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## Referral Pattern and Rate of Intervention in a Small Rural Obstetrical Practice

### SUMMARY

This article describes an obstetrical chart review that covered a seven-year period from April 30, 1978 to March 31, 1984. This review includes both pre- and intra partum transfers and involves two main topics: referral pattern and rate of intervention during labour. The practice was involved in 60% of all pregnancies (344) of the catchment area. Seventeen per cent were transferred in their pre-partum period, and 11% were transferred intra partum. The rates of intervention for forceps, induction, episiotomy and analgesia are presented, and they confirm the non-interventionist attitude of general practice obstetricians. (*Can Fam Physician* 1986; 32:2141-2146.)

### SOMMAIRE

Cet article effectue une révision de dossiers obstétricaux sur une période de sept ans, soit du 30 avril 1978 au 31 mars 1984. Cette révision inclut les transferts au cours des périodes pré et intrapartum et traite de deux sujets principaux : le monde de transfert des patientes et le taux d'intervention pendant le travail. Notre clinique a participé pour 60% de l'ensemble des grossesses de notre secteur (344). Dix-sept pourcent des cas ont été transférés pendant la période prépartum, alors que 11% ne l'ont été qu'en période intrapartum. On y présente les taux d'intervention par forceps, déclenchement, épisiotomie et analgésie, et ceux-ci confirment l'attitude non interventionniste des médecins de famille obstétriciens.

**Key words:** obstetrical chart review, referral pattern, rate of intervention during labour

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**T**HE GATINEAU MEMORIAL hospital (GMH) is a 31-bed level Ib hospital<sup>1</sup> located in the Gatineau Hills, 22 miles north of Ottawa. On-staff physicians do minor surgery, obste-

trics, medicine, pediatrics and emergency medicine.<sup>2</sup> We have full laboratory services, including a blood bank, during normal working hours, and a technician is available on call after hours. Our Radiology Department is staffed by a technician between 8:30 and 16:30 on weekdays. There is no on-call coverage, and all emergency examinations required outside of normal working hours are done at the level II hospital 22 miles away. The

Obstetrics Department has one bed and is staffed only when there is a patient in labour. On occasion, the obstetrical bed is used for clean cases when the hospital is full. The delivery room is equipped with an external fetal monitor, a birthing bed and all the necessary resuscitation equipment. A radiant-heat warmer is not yet available, but will be within the year. During the study period, the hospital was staffed by four general practitioners. One of

these physicians practised anesthesia, and two did obstetrics. Caesarean sections are not performed at the GMH.

Patients delivering at the GMH are usually attended by the doctor who follows them during their pregnancy. Furthermore, at the time of delivery, another doctor is always called in to assist the baby. In this way, a doctor is present should resuscitation be necessary.

The GMH is 40 minutes away from the nearest level II hospital, located in Hull, and 55 minutes away from the nearest level III hospital, located in Ottawa. Most of our catchment area lies north of the hospital. Since the regional centre lies to the south, many patients are 60 to 80 minutes from a level II and level III centre,<sup>3</sup> yet our proximity to a larger centre makes us more vulnerable to closure.

