NURSING AND GENETICS: A FEMINIST CRITIQUE MOVES US TOWARDS TRANSDISCIPLINARY TEAMS

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Genetic information and technologies are increasingly important in health care, not only in technologically advanced countries, but world-wide. Several global factors promise to increase future demand for morally conscious genetic health services and research. Although they are the largest professional group delivering health care world-wide, nurses have not taken the lead in meeting this challenge. Insights from feminist analysis help to illuminate some of the social institutions and cultural obstacles that have impeded the integration of genetics technology into the discipline of nursing. An alternative model is suggested – the transdisciplinary model – which was developed initially by a nurse and introduced in the 1970s into the delivery of health care and social services for children with developmental disabilities. This holistic model enables all health care professionals to have an equal voice in determining how genetic health care will be globalized.

Introduction

'As society moves forward from a highly specialized, individualized, and competitive model of health care delivery' (p. 1),[1] it is important to critique existing models of practice in order to construct new models that are more collaborative, interactive, multiskilled and nonhierarchical, or transdisciplinary.

Feminist thought in the last few decades has both drawn on and contributed to a variety of critical social movements; it has thus been a rich source of insights and strategies for groups seeking to alter traditional hierarchies and oppressions. As well as a model for social activism, feminism has provided various theoretical contributions to the self-understanding of individuals and groups, starting with consciousness-raising in the early years of second-wave feminism and culminating in recent years with theoretical contributions to epistemology, metaphysics, ethics and political theory.[2] Recent feminist theorists have come to

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recognize the importance of contextualizing oppression, supplementing the category of gender with other matrices of subordination, including class, race, sexual orientation or physical (dis)ability. Even when gender is not a primary vehicle of discrimination, the insights derived from the long struggles of feminists against gender-based oppression contribute significantly to the strategies of other groups who are attempting to deal with imbalances of power in social institutions.

We focus on one profession – nursing – and on one serious problem that this profession faces: the global delivery of morally conscious genetic health care in an important period of technological expansion. To address this pressing contemporary problem we suggest an egalitarian solution, which feminists will find both familiar and sympathetic. We propose a transdisciplinary model for disseminating genetic services because the common challenge of improving people's health requires a holistic perspective of how to use genetic science in the light of rapidly changing economic, political, technological and social realities around the world.

Feminism and nursing

The first nursing professionals were women and the profession remains 94% female in the USA. Although many nurses are also feminists and some of the most notable early feminists were nurses,[3] from the earliest days the primary self-identification of nurses has been a professional, not a gender, identification. Florence Nightingale conceptualized nursing as an autonomous collateral profession to medicine, with its own rationale, range of responsibilities and philosophical foundations. The nurse exercises authority over nonmedical treatments for persons who are temporarily or chronically ill, whereas the doctor provides medical treatment to cure disease. The nursing profession is very conscious of the extent to which the gender of its practitioners has contributed at various points in its history to the devaluation of the profession internationally in comparison with its predominantly male brother-discipline of medicine. The result has been a history of alliances and distancing between feminism and nursing, and between nursing and medicine.

The analogies between subordination by virtue of gender and subordination by virtue of professional identification are striking enough to provide some hope that strategies and approaches that have proved fruitful in dealing with gender issues will also help to understand better and deal with some challenges that nursing currently faces. It is feminism as a critical social theory that informs our understanding of the cultural context of nursing and its intersection with the discipline of medicine historically, and specifically with medical genetics in the future. Theoretical developments in feminist epistemology and philosophy of science help to clarify the different approaches that each profession takes to scientific developments of common interest. Feminist practice, too, offers useful strategies for professional nursing. Most feminist practices operate on nonhierarchical, egalitarian, peer-based models. An egalitarian collaborative model of the sort central to feminist politics informs our recommendations about the development of a transdisciplinary model for genetic practice, education and research.

