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Pulmonary anthrax in Florida, United States

A sixty-three year old resident of Florida, United States, developed a severe pneumonic disease at the end of September. Pulmonary anthrax was diagnosed on 4 October, the same day that the man died. He had none of the characteristic risk factors for anthrax. The Centers for Disease Control and Prevention (CDC) and Florida state health authorities were immediately alerted and intensive case finding was undertaken. Nasal swabbing for spores of *Bacillus anthracis* was undertaken for all those who had worked in or visited the man's workplace (American Media Inc) for more than an hour on, or after, 1 August 2001. To date this has yielded two positive specimens from over 700 people tested (not all test results are yet available). An extensive epidemiological and forensic investigation is being undertaken by CDC, Florida health authorities, and the Federal Bureau of Investigation. This has revealed one environmental specimen from the workplace with anthrax spores (1).

Provisional guidelines for action in the event of a deliberate release of anthrax

Pulmonary anthrax is readily diagnosed. There is a rapid onset pneumonia with characteristic mediastinal widening <<http://www.phls.org.uk/advice/anthrax%20QA.pdf>> and <http://www.phls.org.uk/advice/anthrax_guidelines.pdf>. If a pulmonary or other systemic anthrax case is suspected or confirmed the local consultant in communicable disease control and duty doctor at CDSC (020 8200 6868) should be informed immediately. A useful guide is that **any previously healthy patient with the following clinical presentation should be immediately reported to the Consultant in Communicable Disease Control and CDSC:**

- a severe, unexplained febrile illness or febrile death or
- severe sepsis or respiratory failure with a widened mediastinum <<http://www.phls.org.uk/advice/anthrax%20QA.pdf>>, or
- severe sepsis with gram-positive rods or a *Bacillus* spp identified in the blood or cerebrospinal fluid

Clinical microbiology laboratories should take care not to regard all isolates of *Bacillus* species as contaminants, especially if isolated from sterile sites ie blood, and cerebrospinal fluid, and/or multiple cultures from the same patient are positive. The PHLS recommends that all sterile site *Bacillus* isolates be further evaluated, and if non-motile or non-hemolytic, and/or if the clinical syndrome is suggestive of anthrax, the isolates should be immediately referred to Dangerous Pathogens Unit, CAMR, Porton Down, Salisbury, Wiltshire SP4 0JG; tel 01980 612100. **The unit must be notified by telephone beforehand and the samples must be packaged as described in the guidance below.**

Some laboratories are being asked to test objects for anthrax spores. This should not be undertaken. The correct response is to call the police who have well tried procedures for dealing with this eventuality.

Further provisional guidance for clinicians, microbiologists and public health staff on the recognition, diagnosis of and response to anthrax, and in particular pulmonary anthrax is available on the PHLS website at <http://www.phls.org.uk/advice/anthrax_guidelines.pdf> along with questions and answers commonly being asked by health professionals <<http://www.phls.org.uk/advice/anthrax%20QA.pdf>>.

Human anthrax in England and Wales

Anthrax became a notifiable industrial disease under the *Factories Act* in 1895 and in December 1960 became a notifiable disease under the *Public Health Act*. Information about the morbidity of the disease in the general population is available only since 1961. These data were reviewed for the period 1961 to 1980 (2,3).

The last reported deaths both occurred in 1974, one in a patient with haemorrhagic septicaemia and generalised infection with *Bacillus anthracis*, and another in a patient with gastrointestinal and pulmonary anthrax. The latter case is the last reported case of pulmonary anthrax since 1965 (4). Both were believed to be associated with bonemeal fertilizer.

Between 1981 and 2000, 16 possible cases of anthrax were notified to OPCS/ONS under the *Public Health (Control of Diseases) Act, 1984* (5) and none under NADOR or RIDDOR to HSE (6). There were no deaths. One case notified in 1987 had been misdiagnosed and should have been deleted from published annual tables (OPCS); one case notified in 1988 was de-notified. Fourteen cases are considered to remain on the register.

