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Life Stress and Illness: A Systems Approach

SUMMARY

The link between stress and illness has been forged by researchers like Holmes and Rahe whose Social Readjustment Rating Scale can be used by family physicians to assess their patients' stress. The concept of stress has been clarified by the systems approach to illness. Stress and illness are embedded in a biopsychosocial matrix of several systems levels, each of which may be a source of stress as well as a support system. Stress is not the end result of a linear chain of causes and effects, but part of a feedback system in a community or family. The family is the major source of lifestyle and personality, the health belief system and modes of problem solving and coping, as well as of stress and support. The family physician can have a major role in educating the individual and family about stress and illness, and in altering the meaning of stress from catastrophe to challenge and source of growth. Anticipatory guidance for the normal crises of the life cycle and the crises of illness, loss and death can help prevent further family dysfunction and illness. (Can Fam Physician 1983; 29:533-540).

SOMMAIRE

Le lien entre le stress et la maladie a été établi par des chercheurs, tels Holmes et Rahe, dont l'Échelle de mesure de réadaptation sociale peut être utilisée par les médecins de famille pour évaluer le niveau de stress de leurs patients. Le concept de stress a été clarifié par l'approche systémique de la maladie. Le stress et la maladie sont englobés dans une matrice bio-psycho-sociale au niveau de plusieurs systèmes dont chacun peut être une source de stress aussi bien qu'un système de support. Le stress n'est pas la résultante d'une chaîne linéaire de causes et d'effets, mais fait partie d'un système de rétroaction au sein de la communauté ou de la famille. La famille est la plus importante source du style de vie et de la personnalité, du système de croyances sanitaires et des façons de solutionner les problèmes et de les affronter, de même qu'elle est une source de stress et de support. Le médecin de famille peut jouer un rôle majeur dans l'éducation de l'individu et de la famille concernant le stress et la maladie, et dans la modification qu'il peut apporter au sens du mot "stress", le transformant de catastrophe à défi et source de développement personnel. Des conseils anticipatoires pour les crises normales des différents cycles de la vie et les crises survenant à l'occasion de maladies, pertes et décès peuvent aider à prévenir d'éventuelles dysfonctions et maladies au sein de la famille.

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STRESS IS A popular concept today. What is the evidence that stress plays a role in illness, and more importantly, that physicians can do anything about it? Rhetoric about

health and prevention is common in the medical literature, but little is available in the way of practical suggestions for the family physician.

Two major breakthroughs have paved the way to a new perspective on disease and medical practice:

1. Holmes and Rahe¹ developed a simple questionnaire, easy to use and quick to apply (Table 1). This scale was a subjective rating of stressful life events and led to numerous retrospective and prospective studies of almost every common disease, providing impressive evidence that the incidence of both serious and minor illness increases following stress.

2. There is a new way of thinking about illness in its family and social context, which reaffirms what all doctors know but deny in their practice and medical terminology; mind and body are one and illness must be defined in a psychosocial environment. Interactional, Systems, or "organismic" thinking or "the biopsychosocial model"² are various names for looking at illness as part of a complex matrix in which culture, community, family, individual and organ systems and genes play a role in defining, developing and curing disease.

Medicine has been slow to leave the simple, linear model of specific disease causation (e.g., genes and diet

contribute to increased cholesterol level which causes coronary atheroma which produces an infarct). Engel comments that "most lay people have taken for granted that a person's frame of mind has something to do with his propensity to fall ill and even to die. . . . This is a theme that has been commonplace in popular thinking in folklore and literature throughout the ages".³ He ascribes the loss of past insights to the tremendous break-

throughs in the biological sciences. These took place with the aid of powerful tools which could study only the biochemical and physical alterations of the body, not the obvious connections between mind and body. Even the brain was studied without reference to its psychological functions! Currently "the development of an organismic point of view is finally making it possible to understand how the individual functions within an environment and

how mind and brain act as mediators and regulators of the body economy".³

Stressful Life Events

Stress is ubiquitous. Life is stressful and challenging; Antonovsky⁴ said the surprising thing is that we stay healthy in spite of the prevalence of pathogens. Conversely, lack of stress means monotony and boredom. Selye⁵ coined the term "eustress" to remind us that optimal levels of stress are associated with health. Illness may result from levels of stress that are too low, as demonstrated in a Veterans' Administration study of 88 chronically ill, marginally employed men, all of whom had very low levels of recent life events (19% had had no life event, except Christmas, in the past year⁶). Like the normal arousal curve for optimum performance level, both low and high levels of stress can be destructive and impair performance.

