A survey of infection control practices for influenza in mother and newborn units in US hospitals

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The purpose of this study was to describe infection control practices for influenza in mother and newborn units in United States hospitals in the context of the 2009 H1N1 pandemic. We conducted surveys of neonatal intensive care unit directors in February and November 2010 and requested information on infection control practices during the 2009 and 2010 influenza seasons. We received 111 responses to the initial survey and 48 to the follow-up survey. In 2009, 58% of respondents restricted breastfeeding by mothers with influenza-like illness; 42% did not. Ninety percent of the respondents maintained physical separation between an ill mother and her newborn infant, although the approaches to this separation varied. Eighty percent of postpartum units and 89% of neonatal intensive care units restricted access by children. In 2010, fewer hospitals restricted mother-infant contact and children visitation compared with 2009. Infection control practices for influenza in mother and newborn units vary considerably in US hospitals, particularly regarding contact between an ill mother and her newborn infant. The identification of this variation may inform best practices in this area, as well as future investigations and future guideline development.

Key words: infection control, influenza, maternal, neonatal

Pregnant women and newborn infants are known to be at high risk for seasonal influenza infection and its complications.[1] The recent pandemic caused by the 2009 H1N1 influenza A virus appeared to carry particular risks for these groups, as numerous reports documented high rates of hospitalization and death among pregnant and postpartum women and infants who were <1 year old.[2-5] Given the higher burden of influenza in pregnancy, hospitals are faced with the particular challenge of caring for pregnant women with influenza in a manner that will allow for optimal patient-centered care, while limiting the risk of infection to the mother herself, her newborn infant, and other patients.

During the 2009 H1N1 pandemic, public health agencies, including the Centers for Disease Control and Prevention (CDC), offered guidance for hospitals for infection control practices that addressed the use of strict isolation and the use of N95 or equivalent respirator masks for health care workers who cared for patients with suspected 2009 H1N1.[6] Specific guidance for maternal and newborn units for the care of pregnant women with suspected H1N1 illness was offered in July 2009 with the release of "Considerations Regarding Novel H1N1 Flu Virus in Obstetric Settings" (Table 1).[7] Recommendations included the avoidance of close contact between mother and newborn infant while the mother was febrile, the care of the infant by a healthy caregiver in a separate room and the use of expressed breast milk, rather than breastfeeding during that period, and consideration of the newborn infant as potentially infected and the use of appropriate isolation and precautions.

After its release, various professional organizations raised numerous concerns about the statement; the concern was that separation of mother and newborn infant may not be practical (given configuration and staffing of many postpartum wards), that current evidence did not support the possibility of fetal infection and thus, the need to consider the newborn infant as infected, that the placement of the newborn infant in other areas of postpartum wards could increase exposure to other potentially infected individuals, and that separation of mother and infant could lead to lactation failure. Recognizing these concerns, other public health agencies released statements that modified the CDC recommendations. For example, the Massachusetts Department of Public Health recommended new mothers with influenza-like illness be allowed to have their infants in their hospital room, with appropriate use of face masks, gowns, and careful hand hygiene.[8]

Based on the feedback, the CDC issued a revised statement in November 2009 (Table 2).[9] The new guidelines continued to recommend temporary separation of the newborn infant from the ill mother in the postpartum period but allowed for this separation to occur in a separate room or within the mother's room with the infant in an incubator or in a bassinet at least 6 feet from the mother. The new guidelines suggested that the infant who is born to a mother with confirmed or suspected H1N1 illness should be considered exposed, rather than infected, and that standard precautions for the newborn infant were adequate if the infant was well. Other recommendations remained unchanged from the earlier statement, which included the recommendation for expressed breast milk, rather than direct

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TABLE 1
Summary of recommendations in July 2009 Centers for Disease Control and Prevention statement on H1N1 in obstetric settings[7]

Isolate ill mother from other patients
Use surgical mask on ill mother during labor and delivery
Until mother has received antiviral medications for 48 hours, her fever has resolved, and she is able to control cough and secretions, use of the following precautions:
Avoid close contact between mother and infant
Care for the infant in a separate room by a healthy caregiver
Express breast milk rather than breastfeed
After these conditions are met and until at least 7 days after the onset of influenza symptoms, use of the following precautions:
Use face mask and clean gown or clothing and require strict hand hygiene by mother for all contact with infant
Initiate breastfeeding with the use of these precautions
Consider the newborn infant to be potentially infected and use appropriate infection control procedures for the infant while in the hospital
Limit visitors to mother and to those persons who are necessary for emotional well-being and care