Twelve were male and two female, with ages ranging from 23 to 63 years. All were recorded as cases of cutaneous anthrax – none had pulmonary or deep-seated infections. The most common site of the lesion(s) was the hands or arms. The organism was isolated from only one patient, in 1995, and serological confirmation was obtained in one other case, in 1982. In all other cases, diagnosis was made on clinical grounds only. In five, bacteriological and/or serological tests were known to be negative.

Occupation/ source of infection	Number
Slaughterman / butcher/fellmonger	5
Factory worker / imported wool (wool +ve)	1
Factory worker / bonemeal fertiliser	1
Factory worker / imported cotton/wool/leather	1
Labourer / leather bales	1
Engineer / animal skins in Zambia	1
Worked with horses	1
Not determined	3
Total	14

No cases have been recorded in England and Wales in 2001 to week 40.

1. CDC. Ongoing investigation of anthrax in Florida. *CDC Health Update* [online] 8 October 2001 [cited 11 October 2001]. Available at www.bt.cdc.gov/DocumentsApp/Anthrax/08oct01.pdf.
2. CDSC. Anthrax surveillance 1961-80. *CDR Weekly* 1981; **81** (46): 3.
3. Anon. Anthrax surveillance 1961-80. *BMJ* 1982; **284**: 204.
4. Enticknap JB, Galbraith NS, Tomlinson AJH, Elias-Jones TF. Pulmonary anthrax caused by contaminated sacks. *Brit J Industr Med* 1968; **25**: 72-4.
5. *The Public Health (Control of Disease) Act 1984*. London: HMSO, 1984.
6. *The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 (Statutory Instrument 1985 No. 2032)*. London: HMSO, 1985.

Management of possible exposure to CJD through medical procedures

The Department of Health has published a discussion paper on the management of possible exposure to Creutzfeldt Jakob disease (CJD) through medical procedures, produced by the CJD Incidents Panel (1). This expert advisory group was set up in August 2000 by the Chief Medical Officer to advise on issues relating to the possible transmission of CJD and variant CJD from person to person through healthcare. Such CJD incidents can occur when a patient found to have CJD has previously undergone surgery, or donated blood, organs, or tissues.

There is considerable scientific uncertainty about the transmission risk in such circumstances. In sporadic CJD, abnormal prion protein and experimental infectivity have been demonstrated in the brain, spinal cord, and parts of the eye. Rare transmission has been documented through neurosurgical procedures and in recipients of human pituitary-derived gonadotrophins and growth hormone.

Person to person transmission of variant-CJD has not been documented. The distribution of abnormal prion protein in the body in variant-CJD, however, is wider than in sporadic CJD. This leads to the unquantifiable, but theoretical, risk that variant-CJD may be transmissible through surgical procedures, especially those involving lymphoreticular tissues as well as CNS tissues, and through donations of blood, organs, and tissues. Normal decontamination and sterilisation procedures do not destroy abnormal prion protein.

The proposals put forward by the CJD Incidents Panel to support health authorities and trusts in managing CJD incidents acknowledge the uncertainties and ethical dilemmas posed by the limited scientific knowledge of these risks and their possible consequences.

Four main actions are proposed.

- Provide advice on when instruments or blood products should be removed from use.
- Establish a confidential database of all possibly exposed people, who would not be routinely informed about their possible exposure. This database, which would be maintained by CDSC, would be used to increase the knowledge of the risk of transmission.
- Inform a small group of possibly exposed people where the panel considers there is sufficient risk to warrant public health action (advising individuals not to donate blood or organs and that special precautions should be taken if surgery is needed).
- Publicise the database to enable people to find out if they have been possibly exposed, or to choose to remove their names without learning whether they may have had an exposure.

The consultation paper is available electronically at <http://www.doh.gov.uk/cjd/consultation>. The views of a wide range of health care professionals, patient support groups, and other interested people are sought to address a series of questions highlighted within the document. Responses can be returned electronically or by post.

1. CJD Incidents Panel. Management of possible exposures to CJD through medical procedures. A consultation paper. London: Department of Health, October 2001. Available online at <http://www.doh.gov.uk/cjd/consultation>.

