Advances in Nursing Science
Vol. 30, No. 1, pp. E43–E57

The Developmental/Health Framework Within the McGill Model of Nursing

"Laws of Nature" Guiding Whole Person Care

Laurie N. Gottlieb, PhD, RN; Bruce Gottlieb, PhD

The Developmental/Health Framework (DHFW) within the McGill Model of Nursing (MMN) provides the foundational knowledge consistent with Nightingale's vision of working with the "laws of nature" to promote health and healing. The DHFW describes the processes, principles, and mechanisms rooted in the biological, developmental, and nursing sciences that are required to provide "whole person" care. The MMN provides a model of nursing based on a strengths-based approach within a collaborative partnership relationship. The DHFW has been used to modify the MMN to create a universal and comprehensive approach to nursing practice. **Key words:** *attachment*, *coping*, *development*, *Developmental/Health Framework*, *empowerment*, *health*, *laws of nature*, *McGill Model of Nursing*, *regulation*, *whole person care*

MANY nursing leaders are concerned with the growing medicalization of the profession at the expense of nursing's traditional roles rooted in the care of the sick and dying, promoting and restoring health, and alleviating suffering within the context of whole person care.[1–3] If nursing is to maintain itself as a profession distinct from medicine, it needs to occupy a niche that only it can fill within the healthcare system, a distinct role that complements rather than replaces another profession.[4] Although healthcare professions may share tasks and overlap functions, it is the integration of functions and application of knowledge to fulfill a specific mandate that gives a profession its uniqueness. Nursing needs to fulfill its social contract by providing care that is responsive and relevant to the health and illness needs of society. Finally, nursing needs to find approaches, both old and new, to express its traditional values of caring for the well, sick, and dying that are based on best available evidence and practice.

For Florence Nightingale, the focus of nursing was health. She subscribed to health both in the medical sense, as the absence of illness, as well as in a developmental sense—the notion of becoming. Nightingale believed that human beings had the "power" to promote and restore health and to prevent "dis-ease" by "working" with human nature and circumstance. As Nightingale wrote:

> Health is not only to be well but to be able to use well every power we have. . . . Man has to learn how circumstances regulate and modify human

From the School of Nursing (Dr L. N. Gottlieb), McGill University; Lady Davis Institute for Medical Research, Sir Mortimer B. Davis Jewish General Hospital (Dr B. Gottlieb); and the Biology Department, John Abbott College (Dr B. Gottlieb), Montreal, Canada.

We thank Drs Patricia Benner, Nancy Feeley, and Susan French for their insightful comments and to Dr Kathryn Barnard who always inspires.

Corresponding author: Laurie Gottlieb, PhD, RN, School of Nursing, McGill University, 3506 University St, Montreal, Quebec, Canada H3A 2A7 (e-mail: Laurie.Gottlieb@McGILL.Ca).

nature, to learn what circumstances develop and exercise human nature aright.[5(p33)]

Nightingale clearly differentiated the roles of medicine and nursing in bringing about health. As she, in *Notes on Nursing*, wrote:

> It is often thought that medicine is the curative process. It is no such thing . . . nature alone cures. . .. So it is with medicine; the function of an organ becomes obstructed; medicine, so far as we know, assists nature to remove the obstruction, but does nothing more. And what nursing has to do is to put the patient in the best condition for nature to act upon him.[6(p133)]

If nursing is to work with the human condition to "put the patient in the best condition for nature to act upon him (her) or to give man the power . . . to learn what circumstances develop and exercise human nature aright then, nurses need to have a thorough understanding of the 'laws of nature."' Nightingale knew little about the laws of nature other than that they were a thought of God; the laws of life.[5,6]

Thanks to the many scientific advances in the biological, social, and nursing sciences, there is a considerable body of knowledge from a variety of disciplines that address the "laws of life"—that is, processes, mechanisms, and principles governing health and illness. There is a need to synthesize and integrate this knowledge to understand the "laws of life" for nursing to practice "whole person" care.

In this article, we propose a Developmental/Health Framework (DHFW) within the McGill Model of Nursing (MMN) that extends Nightingale's work by identifying some of the "laws of life"—the principles and mechanisms rooted in biological and developmental processes. By identifying these laws, we can explicate nursing's role in promoting, supporting, supplementing, and restoring an individual's capacities and "natural" healing processes to adapt to and meet challenges arising from current circumstances, illness, injury, and other disruptions.

Nursing has long recognized that an understanding of development is essential to nursing practice. For example, the Barnard model,[7] a middle range theory of parent-child interaction to promote healthy child development, was the first nursing model to be grounded in developmental concepts. Moreover, developmental care was devised to support healthy developmental processes in preterm infants.[8] Developmental concepts serve to guide research and practice in such diverse groups as the chronically ill,[9] and homeless adults with psychiatric disabilities.[10]

One of the few nursing models that has development as a core construct is the MMN.[11,12] Within this perspective, health is viewed as involving 2 processes, namely, coping and development. However, the model lacks specificity about the nature of development and coping, the interrelationships between them, and how development and coping contribute to health. The knowledge about *individual*, *health, and environment* derives from the "laws" described in the following in the DHFW, whereas the approach to *nursing* derives from the MMN.

THE DEVELOPMENTAL/HEALTH FRAMEWORK

Individual, health, and environment

The theoretical underpinnings of the DHFW derive from Systems Theory, Ecological Theory,[13] Evolutionary Theory,[14] Transactional Theory,[15] Organizational Perspective of Developmental,[16] and from theories of embodiment.[17] We use the metaphor of a flowering plant to depict the DHFW (Fig 1) because a flowering plant exhibits all stages of development at the same time (ie, origins and current and future development). Although each part of the flower can be described separately, it functions as a unified whole. All parts that make up the individual are defined by their connectedness with other parts. How an individual comes to understand and behave arises from and is shaped by the body, bodily experiences, and environments.[17] Just as the flower is inseparable from the environment in which it grows, so too is the human being. This conception is consistent with the nature via

nurture principle of development. Human development reflects an individual's genetic endowments (nature) that find expression through the quality of their environments and experiences (nurture).

