustainability of the employment. Fifteen years after the introduction of PAs in the Netherlands, there seems to be little discussion about the added value of PAs among those who adopted them. Interviewed professionals experienced many benefits, of which the main benefit turned out to be the gained continuity of care, since PAs are perceived to be a more stable element in the continually changing medical workforce than residents are. Nevertheless, several barriers were identified which need to be considered by those interested in employing PAs and optimising the PA role in inpatient care. Organisational and financial uncertainties play an important role in the decision to employ a PA. Remarkably, many experienced barriers to employ and continue PA employment are a consequence of locally arranged restrictions by hospital management and staff physician, as barriers regarding national laws, PA education and competencies of PAs seemed non-existing. These results might be an example for other countries which face problems with continuity of inpatient care, efficient delivery of healthcare and a (local) shortage of physicians.

### Implications regarding the employment of PAs

Uncertainty on organisational and financial level turned out to play an important role in the decision to employ a PA. The structure of legal and financial embedding of specialists within the hospital is currently subject of major change in Dutch healthcare. From 2015 onwards, the income of self-employed medical specialists is part of integral prices within a performance-based financing system.<sup>18</sup> Because of uncertainty whether the fiscal status of self-employed medical specialists would still be guaranteed while using these integral prices, self-employed medical specialists had to reorganise their partnership to make sure the fiscal status should be maintained.<sup>19</sup> Since our interviews were held during the transition phase, medical specialists experienced many uncertainties regarding their future organisation and positioning within the hospital, and were as a consequence reluctant to employ PAs. It is however thought that when the new system is fully implemented, there will be more emphasis on performance and quality standards, rather than on the amount of treatments performed.<sup>19</sup> This might incorporate an increase in the employment of PAs, since they are thought to add to the quality of care.

An important experienced barrier for the employment of PAs was disagreement between staff physicians and hospital management about who should pay the salary of the PA. Based on the general idea that only the medical specialist benefits from the employment of PAs, the hospital management prefers that the staff physicians are responsible for the PA's salary. Staff physicians disagree because besides performing medical tasks, PAs in inpatient care also improve quality and accessibility of care. Such discussions may hamper the employment of PAs. It is important that staff physicians are aware of these discussions, and make in collaboration with the hospital management a sustainable financial model which is based on the future tasks of the PA, taking into account the balance between substitution of medical tasks and addition to quality and accessibility of care.

Another important topic, which is related to the financial models, is the diversity of different professionals who can be employed for inpatient care. Besides PAs and residents, also nurse practitioners (NPs) are occasionally employed for medical care at the ward. However, in contrast to PA, NPs do not have a broad generalist medical education, which is considered to be important for providing adequate medical care for admitted patients. A qualitative study by Kouwen and Brink<sup>20</sup> showed that a possible incentive of still employing NPs in inpatient care is the local arrangement on how the costs of the PA/NP are divided between the hospital and the partnership. For NPs, mostly an allocation clause applies that divides the costs between the hospital and the partnership. With PAs, the partnership themselves mostly need to raise the costs based on the general idea that only the medical specialist benefits from the deployment of the PA. Another health professional who can be employed for hospital ward care is the

hospitalist. Hospitalists have been introduced in the USA already in 1996.<sup>1</sup> In the Netherlands, they have been introduced in 2012 as an answer to the lack of continuity of care at wards and the need for a better balance between specialists and generalists. Hospitalists are physicians who completed a specialisation in hospital medicine and who's practice emphasises providing care for hospitalised patients. Their activities include patient care, teaching, research and leadership related to hospital medicine.<sup>2</sup> Further research is needed about the added value of these relative new professionals (ie, hospitalists, PAs and NPs) providing care to hospitalised patients, including questions related to how they should relate to each other and to more traditional models involving residents.