***Salmonella stanley* and *Salmonella newport* in imported peanuts**

Three samples of garlic flavoured in-shell Farmer brand peanuts with a best before date of 28 June 2003 have been found positive for *S. newport* or *S. stanley* by the PHLS London Food, Water and Environmental Laboratory and Preston PHL. A further two samples of the same product and batch have been found positive for *Salmonella* spp. by Chester PHL. Molecular typing of these food isolates together with recent human isolates is in progress in the PHLS Laboratory of Enteric Pathogens (LEP). The peanuts, which are produced in China and distributed via Singapore, are likely to be sold through specialist stores. The United Kingdom importer has recalled the product. As a protective measure the Food Standards Agency has advised consumers of what products to avoid, and has issued a food hazard warning asking local authority enforcement officers to ensure that these products are removed from sale (1,2).

Local sampling was undertaken by the Public Health Laboratory Service and local authority environmental health departments in London and the North West at the request of the Food Standards Agency. This followed an international outbreak of *S. stanley* associated with consumption of Farmer brand imported peanuts in Australia (3,4) and Canada (5). A request for information was sent via Enter-net on 8 October 2001 to ascertain whether any other countries had any cases that may be associated with this product. To date, seven cases have been identified in Australia and Canada; no other countries have reported cases associated with this product. *S. stanley* has been isolated from an unopened packet of this product in Australia, while in Canada both *S. stanley* and *S. newport* have been isolated from unopened packets.

From 1 January to 30 September 2001 LEP has reported on 78 and 138 human isolates of *S. stanley* and *S. newport*, respectively in England and Wales. CDSC would be grateful for information on any suspected or confirmed *S. newport* and *S. stanley* occurring in people known to have consumed imported peanuts. Contact Bob Adak, tel 020 8200 6868 (ext 4551).

1. Food Standards Agency. Withdrawal of 'Farmer Brand' garlic flavour peanuts (in shells), *Food Hazard Warning*; 10 October 2001.
2. Food Standards Agency. *Some garlic flavoured peanuts found to be contaminated with salmonella*. Press release [online] 10 October 2001 [cited 11 October 2001]. Available at <http://www.foodstandards.gov.uk/press_releases/uk_press/2001/pr011010peanuts.htm>
3. Australia New Zealand Food Authority. *Shandong peanuts - salmonella contamination*. [online] 10 September 2001 [cited 11 October 2001]. Available from <<http://www.anzfa.gov.au/recallsafety/foodrecalls/currentconsumerlevelrecalls/shandongpeanutssalmo1036.cfm>>
4. Anon. *Salmonella Stanley, peanuts - Australia: recall*. *ProMED-mail* [online] 11 September 2001 [cited 11 October 2001]. Available from <http://www.promedmail.org/pls/promed/promed.searchhtml.showmail?p_filename=20010911.2189&p_year=2001&p_month=09>
5. Canada Food Inspection Agency. *Imported Farmer brand peanuts may contain dangerous bacteria* (Health Hazard Alert). [online] 18 September 2001 [cited 11 October 2001]. Available from <<http://www.inspection.gc.ca/english/corpaffr/recarapp/20010918e.shtml>>

***Salmonella enteritidis* phage type 5c**

Salmonella enteritidis phage type (PT) 5c is a relatively new phage type that was first defined in 1999. Although it was responsible for a number of outbreaks in Scotland that were epidemiologically linked to Chinese restaurants in 2000 (1), it had not been a problem in England and Wales until this year. Since 1 January 2001, the Laboratory of Enteric Pathogens (LEP) has reported on over 320 human isolates. Of these, 93 of the patients are known to have travelled abroad, with Tenerife being the most common holiday venue.

Three outbreaks have occurred where food items have been found positive for *S. enteritidis* PT5c. Two were in the London area, the first in March due to infected Thai fish cakes that had contained egg, and a more recent outbreak was linked to egg mayonnaise bagels. The positive food isolates were made by the London Food, Water, and Environmental Laboratory. The third incident was in Sussex where Brighton PHL isolated *S. enteritidis* PT5c from an egg mayonnaise sandwich and an egg, bacon, and mayonnaise sandwich. Eggs appear to be implicated in infection with *S. enteritidis* PT5c and investigations into the egg supplies, whether imported or home produced, is essential.