The DHFW comprises 4 major components: 3 parts concern the development of the individual, whereas the fourth represents the environment. Nursing is an integral part of an individual's environment.

Before describing Figure 1, our working definition of *development* is that it begins at conception and ends at death and involves the appearance over time of physical structures, psychological traits, capacities, and competencies to adapt to life's challenges. Development is reflected in the many ways that human beings come to perceive and interact with their environments.[13] Development reflects the increasing complexity in organization of the mind (ie, cognitive, affective, social, and spiritual/moral), body (eg, neurological, immunologic, digestive), and behavioral systems (eg, attachment), as each evolves toward greater differentiation as well as increasing integration and coordination among them.[16,18] Health reflects the quality of human development at a given age.

INDIVIDUAL

Genotype-environment interaction (root)

The genetic makeup of the fetus, a human being's genotype, is the major determinant of fetal development. Genes produce the individual characteristics of the fetus that then find expression through interaction with different environmental factors and experiences that result in the phenotype, that is, the physical and mental features of the fetus. The prenatal period is very significant inasmuch as damaging environmental conditions can have a devastating long-term effect on development. The mother is the most important aspect of the fetus's environment.[19]

Although we recognize the contribution of the male progenitor, we are focusing here only on the immediate uterine environment in which the fetus grows and develops during pregnancy. Maternal malnutrition, exposure to tetragenic agents (eg, drugs, smoke, toxins), and mutagenic agents (eg, x-rays) are some of the major influences that can adversely affect the expression of different genes. The mother's age and her own environment (eg, culture, socioeconomic status, family, friends, nutrition) can affect her levels of stress and mood states, which, in turn, may affect the developing fetus' physical makeup including its developing brain.[20] These interactions may result in alterations not only to the physical structure but also to biochemical properties of the fetus such as the fetus' immunologic profile. These effects, therefore, may irrevocably alter the course of an individual's life course development.

Genotype-environment interactions are generally governed by 2 fundamental biological principles, namely, ecological and evolutionary. General *ecological principles* govern the nature of the interaction between the genotype and its environment, whereas *evolutionary principles* determine the factors that establish whether a fetus will survive the uterine environment. For example, genes will determine whether a cell will become a nerve or a muscle cell. However, the size and functionality of the nerve cell is ultimately determined by the type, quality, and quantity of available nutrients, as in the case of fetal alcohol syndrome.[21]

The most important evolutionary principle is natural selection in which only those characteristics that allow the fetus to survive in its uterine and extrauterine environments are chosen and developed.[22] The effects of fetal environment on genotype may only become apparent once the infant is born or as the child develops.

Body, bodily systems, and learning (stem)

An individual's biological endowments influence how he or she experiences his or her environments. An individual's understanding of how the world functions and how he or she subsequently live in it, arises through his or her senses. Whenever a domain of subjective experience or judgment is coactivated

