



Expanding the Art-Science of Chronic Disease Management in Primary Care: A Lifestyle Medicine Perspective

Garry Egger*

Centre for Health Promotion and Research, Lifestyle Medicine and Applied Health Promotion, Southern Cross University, Australia

***Corresponding author:** Garry Egger, AM, MPH, PhD, Director, Centre for Health Promotion and Research, Sydney, Adjunct Professor, Lifestyle Medicine and Applied Health Promotion, Southern Cross University, 14 Arthur St., FAIRLIGHT, NSW 2094, Australia, Tel: 61-2-99777753, E-mail: eggergj@ozemail.com.au

Abstract

- An adjunct discipline of Lifestyle Medicine has arisen in the last decade to deal with environmentally driven lifestyle-related chronic disease
- To date however, there has been little structure or pedagogy around this form of practice
- The current paper considers such a structure under the headings of 'knowledge' 'skills/procedures' and 'tools'.

Changes in living patterns typically result in changes in disease structures within a society. The 'epidemiological transition', which describes the shift from infectious to chronic diseases for example, is common as countries shift from agrarian to industrial lifestyles [1]. Population levels of obesity for example change as societies become more developed, with equivalent BMIs pre development apparently less dangerous than during or after development, as shown recently in China [2]. Health practices then need to be modified to deal with such changes: Hence, the rise of a discipline of Lifestyle Medicine (LM) [3].

Professional associations in LM have arisen in the US, Europe and Australasia. Post-graduate specialties are currently offered in a number of Universities and texts and specialist journals are increasing [4,5]. Yet apart from recognizing the contribution of lifestyle and environmental factors to disease, the field has yet to develop its own structure or pedagogy. If it is to have a function, its contributions to existing care need to be elaborated.

Defining the Field

Lifestyle Medicine has been defined as: "...the application of environmental, behavioural, medical and motivational principles, including self care and self-management, to the management of lifestyle-related health problems in a clinical setting" [5]. The current state of the discipline can be summarised under three headings: 1. knowledge, 2. skills and procedures, and 3. tools.

Developing the Knowledge Base

With infectious diseases, causality can usually be ascribed to biological causes, using classical principles such as Koch's postulates [6]. With chronic disease, establishing causality is more problematic [7]. The closest we can often get is in defining determinants, or drivers, of disease.

The discovery of a new form of low grade, systemic, inflammation ('metaflammation') [8], linked with most, if not all, major classes of chronic disease, helps to delineate such determinants.

Metaflammation contrasts with the more classical type of inflammation first described by Aurelius Celsus some 2,500 years ago. As biological pathogens are usually not causally linked to this category of disease [9], ascription is limited to the level of lifestyle and environmental determinants associated with the major classes of modern chronic disease, in most, if not all, cases accompanied by metaflammation [10]. Considered as a whole, the determinants of chronic disease have been labeled 'anthropogens', or '*man-made environments, their bi-products, and/or lifestyles encouraged by those environments, some of which have biological effects which may be detrimental to human health*' [11].

A limited number of anthropogens (poor nutrition, inactivity, stress, smoking) have been identified as explaining a significant proportion of chronic disease [12-14]. However there are other less apparent but still significant determinants that have been identified in the literature, all of which are directly, or indirectly associated with chronic disease, and most, if not all all of which have evidence of a metaflammatory association [10]. Table 1 provides a broad list of these, covering chronic disease determinants from proximal to distal.

Table 1: Lifestyle and environmentally related determinants of chronic disease

Nutrition - Excess energy, fat, sugar, salt, malnutrition
(in)Activity - Inactive leisure and/or work time; excessive sitting
Stress - "Burnout", "brown out", anxiety, depression
Technology-induced-pathology - Adverse effects of technology, injury
Inadequate Sleep - Sleep time, sleep disorders
Environment - Pollution, endocrine disrupting chemicals
Meaninglessness - 'Learned helplessness'
Alienation - from society
Loss of culture/identity etc (as in Indigenous/migrant groups)
Occupation - Shift work, occupational hazards, bullying
Drugs, smoking and alcohol - iatrogenesis, 'recreational' drugs
Over (and Under) exposure - Sunlight, skin cancers, vitamin D Deficiencies
Relationships - Support, belonging, care
Social inequality - Trust, ratio between rich and poor