1. SCIEH. National outbreak of infection with *Salmonella enteritidis* Phage Type 5c. *SCIEH Weekly Report* 2000; **34**(31): 177.

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General outbreaks of foodborne illness, England and Wales: laboratory reports, weeks 36-40/01*

Health authority	Organism	Place of outbreak	Month of outbreak	No. ill	Cases positive	Suspect vehicle	Evidence
Buckinghamshire	<i>Salmonella enteritidis</i> PT4	Residential home	September	3	3	–	–
East London	<i>S. enteritidis</i> PT5C	Bakery	August	5	5	Egg mayon-naise bagels	M
Somerset	<i>S. enteritidis</i> PT6	BBQ	September	6	6	–	–
S&W Devon	<i>S. enteritidis</i> PT8	Hotel	September	22	19	–	–
Oldham	<i>Staphylococcus aureus</i>	Restaurant	June	3	3	Cooked ham	M
Dorset	DSP	Restaurant	September	6	0	Mussels	D
Warwickshire	Unknown	Public house	September	8	0	Tuna	D

* Preliminary data. Final information will be published in the quarterly report.

M (microbiological): identification of an organism of the same type from cases and in the suspect vehicle, or vehicle ingredient(s), or detection of toxin in faeces or food; S (statistical): a significant statistical association between consumption of the suspect vehicle(s) and being a case; D (descriptive): other evidence, usually descriptive, reported by local investigators as indicating the suspect vehicle.

Salmonella infections (faecal specimens), England and Wales: reports to the PHLS (salmonella data set*)

Details of serotypes of the 2382 salmonella infections recorded in August 2001 are given in the table below. In September 2001, 2074 salmonella infections were recorded and preliminary information was received about four outbreaks (see table above).

* figures quoted from the PHLS salmonella data set are for isolates confirmed and typed by PHLS Laboratory of Enteric Pathogens (LEP)

	August 2001
<i>Salmonella</i> (provisional total)	2382
<i>S. enteritidis</i> (PT4)	784
<i>S. enteritidis</i> (other PTs)	846
<i>S. typhimurium</i>	284
<i>S. virchow</i>	39
Other (typed)	429

Common gastrointestinal infections, England and Wales: laboratory reports, weeks 37-40/01

Laboratory reports	Number of reports received				Total reports	Cumulative reports	
	37/01	38/01	39/01	40/01	37-40/01	2001	2000
<i>Campylobacter</i>	1271	1328	1409	894	4902	43044	42953
<i>Escherichia coli</i> O157*	23	37	36	28	124	614	718
<i>Shigella sonnei</i>	17	30	21	19	87	685	576
Rotavirus	69	120	64	42	295	15470	16035
SRSV	52	19	17	18	106	1349	1710
<i>Cryptosporidium</i>	139	151	193	109	592	2346	3741
<i>Giardia</i>	108	85	108	63	364	2517	3062

* Vero cytotoxin producing isolates (data from LEP)

Less common gastrointestinal infections, England and Wales: laboratory reports, weeks 27-39/01

Laboratory reports	Total reports	Cumulative reports	
	27-39/01	2001	2000
Adenovirus*	98	201	209
Astrovirus	19	111	201
Calicivirus	6	20	34
<i>Shigella boydii</i>	13	42	45
<i>Shigella dysenteriae</i>	9	27	20
<i>Shigella flexneri</i>	71	158	155
Aeromonas	58	132	179
Plesiomonas	4	19	25
Vibrio	18	42	49
Yersinia	6	22	21
<i>Entamoeba histolytica</i>	41	177	200
<i>Blastocystis hominis</i>	76	236	286
<i>Dientamoeba fragilis</i>	27	137	149

*Includes adenovirus EM faeces and adenovirus group F

Genotyping *Cryptosporidium* is an essential addition to microscopy

Traditional methods of diagnosing cryptosporidial infections in clinical laboratories involve non-specific staining and microscopical examination of faecal smears on microscope slides for the oocysts of this protozoan parasite (1). Recent advances and the application of molecular methods have shown that the genus *Cryptosporidium* is more diverse than previously thought, with eight species currently supported by genetic studies: *C. parvum*, *C. muris*, *C. meleagridis*, *C. baylei*, *C. wrairi*, *C. felis*, *C. serpentis*, *C. andersoni* (2,3). The vast majority of cases of human and farmed animal cryptosporidial disease are caused by *C. parvum*, with genotypes 1 and 2 being identified in human infections and genotype 2 in animals. Approximately 1% human infections in the UK have however been found to be with other species, including *C. meleagridis*, and other genotypes (4-6).