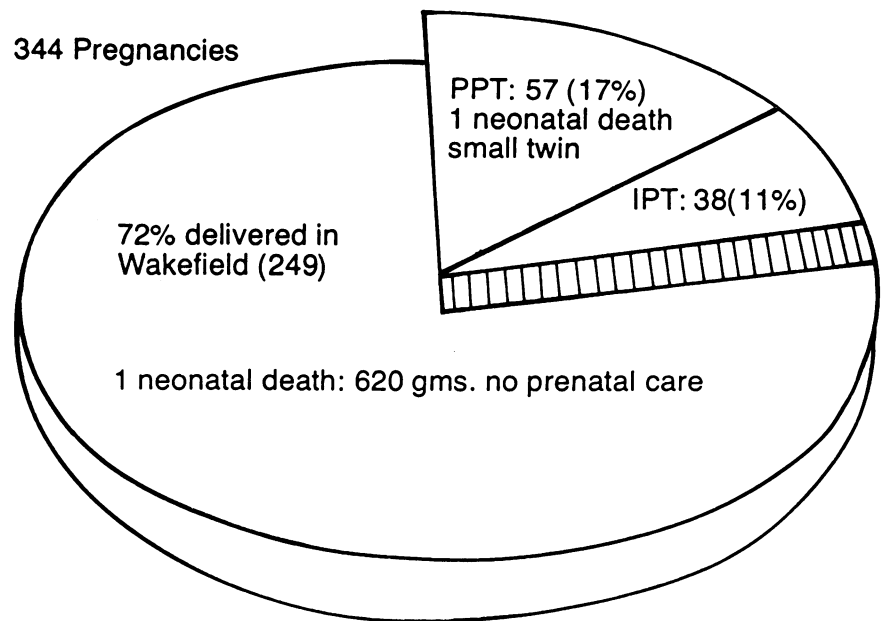
The population of the Gatineau Valley is characterized by a high unemployment rate, the highest rate of single-parent families in the region, absence of running water in many homes, a high degree of poverty and generally low socio-economic status.<sup>4</sup>

## Methods

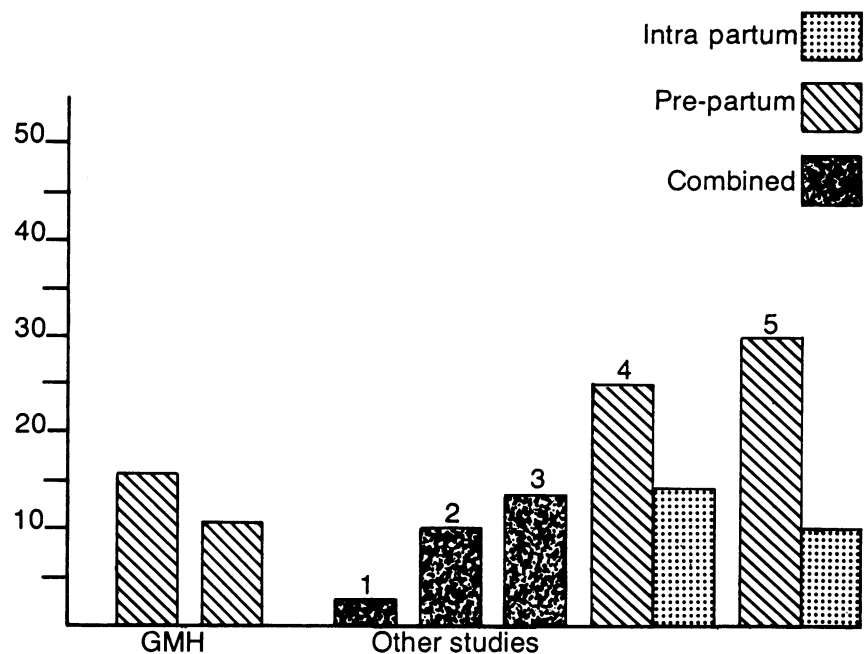
Funding for this study was provided by the Citizen's Committee of the Gatineau Memorial Hospital. A review of all obstetrical charts from 1978 to 1984 was done in November 1984. A medical secretary extracted the following data from each obstetrical chart and from the hospital registry: the patient's age, address and parity; time between arrival and delivery; use of analgesia during labour; use of oxytocics during labour; use of forceps and episiotomy; and whether the patient was transferred during labour. Problems with data collection were reviewed and discussed with the author on a regular basis. The data were collated manually by the author.