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breastfeeding, during the febrile phase of maternal illness. These recommendations around breastfeeding were also included in an information sheet that was directed to parents.[10]

Notably, other organizations continued to struggle with the issue of breastfeeding in the context of possible maternal H1N1 infection. In November 2009, members of the American Academy of Pediatrics (AAP) Section on Breastfeeding and the AAP Committee on Infectious Diseases published a statement that suggested breastfeeding by these mothers could be allowed with proper precautions, which would include washing of hands and breast before breastfeeding and wearing of a mask by the mother.[11]

TABLE 2
Summary of new recommendations in November 2009 CDC statement on H1N1 in intra- and postpartum settings

Temporary separation of ill mother from newborn infant until mother has received antiviral medications for 48 hours, her fever has resolved for 24 hours without use of antipyretics, and she is able to control cough and secretion, with the following options for separation during this period:
Infant in separate room
Infant in incubator in mother's room
Infant in bassinet in mother's room at least 6 feet away from mother, ideally separated by Plexiglas or curtain barrier
Consider the newborn infant to be exposed, with the use of standard precautions in the newborn nursery if the infant is well
After discharge:
Avoid contact with the newborn infant by all persons in the home with suspected or confirmed 2009 H1N1 virus infection
Vaccinate against 2009 H1N1 and seasonal influenza all persons who provide care for the infant or are living with the infant

Summary of recommendations in November 2009 Centers for Disease Control and Prevention statement on H1N1 in intra- and postpartum settings[9] (changes from July 2009 statement).

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After the 2009-2010 influenza season, the CDC continued to update its guidance on infection control practices for influenza and H1N1. Recommendations around 2009 H1N1 were now incorporated into guidelines for seasonal influenza. General guidelines for influenza in health care settings no longer recommended the use of N95 or equivalent respirators for routine patient contact, although their use was recommended during aerosol-generating procedures.[12]

Similarly, the CDC recommendations for the obstetric setting were consolidated into 1 document for influenza, without particular recommendations for 2009 H1N1 (Table 3). The guidelines for infection control practices in obstetrics reverted to the previous document for seasonal influenza from August 2009. With regards to a mother with influenza-like illness, breastfeeding was considered acceptable with appropriate precautions, and rooming-in of the infant with the mother was recommended with use of an incubator located 3 feet from the mother.[13]

The translation of these various guidelines into practice has not been straightforward. Many hospitals struggled with the implementation of the 2009 CDC guidelines with regard to balancing family-centered care and support of breastfeeding with limiting risk of infection transmission to the newborn infant and to other patients. With limited definitive evidence to guide these decisions, hospitals relied on a combination of public guidelines and local expert opinion for policy development.

Given these challenges, we sought to gather further information on the approaches that are taken by hospitals in the implementation of infection control policies about influenza in their mother and newborn units during the 2009 H1N1 pandemic. We believed that a description of the range of hospital practices could provide valuable information regarding the unique issues around infection control in perinatal care and could potentially inform development of public health guidelines in the future.

Methods

In February 2010, we contacted directors of neonatal intensive care units (NICUs) in the United States and sought information on their infection control practices that related to 2009 H1N1 influenza. A listing of NICU directors was obtained from the AAP Section on Perinatal Pediatrics. Directors were contacted by electronic mail.

Directors were asked about the average number of deliveries at their hospital each year, the number of mothers and newborn infants that were seen at their institution with 2009 H1N1 infection by the time of the survey, and for information regarding practices in their hospitals in 4 areas during the 2009 H1N1 pandemic: (1) breastfeeding by mothers with influenza-like illness; (2) separation of mother with influenza-like illness from newborn infant; (3) access by children to the postpartum unit; and (4) access by children to the NICU.

