ing mechanisms for reducing maternal mortality in Japan.

Recommendations for Reducing Maternal Mortality

The CIMDRG reached the following 4 conclusions. First, there is a need to designate regional obstetrics medical facilities to provide 24-hour inpatient obstetric coverage and to increase the number of physicians (especially obstetricians) on duty in regional facilities. Independent analysis concluded that there should be 14 staff obstetricians per hospital to provide adequate inpatient coverage.[21] To achieve sufficient staffing, it may also be necessary to encourage a more active role of nonobstetrician obstetric providers such as family physicians and nurse midwives as in many other parts of the world. Japanese obstetricians and anesthesiologists should develop regional partnerships whereby small medical facilities provide local, ambulatory care for low-risk pregnant women, but the patients deliver at a designated regional medical facility. High-risk patients, such as women aged 35 years and older, should receive ambulatory and inpatient care in designated regional medical facilities. Selected obstetricians from small medical facilities should take rotating duty in the designated regional facilities.

Second, all Japanese hospitals that provide inpatient care for deliveries should be staffed with at least 1 obstetrician and another health provider, eg, an obstetrician or anesthesiologist, competent to provide nonobstetric medical care. All obstetric hospitals should be equipped to provide essential laboratory services. The occurrence of maternal massive bleeding and respiratory distress are relatively uncommon, but they are treatable events, and the same physician should never serve as the obstetrician and anesthetist. Separation of these roles should become the basic community standard. The Japanese government needs to develop policies providing financial incentives for recruiting adequate numbers of obstetricians and anesthesiologists to regional medical facilities.

Third, all death certificates need to be completed according to the *ICD-10* classification that includes the additional definitions *late maternal death* ("death of a woman from direct or indirect obstetric causes greater than 42 days but less than 1 year after termination of pregnancy"), and *pregnancy-related death* ("death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death").[22] Educational efforts encouraging physicians to report this information are needed.

Finally, the Japanese government and the Japanese Society of Obstetrics and Gynecology need to develop clear community practice standards that delineate specific staffing and laboratory services necessary in each type of medical facility. To minimize medical errors, system-based changes are needed.[5,6] While some maternal deaths are inevitable, this systems approach to change should reduce maternal mortality in Japan.

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REFERENCES

1. Brennan TA, Localio AR, Leape LL, et al. Identification of adverse events occurring during hospitalization: a cross-sectional study of litigation, quality assurance, and medical records at two teaching hospitals. *Ann Intern Med.* 1990;112:221-226.
2. Brennan TA, Leape LL, Laird NM, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. *N Engl J Med.* 1991;324:370-376.
3. Leape LL, Brennan TA, Laird N, et al. The nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II. *N Engl J Med.* 1991;324:377-384.
4. Brennan TA, Lee TH, O'Neil AC, Petersen LA. Integrating providers into quality improvement: a pilot project at one hospital. *Qual Manag Health Care.* 1992;1:29-35.
5. Leape LL, Lawthers AG, Brennan A, Johnson WG. Preventing medical injury. *QRB Qual Rev Bull.* 1993;19:144-149.
6. Leape LL. Error in medicine. *JAMA.* 1994;272:1851-1857.
7. Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events: implications for prevention. *JAMA.* 1995;274:29-34.
8. Leape LL, Bates DW, Cullen DJ, et al. Systems analysis of adverse drug events. *JAMA.* 1995;274:35-43.
9. Gurwitz JH, Sanchez-Cross MT, Eckler MA, Matulis J. The epidemiology of adverse and unexpected events in the long-term care setting. *J Am Geriatr Soc.* 1994;42:33-38.
10. Fischer G, Fetters MD, Munro AP, Goldman EB. Adverse events in primary care identified from a risk-management database. *J Fam Pract.* 1997;45:40-46.
11. *Ishi Shikaishi Yakuzaishi Chousa* [Survey of physicians, dentists, and pharmacists]. Tokyo, Japan: Statistics and Information Department, Ministry of Health and Welfare; 1994.
12. *Iryou Shisetsu Chousa Byouin Houkoku* [Survey of medical institutions and hospital report]. Tokyo, Japan: Statistics and Information Department, Ministry of Health and Welfare; 1993.
13. *Boshi Eisei no Omonaru Toukei* [Maternal and child health statistics]. Tokyo, Japan: Maternal and Child Health Division, Children and Families Bureau, Ministry of Health and Welfare; 1993-1996.
14. *International Classification of Diseases, Ninth Revision, Clinical Modification.* Washington, DC: Public Health Service, US Dept of Health and Human Services; 1988.
15. Ichijyo M, Takeda Y. Shussanki Iinkai Houkoku 1991 [Report from the perinatal committee, 1991]. *Nippon Sanka Fujinka Gakkai Zasshi.* 1994;46:59-78.
16. Takeda Y, Jinbo T. Shussanki Iinkai Houkoku 1992 [Report of the perinatal committee 1992]. *Nippon Sanka Fujinka Gakkai Zasshi.* 1994;46:1279-1298.
17. *Nippon Sanka Fujinka Gakkai Meibo* [Directory, Japanese Association of Obstetrics and Gynecology]. Tokyo, Japan: Japanese Association of Obstetrics and Gynecology; 1996.
18. Jintsuu Sokushinzai ni yoru Higai wo Kangaeru Kai [Group to examine injury from uterine contraction stimulants]. Tsuzukerareru jintsuu sokusinzai no tairyou touyo [Continuous high-dose use of uterine contraction stimulants]. *Anzenna Osan Nettowaaku* [Network for Safe Parturition]. 1997;54:17-20.
19. Department of Health (England), Welsh Office, Scottish Office Department of Health, Department of Health and Social Services Northern Ireland. *Report on Enquiries into Maternal Deaths in the United Kingdom, 1991-1993.* London, England: Her Majesty's Stationery Office; 1996.
20. National Health and Medical Research Council (Australia), Health Care Committee. *Report on Maternal Deaths in Australia, 1988-1990.* Canberra: Australian Government Publishing Service; 1993:90.
21. Tada H. Shisutemu toshite no kore kara no shussanki iryou [Future systemization of the perinatal care system]. *Perinatal Med.* 1994;24:17-20.
22. Fortney JA. Implications of the *ICD-10* definitions related to death in pregnancy, childbirth or the puerperium. *World Health Stat Q.* 1990;43:246-248.

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