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A review of the literature: midwifery decision-making and birth.

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Abstract.

Background
Clinical decision-making was initially studied in medicine where hypothetico-deductive reasoning is the model for decision-making. The nursing perspective on clinical decision-making has largely been shaped by Patricia Benner’s ground breaking work. Benner claimed, expert nurses use humanistic-intuitive ways of making clinical decisions: not just rationally as claimed by medicine. Clinical decision-making in midwifery is not the same as either nursing or medical decision-making because of the woman-midwife partnership where the woman is the ultimate decision-maker.

Method
CINHAL, Medline and Cochrane databases were systematically searched using key words derived from the guiding question. A review of the decision-making research literature in midwifery was undertaken where studies were published in English. The selection criteria for papers were: only research papers of direct relevance to the guiding research question were included in the review.

Findings
Decision-making is under-researched in midwifery and more specifically birth, as only 4 research articles met the inclusion criteria in this review. Three of the studies involved qualified midwives, and one involved student midwives. Two studies were undertaken in England, one in Scotland and one in Sweden. The major findings, which can be synthesised from this literature review, are primarily that decision-making in midwifery is socially negotiated involving hierarchies of surveillance and control. Secondly, clinical decision-making encompasses clinical reasoning as essential but not sufficient for midwives to actually implement their preferred decision. The role of the woman in shared decision-making has not been explored by research into clinical-decision making during the second stage of birth.

Conclusion
The existing research has not systematically examined clinical reasoning or clinical decision-making during birth in registered midwives. Further research is needed to explore both clinical reasoning and the intrapersonal and contextual factors that influence midwives actual clinical decision-implementation during birth. The role of the woman as decision-maker in her own care and how this is negotiated between the woman and the midwife also needs careful research attention.
**Introduction**

In midwifery, clinical decision-making is seen as holistic and women-centred. Midwifery clinical decision-making requires intrapersonal negotiation, sensitivity, awareness and consideration for the environment and the people within it (Davis-Floyd, 2006). In summary, as a discipline midwifery is based on a philosophy of primary health care and partnership with the woman (Australian College of Midwives, 2008; International Confederation of Midwives 2005; Pairman, 2000). Pregnancy and birth are seen as normal physiological and social life events, where midwives work continuously with the women from pre-conception through pregnancy, labour and birth and up to six weeks after birth (Australian College of Midwives, 2008; Pairman & McAra-Couper, 2006). Midwives use their expertise and evidenced-based knowledge to support and empower women to exercise autonomy during their unique childbearing journey (Kitzinger, 2005). This has positive effects for the baby and family throughout the childbearing year (International Confederation of Midwives, 2002 & 2005; Pairman & McAra-Couper, 2006; Kirkham, 2000). Page (2000) defines evidenced-based care as “a process of involving women in making decisions about their care and of finding and weighing up information to help make those decisions” (p. 9). The woman/midwife partnership model of care is woman-centred and therein lays its accountability (International Confederation of Midwives, 2002).

The International Confederation of Midwives (ICM) outline an international framework for decision-making in midwifery (2002). A decision-making framework on scope of practice is also offered by the Australian Nursing and Midwifery Council (ANMC) (2007). The midwife is further guided by the Australian College of Midwives (ACM), national midwifery guidelines for consultation and referral (2003). In these documents it stipulates, in instances when problems arise during pregnancy or birth that fall outside the scope of midwifery practice, midwives must consult with and/or refer to another midwife or health professional including an appropriate medical professional (Australian College of Midwives, 2006; Australian Nursing and Midwifery Council 2006; International Confederation of Midwives, 2002). Despite these documents, midwives, however claim to be autonomous practitioners, which according to Pairman Pincombe, Thorogood and Tracy (2006b) means, a midwife uses her ‘knowledge and skills to provide care independently without a requirement to refer to another health professional’ (p. viii). Consequently, there appears to be a mismatch between the concept of an autonomous midwifery practitioner and its implications to decision-making, those decisions midwives must confer about and those that are within the accepted scope of midwifery practice (Australian Nursing and Midwifery Council, 2006; International Confederation of Midwives, 2002; Pairman & McAra-Couper, 2006; Pairman, 2006).