Three global forces

The recent explosion in genetic research and the proliferation of technologies associated with genetic medicine are already having a noticeable impact on the delivery of health care and can be expected to have even greater influence in the future. There are several global forces that will increase demand for genetic services around the globe in the future. Three are identified here: (1) increasing world population; (2) increasing impact of a western attitude towards applied technology on traditional societies; and (3) increasing application of discoveries from the Human Genome Project that promote new genetic diagnostic methods and treatments in health care delivery and exploration in human evolution research.

As genetic technologies proliferate on a global scale, they impact on individuals and populations in ways that demand consideration beyond the provenance of a specific disciplinary perspective. They create moral uncertainties and ethical dilemmas. Economic incentives, scepticism about science, expectations for fair and nonexploitative practices and demand for consumer satisfaction, complicate the integration of genetic services into already established models of clinical practice. Health care professionals need to collaborate[4,5] in order to provide genetic services and genetic research in a manner that promotes trust, enhances quality of life and prevents unintended exploitation. Nurses should be utilized around the world as clinicians, researchers and policy makers to help to bridge an ever-widening gap between this new genetic science, cultural values and human diversity.

There are immediate as well as hidden or latent powers and unknown possibilities within the unfolding of technology as human beings continue to use it. Because of this power, and because technology is itself produced by scientists and technicians who use methods that denature, objectify, quantify, splice and clone DNA, this world view and its inherent assumptions could dehumanize human beings because the mode of defining reality within the mind set of technological thinking,[6] scientism and instrumentality forget aspects of being human that go beyond pure rationality.[7] It is far too easy to overlook the fact that technology is not neutral, but is transformative of the nature of being human.[8]

The three global forces noted above will increase the demand as well as the complexities involving applications of human genetics. The common thread tying them together is their individual and synergistic potential irreversibly to alter civilization by changing cultural patterns of procreation and societal definitions of what it means to be human. The globalization of genetics represents promises of advantage, but also dangers, in each of these areas. Although a philosophy of technology drives up the demand for genetic technologies and their immediate application in health care, there is an opposing force against the use of technology due to fear that it could be used to control world population or discriminate against people and nations who are vulnerable to exploitation. The task that lies ahead is to find a way of using genetic technology to benefit, but not harm, as many members as possible of the wider human community, without imperiling, disadvantaging or exploiting the particular societies in which it is used.

Nursing and genetics

Historically, nurses involved in clinical genetics in the USA adopted a medical model approach to understanding and practicing genetics. All too often they minimized their own nursing perspective in order to fit into the established and legitimized role of the genetic counsellor who is trained in medical genetics and certified in genetic counselling. Despite nurses' participation in genetic services and their interest in developing nursing knowledge that is relevant to clinical genetics, with a few rare exceptions they were excluded from the medical genetic literature and from discourse in the medical genetic community until the 1990s. The prevailing paradigm for delivering genetic services has been, and continues to be, a relationship between a medical geneticist, the patient, a significant other and a genetic counsellor. Recently, this circle has expanded to include other specialized physicians, such as an oncologist, neurologist, gynaecologist or surgeon and perhaps a nurse, psychologist or social worker who has advanced knowledge and skill in genetics.

As the largest health care profession, the discipline of nursing finds itself without adequate knowledge, training or national certification to legitimize nurses' position in the delivery of genetic services or involvement in genetic research. Nursing must develop evidenced-based practice standards and nursing theories for the practice of genetic nursing, and incorporate nursing research together with the knowledge of clinical genetics and genetic research. With nursing knowledge, members of the profession will contribute to improving contemporary models of delivering genetic services and better shape their own family-centred, humanistic practices.

