

# How is sputum microbiology used in general practice?

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## Introduction

Sputum is one of the most commonly received specimens in the microbiology laboratory. However, the authors are unaware of previously published data on how useful sputum, sent for bacterial culture, is in general practice. This paper reports the impact of positive and negative sputum reports on patient management using two questionnaires circulated to local general practitioners (GPs).

## Methods and Results

From November 1993 to March 1994, all sputa received from GPs were surveyed. Sputa received in the Public Health Laboratory, Nottingham are Gram-stained, cultured for *Haemophilus influenzae* and other recognized respiratory pathogens, and appropriate antibiotic sensitivities are carried out and reported. During the study period, 300 specimens were received from 131 GPs (a mean of 2.3 specimens per GP). When each result was posted to the GP, a questionnaire was included which enquired about why the sputum was taken, recent antibiotic treatment, and how the result might influence that patient's management.

Seventy-five (25%) sputa grew recognized or potential respiratory pathogens. These included *H. influenzae* (39 sputa), *Streptococcus pneumoniae* (19 sputa), *Staphylococcus aureus* (5 sputa), *Pseudomonas aeruginosa* (6 sputa), *Branhamella catarrhalis* (2 sputa) and others (8 sputa). The remaining 225 specimens were all cultured and yielded only respiratory commensals. Two hundred and sixty-four of the questionnaires (88%) were returned, 253 of which were suitable for analysis. Reasons for sending a sputum sample included: failure of one or more antibiotics (136 sputa); chronic lung disease (36 sputa); 'to exclude infection' (27 sputa); and recent

sputum production or a significant cough (34 sputa). Patients had already been on antibiotics in the previous 3 weeks in 149 of the 253 cases, and 38 (25%) of these had positive sputum culture. The possible influence of the result on antibiotic prescribing and general patient management is outlined in Table 1. The report was deemed helpful on 210 occasions, 95% of positive and 79% of negative reports.

Ninety-seven GPs returned a second questionnaire sent at the end of the study, relating to general aspects of the sputum-reporting service. Antibiotic sensitivity results were considered the most useful part of the report by 52 GPs, and culture results, by 30 GPs. Reports were received early enough to influence management by 68 of 97 (70%) GPs. Thirty-four GPs were reluctant to send a sputum once a patient had started antibiotics, but 32 GPs indicated they would be happy to do so.

## Discussion

These results show considerable variation in the usage of sputum microbiology by GPs but the study did not investigate the reasons why most of the 500 GPs in this catchment area do not avail of this service. Not surprisingly, two-thirds of GPs were less likely to send sputa for culture when the patient was already on antibiotics, but a significantly high number of specimens taken in such circumstances (26%), yielded a respiratory pathogen. Furthermore, antibiotic prescribing was influenced on 116 occasions following a negative culture result, i.e. the GP decided not to use antibiotics or they were stopped. Following a positive culture result, nearly one-half of cases had an antibiotic changed or started. Thirty percent of GPs, however, considered the reports did not arrive soon enough to influence management. The possible issuing of reports by computer or by facsimile in future may improve this.

The difficulties in evaluating antibiotic therapy in exacerbations of chronic bronchitis are well-documented (1) and a positive result following therapy in the light of clinical improvement may

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Table 1 Effect of bacterial culture results on antibiotic use and patient management

	Positive culture (n=62)	Negative culture (n=191)
<b>Antibiotic use</b>		
Continued	23 (37%)	60 (32%)
Changed	7 (11%)	6 (3%)
Discontinued	1 (2%)	12 (6%)
Started	23 (37%)	4 (2%)
No antibiotics started	8 (13%)	104 (54%)
Not stated	0	5 (3%)
<b>General management</b>		
Patient reassured	6 (10%)	98 (52%)
No action	17 (27%)	29 (15%)
For further investigations	6 (10%)	25 (13%)
Unevaluable/not stated	33 (53%)	39 (20%)

represent residual colonization (2). In the U.K., the majority of bacterial isolates will be sensitive to amoxicillin. Alternatively co-amoxycylav or an oral cephalosporin with good activity against *Haemophilus* may be recommended, especially if the patient has recently been on amoxicillin. However, there is no national consensus of microbiologists on the

subject that the authors are aware of. The decision to continue antibiotics following a negative culture on 60 occasions as well as the failure to use antibiotics on eight occasions following a positive culture may indicate a need for more rational prescribing. It is concluded that a considerable proportion of GPs who send sputa for culture find the results helpful in clinical decision-making. Greater use of this service and improvements in reporting times might result in better use of antibiotics in the management of lower respiratory tract infection in the community.

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#### References

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