

# Unhooking Our Reliance on Boom and Bust: A Sustainable Vision

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## The Principles of Ecologically Sustainable Medicine (ESM)

ECOLOGICALLY SUSTAINABLE MEDICAL PRACTICES ARE:

Safe and harmless

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Clean and non-toxic

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Cost-effective

•

Non-polluting

•

Adaptable and flexible

•

Renewable

•

Protective of the quality of life on earth, the environment and earth's natural resources

•

Synergistic with human health and planetary well-being

•

Connected with the web of life

### ECOLOGICALLY SUSTAINABLE MEDICINE BEGINS

WITH ECOLOGICAL PRINCIPLES THAT GUIDE OUR VISION OF SOCIAL AND PLANETARY WELL-BEING. THIS ARTICLE, THE FIRST IN A SERIES OF ESSAYS ON ECOLOGICAL PRINCIPLES AND MEDICINE, CONSIDERS THE NATURAL TENSION BETWEEN QUANTITATIVE AND QUALITATIVE GROWTH. HOW DO THESE PERSPECTIVES DIFFER? HOW CAN WE BECOME MORE CONSCIOUS OF THE ROLE THAT EACH OF THESE POWERFUL VIEWS PLAYS IN OUR UNDERSTANDING OF MEDICAL TREATMENT AND CHOICE?

*“Prevalence of asthma (cases per 1,000 people) rose 61 percent from 1982 to 1994—from 34.8 to 56.1, according to the American Lung Association. The rise in pediatric asthma (under age 18) was even more dramatic—from 40.1 to 69.1 during that period. (American Lung Association, Epidemiology & Statistics Unit, Trends in Asthma Morbidity and Mortality, 1996: p. 2) Paradoxically, treatment for asthma has improved during this time yet asthma incidence, morbidity and mortality continue to increase. Why asthma is rising, why more people are dying from the condition and why it affects some groups more than others remains a mystery.”*

— PHYSICIANS FOR SOCIAL RESPONSIBILITY

As the above statement from Physicians for Social Responsibility claims, treatments for asthma are improving while frequency of the disease is reaching epidemic proportions worldwide. The answer to this conundrum may have much to do with how one defines “improvement” of treatment. In most cases, asthma treatment focuses on the immediate relief of asthmatic symptoms, i.e., opening obstructed passageways. For the most part, long-term relief and prevention have not been achieved by current treatments, thus treatments essentially fail over time while overall disease incidence, morbidity and mortality continue to rise.

From an ecological perspective, the treatment approach of many contemporary medications, including prevalent asthma treatments, follow what can be thought of as an “exponential” or a “boom and bust” approach. This approach is characterized by an explosive response, reaching an unsustainable high-point, followed by a rapid decline, or “bust” when the system plummets to a low. In the case of asthma, the sufferer waits until he or she has an attack (the system low point) then uses the prescribed medication that brings them to a “high” state where, in the short term, the crisis is solved. However, one can only wait for the



“Our society is more oriented to heroic efforts to heal the sick, to deal with victims and to treat symptoms rather than to changing the social and other circumstances which result in people becoming victims.”

boom or high point to go bust and the cycle repeats over again. This cycle leaves the patient feeling depleted and suffering from a variety of side-effects (see page X for a chart of the side effects of the most commonly used asthma medications).

Ecological science identifies a contrasting growth model, entitled “sigmoidal” or “S-curve”, which is the primary pattern found in a more sustainable wellness cycle. The highs and lows of this pattern fluctuate much more evenly, never reaching huge peaks and valleys, and leaving the patient with a more stable and less stressful energy expenditure. In the long run, current asthma treatment has not proven to create the sustainable wellness defined by the S-curve effect.

What can we learn from these two growth models for thinking about sustainable healthcare?

