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## **Evidence based-practice and Affect: The impact of Physician attitudes on outcomes associated with clinical reasoning and decision-making<sup>1</sup>**

Bruce Dunphy<sup>2</sup>, Stacey Dunphy, Robert Cantwell, Sid Bourke  
*University of Newcastle*  
&  
Mark Fleming  
*St Mary's University*

### **ABSTRACT**

The relationship between obstetrician attitudes and patient outcomes from intrapartum care was examined. Obstetrician attitudes were assessed utilizing a newly-designed pilot 35-item obstetrician attitude questionnaire (OAQ). Twelve obstetricians completed the OAQ, who provided intra-partum care to 4,149 women. Outcome measures included delivery mode and intrapartum asphyxia. Analysis was carried out using logistic regression. A number of OAQ items were significantly associated with outcome. The significance of some of these items may be explained by past clinical experience and attitudes toward certain aspects of clinical care including acceptable intervention rates and risk of patient harm associated with certain procedures. However, the importance of other attitudes was less predictable including an increased incidence of normal delivery associated with a stronger belief in the art of clinical practice (not the evidence-based nature of practice), openness to considering the wishes of the woman in labour was associated with less neonatal asphyxia, and attitudes toward the impact of sleep deprivation on decision making were associated with intervention rates. In conclusion, obstetrician attitudes appear to have a significant impact on maternal and neonatal outcomes from intrapartum care. Clinical and theoretical implications of the findings are discussed, and further development of the OAQ is recommended.

### **INTRODUCTION**

Central to many current accounts of effective clinical reasoning in physicians is the privileged position given to evidence-based medicine as a mandatory template for the evaluation of the clinical reasoning process. Evidence-based medicine (EBM) is bounded in terms of its impact on clinical reasoning by its reliance on rationality, thus not accounting for the potential impact on the reasoning process of non-rationally derived physician affect (Waymack, 2009). In another report (Dunphy BC, Cantwell, Bourke, Fleming, Smith, Joseph & Dunphy, S., 2009), we demonstrated both the existence and predictive power of non-clinical individual differences in the clinical reasoning of specialist physicians. In particular, we found in that study an association between affective factors such as enjoyment of complex cognitive tasks, management of anxiety and use of reflective coping strategies

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<sup>2</sup> Contact

Professor Bruce Dunphy, Suite 12, McCullough Centre  
Sunnybank Private Hospital  
259 McCullough Street  
Sunnybank QLD 4109 AUSTRALIA  
Phone: 61 7 3345 4455 Fax :61 7 3345 4466  
Email: bdunphy@monashivf.com

and the quality of clinical reasoning and clinical outcomes. In this study we elaborate upon the relationship by exploring the potential mediating role of physician attitudes on the quality of clinical reasoning and outcomes.

Previous studies have documented an association between obstetrician attitudes and a diverse range of clinical measures and outcomes including approach to clinical practice guidelines (Farquhar, Kofa, Power, Zinberg & Schulkin, 2002), preconceptual care (Morgan, Hawks, Zinberg & Schulkin, 2006) maternal serum screening (Phillips, Seely, Wan, Wachtel & Schulman, 1998), epidural analgesia in labour (Vandendriesen, Lim, Paech, & Michael, 1998), cesarean delivery on maternal request (Bettes, Coleman, Zinberg, Spong, Portnoy, DeVoto & Schulkin, 2007), vaginal birth after cesarean delivery (Coleman, Erickson, Schulkin, Zinberg, & Sachs, 2005) and birth position and perineal outcomes (Shorten, Donsante & Shorten, 2002). However, we are not aware of any study that has systematically studied whether there are associations between obstetrician attitudes and maternal and neonatal outcomes from intrapartum care.

We have previously utilized a high quality perinatal database to validate a methodology that demonstrated an association between measures of obstetrician coping including reflective coping (Greenglass, 2002), need for cognition (Cacciopo, Petty & Kao, 1984), and state-trait anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1970), and maternal and neonatal outcomes from intrapartum care (Dunphy et al, 2009). We therefore decided to use the same approach to carry out this study attempting to answer the question of whether, under standardized conditions, associations could be found between items from a newly-designed 35-item questionnaire for assessing obstetrician attitudes on a range of subject matter that could be relevant to how they deliver intrapartum care and obstetrician-specific rates of maternal and neonatal outcomes during the provision of intra-partum care.