In November 2010, we surveyed those directors who had responded to the earlier query to obtain information on changes to their infection control practices for the 2010 influenza season. Because the responses to the surveys were not identified, directors were asked about practices for both the 2009 and 2010 seasons to allow for the examination of changes within an institution. This survey was conducted by electronic mail and through an online survey tool. The survey was considered exempt from review by the institutional review board at our hospital as research that involved survey procedures. The survey was approved by the database committee of the AAP Section on Perinatal Pediatrics.

Results from both surveys were collected into a database and analyzed with Microsoft Excel 2007 software (Microsoft Corporation, Redmond, WA). Practices in 2009 and 2010 were compared with the use of the Fisher's exact test with the use of Stata software (version 10.0; Stata Corporation, College Station, TX).

Results

February 2010

Surveys were sent by electronic mail to 602 NICU directors who were listed in the AAP database; 39 messages were returned as undeliverable. From the 563 remaining contacts, 111 responses (20%) were received. The total of the average number of deliveries per year at the hospitals was 424,000, with a median of 3000 and range of 0–18,000 deliveries. Three respondents reported that their hospitals did not have labor and delivery services.

The responses to the number of 2009 H1N1 infections that were seen at each institution by the time of the survey, as estimated by the NICU directors, are summarized in Table 4. Eighty-three percent of the respondents reported at least 1 infection in mothers; 28% of the respondents reported >5 infections in mothers; 19% of the respondents reported having seen at least 1 infection in newborn infants; and only 1% reported >5 infections in infants.

Responses on breastfeeding and separation of mothers and newborn infants are summarized in Table 5. Fifty-eight percent of the respondents indicated that mothers with influenza-like illness were not allowed to breastfeed directly; 42% of the respondents indicated that breastfeeding was allowed; and 90% of the respondents indicated that they would use some degree of physical separation for a mother with influenza-like illness and her newborn infant. Of these, 37% would separate the mother and infant by placing the infant within the mother's room either at a certain distance from the mother or in an incubator; 56% would place the infant in a separate room; and 6% indicated use of both types of separation.

Table 6 summarizes the responses regarding restriction of access by children to the postpartum unit or the NICU during the influenza season. Eighty percent

TABLE 3
Summary of recommendations in 2010 CDC guidance on influenza in obstetric settings

Use droplet precautions for mothers with influenza before, during, and after delivery
Use mask and hand hygiene by mother before contact with newborn infant, including breastfeeding
Room-in newborn infant with mother, if possible
House newborn infant in incubator, when available
Place incubator 3 feet from mother and 3 feet from other babies if housed in nursery
Use droplet precautions for newborn infant, if housed in nursery
Use private room in nursery for newborn infant, if possible

Summary of recommendations in 2010 Centers for Disease Control and Prevention (CDC) guidance on influenza in obstetric settings[13] (statement is from August 2009).

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TABLE 4
Mothers and newborn infants with H1N1 infection (responses, 106 for each category)

Variable	Response	n	%
Mothers with H1N1 infection	None	18	17
	1	8	8
	2–5	50	47
	>5	30	28
Newborn infants with H1N1 infection	None	86	81
	1	10	9
	2–5	9	8
	>5	1	1

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TABLE 5
Approaches to mothers with influenza-like illness, February 2010 survey

Question	Response	n	%
Will you allow a mother with influenza-like illness to breastfeed in the first 48 hours after delivery? (106 responses)	Yes	44	42
	No	62	58
Will you physically separate a mother with influenza-like illness and her baby? (104 responses)	Yes	94	90
	No	10	10
If yes, is the separation only within the mother's room, only in a separate room, or in either?	Mother's room	35	37
	Separate room	53	56
	Either	6	6

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of the respondents indicated restrictions on access to the postpartum unit; 89% indicated restrictions on access to the NICU. Of these units, 95% extended these restrictions to at least some adolescents, employing age thresholds of 12 years or greater.

November 2010

The 111 respondents to the initial survey were surveyed again in November 2010. Forty-eight responses (43%) were received. Respondents were asked to indicate their practices for both the past year's 2009 H1N1 pandemic influenza season and for the current 2010 influenza season. The responses are summarized in Table 7.

