

Are we at risk of groupthink in our approach to teamwork interventions in health care?

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CONTEXT The incidence of medical error, adverse clinical events and poor quality health care is unacceptably high and there are data to suggest that poor coordination of care, or *teamwork*, contributes to adverse outcomes. So, can we assume that increased collaboration in multidisciplinary teams improves performance and health care outcomes for patients?

METHODS In this essay, the authors discuss some reasons why we should not presume that collective decision making leads to better decisions and collaborative care results in better health care outcomes.

RESULTS Despite an exponential increase in interventions designed to improve teamwork and interprofessional education (IPE), we are still lacking good quality data on whether these interventions improve important outcomes. There are reasons why some of the components of 'effective teamwork', such as shared mental models, team orientation and mutual trust, could impair delivery of health

care. For example, prior studies have found that brainstorming results in *fewer* ideas rather than more, and *hinders* rather than helps productivity. There are several possible explanations for this effect, including 'social loafing' and cognitive overload. Similarly, attributes that improve cohesion within groups, such as team orientation and mutual trust, may increase the risk of 'groupthink' and group conformity bias, which may lead to poorer decisions.

CONCLUSIONS In reality, teamwork and IPE are not inherently good, bad or neutral; instead, as with any intervention, their effect is modified by the persons involved, the situation and the interaction between persons and situation. Thus, rather than assume better outcomes with teamwork and IPE interventions, as clinicians and educators we must demonstrate that our interventions improve the delivery of health care.

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INTRODUCTION

They might not be cute, but ants have clearly mastered the art of teamwork. Experiments have shown that when making important decisions, such as the location of a nest, the likelihood of a poor choice is significantly higher when an ant is forced to choose in isolation compared with when other colony members participate in the decision.¹ If we consider proposed teamwork competencies,² ants have a transparent leadership structure, are adaptable and, by living in colonies, have a collective orientation. Similarly, while functioning as a team, ants have closed-loop communication (including the use of pheromones to mark the path to food supplies), and practice mutual performance monitoring and back-up behaviour.² It is difficult to comment on whether ants have shared mental models and mutual trust, but collectively ants make better decisions and perform better than they do individually.

In health care, many individuals from separate disciplines contribute to the delivery of patient care. Unfortunately, the incidence of medical error, adverse clinical events and poor quality health care is unacceptably high, and there are data to suggest that poor coordination of care, or *teamwork*, contributes to adverse outcomes.^{3–6} So, can we take the example of collaborative thinking demonstrated in ants and other animals and extrapolate these benefits to human decision making and performance?^{1,7} In particular, in the area of health care, can we assume that increased collaboration in multidisciplinary teams leads to better decisions, improved performance and better health care outcomes for patients?

In this essay we would like to reopen the debate on teamwork in health care. We will begin by introducing commonly used definitions of teamwork and interprofessional education (IPE). Although IPE is clearly a separate entity from teamwork, we have included this here because one of the goals of IPE is to prepare learners for collaborative practice.⁸ Next, we will review data from the health care literature on the outcomes of teamwork and IPE interventions. We will then focus on proposed teamwork competencies and discuss some reasons why we should not assume that increased collaboration guarantees better decisions, performance and health care outcomes. We will finish by discussing meaningful outcomes for teamwork and IPE interventions and propose an experimental research agenda.

