**FULL STUDY TITLE**

What is the effect of a shared leadership system for maternity emergency teams on team performance?

 **SHORT TITLE OR ACRONYM**

Shared leadership in maternity emergency teams.

**LAY DESCRIPTION OF THE PROJECT (2-3 LINES ONLY)**

Traditionally during maternity emergencies, it is recommended that a single leader take charge. However, in many critical circumstances there may be too many things for a single leader to do. This project aims to refine and test a system where the leadership tasks can be shared to ensure a high level of patient safety.

**STUDY INVESTIGATOR(S)**

|  |  |  |  |  |
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## **BACKGROUND**

Team leadership is a significant determinant of performance in healthcare emergencies,[1] with poor leadership resulting in medical errors and patient harm. [2-6] Paradoxically, leadership appears to deteriorate when patients are at their most critical.[2, 7] Teams responding to maternity emergencies are healthcare action teams (HCATs) defined as “interdisciplinary teams that often work under complex, dynamic, and time-pressured conditions to accomplish critical patient care tasks”.[8] HCATs are commonly recommended to be led by a singular clinician with hierarchical authority.[9-14] Evidence supporting this vertical leadership structure was provided by research in cardiac arrest and trauma teams demonstrating superior performance[9, 11] when a “command physician” led the team. Similarly, current obstetric emergency training courses such as PPROMPT and MOET recommend singular leadership during maternity emergencies. The concept of leadership as an individualistic pursuit has been consolidated in theory and practice as leadership scholars and leadership training continues to focus on the behaviours, attitudes and styles of a singular leader.[15, 16] Training interdisciplinary teams in “proven methods of team management” was recommended in the Institute of Medicine’s report for patient safety published in 2000 [17] and occurs at the Mater in maternity via the Maternity Emergency Management (MEM) course in the form of singular leadership. However, despite the expansion of teamwork and leadership training[18] reports of poor leadership in HCATs persist many years later in both clinical and simulated emergencies, posing a continuing patient safety risk.[3, 4, 6, 19, 20] Such deficiencies in leadership bring into question the suitability of this form of leadership, particularly for maternity teams when the lead doctor may not be able to remain “hands off” as recommended. Despite providing teamwork and leadership training in MEM, leadership quality in emergencies in MMH remains variable.

Shared leadership has gained popularity in recent years in response to identified deficiencies in team and organisational leadership outside of healthcare.[21, 22] Shared leadership is defined as a “set of interactive influence processes in which team leadership functions are voluntarily shared among internal team members in the pursuit of team goals”.[23] Shared leadership acknowledges the existence of formal leaders, such as doctors in emergency teams, but propose these leaders are supported by a network of leadership practices that occur throughout the team or organisation.[24] Leadership behaviours exhibited by team members beyond the hierarchical leader have the potential to enhance or inhibit leadership and team performance. Such leadership may emerge spontaneously (“spontaneous collaboration”), occur intuitively (‘intuitive working relations”)or be planned (“institutionalised practices”). [25] A recent systematic review of shared leadership in healthcare emergency teams [26] identified planned shared leadership as a commonly described leadership structure aimed at improving team leadership. Most teams shared leadership across medical and nursing dyads, although some more complex teams had a triad of medical leaders. Spontaneous leadership sharing was seen to both improve and inhibit team performance, in the presence of perceived ineffective leadership. Planned leadership sharing with clearly defined leadership roles is associated with improvements in some team outcomes[27-32] however these studies are of low quality, and there has been no examination of planned shared leadership in maternity teams.

AIM(S) OF STUDY

The aim of this study is to examine if a planned leadership sharing model impacts the performance of maternity emergency teams compared to traditional singular leadership.

## **HYPOTHESI(E)S or RESEARCH QUESTION**

Part A Research question

Is a proposed system of planned leadership sharing acceptable to and believed to be implementable by midwifery and medical staff?