This literature review is guided by the question: **What factors influence the processes midwife’s use when engaging in clinical decision-making during birth?** The term ‘clinical decision-making’, is best understood by first considering the more medically accepted term ‘clinical reasoning’. Clinical reasoning is a form of hypothetico-deductive logical thinking. Strengths of this approach include the emphasis on development of strong logical cognitive reasoning skills and the emphasis given to basing treatment decisions on knowledge (evidence) and not a rule of thumb or mindlessly following tradition (Newell & Simon, 1972). Hypothetico-deductive
reasoning focuses on ‘the supposed biophysical facts’, which can be defined, measured and consensually agreed upon. When hypothetico-deductive reasoning is applied in clinical practice it is generally agreed to involve a number of phases [see box 1]. In midwifery literature, little emphasis is given to clinical reasoning; for example the three main undergraduate textbooks Myles {2003} and Mayes {Sweet & Tiren, 2002} Pairman et al {2006a} lack any chapters or major sections on this topic. Clinical reasoning has been criticised as being too linear and reductionistic, focussing, as it does, on detail and chains of causal relationships {Tanner 2006}. Clinical decision-making is a broader concept which allows for both reductionism and holism at various points in the decision-making process. The definition of clinical decision-making in midwifery offered in this paper takes account of both hypothetico-deductive and humanistic-intuitive approaches and is in harmony with contemporary ideas in midwifery. ‘Clinical decision-making’ here is defined as a process that may encompass both clinical reasoning and intuitive awareness of the psycho-social-spiritual and environmental factors that are influencing the clinical situation and what the midwife thinks; feels and actually implements.

In nursing, Benner {1984/2000} linked the process of decision-making to five ‘levels’ of experience and practice: novice, advanced beginner, competent, proficient and expert. Benner’s {1984/2000} research findings were that, clinical decisions by less experienced nurses were strongly based on hypothetico-deductive reasoning. Expert nurses however, Benner {1984/2000} claimed, used intuition. Intuition involves an automated quick classification, where the expert nurse intuitively screens available options and eliminates options not perceived as relevant. Intuition tells the nurse when something ‘feels’ right or different, without the nurse necessarily being able to articulate what it is {Benner, 1984/2000; Benner & Tanner 1987}. As a result of these intuitive feelings, the nurse then reaches a judgement and/or decision {Verplanken & Svenson, 1997; Benner, 1984/2000}. The resultant perceptions are of an intuitive decision-making expert nurse who appears quick and spontaneous while operating with profound understanding, without necessarily being able to articulate that understanding {Dreyfus & Dreyfus, 1977; Benner, 1984/2000}. Berry and Dienes {1993} hypothesise part of this process can be referred to as automatic whereby, tacit nursing knowledge acquired through exposure and experience of the usual paths taken by illnesses is subsequently forgotten. Benner {1984/2000} argues, intuition is a valuable part of nurses clinical practice. Other researchers’ go further hypothesising, other health professional’s benefit from drawing on intuition in clinical practice {Mok & Stevens, 2005; Rew, 2000; Rew & Barrow, 2007}. For expert practitioners, knowing what to do in a particular situation usually depends on intuitive pattern matching. Pattern matching is defined by Mok & Stevens (2005) as a “process of making a judgement on the basis of a few critical pieces of information” (-59) but the accuracy of the assessment and final action is dependant entirely upon the fidelity of the match between successfully managed past situations and the current situation which requires action {Newell & Simon, 1972; Terekina, 1990}. When a midwife uses pattern recognition in a clinical situation her judgement may unknowingly be adversely affected because pattern recognition leaves out crucial steps in clinical reasoning such as: hypothesis formation and hypothesis testing. This means that using intuition to guide action may well be a hallmark of an ‘advanced practitioner’ but it is not an example of clinical reasoning {1984/2000}. Thus using intuition in rapidly evolving critical situations may actually lead to detrimental actions because systematic decision-making has not been used.
Search strategy
The key concepts and words in the research question were identified prior to commencing. Exclusion criteria are also defined (see box 2). The databases searched were Medline, CINHAL and Cochrane. Two searches were undertaken in the Cochrane database, one using advanced search and key concepts and words and the other using the Mesh facility. The Mesh facility converts key concepts and words in to terms the database deems most appropriate (see box 3). The key word concepts and words made three keyword strings which related to: decision-making, labo(u)r and midwife. The three keyword strings were combined; this resulted in the following number of hits:

- Medline 168
- CINHAL 25
- Cochrane 461
- Cochrane Mesh 11

Due to the small number of hits from the CINHAL database, no limitations were applied. No limitations were applied to those hits retrieved from the Cochrane database either. Limitations of: humans, English and between January 1998 - May 2009 were applied to those hits from Medline. This reduced the hits to 128. Retrieved results from the three databases were cross referenced to exclude duplication. Abstracts were read to eliminate any literature not relevant. Where abstracts were ambiguous or unclear further clarity was sought from reading the full text. Four research studies meet the inclusion criteria.