## METHODS

### *Setting*

The study was conducted through the Department of Obstetrics and Gynaecology, Dalhousie University, Halifax and the labour and delivery unit at the IWK Health Centre, Halifax, Nova Scotia, Canada.

### *Primary Outcome Measures*

Delivery outcomes that were studied were caesarean section, mid forceps, vacuum, low forceps and normal delivery. The neonatal outcome used was the incidence of a cord arterial pH <7.0 and base excess of -16.0 mmol/L or more, which is recognized as being associated with a marked increase in the incidence of perinatal asphyxia and neonatal morbidity or mortality (Shankaran, Lupton, Ehrenkranz et al. 2005)

### *Variables of Interest*

#### *The 35-item Obstetrician Attitude Questionnaire (OAQ)*

Appendix 1 is the OAQ that was designed to elicit responses with regard to each obstetrician's beliefs, attitudes, and opinions regarding aspects of intrapartum care, caesarean section, intervention rates, and clinical factors that may contribute to the risk of an intrapartum caesarean section. Whilst this is an unstandardized questionnaire and it was not validated prior to the study, the examination of relationship(s) between this instrument and an examination of association(s) with outcome(s) was anticipated to give some indication of this instrument's potential usefulness.

#### *Obstetrician Characteristics and Other Factors Examined*

We have previously described our rationale for the obstetrician characteristics that we examined, and itemized clinical variables and outcomes which were included via the Nova Scotia Atlee Perinatal Database (NSAPD) (Dunphy et al., 2009).

### *Data Analysis*

Statistical analyses were undertaken using SPSS Version 13.0.1 (Meulman & Heiser, 2004). All women who delivered during the study period in which the obstetrician responsible was a study

participant were included. Each record contained all the clinical information from the NSAPD, together with data generated from the OAQ completed by the obstetrician responsible for that case and an anonymized unique identifier (study number) for that obstetrician. Our selection criteria, and approach to logistic regression analysis is described in our prior publication (Dunphy et al., 2009). Odds ratios, 95% confidence intervals and p values were calculated using stepwise modeling.

Finally, due to the pilot nature of the OAQ and the restricted sample size, analyses were constrained to the item level. For ease of understanding, OAQ scores were reversed for the purpose of analysis, so as that any positive association with score would also be positively associated with the statement in each item.

#### *Ethics Approval and Initiation of the Study*

Ethical Approval for the study was obtained through both the IWK Health Centre Research Ethics Board and the University of Newcastle Human Research Ethics Committee (approval number H-964-0205). Informed consent was obtained by the research nurse at the outset of the study, prior to administering the OAQ.

## RESULTS

#### *Study Participant (Obstetrician) Demographics*

Twelve obstetricians participated in the study, of whom 5 were female and 7 were male. We have previously documented the distribution of clinical and demographic details including rates of cesarean, forceps, vacuum and normal delivery within categories of maternal, fetal and obstetrician characteristics, for the 4,149 women who received intra-partum care from these obstetricians during the study period (Dunphy et al, 2009). In that paper we also reported on associations between these factors and clinical outcomes. In this short report we focus solely on OAQ item response and clinical outcome. However, in all of the stepwise analyses reported here, we included all clinical and demographic variables as a check against multicollinearity between attitudinal and other variables in explaining outcome.

#### *Associations between the OAQ and Obstetrician-Specific Intra-partum Intervention Rates*

Items from the OAQ found to be significantly associated with each outcome are summarized in Table 1. Table 1 cross-tabulates significant OAQ items with delivery mode presented in ascending order of complexity and neonatal outcome. Odds ratios (OR) and 95% confidence intervals (CI) are provided for each item found to be significant at the 5% level.

## DISCUSSION

This is the first study to systematically evaluate the impact of obstetrician attitudes on clearly defined maternal and neonatal outcomes from intrapartum care. Physician attitudes appear to have a statistically and clinically significant impact upon such outcomes.

