QUALITATIVE RESEARCH

Discourse analysis

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This articles explores how discourse analysis is useful for a wide range of research questions in health care and the health professions

Previous articles in this series discussed several methodological approaches used by qualitative researchers in the health professions. This article focuses on discourse analysis. It provides background information for those who will encounter this approach in their reading, rather than instructions for conducting such research.

What is discourse analysis?

Discourse analysis is about studying and analysing the uses of language. Because the term is used in many different ways, we have simplified approaches to discourse analysis into three clusters (table 1) and illustrated how each of these approaches might be used to study a single domain: doctor-patient communication about diabetes management (table 2). Regardless of approach, a vast array of data sources is available to the discourse analyst, including transcripts from interviews, focus groups, samples of conversations, published literature, media, and web based materials.

What is formal linguistic discourse analysis?

The first approach, formal linguistic discourse analysis, involves a structured analysis of text in order to find general underlying rules of linguistic or communicative function behind the text.[4] For example, Lacson and colleagues compared human-human and machine-human dialogues in order to study the possibility of using computers to compress human conversations about patients in a dialysis unit into a form that physicians could use to make clinical decisions.[5] They transcribed phone conversations between nurses and 25 adult dialysis patients over a three month period and coded all 17 385 words by semantic type (categories of meaning) and structure (for example, sentence length, word position). They presented their work as a "first step towards an automatic analysis of spoken medical dialogue" that would allow physicians to "answer questions related to patient care by looking at [computer generated] summaries alone."[5]

What is empirical discourse analysis?

Researchers using empirical discourse analysis[4] do not use highly structured methods to code individual words and utterances in detail. Rather, they look for broad themes and functions of language in action using approaches called conversation analysis (the study of "talk-in-interaction")[6] and genre analysis (the study of recurrent patterns, or genres of language that share similar structure and context—such as the case report, the scientific article).[7]

Conversation analysis and genre analysis give more prominence to sociological uses of language than to grammatical or linguistic structures of words and sentences and are used to study human conversations or other forms of communication in order to elucidate the ways in which meaning and action are created by individuals producing the language.[4] Lingard and colleagues, for example, studied communication between nurses and surgeons during 128 hours of observing 35 different procedures in the operating room and categorised recurrent patterns of communication. They then used their findings to draw links between interpersonal tensions, the use of language, and the occurrence of errors in the operating room.[8] Genre analysis is presented in detail in box 1.

What is critical discourse analysis?

Researchers in cultural studies, sociology, and philosophy use the term critical discourse analysis to encompass an even wider sphere that includes all of the social practices, individuals, and institutions that make it possible or legitimate to understand phenomena in a particular way, and to make certain statements about what is "true." Critical discourse analysis is particularly concerned with power and is rooted in "constructivism." Thus the discourse analyses of Michel Foucault, for example, illustrated how particular discourses "systematically construct versions of the social world."[4] Discourse analysis at this level involves not only the examination of text and the social uses of language but also the study of the ways in which the very existence of specific institutions and of roles for individuals to play are made possible by ways of thinking and speaking.

Foucault's study of madness, for example, uncovered three distinct discourses that have constructed

This is the fourth in a series of six articles that aim to help readers to critically appraise the increasing number of qualitative research articles in clinical journals. The series editors are Ayelet Kuper and Scott Reeves.
For a definition of general terms relating to qualitative research, see the first article in this series.

Table 1 | Three approaches to discourse analysis

Orientation to discourse	Sources of data	Analysis
Formal linguistic discourse analysis (such as sociolinguistics)[1]	Samples of written or oral language and texts	Microanalysis of linguistic, grammatical, and semantic uses and meanings of text
Empirical discourse analysis (such as conversation analysis, genre analysis)[2]	Samples of written or oral language and texts; *and* data on the "uses" of the text in social settings	Microanalysis and macroanalysis of the ways in which language and/or texts construct social practices
Critical discourse analysis (such as Foucauldian analysis)[3]	Samples of written or oral language/texts; *and* data on the "uses" of the text in social settings; *and* data on the institutions and individuals who produce and are produced by the language texts	Macroanalysis of how discourses (in many forms) construct what is possible for individuals and institutions to think and to say

what madness is in different historical periods and in different places: madness as spiritual possession, madness as social deviancy, and madness as mental illness.[10] In a similarly oriented study, Speed showed how different discourses about mental health service in use today construct individuals' identities as "patients," "consumers," or "survivors" and are made possible by specific institutional practices and ways for individuals to "be."[11]