Is change itself—good or bad—the stressor?⁷ Life events such as marriage or promotion may be desirable but require a considerable degree of individual adaptation. They can often be associated with the onset of illness if demands for adaptation are excessive.

The Holmes and Rahe scale (Table 1) was developed by asking 394 people to rate the amount of social readjustment required for a series of 43 common events.¹ An arbitrary numerical value of 500 (later changed to 50), was assigned to marriage. If an event represented more intense and longer readjustment than marriage, a larger number was chosen. Death of a spouse was universally rated as the most stressful event. This scale has been rated by many different cultures and age groups and the list remains consistent. Accumulated stress was even more likely to be followed by illness. For example, in individuals with a score of 200-299 over two years, 51% reported significant health changes; in those with a score over 300, 79% had such changes.⁸

The scale has been criticized for being too simple and having poor content validity. For example, 20-30-year-olds using the scale have twice the number of stressful life events (SLE) of those over 60, while most people feel that stress increases with age—as illness increases. However, its very simplicity has led to its extensive use in research studies. Rahe's

TABLE 1
Social Readjustment Rating Scale¹

Rank	Life Event	Mean Value*
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Change in health of family member	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in number of arguments with spouse	35
20	Mortgage over \$10,000	31
21	Foreclosure of mortgage or loan	30
22	Change in responsibilities at work	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begins or stops work	26
27	Begin or end school	25
28	Change in living conditions	24
29	Revision of personal habits	23
30	Trouble with boss	20
31	Change in work hours or conditions	20
32	Change in residence	20
33	Change in schools	19
34	Change in recreation	19
35	Change in church activities	18
36	Change in social activities	17
37	Mortgage or loan less than \$10,000	16
38	Change in sleeping habits	15
39	Change in number of family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

* The mean value assigned to each item on the scale is based on the weighted value attached by the research population to each life event in terms of its tendency to induce stress.

group and others have studied the onset of tuberculosis,⁹ pneumonias and other infections,¹⁰ cardiac disease (particularly myocardial infarction),¹¹ diabetes,¹² inguinal hernias,¹³ schizophrenia¹⁴ and lupus erythematosus¹⁵ in Scandinavian and North American populations. A consistent correlation was found between the total amount of stressful recent life events and the occurrence of a particular illness.

However, in those studies which looked at stressful life events alone, the correlation coefficients are only approximately 0.3; only 9% of the variance of illness is explained.¹⁶ Many people experience terrible stress with no signs of illness; illness often occurs in the absence of apparent stress.

The effects of stress are apparently much greater when mediating and confounding variables are considered.

Systems and Stress

Stress is only one variable in a system of interrelating variables. It can be caused by illness or cause illness. It can result from family interaction and be relieved by family support. Research has been confused by the medical linear approach where variables are taken out of context for measurement. A cybernetic or interactional model is more realistic and suits the family physician who is aware of the context of disease. For example, it has been shown that in 75% of cases, congestive failure with admission to hospital follows a stressful life event.¹⁷ This may represent organic changes as a result of stress (e.g., the 'ripple effect' of disease following the death of a spouse or parent), or an escape from stress into the sickness role. Hospitalization may represent an adaptation to a partner's alcoholic binge, or a way to avoid a lonely Christmas after the last child has left home.

Holmes' and Rahe's Social Readjustment Rating Scale includes not only external and uncontrollable events such as accidental injury but also events which are within the individual's control, such as marriage, jail terms and divorce. Twenty-nine of the 43 on the list¹⁸ can be symptoms or consequences of illness, which itself can be a major stressor, and part of a downward spiral that produces more and more dysfunction in an individual or family.

The source of stress as well as medi-

ation of stress can be from any of the systems levels shown in Figure 1. Brody¹⁹ has illustrated the way in which a national decision has stressful repercussions throughout the community, resulting in organic illness at the cellular level. Conversely, cellular dysfunction (e.g., a genetic defect) can affect that individual, his family, and sometimes his community.

In one such family, the diagnosis of muscular dystrophy in an 18-month-old girl resulted in severe family dysfunction. The family was vulnerable at the outset because of the mother's tuberculosis which has been called a disease of isolation,²⁰ and may have resulted from this woman's isolation in a foreign country with no one but her husband and another sick child to communicate with. Alcoholism in both parents resulted from stress, lack of physician and community support, and the couple's coping styles of denial and avoidance. A sister's obesity and depression were outcomes of multiple stresses which did not affect another healthy sister.