### Implications regarding the sustainability of PAs

Determinants related to professional interactions and political and legal determinants turned out to be of high importance for the sustainability of PAs in inpatient care. Although our interviews were held about 15 years after the introduction of PAs in the Netherlands, it became clear that the PA profession is still in a developing stage. Although we do not know in what strength, our interviews pointed out that resistance from physicians is still an important theme for the PA profession. PAs experienced in varying strengths resistance from, for example, staff physicians from other specialities who do not want to consult a PA, and from residents who think that the employment of PAs interferes with their job and education possibilities. These findings are in line with the results of other interview studies on the implementation process of PAs.<sup>9 11 12</sup> Interestingly, all residents who were involved in our interview study contradicted this interference. The PA, as stable member of the medical team, provides in the opinion of the residents an additional training resource for residents and junior doctors on rotation. They are able to provide information about organisational policy, as well as training and feedback in relation to practical aspects of the clinical work. This statement is in line with the results from a survey which was conducted in 2015 to assess surgical resident's perceptions of the impact of the implementation of PAs and NPs on residents' training experience in intensive care units.<sup>21</sup> The authors concluded that only a minority of residents perceived that APPs interfered with education and their ability to follow patients. Another common subject of resistance is that most PAs do not work during nights and weekends. As a consequence, residents have to work relatively more at irregular shift. However, involving PAs in irregular shifts would negatively influence the continuity of care at the ward during daytime, which was considered a main advantage of employing PAs. Also the positioning of their profession was mentioned by PAs as an important determinant of the implementation process. As with any new profession, it is considered a difficult process to find the right position within a medical team.<sup>10</sup> During the

implementation process, it is important that staff physicians have attention for this issue.

### Strengths and limitations

A strength of this qualitative study is the purposive sampling method, with which we managed to include a breadth of perspectives. We captured a diversity of hospital wards with variation in medical speciality, hospital type and the used inpatient care model. Wards with a relatively long experience with PAs and wards with relatively little experience with PAs were included. Besides, we included hospital wards which have not employed a PA at all. Nevertheless, we cannot exclude selection bias. All care providers voluntarily participated in this study, which could imply that our participants had a more than average affinity with the theme substitution of care or the PA in particular.

### CONCLUSION

Fifteen years after the introduction of PAs in the Netherlands, the profession is maturing. The adopters experience many benefits, but also identified barriers which need to be considered by those interested in employing PAs and optimising the PA role in inpatient care. Organisational and financial uncertainties play an important role in the decision to employ a PA. In addition, many barriers to employ and continue PA employment are a consequence of locally arranged restrictions by hospital management and staff physician, while barriers regarding national laws, PA education and competencies of PAs were barely experienced. Special attention should be paid to the financial embedding of PAs and the positioning of the PA within the medical team, but also to their position in relation to other professions who are responsible for hospitalised patients.

### Author affiliations

<sup>1</sup>Radboud university medical centre, Radboud Institute for Health Sciences, IQ Healthcare, Nijmegen, The Netherlands

<sup>2</sup>Faculty of Health and Social Studies, Physician Assistant Program, HAN University of Applied Sciences, Nijmegen, The Netherlands

<sup>3</sup>Faculty of Health and Social Studies, HAN University of Applied Sciences, Nijmegen, The Netherlands

<sup>4</sup>Department of ENT, Head and Neck Oncology Surgery, Radboud University Medical Centre, Nijmegen, The Netherlands

<sup>5</sup>Department of Surgery, Zuyderland Medical Centre, Sittard, The Netherlands

<sup>6</sup>Department of Gastroenterology, Rijnstate Hospital, Arnhem, The Netherlands

<sup>7</sup>Netherlands Association of Physician Assistants and Physician Assistant, Utrecht, The Netherlands

<sup>8</sup>Department of Cardiology, VieCuri Medical Centre Noord-Limburg, Venlo, The Netherlands

<sup>9</sup>Department of General Practice and Health Services Research, Heidelberg University Hospital, Heidelberg, Germany

**Acknowledgements** The authors wish to thank all interviewed professionals of the 11 hospital wards for their generous participation: Bravis Hospital, Department of Orthopaedics; Elkerliek Hospital, Department of Surgery; Haga Hospital, Department of Surgery; Jeroen Bosch Hospital, Department of Gastroenterology; Radboud university medical centre, Department of ENT, Head and Neck Oncology Surgery; Rijnstate Hospital, Department of Gastroenterology; TweeSteden Hospital, Department of Pulmonology; UMC

Cancer Centre, University Medical Centre Utrecht, Department of Head and Neck Surgical Oncology; VieCuri Medical Centre Noord-Limburg, Department of Cardiology; VieCuri Medical Centre Noord-Limburg, Department of Orthopedics; Zuyderland Medical Centre, Department of Surgery.

**Contributors** MGH and MJCT are responsible for the design of the study with comments of AJAHvV and MW. MJCT and ITHMM carried out the interviews and performed the data analyses, with direct supervision from MGH and AJAHvV. LD, AGMH, MS and WvU were involved in the data collection of the study. MJCT wrote the first draft of the manuscript and all other authors reviewed this critically. All authors read and approved the final manuscript.