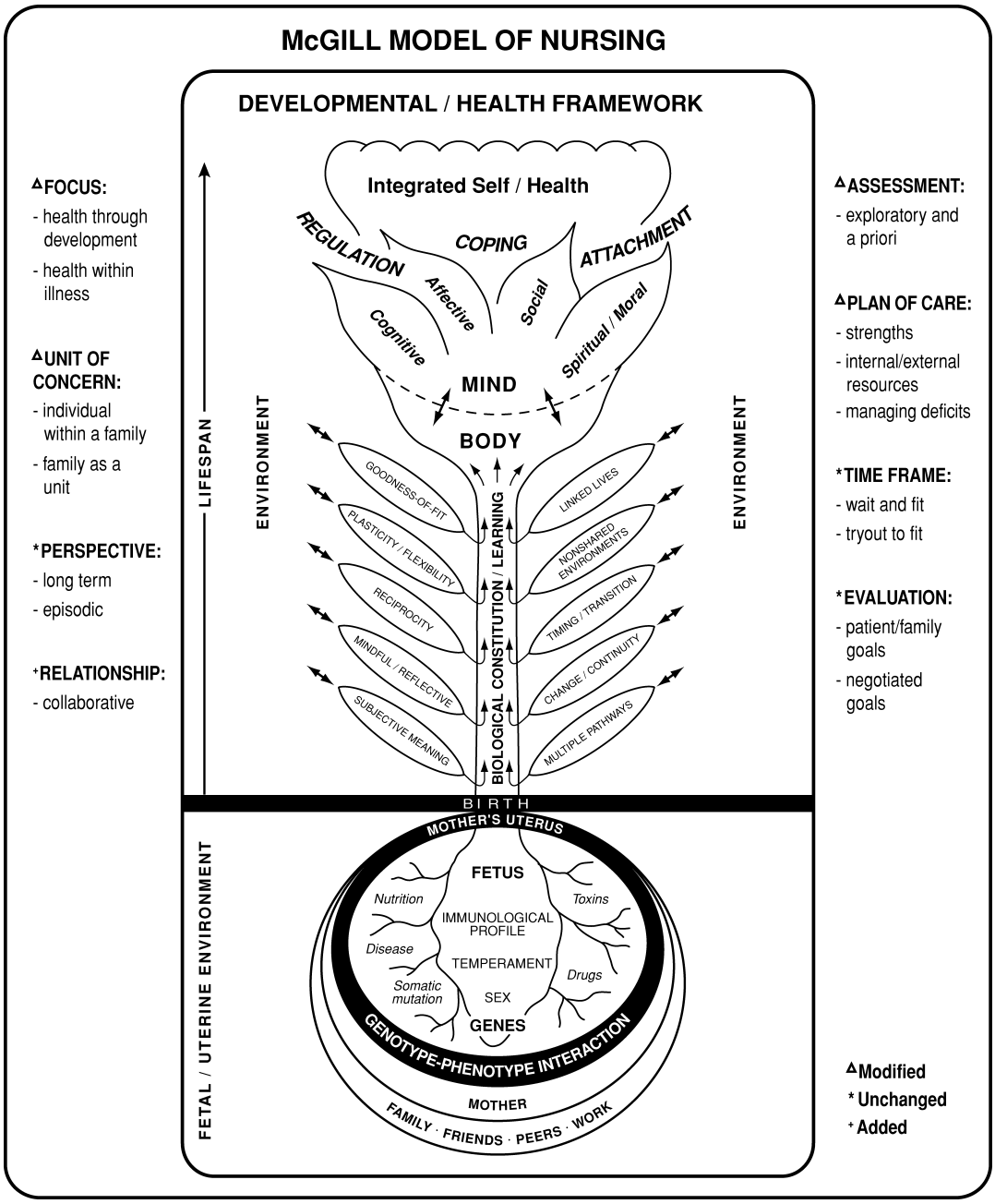

Figure 1. Development/Health Framework within the McGill Model of Nursing.

regularly with a sensory motor domain, permanent neural connections are established via synaptic pathway changes.[18] In this way, an individual "learns" about the world. Although a detailed description of the processes of learning is beyond the scope of this article, we include both biological as well as social learning.

At the biological level, we refer to those principles that are involved in establishing

and pruning neurological pathways,[23] regulating hormonal levels,[24] and establishing immunologic defense and response systems.[25] *Social learning* refers to such processes as observational learning, imitation, and modeling,[26] reinforcement, introspection, reflective learning, social referencing and representational processes (eg, internal working models, mental event representation),[27] and narratives.[28] All learning results in deep (eg, structural and physiological) and surface (eg, behavioral) changes.

"Laws of life": The principles and mechanisms guiding development (leaves)

Just as leaves of a plant contribute to its growth by directing how the plant survives in its environment, the following principles operate in a similar manner in affecting the interface between individuals and their environment. Principles and mechanisms are some of Nightingale's "laws of life" that direct how a human being becomes organized and adapts to various challenges including illness and traumatic events. It is these principles and mechanisms that nurses work with to promote health and healing. (See the "Environment" section for a discussion of environments.)

Subjective meaning

Humans are the architect of their own experience, depending on what they select and attend to and how they encode and experience their environments.[14] The selection process is driven by such factors as genes, temperament, and past experience, whereas the interpretation or the meaning of the event is affected by an individual's "inner landscape" that is shaped by beliefs, emotional states, and motivation.[28] Subjective meaning is often more informative and relevant in understanding how an individual responds than is the objective reality. Nurses help a person construct meaning by using circular questioning, reframing, and other similar strategies. Nurses also work with each person's perceptions and interpretations of events to understand his or her responses and reactions to situations.

Mindful/reflective

A major process responsible for growth and change is an individual's ability to be mindful and reflect on his or her own responses and actions and those of others. The ability to be aware and self-reflect is required for the development of high-functioning professional and personal relationships.[29,30] Mindfulness is a precursor to reflection, and reflection can take place prior to, during, and after an action, interaction, or encounter, and is commonly referred to as reflection in action and reflection on action. Reflection allows for self-correcting behaviors and enables an individual to respond in a sensitive and situation-responsive manner by managing negative emotions and developing deeper insights into how an individual's behaviors or actions affects and is affected by others.

Reciprocity

Reciprocity derives from Transactional Theory[15] and explains how individuals and their environments influence and are influenced by each other and how their needs, concerns, and aspirations are met. Both individuals and their environments participate in creating, maintaining, and changing in response to each other and, in the process, are changed and transformed. Reciprocity also includes the "give and take" between individuals. The type of exchange will determine the nature and quality of the nurse-patient relationship.[29,31] For example, if the nurse believes that the patient is a partner in care rather than a passive recipient of care, then the nurse gives up some power while expecting the patient to assume a degree of power.

Plasticity/flexibility

Plasticity is an individual's ability to adapt in very specific ways, in both the short and long term, to changing demands and allows for recovery of a loss of function.[32] Within

the brain, there are permanent and transient neuronal and chemical-receptor built-in structures. The transient ones enable the brain to be highly plastic, toning its functioning, and recovering from biological and environmental insults. Similarly, the body's immune system is dependent on a high degree of cell and tissue plasticity.

The term *flexibility* is more appropriate for describing behavior and refers to concepts of resiliency and vulnerability. Resiliency and vulnerability are not inherent, inborn characteristics of an individual but rather the result of how well the individual has developed skills and competencies in the face of adversity and challenges. This principle explains how some individuals are able to survive the most adverse conditions (ie, are resilient), whereas others are not (ie, become vulnerable).[33] Nursing works with the principles of plasticity and flexibility to help an individual cope, develop new capacities, and restore and maximize function.

Goodness-of-fit

Goodness-of-fit between an individual and his or her environment is one important predictor of successful adaptation. It refers to the "compatibility" between the capacities and characteristics of an individual and the demands, expectations, and characteristics of the environment. Originally, this principle explained why some individuals with a specific temperament flourished in one environment but not in another, or why two individuals adapted differently to the same environment.[34] This principle can be extended beyond temperament to explain why some individuals function well in some environments and not in others. This is a useful principle to guide nursing to maximize an individual's capacities to adapt to, or in helping an individual select environments that are a better fit. When nurses respond to and work with each individual's unique dispositions, needs, and wants, the nurse is being situation responsive and creating conditions for goodness-of-fit.