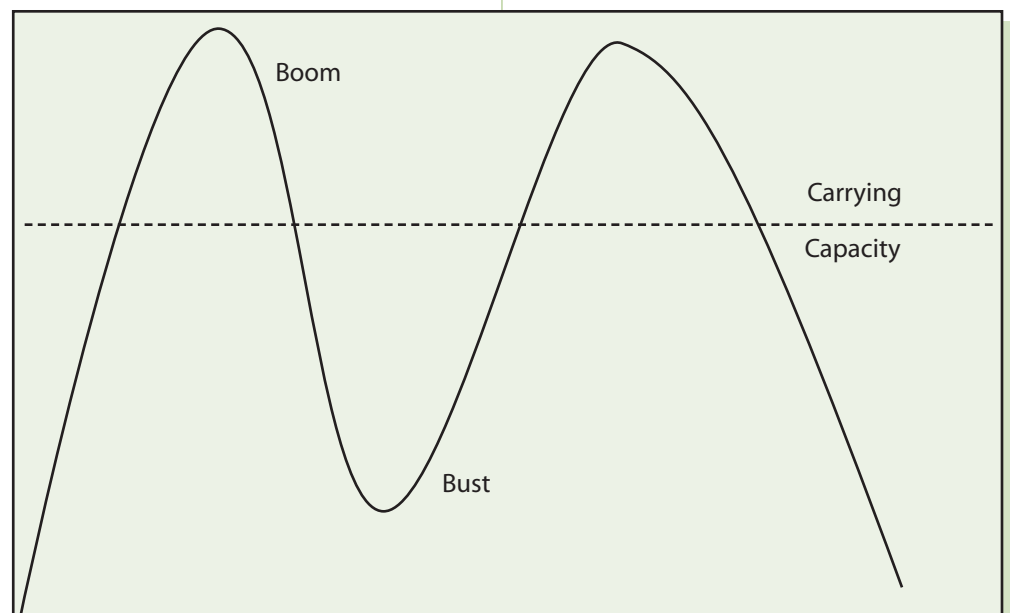
### Two Types of Growth, Exponential versus Sigmoidal

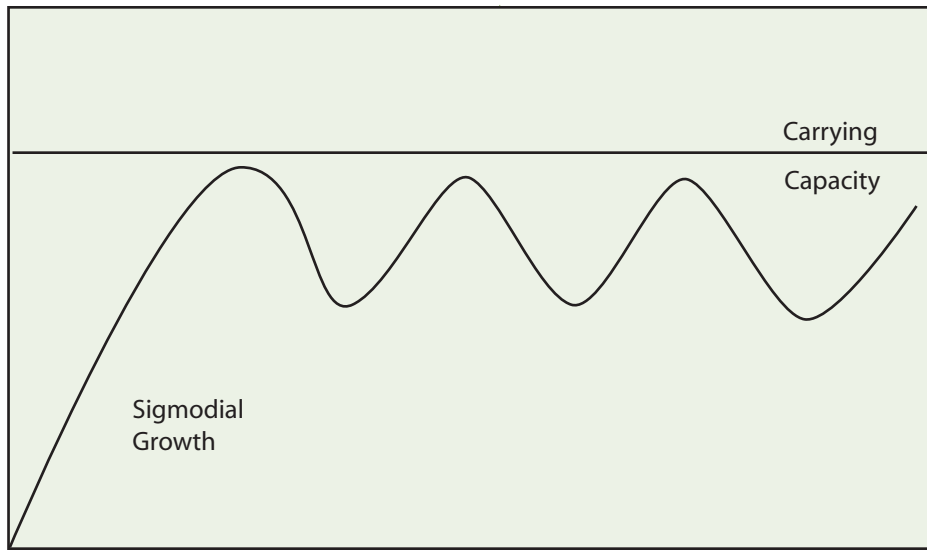
We hear often in our economic news about the need for continued growth to ensure a healthy economy. This orientation has

served the American economy for several centuries and has produced many great technological and social advances. But as the global population continues to rise, and the earth’s resource capacity is reaching its natural limits, many of us have begun to ask – is this the only way to do business? Does everything need to continue to grow bigger in order for us to thrive? Is this the most sustainable approach?

Exponential growth, which is defined as a steady doubling of size, is not only found in our economic philosophy, but is also commonly found in natural systems. Most animals follow this pattern at a cellular level as they grow from birth to adult maturity. Other examples include insect population growth, incidences of rapid colonization of vegetation, and the growth of bacterial infections. In each of these cases, very rapid growth leads to more cells, more reproduction, more beings and more biomass. This pattern is also found in social, business, and institutional systems. In human pathology, we find cancer cells behaving in this way.