Part B Hypotheses:

**Primary**

1. Planned Shared leadership improves teamwork

**Secondary**

1. Planned shared leadership improves clinical performance in maternity emergencies
2. Planned shared leadership improves documentation in maternity emergencies
3. Planned shared leadership reduces team leader work load
4. Planned shared leadership improves team member perceptions of teamwork in maternity emergencies.

STUDY DESIGN

The study will be performed in Action Research framework, with mixed methods used.

Part A

Planning phase will include refinement of a proposed list of leadership tasks to be performed in a maternity emergency developed from a literature review. The action phase will include interviews across all clinician groups attending maternity emergencies. Analysis of one or more cycles of design and qualitative investigation will inform the design of the system of shared leadership for testing in simulation.

Part B

The developed system of shared leadership will be compared to traditional vertical leadership in the MEM course using a comparative trial with a counterbalanced, crossover design.

Two teams will participate in 2 research scenarios each during the MEM course day. (see MEM lesson plan – research scenarios will be 2&5 (one team) and 3&6 (second team)). These scenarios will be similar in the diagnostic approach and management required by the team. Teams will be trained in the use of a cognitive aid during non-research scenarios (scenarios 1&3) to enable singular or shared leadership to be practiced prior to participation in the scenario utilising the respective leadership structure. Teamwork scores (primary outcome) for shared and singular leadership will be compared within groups. The leadership type and scenario order will be counterbalanced to reduce the impact of the learning curve through the day.

## **STUDY POPULATION**

Midwives, Public and Private obstetric doctors, Anaesthetic Doctors working within Mater Mothers Hospital and the Gold Coast University Hospital

### Recruitment Process

Part A - Planning, action, analysis

The study will aim to initially recruit participants from across the range of specialties for short interviews to provide input into designing a shared leadership system. Interviews will initially be individual, but as an iterative process, small focus groups of either single or multiple disciplines may be required to refine the system. Outlined below is the recruitment process for the initial round of interviews. A target sample of 5 clinicians from senior midwifery, public obstetrics, private obstetrics and anaesthetics will be sought, however further recruitment may be required if saturation is not achieved.

A poster will be placed on the Birth Suite research board, private handover room, surgeons waiting room in the obstetric theatres, registrar’s room on birth suite and Aubigny Place and research board in the operating theatre tea room to notify all staff of the study. Additionally, notification will occur via birth suite newsletter, obstetric and anaesthetic staff meetings, and obstetric related Yammer groups.

Potential participants who identify as interested in participating in the study will be chosen via a random number generator and approached via email or phone by the researcher to identify an appropriate time to conduct an interview.

Midwifery participants will be interviewed with the permission of the midwifery unit manager for approximately 15 minutes with the during shift when relief staff are available

Private obstetric participants will be interviewed by the researcher at a time convenient to them – which may include an interview during work hours while waiting to attend a birth, or by telephone at a time convenient to them.

Public obstetric and anaesthetic participants will be interviewed by the researcher at a time convenient to them – which may include an interview during work hours or in rostered administration time, or by telephone at a time convenient to them.

Part B: Testing in simulation

Participants will be attendees (midwives, midwifery students, obstetric doctors and anaesthetic doctors) at the simulation training course “Maternity Emergency Management” (MEM). At course enrolment, participants will be send information regarding the research and contact number of the principle investigator. Recruitment with signed written consent will occur prior to course commencement.

### Exclusion criteria

Part A: non-consent to recording of interview.

Part B: Groups of participants in which any team member has not consented to participate or have video storage.

### Potential for Risk, burdens and benefits

Part A:

There will be negligible risk to participants. The burden on participants will be no more than the short amount of time spent during the interview. Interviewing during work hours does carry the risk of impeding clinical care, however, this risk will be minimised by only conducting interviews when relief staff are available and explaining that if at any stage the participant is required for clinical care, the interview can be terminated or rescheduled. Participants may benefit from a feeling of actively contributing to redesign of systems that improve patient care.