WORKING ALONGSIDE ≠ EFFECTIVE TEAMWORK

It may seem strange to be debating the merits of teamwork in health care given the long tradition of different professions working alongside each other with the goal of achieving optimal patient outcomes. However, working alongside each other and working effectively as a team are not synonymous. Xyrichis and Ream define teamwork as ‘...a dynamic process involving two or more health care professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted physical and mental effort in assessing, planning, or evaluating patient care. This is accomplished through interdependent collaboration, open communication and shared decision-making...’.⁹ Historically, different disciplines have focused on particular aspects of patient care and worked in series (or in parallel) in assessing patients, making management decisions and delivering care, rather than performing interdependent assessments and sharing decision making. In debating the merits of collaboration, we are not questioning the existence of the multidisciplinary health care team or proposing that we should consider disassembling teams. Instead, we will focus on the dynamics within teams; in particular, whether we should remove the physical and psychological barriers to collaboration and adopt the proposed model of effective teamwork that focuses on competencies such as shared mental models, team orientation and mutual trust.^{2,10}

THE PUSH TOWARDS TEAMWORK IN HEALTH CARE

In 2001 the Institute of Medicine published two reports dealing with patient safety: ‘To err is human: building a safer health system’¹¹ and ‘Crossing the quality chasm: a new health system for the 21st century’.¹² The first report commented that ‘The decentralised and fragmented nature of the health care delivery system...contributes to unsafe conditions for patients, and serves as an impediment to efforts to improve safety’ and made a recommendation to ‘Establish interdisciplinary team training programs for providers that incorporate proven methods of team training, such as simulation’. The second report also called for the ‘Development of effective teams’. Teamwork in health care did not begin with these reports,¹³ but given the frequency with which these reports are cited in studies on teamwork, and the fact that 21 389

articles were indexed in Medline under the subject heading 'Patient Care Team' in the 10 years that followed these reports compared with 1811 in the 10 years before these reports, it appears that the health care community took notice of these reports and responded with interventions to improve teamwork in health care. Recommendations for training soon followed,¹⁴ fostering the development of IPE, defined as '...an intervention where the members of more than one health or social care profession, or both, learn interactively together, for the explicit purpose of improving interprofessional collaboration or the health/well being of patients/clients, or both'.¹⁵

EVIDENCE SUPPORTING TEAMWORK INTERVENTIONS AND IPE IN HEALTH CARE

In a meta-analysis of the literature on teamwork from a wide range of disciplines with a variety of cognitive, affective, process and performance outcomes, Salas *et al.*¹⁶ provide data to suggest that outcomes are typically improved with teamwork interventions. This analysis, however, has important limitations. First, the studies included in this review had a diverse content and duration of their teamwork interventions, and outcome measures that may not be relevant to health care. Second, although methodological details for individual studies are limited, the predominant study design appears to have been a pre/post study with no control group. With this study design it is not possible to separate the effects of *teamwork training* from those of *training versus no training*, and the authors of this study acknowledge that '...it is not possible to unequivocally conclude that team training interventions cause improvements in team functioning'.¹⁶ Third, of the 2650 teams included in this analysis only 80 were health care teams (compared with 1660 teams from the laboratory or classroom, 762 teams from the military sector and 138 teams from aviation), which limits generalisability of these findings to health care.¹⁶ It is also worth noting that in this meta-analysis the effect size for changes in outcomes post-intervention was smaller for health care teams than for any other discipline.¹⁶

Reviews of teamwork interventions specific to the health care setting include a Cochrane review of five randomised trials that evaluated interprofessional rounds, meetings or audit (four of which compared an interprofessional intervention with no intervention).¹⁷ The results of this review suggest

that in some settings, work-based interprofessional interventions may lead to shorter length of hospital stay and reduced health care costs, a reduction in the inappropriate prescribing of psychotropic medication to nursing home residents and increased audit activity. A recent systematic review of interdisciplinary team interventions on general medical wards included 30 studies (of which 17 were randomised controlled trials) assessing the impact of teamwork initiatives on health care outcomes.¹⁸ Interventions included the addition of a pharmacist to the clinical care team, geriatrician-led teams to increase detection and guide management of delirium, and an antimicrobial-utilisation team to screen for unnecessary prescribing of antibiotics and provide information to prescribers. The authors of this review concluded that the majority of these interventions did not reduce mortality, length of hospital stay or hospital readmission rates.¹⁸

