During a pandemic, when supplies are unavailable, the balance of benefit to harm would favor using the expired product.

The 1918 influenza pandemic is estimated to have killed 50 million persons worldwide (*10*), many in developing countries. By better safeguarding available drug stockpiles, more drugs could be made available to poorer countries that have few drugs stockpiled.

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DOI: 10.3201/eid1510.090844

References

1. Jack A. Roche steps up production of Tamiflu. The Times; 2009 May 12 [cited 2009 May 29]. Available from http://www.ft.com/cms/s/0/f7ca6e42-3f1d-11-de-ae4f-00144feabdc0.html
2. Department of Health UK. Pandemic flu drug stockpiles are set to double [cited 2009 Jul 29]. Available from http://www.medicalnewstoday.com/articles/137256.php
3. Mroso PV, Li Wan Po A, Irwin WJ. Solid-state stability of aspirin in the presence of excipients: kinetic interpretation, modeling, and prediction. J Pharm Sci. 1982;71:1096–101. DOI: 10.1002/jps.2600711004
4. Li Wan Po A. Too much, too little, or none at all: dealing with substandard and fake drugs. Lancet. 2001;357:1904. DOI: 10.1016/S0140-6736(00)05092-3
5. European Medicines Agency. European Medicines Agency recommendations on extension of shelf life for Tamiflu. 2009 May 8 [cited 2009 Jul 29]. Available from http://www.emea.europa.eu/humandocs/PDFs/EPAR/tamiflu/28497109en.pdf
6. Li W, Escarpe PA, Eisenberg EJ, Cundy KC, Sweet C, Jakeman KJ, et al. Identification of GS 4104 as an orally bioavailable prodrug of the influenza virus neuraminidase inhibitor GS 4071. Antimicrob Agents Chemother. 1998;42:647–53.
7. He G, Massarella J, Ward P. Clinical pharmacokinetics of the prodrug oseltamivir and its active metabolite Ro 64-0802. Clin Pharmacokinet. 1999;37:471–84. DOI: 10.2165/00003088-199937060-00003
8. Brewster M, Smith JR, Dutkowski R, Robson R. Active metabolite from Tamiflu solution is bioequivalent to that from capsule delivery in healthy volunteers: a cross-over, randomised, open-label study. Vaccine. 2006;24:6660–3. DOI: 10.1016/j.vaccine.2006.05.080
9. Radonovich LJ, Magalian PD, Hollingsworth MK, Baracco G. Stockpiling supplies for the next influenza pandemic. Emerg Infect Dis [serial on the internet]. 2009 Jun [cited 2009 Jul 29]. Available from http://www.cdc.gov/EID/content/15/6/e1.htm
10. Taubenberger JK, Morens DM. 1918 influenza: the mother of all pandemics. Emerg Infect Dis. 2006;12:15–22.

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Intrafamilial Transmission of Methicillin-Resistant *Staphylococcus aureus*[1]

To the Editor: Community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infection was first described in our region over 15 years ago (*1*). More recently, CA-MRSA has become a global concern and is now a common cause of skin and soft tissue infections in the United States (*2*). An association between severe CA-MRSA infection (e.g., necrotizing fasciitis and pneumonia) and the synergohymenotrophic exotoxin Panton-Valentine leukocidin (PVL) has been made (*3,4*). Reports have documented CA-MRSA transmission among household members; however, most cases have been mild or moderate infections or asymptomatic colonization (*5–7*). We describe intrafamilial transmission of a PVL-containing CA-MRSA clone common in Australia (ST30-MRSA-IV) between a nurse who experienced recurrent abscesses and her husband, who died of severe pneumonia.