The association between a number of items and outcome would appear to be in keeping with approaches to patient care. Obstetricians who believed more strongly that caesarean section is a risky procedure for the mother (Item 3) and/or that a continued rise in the caesarean section rate is avoidable (Item 18) were more likely to perform a mid-forceps delivery. This may be because they waited comparatively longer in certain complex cases for the woman to reach full dilatation so that a forceps delivery could be performed, rather than resort to a caesarean. Those obstetricians who believed more strongly that they had a bad past experience with fetal distress that influenced how they provided intrapartum care (Item 4) were more likely to resort to performing a caesarean section, and so may have been more likely to intervene early in the presence of any concern about fetal wellbeing. Those obstetricians who believed more strongly that their capacity to make a good clinical decision was largely based upon their years of experience in medical practice (item 12) were associated with a lower incidence of vacuum delivery, and this may simply represent that vacuum delivery has become more widely used comparatively recently and so may be employed less often by older obstetricians.

**Table 1:** Items from the OAQ found to be significantly associated with each outcome

ITEM	Delivery mode (presented in ascending order of complexity)															Neonatal outcome		
	Normal Delivery			Low Forceps			Vacuum			Mid Forceps			Caesarean Section			Cord pH <7.0 and BE ≥-16.0 mmol/L		
	<i>p</i>	OR	CI	<i>p</i>	OR	CI	<i>p</i>	OR	CI	<i>p</i>	OR	CI	<i>p</i>	OR	CI	<i>p</i>	OR	CI
3. I think that caesarean section is a risky procedure for the mother										.000	1.56	1.27-1.92						
4. I have had a bad past experience with fetal distress that has influenced how I provide intrapartum care				.000	.54	.43-.68							.006	1.16	1.04-1.28			
6. I frequently use fetal scalp blood sampling to confirm a diagnosis of fetal distress	.000	1.35	1.18-1.56															
7. My decision to perform an intrapartum caesarean section is influenced by the wishes of the woman who is in labour																.000	.05	.01-.24
8. My decision to perform an intrapartum caesarean section is influenced by other health professionals such as residents or nurses										.005	1.35	1.27-1.67						
12. My capacity to make a good clinical decision is largely based upon my years of experience in medical practice							.006	.72	.57-.91									
14. Good obstetrical management of a woman in labour is an art rather than a science	.000	1.59	1.33-1.89	.000	1.75	1.28-2.38												
18. A continued rise in the caesarean section rate is avoidable										.000	1.59	1.32-1.92						
21. I would feel comfortable being mentored by a colleague in order to help me lower my intervention rate				.046	.82	.68-1.0	.000	.67	.57-.79									
23. When I am sleep deprived, the quality of my clinical decision-making is impaired							.004	1.22	1.06-1.41									
24. I am more likely to intervene for a clinical problem in labour when it occurs between midnight and 7:00 am													.005	1.27	1.08-1.49			
27. I believe that I am capable of accurately diagnosing fetal distress by interpreting intrapartum continuous fetal heart monitoring and/or fetal scalp blood sampling	.042	.83	.70-.99															
31. Forceps deliveries are frequently associated with unnecessary maternal and/or neonatal morbidity																.065	.38	.13-1.06

The potential impact of sleep deprivation on approaches to clinical care is evident from items 23 and 24. Obstetricians who believed more strongly that when they were sleep deprived the quality of their clinical decision-making was impaired were more likely to perform a vacuum delivery. Obstetricians who believed more strongly that they were likely to intervene for a clinical problem in labour when it occurred between midnight and 7:00 am had a higher likelihood of performing a caesarean section. Interpretation of these data would imply that such obstetricians were aware of the impact of sleep deprivation on their decision-making, that they intervened more often by performing a caesarean section and/or vacuum delivery, and that this may have been associated with either a reduced willingness to lose sleep in order to continuously monitor cases throughout the night, or an acknowledgement that they were less able to make complex decisions when sleep deprived and so a decision that during the night it was safer to intervene early for the sake of the mother and/or the baby.