Understanding nursing's minimal involvement in genetics

Why has the discipline of nursing been involved minimally in genetic research and its applications in clinical settings? Why has it been so slow in effecting curricular change that incorporates genetics into all levels of nursing education on a national and international scale? There are many factors that contribute to this current state of affairs. In keeping with our original purpose of using feminist analysis to address this question, three factors are considered here: (1) the subordination of nursing to medicine; (2) conflicting paradigms between physicians and nurses by their ways of human knowing and in caring for and about persons; and (3) the oppressive nature of nonegalitarian models that are characteristic of interdisciplinary and multidisciplinary clinical and research practices. Feminism contributes to this analysis in three ways: by sensitizing us to the importance of disparities of power in institutional settings; by challenging us to develop humanistic models for understanding the impact of genetics on families and population; and by reminding us of the importance of context in applying genetics in different cultures. We contend that, by publicly acknowledging the historical context that has shaped nursing, it becomes possible to understand potential barriers that stand in the way of new dialogue among nursing leaders and between nursing, medicine, genetic scientists and the public.

Science, technology and the doctor–nurse relationship

During the 1960s and 1970s, the introduction of new medical technologies began to transform the face of medicine. As the profession responsible for bedside care, nursing assumed increasing responsibility for machines at the bedside, from ventilators to dialysers to the increasingly sophisticated monitors that fill contemporary intensive care units. Nurses embraced machine technology in an effort to make their practice more scientific, to improve the reliability of their observation of human functioning and to strengthen the nurse–physician relationship. However, the 'transfer of technology from medicine to nursing reinforced the subordination of nursing to medicine and impeded the development of nursing as a valued province of knowledge and practice' (p. 171).[9] Despite its history, nursing has been and continues to be thought of as a subsidiary of medicine rather than as a separate and unique discipline by a majority of physicians around the world.[10–12]. The following re-analysis of a familiar topic is intended to help the discipline of nursing to understand why this history still affects its readiness to forge new avenues for integrating genetics into nursing practice, education and research.

Successes of basic and applied science continue to reward medicine with the top position in a hierarchical structure in 'medical' institutions, centres and clinics where 'the doctor has a vastly inflated status within the hospital' (p. 60).[13] Nationally and internationally, medicine not only survives but it gathers authoritative power, control and economic privilege within all health care and research settings, while the discipline of nursing is assumed to be subordinate to medical knowledge and subservient to the institution of medicine and the hard sciences. In this social structure, nurses are viewed as physician helpers or handmaidens to medical services.[5,10] In today's societies they are disenfranchised workers within a national health care industry. As handmaidens, nurses were once trained to provide services that promoted medical goals and they were 'primarily accountable to physicians for patient care' (p. 137).[14] This situation still exists in many countries today where nurses are obliged to obey physicians' orders rather than to think critically about their practice or openly advocate for the welfare of patients and families. To a large extent, nurses' identity and roles are controlled overtly and covertly by the authoritative and 'expert' power of medicine. Economically and intellectually, nursing education, the possibility for conducting nursing research and the possibility of holistic nursing practice, are systematically oppressed because a medical model of practice has been adopted as the only model for all health care systems. Collectively, millions of nurses around the world still feel oppressed and undervalued by the institution of medical research and the bureaucracies of clinical medicine, although not by the public whom they serve. When nurses from around the world gather together, they strive to make their voices heard and claim their rightful place as valuable leaders in the future of global health care delivery in a technological age.

Conflicting paradigms of knowing

The discipline of nursing has developed a philosophy of science that values and legitimates multiple sources for and ways of developing knowledge based on a

value for a holistic understanding of being human. This philosophy underlies the goals and practice of nursing. The epistemological and ontological presuppositions of nursing differ in many respects from the epistemology and ontology of modern medicine.[15–17] Discussions within nursing raise important questions about what counts as knowledge, how knowledge is obtained and the ways it is applied in human contexts. These are questions to which many of the conclusions of feminism have great relevance. Likewise, feminists have urged the acknowledgement of a variety of sources of information that are required to deal sensitively and comprehensively with human beings, sources such as the ethical, aesthetic and subjective understandings that are often neglected by an empirically driven scientific objectivism and medical rationalism.[18,19] For nurses who believe in holistic practice, a philosophy of science that holds rationalism and objectivism pre-eminently in 'medical services' is problematic because it creates 'a false universalism that silences the voices of all those other than the dominant group by presuming that it can speak for all' (p. 81).[20]

