RESEARCH ARTICLE

International Journal of Geriatric Psychiatry

Symptom relief in patients with pneumonia and dementia: implementation of a practice guideline

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Objective: This study aimed to assess the degree of implementation and barriers encountered in the use of a practice guideline for optimal symptom relief for patients with dementia and pneumonia in Dutch nursing homes.

Methods: A process evaluation included assessment of reach, fidelity, and dose delivered using researcher's observations, and dose received was addressed in a question "use of the practice guideline," which the physicians completed for each patient included in the study. Perceived barriers were assessed with a structured questionnaire (response 69%) and semi-structured interviews ($n = 14$), which were subject to qualitative content analysis.

Results: Of the 55 physicians involved in the intervention phase, 87% attended an implementation meeting; 20 physicians joined the study later (reach). The intervention was implemented as planned, and all intervention components were delivered by the researchers (fidelity and dose delivered). Thirty-six physicians included 109 patients. For 81% of the patients, the treating physician stated to have used the guideline (dose received). The guideline was perceived as providing a good overview of current practice, but some physicians had expected a more directive protocol or algorithm. Further, recommended regular observations of symptoms were rarely performed. Physician's often felt that "this is not different from what we usually do," and with the acute illness, there was not always enough time to (re)familiarize with the contents.

Conclusions: The physicians used the practice guideline frequently despite important barriers. Future implementation may involve strategies such as multiple interactive meetings. Further, the greatest potential to alter usual practice should be emphasized, such as using observational instruments.

Key words: nursing homes; dementia; pneumonia; discomfort; process evaluation
History: Received 22 March 2016; Accepted 02 June 2016; Published online in Wiley Online Library (wileyonlinelibrary.com)
DOI: 10.1002/gps.4533

Introduction

Pneumonia is common in nursing home (NH) patients with dementia (Mitchell *et al.,* 2009), and has been associated with severe discomfort (van der Maaden *et al.,* 2016; van der Steen *et al.,* 2002; van der Steen *et al.,* 2009). In a cluster randomized trial in 32 NHs that evaluated the effects of evidence-based and consensus-based practice guideline for optimal symptom relief (van der Maaden *et al.,* 2015) in patients with dementia and pneumonia, discomfort and symptoms did not differ between the control

and the intervention condition (manuscript submitted).

Practice guidelines, which are defined as "systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific circumstances" (Field and Lohr, 1990), are popular tools to promote best practice for various disciplines and settings. For the adoption of guideline recommendations in practice, however, physician adherence is crucial. Furthermore, actual usage of a guideline may be hindered by characteristics of the care setting and of the guideline itself and its implementation. Proper understanding of barriers and facilitators perceived by physicians is critical for the development of effective implementation strategies (Cabana *et al.,* 1999). However, these, and the intervention and implementation quality, are often not considered in the interpretation of trial results.

A process evaluation can be used to open up the "black box" to enhance understanding of the relation between intervention characteristics and the study outcomes (Harachi *et al.,* 1999). Frameworks such as that of Saunders *et al.* assess the degree of intervention components' implementation, and whether this can explain why an intervention was, or was not successful, using the factors reach, fidelity, dose delivered, dose received–exposure, and dose received–satisfaction (Baranowski and Stables, 2000; Leontjevas *et al.,* 2012; Linnan and Steckler, 2002; Saunders *et al.,* 2005). In this paper, we aim to provide further understanding on the lack of an intervention effect in the cluster randomized trial.

Methods

A mixed-methods process evaluation was conducted during implementation of the practice guideline and during and shortly after the data collection of the trial. Methods and results of the effectiveness study are described elsewhere (manuscript submitted).

The practice guideline

The evidence-based and consensus-based practice guideline for optimal symptom relief was developed using a Delphi study, and its development, contents, and suggestions for use are described elsewhere (van der Maaden *et al.,* 2015). The guideline components were as follows: (1) a checklist with symptoms of pneumonia; (2) observational instruments to monitor the symptoms pain and respiratory distress; and (3) tailored treatment recommendations (**Box 1**). Physicians were instructed to use the practice guideline at their own discretion, but we recommended to thoroughly read the practice guideline at least once before patient inclusion, to use the checklist and the observational instruments to monitor symptoms, and the treatment recommendations in the guideline in response to the completed checklist, or the patient's condition.