The association between a number of items and outcome may have been less predictable and raises interesting points for discussion and potential areas for future research. Those obstetricians who believed more strongly that they would feel comfortable being mentored by a colleague in order to help them lower their intervention rate (item 21) had a significantly lower intervention rate. Conversely, obstetricians who had a higher intervention rate indicated that they would be less comfortable being mentored by a colleague. These findings have significant implications for continuing professional development and quality assurance exercises requiring loop closure, in that these data raise the possibility that those obstetricians most in need of educational interventions are aware that there may be an issue related to their clinical practice that needs to be addressed but are more resistant to participating in a mentoring process.

Those obstetricians who were more prepared to be influenced by the wishes of the women in labour (item 7) were less likely to deliver a baby with severe asphyxia (a cord arterial pH <7.0 and base excess of -16.0 mmol/L or more). However, those obstetricians whose decision to perform an intrapartum caesarean section was more influenced by other health professionals such as residents or nurses were more likely to perform a complex mid-forceps delivery (item 8). One potential explanation for this might be an association between patient centred care and lower anxiety levels in obstetricians. State trait anxiety levels have previously been linked to whether medical students prefer a more doctor-centred (higher anxiety levels) or patient-centred (lower anxiety levels) approach to patient communication (Graugaard and Finset, 2000). Furthermore, we have previously studied state trait anxiety levels in this population of obstetricians and found an association between higher obstetrician anxiety levels and a greater frequency of poorer maternal and neonatal outcomes of intrapartum care (Dunphy et. al, 2009). Another potential explanation is that expertise is associated with a greater ability to see the big picture and consider more alternatives (Dunphy & Williamson, 2004), and thus the capacity to consider the views of the woman in labour at the same time as considering other variables. A third, and more speculative hypothesis is that some women in labour may intuitively know when their fetus is compromised, and that it may be important to take such beliefs into account in the same way that some mothers know when their young child may be ill even when there is comparatively little clinical evidence.

The association between a greater belief in the practice of obstetrics as an art rather than a science (item 14), and a higher incidence of normal delivery without any evidence of an increased incidence of neonatal compromise is interesting. Furthermore, a stronger belief that capacity to make a good clinical decision was largely based upon evidence-based clinical knowledge (item 14) was not associated with outcome. Some aspects of medical care are not yet evidence-based in that high quality studies are not yet available as a platform for providing clinical guidance, and so under such circumstances clinical care may be more of an art form. However, these data also raise the possibility that there is more to providing high quality care than simply following algorithms and guidelines, and that in addition to the importance of being aware of the published literature there is a critical element of problem solving/strategizing taking into account the unique nature of each patient's presentation that cannot easily be prescribed by protocols and guidelines. This is certainly central to Waymack's (2009) contention that the value systems underlying physician practice go well beyond purely evidenced-based medicine.

In conclusion, our study shows that there is a significant potential association between obstetrician attitudes as indicated by responses to the 35-item OAQ and maternal and neonatal

outcomes of intrapartum care, however, more research is required to validate our findings. Questions of both concurrent and convergent validity may also require addressing: the extent to which such attitudes have an independent impact, whether they are influenced by local/cultural factors and whether they are associated with any psychological factors such as higher levels of state or trait anxiety.

Moreover, the recognition of physician affect as a contributing factor to clinical reasoning does suggest a need to further theorise about the role of affect in the clinical reasoning process. Particularly, it may well be that the issue is not necessarily one of minimizing affective influences, but rather that fundamental to physician clinical reasoning may be the effective management of the inevitable affect. In a purely evidence-based model of medical practice, uncertainty is minimized. However, as Waymack (2009) and others have noted, physician practice is centred upon humanistic practices as much as it is centred upon rational scientific practices. As such, physician values, attitudes and beliefs will inevitably act in concert with the underlying science – either to enhance or diminish the clinical outcome. Management of uncertainty, and therefore of underlying affect, becomes central then to effective practice. As Waymack notes, "...the fundamental question is how we want medicine as a practice (and physicians) to confront ineliminable fear and uncertainty." (p216) These findings open up a new area of research (see Dunphy et al, 2009), and open the door for studies to be undertaken in other clinical domains.

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## Appendix 1

**Obstetrician Attitude Questionnaire (OAQ)**

**Directions:** There are no right or wrong answers for the following questions. We want to know what you really believe. For each statement circle the degree to which you agree or disagree. **Answer every statement**, even if you are not completely sure of your answer.