Since all the doctors in the GMH catchment area who practise obstetrics share the same private office, data on all patients transferred prior to the onset of labour were easily obtainable from the office transfer registry, started in 1980. The pre-partum referral pattern from 1978 to 1979 was assumed to be the same as that following the establishment of the transfer registry. Therefore the pre-partum referral rates for 1978 and 1979 were assumed to be the average rate of 1980-1984. Information on the intra partum transfer was obtained from the GMH

**Figure 1**  
Local and Transferred Deliveries in Wakefield, Quebec  
April 30, 1978-March 31, 1984



**Figure 2**  
Transfers as % of Total Deliveries



Sources:

1. Yates WR, Hill JW. A preliminary study of a rural obstetrical practice.
2. Owen JD. A review of the general practitioner obstetric service in Colchester.
3. Casson RI, et al. Prenatal risk assessment and obstetric care in a small rural hospital: comparison with guidelines.
4. Richmond GA. An analysis of 3199 patients booked for delivery in general practitioner obstetrical units.
5. Cavanaugh AJM, et al. Contribution of isolated general practice.

transfer registry, and consultants' discharge summaries were obtained from the regional centre to which the patient had been transferred. The catchment-area population was obtained from statistics<sup>5</sup> provided by the Centre régional de santé et des services sociaux de l'Outaouais.

## Results

During the study period, 344 pregnancies were managed, of which 249, or 72%, delivered at the Gatineau Memorial Hospital; 57, or 17%, were transferred in the pre-partum period because they were high risk; and 38, or 11%, were transferred in the intra-partum period, as they became high risk during labour (Figure 1). The 344 pregnancies managed constitute approximately 60% of the total number of deliveries for our catchment area.<sup>5</sup> In those papers from the literature where transfer rates are quoted, they varied from 4% to 50% (Figure 2).<sup>6-10</sup>

## Data Recorded

### Birth Weights

Of the babies that were born at the GMH, all but seven (2.4%) weighed more than 2500 grams. Six of these babies weighed between 2350 and 2500 grams, and one weighed less than 2350 grams.

### Forceps-Application Rate

The rate of forceps application at the GMH was 9%. Other studies show a great deal of variation, the lowest rate standing at 4% and the highest at 43%. Low and low-mid forceps were not described separately in many studies (Figure 3).<sup>7, 11-16</sup>

### Induction and Augmentation of Labour

At the GMH induction and augmentation of labour with either oxytocin drip or artificial rupture of membranes took place in 15% and 24% of deliveries respectively. Rates in the literature varied from 4% for artificial rupture of membranes and no oxytocin administration, to a high of 40% artificial rupture of membranes and 30% oxytocin drip (Figure 4).<sup>7, 9, 12-14, 16</sup>

### Episiotomy Rate

The episiotomy rate (Figure 5) at the GMH was 42% for the study period.

Data in the literature show variation from 20% to 85%.<sup>7, 10, 13, 16</sup>

### Use of Analgesics

The use of intramuscular narcotics (Figure 6) during labour was 20% at the GMH. In other studies the number of patients receiving narcotics during labour varies from 28% to 74%.<sup>11, 12, 14, 16</sup>

## Outcome

In order to determine the number of precipitous deliveries, data were also collected on the time elapsed between arrival at the hospital and delivery. From 1978 to 1984, 20 deliveries (8%) occurred within one hour of admission, and six occurred within 30 minutes of admission.