Nursing's conception of human nature emphasizes the importance of relationships in which patients exist in families within cultural and social contexts and where important consideration is given not only to 'facts', but to a multiplicity of meanings that emerge from living a life. If medicine is a positivistic science, nursing is a humanistic one. Nursing ontology seeks ways of discovering and revealing the phenomenon of being human and living a life during the course of illness and healing, and in many ways echoes feminist reactions against some of the objectifying tendencies of contemporary science[21] and the bureaucratization of the medical encounter.[22]

As a practice discipline, the art of nursing is founded upon traditions of caring, nurturing, healing, listening, intuiting, presencing and seeking holistic understanding, rather than curing disease and prolonging human life, practices that are dominant in medicine.[22] Nurses believe that all people deserve to be treated in a manner that recognizes their equality, strives to promote human potential and maximizes their human potential, integrity, dignity, social reciprocity, spirituality and wholeness of personhood.[23] These beliefs enable nurses to create respectful, genuinely caring and interconnected relationships with the people and their families who are recipients of genetic services. Many of these nursing practices are more extensively discussed in feminist writing than in contemporary medicine. Feminist work that promotes an ethos of professional caring has found such a broad practical application in nursing that caring is conceptualized in a multiplicity of ways as a human trait, a moral imperative, a therapeutic intervention and an essential attribute of the nurse–patient interpersonal relationship.[24] Ethics of care and relational ethics, like the epistemology and ontology of nursing, also bear greater similarity to some feminist work than to contemporary medical ethics.[25,26]

This history of alliance in clinical practice, but divergence in philosophy and theory, between medicine and nursing, which we have recounted, points to substantial reasons why the involvement of nursing in the global delivery of genetic health care is obligatory. At the same time this history emphasizes the importance of extending nursing philosophy and theory into the area of genetics and of doing it in a way that remains sensitive to and supportive of the ways in which this perspective differs from the dominant medical model. Nursing's views of episte-

mology and ontology, so similar in many ways to some feminist approaches, may very well prevent leaders in nursing from buying into the principles and practices that are inherent in a philosophy of atomism, reductivism,[7] biological-determinism[27] and scientism[28] that underlie the science of medical genetics and some of its applications in health care services and research. Perhaps nurses think that there is something fundamentally wrong with this philosophy and its subsequent practices as the pre-eminent paradigm in health care and research that promotes genetic technology transfer. One way of addressing this concern is to ask: is it possible to practice in an environment where humanists and natural scientists collaborate and respect each other's different perspectives so that patients and families can benefit from both old and new philosophies of science?

Hierarchical practice settings

An additional barrier to nursing involvement in genetic health care may be found in the hierarchical structure of health care delivery in most countries, which complicates the relationship between nursing and medicine. Autonomous in theory, nursing often remains subordinated in practice. A power differential in practice settings has had consequences for the discipline of nursing that may contribute to the current situation of nursing with respect to genetic medicine. While the discipline of medicine flourished, that of nursing was split into two forces – academic and practicing nurses.

Nurse academicians and researchers have long pursued humanistic and holistic practices and ways of respecting and communicating that are complementary but heretical to the medical model.[29] In practice settings, many nurses adopt medical model thinking in order to survive in institutions that privilege physicians and scientism, but devalue caring, teaching and the healing practices performed by nurses. These same nurses cast aside teachings from academic nursing and nursing research that legitimate multiple ways of knowing and being human, including aesthetic, personal, ethical[30] and moral[31] factors. Thus, nursing as a disciplinary approach remains distanced from the practice of genetic health care, even when individual nurses are involved in its actual delivery. In summary, we think that change is needed before the entire discipline of nursing can become involved in a genetic health care paradigm.