Thus, biomedical factors, the sickness role, individual and family coping styles, the degree of family and com-

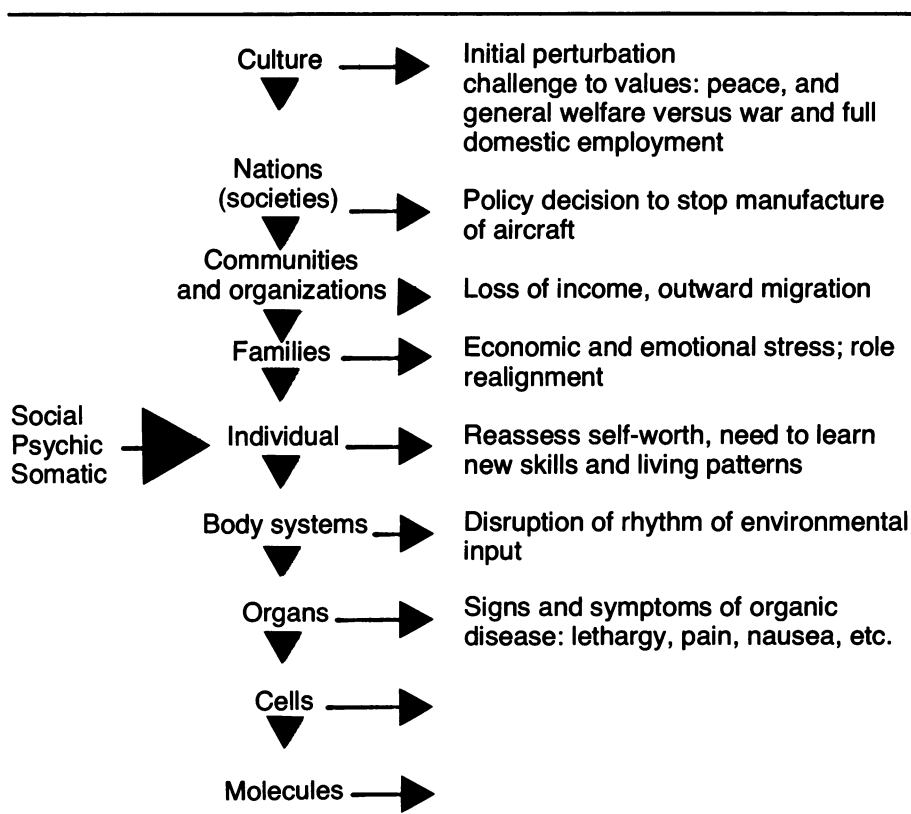
munity support, and the characteristics of the stress must be considered when the stress-illness relationship is evaluated. Each factor interrelates with others.

Mediating Factors

Mirsky²¹ did a pioneer study in young army recruits showing that peptic ulcer developed under the stress of being away from home for the first time. However, this happened only in those recruits genetically predisposed by high levels of blood pepsinogen, and with particular personality variables. Spilken and Jacobs²² found that upper respiratory infections in college students increased after events which provoked a sense of personal failure or social isolation coupled with helplessness.

The concept of the "giving up/given up complex"²³ or the feeling of hopelessness and helplessness following a loss or stressful life event was developed by George Engel, William Greene, and Arthur Schmale at the University of Rochester. Greene²³ studied lymphomas and leukemias, and Le Shan²⁴ and Schmale²⁵ each independently observed that cancer

Fig. 1 Downward Spread of Perturbations: Stress-Related Illness of Aerospace Engineer¹⁹



patients had a high incidence of this complex. Schmale's study of cervical cancer²⁵ accurately predicted biopsy results in 76% of patients based on their helplessness/hopelessness rating. The increased mortality rate from cancer and other diseases²⁶ after losing a spouse has been documented many times. Table 2 shows one of the earliest studies by Kraus and Lillienfeld,²⁷ which demonstrates the increase in mortality rates of the widowed, aged 25-35, compared to married people of the same age. The 12-fold increase of tuberculosis in men is striking.