Multiple pathways

Development is neither linear nor predictable and comes about through multiple pathways. Age, capacities, circumstances, and contexts determine an individual's ability to adapt and function in stressful events at different times. Each individual follows his or her own multiple pathways, and these pathways may change over the life course depending on developmental challenges and predictable or random life events.[16] The effect of cumulative experiences does affect how the individual reacts to and adapts to stressful events. Knowing that there are multiple pathways to development requires nursing to entertain multiple approaches to working with different individuals in similar situations and multiple approaches to working with the same individual in different situations.

Change/continuity/stability

Development involves balancing between change and stability. Change is critical to growth and development. The growth in new structures and capacities comes about when there is a need to learn new skills, acquire different roles, develop new relationships, and revise identity as is the case in most transitional events.[35] Generally, there is continuity in the major biological and psychological processes, except during transitions and alterations in environmental supports.[16]

Although change drives development, an individual can only accommodate to a certain amount of change at any one time. There are a number of stabilizing processes to protect individuals from becoming overwhelmed and to prevent disorganization and deterioration.[36] The major biological and psychological stabilizing process is homeostasis, which helps an individual resist change. Routines and rituals can be stabilizing forces. Nursing needs to be aware of the processes that govern change and work with them to create environments that foster growth while at the same time limit disruptions that compromise an individual's integrity.

Time and timing of experience

Time and the timing of experiences also affect development. *Time* can refer to internal time, as in the case of biological clocks that are controlled by circadian rhythms and other chronobiologic factors. *Biological clocks* involve physical processes that are genetically preprogrammed, as illustrated by changes in sleep requirements throughout the lifespan. It can also refer to external time clocks such as social, historical, and psychological clocks. The social-historical clock is influenced by cultural expectations, whereas specific societal and/or cultural values define the optimal time for the accomplishments to meet specific developmental challenges.

There are certain periods in which the development of specific capacities and skills is more affected by experience than at other times, such as during critical or sensitive periods. During critical and sensitive periods, an individual is more vulnerable to environmental insults that may affect the course and completeness of recovery.[32] The effectiveness of nursing actions is very much affected by time and timing, and nursing needs to have knowledge of these principles when planning care.

Nonshared environments

Nonshared environments explain why people exposed to similar environments may hold very different perspectives and react very differently. This principle was originally derived to explain why siblings growing up in the same family turn out very differently because of differences in genetic dispositions, previous experience, skills of relating, and timing of critical events.[37] This principle can be extended to explain why individuals within the same environment experience their environments so differently, as in the case of patients with the same diagnosis, sharing the same hospital room, and being cared for by the same nurse, who may react so differently.

Linked lives

The principle of *linked lives* refers to the fact that individuals are embedded in a web of social relationships, past and present. They are also linked to previous generations through genetics and transmitted values. These relationships shape memory, perceptions, reactions, and responses.[38] An individual's choices are often influenced by what has or is happening in the lives of others. Each individual follows his or her own developmental trajectory, and these trajectories are interlocked with other members in their social networks. When nursing understands this principle, the nurse expands and deepens the focus of care by working with multiple foci and through an intergenerational lens.

Biophysical systems

The above-described principles and mechanisms ("laws of nature") interact with the genetically constituted structures to determine an individual's biophysical systems. The biophysical systems develop until they form the complete constitution of the individual that is represented by the flower's receptacle in Figure 1 to which the mind, as represented by the petals, is embodied. The body systems, in particular, contribute to the acquisition of motor and sensory skills that enables the individuals to react and interact with their environments. The biophysical characteristics also control and affect several domains of functioning.

The flower in Figure 1 includes both the brain and mind. The brain comprises the motor and sensory neurons of the central nervous system located in the cephalic region of the body, whereas the mind emanates from the activity of the neurons within the brain. The mind consists of patterns in the flow of energy and information[18] and of several interrelated domains briefly described in the following.

Interrelated domains of functioning of the mind (petals)

The 4 domains of the mind (viz, cognitive, affective/emotional, social, and spiritual/moral) affect the functioning of the individual. These domains, although distinct, are highly

integrated with continuous interplay among them. For this article, we highlight only some of the features of each domain.

The *cognitive* domain is almost exclusively located in the neo and cerebral cortex of the brain and is responsible for all information-processing functions such as perception, thinking, and reasoning. Information processing requires the ability to store and access information (ie, memory), to evaluate information (ie, appraisal), and to communicate information (ie, verbal and nonverbal communication).[18] Environmental inputs (eg, experiences and interactions) play a critical role in the development of cognitive structures and functioning, which, in turn, affects how an individual comes to know and experience his or her environments.

The *affective/emotional* domain is the "emotional lens" through which experience is filtered and affects the development and functioning of the other domains. The affective/emotional domain encompasses the processing and expression of all emotions (eg, anger, sadness, fear) and emotional states (eg, anxiety, depression, happiness) and the development of emotional competence.[18] *Emotions* represent dynamic processes that are created in those parts of the brain (ie, primarily the limbic system) that are responsible for evaluating and appraising experiences that can be socially influenced. An individual's emotional state has a profound effect on how he or she experience his or her environments.

