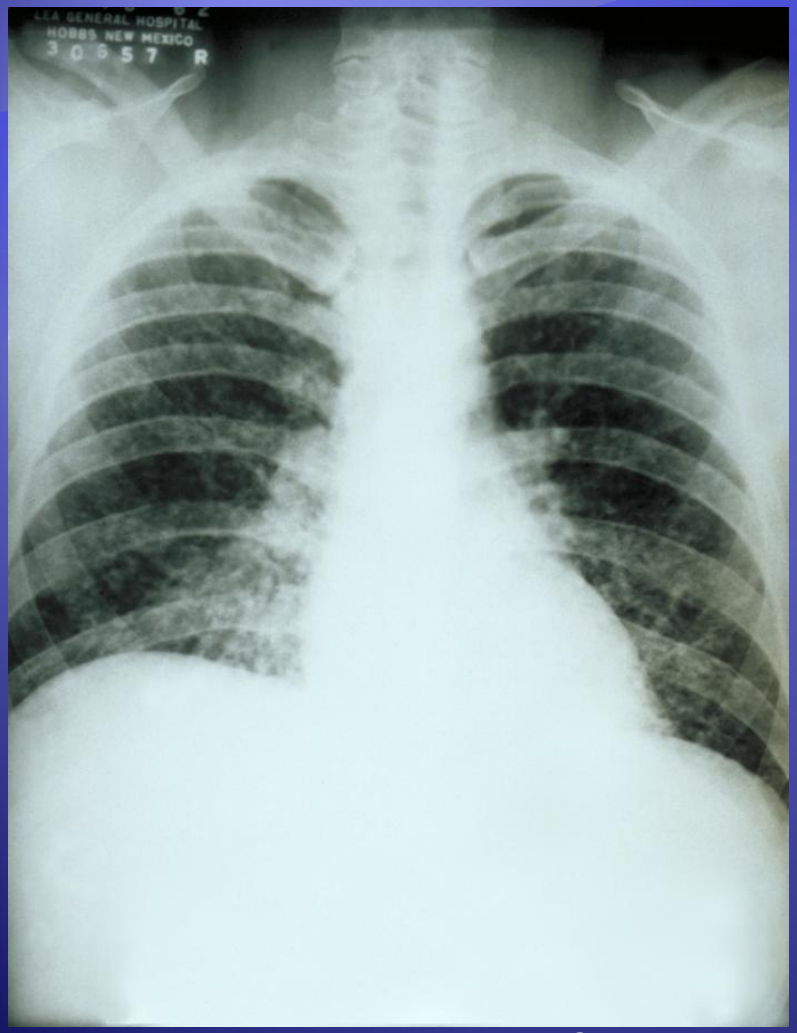
H1N1新型インフルエンザ　一次性肺炎



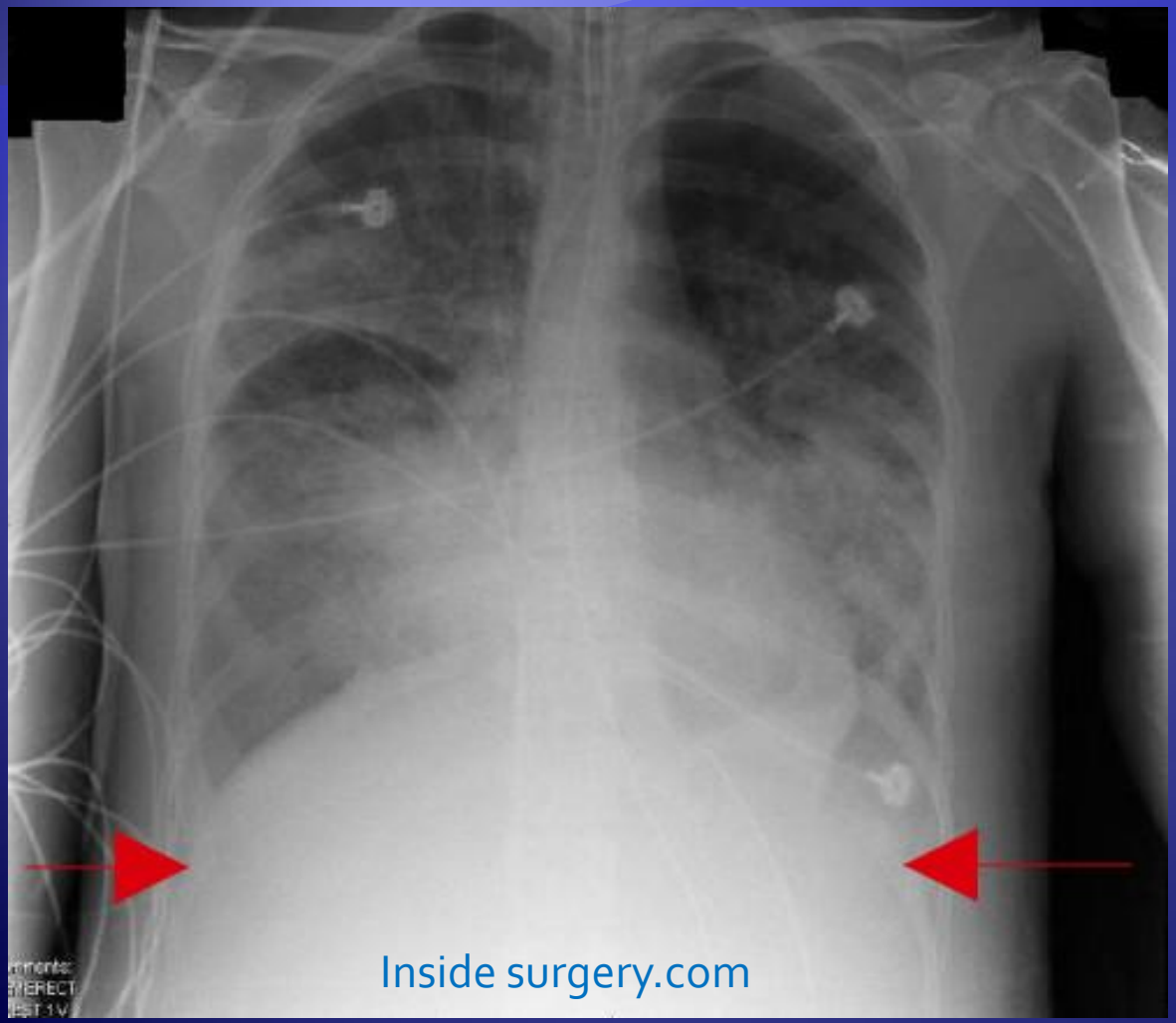
１．右下肺＞左下肺を中心に
両肺に淡い、斑状陰影を
認める
(patchyと表現される肺胞性陰影)
上肺野にも影は広がっている