Traditional models of practice in genetics are competitive

While it is important that nursing becomes more involved in the utilization and dissemination of genetic information, genetic diagnostics and therapeutics, it is equally important that the profession should think seriously about how that involvement should be structured. In the section that follows, we borrow from contemporary feminist analysis to examine the effects of power distributions in institutional structures; then we recommend a model for a disciplinary alliance, which spotlights the advantages of professional diversity and allows all participants to collaborate for the benefit of all the people and populations involved.

We specifically contrast it with extant models of multidisciplinary and interdisciplinary practice, which are dominant modes of practice in nations around the world. This feminist analysis critiques two traditional models of delivering health care services by addressing philosophical assumptions, power imbalances and effects on patients and families. The key elements necessary for moving towards a transdisciplinary model for genetics are spelled out in terms of educational goals, team building strategies, a system of practice and outcomes that can be expected from such a model for genetic services and research.

A multidisciplinary model of practice

Members of an interprofessional team work in parallel or sequentially towards pre-established goals. Each person works from within his or her own disciplinary philosophy. Team members have a clearly specified role and their participation is bounded by their disciplinary expertise.[32] The power, authority and responsibility for a final decision and future directions for the plan of care lie with one discipline, often with only one member of the team. This occurs because team members are not considered equal in terms of their expertise, status or function in the team. Usually the physician is the identifiable leader to whom other team members provide information. The physician utilizes this information to prescribe an appropriate medical intervention, which other team members are charged to carry out. Services can be fragmented; there may be disagreement between team members about which interventions are most appropriate or how these should be implemented. A lack of attention to relationship building among team members and a lack of understanding about what each team member has to offer can result in disputes over the ownership of certain domains of service. This results in focusing on the integrity of professional practices and traditions rather than on patient-centred well-being. This prevents the maximum use of the talents and attributes of every team member for the benefit of the patient. The patient is the recipient of care rather than the family; this prevents the team from really understanding the cultural, environmental, social and psychological context in which the patient must live. The major disadvantage is that when team members work in isolation they are likely to conduct assessments and collect information that fails to address the holistic nature of what it means to be human in a given context.[33] Competition for dominance, control, superiority and extreme individualism can threaten and inhibit other team members from participating fully in the plan of care or research team.

An interdisciplinary model of practice

Philosophically, the interdisciplinary model promotes collaboration across disciplines by gathering three or more practitioners into an interdependent working relationship.[1] Team members are likely to have some idea about the roles, knowledge base and general overall framework and approach used by other team members. The team functions within a formal structure that facilitates interaction and communication among disciplines. For this model to work effectively there must be a high level of trust and comfort among team members.[1] This model allows for consensus building and group decision making. Programme planning is more

collaborative than in the multidisciplinary model, but each discipline implements the plan of care or programme in isolation from other disciplines.

Consequently, an interdisciplinary model still promotes hierarchical relationships because team members operate from within their own disciplinary perspective, although they agree to work on problems, concerns and goals that are identified as priorities.

> Team members often work individually and in isolation which creates a fragmented approach to care despite a team decision to set goals and to co-ordinate services involving a variety of disciplines.[33] In actual practice team members fail to consult each other and they implement individual therapies without understanding the impact of their actions on other team members' (p. 256).[34]

Team members lose the potential for innovative and creative problem solving in the clinical setting. This model provides co-ordinated but not integrated family-orientated services.[35] Team members do not often reach out to other disciplines to make formal links that could benefit the patient or the family. Services remain fragmented because continuity of care is not reinforced, nor is cohesiveness within the team valued as a therapeutic strategy that serves the best interest of the patient and the family.

A transdisciplinary model of practice

This model is different from the multidisciplinary and the interdisciplinary models, where occupational power, status and professional recognition are key issues.[36] Philosophically, every team member is considered an equal partner and his or her professional abilities, unique personal qualities, values, cultural traditions, personal emotions, knowledge, special training and life experiences are taken into account and considered as valuable attributes for the team's functioning. These attributes are thought to enrich the team process and enhance patient outcomes.