In a different context, Stone contrasted the specific discourses used in the education literature for diabetes patients ("patient self care" and "autonomy") with the medical literature's use of doctor centred discourses ("compliance" and "adherence"). Stone related the resulting tension (and the important implications for patients' behaviours) to the ways in which the roles that physicians and patients play are historically determined by different and conflicting models of what disease and healing are.[12]

Finally, Shaw and colleagues used a discourse analysis to illustrate the many ways in which research itself can be defined (for example, by a lay person, a medical editor, the World Medical Association, a hospital, the taxman) and how these various definitions are linked to the power and objectives of particular institutions.[13]

In these examples of critical discourse analysis, the language and practices of healthcare professionals and institutions are examined with the aim of understanding how these practices shape and limit the ways that individuals and institutions can think, speak, and conduct themselves. Table 2 illustrates how a critical discourse approach to diabetes education would compare with discourse analyses using other linguistic and empirical approaches to research.

Although our categorisation (tables 1 and 2) emphasises the distinctions between these approaches to discourse analysis, in practice researchers often use more than one of the approaches together in a study. For example, genre analysts may invoke critical theorists in order to study the origins of the sanctioned methods of communication, asking, for example, "What historical and contextual factors led to the adoption of the scientific journal article as a legitimate form of expression of medical 'truth' rather than the adoption of another format?"

What should we be looking for in a discourse analysis?

Given the wide variety of approaches to discourse analysis, the elements that constitute a high quality study vary. Rogers has argued that some discourse analysis research suffers from scanty explanation of the analytical method used.[14] Thus one should expect clear documentation of the sources of information used and delimitation of data sources[3] (including a description of

Box 1 An empirical discourse analysis (genre analysis) of case presentations by medical students*

This study took place at a tertiary care teaching hospital in Canada. It was conducted in the context of a medical student rotation in paediatrics. The aim of the study was to gain understanding of how the formal linguistic structure of the case presentation is used in academic medical settings.

The researchers conducted 21 in-depth interviews with medical students and faculty members. Pairs of researchers also observed 16 oral case presentations as well as the teaching exchanges that surrounded them. All of these encounters were tape recorded and transcribed (for a total of 555 pages of text); the transcriptions were iteratively analysed. The analysis was structured to allow themes to emerge from the data (that is, as indicated by multiple examples of such themes throughout the data). However, it particularly focused on themes that helped to illuminate the rules around certain modes of case presentation and on the role of these rules in teaching and learning.

The study showed a pronounced tension between the educational ("schooling") uses and clinical ("workplace") functions of case presentations. For example, students saw the case presentation as a school mode and emphasised that they wanted to get through their presentations without being asked any questions. Faculty, on the other hand, understood the case presentation as a way for professionals to jointly create shared knowledge. Their cross-purposes affected the effectiveness of faculty feedback to the students about their case presentations.

*Description based on study by Lingard et al [9]

Box 2 Further reading

Books

- Fairclough N. *Language and power*. London: Longman, 1989.
- Foucault. *The archaeology of knowledge and the discourse on language*. New York: Random House, 1972.
- Jaworski A, Coupland N, eds. *The discourse reader*. London: Routledge, 1999.
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Journal articles

- Barnes R. Conversation analysis: a practical resource in the health care setting. *Med Educ* 2005;39:113-5.
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Table 2 | Three approaches to a specific research question: example of doctor-patient communications about diabetes management