In a study of prognosis of tuberculosis, Holmes found that all treatment failures were in the lowest third of the social support scale.⁹ Alcoholism in young widowers might be one factor in the high incidence of tuberculosis. Alcoholics who stop drinking without social support have a 20-fold increase in tuberculosis incidence. Those who stop drinking with full social support, have an incidence of tuberculosis lower than that of the general population.²⁸

Characteristics of stressor

The more intense the life event and the longer the exposure to it, the higher the incidence and severity of illness that may result. In fact, very severe stress such as war or disaster will cause breakdown in all those exposed. For example, there is evidence that the Holocaust had irreversible effects on all survivors.¹⁶

Individual's characteristics

The individual's response to stress depends on his or her genetic makeup, culture, family beliefs and use of the sickness role, upbringing and experiences. A person's own behavior may contribute to stress in himself and in others.

Antonovsky⁴ has described a "sense of coherence" or meaning in a person's view of the world as a major determinant of resistance to stress. Life experience, family and cultural attitudes contribute to this. Culture may also help define the response to stress. For example, stomach ulcer and cancer are very prevalent in Japan, whereas heart disease is more common in North America. Factors such as diet are assumed to explain these differences, but it is of interest that the stomach is considered the soul or locus of emotion for the Japanese, while terms like 'broken-hearted', at the 'heart of things', cold- and warm-

hearted reflect our own culture's emphasis on the heart and its vulnerability.

Early trauma, particularly a parent's death, seems to predispose to the helplessness/hopelessness response.² It is the individual's perception that distinguishes a stressor from a stimulus. The meaning of a stress or an illness has been largely ignored in medicine, but is a major factor in determining a patient's response. Remen discusses how the physician can help by relabeling or redefining the illness so that the stress produces growth rather than dysfunction.²⁹ For instance, a myocardial infarction can mean the end of a career or a reorientation of values and an opportunity to get to know one's family.

Uncertainty, lack of knowledge or understanding of the situation, lack of resources and poor coping and competence in the past all diminish coping ability in the present.

Past efforts to identify personality types with specific illnesses,³⁰ conflicts with specific organ responses,³¹ or organ inferiority³² are in disrepute. This tradition is maintained, however, in the popular concept linking type A personality³³ with cardiac disease.

Family characteristics/support systems

Individual's personalities are devel-

oped and maintained in families. In contrast to the type A personality, the family types associated with cardiac disease have not been studied. However, the type A personality is supported by a spouse who encourages workaholicism (sometimes by complaining about it!) and whose own family pattern was often type A.

For example, The C family presented to the family physician through their ten-year-old son who was depressed and had cried every night since the family dog had been sold. The mother had recently developed asthma and this was the official reason the dog had been sold. It became apparent that she was in fact anxious to get a job, since her husband had recently had a serious cardiac operation for triple artery disease. The child had not been told of the operation and had been 'protected' from worry by the general family denial. However, his depression represented the fear of losing the father who was symbolized by the dog. The mother said her husband would be better off 'if he died in harness' since this was his personality and way of life. She and the patient claimed he had slowed down considerably since the operation. The ten-year-old son and a 20-year-old son both contradicted her in a discussion with

TABLE 2
Average Annual Death Rates for Selected Cases in the Married and The Widowed, for the 25-to-35 Age Group, by Sex, United States 1949-1951 (Deaths rates per 100,000 population in each specified group)

Cause	Sex	Married	Widowed	Widowed-Married
Tuberculosis	M	11.2	141.8	12.7
	F	15.4	76.1	4.9
Vascular lesions of the central nervous system	M	3.6	29.3	8.1
	F	4.1	17.4	4.2
Hypertension with heart disease	M	1.7	18.3	10.8
	F	2.3	10.9	4.7
Influenza and pneumonia	M	2.6	20.1	7.7
	F	2.7	13.4	5.0
Arteriosclerotic heart disease	M	8.6	42.1	4.9
	F	2.8	16.5	5.9
Malignant Neoplasms	M	16.2	37.5	2.3
	F	20.9	52.4	2.5
Diabetes	M	1.4	4.6	3.3
	F	1.7	4.2	2.5
Motor Vehicle Accidents	M	32.3	88.2	4.5
	F	7.8	19.8	3.3

Adapted with permission from Kraus A, Lillienfeld A: Some epidemiologic aspects of the high mortality rate in the young widowed group. *J Chron Dis* 10:207, 1959

the family physician, and revealed that the couple's denial was continuing his type A behavior.