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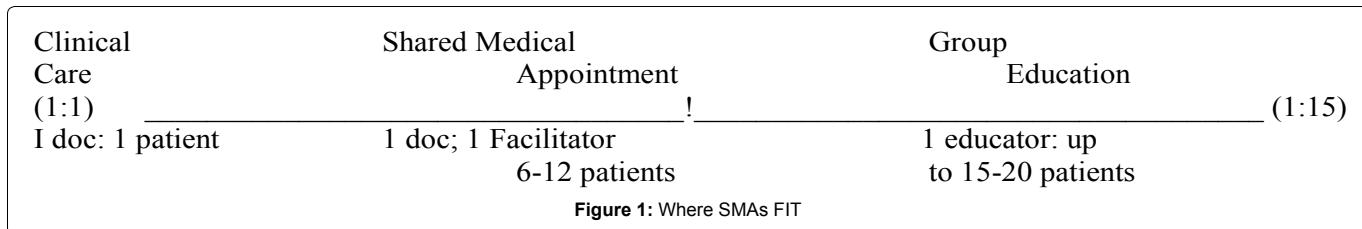


Figure 1: Where SMAs FIT

Table 2: LM 'Tools'.

Clinical Application	Device	Measure
'mHealth' -messages/education/marketing -phone + feedback/ Bluetooth	Mobile phone	Health promotion; reminders BP; HR; BG; Temp; O ₂ Sat etc.
Telemetric monitoring -movement - asthma	Accelerometers; Movement sensors 'health buddy'	Activity levels; Sleep patterns BP; Glucose; Temp
Ambulatory monitoring - Sleep - Blood quality - Heart measures - Neurological sensing	Sensor devices Breathing sensors Meter ECG vest Inertial sensor	Breathing Apneas; Sleep quality INR Sinus rhythm Gait, paralysis; early Parkinson's
Implantable devices - Cardiac rhythm - resynchronisation devices	ECG Defibrillator	Atrial Fibrillation Correct Arrhythmias
Self-Monitoring -Body composition - Strength - Lung function - Hypertension	BIA scales Dynamometer PICO6 BP machine	Body fat; muscle. Grip strength VE2/VE6; lung age BP; Pulse
Brief Assessments - Dietary questionnaire - DAB-Q - Physical fitness	Short diet quest Diet/activity quest SPA Quest	Basic diet quality Diet/exercise (Est) VO ₂ max
Internet connections - Prevention/rehabilitation	Internet user groups; Bibliotherapy	Depression; Anxiety; Asthma; Arthritis etc.

Expanding Procedural Skills

While the science (epidemiology) of chronic disease is relatively well understood, a distinctive 'art', including the skills and procedures required to change unhealthy lifestyles and the environments driving these, is less clear. Environmental change for example is generally seen as a public health issue, primarily because this has involved largely structural (eg. sewerage, water, food quality etc) interventions. Modern environments on the other hand (eg. the obesogenic, profit-based, growth driven environment) drive behaviour, making environmental health a significant part of LM. The link with traditional public health thus needs further elaboration.

At the behaviour change level, while all the usual counseling skills (motivational interviewing, health coaching, cognitive behaviour therapy, self management training etc) are *necessary*, they may not be *sufficient* for dealing with behaviours and the environments driving chronic diseases. Management may thus require a lateral shift.

At a conventional level, it has been assumed that the clinical process of one-on-one (1:1) counseling (despite the lack of data supporting this over other forms of clinical engagement), is set in stone and would play the part in chronic disease management that it has successfully done in the past for acute diseases and injury.

Yet chronic diseases (cardio-vascular, respiratory, metabolic, carcinogenic diseases, and even clinically severe obesity) have distinct requirements over acute care. By definition, they are long-term and need ongoing, often lifetime, attention. Secondly they have their determinants in complex behaviours that are difficult to change, rather than microbial causes. Consequently short consultations, as afforded by Medicare recompense determined in an acute disease era, are unlikely to be totally appropriate.

Health education in groups, with an experienced leader (diabetes educator, dietitian, exercise physiologist etc) arose to help overcome these problems, and education programs were developed in different

countries in the late 20th Century to deal with this. But group education lacks medical input and has had limited uptake in medical payments systems. Individual 1:1 consulting on the other hand, has medical input, but lacks the educational component and time and peer support associated with group education.