Orientation to discourse	Question	Data collection and analysis	Application
Formal linguistic discourse analysis	What are the characteristics of linguistic structures that doctors use to instruct patients on medication?	Analyse sentences from a patient education pamphlet such as "you must control your blood sugar" in terms of rules of linguistic function *in general use*	Could be used to restructure the linguistic structure of patient education materials
Empirical discourse analysis or conversation analysis	What is the nature of conversations between doctors and their patients about diabetes management?	Record and analyse doctor-patient conversations about diabetes management; analyse the kinds of utterances commonly used, their meanings, and their effects *in the context studied*	Could be used to create programmes for training of health professionals in effective doctor-patient communication strategies
Critical discourse analysis	What sociohistorical phenomena have made it possible for individuals in society to have roles called "doctor" and "patient" and to create an interaction called the "doctor-patient relationship," in contrast to what might be possible in other places or times. What enables or constrains this relationship (such as power, definitions of "truth")?	Create an "archive" of data (for example, verbal, text, graphic) illustrating the nature of these roles and relationships, how they came about, and how they have shifted or changed over time	An analysis of relations of power and constructions of "truths" could be used to rethink or reconfigure the roles, relationships, or institutional practices such as teaching, work policies, codes of professional (or patient) behaviour

decisions made with regard to selection of groups or individuals for interviews, focus groups, or observation) and, importantly, a description of the context of the study. The method of analysis should be clearly explained, including assumptions made and methods used to code and synthesise data. Finally, given that the goal of critical discourse analysis is to illuminate and critique structures of power, it is especially important that researchers describe the ways in which their own individual sociocultural roles may influence their perspectives.

Conclusion

Discourse analysis is an effective method to approach a wide range of research questions in health care and the health professions. What underpins all variants of discourse analysis is the idea of examining segments, or frames of communication, and using this to understand meaning at a "meta" level, rather than simply at the level of actual semantic meaning. In this way, all of the various methods of discourse analysis provide rigorous and powerful approaches to understanding complex phenomena, ranging from the nature of on-the-ground human communication to the inner workings of systems of power that construct what is "true" about health and health care. While these methods are gaining popularity, much remains to be done to develop a widespread appreciation for the use, funding, and publication of discourse analyses. As a start, we hope this article will help readers who encounter these approaches to understand the basic premises of discourse analysis. Box 2 offers further reading for those interested in learning more or undertaking discourse analytical research.

SUMMARY POINTS

Discourse analysis is an effective method for approaching a wide range of research questions in health care and the health professions

Discourse analysis is about studying and analysing the uses of language

A vast array of data sources is available to the discourse analyst

The various methods of discourse analysis provide rigorous and powerful approaches to understanding complex phenomena, ranging from the nature of on-the-ground human communication to the inner workings of systems of power that construct what is "true" about health and health care

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LESSON OF THE WEEK

Extensive transmission of *Mycobacterium tuberculosis* from 9 year old child with pulmonary tuberculosis and negative sputum smear

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A negative sputum smear does not exclude substantial risk of infection from patients with pulmonary tuberculosis

Patients with pulmonary tuberculosis and either a positive sputum smear or cavitating pulmonary lesions have been considered to be infectious[1] as these indicate higher bacterial load accumulating with longer duration of infection. The source of infection in outbreaks among children is usually an adult with these features.[2] Children have been considered less likely to transmit infection because they were unlikely to expectorate infective droplet nuclei. In the absence of a positive sputum smear, guidelines do not recommend screening of wider contacts in addition to household contacts,[3] although in the United States, contact screening is recommended if resources are sufficient.[4] Here, we report extensive transmission of tuberculosis in a junior school in Luton, England, from a child with pulmonary tuberculosis in whom a sputum smear was negative.

The index case

The index case was a 9 year old boy of Black African ethnicity born in the United Kingdom. He was investigated by his family doctor because of a six year history of recurrent cough evolving into a daily chronic cough with night sweats and weight loss for eight weeks before referral to a paediatrician. The cough was occasionally productive with one episode of haemoptysis. He continued to attend school while symptomatic. A chest x ray film showed a right upper lobe consolidation and multiple poorly defined opacities in the right lower lobe (figure). Three sputum collections were smear negative, and culture showed *Mycobacterium tuberculosis*, fully sensitive to all drugs tested (isoniazid, rifampicin, pyrazinamide, ethambutol). He started chemotherapy with a two month course of pyrazinamide, rifampicin, and isoniazid, followed by four months of isoniazid and rifampicin. All household contacts of the child were screened for *M tuberculosis* infection.