Although the wife was very supportive, she clearly contributed to her husband's high risk behavior. Hoebel's study³⁴ of men with cardiac problems through up to five interviews with their wives, showed that by altering the wives' approach to their husbands' behavior they altered the family system that was maintaining the high risk behavior.

Family dysfunction can promote illness. Minuchin's description³⁶ of 'psychomatic families' explains how a family can trigger an asthmatic attack, anorexia nervosa or a diabetic coma in a labile diabetic child. The child with a physiologic predisposition develops an exacerbation of the disease in response to household tension and becomes the focus of attention. Parental conflict—denied in these overly close, 'happy' families—is avoided when one parent takes the symptomatic child to the doctor or emergency department.

In other families, sickness can maintain the balance of power³⁷ or a marriage that would otherwise break up. In the N family there was a precarious balance between the domineering artist wife and her ineffectual husband who had repeated business failures. These failures were similar to those of the wife's father. The couple colluded in the destructive myth that Mrs. N was the creative partner who had no need for her dependent husband. When Mrs. N threatened to leave her husband, the stress induced him to 'pull a heart attack on me' so that she was unable to leave. However, it later became her turn to develop the sickness role to prevent marital disruption, revealing her need for the relationship. She developed incapacitating low back pain, and though she persuaded surgeons to intervene twice, against their better judgment, it only made things worse. When asked what would happen if her back pain miraculously were cured, she replied, 'Oh, I guess I would leave my husband'; when her husband was separately asked the same question, he said, 'Oh, she would be back in control again, I suppose'. The back pain enabled him to control her clandestine affairs with student artists and to become the breadwinner again. Clearly a new family homeostasis, stabler than the first, had

evolved around the back pain. Mrs. N's need to be taken care of without losing self-esteem was now answered, and Mr. N felt more of a man.

Despite families like this, which generate more stress than support, one of the chief mitigating variables for life stress is that of social support. For example, a study by Nuckolls et al.³⁸ showed that stressful life events alone did not predict the development of complications of pregnancy. However, when the pregnant women were divided into groups with high, medium and low social support, the occurrence of complications after stressful events during the pregnancy was 33% in women with high social support and 91% in those with low social support ($p > .001$). Conversely, Lynch's book *The Broken Heart, the Medical Consequences of Loneliness*³⁹ outlines numerous studies demonstrating the effect of isolation on illness.

Cobb²⁰ divides social support into three components:

1. Emotional support: the sense of being cared for and loved.
2. Esteem support: the sense of self-esteem, value and recognition.
3. Network support: the sense of belonging to one or preferably several networks of mutual obligation and having a place in society.

There is an extensive literature demonstrating positive effects of social support on compliance,^{40, 41} recovery

from illness,⁴² and on preventing illness from severe stressful life events.

Several studies demonstrate that the physician's support is important. Chambers and Reisers¹⁷ found the physician's emotional support had an extraordinarily beneficial effect on congestive heart failure. Egbert et al.⁴³ showed that specific supportive care by the anesthetist to one group of surgical patients (the surgeons were unaware which patients had the support and which were controls) resulted in less pain medication and discharge 2.7 days earlier than controls.

Biological Mechanisms

Several recent studies elucidate how stress influences the body and support protects. A study of parents with children dying of leukemia⁴⁴ revealed a drop in 1-hydroxy-ketosteroids prior to the death in parents who seemed to be going through a normal period of anticipatory grief. Parents who did not show this developed a more precipitous hormonal drop after the death, which seemed to correlate with greater difficulty in adjustment. Bartrop and associates⁴⁵ studied the T-lymphocyte function during bereavement and found a significant decrease in function that was greatest six weeks after the death. There is speculation about the role of the immune system in increasing vulnerability to illness and about the neuroendocrine axis as a



Children's Aid Metropolitan Toronto

"Stress . . . can be caused by illness or cause illness."

mediator of stress (Seyle's original "general adaptation syndrome"⁵).

Gore⁴⁶ studied a hundred men whose jobs were eliminated; they showed changes in cholesterol, uric acid levels, norepinephrine in urine and serum creatinine. The same study produced a surprising finding; men with low social support developed pain and swelling in two or more joints in 41% of cases, compared with 4% of men with high social support and 12% with medium social support.

Minuchin⁴⁷ has studied labile diabetic children and their parents under stress, monitoring free fatty acid levels as ketone precursors and indicators of emotional arousal. He demonstrated a transfer of stress at the biochemical level from parent to child, in these psychosomatic families. This phenomenon could be predicted from systems theory.