Chakraborti *et al.*¹⁹ performed a systematic review of the literature on the impact of teamwork training for medical students and residents. Overall, outcomes (which were primarily judged by self-assessment) were improved with teamwork training, but the majority of studies (10 of 13) in this review had a pre/post design with no control group. Of the three studies that included a control group, two failed to show an improvement in teamwork in the intervention group compared with the control group.^{20,21} In a recently updated Cochrane review of the impact of interprofessional education on professional practice and health care outcomes, Reeves *et al.*¹⁵ identified 15 studies on IPE but, once again, each study compared the effect of an IPE intervention with no educational intervention. Of the 15 studies, seven showed a positive impact compared with no intervention, four had mixed outcomes, and four showed no impact on either practice or patient outcomes.

Around the time that the Institute of Medicine reports were published, an editorial in the *British Medical Journal* questioned the merits of teamwork interventions based upon the literature of that time.²² In the 15 years since, there have been thousands of publications on teamwork and there is now a growing industry that will, for a fee, import models of teamwork training developed for aviation and business into health care.²³ Yet, we are still lacking good quality data suggesting that teamwork interventions or IPE actually improve decision making, team performance and health care outcomes.

COMPONENTS OF 'EFFECTIVE TEAMWORK'

To understand why interventions designed to improve teamwork may or may not improve the team process, performance and outcomes, we need first to understand the construct of teamwork. Most models describing teamwork acknowledge multiple dimensions, although consensus is lacking on the precise number and description of these dimensions. Using realist synthesis, Hewitt *et al.*^{24,25} identified 13 'mechanisms' of teamwork. The framework of the Canadian Interprofessional Health Collaborative includes six competency domains.²⁶ Salas *et al.*^{2,10} defined the 'Big Five' in teamwork, which was then expanded to eight 'critical teamwork competencies': team leadership, mutual performance monitoring, backup behaviour, adaptability, team orientation, shared mental models, mutual trust and closed-loop communication. These competencies have guided the content of curricula for team training interventions in education and health care, including TeamSTEPPS® (Team Strategies and Tools to Enhance Performance and Patient Safety).^{27–29} However, as discussed above, the evidence supporting this model (and other models) of effective teamwork comes largely from pre/post intervention studies that do not have a comparison intervention, so this model and its individual components lack experimental validation. This type of validation is important because there are data to suggest that some of the proposed teamwork competencies, such as collaborative decision making (or 'shared mental models'), can also impair decision making and performance.

THE ALLURE OF COLLABORATIVE DECISION MAKING

The notion that collaborative decision making leads to better decisions is enticing because we typically seek the advice of others when faced with difficult decisions and, on a larger scale, we live in a democratic society that seeks the input of many individuals when making important decisions. In short, we have been conditioned to use social heuristics, such as the 'wisdom of crowds', when making complicated decisions.^{30–32} In the 1950s Osborn³³ popularised the concept of collaborative thinking in a non-judgemental environment, or *brainstorming*, which he felt led to more creative thinking by his employees. This notion of intellectual synergy between individuals thinking and working in teams has been embraced by the business

community and industrial organisations^{34,35} and has fuelled the move towards open-plan work places so that barriers to collective intelligence could be removed.³⁶ There are data to support the notion that under certain circumstances (e.g. when trying to estimate the number of jelly beans in a jar) taking the aggregate of opinions is consistently better than following the advice of any given individual.³¹ However, there is also a large body of literature questioning the utility of collaborative decision making.

