

# Predictors of patient-initiated reconsultation for lower respiratory tract infections in general practice

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## ABSTRACT

Reconsultation for lower respiratory tract infection (LRTI) is common in general practice, but those who reconsult rarely have more significant illness warranting antibiotics. Knowledge of factors that predict patient-initiated reconsultation may allow clinicians to address specific issues during the initial consultation that could reduce reconsultations. Thirty-three per cent of a cohort of 431 LRTI patients in a randomised controlled trial reconsulted. Excluding 35 patients with GP-requested reconsultation left 28% (112/396) with a patient-initiated reconsultation during 28-day follow-up. Patient-reported dyspnoea and concerns that persisted after the initial consultation independently predicted patient-initiated reconsultation.

### Keywords

communication; family practice; respiratory tract infections.

## INTRODUCTION

Reconsulting for lower respiratory tract infection (LRTI) is common in general practice, and may often be unnecessary.<sup>1-3</sup> This increases workload and puts patients at risk for unnecessary antibiotic prescribing. Reconsultation can either be requested by the physician, for a check-up after the initial consultation, or initiated by the patient. Knowledge of factors that predict patient-initiated reconsultation may allow clinicians to address specific issues during the initial consultation that could make reconsultations unnecessary.

## METHOD

A secondary analysis was conducted of data from 431 patients enrolled into a pragmatic cluster-randomised factorial trial investigating the effect of GP use of C-reactive protein (CRP) point-of-care testing and GP training in enhanced communication skills on antibiotic prescribing for LRTI in general practice in the Netherlands.<sup>4,5</sup>

GPs made their own decisions about diagnostic procedures and treatment, including whether to prescribe antibiotics or to request a follow-up consultation. GPs were informed that CRP was an additional diagnostic tool to complement findings from medical history taking and physical examination. Extensive information on the training in the use of point-of-care CRP testing and enhanced communication training can be found elsewhere.<sup>4,5</sup> Reconsultation data for the 28-day follow-up were obtained from patients' medical records and were cross-checked with patient diary data. Patient-initiated reconsultation was defined as any LRTI-related reconsultation within 28 days after the first consultation, and not specifically requested by the managing GP.

Demographic, clinical, and psychosocial variables possibly associated with patient-initiated reconsultation were predefined by the study team and are shown in Table 1. Post-consultation worries were assessed by a Likert-type scale diary question. The association of these variables with patient-initiated

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## How this fits in

Lower respiratory tract infection accounts for considerable workload in general practice. Reconsultation is common, and may often be unnecessary in that no further treatment is indicated apart from reassurance. Understanding the predictors of reconsultation may help clinicians appropriately modify help-seeking behaviour and could potentially reduce workload through promotion of appropriate self-care. Patient-reported dyspnoea and concerns persisting beyond the initial consultation independently predicted patient-initiated reconsultation. Patients with intermediately elevated levels of C-reactive protein were also more likely to reconsult.

reconsultation was assessed with  $\chi^2$  tests in univariate analysis. Variables with  $P$ -values  $\leq 0.20$  were selected for multilevel logistic regression analysis, and odds ratios (OR) with 95% confidence intervals (CIs) are presented. Analyses were by a three-level model to account and correct for variation at the level of the practice, GP, and patient.<sup>4</sup> In a second model, CRP categories with measured values at baseline were added to the multiple regression model (available for 227 patients). All models were corrected for the intervention effects, including the interaction term as in the primary analysis.<sup>4</sup> Data were analysed using SPSS (version 13.0) and MLwiN (version 2.0).

### RESULTS

The reconsultation rate in the total study population was 32.7%. After exclusion of patients with GP-initiated reconsultations ( $n = 35$ ), data of 396 patients were available, of which 112 (28%) reconsulted during the 28-day follow-up period. Of these 112 patients, 48 (43%) were prescribed antibiotics on reconsultation (of which 12 received a second course of antibiotics). Hence, a total of 85 of 112 (76%) reconsulting patients received antibiotics throughout their LRTI episode. Table 1 shows the associations of the predefined variables with patient-initiated reconsultation. Reconsultation was univariately associated with auscultation abnormalities and shortness of breath as recorded by the GP, and three patient-rated symptoms on day 1. Ongoing concerns after the initial consultation was most strongly associated with patient-initiated reconsultation (OR: 2.12, 95% CI = 1.21 to 3.70). Subsequent multiple regression analysis showed that patients who reported severe dyspnoea on day 1 (OR: 1.75, 95% CI = 1.03 to 3.03) and those with ongoing post-consultation concerns (OR: 1.87, 95% CI = 1.03 to 3.41) were more likely to revisit their GP during the 28 days following their first consultation for their LRTI. In the subset of patients for whom CRP was measured, CRP values  $>20$  mg/l in general, and intermediately elevated results (21–100 mg/l, OR:

2.83, 95% CI = 1.30 to 6.17) in particular, were additional independent predictors of reconsultation. Ongoing concerns after the initial consultations were not significant in the model. However, this was due to the widening confidence interval associated with the smaller sample size, and the point estimate of the odds ratio remained nearly unchanged.