Setting and participants

The practice guideline was implemented in Dutch NHs (16 intervention NHs of the 32 NHs that participated in the trial). Dutch NHs employ elderly care physicians who are on the staff and who are responsible for medical care (Hoek *et al.,* 2003; Koopmans *et al.,* 2003). The elderly care physicians who worked on the wards and who participated in the intervention phase of the trial were the target users of the practice guideline. The target patients of the practice guideline were NH patients with dementia and (suspected) pneumonia.

Implementation strategy

The intervention was introduced by the primary researcher (T. v. d. M.) and supported by a project assistant during a 1-h meeting in each NH. Physicians were given access to a digital version of the guideline ahead of the meeting to encourage self-study. The meeting addressed guideline development, guideline components, and instructions for using the practice guideline. The contents of the practice guideline were only discussed globally, but there was room for discussion and questions. The meetings were primarily meant for the physicians working on the participating wards ($n = 55$) in the intervention homes, but meetings were often held for the full physician team of the NH.

Physicians who did not attend a meeting received the practice guideline with explanation of use in an e-mail, and colleagues who did attend were asked to inform the non-attendees. Newly employed physicians received the practice guideline along with information about the study per mail. During the study period, physicians in participating NHs were reminded of using the practice guideline by monthly reminder e-mails that included a link to the digital version of the guideline, a semi-annual newsletter, and regular phone calls. Halfway during the study period, when we noticed that some physicians often did not use the guideline, we introduced a poster displaying the checklist, an action plan, and key points of the practice guideline.

Box 1 The intervention

The intervention

A consensus-based and literature-based **practice guideline** for optimal symptom relief for patients with pneumonia and dementia

Practice guideline components:

1. Checklist of symptoms
2. Observational instruments to monitor symptoms*
3. Tailored treatment recommendations
4. Poster displaying key points and action plan

*Respiratory distress	RDOS:	Respiratory Distress Observation Scale
*Pain	PAINAD:	Pain Assessment in Advanced Dementia
	PACSLAC:	Pain Assessment Checklist for Seniors with Severe Dementia
	REPOS:	Rotterdam Elderly Pain Observation Scale

Action plan:

A. Suspected pneumonia in patient with pneumonia and dementia
B. Right away: Complete checklist
C. Optional: Use the RDOS to asses respiratory distress
D. Optional: Observe pain using one of three instruments
E. Consult relevant treatment recommendations
F. Re-use the checklist on day 1, 2, 3, and 7 days after pneumonia diagnosis
G. Repeat steps at a later time and monitor symptoms using the checklist and observational instruments

Key points:

- Treatment advice is grouped into supportive care and both pharmacological and non-pharmacological treatments
- The practice guideline is suitable for all treatment goals, including cure or palliation
- The practice guideline is intended as a decision aid; the physician is of course free to deviate from it if there are good clinical reasons.
- Administering a low dose of opioids can provide relief of the overall condition of the patient, regardless of the treatment goal

The practice guideline was expected to enhance comfort by

- Enhancing awareness with regard to discomfort
- Providing a more structured treatment approach
- Regular observations to monitor symptoms

Process evaluation

We applied an approach for designing process evaluations developed by Saunders *et al.* (2005), using the components from Linnan and Steckler's (2002) framework. We assessed reach, fidelity, and dose delivered using observations by the researchers, dose received–exposure with a closed-ended evaluation questionnaire, and dose received–satisfaction using interviews with physicians. Barriers were assessed both qualitatively in the interviews and quantitatively in the closed-ended questionnaire (Table 1).

Qualitative data collection

Observations by the researchers. The project assistant recorded attendance of the physicians who worked on the participating psychogeriatric wards and assessed whether all topics were addressed and all materials were provided during the implementation meetings. Throughout the project, the primary researcher (T. v.d.M.) and the project assistant had close contact with all the NHs via telephone, e-mail, and visits, to monitor involvement in the study.