The *social* domain governs all forms of relating. It is through relationships and the quality of relating that individuals develop a sense of self and self-worth, develop their identity, learn various roles, and develop an understanding of their environments. It is also through this domain that ideas, attitudes, and behaviors about health and illness are learned. The social system requires input from all other domains, however, this input needs to be coordinated. The social support literature provides the clearest links between social support and health/illness status.[39]

The *spiritual/moral/ethical* domain governs all forms of beliefs, morals, ethics, and religious practices. *Spirituality* is an awareness of the inner self and the sense of connection to a higher being, to nature, or to some purpose greater than oneself,[40] whereas *ethical/moral beliefs* direct decision-making and religious practices. Spirituality is believed to be intrinsic to human nature and an important inner resource for healing.[6]

Integration of domains

Each domain has traditionally been studied in isolation, with little consideration of the nature of its interdependency. During the past decade, researchers have examined how the domains are integrated and coordinated to create the whole person. Scientists have made significant inroads in identifying many of the mechanisms and processes that enable intraindividual integration.[18] Although it is beyond the scope of this article to detail these mechanisms, there are many mechanisms within the brain that enable communication among the various regions. For example, the limbic system—responsible for emotional processing, communicates with the cerebral cortex—responsible for cognitive functioning. Moreover, there are communication channels within the cerebral cortex so that all domains influence each other. These mechanisms underpin whole person care and provide the foundational knowledge for mind/body therapies.

Driving forces: Regulation, attachment, and coping

Regulation, attachment, and coping are 3 core forces that drive development and are the primary focus of nursing care. They contribute to the development of the body and the 4 domains of functioning (viz, cognitive, affective, social, and spiritual), and require input from each domain for its own development. Regulation, attachment, and coping are separate, distinct forces. Although each has its own structure and function, they are highly interconnected. They share a common underlying structure and have similar features that include:

1. All are universal processes. Humans are "hard-wired" for regulation, attachment, and coping because these forces are needed for survival.
2. As an individual develops, these forces become more coordinated and integrated to function "in sync."
3. They all have built-in behaviors that are goal directed and a goal-corrected system that operates when goals are not achieved. They all have a feedback function that requires (*a*) information and feedback loops from internal (eg, biological clocks) and/or external (eg, physical/social) sources; (*b*) an appraisal or meaning-making structure that allows for comparisons and that results in subjective interpretations; (*c*) a shutdown system to prevent overload; and (*d*) mechanisms for preventing illness and allowing for recovery from injury and insult.

We now examine each force in terms of its respective role in human development and health.

Force 1: Regulation, self-regulation

Self-regulation cuts across all aspects of functioning and involves processes that are responsible for such tasks as managing physiological arousal, emotions, self-control, self-management, and attention.[32,41] Each of these tasks requires different subprocesses and follows different developmental trajectories.

Physiological self-regulation involves all body systems and functioning such as maintaining normal body temperature, controlling blood pressure, modulating sleep-wake states, hunger-satiation, and so forth. The biological processes involved in physiological regulation are driven by the principle of homeostasis.[42] *Homeostasis* involves processes that maintain a constant set of cellular and organ conditions and are regulated by feedback mechanisms. If homeostatic conditions are disrupted, the body systems initiate any number of processes to return the body to its homeostatic state. The basic system of physiological self-regulation involves a series of set points using negative or positive feedback mechanism to maintain homeostasis. Negative feedback occurs when overstimulation results in system shutdown.

Self-regulation is also involved in controlling and managing both positive and negative emotions and feelings. Emotions, by their very nature, are relational. They emerge from interactions and provide the basis for human attachments, social communication, and prosocial and antisocial encounters. Regulating emotions involves many complex processes such as the ability to modulate state arousal, develop emotional competence, and organize events sequentially.[32]

Self-regulation is involved in learning to control behavior and regulate mental processes. The ability to think, retrieve, and remember information, solve problems, and engage in social relationships involves the development of attention, intention, memory, and executive functioning.[32,41] Self-regulation is involved in problem-solving behaviors inasmuch as the ability to solve problems requires control to modulate information, sustain a plan, organize information, and strategize.

Specific self-regulatory skills are learned in the course of relating, and self-regulation is considered the cornerstone of development inasmuch as it affects how an individual copes with immediate challenges. Regulation and self-regulation are consistent with Nightingale's belief that disease is a restorative process that enables the body to recover from overload.[5] It is the principles of regulation and self-regulation that provide the knowledge base for so much of nursing practices.

Force 2: Attachment

The term *attachment* was first used to describe the special tie that an infant forms with a primary caregiver (usually the mother) and to explain how disruptions in early attachment relationships were related to psychopathology in adulthood.[43] However, the quality and nature of early attachment relationships extend beyond the infant-caregiver bond to all close relationships and influence

all domains of functioning throughout the lifespan.[44]

All human beings are genetically programmed to attach to other human beings. Attachment is an inborn system of the mind that evolves in ways that influence and organize motivational, emotional, and memory processes with respect to significant others.[18] Studies of attachment reveal that the pattern or organization of attachment relationships is associated with characteristic processes of how individuals regulate their emotions, relate to others, and see themselves.[18] Moreover, attachment is pivotal to the functioning of the other behavioral systems including care giving, affiliative (ie, other relationships), exploratory, and sexual.[43,44]

The attachment system has several characteristics that meet a number of goals: (1) Foremost, the attachment system is activated during times of stress and perceived threat and deactivated when needs for security and safety are met; (2) attachment enables an individual to explore with confidence novel situations, learn how to manage stress, and regulate emotions by knowing that the attached person(s) will provide the needed security in the face of perceived danger; and (3) attachment strengthens an individual's sense of self-efficacy and competence. Although there is some understanding of the significance of attachment theory for nursing practice, its full significance has been far too limited. We may better be able to predict and explain nurses' effectiveness with different groups of patients if nurse-patient interactions were studied from an attachment perspective such as the activation of the attachment system and its interface with the caregiving (ie, nursing) system.