In nature, however, such rapid growth is not sustainable. When a given population of





insects, plants or cells, exceeds its *carrying capacity*—the natural limit that any system can sustain—what generally follows is a significant die-off. Thus the ‘boom and bust’ pattern is established. When bacteria reach the limits of their host, the host dies. When cancer cells proliferate beyond the ability of the patient to manage them, the patient dies. Other common examples from the natural world include lemmings who commit mass suicide to keep their population intact and plagues of locust that sweep through ecosystems, depleting the local vegetative resources. In these cases, populations rapidly disappear only to return years later to repeat the pattern again.

But in practice, bacteria generally do not kill their hosts. This would not be a very sustainable strategy for bacteria to follow if indeed they are interested in long-term survival. What generally happens is that population growth levels off. A period of diminishing returns is generally entered that serves as a negative feedback loop for the system, instructing it to reduce its growth rate. If this reduction is timely enough and the resources of the larger environment are not too badly depleted, a pulsing pattern begins in which population size varies depending a variety of external or environmental factors. In this case, the negative

feedback is gentle and successful and a sigmodial, (S-curve), or sustainable, growth pattern emerges. If the negative feedback factors do not curb the growth rate sufficiently, or if the growth rate overshoots the carrying capacity of the environment, resources are quickly depleted and rapid downsizing occurs. Hence the sharp spikes in the boom and bust pattern.

With sigmodial growth, growth rate slows as it reaches the upper limit or the carrying capacity. This slowing enables the peak growth to occur before the carrying capacity is breached. This leads rhythm of rising and falling growth pattern remains below the maximum capacity and above the minimum threshold, providing long-term sustainability. The sigmodial curve might not reach the same overall height (or depths) as the boom and bust cycle, but it will sustain itself for a much longer period of time. Examples of sigmodial growth in nature include territorial limits in animal populations, population densities of various trees within a forest, and the healthy balance of intestinal bacteria in the human digestive system.

**Growing Bigger Versus Growing Better?**

The difference between exponential growth and sigmodial growth can be understood as

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## Healthy Quality of Life

THIS LIST OFFERS A GUIDE TO THE TYPES OF CHANGES A MATURE PERSON MUST MAKE IN THEIR LIFE IN ORDER TO MAINTAIN A HEALTHY QUALITY OF LIFE.

- Increase efficiency in the use of energy
- 
- Increase efficiency in the use of resources
- 
- Decrease the in turnover rate of components (repair before replacement)
- 
- Increase in rate and efficiency in recycling of material
- 
- Increase in proportion of energy devoted to maintenance
- 
- Increase in diversity of components
- 
- Increase in stratification, Increase in quality of components

a matter of bigger versus better, or quantitative versus qualitative. Exponential growth creates bigger populations at its high point (quantitative) while sigmoidal growth creates a better population when viewed from the perspective of overall longevity (qualitative). Both growth types occur naturally throughout our world and can be found in the human life cycle. For example, in childhood and adolescence, exponential growth is required for humans to reach maturity.

In these developmental years, teeth, bones and organs grow very rapidly. When the young human reaches full, adult maturity, he or she reaches a finite size of physical growth. A natural shift then begins toward more qualitative growth cycles wherein the goal of the organism is toward sustaining richer life experience and maintaining health and vitality.

Unfortunately, qualitative or sigmoidal growth is seldom the goal of medical treatment in our country. Asthma offers a clear example of this. John Cobb and Charles Birch, in their seminal work *The Liberation of Life*, observe that “Our society is more oriented to heroic efforts to heal the sick, to deal with victims and to treat symptoms rather than to changing the social and other circumstances which result in people becoming victims (p. 211).” In true form, much if not all of medical investment for asthmatics is the heroic kind. If you have an acute asthmatic attack, you can be sure to receive medication to get you breathing again. But little, if any, investment is paid to the long-term causes and issues involved in eliminating the disease, such as air pollution, nutrition, poverty and education.

Cobb and Birch go on to say “Preventive medicine is far less expensive than curative medicine and has a greater effect on the total well-being of the community.” The treatment of asthma would benefit from a qualitative approach. Asthma

might then be defined as a failure in the quality of respiration, which is a part of the life process of a person, rather than a failure in getting enough air in the lungs. Our medical focus would look different. To make this shift we must first learn the attributes of qualitative growth.