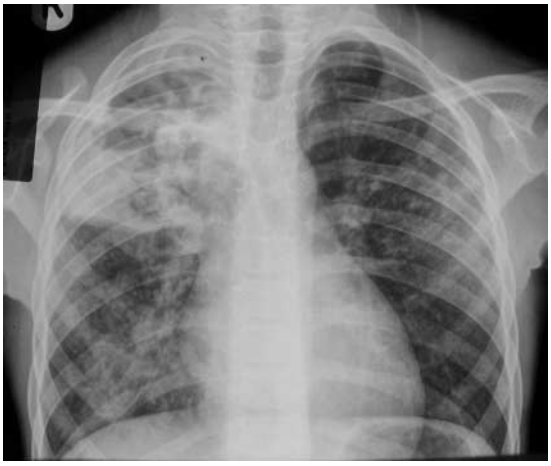
The boy's three siblings had positive Mantoux readings, positive T-SPOT tests (Oxford Immunotec), and normal chest x ray examinations. The T-SPOT test is one of two immunological tests that measure the release of interferon γ by T cells in response to *M tuberculosis* specific antigens and are commercially available in the United Kingdom. These tests correlate better with exposure to *M tuberculosis* than the Mantoux test.[3]

The three siblings started chemoprophylaxis (three month course of rifampicin and isoniazid). Three children from further extended family had positive T-SPOT tests; two of these had normal chest radiographs and started chemoprophylaxis. The third, asymptomatic child had bilateral hilar lymphadenopathy on chest radiography and started chemotherapy. All five adults in the immediate and extended family screened positive and required chemoprophylaxis. In the absence of an apparent adult source of infection among household contacts, screening was extended to include the index case's school contacts.

School contacts of the index case

The boy who was the index case attended a junior school with 200 other pupils aged 8 to 12 years. Initially, all contacts within his year group (classes 5 and 6) who shared lessons and class teachers were screened using Mantoux tests. In his year group 36% of pupils were white; 23% were Bangladeshi, Indian, or Pakistani; 14% were Black African or Black Caribbean; and 21% were of mixed ethnicity (white and either Asian or Black Caribbean parents). Positive Mantoux tests were confirmed using T-SPOT tests, in accordance with national guidance.[3]

As the infection rate among these contacts was high (30/43=69.7%), screening was extended to include all pupils. Owing to the numbers involved and because the school term was coming to an end, pupils were screened using the T-SPOT test and chest radiography. Each chest radiograph was read by a paediatrician with expertise in tuberculosis and independently read again and reported by a consultant radiologist. Children with pulmonary parenchymal changes on chest radiography were regarded as potentially infectious and investigated by obtaining three sputum and three gastric lavage samples. As we were seeking an adult source of infection, adults with at least eight hours' cumulative contact with the school (including staff, support workers, and adult visitors) during the previous eight months were invited for chest radiography.



First chest radiograph of the index case, a 9 year old boy with chronic cough and *M tuberculosis* grown from sputum samples

Altogether, 85 children (42% of all school pupils) had positive T-SPOT tests; of these, 16 had hilar lymphadenopathy but were asymptomatic and two had pulmonary parenchymal changes and were admitted for gastric lavage and sputum collection. One of these two, an 8 year old boy in year 3, had acid fast bacilli on gastric lavage and a negative sputum smear (second case).

All adult chest x ray examinations were normal, and no additional cases of active or latent tuberculosis were detected among the household contacts of the children diagnosed with active tuberculosis on screening.

Epidemiological findings

Infection rates were highest in the class of the index case (79%). The infection rate in this class was significantly higher than that among the other pupils at the school (35%) ($P<0.01$). Infection rates did not correlate with ethnicity.

Microbiological investigations and DNA fingerprinting

DNA fingerprinting—using a 15 loci based typing scheme known as mycobacterium interspersed repetitive units variable number tandem repeats (MIRU-VNTR)—showed that the *M tuberculosis* strain (42433 23315 14321, S lineage) of the index case was genetically identical to a strain isolated six years previously in an adult from the extended family of the index case who was living in London at the time of his diagnosis but had since returned to Africa. *M tuberculosis* grown from the gastric lavage sample of the second case detected in this outbreak was found to be genetically indistinguishable from the sample of the index case.

Discussion

Smear negative pulmonary tuberculosis is significantly less infectious than smear positive disease, and although transmission has been documented,[5] this is the first report of extensive transmission from a child.