While microscopical methods are appropriate for the diagnosis of acute infection, they do not differentiate between many species of *Cryptosporidium* because the oocyst size ranges overlap. Diagnosis should therefore be reported as *Cryptosporidium* sp. since molecular methods are required for species confirmation and genotype designation. This is particularly important during outbreak investigations, where environmental sampling may be undertaken to identify sources of contamination and infection. For example, during the investigation of an outbreak of waterborne cryptosporidiosis in the human population caused by *C. parvum* genotype 2, sheep flocks grazing near the water supply were sampled, although for logistical reasons this occurred some 12 weeks after the first case of human illness. The flocks were found by microscopy to have a high prevalence of *Cryptosporidium* sp. Genotyping revealed that the sheep were shedding a different isolate to that causing human illness (7).

Two messages emerge from this experience. The first is that microscopy alone is insufficient to identify sources of contamination and infection with *Cryptosporidium* sp. Secondly, timely sampling of the sheep in this case, or other suspected sources in other outbreaks, would provide a more precise picture of their role in the outbreak.

The genotyping of large, representative numbers of isolates from cases of illness, using PCR/RFLP and analysis with epidemiological data has also shown that unusual isolates of *Cryptosporidium* are not restricted to immunocompromised hosts (6). This is important because it demonstrates that these isolates are present in the community. The Cryptosporidium Reference Unit is currently undertaking genotyping of isolates of *Cryptosporidium* to support the development, evaluation and application of more discriminatory subtyping methods. These include the use of microsatellite DNA markers in collaboration with the colleagues in Scotland and single strand conformation polymorphisms in collaboration with Australian scientists (8). Specimens can be sent to the Cryptosporidium Reference Unit, Swansea PHL, Singleton Hospital, Swansea SA2 8QA; DX 6070300 Swansea 90 SA. The submission of specimens other than faeces is welcomed, but please discuss this first with the head of the unit, Dr Rachel Chalmers, tel 01792 285341.

1. PHLS Technical services. Standard operating procedure for the investigation of specimens other than blood for parasites. PHLS B.SOP 31. London: PHLS, 1998.
2. Fayer R. The general biology of *Cryptosporidium*. In R. Fayer (ed.), *Cryptosporidium and cryptosporidiosis*. Boca Raton, CRC Press, Inc. Florida 1997; pp.1-41.
3. Morgan UM, Xiao L, Fayer R, Lal AA, Thompson RCA. Variation in *Cryptosporidium*: towards a taxonomic revision of the genus. *Int J Parasitol* 1999; **29**: 1733-51.
4. Pedraza-Diaz S, Amar C, McLauchlin J. The identification and characterisation of an unusual genotype of *Cryptosporidium* from human faeces as *Cryptosporidium meleagridis*. *FEMS Microb Lett* 2000; **189**: 189-94.
5. Pedraza-Diaz S, Amar C, Iversen AM, Stanley PJ, McLauchlin J. Unusual *Cryptosporidium* species recovered from human faeces: first description of *Cryptosporidium felis* and *Cryptosporidium* dog type from patients and England. *J Med Microbiol* 2001; **50**: 293-6.
6. Chalmers RM, Elwin K, Thomas A. Unusual types of cryptosporidia are not restricted to immunocompromised patients. *J Infectious Dis*, In press.
7. Chalmers RM, Elwin K, Reilly WJ, Irvine H, Thomas AL, Hunter PR. *Cryptosporidium* in farmed animals: the detection of a novel isolate in sheep. *Int J Parasitol*, In press.
8. Gasser RB, Zhu XQ, Caccio S et al. Genotyping *Cryptosporidium parvum* by single-strand conformation polymorphism analysis of ribosomal and heat shock gene regions. *Electrophoresis* 2001; **22**: 433-7.

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