Interviews. We selected physicians for interviews using purposive sampling with a strategy aiming at maximum variation with regard to geographic location of the NH, physician's age and level of experience, active involvement of physicians in the study or not, and whether the physicians had used the practice guideline or not. Interviews were semi-structured, with open-ended questions, and followed an interview guide including the following topics:

(1) Using the practice guideline (which components, how, when, where, how often)
(2) Evaluating the practice guideline components
(3) Perceived barriers for using the practice guideline
(4) Expectations about the effectiveness of the practice guideline

Table 1 Key process evaluation components

Components	Operationalization	Data source	Methods and instruments
Reach	Proportion of physicians working on participating wards who attended the practice guideline implementation meeting	Observations by researchers	Attendance during implementation meetings
Fidelity	Extent to which the practice guideline was implemented as planned	Observations by researchers	Monitoring of the implementation meetings
Dose delivered	Amount of components of the practice guideline that was actually delivered or provided by the interventionists	Observations by researchers	Assessment of topics addressed and materials provided during implementation meetings
Dose received–exposure	Extent to which physicians actively engage in, interact with, are receptive to and/or use the practice guideline and its components	Closed-ended questions	Question "using the practice guideline" for every included patient. Evaluation questionnaire for all physicians working on participating wards
Dose received–satisfaction	Satisfaction of physicians on participating wards with the practice guideline or its components	Interviews	Semi-structured interviews with physicians working on participating wards addressing the topic "experiences with and opinions about the practice guideline"
Barriers	Perceived barriers of using the practice guideline	Closed-ended question, Interviews	Evaluation questionnaire for all physicians working on participating wards. Semi-structured interviews with physicians working on participating wards addressing the topic "perceived barriers for the practice guideline"

All sessions were audiotaped, and new interviews took place until no new information emerged (saturation).

Quantitative data collection

Use of the practice guideline for every patient. For every patient, the attending physicians named which component of the practice guideline component they had used: i.e. whether checklist of symptoms, observational instruments, and treatment recommendations were used or not; whether extra observations were performed without the observational instruments; or whether physicians only applied knowledge inferred from the practice guideline.

Physician evaluation questionnaire. A final evaluation questionnaire was sent to all physicians who enrolled patients during the study period ($n = 36$). This questionnaire assessed whether the physician had used the practice guideline and at what moments. Furthermore, a barrier assessment was developed. To ensure that we have included all relevant barriers, we used relevant barriers addressed in frameworks such as that of Cabana *et al.* (1999), Peters *et al.* (2002), barriers coming from a study assessing perceived usefulness and acceptability of a family booklet about comfort care in dementia (van der Steen *et al.*, 2011). Further, we used the first four physician interviews to supplement with barriers that were specific to our study and the practice guideline.

The barrier assessment contained 30 statements to be answered on a 5-point Likert scale (strongly agree to strongly disagree) to quantify perceived barriers while using the practice guideline. In the last statement of the evaluation questionnaire, physicians were asked whether they felt using the practice guideline was worth the invested time.

Analyses

Quantitative data were analyzed by means of descriptive statistics. Barriers from the evaluation questionnaire and the interviews were inventoried quantitatively and qualitatively, respectively.

Interviews were transcribed verbatim, and content analysis was used to identify themes emerging from the interview data. The primary researcher (T. v. d. M.) and a second researcher who had not been involved in the study (S. D.) reviewed the first three transcripts and used open coding to independently create a code list. After agreement was reached about the code list, all manuscripts were coded by both researchers; codes and manuscripts were discussed until consensus was reached. We further structured the codes that were assigned according to topics that were addressed and subsequently reviewed topics within the codes to specifically address our research questions. Citations regarding perceived barriers for using the

practice guideline were classified into categories of potential barriers according to the evaluation questionnaire, and barriers addressed in the interviews but not in the questionnaire were described separately. We added examples of quotations for each topic, to illustrate physicians' experiences with the practice guideline. The Atlas.ti software, version 7.5.6 (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany 2015) was used to process the coded transcripts.

Results

Nursing homes that participated in the intervention phase of the study had a total number of 1700 beds (mean 106 beds, range 30–189). A total number of 109 patients was included by 36 physicians (Figure 1). The question "use of the practice guideline for every patient" was completed for 93 of 109 patients (response 85%); physicians' response to the evaluation questionnaire was 69% (25/36). Fourteen physicians were interviewed (see for characteristics Table 2), and the average duration of interviews was 32 min (range 16–49).