The decision to screen wider contacts of the index case was not consistent with current national guidelines[3] but was driven by the high rate of infection among the children who were household contacts of the index case. We were unaware then of the extended family contact who had previously had a diagnosis of tuberculosis and had no direct link with the school. We screened staff and pupils attending the school as we were seeking an adult source of infection and any other infected children.

Our results led us to hypothesise that the index case was the source case for the infected school children. Several findings supported this hypothesis. Firstly, the infection rate in the class of the index case was higher than the rates in the other classes. Secondly, the identification of an epidemiological and DNA fingerprinting link of the index case with an adult contact who had had no contact with the school of the index case supports the hypothesis that the index case was the source case of the school outbreak. The shared strain type between the two children at the junior school provided good evidence that child to child transmission occurred.

Thirdly, the strain identified is relatively rare in England as it was found in only two other patients in the national strain typing database that currently holds 17 305 records. Both of these were from the same West African country as the index case but had no epidemiological link with the index case or the school.

Finally, the area of Luton where the school is located has an annual incidence of tuberculosis of 45 per 100 000 people, meeting the definition of a high incidence area.[3] Previous screening of school contacts in this area following cases of sputum smear positive pulmonary tuberculosis in teenage children in the past two years found rates of positive Mantoux tests of pupils between 0% and 2.4%. This indicated that most of the high rate of infection in the school (42%) could not be explained by the expected rate of infection associated with the prevalence in the area. The high rate of infection among school children may have been facilitated by poor ventilation and all pupils sharing a room for lunch.

Our report, together with evidence from other studies,[4 6-8] highlights the need for increased awareness of pulmonary tuberculosis as a differential diagnosis in children who present to general practitioners with a long history of recurrent or chronic cough.

Conclusion

This report is evidence of extensive transmission of *M tuberculosis* from a young child with smear negative tuberculosis. National guidelines, which place emphasis on sputum smear positivity as main indicator of infectivity for starting contact tracing outside the household setting,[3] may have to be revised, with longstanding exposure to a coughing tuberculous patient with extensive pulmonary lesions included in the criteria for contact screening.

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UNCERTAINTIES PAGE

How can we best prevent new foot ulcers in people with diabetes?

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This is a series of occasional articles that highlights areas of practice where management lacks convincing supporting evidence. The series advisers are David Tovey, editorial director, BMJ Knowledge, and Charles Young, editor of BMJ Clinical Evidence, and editor in chief, BMJ Point of Care.

Screening people with diabetes for peripheral neuropathy and the presence of peripheral pulses every 15 months forms part of the quality and outcomes framework of the General Medical Services contract.[1] Our understanding about the best ways to identify those at risk of foot disease, although not entirely definitive, has been greatly helped by epidemiological research to evaluate the prognostic value of tests.[2] Unfortunately, the same progress has not been made with preventive strategies, and uncertainty exists about the best ways to prevent foot ulcers, especially new cases.[3]

What is the evidence of uncertainty?

Little evidence from randomised controlled trials (RCTs) is available to inform clinical guidelines on preventing diabetic foot ulcers.[4-6] Naturally, good glycaemic control is highly desirable and has been shown to reduce the incidence of neuropathy.[7] However, the effects of interventions that explicitly focus on foot health, specialist foot care, pressure deflection, and patient education have not been rigorously evaluated.

Screening and specialist foot care

A systematic review of interventions to prevent diabetic foot ulcers found no evidence that foot screening and care by multidisciplinary teams of healthcare professionals prevents foot ulcers.[8] The reviewers found one RCT that showed the number of foot amputations was reduced when patients were screened for neuropathy and pulses and, if the test results were poor, were given support hosiery, protective shoes, and foot health education.[9] Although the review concluded that RCTs urgently need to be conducted in much less select groups of patients, regrettably—almost a decade later—this message seems to have been overlooked.[8]

An RCT conducted after the systematic review compared the number of recurrent ulcers in patients receiving hospital based care who were randomised to receive routine chiropody free of charge or non-routine chiropody paid for by themselves.[10] A statistically significant effect was seen only when the analysis was based on the number of feet rather than the number of patients. This suggest that the study was underpowered for an analysis at the patient level, and although specialist teams may improve patient outcomes, a thorough evaluation of the cost effectiveness of this type of care pathway is needed.