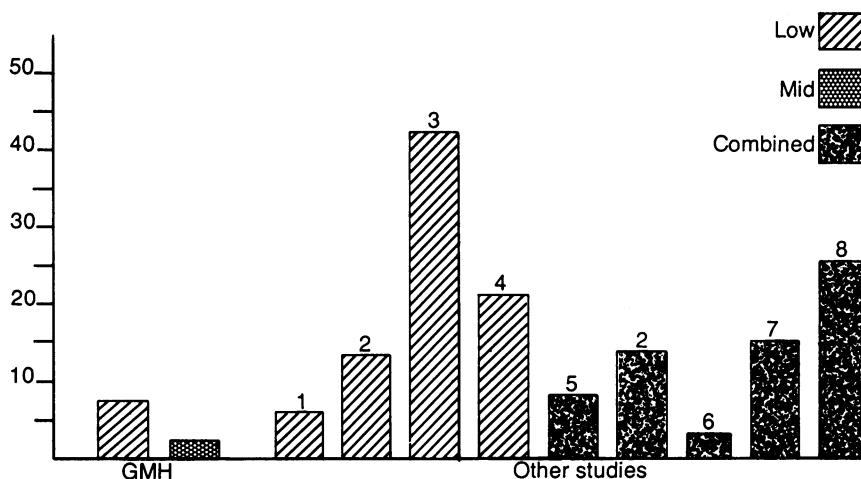
During this study period there were two neonatal deaths, giving a mortality

rate of 5.8/1000. One was a small twin whose mother had been transferred to the care of an obstetrician in a tertiary care centre in the pre-partum period. The patient went into premature labour and was transferred to the nearest level III centre for delivery. The surviving twin has done well. The other neonatal death was the result of a 24-week pregnancy in a mother with no prenatal care who arrived in hard labour and was delivered in the emergency department. The 620 gram fetus died shortly after birth.

## Discussion

The methodology used by the government to determine the catchment area of a hospital is rather imprecise. The total number of deliveries quoted for the catchment area is therefore unreliable.<sup>5</sup> The municipality in which

**Figure 3**  
**Forceps Deliveries**



### Sources:

1. Wanderer MJ, Suyehira JG. Obstetrical care in a prepaid cooperative: a comparison between family practice residents, family physicians and obstetricians.
2. Taylor GW, et al. How safe is general practitioner obstetrics?
3. Phillips WR, et al. Audit of obstetrical care and outcome in family medicine, obstetrics and general practice.
4. Ely JW, et al. An audit of obstetrical care in a university family medicine department and an obstetrics-gynecology department.
5. Owen JD. A review of the general practitioner obstetric service in Colchester.
6. Cavanaugh AJM, et al. Contribution of isolated general practitioner maternity units.
7. McKerr M, et al. General practitioner obstetrics.
8. Klein M, et al. A comparison of low risk pregnant women booked for delivery in two systems of care: consultant and integrated general practice unit. I—Procedures and neonatal outcome.

the GMH is located covers the largest area of any municipality in the Province of Quebec.<sup>3</sup> Rural municipalities in the surrounding area are widespread and often consist of an amalgamation of several small communities that were once municipalities in their own right. Only if more than 50% of an entire municipality uses our hospital is this population designated to the GMH catchment area. Therefore if 49% of the municipality uses another hospital, the entire municipality is nonetheless attributed to us. Conversely if our hospital serves 49% of a particular municipality, those patients are attributed to another catchment area. A more precise method would involve six-number postal codes. In this way, part of small hamlets could be attributed to a specific hospital catchment area, thus giving much more precise totals of patient use than those based on municipal boundaries.

In comparing transfer rates with the general practice literature, several aspects of referral patterns come to light. First, referral patterns are rarely discussed when level I and level II hospitals report their obstetrical performances. Furthermore, whenever referral patterns are discussed, only hospitalized population rates are studied. In this study, it was possible to describe the referral pattern of a hospital catchment-area population.

The variation from one centre to another in decisions to manage or transfer a particular obstetrical problem is quite significant (Figure 2). If we assume that there is no gross difference in the population's risk categories—and there is no indication of any such difference in the articles cited—why does one general practice (GP) obstetric unit transfer over 40% of its cases, while others transfer fewer than 5%? Are some units transferring too many patients, while others are keeping some that should be transferred?