Degree of implementation—process evaluation components:

Reach, fidelity, dose delivered, dose received–exposure, and implementation score. At the time of guideline implementation, 55 physicians worked on the wards that participated in the study, of whom 48 (87%)

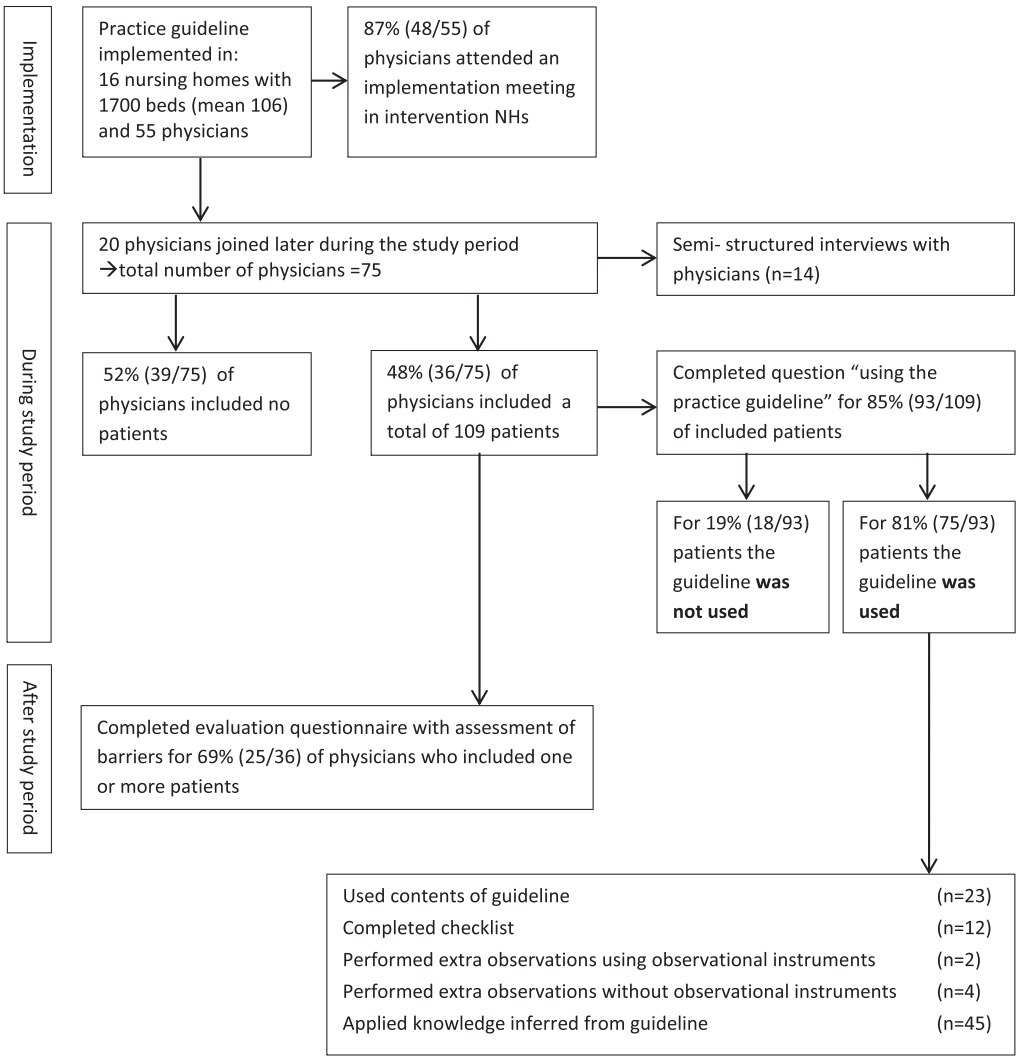

Figure 1 Data sources and response rates in the process evaluation.

Table 2 demographics and practice patterns of physicians who were interviewed and who completed the evaluation questionnaire

Demographic	Interviewed physicians ($n = 14$)	Physicians who completed the evaluation questionnaire ($n = 25$)
Sex		
Male	4	4
Female	10	21
Age, mean (range)	47 (29–60)	44 (27–60)
Years of professional experience (range)	15 (1–30)	14 (1–30)
Facility location		
Urban	8	14
Rural	6	11
Professional specialism		
Elderly care physician	11	18
Elderly care physician in training	2	4
Junior physician	1	3

attended an implementation meeting (Figure 1). Twenty physicians joined the study later, so that the total number of physicians was 75. They did not attend the meeting but received the guideline by email (48/75 = 64%) so that the reach ranged between 64% and 87%. The intervention was implemented consistent with the implementation strategy described, in all NHs (fidelity = 100%). All implementation meetings were chaired by the primary researcher while the project assistant monitored whether all topics were covered in each meeting and whether all materials were provided (dose delivered = 100%).