'Representatives of different disciplines are encouraged to transcend their separate conceptual, theoretical and methodological orientations in order to develop a shared approach to . . . building a common conceptual framework' (p. 1351).[32] The shared philosophical perspective that is created by all disciplines and public representatives enables practitioners to provide integrated services. All team members, including consumers, parents and community members, are involved in discussion, consensus building, decision making and implementation of the plan or the programme. Team members work together to explore different theories, conceptual frameworks, concepts or approaches that might be in the best interest of the patient, family and the community. This sharing of knowledge enables team members to learn from one another. Boundaries between disciplines are loosened, and overlap between services is recognized and incorporated into the plan, so that patients and families benefit from using similar but different resources in increasingly more practical and more meaningful ways. By redefining and diffusing disciplinary power, the team can collectively achieve a better understanding of the whole human enterprise involved in providing comprehensive and meaningful patient- and family-centred services. This encourages

individuals to take on different roles within the team as appropriate for the situational context and the laws and standards of practice for each discipline. Collaborative practice thrives when all professions are assumed to have a unique disciplinary perspective and are encouraged to use their talents collectively to promote health and well-being. Clarification of the roles, goals and philosophical assumptions within each discipline decreases competition and increases collaboration.[37] This approach can be very satisfying for team members, patients and families because really creative approaches can be achieved to solve tangible human problems and to improve human well-being around the world.

In both multidisciplinary and interdisciplinary models, medicine retains expert power, authoritative control and economic privilege. In such a social/cultural environment, other practitioners are all too often considered as physician's 'handmaidens',[5] whose purpose is to further the curative powers of medical genetics. A transdisciplinary model challenges this tradition by calling for a new way of thinking about who can be the members of the team and who might be the best team leader in a given context or at a specific stage of delivering the service. This model also challenges all disciplines to expand their thinking about patients as whole people living within multiple communities. The consideration of whole people within their cultural, social and psychological contexts is an essential principle that enables the best use of different and similar contributions by each discipline.

The transdisciplinary model was developed and introduced into the field of developmental disabilities by the discipline of nursing.[32] A fundamental aspect of the model is that every discipline, including nursing, has an equal opportunity to shape how genetics can be used for potentially improving human health and enhancing the quality of life of people as genetics becomes globalized. This model is an egalitarian approach that is holistic in perspective; it is based on the assumption that people with genetic conditions or concerns require the co-ordination of complex and specialized services from a variety of health care professionals. Such a holistic model is important to nurses because they are often *the* health care professionals who witness and attend to the problems that arise for families when genetics services are not co-ordinated or evaluated for their effects on the whole family. Because this model values a holistic perspective, it is described as an environmentally sensitive approach.[1] It is particularly beneficial for patients and families because it allows every discipline to provide services at the highest standard of practice, depending on their education, experience, skill[38] and professional ethos.

Moving towards a transdisciplinary model in genetics

The value of a transdisciplinary approach in delivering genetic health care services must be instilled during clinicians' educational training and professional socialization. Only when a transdisciplinary model is valued by every professional can it be used to achieve equality among professions and to foster partnerships with the public during the discourse of daily practice. Once students become clinicians they resist transdisciplinary team practices owing to perceived

barriers such as unequal work-loads, insufficient time, disciplinary-specific jargon and a lack of willingness to teach each other decision-making and judgement skills as part of the process of role release.[39]

A transdisciplinary educational model must foster understanding and respect for differences and similarities in the role of each professional, patient and family member (including surrogates). Valuing each other's differences and similarities fosters sharing and transferring information, skills and decision-making responsibilities across disciplines. Making the boundaries that divide each discipline transparent and permeable encourages the cross-pollination of ideas, builds new frameworks that establish a shared common social mission and allows more variety in the goals to be achieved. A better understanding is needed about each discipline's philosophical traditions. Moreover, we need to acknowledge that patients and families embody multiple ways of being human and living a life, and they may very well have ways of understanding 'reality' that lie outside medicine's definition of scientific evidence. In practical terms, team-building strategies support interchange and collaboration, which enable team members to envision how to work together and how to maximize the benefits for patients and families in different cultural contexts.[32]