In the study done in England by G.A. Richmond et al.<sup>9</sup> 48.8% of intrapartum transfers were for prolonged first-stage labour. In the same study oxytocin was used in only one of 115 inductions. The reluctance to stimulate or augment labour with oxytocin would certainly result in more transfers. In England, the GP units are frequently located in the same building<sup>11, 15, 17</sup> as the consultant unit, and the patient can be transferred without leaving her room, as the consultant

need only come down one floor to see her. Another reason that might account for the high transfer rate is the high proportion of births being performed by midwives.<sup>7, 19, 17</sup> Possibly midwives are more inclined than a general practitioner to refer a patient to an obstetrician.

To whatever extent these factors influence the transfer rate, they clearly do not fully explain the discrepancy. Physicians' teaching experience and attitude to perinatal regionalization also have a great influence on referral patterns.

### Evaluation of Small Units

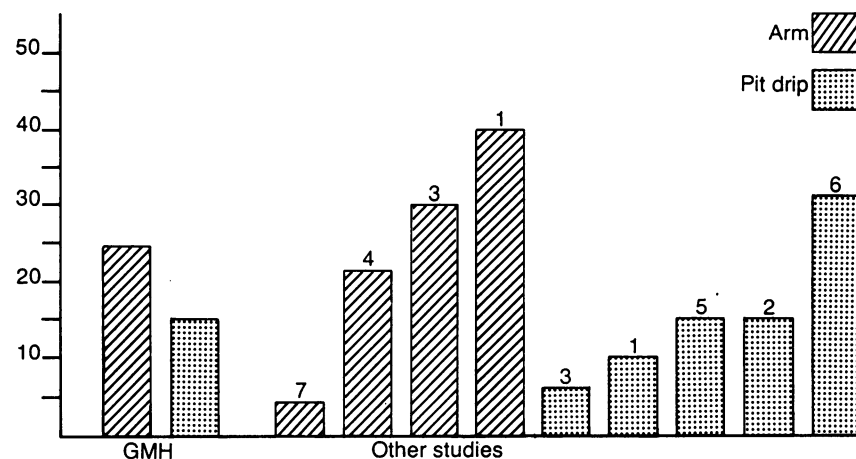
In small obstetrics units perinatal mortality rates are doubtless a poor index of performance because the numbers of deliveries are too small in these units to give valid statistics. Since the perinatal mortality-rate yardstick is used by government and hospitals to make decisions about small ob-

stetrical units, faulty decisions are inevitable. It is therefore essential that other means be found to evaluate small units. We suggest transfer rates, number of low birth-weight infants, and intervention rates.

### Referral Pattern

There is a relationship between referral patterns and perinatal mortality rates. One could easily defend the claim that a general practice unit that does not refer any of its obstetrical cases is probably behaving inappropriately. With similar logic, one could claim that a small unit that refers 80% of its cases is also demonstrating inappropriate behaviour. Both of these extremes would result in a less-than-optimal service to the population. What is the optimal referral pattern? It would be useful to clarify the relationship between referral patterns and perinatal mortality rates. Large numbers of small obstetrical units would need to be grouped and studied according to

**Figure 4**  
**Inductions**



### Sources

1. Meyer B. Audit of obstetrical care: comparison between family practitioners and obstetricians.
2. Klein M, et al. A comparison of low risk pregnant women booked for delivery in two systems of care: consultant and integrated general practice unit. I—Procedures and neonatal outcome.
3. Phillips WR, et al. Audit of obstetrical care and outcome in family medicine, obstetrics and general practice.
4. Wanderer MJ, Suyehira JG. Obstetrical care in a prepaid cooperative: a comparison between family practice residents, family practitioners and obstetricians.
5. Owen JD. A review of the general practitioner obstetric service in Colchester.
6. Taylor GW, et al. How safe is general practitioner obstetrics?
7. Richmond GA. An analysis of 3,999 patients booked for delivery in general practice obstetric units.

the percentage of patients referred. If it could be shown that a specific rate of transfer is associated with the lowest perinatal mortality rate, the transfer rate itself could be used by small units to monitor their performance on a year-to-year basis. An optimal referral rate could then be suggested as a guideline for level I hospitals. The Gatineau Memorial Hospital transfers 28% of its maternity cases for delivery at a level II and III hospital. Some centres refer as few as 4% of their maternity cases, while others refer up to 40%.