THE COGNITIVE DISADVANTAGES OF COLLABORATIVE DECISION MAKING

Almost from the start of the brainstorming and teamwork revolution there were data suggesting that thinking and working in groups results in *fewer* ideas rather than more, and *hinders* rather than helps productivity.^{37–41} There are several possible explanations for this effect, including 'social loafing', where some individuals apply less effort when trying to solve problems in a group.⁴² In those who do not loaf in group activities, brainstorming may increase the risk of cognitive overload. Ideas are generated and processed in the working memory, which has a limited capacity and is, therefore, susceptible to overload.^{43,44} During the process of brainstorming, while one person is proposing ideas the others must juggle multiple competing demands on the working memory, such as listening attentively and processing the ideas of others, generating their own ideas, trying to remember recent ideas, and worrying how the members of the group might judge their ideas.³⁶ Thus, the cognitive multi-tasking involved in brainstorming may overload the capacity of the working memory, which results in fewer and less well-processed ideas being generated.

GROUPTHINK AND GROUP CONFORMITY BIAS

During the process of collaborative decision making, humans may influence and bias each other's decision making. When examining the decision making processes during 'fiascos', Janis described the process of *groupthink* that he felt led to poor decision making.^{45–47} He defined groupthink as 'a mode of thinking people engage in when they are deeply involved in a cohesive in-group, when the members striving for unanimity override their motivation to realistically appraise alternative courses of action', and some of the symptoms of groupthink that he

identified include 'collective rationalisation', 'self-censorship', 'direct pressure on dissenters' and 'self-appointed mind guards'.^{45–47} Despite the ongoing debate in the psychology literature on the validity of this model, even those who contest the groupthink model agree that certain group dynamics may increase the likelihood of poorer decisions and that this effect is ubiquitous.^{48,49}

Direct evidence of the potential for collaborative decision making to lead to poorer decisions comes from the literature on group conformity bias. In general, when humans interact together there is preference for consistency and this may lead to individuals changing a decision to avoid inconsistency.⁵⁰ Group conformity bias was first described by Asch more than 60 years ago in a series of psychology experiments, and has also been described in the context of medical education.^{51–53} In recent experiments involving nursing and medical students, Kaba *et al.*⁵⁴ found that both groups of students were susceptible to group conformity bias, although nursing students were significantly more likely to conform to the opinion of medical students than vice versa. In these experiments, group conformity resulted in incorrect interpretation of important physical findings, from which we can infer that this type of bias could increase the risk of adverse clinical outcomes. When interviewed after the experiment three-quarters of participants who demonstrated conformity bias denied conforming, suggesting that preference for consistency and pressure to conform are largely subconscious and may, therefore, be difficult to modify.^{55,56}

WHY WE SHOULD ACCEPT THE UNPREDICTABLE RELATIONSHIP BETWEEN COLLABORATION AND PERFORMANCE

The fact that there are divergent bodies of literature on the effect of collaborative decision making on the quality of decisions and performance implies that the effect of collaboration on decision making cannot be inherently good, bad or neutral. Instead, we can conclude that in a given context, collaboration can utilise the wisdom of crowds and improve decision making, whereas in a different context collaboration may lead to social loafing, cognitive overload or pressure to conform, each of which might contribute to poorer decisions and fiascos (Fig. 1). In addition to collaborative decision making or shared mental models, we should also question whether some of the other components of the effective teamwork model might have an unpredictable

effect on team performance. For example, does training in 'team orientation' increase the likelihood of group conformity? Does 'mutual trust' foster symptoms of groupthink, such as 'illusion of invulnerability' and 'belief in group's inherent morality'?⁴⁶ If we acknowledge that the impact of collaboration on performance is unpredictable, we can then focus on identifying contextual variables that influence the outcomes of collaborative practice in health care and explore whether interventions that mitigate social loafing, cognitive overload and groupthink in other fields can also improve the outcomes of collaborative care in the health care setting.^{57–60}