In July 2006, a 61-year-old previously healthy nurse (Mrs A) sought treatment for an infected seborrheic cyst of the scalp. Culture of pus yielded MRSA that was susceptible to clindamycin. She was treated with oral clindamycin. After resolution of the infection, topical MRSA decolonization therapy with 3% hexachlorophane body wash (daily), 20% cetrimide shampoo (3×/wk), and 2% mupirocin nasal ointment (3×/d) was administered for 10 days, as per our institutional protocol for MRSA-colonized healthcare workers. Subsequently, MRSA surveillance swabs from the nose, throat, and scalp obtained weekly for 10 weeks and cultured on selective MRSA chromogenic agar and in selective broth enrichment media were negative. Household members were not screened for MRSA colonization.

Six months later, in January 2007, the patient's husband (Mr A), a 60-year-old smoker who was her only household contact, was admitted with a 1-day history of dyspnea, pleuritic chest pain, cough with sputum, fever, vomiting, and diarrhea. On admission, he was unwell, with tachycardia (pulse rate 132 bpm), hypotension (95/60 mm Hg), tachypnea (40 breaths/min), and hypoxia (oxygen saturation 93% on 15 L O_2/min). A chest radiograph showed bilateral infiltrates and a right pleural effusion. He was diagnosed with community-acquired pneumonia and treated with intravenous ceftriaxone and azithromycin as per local protocol. However, within 12 hours, his condition deteriorated, necessitating admission to the intensive care unit for ventilation and inotropic support.

[1]Results presented in part at the Australasian Society for Infectious Diseases Annual Scientific Meeting, Sunshine Coast, Queensland, Australia, 2008 April 2–5.

Broncho-alveolar lavage (BAL) fluid demonstrated gram-positive cocci in tetrads, and intravenous vancomycin and dicloxacillin were added to therapy. Despite aggressive supportive measures, Mr A's condition continued to deteriorate, and he died 28 hours after admission. MRSA was subsequently cultured from blood, sputum, and BAL fluid; an autopsy was not performed.

In June 2007, Mrs A sought treatment for an abscess with cellulitis on the left thigh. The abscess was surgically drained, and cultures again yielded MRSA. She was treated with intravenous and oral clindamycin for 10 days and subsequently underwent repeat MRSA decolonization therapy; again, swabs taken 1×/wk for 10 weeks postdecolonization were negative.

Molecular typing of the MRSA isolates obtained from Mrs A at the time of her initial skin infection, Mr A's blood culture, and Mrs A's second skin infection was performed by using contour-clamped homogenous electric field electrophoresis (CHEF) according to a previously described method (*8*) (Figure). The CHEF patterns were indistinguishable and were identical to the known CHEF pattern for ST30-MRSA-IV (*9*). All 3 isolates contained the *lukF-PV/lukS-PV* genes that encode PVL and had the same antibiogram (i.e., isolates were resistant only to β-lactam antimicrobial agents).

We describe intrafamilial MRSA transmission (defined as ≥2 family members who live at the same postal address and who are colonized or infected with a MRSA strain having the same CHEF pattern) that resulted in a fatal outcome. The MRSA strain responsible (ST30-MRSA-IV, or Western Samoan phage pattern/Oceania strain MRSA) is a common cause of CA-MRSA infection in Australia.

Recurrent MRSA infection developed in Mrs A several months after completion of apparently successful MRSA decolonization therapy. We could not determine whether this recurrence was because of persistent MRSA colonization not detected by surveillance (e.g., perineal or gastrointestinal colonization) or whether Mrs A was successfully decolonized but Mr A's colonization/infection resulted in recolonization and subsequent infection. Whatever the explanation, this case highlights a potential weakness in MRSA surveillance programs that rely on short-term, limited-site surveillance.

A comprehensive MRSA search-and-destroy policy in place for over 25 years has prevented MRSA from becoming endemic in our institution (*10*). However, the rapidly changing epidemiology of MRSA in becoming a predominantly community pathogen represents a significant challenge to the ongoing success of this policy. In response to this challenge, the Western Australian Department of Health has implemented a community-based MRSA search-and-destroy program for patients with MRSA infection caused by exotic PVL-positive clones (e.g., ST30-MRSA-IV, ST93-MRSA-IV, ST80-MRSA-IV, and ST8-MRSA-IV/USA300). This program includes treatment/decolonization therapy for the index case, screening of household members for MRSA infection/colonization, and simultaneous treatment/decolonization if MRSA is identified. Although a similar approach has proved successful in Denmark (*6*), whether this success can be sustainable on a larger scale remains to be seen.

