Progressive Independence in Clinical Training: A Tradition Worth Defending?

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Abstract
Background: Progressive independence is a traditional premise of clinical training. Recently, issues such as managed care, work hours limitation, and patient safety have begun to impact the degree of autonomy afforded to clinical trainees. This article reviews empirical evidence and theory pertaining to the role of progressive autonomy in clinical learning.

Method: A computerized literature search was performed using Medline, PsycINFO, Social Sciences Citation Index, and Educational Resources Information Center. This article presents a synthetic review of relevant empirical and theoretical concepts from the domains of medicine, psychology, education, kinesiology, and sociology.

Results: The clinical psychology and medical education literatures provide evidence that clinical trainees act more independently as their training progresses, but have not yet evaluated the educational efficacy of providing progressive independence, or the consequences of failing to do so. The expertise and motor learning literatures provide some theoretical evidence (as yet untested in complex clinical environments) that the provision of too much guidance or feedback to trainees could be educationally detrimental in the long term. The sociology literature provides insight into the cultural values underlying the behavior of clinical teachers and trainees relating to issues of supervision and independence.

Conclusions: There is limited empirical support for the current model of progressive independence in clinical learning; however, diverse theoretical perspectives raise concern about the potential educational consequences of eroding progressive independence. These perspectives could inform future research programs that would create a creative and effective response to the social and economic forces impacting clinical education.
Traditionally, the clinical education of medical trainees involves a process of progressively independent delivery of patient care by a trainee, associated with a decreasing level of supervision by clinical teachers. The trainee eventually reaches competence for independent practice, presumably at the end of a multi-year training program. The concept that progressive independence is necessary in order for clinical trainees to become competent, independent practitioners is clearly entrenched in medical education policies and practices. Both American and Canadian policy documents on clinical supervision of postgraduate medical trainees contain the notion of 'graded, progressive responsibility’. Clinical training programs across North America are based on the assumption that trainees should be permitted clinical independence “to an extent that is justified by the competence and experience of the trainee.” From an educational perspective, then, the extent of trainees’ clinical independence is to be determined by their relevant skills and experience (and their supervisor's assessment of such).

In recent years, however, a number of forces outside the realm of medical education have begun to impact the nature of the clinical supervision provided to medical trainees and the degree of clinical autonomy that they are afforded. These forces include managed health care and Medicare, resident work hours legislation, and the patient safety movement.

The widespread implementation of managed health care systems across the United States has had an undeniable effect on clinical training programs, although the benefits and drawbacks of this effect are still hotly debated. The specific changes in clinical training programs related to supervision and autonomy include a shift toward more training in ambulatory settings (where it has been argued that trainees have less continuous, autonomous patient care experience than they do in the traditional inpatient setting) and limitations by managed care companies on autonomous trainee performance of specific patient care activities. Medicare rules have had a further impact on clinical training and supervision practices, as reimbursement for clinical services provided by trainees has been limited to situations where the presence of the supervising physician is documented.

In the past 15 years, policies and legislation to limit resident work hours have come into effect throughout North America. Although recent evidence suggests that trainees’ exposure to important clinical experiences may not be decreased in the new work structure, limits to resident work hours are often identified as a significant impediment to trainee autonomy, as trainees were thought to have the bulk of their independent patient care experiences during overnight on-call shifts. The debate continues about whether the increased time for nonclinical learning (and rest, etc.) outweighs any potential loss of clinical experience and continuity.

Finally, with the increasing awareness of the prevalence of medical errors, patient safety has become a central concern in clinical training. A number of studies documenting that higher levels of direct supervision result in improvements in guideline compliance, changes in treatment plans, or better patient outcomes all directly or implicitly conclude that the level of supervision provided to clinical trainees should increase, and trainee autonomy decrease, in order to improve quality of care and patient safety. Calls for increased vigilance in clinical supervision in the name of quality and safety have also hailed from government committees, medicolegal review boards, medical education researchers, clinical specialists, and the popular press. These
recommendations clearly imply a central role for the supervisor’s immediate personal responsibility for patient safety. Personal responsibility and accountability for patient safety and quality of care are issues which have been recognized by prominent safety theorist James Reason as necessary additions to the systems of care issues emphasized in much of the patient safety literature.

It is clear that the issues shaping clinical training in recent decades have been social, political, and administrative, rather than educational. The resultant changes in clinical training practices have occurred without the support of a body of empirical or theoretical work examining their educational impact. There is to date in the medical education literature little reflection on the potential long-term educational consequences of altering the traditional clinical training model of progressive independence. Significant alteration of the level of supervision and degree of autonomy provided to clinical trainees has the potential to alter the nature of the clinicians who graduate from the system. The impact of forces like managed health care systems, resident work hours legislation, and the patient safety movement has produced an urgent need for consideration of the relationship between clinical supervision, trainee autonomy, and the development of the skills necessary for expert independent practice, in order that an empirically sound research and advocacy agenda might be developed to inform policy decisions in clinical training.