Part B.

There is a risk that singular or shared leadership may inhibit rather than enhance performance. There a risk that poor performance during simulation may adversely affect participant sense of wellbeing. This is a known risk of simulation-based education and a number of strategies are employed to minimise risk of participant distress.

Prior to undertaking the simulation activity, the simulation team will create a ‘psychologically safe container’[33] or effective learning environment, where participants understand that any mistakes are ‘puzzles to be solved’ and not ‘crimes to be punished’. The simulation faculty have all undergone additional training in simulation-based education and have experience in creating and maintaining psychological safety for participants. Any participant who identifies stress or concern during the simulated emergencies will be able to approach any member of the simulation team with these concerns. The simulation team will provide support within their expertise; however, acknowledge that some concerns are outside of their scope. Participants with issues beyond the scope of the simulation education team’s expertise, will be referred to the employee assistance program with the consent of the participant.

Additional risks include the introduction of an untested system of leadership into clinical practice. Cognitive aids designed to implement shared leadership (or enable current leadership systems) will not be introduced into in clinical areas.

Potential burdens include the completion of short questionnaires taking approximately two minutes following the learning experience.

Potential benefits for participants include improved wellbeing secondary to enhancement of teamwork skills and improvement in clinical care for patients. If shared leadership is found to enhance clinical performance or secondary outcomes, future studies will be planned in the clinical environment. The project has the potential for benefit to patients experiencing clinical emergencies in maternity settings.

## **PRIMARY AND SECONDARY OUTCOME(S)**

Part A:

A system of division of leadership tasks for maternity emergencies

Part B:

OUTCOMES: see measurement tools below for detail.

Primary outcome:

* Team work score

Secondary outcomes:

1. Clinical performance
2. Documentation completeness
3. Team leader and member work load
4. Team member perceptions of teamwork in maternity emergencies.

## **STUDY PROCEDURES**

Recruitment will occur as per section 3.

Written informed consent will be obtained from all participants.

During subsequent rounds of PART A, the same participants will be approached for ongoing interview or participation in small group discussions. If drop outs occur further participants may be approached via random number generator.

### Measurement tools used

PART A

* Semi structured interview - See Appx A for question list.
* Interviews will be transcribed for analysis

PART B

* Primary outcome:
	+ Teamwork score (Auckland team behaviour tool)
		- Measured by analysis of video data by raters who have teamwork and clinical expertise and have undergone rater training using the tool.
* Secondary outcomes:
	+ Time to completion of critical patient management tasks as per clinical scoring checklist
		- Tool to be developed in conjunction with simulation scenario, scoring will occur by analysis of video data
	+ Completeness of documentation:
		- Count of missing items on emergency documentation form – assess by researcher post scenario
	+ Workload: Visual Analogue Scale
		- 2 questions VAS for Mental and Task workload
	+ Participant perceptions of teamwork: Team Emergency Assessment Measure (with modification of “team leader” to “team leadership” to suit both models)
		- 12 item questionnaire completed post scenario
		- *The qualifier prior to items one and two* “Leadership: it is assumed that the leader is either designated, has emerged, or is the most senior – if no leader emerges allocate a “0” to question 1 and 2” *will be changed to: “ Leadership: please average the leadership seen if more than one person is seen to be leading”*

### Data management and storage

PART A

Data will be collected by the researchers. Digital audio recordings of interviews will be transcribed and then deleted.

Re-identifiable demographic data of participants will be recorded during the interviews, but no individual identifiers will be stored with the transcriptions. Transcriptions will be stored in a password protected file in the researchers locked office.

PART B.