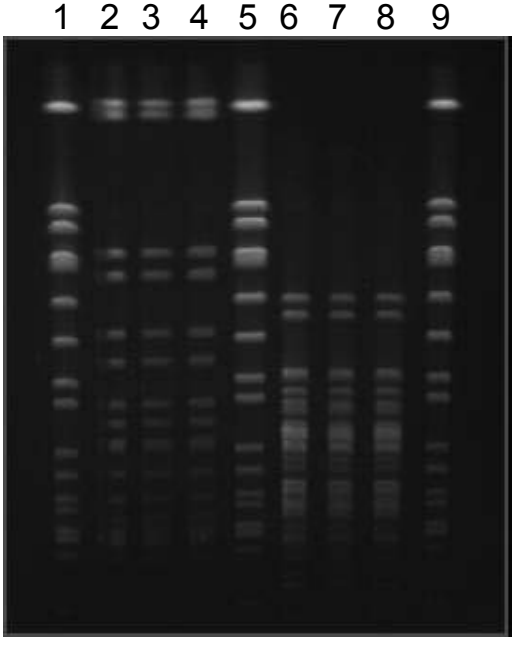

Figure. Contour-clamped homogenous electric field electrophoresis of *Staphylococcus aureus* isolates. Lanes 2, 3, and 4 *(Sma*1 restriction): methicillin-resistant *S. aureus* (MRSA) isolated from Mrs A's first infection, Mr A's blood culture, and Mrs A's second infection, respectively. Lanes 6, 7, and 8 (*Apa*1 restriction): MRSA isolated from Mrs A's first infection, Mr A's blood culture, and Mrs A's second infection, respectively. Lanes 1, 5, and 9: *S. aureus* NCTC8325.

Acknowledgment

We thank our patient for allowing us to discuss her case in this report.

This research was supported by the Department of Microbiology and Infectious Diseases, Royal Perth Hospital, Perth, Western Australia, Australia.

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DOI: 10.3201/eid1510.081532

References

1. Udo EE, Pearman JW, Grubb WB. Genetic analysis of community isolates of methicillin-resistant *Staphylococcus aureus* in Western Australia. J Hosp Infect. 1993;25:97–108. DOI: 10.1016/0195-6701(93)90100-E
2. Moran GJ, Krishnadasan A, Gorwitz RJ, Fosheim GE, McDougal LK, Carey RB, et al. EMERGEncy ID Net Study Group. Methicillin-resistant *S. aureus* infections among patients in the emergency department. N Engl J Med. 2006;355:666–74. DOI: 10.1056/NEJMoa055356
3. Gillet Y, Issartel B, Vanhems P, Fournet JC, Lina G, Bes M, et al. Association between *Staphylococcus aureus* strains carrying gene for Panton-Valentine leukocidin and highly lethal necrotising pneumonia in young immunocompetent patients. Lancet. 2002;359:753–9. DOI: 10.1016/S0140-6736(02)07877-7
4. Miller LG, Perdreau-Remington F, Rieg G, Mehdi S, Perlroth J, Bayer AS, et al. Necrotizing fasciitis caused by community-associated methicillin-resistant *Staphylococcus aureus* in Los Angeles. N Engl J Med. 2005;352:1445–53. DOI: 10.1056/NEJMoa042683
5. L'Heriteau F, Lucet JC, Scanvic A, Bouvet E. Community-acquired methicillin-resistant *Staphylococcus aureus* and familial transmission. JAMA. 1999;282:1038–9. DOI: 10.1001/jama.282.11.1038
6. Urth T, Juul G, Skov R, Schonheyder HC. Spread of a methicillin-resistant *Staphylococcus aureus* ST80-IV clone in a Danish community. Infect Control Hosp Epidemiol. 2005;26:144–9. DOI: 10.1086/502518
7. Huijsdens XW, van Santen-Verheuvel MG, Spalburg E, Heck ME, Pluister GN, Eijkelkamp BA, et al. Multiple cases of familial transmission of community-acquired methicillin-resistant *Staphylococcus aureus*. J Clin Microbiol. 2006;44:2994–6. DOI: 10.1128/JCM.00846-06
8. O'Brien FG, Udo EE, Grubb WB. Contour-clamped homogeneous electric field electrophoresis of *Staphylococcus aureus*. Nat Protocols. 2006;1:3028–33. DOI: 10.1038/nprot.2006.382
9. Coombs GW, Pearson JC, O'Brien FG, Murray RJ, Grubb WB, Christiansen KJ. Methicillin-resistant *Staphylococcus aureus* clones, Western Australia. Emerg Infect Dis. 2006;12:241–7.
10. Pearman JW, Christiansen KJ, Annear DI, Goodwin CS, Metcalf C, Donovan FP, et al. Control of methicillin-resistant *Staphylococcus aureus* (MRSA) in an Australian metropolitan teaching hospital complex. Med J Aust. 1985;142:103–8.