The Role of the Family Physician

Advisor

The Social Readjustment Rating Scale can aid both physician's and patient's assessment of a situation. A patient's increased awareness of the level of stress and education about the possible correlates of illness and dysfunction may make a difference in his decisions. For example, a physician can advise someone recently bereaved not to make any major changes in lifestyle or living arrangements for some time after the death. The patient can fill in the SRRS himself and avoid precipitous moves that would increase the stress level. Conversely, it is often helpful for people to recognize that stress is a normal part of living, that their level of stress is not greater than average and that improved methods of coping with stress are indicated. The physician can facilitate coping by advising methods of relaxation (yoga, transcendental meditation, Christian meditation), better pacing of time commitments, organization, exercise, recreation, hobbies and community groups to foster improved wellbeing and better network support. Cobb says "We should start now to teach all our patients, both well and sick, how to give and receive social support".²⁰ The statement may seem naïve but in fact it covers a range of advice that can make a difference to family relation-

ships. If the physician acknowledges to patients that they may find it difficult to request help from the physician and family members, patients may feel they have permission to be more open in asking for help. Direct coaching on acceptable ways to obtain help from family members can discourage the stoicism and martyrdom that impedes family communication and support. In meetings with the whole family—a habit and skill that family physicians should develop⁴⁸—the physician can take a non-judgmental interest in each member and facilitate open communication. The physician might suggest that family members exchange days off with neighbors with small children, take a vacation or time out from work (defining 'sick-leave' is a time-honored task for the physician), or consider respite care for the elderly when the family's endurance is stressed to the breaking point.

Educator

'Heed nature's warning' is advice often ignored and not given often enough. The physician has an important role in educating his or her patients about the meaning of symptoms. For example, I found it useful to enquire about recent stress in a man presenting with facial impetigo for the first time. He admitted to severe work stress and to a series of furuncles. The inquiry added only two minutes to the interview but helped him recognize how stressed he felt and the need to make some changes.

The intensity of stress is increased by lack of knowledge and uncertainty. The physician plays a major role in increasing the patient's and family's knowledge about actual illness, about biomedical effects of stress, and about what can be expected from a life crisis. Bereavement can be a terrifying experience for people who are unaware that physical symptoms mimicking those of the deceased, auditory and visual hallucinations, personality changes (irritability, extreme hostility), and fears or isolation can all be normal components of mourning.⁴⁹ The physician's experience with life stress can extend the coping abilities of a family with an elderly person who has had a stroke or has a newly diagnosed cancer. A child's hospitalization has been shown to have no adverse effects when the child is adequately prepared,⁵⁰ while a single episode of gastroenteritis has

been shown to have longterm consequences if parents' and pediatricians' worries were not adequately discussed.⁵¹ In all these situations knowledge and understanding conveyed by a trusted personal physician decreases insecurity and improves coping.

Facilitator

The importance of communicating and expressing feelings cannot be overemphasized as a coping mechanism that decreases stress. If the family physician does not take the opportunity to see the whole family during a serious life event or medical crisis, he or she ignores a major resource. Decision-making, problem solving, and action, with feedback to monitor success, are all more effective in the family setting. If the family decision-maker is the grandmother who lives next door, it is inappropriate to discuss decisions only with the parents. Families function as units in which the whole is greater than the sum of the parts;⁴⁸ it is important to have the 'whole' in the office when efficiency and resources are needed. Discussion with the patient alone will result in poor compliance, poor understanding and will leave the stress of changing on the person already most stressed.

A crisis often represents a family's difficulty in problem-solving. The physician can facilitate family communication and problem solving. A single session can be most effective, particularly at a moment of crisis when family flexibility is maximal. A family interview before the death of a family member can markedly alter coping responses; counselling decreases the morbidity and mortality rate in the bereaved.⁵²

Anticipatory Guidance And Normal Life Crisis

I have previously described the stages of the life cycle as high risk states in which vulnerability to illness and family dysfunction increases.⁵³ Knowing the stages and tasks of the family life cycle is essential for the physician who wishes to understand the increased frequency of visits in certain stages; frequent minor illness in young children or young mothers may indicate family stress;⁵⁴ a single mother whose children are threatening to leave the nest may develop angina;

and a widow who lost her husband to a heart attack a year ago may have chest pains.