The purpose of this review is to consider both empirical evidence and theory that pertain to graduated responsibility in clinical training and the role of trainee autonomy in clinical learning. Due to the paucity of relevant evidence and theory in the medical domain, our search led us to consider theoretical perspectives and data from other related disciplines (nursing, psychology, education, kinesiology, sociology). This article is a synthesis of the findings of this broad-based review, with a focus on the implications of these ideas for future research guiding the development and evaluation of clinical education practices that will promote the development of expert, autonomous professionals.

Method

A computerized literature search was performed of the Medline (1966 to February 2005), PsycINFO (to June 2004), Social Sciences Citation Index (to February 2005), and the Educational Resources Information Center (ERIC, to June 2004) databases. Search terms included combinations of clinical supervision, resident supervision, progressive independence, supervision and feedback, guided practice, trainee autonomy, and unsupervised learning. The bibliographies of relevant articles obtained by these methods were also inspected. In an attempt to include the widest possible spectrum of relevant theoretical perspectives, experts in the domains of cognitive psychology, education, kinesiology, and health policy were polled for suggestions for additional search terms. Articles were considered for inclusion in this review if they described or evaluated the relationship between supervisory practices, learner autonomy, and educational outcomes. Articles regarding the therapeutic nature of the supervisory relationship, the clinical supervision of practicing clinicians, and resident work hours were not included. Both empirical studies and papers of a theoretical nature were included. Due to the wide variety of contexts, methodologies, and disciplines represented in the papers that were reviewed, no systematic meta-synthesis was feasible. This article is not intended to provide a comprehensive bibliographic review (see Kilminster and Jolly, 2000), but is rather a synthesis of the most relevant empirical and theoretical concepts related to progressive independence in clinical learning from the domains of medical education, clinical psychology, education, cognitive psychology, kinesiology, and the sociology of medicine.
Results

Medical education

The medical education literature demonstrates a pervasive acceptance of the notion of progressive independence in clinical training, but empirical evidence regarding the efficacy of related practices is lacking. The perceived benefits of autonomous clinical practice during training were articulated by junior doctors (equivalent to residents in North America) interviewed in the United Kingdom who stated that being permitted to work unsupervised “allows a degree of freedom to make decisions independently and stand on your own feet,” and allows one to “learn to take responsibility,” but no empirical evaluation of these claims is provided. A study of family medicine residents showed that residents consulted their supervising physicians about a decreasing number of their patients as they gained experience, thus demonstrating a progressive clinical independence, but the study did not include any evaluation of the effectiveness of this process. The notion of a progressive independence in learning, and the associated need for progressively less guidance from tutors, is also described in the literature on problem-based learning, but again there is little empirical study of the concept.

A related body of literature examines the educational effects of changes to the clinical supervision (and presumably to the level of independence) of trainees. No studies have systematically assessed the effects of increasing the intensity of trainee supervision on the educational experience of those trainees. There are, however, a small number of studies that peripherally address the educational effects of an increase in clinical supervision. A prospective, nonrandomized cohort study of pediatric residents compared residents who had clinical experience in the offices of private pediatricians with those whose experience occurred in hospital settings or publicly funded clinics. The residents who trained in the private offices, where they had more direct supervision and a “better patient mix,” had better results on the Behavioral Pediatrics portion of their final examination than the residents who trained in the other settings. This study has been cited to support the claim that increased supervision is educationally beneficial, but consideration should be given to possible confounding variables and choice of outcome measure when interpreting the results. Similarly, questionnaire and interview studies have concluded that increased supervision would enhance the education of trainees because the trainees themselves report that they benefit from a higher degree of supervision. However, without well-designed outcome studies to assess the educational effects of differing levels of supervision, it is unclear whether the residents’ desire for more supervision represents a desire for an improvement in their educational experience, or merely a desire for a higher comfort level in clinical situations. On the other hand, a nonrandomized evaluation of the implementation of a hospitalist system showed a “nearly” significant decrease in residents’ ratings of their independent decision making ability after the arrival of the hospitalists (who provided a more constant supervisory presence on the wards than did the attending physicians). This study raised concern about the educational implications of the increased supervision (and decreased trainee independence) in a hospitalist system. In summary, there is little information available about how clinical supervision affects trainee learning in the long term, and the support for the educational effects, either positive or negative, of increased clinical supervision in the medical education literature is sparse.
Counseling psychology and education