２．含気不良（９番目の肋骨
まで頸の太さ、胸郭の広さ
などより、肥満であることが
伺われる

U.S. Centers for Disease Control and Prevention

山口内科

H1N1新型インフルエンザ　一次性肺炎



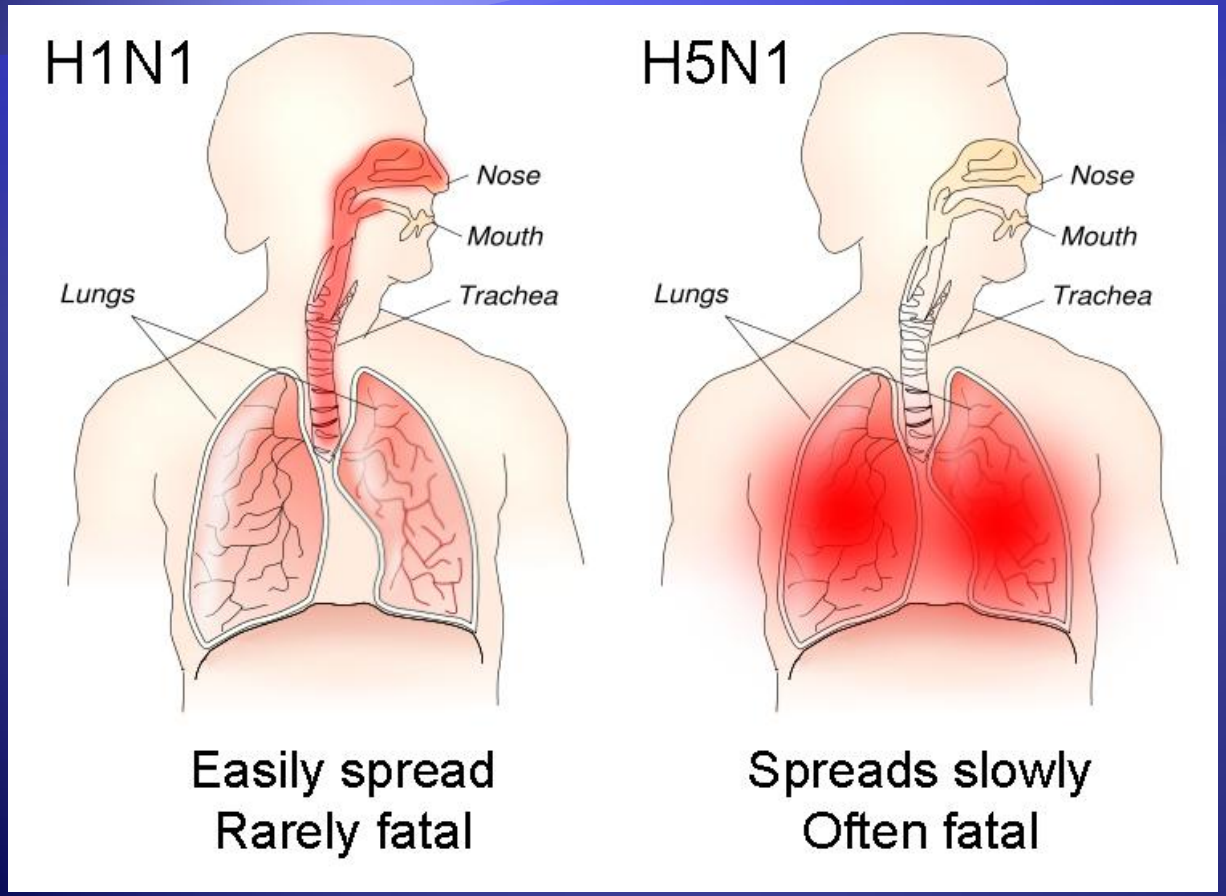
In type A flu pandemics, about 20%　of patients that develop an pneumonia will have the primary viral type. It occurs particularly in patients who are immunocompromised or who have underlying cardiac or pulmonary conditions. It also occurs with an increased frequency in pregnancy.