In 81% (75/93) of included patients, the attending physician used one or more components of the practice guideline, although in almost half of the cases (45/93), physicians did not use the guideline at that moment, but only the knowledge inferred from it (Figure 1; dose received–exposure = 81%). The checklist of symptoms was completed for 12 patients, and supplementary observations as recommended in the guideline with or without the observational instruments were performed in only six cases. More than half (52%) of the physicians who indicated to have used the practice guideline in the evaluation questionnaire consulted it at pneumonia diagnosis. Others consulted the guideline not for a specific patient (29%), or later, but at some point following a pneumonia diagnosis (19%).

Overall, the practice guideline was implemented for 52–70%, taking into account the range in proportion of physicians reached with the practice guideline (64–87%), fidelity (100%), dose delivered (100%), and dose received (81%; (0.64–0.87)*1*1*0.81). This indicates that on average, every patient received 52–70% of the intended dose of the intervention.

Dose received–satisfaction. Ultimately, 42% of physicians felt using the practice guideline was worth the invested time, and they indicated they would continue to use the guideline even after the study period. Physicians described the practice guideline all together as a helpful tool for the treatment of pneumonia in patients with dementia and a good overview of current practice. "*As a doctor you are constantly looking things up and I think that the guideline is a good summary. I think it's quite user-friendly*" (*physician 5*). Part of the physicians had difficulties choosing the relevant topics to consult in a particular situation and had expected a more directive intervention, such as an algorithm or a protocol instead of a practice guideline. Satisfaction with the practice guideline and the degree of implementation differed for the intervention components. Interviewed physicians were generally pleased with the checklist of symptoms, because it provides a quick overview of what subjects are relevant for the particular patient. "*I think it* [*the checklist*] *is useful, especially for the sake of completeness. It's very convenient to quickly check whether you have thought of everything.*" (*physician 6*) The observational instruments were judged as pleasant to work with and helpful for a more objective approach to symptom assessment, but many physicians did not use them. "*yes, you objectify it just a little bit more than without this list* [*pain observational instrument*]. *Without it you also simply add up everything in your mind, but that doesn't give you a number. But it can also have the opposite effect. When you think*: "*well, I see that* grimace", *but that's only two points and the rest is all zero, so OK*" (*physician 1*). "*I think I am quite able to assess it* [*respiratory distress*] *myself, but that may be dangerous, when a doctor thinks that. But otherwise you just need to learn to get it* [*the RDOS*] *and we haven't really done that yet but I think we should*" (*physician 9*).

Interviewees raised the issue that the tailored treatment recommendations overlapped with the current practice in the NH, and that parts of the guideline were therefore obvious. In these cases, physicians acknowledged that they used the guideline mostly to seek confirmation of their belief that they adopt the right approach. "*yes, yes, I do think having such a guideline is a good thing, so you really know, I'm still working according to the latest insights*" (*physician 13*). With regard to the comprehensiveness of the treatment recommendations, some physicians felt the guideline was perhaps "more than complete" referring

to the large amount of information, which may be difficult to handle. Only minor additions were suggested.

Perceived barriers. Thirteen of the 30 barriers addressed in the evaluation questionnaire were mentioned by one or more physicians in the interviews (Table 3). The most prominent barrier (79% of physicians (strongly) agreed in the questionnaire) was working already according to the practice guideline, and related to that, the feeling that the information in the practice guideline is not new or innovative (42% of physicians (strongly) agreed in the questionnaire). Other barriers were the hectic pace of daily practice in the NH, the need to re-familiarize with the contents, and the lack of time to do so.