Force 3: Coping

Living requires dealing with challenges that can be stressful. Individuals are required to adapt and adjust often minute to minute, to daily strains as well as anticipated and nonanticipated events that are appraised as threatening or endangering. *Stress* refers to the quality of the experience, produced through the individual-environment interaction that, through either overarousal or underarousal, results in distress.[45] The coping system comes into play during stressful events.

The concept of *coping* relates to how an individual appraises and deals with stress and distress, and is central to the practice of nursing. Consistent with a transactional approach to development, the individual's appraisal of the event and his or her actual coping behaviors are intertwined with the event per se. An individual's coping strategies may change in response to how the environment is actually responding, the availability of resources (both internal and external), and the expectation of how the environment can and will respond.

Throughout the life course, the individual develops an organizational system and a wide repertoire of coping strategies to minimize stress and distress. Some strategies are related to the appraisal process, some involve regulation (eg, emotional, informational),[46] and others involve using attachment relationships as secure bases.

Knowledge of regulation, attachment, and coping provides the rationale and scientific basis for much of nursing's work. To utilize these forces requires extensive knowledge of the domains of functioning and the principles and mechanisms outlined in the leaves.

HEALTH

The integrated self

At the center of the flower is the integrated self, namely, health. The "laws of nature," as expounded in the DHFW, provides a new lens from which to conceptualize health and to support health in innovative ways. At the individual level, health is a reflection of development, of how the biological, psychological, and behavioral systems are organized, coordinated, and integrated commensurate with an individual's competencies, capacities, and skills to meet developmental and environmental challenges. Health is best assessed when systems are challenged, as is the case during change, stressful events, illness, injury, and traumas.

Within the DHFW, *health* is the ability to:

1. Rally and recover from insults at both the biological and behavioral levels.
2. Integrate various inputs to optimize functioning.
3. Learn new roles and skills.
4. Effectively regulate levels of physiological, emotional, and mental arousal states.
5. Develop attachments and relationships.
6. Use internal and external resources to meet life's challenges in a flexible and adaptive manner within a variety of different contexts.
7. Use disruptions caused by illness as opportunities for growth.

The specific expressions of each of the above indicators of health vary as a function of age, developmental stage, and cultural contexts.

ENVIRONMENT

Because every individual is an integral part of his or her environment, we cannot discuss one without referring to the other. Nonetheless, there are specific features of the environment that need to be understood. By environments, we mean (1) the internal environments that affect an individual cells, tissues, and organs and includes genetic (ie, at the DNA level), biological (eg, effects of microorganisms), and physical influences (eg, effects of enzymes and hormones), and (2) the external environments that consist of biological (eg, other organisms), physical (eg, water, food, housing), and social environments (eg, relationships, culture, socioeconomic status, and family). Nursing works through affecting environments in some of the following ways.

Internal environments

It has long been recognized that our mental states affect our internal environments (eg, immunologic states) and vice versa. When nursing reduces the patient's anxiety, it is in effect helping to boost the patient's immunologic system, and therefore working with the patient's internal system.

External environments

Nursing's traditional role of providing such things as adequate nutrition, ensuring correct fluid-electrolyte balance, and promoting sleep-rest cycles is supporting health-promoting external environments.

Social environments

We ascribe to the principles as outlined in Bronfenbrenner's ecological theory of development.[13] In social environments, relationships derive from direct or indirect interactions from different levels of environments both animate and inanimate. Such factors as biological constitution, history, stress level, and mood states will affect the degree of influence. Individuals vary in their reactivity to their environments, in particular by what they select to attend to. Social environments change over the course of an individual's lifespan in response to changes in physical, social, and emotional needs and changes in life circumstances.

NURSING

The DHFW provides the substantive knowledge to guide nursing practice. Nursing works primarily with the major forces of regulation, attachment, and coping through an understanding of nature via nurture, the principles governing individual/environment interaction (leaves), and the domains of functioning (petals) within the embodied mind. The DHFW has universal application across all nursing situations and with all populations. To give just a few examples, it is an important framework to guide practice when helping a patient regulate his or her arousal levels, cope with biological and psychological insults, and maintain and strengthen relationships that can meet needs of connectedness, support, safety, and security. In many situations, the nurse needs to assess how the patient appraises the situation (eg, subjective meaning), deals with the demands of the environment (eg, goodness-of-fit), and the significance of past and present relationships (eg, linked lives).

The Developmental/Health Framework within the McGill Model of Nursing

The MMN has given clinicians, educators, and administrators a distinct nursing focus and approach to practice.[47] The MMN is based on ideas of whole person care, patient/family-centered care, and empowerment, whereas the DHFW provides the substantive knowledge underlying whole person care. Together they provide a comprehensive, integrated model to guide everyday nursing practice.

According to the MMN, the focus of nursing is health—health that is a separate and distinct entity from illness and that coexists with illness. The approach to care is a strengths-based approach in which the nurse is responsive to an individual's unique personal characteristics and circumstances. The nature of the relationship is a collaborative partnership. The MMN is as relevant today as it was when Dr Moyra Allen articulated it 30 years ago because the ideas were borne from practice and tested in practice. It continues to be practice driven. The DHFW clarifies the relationships among health, development, coping, and learning within the MMN.

In light of more recent scientific evidence, of the original 7 features of the MMN,[11,47] 4 are reconceptualized here. One feature has been added (ie, relationship) and 3 remain unchanged (ie, perspective, time frame, and evaluation) (see Fig 1). Allen, in an attempt to distinguish nursing from medicine and to articulate an expanded role for nursing that complemented rather than replaced medicine, dichotomized the features (eg, health vs illness) that distinguished the McGill nursing approach from other nursing approaches that used the medical model as their framework of practice.[11] This dichotomy has proven artificial and does not reflect the clinical reality. Only those original MMN features that have been reconceptualized are presented in the following.