1                      2                      3                      4                      5  
Strongly Agree      Agree              Neutral              Disagree          Strongly Disagree

						Strongly Agree					Strongly Disagree
1.	I believe that my caesarean section rate is too high	1	2	3	4	5					
2.	I believe that my caesarean section rate is controllable	1	2	3	4	5					
3.	I think that caesarean section is a risky procedure for the mother	1	2	3	4	5					
4.	I have had a bad past experience with fetal distress that has influenced how I provide intrapartum care	1	2	3	4	5					
5.	I believe that current methods of diagnosing fetal distress are accurate	1	2	3	4	5					
6.	I frequently use fetal scalp blood sampling to confirm a diagnosis of fetal distress	1	2	3	4	5					
7.	My decision to perform an intrapartum caesarean section is influenced by the wishes of the woman who is in labour	1	2	3	4	5					
8.	My decision to perform an intrapartum caesarean section is influenced by other health professionals such as residents or nurses	1	2	3	4	5					
9.	If I anticipate that two women in labour may require a medical intervention at the same time, I will intervene earlier on one woman in order to avoid such an occurrence	1	2	3	4	5					
10.	I believe that a woman should be allowed to choose whether she continues in labour or has a caesarean section	1	2	3	4	5					
11.	I believe that most decisions regarding intrapartum care are evidence-based	1	2	3	4	5					
12.	My capacity to make a good clinical decision is largely based upon my years of experience in medical practice	1	2	3	4	5					
13.	My capacity to make a good clinical decision is largely based upon evidence-based clinical knowledge	1	2	3	4	5					
14.	Good obstetrical management of a woman in labour is an art rather than a science	1	2	3	4	5					
15.	My decision to perform an intrapartum caesarean section is influenced by my feelings/	1	2	3	4	5					



		Strongly Agree					Strongly Disagree				
		1	2	3	4	5	1	2	3	4	5
	emotions										
16.	The timing of my management decisions is sometimes for convenience	1	2	3	4	5					
17.	My caesarean section rate is influenced by the risk of litigation/ malpractice	1	2	3	4	5					
18.	A continued rise in the caesarean section rate is avoidable	1	2	3	4	5					
19.	Quality assurance exercises that let me know my own caesarean section rate are useful	1	2	3	4	5					
20.	I would like to have the opportunity to take part in an educational program that could lower my caesarean section rate	1	2	3	4	5					
21.	I would feel comfortable being mentored by a colleague in order to help me lower my intervention rate	1	2	3	4	5					
22.	I believe that my caesarean section rate is associated with the quality of my thinking	1	2	3	4	5					
23.	When I am sleep deprived, the quality of my clinical decision-making is impaired	1	2	3	4	5					
24.	I am more likely to intervene for a clinical problem in labour when it occurs between midnight and 7:00 am	1	2	3	4	5					
25.	A continued rise in the caesarean section rate is unnecessary	1	2	3	4	5					
26.	The evidence about whether to perform an intrapartum caesarean is frequently not clear-cut	1	2	3	4	5					
27.	I believe that I am capable of accurately diagnosing fetal distress by interpreting intrapartum continuous fetal heart monitoring and/or fetal scalp blood sampling	1	2	3	4	5					
28.	I regularly find that neonatal cord blood acid/base results support my clinical diagnosis of fetal distress in labour	1	2	3	4	5					
29.	I believe I am capable of safely performing a difficult forceps delivery	1	2	3	4	5					
30.	I believe that I am capable of accurately diagnosing dystocia	1	2	3	4	5					
31.	Forceps deliveries are frequently associated with unnecessary maternal and/or neonatal morbidity	1	2	3	4	5					
32.	A long labour or a difficult vaginal birth is associated with increased risk of prolapse or urinary stress incontinence	1	2	3	4	5					
33.	I believe that current caesarean section rates are too high	1	2	3	4	5					
34.	I frequently become anxious when managing a complex intrapartum case	1	2	3	4	5					
35.	I feel confident that I could justify to a panel of my colleagues all of my decisions to undertake an intrapartum caesarean section	1	2	3	4	5					