We found additional barriers that were addressed during the interviews, but not in the evaluation questionnaire (Table 3). One of these was the practical use of the guideline, as physicians felt it was not appropriate to browse through the guideline while being with the patient. Moreover, fixed routines in the NH have hindered use of the guideline in some cases. For example, physicians sometimes hesitated to involve the nursing staff in pain observations, because they felt staff members' time or motivation was lacking. For barriers that were addressed in the evaluation questionnaire, but not in the interviews, at most 33% of the physicians (strongly) agreed.

Discussion

We found that the implementation strategy resulted in 52–70% of the intended implementation, which may in part account for the lack of effect of the practice guideline. Although physicians were generally satisfied with the practice guideline and its contents, the actual use varied substantially for the different guideline components (i.e., checklist of symptoms, the observational instruments, and the treatment recommendations). Other clues for an explanation of the lack of an intervention effect were obtained from the barrier assessment. Namely, important barriers to be addressed remained, including physician's feeling that practice was already consistent with the guideline's recommendations.

Barriers for using the practice guideline

The most prominent barrier addressed in both qualitative and quantitative data sources—already working according to the guideline—was tightly related to the practice guideline's characteristics and way of use and therefore specific for our guideline. Other important barriers, such as lack of time to use the guideline, and the hectic pace of the setting have been described more often (Forsner *et al.*, 2010; Larisch *et al.*, 2009; Schouten *et al.*, 2007; Zwijsen *et al.*, 2014). A comparison among physicians with various specialisms (among others, internists, oncologists, and general practitioners) shows that relatively few physicians in our study regarded the use of practice guidelines in general as a challenge to their autonomy (4% vs. 8–45%; Farquhar *et al.*, 2002; Larisch *et al.*, 2009). This may be explained by use of the guideline at the physicians' own discretion and the fact it could be regarded as "best practice". The percentage of physicians who felt working according to the guidelines is oversimplified or "cookbook" medicine was within the range of what was found in other studies (22% vs. 14–49%; Farquhar *et al.*, 2002; Larisch *et al.*, 2009).

The practice guideline, how to explain its ineffectiveness

Overall, patients received 52–70% of the intended dose of the practice guideline, and suboptimal implementation may in part explain the guideline's ineffectiveness. Some physicians indicated to have difficulties with the large volume of information and found it hard to truly familiarize themselves with the guideline's contents. Regularly, the guideline was not consulted at the moment of the treatment decision, but retrospectively after physicians and staff or family had agreed on treatment. In this way, using the guideline was only a check of having dealt with the most important issues, rather than as a decision aid. According to most physicians, the guideline deviated little from usual practice, and it was often not physically consulted after the first time. Therefore, new parts may have been overlooked. For example, physicians rarely applied the observational instruments supplied with the guideline, although regular observations were one of the guideline's possible mechanisms to enhance comfort (Fuchs-Lacelle *et al.*, 2008; Lukas *et al.*, 2013). Physicians may not truly feel the need of using these instruments and were sometimes reluctant to consult instruct the nursing staff to perform observations.

Strengths and limitations

The strengths of this study were that we combined qualitative data from semi-structured interviews and a quantitative barrier assessment that allowed for validation of findings. Furthermore, we assessed the

Table 3 Perceived barriers for using the practice guideline from evaluation questionnaire ($n = 24$) and interviews with physicians ($n = 14$)