The clinical domain that has developed the most support for the principle of progressive independence in clinical training is that of counseling psychology. Although there is ongoing debate in the field, there is a wealth of empirical evidence that supports a developmental model for the cognitive, attitudinal, and identity changes that occur over the course of clinical training in counseling. Models of effective supervisory strategies have been developed for trainees at different stages of development, which progress from being highly structured, with intensive supervision and feedback for the novice, to being collaborative and consultative for the advanced trainees. Although the developmental model of supervisory strategies in this domain is sophisticated, the evidence supporting the need for progressively less directive supervision is derived primarily from self-report by trainees about their perceptions of their supervisory needs, and thus objective evidence for the effectiveness of this approach is lacking. Arguably the best evidence for the effectiveness of a developmental model of supervision comes from the domain of teacher education. Barak et al. found that when the supervisory approach was matched to the developmental level of the teacher-in-training (directive approach for trainees with a low level of conceptual understanding, collaborative approach for trainees with a medium level of conceptual understanding, and nondirective approach for trainees with a high level of conceptual understanding), better learning outcomes were achieved by the students taught by the trainee teachers.

Cognitive psychology: expertise

A different approach to the importance of independent practice for learning can be found in the psychological literature on expertise. Two important theorists in the expertise field, Dreyfus and Dreyfus, developed a model involving five stages of skill acquisition: novice, advanced beginner, competent, proficient, and expert. It has been suggested that medical school moves students from the novice to the advanced beginner stage, and that residency is focused on the progression of physicians from advanced beginner through the competent stage to early in the proficient stage. In nursing studies, it has been shown that educational needs change as an individual proceeds along the stages of skill acquisition. Novices and advanced beginners cannot recognize pertinent details or prioritize actions, and thus require deliberate guidance in clinical work. Clinicians in the competent stage, however, must be engaged in active decision making and must take responsibility for the results of their actions in order to integrate new information into their increasingly extensive understanding of clinical situations. This implies that some degree of independence is required for clinicians at the competent stage in order for them to progress toward expertise. This body of literature has not gone so far as to test various instructional approaches for their ability to promote progression through the stages of skill acquisition.

Critics of the Dreyfus model argue that progression toward expertise must be more deliberate than this model implies, and that the acquisition of expertise does not come automatically with sufficient experience. Bereiter and Scardamalia, who distinguish between experts and “experienced nonexperts,” see the expert as one who chooses to “progressively advance on the problems constituting a field of work.” They see the development of expertise as the deliberate choice to approach a field of work at the upper limit of complexity that is manageable, and claim that this choice must be made early in one’s career. The implications of this line of thinking for clinical teaching are that...
trainees must work at the upper edge of their competence (i.e., without “overprotection” by a supervisor) in order to develop expert performance. Another important body of work in this vein follows the pioneering work of K. Anders Ericsson, who developed the notion that the acquisition of expertise requires years of intensive engagement in what he has termed “deliberate practice,” which he distinguishes from play and from work. The essential components of deliberate practice include the intention to improve performance, the engagement in activity that is sufficiently challenging, and the provision of immediate, informative feedback combined with opportunities for application of this feedback by correcting errors. That the acquisition of expert performance corresponds directly with the number of hours spent engaged in deliberate practice has been documented in such diverse fields as chess, musical performance, sports, teaching, insurance sales, and acquiring medical decision-making skills in laboratory settings. The application of the notion of deliberate practice for clinical teaching would imply that supervision close enough to provide informative feedback while allowing enough independence to challenge a trainee’s abilities is necessary for the development of clinical expertise.

**Kinesiology: motor learning**

Further support for the need for a certain measure of independence in learning is provided in the kinesiology literature on motor learning. In simple motor tasks, like blindfolded limb-positioning, it has been clearly shown that feedback providing knowledge of results (e.g., information about how far a movement was from the target and in which direction) improves performance. When this feedback is provided after every trial, performance improves faster than if summary feedback is provided after a group of trials. However, once the feedback is removed, performers who had summary feedback maintain their performance at a much higher level than do performers who were accustomed to receiving feedback after each trial. This has been interpreted as evidence that frequent feedback is detrimental to learning, as it is used as a ‘crutch’, preventing the development of self-regulatory capacities. This line of inquiry is just starting to be applied to the clinical domain in simulation settings. If the principles derived from this simple motor learning paradigm can be applied to the complex learning environment of clinical education, however, the implication would be that the frequent feedback provided through intensive supervision of clinical trainees could impede their ability to maintain their level of performance once the supervision is withdrawn at the end of their training program.