WHY WE SHOULD NOT USE PROCESS OUTCOMES TO JUDGE THE EFFECTIVENESS OF TEAMWORK INTERVENTIONS AND IPE

The effectiveness of teamwork interventions is most frequently evaluated by questionnaires capturing self-assessed changes in cognitive, affective and process outcomes.^{16,19,23} The 'explicit purpose' of IPE is '...improving interprofessional collaboration or the health/well being of patients/clients, or both'.¹⁵ The implication here is that for teamwork interventions and IPE, process outcomes are either equal to or a surrogate for patient outcomes. In an analysis of the literature on interprofessional collaboration, Haddara and Lingard⁶¹ identify two different discourses: *utilitarian*, where the value of collaboration is dependent upon demonstrating that this improves 'outcomes', and *emancipatory*, where interventions to improve collaboration are justified if they result in 'flattening of the power hierarchy' that has traditionally existed in interprofessional care. Considering these results to be equal is at odds with clinical medicine where patient-centred outcomes are increasingly required to justify health-care interventions.^{62,63} The fact that the individual components of the effective teamwork model (such as collaborative decision making) have an unpredictable relationship with performance implies that these process outcomes cannot be considered as valid surrogates for patient outcomes. Consistent with the utilitarian perspective, we propose that unless we can provide evidence based upon consequences for process variables, we should use patient-centred performance measures to evaluate teamwork interventions and IPE, and that interventions to improve teamwork should be considered 'effective' if and when we can demonstrate an improvement in these outcomes.²³