Primary viral influenza is marked by high fever, cough, dypsnea, and cyanosis. Patients can become rapidly hypoxic (low blood oxygen) and cyanotic (blue colored skin.) The sputum may contain blood and sputum cultures show many polymorphonuclear leukocytes but few bacteria.

Radiographic examination (chest X-ray) shows most typically patchy bilateral infiltrates.

山口内科

H1N1新型インフルエンザ　と　H5N1鳥インフルエンザとの比較



In type A flu pandemics, about 20% of patients that develop an pneumonia will have the primary viral type. It occurs particularly in patients who are immunocompromised or who have underlying cardiac or pulmonary conditions. It also occurs with an increased frequency in pregnancy.

Primary viral influenza is marked by high fever, cough, dypsnea, and cyanosis. Patients can become rapidly hypoxic (low blood oxygen) and cyanotic (blue colored skin.) The sputum may contain blood and sputum cultures show many polymorphonuclear leukocytes but few bacteria.

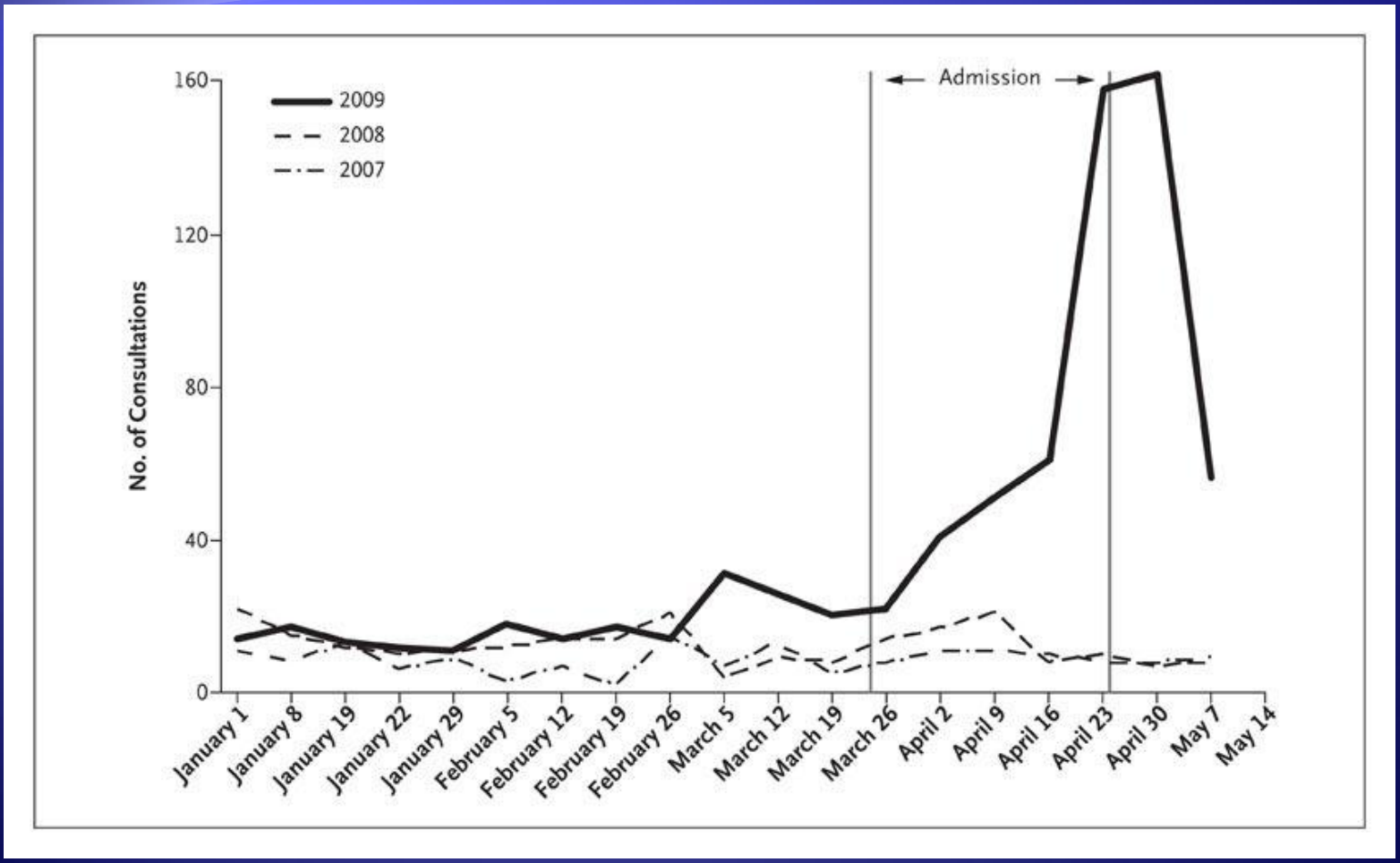
Radiographic examination (chest X-ray) shows most typically patchy bilateral infiltrates.