Intervention such as counselling need not take time and can be added to the routine checkup or visits for immunizations or upper respiratory infections. Knowing each family is essential for these to be effective. Other family members often provide the clue that will help the physician understand a situation. This occurred in the following family:

A woman in her 50s began to experience episodes of lightheadedness and palpitations that took her to the emergency department on several occasions. Referral to a cardiologist and a neurologist and two periods on a Holter monitor revealed no abnormality. The family physician noted an increased frequency of visits by the whole family, including the woman's brother, whose coping style was noted for denial and lack of emotional expression. However, when the physician saw him with his wife, he responded to a question about his sister's health with tears in his eyes which he immediately tried to hide. His wife, whose chief complaint of her husband was that he was unemotional, quickly stated very protectively, "Oh he's never worried about anything". The man then hesitatingly asked the physician if she knew of a pregnancy in his unmarried sister's past; there were ten months during her forties that he had been unable to account for because she was overseas.

This couple's daughter, also the physician's patient, had just had a baby. The birth had occurred just before her aunt's onset of symptoms. Another clue in the development of symptoms was the twelfth anniversary of their father's death from leukemia. He had experienced episodes of faintness and loss of consciousness which had been undiagnosed until just before his death—a fact for which the family still resented the medical profession. The family's exasperation at the current difficulty in diagnosing the sister's symptoms was thinly veiled and their worry manifested by frequent office visits by all members.

Symptoms such as the above often disappear when the past events that are being relived become conscious, as they did in this case.

Referral to Other Resources

The physician is often the only readily available person to a patient who is aware of resources like legal aid, home help facilities, and support groups. In some families the difficulty with problem solving and communication requires more than a few sessions with the family physician. In these families, stress is compounded by escalating problems, isolation, and frustration of needs and conflict. For these families, family therapy may markedly reduce the incidence of illness and the need for the sickness role as an escape from family problems.

The S family were referred for family therapy because of Mr. S's obesity, which was unresponsive to treatment and was associated with hypertension, both of which he felt were caused by his wife. She in turn was overwhelmed with the family's financial problems, a family business in which her husband made few of the decisions, a sick mother and mother-in-law, and her own history of recurrent illness, particularly pulmonary embolus, hypertension and occasional depression. The couple were locked into a pattern where she was the boss. He resented this yet took so long making decisions that he colluded with her. He then ate to excess or developed a migraine in response. The extended family were involved in the financial tangle and three sons were triangled whenever conflict developed between the couple. Finally, the family's ability to make any decisions ground to a halt and all three sons developed severe school problems. This family required family therapy to clarify the collusion in the parental roles that resulted from Mrs. S's displaced anger towards her own abusive father, and Mr. S's anger at his mother who had run his life and was now dying. As the power struggle decreased, weight and blood pressure control improved and visits for physical illness decreased.

Referral skills must be developed for families who somatize their stresses and difficulties. Referral includes the art of relabelling a physical symptom or illness that is a result of stress, and indicating that the stress results from poor problem solving or communication. This suggestion tactfully leads to the suggestion that family therapy is indicated. Normalization—"communication is poor in most

families", "you're in good company—most families could do with a bit of help in problem-solving"—and removing the stigma of counselling results largely from the physician's reassuring and non-judgmental attitude.

As longterm family confidant, the family physician is in an ideal position to help the individual and family at times of stress, and may play a major—but as yet unresearched—role in preventing disease. ●

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Keflex® cephalexin

DESCRIPTION: Keflex is a semisynthetic cephalosporin antibiotic intended for oral administration. It is 7-(D-a-amino-phenylacetamido)-3-methyl-3-cephem-4-carboxylic acid monohydrate.

ACTION: Cephalexin is bactericidal against many gram-positive and gram-negative organisms. In vitro tests demonstrate that the cephalosporins are bactericidal through their inhibition of cell-wall synthesis.

INDICATIONS: Keflex may be indicated in the treatment of bacterial infections of the respiratory tract, including otitis media, genitourinary tract, bones and joints, skin and soft tissue when the infection is caused by susceptible organisms.

CONTRAINDICATIONS: Keflex is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

PRECAUTIONS: Antibiotics, including Keflex, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

In penicillin-allergic patients, cephalosporin antibiotics should be used with caution. There is some evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Of 7450 clinical trial patients, 291 had histories of penicillin allergy. Nineteen of them (about 6.5 percent) were among those in whom possible allergic reactions to cephalexin were observed.