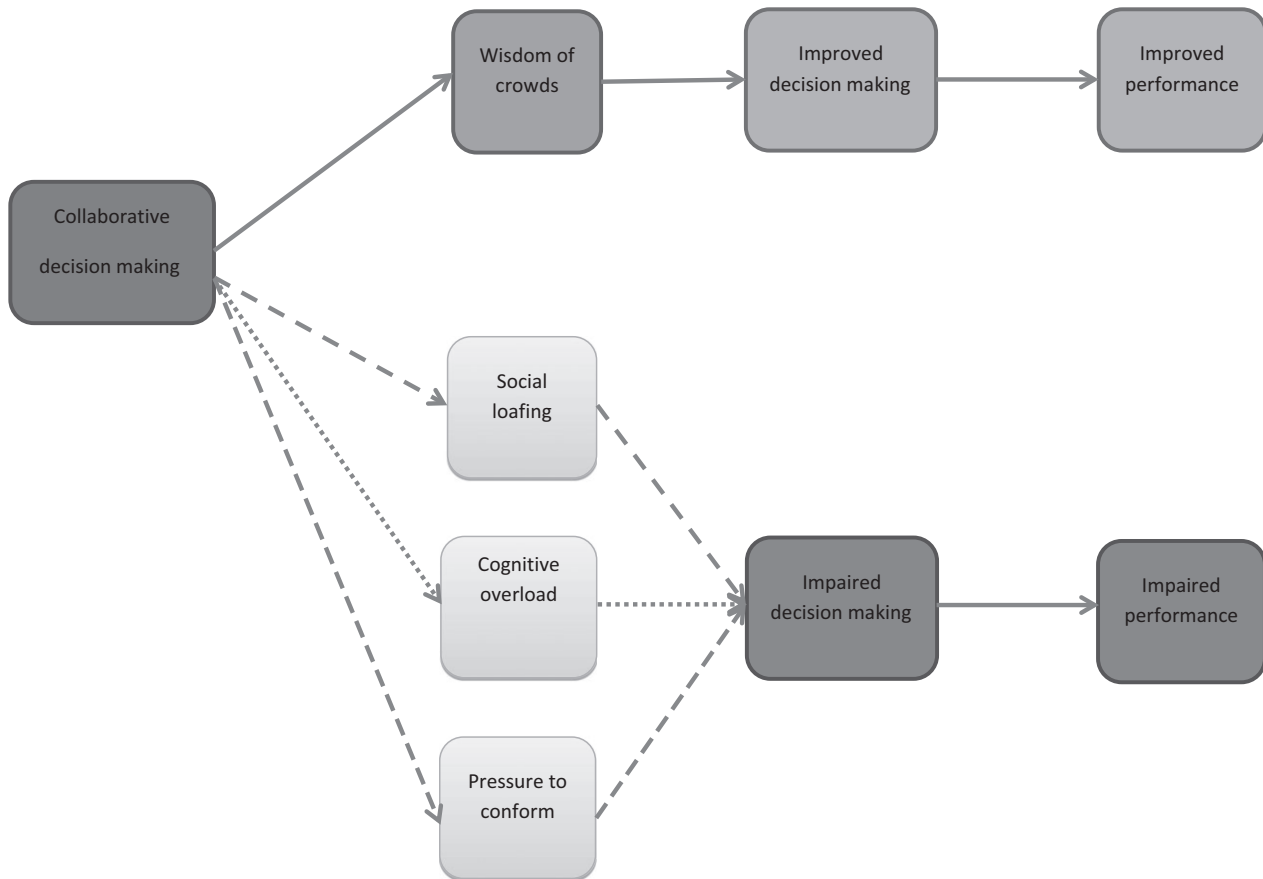


Figure 1 Impact of collaborative decision making on the quality of decisions and subsequent performance

DEVELOPING AN EXPERIMENTAL RESEARCH AGENDA FOR TEAMWORK INTERVENTIONS AND IPE

Ideally an experimental research programme should begin with defining the construct of interest, providing evidence to support the validity of tools assessing this construct, performing experiments to evaluate interventions that might improve important outcomes, and then designing pragmatic studies to see if our interventions improve these outcomes in real life. We would then move on to studies of the comparative effectiveness and cost-effectiveness of different interventions, after which we could make evidence-based recommendations.⁶⁴ Interestingly, teamwork interventions and IPE appear to have bypassed most of these steps and many centres are already implementing teamwork interventions, presumably based upon the assumption of effectiveness.^{27,29,65} Similarly, despite limited data on effectiveness, having a formal curriculum for inter-professional training of medical students is now an accreditation standard for medical schools in North America.⁶⁶ In education and health care it not

unusual for implementation to charge ahead of the evidence base, but this does not excuse us from trying to catch up.

In proposing an experimental research agenda, we are not suggesting that we halt all teamwork and IPE activities until we have solid evidence that all outcomes are improved by these interventions. This goal is unrealistic because the effect of any intervention is modified by the persons involved, the situation and the interaction between the persons and situation.⁶⁷ Thus, our ambition is not to determine whether teamwork and IPE interventions are good or bad; instead, we need to define which outcomes can be improved by which interventions in which context. Instead of interrupting teamwork and IPE activities, which would limit our ability to gather evidence on effectiveness, we would suggest that we take advantage of the momentum in these areas by incorporating assessment of patient-centred outcomes into existing and planned teamwork and IPE interventions. This approach would allow us to accelerate our research agenda in these areas. Encouragingly, some progress is already being

made, including the development of assessment tools with internal structure evidence of validity⁶⁸ in addition to studies that have attempted to measure changes in important clinical outcomes (albeit with varying success).^{69–72} However, there is still much work to be done before we have an evidence base from which to make strong recommendations on teamwork interventions and IPE.⁷³

CONCLUSIONS

Contemporary health care is delivered by multiple professions working together with the goal of optimising patient outcomes. Outcomes are frequently suboptimal and there are data to suggest that poor teamwork may contribute to poorer health care outcomes. It seems logical, therefore, that interventions designed to improve teamwork, including IPE, should improve health care outcomes. However, logic is not a surrogate for better performance or improved outcomes, and the strong arguments suggesting that teamwork interventions and IPE will improve decision making, performance and clinical outcomes can be countered by equally strong arguments as to why these might impair process, performance and outcomes. According to Janis,⁴⁶ being closed minded and failing to criticise proposed models and interventions is one of the symptoms of groupthink. Thus, to minimise the risk of groupthink as we move forward with teamwork interventions and IPE, we need to critically evaluate our performance and, more importantly, we need patients and clients to tell us if our interventions are effective.

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