Focus of care

In the original model, Allen stated that nursing focused on health rather than illness and that health was composed of coping and development. In our reconceptualization, the focus of nursing care is on promoting health through development and health within illness. Nurses work with diagnosis and treatment to achieve better health.

Nursing promotes health during an individual's life course by supporting and working to encourage the integration of regulation, attachment, and coping. Nursing is also involved in preventing illness by working with inborn biological and developmental "laws of nature" to minimize risk and maximize those protective forces and by developing and working with individual strengths (eg, attitudes, capacities, competencies, skills) and resources (eg, relationships and physical and emotional environments).

During illness, nursing supports the natural repair and restorative processes by working with the mind/body domains of functioning (viz, cognitive, emotional/affective, social, and spiritual/moral), the core forces (ie, regulation, attachment, and coping), and creates healing environments. Because an individual derives meaning through bodily experiences, the nature and type of caring for the body and bodily functions are central to how an individual rallies from physical and mental illnesses and injuries. Nurses need to reclaim their traditional role of providing basic bodily care because it is an important "way in" to healing.[3,48]

Unit of care

Allen proposed that the unit of care was the family rather than just the individual because it is in the family that individuals learn about health (ie, how to cope) and that all problems are a phenomenon of the family. In our reconceptualization, the focus of nursing attention is *both* the individual and the family; the individual within the context of the family as well as the family as a unit of care. *Family* is defined in the MMN as any individual that the patient identifies as family. Although the nurse does not always work with the family as a unit, the nurse is "family minded" and many nurse-patient interactions are, at the very least,

considered through a family lens where relevant and appropriate. We have added the principle of linked lives to enlarge the web of relationships beyond family as important determinants and influences in shaping behavior and experiences.

Nature of the nurse-patient relationship

Nursing, as an integral part of the individual's environment, affects development and health by the quality of physical, psychological, moral, and ethical care provided. Nursing is most effective when the nurse creates conditions where the individual and/or family is the central focus of care, and enters into a collaborative partnership. Collaborative partnership is premised on notions of sharing power, being open and respectful of the other's knowledge, skills, and competencies, being nonjudgmental and accepting, and being self-aware and reflective.[29] It is through collaborative partnerships that patients have a voice and are empowered. The distribution of power within the nurse-patient relationship varies with the individual's level of health, resources, capacities, and competencies.

Assessment

In Allen's first writings on the MMN, nursing practiced by the medical model derives the assessment of the patient primarily from knowledge of the diagnosis and treatment. In contrast, nursing practiced by situation-responsive care (the original name given to this approach to nursing, and later, renamed the MMN) derives its assessment from a multitude of sources, with the patient and family as the primary source. Allen calls the former approach to gathering information *a priori* and the latter, *exploratory*. In our reconceptualization, the nurse requires both approaches to make a comprehensive assessment. Each patient is unique, and patients construct their own reality, hence the need for an exploratory approach. At the same time, many patient responses, particularly biological, are universal and consistently patterned, which suggests that an a priori approach is also appropriate. Both a priori and exploratory approaches to gathering information are required for valid assessments.

Plan of care

Allen espoused to a strengths-based rather than a deficits-based approach to working with patients. In our reconceptualization the nurse identifies and works with strengths and manages deficits, or tries to work with patient's deficits to turn them into strengths.[49] The principles of timing, change and continuity, readiness, and plasticity[50] are central components to planning care and to maximizing strengths. A strengths-based approach is at the heart of empowering patients by giving them the skills and confidence to be active participants in their own care.

CONCLUSION

Nursing, in part, fulfills its societal mandate of promoting health through facilitating healthy development and in caring for sick patients by restoring them to health and optimizing their level of functioning. This mandate requires that nurses have extensive knowledge of the biological and developmental principles and mechanisms as outlined in the DHFW within the MMN. These principles and mechanisms are what Nightingale referred to as the "laws of life." The DHFW within the MMN gives nursing the knowledge and approach to provide whole person care that is true to Nightingale's vision.

REFERENCES

1. Chinn P. Where is the nursing in nursing education? [Editorial]. *Adv Nurs Sci.* 2000;23:v–vi.
2. Scott H. Nurses must not become substitute doctors [Editorial]. *Br J Nurs.* 1999;8:1476.