Shared Medical Appointments (SMAs), are "... consecutive individual medical visits in a supportive group setting where all can listen, interact, and learn," [15]. SMAs involve 10-12 patients at a time over 1 to 1.5 hours, with a doctor and facilitator, who is usually a health professional experienced in group dynamics, and whose goal is to keep the consultations on track and utilize the peer support of the group [15]. SMAs have been used as an adjunct clinical approach in the US, Canada, and other countries and have now been successfully trialed in Australia [16]. They provide more time with the doctor, increased peer support, and greater opportunity for self-management. SMAs sit between clinical 1:1 care and group education as shown in figure 1. In the future they are likely to become part of the procedures defining Lifestyle Medicine.

Utilizing Tools

LM tools are centred mainly around the concept of the 'quantified self' [17], which is evolving the role of patient from a minimally informed recipient to an active collaborator in the patient-provider relationship. Improvements in technology however, have given rise to new devices and developments called 'mHealth', or health care and public health practices supported by mobile devices and other advances in telemetry (Table 2).

Limited evaluations of single mHealth devices have appeared in the literature since 2003, shadowing the recognition of chronic ailments as a rising category of disease. Now two systematic reviews of such devices, have highlighted the potential of these as a new set of tools for chronic disease management [18,19].

A recent review notes that "Increasing adherence may have

a greater effect on health than improvements in specific medical therapy [20]." Well controlled studies comparing adherence with mHealth devices compared to prescriptive advice controls typically show a 50% improvement in adherence from the former, more than justifying a serious look at these for chronic disease management.

SMS messages are the most popular current mHealth devices, used for medication reminders, education, or information about disease management. Simple SMS reminders or information about new programs or treatments are not only effective, but cost effective. As an example, one of us (GE) involved in the 1990s development of the successful men's waist loss program (GutBuster's) [21] found weekly advertising costs of \$10,000 for recruiting men through mainstream media crippling, leading to the early retirement of the program.

Operating out of medical centres we have now found a personal SMS invitation to 10 times the desired number of men to fill a Shared Medical Appointment group of 10-12, identified through medical records systems as falling within the required audience (eg. BMI>35; Metabolic Syndrome etc), is not only successful, but virtually cost free. SMS is also used for follow-up weekly tips. Fine targeting, combined with a personalized invitation from the patient's GP could hold the key to better long-term chronic disease management in a number of disease areas [22].

Other mHealth devices include mobile phones plus software or applications, specific medical telemetry devices or phone plus wireless or Bluetooth compatible devices. Between them, these devices not only deliver education and reminders, but monitor functions such as blood pressure, heart rate and blood sugars to patients and providers.

Multiple outcome measures were used in the most recent review, including usability, feasibility and acceptability of the mHealth tools studied as well as adherence and disease specific outcomes. Examples of improved management included reduced HbA₁C, hyperglycemic events and blood pressure, and improved lung function, use of nebulizers, fitness levels etc.

mHealth tools were also found to increase self-care awareness and knowledge, improve patient confidence to monitor chronic diseases, and decrease anxiety about disease. Improvements were noted across all age and SE categories. As might be expected, take up and use by adolescents, was shown to be particularly effective.

Significantly, a mHealth system between the patient and provider was less burdensome and judgmental compared to face-to-face contact, making such tools likely to be even more effective in a Shared Medical Appointments context, or with individuals who are adverse to the 'scary' doctor-patient environment in a closed setting, such as Indigenous individuals.

When added to other modern telemetry tools such as movement sensors, portable sleep monitors, Bio-Impedance Analysis scales (BIA), grip strength dynanometers, pulse measures and other 'tools', for self-monitoring, motivation, brief assessments, self-care (primary prevention) and self-management (secondary/tertiary prevention), the future for chronic disease management, and the potential for lifestyle-related disease management through mHealth is encouraging-at least in comparison to the prescriptive environment developed for acute disease. Instantly accessible Internet assistance, self-help-groups and virtual games provide further assistance.

Summary

Although not a departure from conventional medicine, Lifestyle Medicine knowledge, skills and tools provide an adjunct approach to managing lifestyle and environmental determinants of much modern chronic disease. LM fits a role between clinical medicine and public health, enticing clinicians to consider more distal environmental determinants of chronic disease than merely risk factors and behaviours within their bailiwick. Shared Medical Appointments (SMAs) provide an adjunct process for conducting LM consultations, and new 'tools', such as mHealth for doing this by capitalizing on

modern technological developments increase treatment options. No doubt the field will expand further with research further assessing these ideas.

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