### DISCUSSION

#### Summary of main findings

Identifying one or more of the factors predictive of patient initiated reconsultation during an initial consultation for acute cough may prompt GPs to provide more information to the patient and further discuss symptoms and the usual clinical course of the condition. In the present study, patient-reported dyspnoea strongly predicted patient-initiated reconsultation, confirming the findings of Holmes and colleagues.<sup>1</sup> It is known from findings in chronic pulmonary disease patients that dyspnoea contributes to discomfort and anxiety.<sup>6</sup> Interestingly, and in line with previous findings, not receiving antibiotics at index consultation was not associated with patient-initiated reconsultation, suggesting that patients may mainly be seeking symptom relief or reassurance when reconsulting.<sup>1,7,8</sup>

Addressing both unnecessary reconsultation and antibiotic prescribing is required to optimise management of respiratory tract infections in general practice,<sup>9</sup> and the two issues are closely interrelated. A recent study shows that patients who had been prescribed antibiotics for cough in the previous 2 years were much more likely to reconsult for LRTI.<sup>10</sup> Fewer reconsultations for LRTI decreases workload and will decrease antibiotic prescribing for patients who are at particular risk of unnecessary antibiotic prescribing during reconsultations. Nearly half of all patients were prescribed antibiotics during patient-initiated reconsultations, despite evidence suggesting that they are unlikely to benefit at the point of reconsultation, except for a minority of patients with evident deteriorating illness.<sup>3</sup> Antibiotic prescribing during reconsultations — as well as at the index consultation — encourages patients to assume recovery is caused by the antibiotics, which encourages future consultations.

#### Strengths and limitations of the study

The chance of attrition bias in the present study was minimal as there was a follow-up rate of 90% on patient-reported outcomes.<sup>4</sup> This study was powered for group comparisons in the trial rather than for this analysis; however, the sample size achieved gives adequate power (80%) to detect an OR of 2 at a 5% significance level.<sup>11</sup> When the

**Table 1. Factors predicting patient-initiated reconsultation for lower respiratory tract infection within 28 days after initial consultation.**

	n/N with reconsultation (%)	n/N without reconsultation (%)	Univariate analysis crude OR (95% CI)	Multivariate analysis adjusted OR (95% CI) <sup>a</sup> n = 349	Multivariate analysis adjusted OR (95% CI) <sup>b</sup> n = 205
<b>Demographics and comorbidity</b>					
Female sex	67/112 (59.8)	176/284 (62.0)	1.07 (0.78 to 1.47)		
Age >65 years	26/112 (23.2)	51/284 (18.0)	1.39 (0.81 to 2.39)		
Smoking	25/101 (24.8)	72/250 (28.8)	0.81 (0.47 to 1.38)		
Antibiotics received at index consultation	49/112 (43.8)	107/284 (37.7)	1.25 (0.79 to 1.98)		
COPD	10/112 (8.9)	19/284 (6.7)	1.28 (0.56 to 2.90)		
Asthma	12/112 (10.7)	21/284 (7.4)	1.52 (0.71 to 3.23)		
<b>GP-recorded signs and symptoms</b>					
Shortness of breath <sup>c</sup>	77/112 (68.8)	172/284 (60.6)	1.44 (0.89 to 2.33)	1.32 (0.76 to 2.29)	0.75 (0.35 to 1.61)
Wheezing	44/112 (39.3)	102/284 (35.9)	1.15 (0.73 to 1.82)		
Chest pain	71/112 (63.4)	164/284 (57.7)	1.28 (0.81 to 2.02)		
Auscultation abnormalities <sup>c</sup>	68/112 (60.7)	137/284 (48.2)	1.67 (1.05 to 2.64) <sup>d</sup>	1.60 (0.97 to 2.65)	1.07 (0.53 to 2.15)
Fever	45/112 (40.2)	119/284 (41.9)	0.92 (0.59 to 1.45)		
Perspiring	54/112 (48.2)	119/284 (41.9)	1.24 (0.79 to 1.95)		
Headache	52/112 (46.4)	142/284 (50.0)	0.86 (0.55 to 1.34)		
Myalgia	58/112 (51.8)	130/284 (45.8)	1.25 (0.80 to 1.94)		
Generally feeling unwell	91/112 (51.8)	130/284 (45.8)	1.28 (0.73 to 2.22)		
Symptom duration >7 days	60/111 (54.1)	146/284 (51.4)	1.10 (0.70 to 1.73)		
<b>Patient-reported signs and symptoms — scored as severe problem or worse on day 1</b>					
Cough	74/100 (74.0)	169/249 (67.9)	1.37 (0.81 to 2.31)		
Shortness of breath <sup>c</sup>	50/100 (50.0)	80/249 (32.1)	2.11 (1.31 to 3.40) <sup>d</sup>	1.75 (1.01 to 3.03) <sup>d</sup>	2.21 (1.06 to 4.65) <sup>d</sup>
Phlegm	39/100 (39.0)	86/250 (34.4)	1.22 (0.75 to 1.97)		
Sleeping problems <sup>c</sup>	52/101 (51.5)	110/251 (43.8)	1.36 (0.85 to 2.17)	1.04 (0.63 to 1.73)	1.30 (0.66 to 2.55)
Limitation of activities	41/100 (41.0)	89/250 (35.6)	1.24 (0.77 to 2.00)		
General feeling of illness <sup>c</sup>	44/101 (43.6)	88/249 (35.3)	1.41 (0.88 to 2.26)	1.03 (0.60 to 1.76)	0.82 (0.38 to 1.79)
<b>Psychosocial factors</b>					
Post-consultation worries <sup>c</sup>	28/102 (27.5)	38/251 (15.1)	2.12 (1.21 to 3.70) <sup>d</sup>	1.87 (1.02 to 3.41) <sup>d</sup>	1.76 (0.76 to 4.11)
Satisfaction with consultation	78/102 (76.5)	185/250 (74.0)	1.14 (0.66 to 1.97)		
Education (high)	18/97 (18.6)	52/245 (21.2)	0.86 (0.47 to 1.57)		
<b>C-reactive protein, mg/l</b>					
<20	37/66 (56.1)	113/145 (77.9)	0.36 (0.19 to 0.67) <sup>d</sup>	<sup>e</sup>	1.00
20–100	23/66 (34.8)	25/145 (17.2)	2.70 (1.35 to 5.40) <sup>d</sup>	<sup>e</sup>	2.83 (1.30 to 6.17) <sup>d</sup>
>100	6/66 (9.1)	7/145 (4.8)	2.27 (0.70 to 7.37)	<sup>e</sup>	2.23 (0.58 to 8.67)