Summary and Critique of Existing literature
Study 1
The effectiveness of using clinical simulation to teach hypothetico-deductive reasoning was investigated using a cohort design (Cioffi, Purcal & Arundell 2005). Thirty-six midwifery students were recruited: 18 experienced the intervention of simulation and 18 experienced the standard lecture. How student midwives were allocated to groups was not stated. The researchers developed two simulation scenarios involving written and audio-taped information and a set of decision-rules. Midwifery students worked in pairs using think-aloud techniques, a proven technique to aid understanding through verbalisation (Kitson-Reynolds, 2009) The first scenario concerned normal labour, the other concerned neonatal physiological jaundice. The findings indicated, midwifery students who received the simulation strategy collected more clinical information, revisited collected clinical information less, made fewer formative inferences and self reported higher confidence levels than those student midwives who underwent traditional lectures. Midwifery students’ who self completed the posttest for normal labour simulation, were found to undertake more rapid decision-making. Self reporting Posttest, however are subjective and potential for variation of results between cohorts may exist. The limitations of this study in terms of generalisability include the small number of midwifery students and the homogeneity of a single student cohort. Further, the lack of definition and description of the simulation intervention makes study replication very difficult. Importantly, the findings of a controlled clinical simulation may not be generalisable to the complex world of real practice where multiple variables operate simultaneously. This is particularly so during birth where rapid decisions are required in a complex, fast changing situation that is strongly influenced by the environment and the people within it. There is limited literature comparing the effectiveness on fitness to practice using simulated environment with the real complex world of clinical midwifery practice (Kitson-Reynolds, 2009). This broader environmental context was not considered in the Cioffi et al study (2005)
Study 2

An ethnographic study design was used to explore complexities of decision-making and how perceptions of risk, uncertainty, relevant knowledge and professional autonomy influence the outcome pre-implementation of a computerised decision-making support system, {Lankshear, Ettore & Mason 2005}. The study was conducted at two delivery suites in England. Data collection included direct observation of midwives’ and doctors and in-depth interviews. Comprehensive details of the sixteen people interviewed were not stated. Key findings of the research were:

1. Midwives were generally not autonomous in their decision-making;
2. There was a hierarchical order to decision-making:
   - Midwives sought confirmation and/or opinion for their decisions with the coordinating midwife;
   - The coordinating midwife deferred decisions to junior and/or senior medical staff;
   - Senior medical staff deferred some decisions to Consultants;
3. The individual midwife or doctor’s perception of risk shaped their decision-making;
4. Midwives tried to involve women in decision-making more than doctors;
5. Midwife-doctor decisions occurred outside the woman’s room;
6. Midwife-woman decisions occurred inside the woman’s room;
7. Midwives overtly or covertly influenced decision-making by others higher up the hierarchical chain.

Midwives indicated, in this study, they were autonomous in some decisions such as when to consult and/or grant admission to the birth room. Women were claimed to be central to midwives decision-making, yet the research demonstrated this to be tokenistic. Rather women were generally seen to be passive with the midwives and doctors dominating the decision-making process. A strength of this study is, it was observational and captured the real world of practice of over 500 hours. The researchers reported decision-making in the studied ‘real world’ of a delivery suite, was influenced in both directions: top down decisions were open to contestation as much as bottom-up decisions could be countermanded. This resulted in decision-making being a socially and culturally negotiated activity. Midwives identified risks and made decisions, however at times, midwives had no power to implement those decisions. Rather the midwives’ action was often to defer to medical professionals to enact ‘formal’ decision-making. Limitations of this study are the midwives autonomous scope of practice and the number of times when the midwife was obliged to consult and/or refer to a doctor was not clearly differentiated. The study provides data on the organisational complexity of midwifery work processes and decision-making, but there are no details concerning the way that midwives actually made and enacted their clinical decisions. The study would have been improved if the observational hours were equal at both sites. As it was 500 hours of observation was conducted at one site and only 30 hours at the other. The different cultural context of England and current different educational training programs for Australian midwives somewhat limits transferability to an Australian context.

The conclusions drawn from this study primarily relate to the ‘real world’ of delivery suites in England pre-implementation of the proposed computerised decision-making support system. Implementing such a system may provide a means of enhancing hypothetico-deductive reasoning, which may enhance midwifery autonomy in
decision-making and reduce the hierarchically negotiated aspects of midwifery
decision-making (Lankshear et al, 2005).