In all areas, significantly fewer hospitals were using restrictions on mother-infant contact and children visitation in 2010 than in 2009. Eleven of 35 hospitals (31%) that did not allow direct breastfeeding by a mother with influenza-like illness in 2009 were allowing breastfeeding in 2010. Eleven of 35 hospitals (31%) that required separation of a mother with influenza-like illness and her newborn infant in 2009 were not requiring separation in 2010. Twelve of 25 hospitals (48%) that restricted access by children to postpartum units in 2009 were no longer restricting access in 2010. Seventeen of 40 hospitals (42%) that restricted access by children to the NICU in 2009 were no longer restricting access in 2010.

Comment

Obstetric and newborn providers are faced with unique challenges with regards to protecting their patients from influenza infection. Pregnant women and young infants are at high risk for serious complications from influenza, including death, and this risk appeared to have increased during the 2009 H1N1 pandemic. Traditional infection control measures cannot be applied easily to women with influenza during the perinatal period. Isolating the mother from the newborn infant and avoiding direct breastfeeding may minimize the risk of infection transmission to the infant but may not be practical in the hospital and may not be possible after discharge. Furthermore, this temporary separation may impact other aspects of mother and newborn care negatively, such as emotional well-being and breastfeeding. The measurement of the benefits and risks of these types of interventions is difficult, and no significant evidence exists regarding their potential or real impact.

The difficulties in balancing the risks and benefits of these interventions were evident in the various iterations of guidelines that were produced by the CDC from 2009-2010. Although the initial guidance included recommendations for isolating ill mothers from newborn infants, for avoiding direct breastfeeding while the mother was ill, and for treating the well newborn infant who was born to a mother with influenza as potentially being infected, subsequent statements revised all of these recommendations.

Given these challenges, hospitals are compelled to formulate policies and practices that best balance available medical knowledge, public recommendations, and their own clinical expertise. Our survey suggests that this approach led to significant variability in practices during the 2009 H1N1 pandemic season.

The most variability was seen in approaches to breastfeeding. Forty-two percent of the hospitals that were surveyed allowed direct breastfeeding by mothers with influenza-like illness; 58% of the hospitals prohibited it. Although influenza is not thought to be transmitted in breast milk, there are increased risks for transmission to the infant that are based on the close contact with the mother during breastfeeding. These risks are balanced by the benefits of breast milk in supporting newborn immunity and the psychologic and developmental benefits of breastfeeding for mother and infant. Provision of expressed breast milk may preserve some of the benefits of breastfeeding, at least with regards to neonatal immunity, but the temporary prohibition of breastfeeding even with the provision of expressed breast milk may still have a negative impact on maternal and neonatal well-being and on long-term breastfeeding success. The complexity of these considerations is reflected in the variability of hospital practices and the contrasting guidelines that were issued by the CDC and the AAP in 2009.

Less variability was seen in the approaches to separation of ill mothers and newborn infants, with most hospitals using some degree of separation during the 2009 H1N1 pandemic season. However, the approach to separation was quite varied: 37% of the hospitals indicated that they would separate the infant within the mother's room; 56% of the hospitals indicated that they would separate the infant in a separate room. Most likely, an individual hospital's approach to this issue is driven in large part by what is practical, given staffing limitations and the physical design of their postpartum units. The identification of both approaches of separation as appro-

priate in the final CDC guidelines likely allowed more hospitals to be able to follow those recommendations than would have been possible with the original recommendations for separation by placement of the infant in a separate room.

Most hospitals similarly restricted access for children to postpartum units and the NICU. The age thresholds for these restrictions were largely from 10-18 years old, which suggests that most hospitals restricted most children, rather than only infants and toddlers. The concordance of practice with regards to the restriction of child visitors is notable, particularly given that virtually no data exists around the efficacy of this approach.[14]

Several trends are notable among the responses to the follow-up survey. Overall, it appears that hospitals are being less restrictive regarding mother-infant contact and children visitation to maternal and newborn areas in 2010, as compared with the 2009 H1N1 season. More hospitals are allowing breastfeeding by mothers with influenza-like illness, not requiring separation, and allowing access for children to the postpartum unit and to the NICU. These trends would be consistent with the changes to the CDC recommendations for 2010 from 2009 and may reflect greater confidence in standard infection control procedures for a number of factors, such as the availability of an effective vaccine for influenza that would include 2009 H1N1, greater herd immunity, and greater community knowledge around a novel virus.