Barriers	Percentage of physicians who (strongly) agreed in the evaluation questionnaire	Description of corresponding barrier addressed in interviews	Relevant quotations from interviews
Evaluation questionnaire I already work according to the recommendations in the guideline[b]	79	Already working according to guideline and therefore not consulting it anymore	"Because I discovered that I already apply everything that is in it, I don't think it's necessary to take it [the guideline] with me every time""I think that the guideline has considerable overlap with what we already do"
The hectic pace of the nursing home prevents me from using the guideline[b]	67	Being so busy with patient care and regular activities that there is no time to use the guideline	"That has more to do with the day-to-day practice. The pace in nursing homes is hectic, and you have very little time. It's, you have to keep going …"
The lack of time to use the guideline	58	Using the guideline takes time/you need to make time for it, and that gets in the way of using it	"Lack of time I think. You just need a phase in which you need to take the time to really read it and then go through it completely with clients and then it becomes part of your system. And it simply takes time in the beginning…"
The guideline does not contain any innovative information[b]	42	There is not much new information in the guideline, which is reason to not use it or not use it frequently	"This is more a list of things that are already there"
I'm not familiar enough with the content of the guideline	36	Pneumonia isn't very common and between pneumonia episodes the knowledge fades.	"At one point I had a patient, this was a good deal later so I really had to search to know what I needed to do"
I have a problem with the amount of information in the guideline	32	The application of the guideline is impractical because there is too much information to absorb quickly.	"I thought it was quite long, you have to think about many points so it takes quite a bit of time"
I am not optimally motivated to adapt my routine to a new guideline	29	A skeptical attitude towards guidelines, or laziness regarding application of the guideline.	"I think it's simple laziness. A passive attitude, that definitely comes into it. And that is also the reason, I think, that we didn't use it very actively."
The content of the guideline is too general, and therefore not concrete enough[b]	21	Not seeing the wood for the trees because there is so much information and so many options.	"…there are so many options. And I grew a bit tired of that."
In my opinion the guideline is not accessible enough	16	Not having the guideline on hand when visiting patient, and therefore no applying it (immediately)	"where is it? So you're on the ward and you are called to see a patient, then your first thought is not to go and get the guideline"
The difference/ transition between a curative and a palliative goal is not clear[b]	8	Wondering whether the guideline is suitable for all treatment goals, or missing information on the transition to a palliative treatment goal	"… and what struck me first; what was the treatment goal? It only lists symptomatic and palliative[b]. As it happened symptomatic or palliative were not relevant for these people, the objective was curative. So I didn't go into it very deeply."
I feel that guidelines/ guidances generally limit my own autonomy	4	If you work with guidelines you lose your autonomy as a practitioner	"maybe fear on the user's part, *am I doing it right* or *I am losing my independence or autonomy as a practitioner*, that's a possibility. Although I don't feel that way myself, I can imagine some people would."
I **disagree** with the guideline	0	Treatment is carried out in a particular order that is incompatible with the guideline, or being less inclined to use (parts of) the guideline because of its content	"This hypoderoclysis, I'm not doing that, that is really obsolete. … I also think it's very unpleasant for people, and that doesn't go with a comfort-oriented policy."
It is difficult to reconcile the guideline with the wishes of patient and family	0	Patients or family have their own opinion on what they want and don't want in terms of treatments and that is why the guideline can't always be applied	"You don't make these decisions alone, but often with families, so you often depend on whether you can get people, when their cognitive functions are still OK, or families, to follow your ideas. Sometimes you'll

(*Continues*)

Table 3. (Continued)

Barriers	Percentage of physicians who (strongly) agreed in the evaluation questionnaire	Description of corresponding barrier addressed in interviews	Relevant quotations from interviews
			think that people need something to be comfortable, and the client or family disagrees. You could still use it then, but you could run into the limitation that you don't make the decisions on your own and that this is a dialogue."
Other barriers			
Practical application	n/a	Using the guideline is not practical, because it is unpleasant to leaf through it in front of the patient	"… and not when I am at a patient's bedside, then I don't want to be leafing through it."
Implementation	n/a	It takes more time and/or conviction during the implementation to get everyone on board, attending the meeting is essential	"… but I would have appreciated knowing more and receiving more support in how to best perform the research"; "Of course it is a large group of doctors, and with many changes … to always communicate it consistently is where there have been some failures."
Setting	n/a	The way of working on the ward or in the nursing home gets in the way of using the guideline.	"I think that if I come to the nurses with one more paper and list, they will kill me."
You're accustomed to doing your own thing	n/a	Being so accustomed to a particular way of working that it is difficult to change behavior and start working with a guideline/guidance	"some physicians are used to a particular strategy. And you also came in with a particular strategy, so I also noticed it almost became a competition."
Not knowing whether it works	n/a	Not being sure whether the guideline will have effect makes it less appealing to actually use it.	"yes and with research, suppose your study demonstrates a real improvement in quality, that would help. Because then you know it works. That would be a huge incentive."
Working according to lists	n/a	Fear of the danger of working too much according to lists	"it can be difficult to assess when a person is in pain if he is no longer able to indicate it, so maybe that's an aid that could or should be used more often. On the other hand you should guard against simply handing out lists to everyone…"