Study 3
A Swedish phenomenological study focused on midwives problem solving in critical
antenatal and birth situations where no medical assistance was available (Danerek &
Dykes, 2001). Seven midwives participated in the research. Participant information
was limited to a statement about the midwives range of years since qualifying. Data
was collected via in-depth interviews and analysed using thematic analysis. Analysis
identified thirteen factors deemed necessary to effectively solve critical antenatal and
birth situation problems in midwifery (see box 4). This study reported that initially, the
midwives employed a process of hypothetico-deductive reasoning. The midwives
listened, observed and assessed women in order to collect cues, from which one or
more hypothesis were generated. When interpreting these cues midwives
acknowledged drawing upon theoretical and clinical knowledge and past
experiences. Once this happened the midwives claimed that they ‘intuitively’ knew
how and when to act. Midwives stated they felt confident and safe in this approach as
they had the relevant professional knowledge. This resulted in the midwives
experiencing feelings of being in control of the unfolding critical situation excluding
any irrelevant peripheral social and environmental influences. The midwives claimed
to engage in calm negotiation with the woman and peers in order to ensure a positive
outcome for mother and baby. When the need arose, midwives indicated they
orchestrated collegial and technological support. Further, in anticipation of medical
agreement with their decisions the midwives prepared any necessary equipment
needed. In these critical clinical situations the midwives reported feeling euphoric
when they performed well.

An important consideration is that this study took a non-critical view of what midwives
said they did during decision-making. We have no way of knowing what midwives
actually did. Further transferability of this study to an Australian context may be,
restricted because there were only seven midwifery participants and the cultural
context of midwifery in Sweden is quite different from the Australian context. Another
limitation is, midwifery problem solving in critical situations was reported to be
dependant upon verbal and non-verbal interactions with the women, yet the women’s
perspective was not taken in to consideration by the researchers who could have
also interviewed women. Because no specific examples were given, it is not possible
to tell from this research if midwives engaged in formal hypothetico-deductive
reasoning. They may have used heuristics based upon pattern matching and past
experiences.

Study 4
Midwives decision-making in relation to accurate diagnosis of active labour was the
focus of a Scottish qualitative study (Cheyne, Dowding & Hundley 2006). Thirteen
midwives were allocated to two focus groups. The midwives were invited to discuss
how they made decisions differentiating women who were in active labour and
needed to be admitted, versus early labour when the woman would be sent home.
Latent content analysis identified two major categories midwives consider when
making decisions related to diagnosing labour: the woman and the institution. More
specific themes were subsumed under each category. When diagnosing labour and
making clinical management decisions midwives indicated they take both categories
and all of the subsumed themes into consideration. Midwives diagnostic judgements
were found to be predominately based upon linear collection of information cues in
order to generate one or more hypothesis. Primary cues such as: those related
directly to the diagnosis of labour (observing the women’s physical signs and a vaginal examination) were sought first. This method of information gathering is congruent with hypothetico-deductive reasoning (Newell & Simon, 1972). Once the midwife reached a diagnosis, Cheyne et al. (2006) reported, midwives then took secondary cues into account, which informed decisions about whether or not to admit the woman to the delivery suite. Secondary cues included: the woman and her family’s expectations and the daily contextual environment of the organisation such as: workload, bed allocation and staffing issues. Organisational guidelines, the midwives indicated, placed significant constrictions on their decision-making processes. If a woman was not judged to be in active labour, but the midwife made the decision to admit her, the woman was likely to be exposed to a cascade of intervention. Conversely, some women were thought to be able to benefit from admission even though they were not technically in active labour. Importantly, regardless of which decisions were made, midwives felt the need to justify their actions to colleagues. The researchers conclude, due to competing physical, psycho-social and organisational cues midwifery management decisions are not solely reliant on diagnostic decisions. This demonstrates how midwifery clinical decision-making can be controlled by organisational matters, thus undermining the midwife’s clinical autonomy.

The strengths of this study include the identification of how clinical decisions can be made on organisational grounds. The emphasis this research gives to psycho-social and organisational factors are also reflective of the complex reality of midwifery practice. The weaknesses of this study include the group-based nature of the data collection where midwives tend to tell stories placing themselves in a positive light. When midwives sit together they may add to each others’ stories until a holistic picture of the hypothetico-deductive reasoning and compassionate care is presented: this may be a constructed myth rather than a reflection of actual midwifery practice. Focus groups work best when there is diversity of views and positions but there were only two focus groups from a single hospital, which again weakens the study (Denzin & Lincoln, 1994).