### Birth Weight

In spite of meticulous screening, some cases will escape the process, and thus every small obstetrical unit is likely to deliver low birth-weight (LBW) infants from time to time. What rate of LBW infant constitutes acceptable performance? Small hospitals should be able to review the birth weights of its infants at the end of the year to determine whether the number of babies weighing less than 2500 grams is too high, or that the number of LBW babies is acceptable. Unfortunately, there are no guidelines in the literature to help small hospitals in this matter, other than the general statement that all small babies should be delivered in larger centres. Birth-weight patterns may prove to be a useful index to evaluate performance of small obstetrical units.

### Intervention

As appropriate as it is for level III centres to intervene in high-risk cases, it is inappropriate for level I centres to intervene in low-risk cases. No intervention is without risk. When interventions are unnecessary, they increase the risk of complications. The Gatineau Memorial Hospital seemed to fit a non-interventionist pattern when compared to the general practice literature (Figures 3-5). The number of episiotomy and forceps deliveries should be decreased, however, as some groups seem to do just as well with less intervention.<sup>8, 10, 12, 18, 19</sup> My proposal is that rate of intervention be used as an index to evaluate small obstetrical unit performances.

### Conclusions

The exercise of looking at the management of obstetrics was useful and informative to the doctors at the GMH.

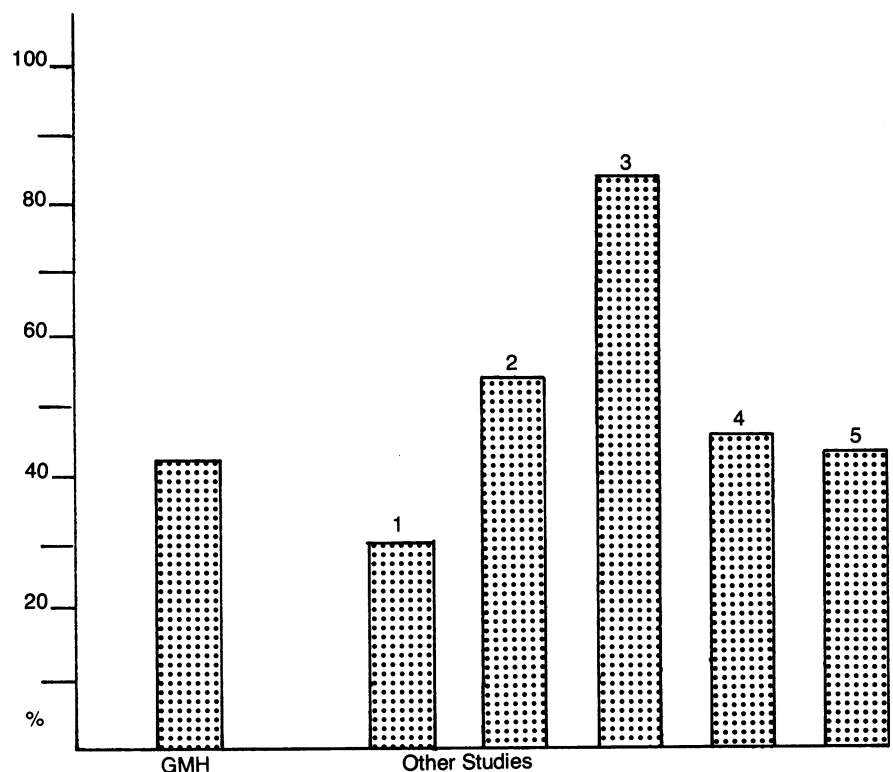
It has allowed a small unit to conclude that its efforts to identify and refer high-risk obstetrics are quite successful. Its efforts to intervene as little as possible in the process of childbirth are good, but could possibly be improved on.