Inside surgery.com

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Emergency Room Consultations for Pneumonia or Respiratory Infection, Including Influenza-like Illness, at the National Institute of Respiratory Diseases of Mexico



Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Table 1. Characteristics of the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A (H1N1) Virus.*

Variable	Value
Male sex — no./total no. (%)	9/18 (50)
Age — yr	
Median	38
Range	0.75–61
All patients — no./total no. (%)	
≤5 yr	3/18 (17)
>5 to ≤10 yr	1/18 (6)
>10 to ≤15 yr	1/18 (6)
>15 to ≤50 yr	11/18 (61)
>50 yr	2/18 (11)
Patients who died — no./total no.	
≤5 yr	0/3
>5 to ≤10 yr	1/1
>10 to ≤15 yr	1/1
>15 to ≤50 yr	4/11
>50 yr	1/2
Symptom or outcome — no./total no. (%)	
Cough	18/18 (100)
Blood in sputum	6/18 (33)
Rhinorrhea	5/18 (28)
Wheezing	2/18 (11)
Headache	4/18 (22)
Myalgia or arthralgia	8/18 (44)
Fever (temperature >38°C)	18/18 (100)
Dyspnea or respiratory distress	18/18 (100)
Diarrhea	4/18 (22)
Sudden onset of symptoms	13/18 (72)
Hypotension that did not resolve after fluid administration	9/18 (50)
Mechanical ventilation on admission	10/18 (56)
Death	7/18 (39)

Characteristics of the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A (H1N1) Virus

①男女差は無し
②全員が呼吸困難を呈した
③人工呼吸器　10/18 (56%)
④死亡　7/18 (39%)

その他臨床的な特徴は季節性インフルエンザと大差なし

Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Table 1. (Continued.)