Univariate and multiple regression analyses presented in this table were performed multilevel with adjustment on level of practice and GP. <sup>a</sup>Corrected for interventions and interaction variable. <sup>b</sup>Selected for multiple regression analysis based on  $P \leq 0.2$ . <sup>c</sup>Previous model extended to include C-reactive protein values. <sup>d</sup>Corrected for communication intervention. <sup>e</sup>Significant at  $P < 0.05$ . <sup>f</sup>Not used in this model. COPD = chronic obstructive pulmonary disease. OR = odds ratio.

analysis of the subset of patients with CRP values was analysed, similar point estimates were obtained for the other factors in the model, but they were no longer significant.

### Comparison with existing literature

Reconsultation behaviour may be culturally determined and may differ between countries. Yet the present findings and overall reconsultation rate from the Dutch context are in line with the limited available evidence in this field.<sup>1,2</sup> Because of the broad inclusion criteria of the present study, a wide range of LRTI patients from general practice were included. The patient-reported variables that were included in the study models may shed light on non-medical influences affecting help-seeking behaviour in LRTI.

### Implications for clinical practice

Concerns regarding the potential medicalising effect of point-of-care testing have been expressed.<sup>12,13</sup> The primary analysis showed no association between CRP testing and reconsultation, and no association with future intention to reconsult for similar symptoms.<sup>4</sup> Patients with a low CRP value are probably reassured about their illness. Patients with high CRP values (>100 mg/l) are likely to receive an antibiotic, and may most likely benefit from antibiotic treatment. Yet, patients with intermediately elevated CRP values (24% of patients with measured CRP in the study) may not be reassured by this result. Indeed, an intermediate CRP test result may increase anxiety, resulting in requests for re-assessment. But elevated CRP could also be an indicator of intermediate illness, as some patients with elevated

CRP values may deteriorate and therefore reconsult. Yet, no influence was found of CRP level on recovery, with a median patient-reported time to full recovery of 22 days for the full group. In cases with elevated CRP, a follow-up CRP test result may guide both the GP as well as the patient towards further management: antibiotics or even referral in cases of severe deterioration and increased CRP levels, or reassurance in cases of clinical improvement and reduced CRP levels. The delayed prescription strategy, commonly used in the UK but not in the Netherlands, might be particularly suited to preventing these reconsultations without unnecessarily increasing antibiotic prescribing in this group of patients with intermediately elevated CRP values.<sup>10</sup> All together, this stresses the importance of explanation provided to the patient on the implications of CRP values.

Communication remains a cornerstone of quality management of LRTI and this includes communication about point-of-care tests. Eliciting concerns and expectations is associated with less

medication prescribing, both in general and in antibiotic prescribing decisions in particular.<sup>4,14</sup> Moreover, describing the often longer than realised natural course of LRTI and addressing ongoing patient concerns may lead to fewer reconsultations. Finally, it may also be enlightening to realise that not prescribing antibiotics at index consultation does not mean that patients are more likely to reconsult.

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### Competing interests

The authors have stated that there are none.

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