**Funding** This work was funded by The Netherlands Organization for Health Research and Development (ZonMw), grant number 171202006.

**Competing interests** None declared.

**Ethics approval** Research Ethics Committee of the Radboud University Medical Centre.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** The topic guide and coding tree are available by emailing MJCT: marijke.timmermans@radboudumc.nl.

**Open Access** This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

### REFERENCES

- White HL, Glazier RH. Do hospitalist physicians improve the quality of inpatient care delivery? A systematic review of process, efficiency and outcome measures. *BMC Med* 2011;9:58.
- Society of Hospital Medicine. [http://www.hospitalmedicine.org/Web/About\\_SHM/Industry/Hospital\\_Medicine\\_Hospital\\_Definition.aspx\\_FAQs&](http://www.hospitalmedicine.org/Web/About_SHM/Industry/Hospital_Medicine_Hospital_Definition.aspx_FAQs&) (accessed 17 Aug 2015).
- Ford WT, Britting LL. Nonphysician providers in the hospitalist model: a prescription for change and a warning about unintended side effects. *J Hosp Med* 2010;5:99–102.
- Hartsell Z. The emerging role of PAs in the hospitalist movement. *JAAPA* 2007;20:10.
- Hooker RS, Brock DM, Cook ML. Characteristics of nurse practitioners and physician assistants in the United States. *J Am Assoc Nurse Pract* 2016;28:39–46.
- Merkle F, Ritsema TS, Bauer S, *et al*. The physician assistant: shifting the paradigm of European medical practice? *HSR Proc Intensive Care Cardiovasc Anesth* 2011;3:255–62.
- De Bruijn-Geraets DP, Van Eijk-Hustings YJ, Vrijhoef HJ. Evaluating newly acquired authority of nurse practitioners and physician assistants for reserved medical procedures in the Netherlands: a study protocol. *J Adv Nurs* 2014;70:2673–82.
- Morgan P, Everett CM, Humeniuk KM, *et al*. Physician assistant specialty choice: distribution, salaries, and comparison with physicians. *JAAPA* 2016;29:46–52.
- Zwijnenberg NC, Bours GJ. Nurse practitioners and physician assistants in Dutch hospitals: their role, extent of substitution and facilitators and barriers experienced in the reallocation of tasks. *J Adv Nurs* 2012;68:1235–46.
- Niezen MG, Mathijssen JJ. Reframing professional boundaries in healthcare: a systematic review of facilitators and barriers to task reallocation from the domain of medicine to the nursing domain. *Health Policy* 2014;117:151–69.
- Taylor MT, Wayne Taylor D, Burrows K, *et al*. Qualitative study of employment of physician assistants by physicians: benefits and barriers in the Ontario health care system. *Can Fam Physician* 2013;59:e507–13.
- White H, Round JE. Introducing physician assistants into an intensive care unit: process, problems, impact and recommendations. *Clin Med (Lond)* 2013;13:15–8.
- Timmermans MJ, van Vught AJ, Wensing M, *et al*. The effectiveness of substitution of hospital ward care from medical doctors to physician assistants: a study protocol. *BMC Health Serv Res* 2014;14:43.



14. Flottorp SA, Oxman AD, Krause J, *et al.* A checklist for identifying determinants of practice: a systematic review and synthesis of frameworks and taxonomies of factors that prevent or enable improvements in healthcare professional practice. *Implement Sci* 2013;8:35.
15. Bowen GA. Naturalistic inquiry and the saturation concept: a research note. *Qual Res* 2008;8:137–52.
16. Pope C, Ziebland S, Mays N. Qualitative research in health care. Analysing qualitative data. *BMJ* 2000;320: 114–16.
17. Smith J, Firth J. Qualitative data analysis: the framework approach. *Nurse Res* 2011;18:52–62.
18. Nederlandse Zorgautoriteit. *Verantwoordingsdocument: Invoering prestatiebekostiging medisch specialistische zorg. [Introduction of performance-based financing of medical care]*. Utrecht: Nederlandse Zorgautoriteit, 2011.
19. Stel E. *Regulated performance-based financing. Cost containment vs. performance-based financing*. Rotterdam: Erasmus University, 2012.
20. Kouwen A, Brink vdG. *Task reallocation & cost prices. A research of obstacles concerning substitution*. Radboud University Medical Center, 2014.
21. Kahn SA, Davis SA, Banes CT, *et al.* Impact of advanced practice providers (nurse practitioners and physician assistants) on surgical residents' critical care experience. *J Surg Res* 2015;199:7–12.