Pressure deflecting insoles and footwear

High peak plantar pressure is known to be a risk factor for foot ulceration.[3] RCTs provide some evidence that specially manufactured shoes and insoles reduce the incidence and frequency of repeated ulcers in high risk patients, but the cost effectiveness of these interventions remains unclear because of the small sample sizes.[8 11]

Guidance issued by the National Institute for Health and Clinical Excellence (NICE) in 2004 lists the evaluation of pressure relieving devices (shoes and orthoses or insoles) as a research priority in diabetes.[6] A trial of callus reduction with the use of pressure deflecting insoles, which includes an economic evaluation, would be particularly useful for those who make decisions about cost effective care.

Patient education

Evidence about the value of patient education strategies to reduce the incidence of foot ulcers is

inconsistent. A Cochrane systematic review found that an intense educational intervention prevented foot ulcers in high risk patients compared with a brief educational intervention, but this effect was not seen in a second RCT in the same review.[12]

The evidence for educational interventions is inconclusive in the short term and unknown in the longer term.[8] Large RCTs are needed to find which education formats are effective and enduring. Such trials of the general diabetic population should use foot ulceration as the primary outcome and have sample sizes of 430-870 per treatment arm.[12]

Is ongoing research likely to provide relevant evidence?

The update of the Cochrane systematic reviews of preventive interventions is ongoing and necessary (personal communication, Cochrane Wounds Group, 2007).[11 12] However, randomised evaluations of specialist foot care clinics, insoles or orthoses, footwear, callus reduction to reduce pressure, and patient education are all urgently needed to inform effective clinical practice. A search of the National Research Register Archive identified only one ongoing RCT, which aims to evaluate the value of padded socks.[13] Although such an evaluation is welcome, it seems to focus on people who already have or have had a foot ulcer and may contribute little to the prevention of this serious consequence of diabetes.

What should we do in the light of the uncertainty?

Healthcare professionals should continue to conduct annual foot screening for people with diabetes. Those with poor test results should be referred to their podiatry department for specialist care, where patient education, callus reduction, and weight deflecting insoles can be provided in accordance with national guidelines.

Researchers who have access to large numbers of patients with diabetes need to conduct high quality RCTs. Evidence is needed from all patients, treated in all healthcare settings where foot care is delivered. People with diabetes should be encouraged to take part in such trials.

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Occluded circulation

Thirty years ago my boss had told me of an aortic valve replacement he had performed. The heart came off bypass well with a good output, but later it was apparent that, although the patient's legs were warm to the touch, there was no pulsatile flow. "It was as if," he said, "there was a sponge in the aorta." And then the penny dropped. During the operation, it was customary to put a sponge in the left ventricular cavity to prevent calcium from the valve getting into the heart. This sponge in those days did not appear on the swab count, and it had not been removed after the valve replacement. At laparotomy the embolic sponge was removed, and a healthy flow restored to the legs.

I am now a retired cardiothoracic surgeon and have thus spent most of my life dealing with human pumps, valves, tubes, leaks, and blockages, so that when we had a new central heating boiler installed and there were difficulties with water flow I expected to be able to solve the problem. The filling pressure was fine in that the header tank was full, the valves were fully open, and the pump was running, but the flow to the radiators was so slow that I was unable to bleed them. I unkindly thought some sealant had got into the pipes when the plumbers had fitted the new pump.

The engineer we called out disagreed and said the problem would lie in the outflow from the header tank. I was not convinced, but, like a registrar with a consultant, I followed him to the tank. The water was crystal clear. "Feel the bottom for sludge," he said. There was none. "Feel the outflow pipe." I put my arm in again and palpated the orifice of the pipe. It was occluded. A piece of insulating foam had obviously fallen in a day earlier when I had taken the lid off the tank. Being sponge, it was not totally occlusive but was allowing only a very slow flow. Sponge removed, there was a whoosh of water and the problem was solved. The "consultant" was right, the incredulous trainee wrong.

Perhaps I should have learnt from that original episode, it would have saved me many hours of fruitless activity trying to bleed radiators without an adequate fluid flow.

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