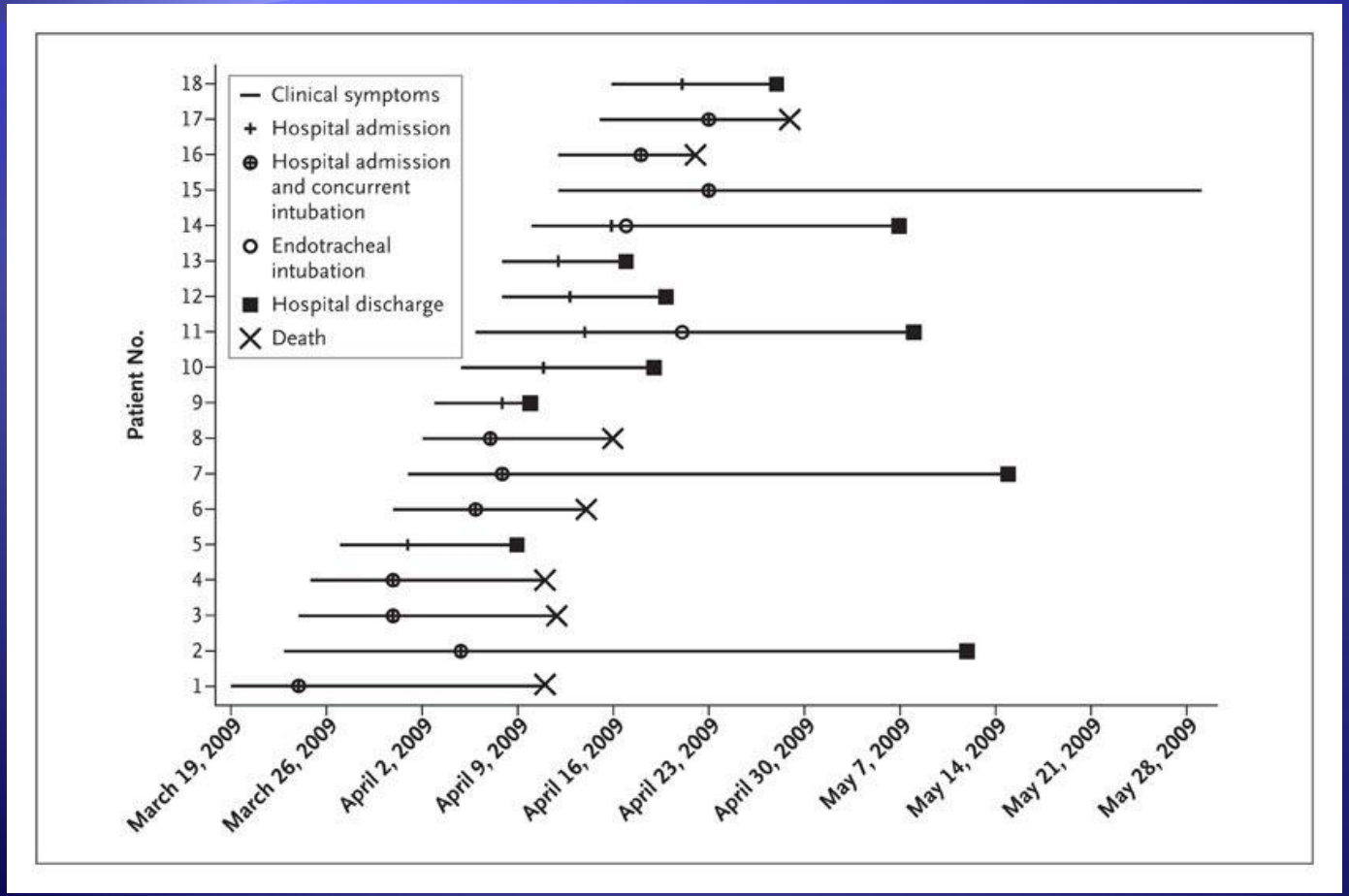
Variable	Value
Days from onset of symptoms to emergency room — median (range)	6 (4–13)
Days from onset of symptoms to death — median (range)	14 (10–23)
Days from admission to death — median (range)	9 (4–18)
Laboratory findings — median (range)	
Leukocyte count — per mm^3	6000 (3100–22,200)
Lymphocyte count — per mm^3	850 (200–3700)
Serum creatine kinase — U/liter	366 (58–2156)
Serum lactate dehydrogenase — U/liter	1226 (594–3871)
Abnormal finding — no./total no. (%)	
Lymphocyte count <1000 per mm^3	11/18 (61)
Creatine kinase >240 U/liter	10/16 (62)
Lactate dehydrogenase >350 U/liter	16/16 (100)

* Coexisting conditions were type 2 diabetes, asthma, high blood pressure, and the obstructive sleep apnea syndrome, as described in the Supplementary Appendix.

Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Clinical Courses of the Study Patients



Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

山口内科

Survival and Death among the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A

Table 2. Survival and Death among the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A (H1N1) Virus.*

Variable at Admission	Patients Who Survived (N = 11)	Patients Who Died (N = 7)	Hazard Ratio or Odds Ratio for Death (95% CI)	P Value
Age — yr				0.81
Median	37	45	1.00	
Range	0.75–61	9–52	0.96–1.04	
Male sex — no./total no.	4/11	5/7	2.2 (0.4–11.5)	0.34
Hypotension that did not resolve after fluid administration — no./total no.	2/11	7/7		0.02
Orotracheal intubation required within first 24 hr after admission — no./total no.	3/11	7/7		0.06
Renal failure any time during follow-up — no./total no.	1/11	5/7	25 (1.3–1295)	0.01
Coexisting condition — no./total no.†	5/11	3/7	0.78 (0.2–3.6)	0.75
Days from illness onset to admission				0.20
Median	6	6	0.71	
Range	4–13	5–8	0.4–1.2	
Lactate dehydrogenase — U/liter				0.40
Median	1086	2032	1.00	
Range	594–2429	690–3871	0.99–1.01	
Creatine kinase — U/liter				0.45
Median	189	514	1.00	
Range	58–1249	175–2156	0.99–1.01	
Lymphocyte count per mm^3				0.25
Median	1000	400	0.99	
Range	500–3700	200–1300	0.98–1.00	
PaO_2 — mm Hg				0.44
Median	55.4	41.5	0.96	
Range	33.7–70.1	39.0–51.0	0.89–1.04	
$PaCO_2$ — mm Hg				0.91
Median	28.7	36	0.99	
Range	23.7–61.7	15–66	0.94–1.05	
pH				0.02
Median	7.42	7.35	3.19×10^{-12}	
Range	7.38–7.93	7.19–7.43	3.43×10^{-22}–0.29	
Initial PaO_2:FIO_2				0.71
Median	231	197	0.99	
Range	22–334	186–243	0.98–1.01	
Acute respiratory distress syndrome — no./total no.	3/10	4/7	1.18 (0.26–5.33)	0.82
APACHE II score				0.02
Median	11	19	1.20	
Range	4–20	14–32	1.03–1.40	