It is also notable that, although the 2010 CDC guidelines do not recommend avoidance of breastfeeding by mothers with influenza-like illness, 23 of 48 respondents to our follow-up survey indicated that they would continue to restrict breastfeeding by ill mothers in 2010. Despite greater familiarity with 2009 H1N1 influenza, hospitals continue to vary in their interpretations of the balance of risks and benefits for these particular infection control practices.

Several limitations of our report are evident. The initial survey generated a fairly large number of responses. The responding hospitals represented >10% of births in the United States and, therefore, allowed a fairly robust description of hospital practices during the 2009 H1N1 influenza season. The follow-up survey was returned by fewer than one-half of the initial respondents, which limited our ability to describe changes in practices from 2009-2010. However, we would predict that the patterns that were seen of less restrictive practices in 2010 compared with 2009 would be confirmed by a larger survey, because the direction of change was consistent in all 4 of the practice areas that were assessed.

Our surveys were also limited in terms of the breadth and depth of information that we were able to obtain regarding infection control practices. The surveys were designed intentionally to be able to be completed quickly; thus, we restricted questions to those areas that appeared to be of most interest. Future studies could explore variations in other practices, such as the restriction of visitors and family members with symptoms of influenza, seasonal variations in infection control practices, methods of hand hygiene for staff members, the use of precautions and cohorting for infants with possible influenza, and the use of antiviral medications in infants with influenza.

As a descriptive study, our survey was not designed to examine factors that are associated with variations in practice or to assess the efficacy of the various practices that were identified. Future studies

TABLE 6
Restrictions on access by children to postpartum unit and to neonatal intensive care unit, February 2010 survey

Question	Response	n	%
Have you restricted access of children to the postpartum unit during the influenza outbreak? (105 responses)	Yes	84	80
	No	21	20
Under what age? (70 responses)	4 y	2	3
	6 y	1	1
	12 y	15	21
	13 y	2	3
	14 y	11	16
	15 y	1	1
	16 y	10	14
	17 y	1	1
	18 y	27	39
Have you restricted access of children to the neonatal intensive care unit during the influenza outbreak? (110 responses)	Yes	98	89
	No	12	11
Under what age? (81 responses)	4 y	2	2
	6 y	2	2
	10 y	1	1
	12 y	14	17
	13 y	3	4
	14 y	13	16
	15 y	2	2
	16 y	11	14
	17 y	1	1
	18 y	32	40

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TABLE 7
Responses to November 2010 survey

Question	Response	2009–2010 n	2009–2010 %	2010–2011 n	2010–2011 %	*P* value[a]
Direct breastfeeding by mother with influenza-like illness	Yes	13	27	24	51	.021
	No	35	73	23	49	
Separation of mother with influenza-like illness and newborn infant	Yes	35	76	23	51	.017
	No	11	24	22	49	
Restriction of access of children to postpartum unit	Yes	25	60	12	29	.008
	No	17	40	29	71	
Restriction of access of children to neonatal intensive care unit	Yes	40	85	22	48	.0002
	No	7	15	24	52	

There were 48 total responses. Not all respondents answered all of the questions.

[a] Two-sided Fisher's exact test that compared 2009-2010 and 2010-2011.

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could investigate whether certain features of hospitals or NICUs are associated with more or less restrictive infection control practices and whether different infection control practices are associated with higher or lower rates of nosocomial infections in newborn infants.

Despite these limitations, our study does offer valuable information on approaches to infection control practices for influenza in mother and newborn units. Given the lack of clear evidence, the survey results can be viewed as a summary of "expert opinion" in this area. In the context of the 2009 H1N1 epidemic, the concordance of practices around restriction of child visitors to postpartum units and NICUs suggests a general consensus that avoiding introduction of the virus into the units is perhaps the most vital hospital-based infection control practice, and that the benefits of restricting children outweigh the negative impact on family-centered care. On the other hand, the lack of consensus on the separation of mothers and newborn infants and the restriction of direct breastfeeding reveals the greater difficulty in balancing risks and benefits of these interventions.