3. Keighley T. From sickness to health. In: Nelson S, Gordon S, eds. *The Complexities of Care: Nursing Reconsidered*. Ithaca, NY: ILR Press; 2006:88–103.
4. Gottlieb LN, Gottlieb B. Evolutionary principles can guide nursing's future development. *J Adv Nurs.* 1998;28:1099–1105.
5. van der Peet R. *The Nightingale Model of Nursing.* Edinburgh: Campion Press; 1995.
6. Nightingale FN. *Notes on Nursing: What It Is and What It Is Not.* New York: Dover Publications; 1860/1969.
7. Sumner G, Spietz A. *NCAST Caregiving Parent-Child Interaction Teaching Manual*. Seattle: NCAST, University of Washington; 1999.
8. Symington A, Pinelli J. Developmental care for promoting development and preventing morbidity in preterm infants. *Cochrane Lib.* 2006; (CD001814).
9. Rankin SH, Weekes DP. Life-span development: a review of theory and practice for families with chronically ill members. *Sch Inq Nurs Pract*. 2000;14:355–373.
10. Levy JS. Homeless outreach: a developmental model. *Psychiatr Rehabil J*. 1998;22:123–130.
11. Allen FM. Comparative theories of the expanded role in nursing and implications for nursing practice: a working paper. *Nurs Papers.* 1977;9:38–45.
12. Gottlieb LN, Rowat K. The McGill Model of Nursing: a practice-derived model. *ANS Adv Nurs Sci*. 1987;9:51–61.
13. Bronfenbrenner U. *The Ecology of Human Development.* Cambridge, Mass: Harvard University Press; 1979.
14. Scarr S. Why developmental research needs evolutionary theory to ask interesting questions. In: Bertelson P, Eelen P, eds. *International Perspectives on Psychological Science Vol 1: Leading Themes*. Hillsdale, NJ: Erlbaum; 1994:159–179.
15. Sameroff AJ, Fiese BH. Transactional regulation: the development ecology of early interventions. In: Shonkoff JP, Meisels SJ, eds. *Handbook of Early Childhood Intervention*. 2nd ed. New York: Cambridge University Press; 2000.
16. Sroufe AL, Egeland B, Carlson EA, Collins WA. *The Development of the Person.* New York: Guilford Press; 2005.
17. Lakoff G, Johnson M. *The Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books; 1999.
18. Siegel DJ. *The Developing Mind: Toward a Neurobiology of Interpersonal Experience.* New York: Guildford Press; 1999.
19. Hrdy SB. *Mother Nature*. London: Chatto & Windus; 1999.
20. Levitt P, Peuroso B, James L. The critical importance of early cellular environment on neuronal development. *Prev Med.* 1998;27:180–183.
21. Riley EP, Thomas JD, Goodlett CR, et al. Fetal alcohol effects: mechanisms and treatment. *Alcohol Clin Exp Res*. 2001;25:110S–116S.
22. Rutherford SL. From genotype to phenotype: buffering mechanisms and the storage of genetic information. *BioEssays.* 2000;22:1095–1105.
23. Chechik G, Meilijson I, Ruppin E. Neuronal regulation: a mechanism for synaptic pruning during brain maturation. *Neurol Comput*. 1999;15:2061–2080.
24. McLachlan JA. Environmental signaling: what embryos and evolution teach us about endocrine disrupting chemicals. *Endocr Rev.* 2001;22.319–341.
25. Lightman SL, Windle RJ, Wood SA, Kershaw YM, Shanks N, Ingram CD. Peripartum plasticity within the hypothalamus-pituitary-adrenal axis. *Prog Brain Res.* 2001;133:111–129.
26. Bandura A. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall; 1977.
27. Bretherton I. Updating the "internal working model" construct: some reflections. *Attach Hum Dev.* 1999;1:343–357.
28. Mattingly C. *Healing Dramas and Clinical Plots: The Narrative Structure of Experience.* London: Cambridge University Press; 1998.
29. Gottlieb LN, Feeley N, Dalton C. *The Collaborative Partnership Approach to Care: A Delicate Balance.* Toronto, Canada: Elsevier; 2006.
30. Heffron MC, Ivins B, Westin DR. Finding an authentic voice-use of self: essential learning processes for relationship-based work. *Infants Young.* 2005;18:323–336.
31. Nodding N. The cared for. In: Gordon S, Benner P, Nodding N, eds. *Caregiving: Readings in Knowledge, Practice, Ethics, and Politics.* Philadelphia: University Pennsylvania Press; 1996:29–39.
32. Shonkoff JP, Phillips DA. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academies Press; 2000.
33. Walsh F. *Strengthening Family Resilience*. 2nd ed. New York: Guilford Press; 2006.
34. Chess S, Thomas A. *Temperament in Clinical Practice*. New York: Guildford Press; 1996.
35. Meleis I, Sawyer LM, Im E-O, Messias DK, Schumacher K. Experiencing transitions: an emerging middle-range theory. *ANS Adv Nurs Sci.* 2000;23:12–28.
36. Mahoney MJ. *Human Change Processes: The Scientific Foundations of Psychotherapy.* New York: Basic Books; 1991.
37. Dunn J, Plomin R. *Separate Lives: Why Siblings Are so Different*. New York: Basic Books; 1990.
38. Elder GH. The life course as developmental theory. *Child Dev.* 1998;69:1–12.
39. Hupcey JE. Clarifying the social support theory-research linkage. *J Adv Nurs.* 1998;27:1231–1241.
40. McSherry W, Cash K, Ross L. Meaning of spirituality:

implications for nursing practice. *J Clin Nurs.* 2004;13:934–941.
41. Boekaerts M, Pintrich PR, Zeidner M. Self-regulation: an introductory overview. In: Boekaerts M, Pintrich PR, Zeidner M, eds. *Handbook of Self-Regulation*. London: Academic Press; 2000:3–11.
42. Watson R, Fawcett TK. *Pathophysiology, Homeostasis and Nursing.* London: Routledge; 2003.
43. Bowlby J. *Attachment and Loss*. New York: Basic Books; 1969.
44. Cassidy J. Shaver PR. *Handbook of Attachment*. New York: Guilford Press; 2004.
45. Aspinwall LG, Taylor SE. A stitch in time: self-regulation and proactive coping. *Psychol Bull.* 1997;121:417–436.
46. Johnson J. Self-regulation theory and coping with physical illness. *Res Nurs Health.* 1999;22:435–448.
47. Gottlieb LN, Ezer H, eds. *A Perspective on Health, Family, Learning and Collaborative Nursing: A Collection of Writings on the McGill Model of Nursing.* Montreal, Canada: McGill University; 2001.
48. Gordon S. The new Cartesianism: dividing mind and body and thus disembodying care. In: Nelson S, Gordon S, eds. *The Complexities of Care: Nursing Reconsidered*. Ithaca, NY: ILR Press; 2006:104–121.
49. Feeley N, Gottlieb LN. Nursing approaches for working with family strengths and resources. *J Fam Nurs.* 2000;6:9–24.
50. Dalton C, Gottlieb LN. The concepts of readiness to change. *J Adv Nurs.* 2003;42:1–10.