死亡者 / 生存者の比較

①死亡者はLDHが著高

LDH　2032 / 1086 U/l

②死亡者はリンパ球低下が著明

リンパ球 400 / 1000 per mm^2

③死亡者ほどCPKが高い

CPK 514 / 189 U/l

④死亡者ほどPaO2が低い

PaO2 41.5 /55.4 mmHg

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Table 1. Characteristics of the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A (H1N1) Virus.*

Variable	Value
Male sex — no./total no. (%)	9/18 (50)
Age — yr	
Median	38
Range	0.75–61
All patients — no./total no. (%)	
≤5 yr	3/18 (17)
>5 to ≤10 yr	1/18 (6)
>10 to ≤15 yr	1/18 (6)
>15 to ≤50 yr	11/18 (61)
>50 yr	2/18 (11)
Patients who died — no./total no.	
≤5 yr	0/3
>5 to ≤10 yr	1/1
>10 to ≤15 yr	1/1
>15 to ≤50 yr	4/11
>50 yr	1/2
Symptom or outcome — no./total no. (%)	
Cough	18/18 (100)
Blood in sputum	6/18 (33)
Rhinorrhea	5/18 (28)
Wheezing	2/18 (11)
Headache	4/18 (22)
Myalgia or arthralgia	8/18 (44)
Fever (temperature >38°C)	18/18 (100)
Dyspnea or respiratory distress	18/18 (100)
Diarrhea	4/18 (22)
Sudden onset of symptoms	13/18 (72)
Hypotension that did not resolve after fluid administration	9/18 (50)
Mechanical ventilation on admission	10/18 (56)
Death	7/18 (39)
Days from onset of symptoms to emergency room — median (range)	6 (4–13)
Days from onset of symptoms to death — median (range)	14 (10–23)
Days from admission to death — median (range)	9 (4–18)
Laboratory findings — median (range)	
Leukocyte count — per mm³	6000 (3100–22,200)
Lymphocyte count — per mm³	850 (200–3700)
Serum creatine kinase — U/liter	366 (58–2156)
Serum lactate dehydrogenase — U/liter	1226 (594–3871)
Abnormal finding — no./total no. (%)	
Lymphocyte count <1000 per mm³	11/18 (61)
Creatine kinase >240 U/liter	10/16 (62)
Lactate dehydrogenase >350 U/liter	16/16 (100)

* Coexisting conditions were type 2 diabetes, asthma, high blood pressure, and the obstructive sleep apnea syndrome, as described in the Supplementary Appendix.

Characteristics of the 18 Study Patients Who Had Confirmed Infection with Novel Swine-Origin Influenza A (H1N1) Virus

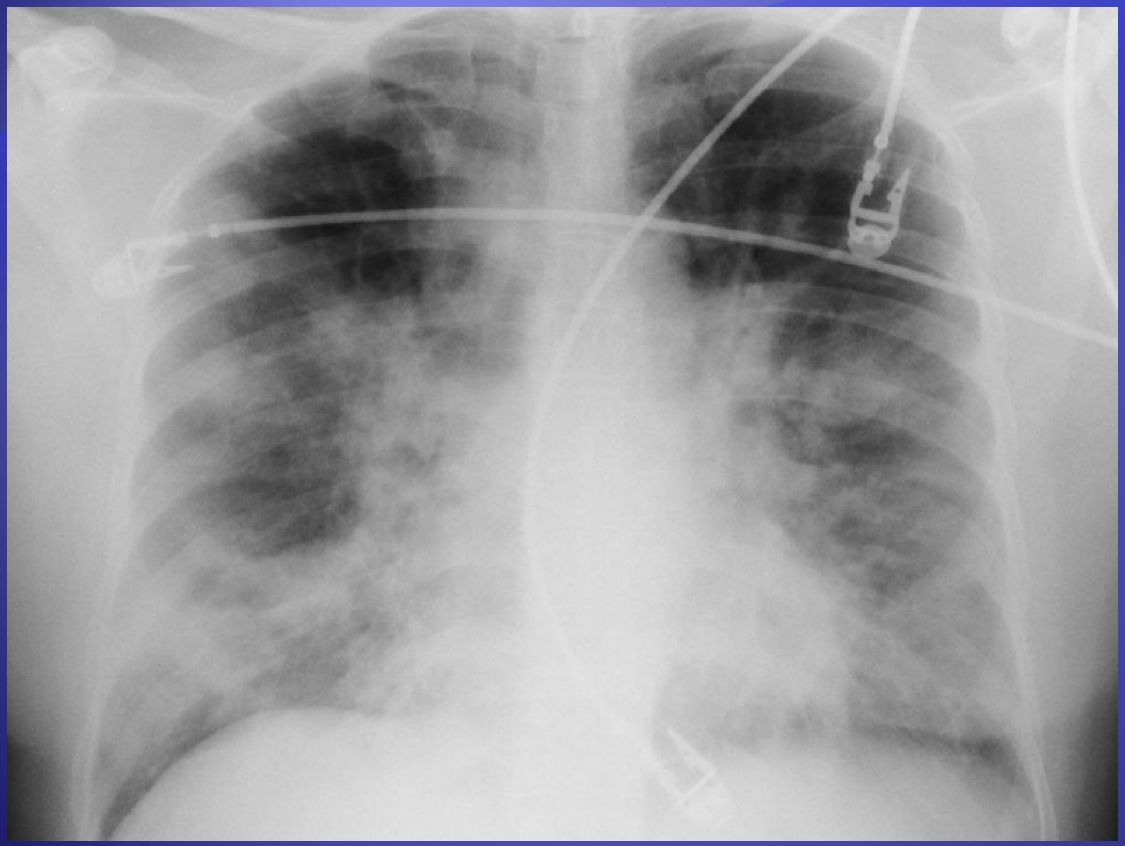
①男女差は無し
②全員が呼吸困難を呈した
③人工呼吸器　10/18 (56%)
④死亡　7/18 (39%)