Numerous challenges persist in the identification of the optimal hospital practices to limit the risk of influenza for mothers and newborn infants while supporting family-centered care. At the least, this report should help providers who are charged with developing infection control guidelines for the mother and newborn units in their hospitals to understand the range of practices that have been used. In addition, the identification of the practices with the highest variation should help inform efforts by public health agencies and investigators in terms of areas of emphasis for further study and guideline development. In the meantime, all of us who provide care to mothers and newborn infants should continue to emphasize those primary interventions that we know to be essential and on which we can have a major impact: to encourage universal influenza vaccination of pregnant women and caregivers and household contacts of newborn infants, to ensure meticulous hand hygiene by hospital staff members and by families, to use restrictions on healthcare workers with influenza-like illness to limit exposure to patients and families, and to provide careful education and discharge preparation to ensure safe practices in the hospital and at home. ■

REFERENCES

1. Fiore AE, Shay DK, Broder K, et al. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009. MMWR Recomm Rep 2009;58:1-52.

2. Louie JK, Acosta M, Jamieson DJ, Honein MA. Severe 2009 H1N1 influenza in pregnant and postpartum women in California. N Engl J Med 2010;362:27-35.

3. Jamieson DJ, Honein MA, Rasmussen SA, et al. H1N1 2009 influenza virus infection during pregnancy in the USA. Lancet 2009;374:451-8.

4. Libster R, Bugna J, Coviello S, et al. Pediatric hospitalizations associated with 2009 pandemic influenza A (H1N1) in Argentina. N Engl J Med 2010;362:45-55.

5. Louie JK, Gavali S, Acosta M, et al. Children hospitalized with 2009 novel influenza A(H1N1) in California. Arch Pediatr Adolesc Med 2010; 164:1023-31.

6. Centers for Disease Control and Prevention. Interim guidance on infection control measures for 2009 H1N1 influenza in healthcare settings, including protection of healthcare personnel. [Internet]. Atlanta: CDC; 2010 [updated July 15, 2010; cited October 30, 2010]. Available at: http://www.cdc.gov/h1n1flu/guidelines_infection_control.htm. Accessed Oct. 30, 2010.

7. Centers for Disease Control and Prevention. Considerations regarding novel H1N1 flu virus in obstetric settings. [Internet]. Atlanta: CDC; 2009 [updated July 6, 2009; cited July 8, 2009; Archived Nov 10, 2009]. Available at: http://www.cdc.gov/h1n1flu/guidance/obstetric.htm. Accessed July 8, 2009.

8. Commonwealth of Massachusetts. Fall 2009 clinical advisory for new mothers with influenza like illness who are hospitalized. Boston: Department of Public Health; September 29, 2009.

9. Centers for Disease Control and Prevention. Interim guidance: considerations regarding 2009 H1N1 influenza in intrapartum and postpartum hospital settings. [Internet]. Atlanta:

CDC; 2009 [updated November 10, 2009; cited October 30, 2010]. Available at: http://www.cdc.gov/h1n1flu/guidance/obstetric.htm. Accessed Oct. 30, 2010.

10. Centers for Disease Control and Prevention. 2009 H1N1 flu (swine flu) and feeding your baby: what parents should know. [Internet]. Atlanta: CDC; 2009 [updated October 23, 2009; cited October 30, 2010]. Available at: http://www.cdc.gov/h1n1flu/infantfeeding.htm. Accessed Oct. 30, 2010.

11. Lawrence RA, Bradley JS. Breastfeeding advice for mothers with possible H1N1 infection. AAP News 2009;30:11.

12. Centers for Disease Control and Prevention. Prevention Strategies for Seasonal Influenza in Healthcare Settings. [Internet]. Atlanta: CDC; 2010 [updated September 20, 2010; cited October 30, 2010]. Available at: http://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm. Accessed Oct. 30, 2010.

13. Centers for Disease Control and Prevention. Guidance for Prevention and Control of Influenza in the Peri- and Postpartum Settings. [Internet]. Atlanta: CDC; 2009 [updated August 1, 2009; cited October 30, 2010]. Available at: http://www.cdc.gov/flu/professionals/infectioncontrol/peri-post-settings.htm. Accessed Oct. 30, 2010.

14. Groothuis J, Bauman J, Malinoski F, Eggleston M. Strategies for prevention of RSV nosocomial infection. J Perinatol 2008;28:319-23.