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Rhombencephalitis and Coxsackievirus A16

To the Editor: Hand, foot, and mouth disease (HFMD) is a common illness in children and is mainly caused by coxsackievirus A16 (CA16) and enterovirus 71 (EV71). Although its clinical course is usually uneventful and most patients experience a full recovery, serious neurologic complications, including encephalitis, can occur secondarily to HFMD caused by EV71. Such neurological complications occurred during an epidemic in Taiwan in 1998 (*1*). Encephalitis caused by EV71 is characterized by rhombencephalitis, which is a combination of brainstem encephalitis and cerebellitis. Signs and symptoms of rhombencephalitis are irritability, myoclonus, ataxia, and cranial nerve involvement (*1*). In contrast to EV71, HFMD caused by CA16 is associated with few neurologic complications with the exception of infrequent aseptic meningitis (*2*). We report a case of rhombencephalitis that developed in an infant as a complication of HFMD caused by CA16.

HFMD was diagnosed in a 23-month-old girl on the basis of high fever (>40°C, 3 d duration), stomatitis, and multiple papules on her palms, soles, and buttocks. Her illness occurred in the summer of 2007, when sentinel surveillance in the region indicated an epidemic of HFMD caused by both CA16 and EV71. She was admitted to our hospital in Fukoka, Japan, on day 4 of illness because of abnormal eye movement, irritability, and inability to stand. She had intermittent to-and-fro, horizontal oscillations of the eyes (ocular flutter). She also had truncal and limb ataxia and myoclonus in her head and limbs. Brain magnetic resonance imaging (MRI) showed T1-low and T2-high bulbopontine and cerebellar lesions around the fourth ventricle (Figure). Peripheral blood showed a mild leukocytosis (13.13×10^9/L) and a C-reactive protein level within reference range (0.9 mg/L). Blood chemistry results were unremarkable. Cerebrospinal fluid (CSF) examination showed mononuclear pleocytosis (74/μL) with normal protein and glucose levels. CA16 was isolated from her stool specimen on day 4 of illness. Based on reverse transcription–PCR, CSF was negative for enterovirus RNA.

Without specific treatment, our patient's fever resolved on day 5 of illness. The myoclonus, ocular flutter, and irritability subsided by day 16, when MRI findings returned to normal. Ataxia disappeared gradually ≈1 month after onset, and no neurologic sequelae occurred. Neutralizing antibody titers against CA16 and EV71 on day 21 of illness were 32 and <8, respectively. Based on the sequence analysis of the partial VP1 region (876 bp), we classified the patient's CA16 strain phylogenetically as genetic lineage C (*3*). This lineage was identical to lineage 2 (*4*), which became the dominant circulating strain in Asia, including Japan, after the late 1990s (98.2% identical to the 1018T/VNM/05 strain isolated in Vietnam