その他臨床的な特徴は季節性インフルエンザと大差なし

Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

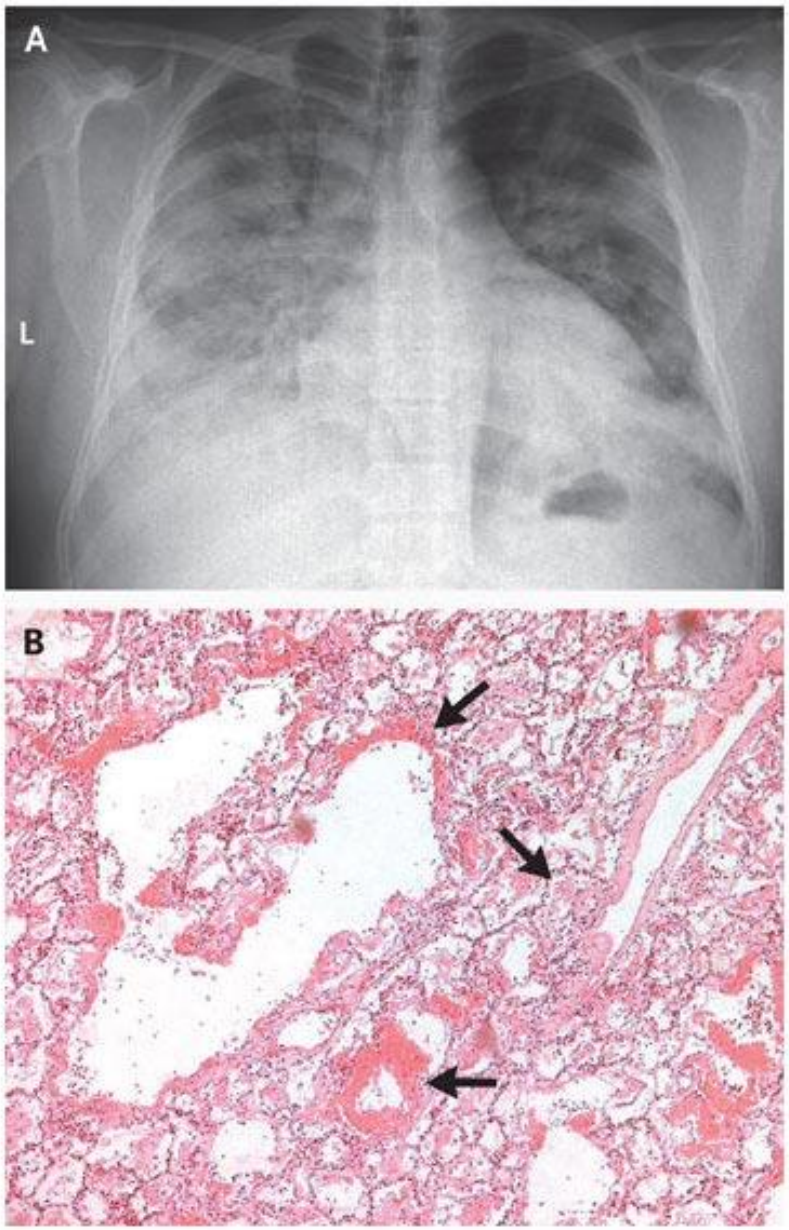


Initial Radiograph of the Lung from Patient 2

bilateral four quadrant lung opacities. Patient required mechanical ventilation but recovered and finally was discharged from hospital.