**Sociology of medicine**

Issues of trainee autonomy and clinical supervision are culturally situated phenomena, and research in the sociology of medicine provides critical insight into how they unfold, the motivations underlying them, and their relational quality. Thus research into the culture of clinical apprenticeship is also centrally relevant to the clinical supervision practices that affect trainee autonomy. Lave and Wenger have used the concept of “legitimate peripheral participation” to describe situations, like clinical training, where a novice participates in a social practice that includes learning as an integral part. Clinical training, in their conception, is a “situated activity” where the “situatedness” involves not only the physical setting but also the relational character of learning and knowing, and the negotiated character of meaning. All communication between clinical teachers and trainees thus happens in the context of, is shaped and constrained by, and can only be interpreted through, the culture of clinical medicine. The cultural effects on
communication related to clinical supervision have been reported in ethnographic studies of medical training. Sinclair describes the pressure caused by the constant evaluation of clinical trainees by their supervisors that results in a tendency for trainees to be dishonest in discussions of their management decisions. Similarly, Lingard et al. found that medical students attempt to disguise their uncertainty during case presentations in order to portray an air of competence. Sommers et al. report that due to implicit beliefs about the evaluative function of the case presentation, medical students will attempt to “read the attending” and alter the content of their presentations based on their perception of what the attending physician wants to hear. The culture surrounding the evaluative aspects of clinical education thus shapes supervisor–student communication about patient care in a way that is highly relevant to supervisors’ ability to determine a trainee’s competence to act independently in any given situation. The tendency for trainees to disguise any knowledge gaps or uncertainty in order to benefit their evaluations is an impediment to implementation of the educational principle that clinical independence should be granted in accordance with supervisors’ assessments of trainees’ competence. Any educational intervention aimed at improving the educational impact of supervision practices will be implemented in the cultural context of clinical training, and the efficacy of such interventions will depend on the degree to which the cultural context is considered in the intervention design process.

Conclusions

In summary, the time-honored and well-entrenched tradition of clinical education through an apprenticeship system of progressively independent clinical practice has, as yet, little empirical support or theoretical basis. However, the thrust of recent social and economic developments creates the possibility that the compelling, but, to date, merely intuitive, model of progressive independence in clinical training will be lost in an unreflective attempt to ensure efficient health care, resident well-being, quality of care and patient safety in the short term. The time has come to reflect more fully on what function trainee autonomy plays in the development of a safe and self-regulating professional, and what the model(s) of supervision should be to ensure that this experience of autonomy is maximized within a framework of safe, efficient practice.

A broad look at the literature raises concern that a significant decrease in trainee autonomy, whether due to changes in practice setting, work hours, or supervision practices, might have the unintended long-term consequence of producing clinicians who have had little experience in functioning independently. The current review provides a framework from which to reconsider the tension between the short-term need to maximize efficiency and safety, and the long-term need to produce independently functioning clinicians. The results of this review have implications for a broad-ranging research agenda in this domain. Firstly, application of the expertise and motor learning studies in the medical education domain would usefully expand the theoretical framework on which clinical training models are based. For example, the frequency and type of feedback provided as trainees learn complex technical procedures could be experimentally manipulated and the educational effects of different levels of feedback could be compared. Such a research program could be initiated in the simulation laboratory, though the extent to which autonomous practice in the simulated situation can functionally replace autonomous experience in the real clinical situation with all its complexities and constraints would have to be explicitly evaluated. Secondly, the studies associating clinical supervision with patient care outcomes should be extended to provide a long-term picture. Studies that associate different models of clinical supervision with patient outcomes beyond the immediate patient care encounter would start to address
the educational impact of these models. Thirdly, new and creative models of clinical supervision that incorporate both educational and practical considerations, with deliberate incorporation of opportunities for trainees to experience autonomous practice, need to be developed and evaluated. Supervision practices informed by coaching principles, clinical training that encompasses competency-based instruction, and formalized systems of deliberate practice and feedback are models that could be evaluated, and this evaluation would have to include careful consideration and development of appropriate outcome measures that would assess proficiency at autonomous, self-regulating practice. Finally, rigorous sociological research exploring the cultural context of clinical supervision, as it relates to trainee autonomy and education, is required in order to inform the implementation of any new clinical supervision initiatives. In-depth study of the multiple and potentially conflicting roles of clinical supervisors (such as patient care provider, teacher, and evaluator) and clinical trainees (such as patient care provider, learner, and evaluated student) would contribute to a theoretical understanding of the relationships which form the basis of clinical learning.

Recently, social and economic movements have changed clinical training practices without a prior understanding of how these changes could affect trainee autonomy and ultimately the expertise of physicians. Without further study, we cannot be sure that changes to clinical training practices, implemented without consideration of the potential educational role of autonomy, would not ultimately lead to deterioration in quality of care by interfering with the development of independent, expert physicians. This article has reviewed the limited empirical support for our current model of progressive independence in clinical learning, and has considered relevant theoretical perspectives on the role of autonomy in learning from a number of domains. These perspectives could inform future research programs that would create a more creative and effective response to the forces impacting clinical education. Such programs would lead to the development of new models of supervision that involve the deliberate construction of opportunities for trainees to experience and learn the nature of autonomous, self-regulating practice. Once these models are developed and tested, medical educators will be better equipped to defend, through curriculum and policy development activities, clinical training practices that have maximal educational benefit.

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Section Description

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