Researchers will be given access to secure database on which the study video recordings are held. Only study videos will be accessible by the researchers. Access to video storage will be withdrawn following the study. Video scoring sheets will be collated and stored in a re-identifiable manner - re-identifiable to the scenario time and date only – no participant identifiers will be stored with the scoring sheets. Data from participant tools and scoring sheets will be entered into a password protected file in the researcher’s locked office. Data will be stored for 12 months following the completion of the study and then destroyed as per Mater Policy PR RSH-300314. Participants may elect to have their video data not utilised for any other purpose, or may consent to use of video data for other HREC approved studies. The option of being contacted to ask permission for use of video data in future studies is also offered. Participants who leave this section blank are considered to not have consented for use of video beyond this study.

## **SAMPLE SIZE AND DATA ANALYSIS**

Part A – initial sample size of 20 participants

Part B- Using a repeated measures ANOVA test comparing mean team behaviour scores teams, a total of 24 teams will be required to detect an effect size of at least 0.14 with a F score of 0.4.

## **ETHICAL CONSIDERATIONS**

 This study complies with the NHMRC statement on Ethical Conduct in Human Research definition of Low/Negligible risk research. This study forms part of Dr Janssens’ PhD. Her primary supervisor is A/Prof Marshall.

## **OUTCOMES AND SIGNIFICANCE**

The aim of this research is to compare a system of shared leadership to traditional singular leadership to assess the impact on patient care and health worker wellbeing. Systems of dual leadership in trauma teams have become a standard of care in many trauma services, and if demonstrated to improve team performance in simulated maternity emergencies, would lead to further evaluation in the clinical context. Even in the developed world, childbirth remains associated with significant rates of maternal morbidity and neonatal morbidity and mortality, making the design of effective systems of emergency response critical to safe patient care.

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# Appendix A - Interview questions:

Introduction:

We don’t yet know if leadership sharing will be effective in maternity, but we’d like to understand how it could be best shared.. The information gained by these interviews will be used to refine a system of leadership sharing that will be compared to singular leadership in simulation in a later part of this study.

I’m going to show you a list of leadership tasks that may be required during a maternity emergency. I’d like you to read over them and I’ll ask you a few questions.

Questions:

1. Is there anything missing that a leader should do in an emergency?
2. Is there anything there that shouldn’t be?
3. If leadership was shared, what (if anything) has been allocated to the incorrect role?
4. What would help you perform your role as either of these leaders?
5. What will make it hard for clinicians to perform these leadership roles?
6. Would you find sharing leadership in this way acceptable? why / why not?
7. Do you think this system of leadership could be implemented in practice? why / why not?

**Leadership functions**

|  |  |
| --- | --- |
| Clinical leader  | Logistics leader  |
| Seek information to assess, diagnose and re-assess patient | **Allocates clinical roles** |
| * Ask for clinical handover
* Asks for clinical information (Hx, Exam, therapy so far, clinical updates)
* Directs team member to obtain diagnostic information.
 | * Declares or affirms leadership or team member roles
 |
| Formulates and implements management plan | **Manages material resources** |
| * Gives directions to team members to perform therapeutic interventions
* Announces working diagnosis
* Communicates to team management plans, current and future
 | * Monitors and manages material resources
* Allocates tasks to team members relating to use of material resources
 |
| Anticipates and plans for potential complications | **Manages human resources** |
| * Alerts team members to monitor for complications
* Communicates contingency plans for complications or failed therapy
 | * Monitors status of human resources, calling for additional help if required (or removing excess human resources)
* Monitors performance of team member task completion and arranges team member back up when required
 |
| Co-ordination and prioritization | **Situational awareness** |
| * Advises team members of priorities for tasks
* Co-ordinates smooth performance of team actions
 | * Monitors team understanding
* Provides or requests re-caps to establish and maintain SA
* Monitors updates and provides directives to new team members arriving (including handover)
 |
| Patient communication | **Patient communication** |
| * Ensures consent for procedures
 | * Ensures communication with patient/family regarding diagnosis and management plan
 |
| Team Climate | **Team Climate** |
| * Invites and encourages team member input
 | * Invites and encourages team member participation
 |