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico



Initial Radiograph of the Lung and Lung-Tissue Sample from Patient 3

両側肺底部：
肺胞性の不透明像が癒合する

細気管支壁の壊死

好中球の浸潤

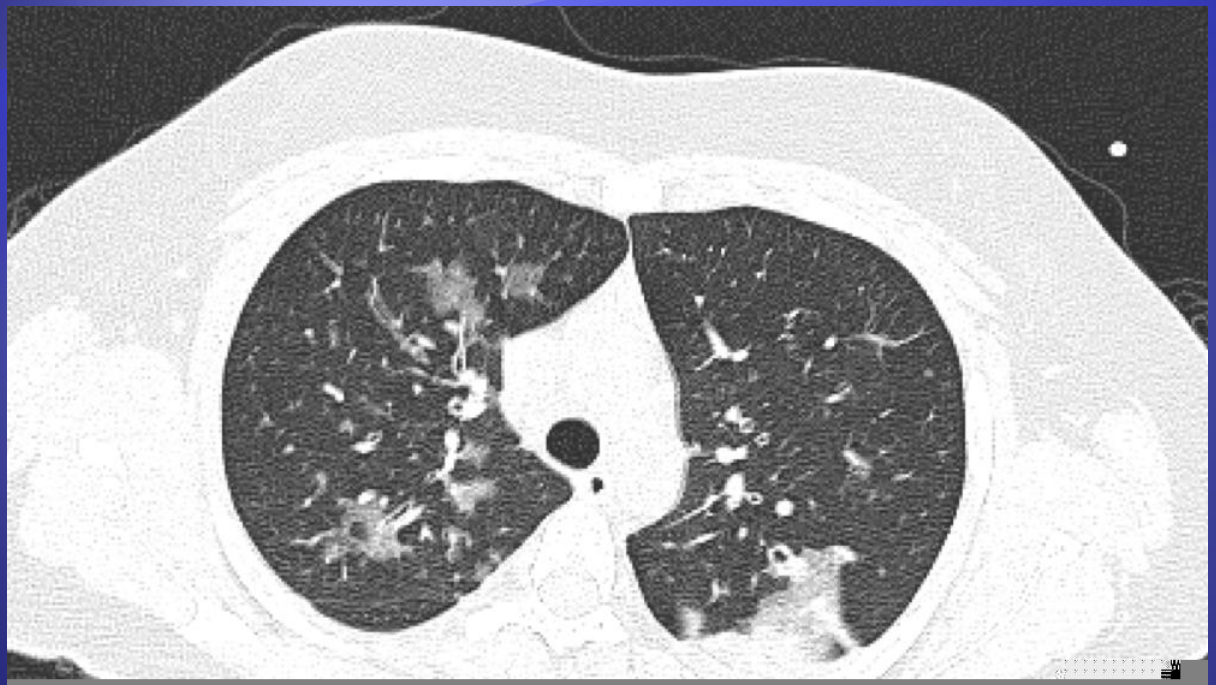
著明なヒアリン膜を伴う肺胞のダメージ

Perez-Padilla R et al. N Engl J Med 2009;10.1056/NEJMoa0904252

山口内科

Pneumonia and Respiratory Failure from Swine-Origin Influenza A(H1N1) in Mexico

Chest CT from Patient 9



showing patchy cottony ground glass opacities in both lungs with axial predominance. Opacities were present in the four lung quadrants. She had a milder disease and the chest roentgenogram had only minimal abnormalities at admission, mostly linear or patchy opacities, but presented with oxygen desaturation (85%).
Patient was discharged from hospital two days after admission and recovered fully.

山口内科 Yamaguchi Clinic

Microbiology and pathogenesis

WHO Weekly epidemiological record

Few patients have had evidence of bacterial infection upon admission, but instances of empyema, necrotizing pneumonia and bacterial coinfection, as well as ventilator-associated pneumonias, have occurred. Some cases had received antibiotic treatment before hospitalization. In Mexico, bacterial coinfections were documented in 3 fatal cases.1 Preliminary studies utilizing molecular detection methods found 2 instances of coinfections (1 *Streptococcus pneumoniae, 1 adenovirus) among 21 severe or fatal* cases.

Initial autopsy reports from Mexico indicate that the pathology was consistent with ARDS secondary to primary viral pneumonia, including diffuse alveolar damage, peribronchiolar and perivascular lymphocytic infiltrates, hyperplastic airway changes and bronchiolitis obliterans. Muscle biopsies performed in 2 cases showed skeletal muscle necrosis.

Examining how swine flu killed a 'very healthy' teen
June 23th The Baffalo News

"Both children were unusually ill with severe lung disease, and both required ECMO, and that was unusual," said Dr. Howard S. Faden, chairman of infection control and director of virology at Women & Children's. ECMO, or extracorporeal membrane oxygenation, is similar to a heart-lung bypass machine utilized in open-heart surgery and is used when patients fail to respond to a respirator or other typical treatments for breathing problems. Under ECMO, the patient's blood receives oxygen from an artificial lung.