To deliver appropriate genetic services that are acceptable to diverse cultures, it is necessary to combine a variety of practice models from different disciplinary perspectives, so that patients, families and communities benefit from the strength of all possible models and frameworks. In this way, each theoretical possibility can be assessed and evaluated in terms of its potential to meet the needs of the public. By initiating a transdisciplinary model in professional education, future generations of clinicians and academicians will come to recognize how easy it is to step into a transdisciplinary approach when asking research questions and designing research methods. Using this approach in research, we claim, will rejoin human science and natural science, thus producing increasingly sensitive knowledge that can be used for practical patient outcomes.

Final remarks

If the current promising possibilities for human genetics are to be fully realized in a beneficent way, a greater involvement for nursing is both inevitable and desirable. The disciplinary perspective that the profession of nursing embodies, different in many respects from the techno-scientific philosophy that medicine promotes,[40] offers an important resource for individuals, families and communities in different cultures whose lives will be increasingly influenced by genetic technology. In order to use their resource in transdisciplinary teams, nurses must incorporate genetics into domains of nursing knowledge, research and theory, and in teaching and practicing excellent nursing care. They must not allow nursing values to be subordinated to genetic medicine. If nurses are to do this effectively, the discipline of nursing needs to include genetic content in its disciplinary knowledge base and encourage genetic nursing research to show the positive effects of nursing practice on clinical genetics. The challenge that must be met is to find ways of educating future generations of genetics nurses to articulate clearly their unique nursing perspective within the genetic health care

paradigm. They must be made ready to contribute a nursing perspective to future developments in genetic services and research around the world. 'This shift parallels the process of enabling and empowering, which produces competence and hope' (p. 71).[41]

Integrating the efforts of practitioners, researchers and theorists within nursing itself will contribute to this process, as graduates and practicing nurses understand better how to use genetic medicine to meet the needs of a global community. Nurses must recognize their obligation to fulfil nursing's social mandate by more effectively asserting their roles as patient advocates, co-ordinators, educators and leaders in their interactions with other health professionals, patients, families and communities, by making a global commitment to fostering reciprocally responsible working relationships. Within transdisciplinary teams,

> the promising outlook for nursing is realization of the opportunity for advanced practice roles ... One discipline alone cannot serve the complex needs of clients with chronic, disabling, or developmental disorders. We must synchronize our paradigm shift as a team' (p. 71).[41]

Relinquishing nurses from the 'handmaiden' role in medical genetics will enable professional nursing around the world to move to more complex, productive and collaborative modes of being.

Patients, families and communities expect scientists and practitioners in all disciplines to deliver services that ultimately mitigate their suffering and improve their quality of daily life without stripping them of their human dignity or wholeness. The ethical challenge we all face is to recognize and begin to deal with the fact that westernized approaches to science, technology and genetic health care cannot merely be transferred intact and imposed upon populations with different cultural, religious and historical traditions without the risk of doing serious damage to the cultures and people involved. Likewise, no single type or source of knowledge will be adequate to help the public to come to terms with the idea that ethnicity (family and genetic heritage), as well as the global environment, have an influence on human health and illness.

The voices of all disciplines must be given an equal chance to contribute and to promote genetic information and genetic therapeutics as human goods. Together, nurses, physicians and other health care professionals are responsible for disseminating genetic information wisely. If they do not do this, we all run the risk of provoking a backlash against genetic technology because the public could perceive these advances as tools that reduce their humanity and benefit only those in society who are already privileged. Genetic services and research must be conducted within an environment of collaboration across clinical specialties, disciplines and cultures. Collaboration will improve patient services by expediting a compassionate and comprehensive response to patients and families who have high hopes that genetics will cure common diseases despite their uncertainties about genetic technology.

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