[a]Barriers that emerged from the first four interviews with physicians.
[b]In the Netherlands, treatment goals for patients with dementia comprise goals directed at cure or at comfort. Comfort goals may be palliative or symptomatic. For a palliative care goal, extending life as a potential side effect of treatment is not contraindicated—or is even part of the care goal. In contrast, for a symptomatic care goal, a life-extending side effect as a result of medical treatment aimed at this goal is undesirable.

extent to which the practice guideline and its components were used both on the patient level and on the physician level. However, some limitations should be acknowledged. First, as our intervention was delivered directly by the researchers to the intended users, we were able to fully control the implementation procedure. As a result, there was a major overlap in the operationalization of fidelity and dose delivered. We also felt that the process evaluation framework of Saunders *et al.* using these traditional components yielded little information in addition to the barriers addressed in both the interviews and the evaluation questionnaire. Second, the physicians were instructed to use the guideline at their own discretion, and we were therefore not able to assess clinical adherence to the practice guideline. Third, because they are employed for a few months only, non-responders to the quantitative barrier assessment were more often elderly care physicians in training than experienced elderly care physicians. Fourth, dose received was only assessed using self-report of the physicians rather than by the researchers using objective data. Last, both qualitative and quantitative data were collected by the primary researcher who was also responsible for the implementation of the guideline and for the data collection during the trial that may have led to socially desirable responses by the participating physicians.

Recommendations

Physicians were generally satisfied with the guideline's content, but a different format and a more substantive implementation strategy may have led to more effect of the guideline on reducing discomfort. For example, a more practical tool, such as an algorithm that is easy to apply to monitor and tailor care to patient needs (personalized medicine), or a multifaceted intervention may be more successful than a practice guideline only (Wensing *et al.*, 1998). Alternatively, the guideline may be restricted to the items that contrast from usual practice, or these items may be emphasized such as the observational instruments that were used only occasionally. More effort training and close collaboration with physicians may be needed to implement such new instruments on the wards, so that they can be applied by the nursing staff.

Overall, to change physicians' behavior, the need of thorough familiarizing with the guideline's contents must be highlighted. This may be accomplished with a more substantive implementation procedure including evidence-based strategies such as audit and feedback, multiple interactive meetings with discussion of cases, and the involvement of multiple disciplines such as the nursing staff (Bero *et al.*, 1998; Prior *et al.*, 2008). Moreover, future implementation studies may involve a two-step procedure including an evaluation phase in which the efficacy of the intervention is tested under ideal conditions (i.e., the mechanisms of practitioner behavior are highly controlled, and motivated stakeholders are selected). When the impact is positive, we may proceed to a pragmatic randomized trial to test effectiveness in daily practice (Vernooij-Dassen and Moniz-Cook, 2014).

Conclusion

The practice guideline for optimal symptom relief was only partially (52–70%) implemented as planned, although physicians were mostly satisfied with its contents. The lack of effectiveness of guideline implementation on patient outcomes may be explained by both a modest effect of the implementation strategy as well as by the small contrast of practice guideline with usual care. Future implementation should emphasize parts of the guideline that deviate from usual practice such as the observational instruments, include more directive training and discussion of cases, and highlight that the guideline may be effective only through thorough familiarizing with the guideline's contents.

Conflicts of interest

There are no conflicts of interest

Key points

- Dementia
- Pneumonia
- Discomfort
- Process Evaluation

Acknowledgements

We wish to thank the NHs that participated in the study and the attending physicians for including pneumonia episodes and completing questionnaires regarding the process evaluation. We particularly thank the physicians who gave interviews about their experiences with the practice guideline. Furthermore, we acknowledge Yvonne Hoekstra-Lolkema for her contribution to the data collection.

This study is supported by the Netherlands Organisation for Scientific Research (NWO), the Hague; Innovational Research Incentives Scheme, a career award to J. T. S (grant number Vidi 91711339). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Authors' contributions

T. v. d. M. coordinated the data collection and drafted the manuscript; J. v. d. S. obtained funding; T. v. d. M., J. v. d. S., R. K., J. A., C. H., and H. d. V. contributed to the conception and design; T. v. d. M., S. D., and C. H. contributed to the analysis and interpretation of results; J. v. d. S., R. K., S. D., J. A., C. H., and H. d. V. revised the manuscript critically for important intellectual content. All authors have read and approved the final version of the manuscript.

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