Discussion

One study indicates high-fidelity simulators enhanced and improved hypothetico-deductive reasoning and decision-making in student midwives in the educational setting. There was no finding about how these improved reasoning skills may have been transferred to actual practice. The Swedish phenomenological study presents a very positive view of the research participants. Based only on their own positive stories, midwives are presented as skilled in clinical decision-making and in interpersonal skills with women, families and colleagues (Danerek & Dykes, 2001). If a study like this was to be believed, midwives have no problems either in making or in being able to implement their planned action. These research findings stand in contrast to the ethnographic study where midwives were often not autonomous in decision-making and sometimes could not implement planned action (Lankshear et al., 2005). Although midwives claim to be woman-centred in their approach to decision-making the ethnographic and focus-group based research shows that clinical decision-making in midwifery is based a hierarchical system where the ultimate decision-maker is the doctor or the health service manager.

The key weaknesses of these studies are that each study has involved small numbers from only one or two research sites, which limits transferability. Another weakness is, studies using the interpretive paradigm have unacknowledged bias towards presenting idealised versions of how midwives make and implement
decisions. Interpretive researchers accepts ‘truth’ is what participants’ present at interview often without probing and searching for negative examples or cases {Lobiondo-Wood & Haber, 2006}.

Conclusion
The guiding question has been: What factors influence the midwife’s clinical decision-making during birth? Previous research in medicine and nursing is not adequate to address decision-making in midwifery because although clinical reasoning is a necessary condition for valid decision-making, it is not sufficient when decisions have to be negotiated with the woman and with other members of the maternity care team. Thus we see clinical reasoning as a sub-component of midwifery clinical decision-making. We specifically reject Benner’s research as providing a basis for understanding and optimising clinical decision-making in midwifery. Her concept of the ‘advanced practitioner’ who uses ‘intuition’ to make decision seems to us to be an oxymoron. Dreyfus and Dreyfus {1986} claimed that “experts don’t solve problems and don’t make decisions; they do what normally works” (p 30-31). Thus, if advanced practitioners do use intuition then they must be less likely to use formal clinical reasoning processes, which make them more prone to errors in decision-making.

Clinical decision-making seems to be undervalued in the midwifery literature thus the existing midwifery research provides only a partial answer to the research question. There have been no midwifery studies that have systematically and critically examined clinical decision-making during birth in registered midwives. Further research is needed to explore both clinical reasoning and the intrapersonal and contextual factors that influence midwives actual clinical decision-making and decision-implementation during birth. The role of the woman as decision-maker in her own care and how this is negotiated between the woman and the midwife needs careful analysis. New, critical midwifery research is particularly needed which focuses on labour and birth where decisions are required in a complex, fast changing situations that are strongly influenced by the environment and the people within it.

**Box 1**
- Cue acquisition – sense data collected i.e. signs and symptoms;
- Cue clustering- all relevant cues joined together;
- Generating multiple hypotheses - explains cue clusters;
- Cue interpretation – information is interpreted in the light of the explanations/hypotheses that are under consideration;
- Focused cue acquisition - ruling in/ ruling out hypothesis;
- Hypothesis evaluation – based on all available data -differential diagnoses;
- Evaluation of treatment options;
- Implementation of preferred treatment plan, and
- Evaluation of treatment - to confirm or change diagnosis (Thompson, 1999; Elstein & Bordage, 1988; Mong-Chue, 2000; Crow, Chase & Lamond 1995; Elstein Shulman & Sprafka 1978; Offredy, 2002).
Box 2

1st keyword string: Decision-making OR reasoning OR judgement OR thinking OR problem solving OR logic OR concept formation OR cognition OR uncertainty

2nd keyword string: clinical OR practice OR labor OR labor obstetrics OR delivery OR Natural childbirth OR water birth OR birth OR parturition OR second stage OR third stage OR obstetric emergencies.

3rd keyword string: Midwives OR midwife OR student midwife OR nurse midwife OR nurses

Exclusion criteria: Non-humans; Non-English; <10 years; Non-peer reviewed journals; studies pertaining to nursing; studies involving women’s decision-making.

N.B

Studies related to professionals who practice within the field of midwifery, but are classified as nurse-midwives within their country were included.
Australian College of Midwives (2006). *Competency standards for midwives*. Canberra: ACMI.