Patients should be followed carefully so that any side effects or unusual manifestations of drug idiosyncrasy may be detected. If an allergic reaction to Keflex occurs, the drug should be discontinued and the patient treated with the usual agents (e.g., epinephrine or other pressor amines, antihistamines, or corticosteroids).

Prolonged use of Keflex may result in overgrowth of non-susceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Keflex should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

If Keflex is to be used for long term therapy, periodic monitoring of hematology, renal and hepatic functions should be done. Indicated surgical procedures should be performed in conjunction with antibiotic therapy, e.g. the incision and drainage of abscesses.

Safety of this product for use during pregnancy has not been established.

Positive direct Coombs tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs test may be due to the drug.

In patients being treated with Keflex, a false-positive reaction for glucose in the urine may occur with Benedict's or Fehling's solutions or with Clinistest tablets, but not with Tes-Tape®.

ADVERSE REACTIONS: Gastro-intestinal—Diarrhea has been reported in only 1.5 percent of 7450 clinical trial patients. It was very rarely severe enough to warrant cessation of therapy. Nausea, vomiting, dyspepsia and abdominal pain have also occurred.

Hypersensitivity—Allergies (in the form of rash, urticaria and angioedema) have been observed. These reactions usually subsided upon discontinuation of the drug.

Other reactions have included genital and anal pruritus, genital moniliasis, vaginitis and vaginal discharge, dizziness, fatigue, and headache. Eosinophilia, leucopenia due to neutropenia, and slight elevations in SGOT and SGPT have been reported.

SYMPTOMS AND TREATMENT OF OVERDOSAGE: No information is available on the treatment of overdose with Keflex. There is no specific antidote.

MICROBIOLOGY: Keflex is active against the following organisms in vitro:

Beta-hemolytic and other streptococci (many strains of enterococci; e.g., *Streptococcus faecalis*, is resistant)

Staphylococci, including coagulase-positive, coagulase-negative, and penicillinase-producing strains (a few strains of staphylococci are resistant to cephalexin)

Diplococcus pneumoniae Hemophilus influenzae
Escherichia coli Proteus mirabilis
Klebsiella pneumoniae Neisseria catarrhalis

Keflex is not active against most strains of *Enterobacter* sp., *Pr. morgani*, and *Pr. vulgaris*. It has no activity against *Pseudomonas* or *Herellea* species. When tested by in vitro methods, staphylococci exhibit cross-resistance between Keflex and methicillin-type antibiotics.

DOSEAGE AND ADMINISTRATION: Keflex is administered orally. The adult dosage ranges from 1 to 4 g daily in divided doses. The usual adult dose is 250 mg every six hours. For more severe infections or those caused by less susceptible organisms, larger doses may be needed. If daily doses of Keflex greater than 4 g are required, parenteral cephalosporins, in appropriate doses should be considered.

The recommended daily dosage for children is 25 to 50 mg per kg divided into four doses.

Keflex Suspension

Child's Weight	125 mg/5 ml	250 mg/5 ml
10 kg (22 lb.)	1/2 to 1 tsp. q.i.d.	—
20 kg (44 lb.)	1 to 2 tsp. q.i.d.	1/2 to 1 tsp. q.i.d.
40 kg (88 lb.)	2 to 4 tsp. q.i.d.	1 to 2 tsp. q.i.d.

In severe infections, the dosage may be doubled.

In the therapy of otitis media, clinical studies have shown that a dosage of 75 to 100 mg per kg per day in four divided doses is required.

In the treatment of beta-hemolytic streptococcal infections, antibiotic therapy should be administered for at least ten days.

To obtain maximum peak levels, cephalexin should be administered on an empty stomach.

DOSEAGE FORMS:

Tablets Keflex, equivalent to 250 mg cephalexin (No. 1894). Identical Code U57, are supplied in bottles of 100, and 500.

Tablets Keflex, equivalent to 500 mg cephalexin (No. 1895). Identical Code U49, are supplied in bottles of 100, and 250.

Keflex, for Oral Suspension, equivalent to 125 mg cephalexin per 5 ml teaspoonful, is supplied in a 100 ml size package (No. M-201). Identical Code W21.

Keflex, for Oral Suspension, equivalent to 250 mg cephalexin per 5 ml teaspoonful, is supplied in a 100 ml size package (No. M-202). Identical Code W68.