At the present time, perinatal mortality rate is the yardstick used to evaluate obstetrical performance in hospitals. Although perinatal mortality rates may be useful to evaluate performance of a province, a country or even a large, urban, tertiary care centre, this method is of little value in helping a level I hospital with 100 deliveries a year or fewer evaluate its performance on a year-to-year basis. It is essential that a better index be found. Referral pattern, birth-weight category, analy-

sis and intervention rates are proposed as alternatives to perinatal mortality rates. As a first step in evaluating the usefulness of such an index, it will be necessary to have as many level I hospitals as possible report their practice in this way.

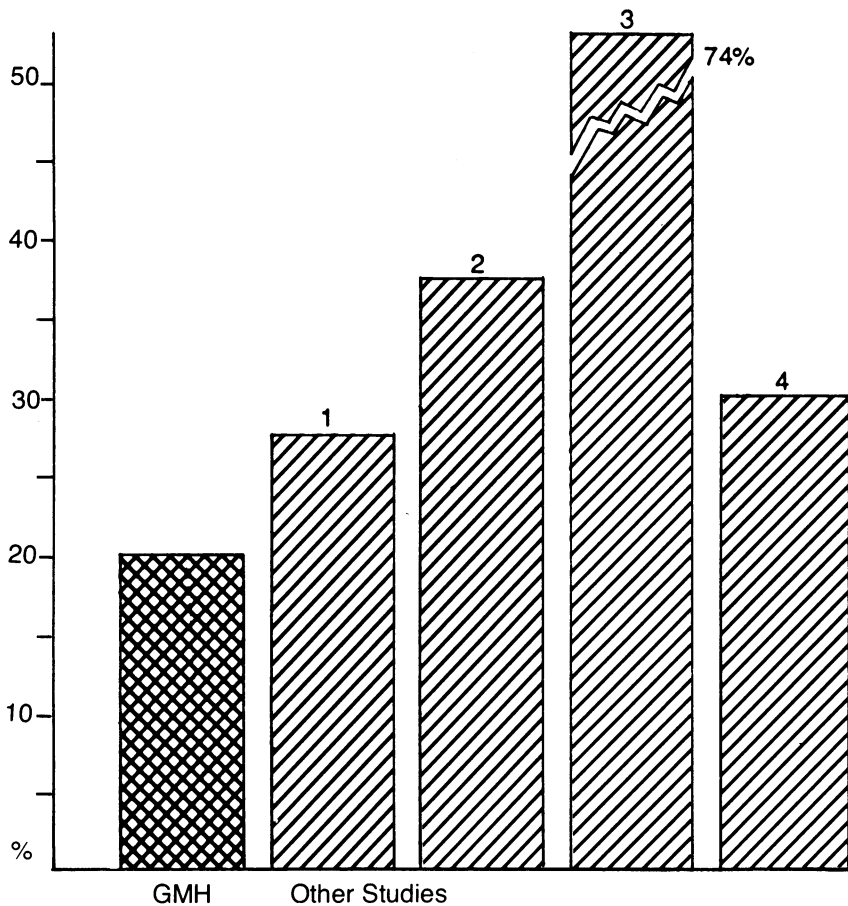
The various indices proposed are easily measured, and the data are available to the smallest of institutions. However, there are few data in the literature, and many different geographical and personal factors need to be taken into consideration. Because of the diversity of small obstetrical units, the guidelines proposed might not be applicable everywhere. They will, however, allow small obstetrical units to situate themselves relative to other centres. ●

**Figure 5**  
**Episiotomy Rate**



1. Cavanaugh AJM, et al. Contribution of isolated general practitioner maternity units.
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5. Owen JD. A review of the general practitioner obstetric service in Colchester.

**Figure 6**  
**Use of Demerol During Labour as % of Total Deliveries**



**Sources**

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