### The Attributes of Qualitative Growth

Sigmoidal or qualitative growth can be understood through a series of attributes that can be applied to medical treatment and philosophy, enhancing our understanding of a sustainable model of medicine.

#### **Increasing the efficient use of energy**

When we are young, there is greater room within our systems to waste energy through frivolous behavior. As we mature, we begin to refine our use of energy by implementing practices that improve our efficiency, including better food quality, regular exercise, and learning to relax and rest appropriately. As many studies have shown, the practice of meditation—regular, conscious rest for the mind and spirit—has a powerful ability to improve our overall energetic capacity.

#### **Increasing the efficient use of resources**

When we learn to work with the natural generation and depletion cycles of nature, we find that we use our resources more efficiently. In healthcare that means shifting our focus to medical interventions that use the least amount of natural resources. This implies allocating scarce medical resources at the correct scale and when legitimately warranted, allowing for equitable distribution.

#### **Decrease the turnover rate of components (repair before replacement)**

Medical technology is very successful with replacement—including many of our body parts, from dental prosthesis to joint replacements. A more sustainable medical model will value regeneration over replace-

ment. This is the goal of most body-based and manipulative therapies, of which are there many. This is also the goal of good exercise and nutrition—enabling the body to repair itself.

#### ***Increase the rate and efficiency in recycling material***

Natural medicinal substances and ESM practices are more efficient in general and create little or no waste. On the other hand, the waste generated by many of our more “advanced” medical technologies creates iatrogenic (treatment related) disease.

#### ***Increase the proportion of energy devoted to maintenance***

Exercise, yoga, meditation, and relaxation are all proven techniques that enable us to maintain greater health and vitality. Investment in these practices as part of the healthcare system will serve to maintain well-being by providing a more efficient, long-term approach.

#### ***Increase the diversity of components***

Diversity is seldom the orientation of contemporary medicine. Drug companies generally provide monotypic solutions offering precise effects on human physiology. Research protocols reinforce a causal perspective based on the belief that a particular drug will have a precise and focused effect that can be measured physically. In a sustainable system, diversity facilitates synergistic effects, creating a potential multiplier for healing. One noted example comes from Dean Ornish’s research on reversing heart disease, diet and meditation are both effective interventions, but when used together, the result is much greater—a positive synergistic effect is born.

#### ***Increase in stratification***

Stratification refers to the technique of using multilevel approaches to an issue. Returning

to the asthma example, a sustainable approach to disease would consider the treatment of the individual both physically and emotionally, examine family and community proximity to outdoor air contaminants, and look at indoor air pollution in the household, school, and workplace. This approach would encourage remediation of potential pollutants and encourage the use of healthier building materials. Outdoor air pollution, a more complex problem, would also become a concern of the medical community in a more stratified model.

#### ***Increase the quality of components***

Improving the quality of the components implies a multivalent or “whole person” approach to healthcare. In the case of asthma, this translates into improving cardiovascular integrity through exercise, improving pulmonary functioning with breath therapy, improving emotional wellness through meditation and counseling, and improving immune functioning through nutrition and/or energetic medicines.

When the attributes of sigmoidal systems are applied to healthcare, there is a dramatic shift toward sustainability. In our own lives, we move away from the “boom and bust” that occurs from emotional, physical and cultural stress and we begin to put time and effort into taking care of ourselves through exercise, eating well, and implementing a variety of wellness practices. This slow and steady approach yields a result that seldom overburdens the carrying capacity of the system—our bodies and our healthcare system. When we cannot, for a variety of reasons, maintain this steady state and our health is seriously threatened, exponential solutions become justifiably required.

#### **Treatment of Asthma: Quantitative Versus Qualitative Approaches**

How is it that asthma treatment has improved while incidence of the disease and mortality continue to rise? We can begin by





looking at the meaning of “improved”. Current asthma treatments generally rely on steroids, a perfect example of a boom and bust solution. The patient waits until they are in serious crisis and medications such as bronchodilators are applied. The initial response is excellent (the boom): the airways are opened and oxygen deficiency is relieved. However, the treatments themselves disrupt the natural carrying capacity of the patient. In essence, the treatments create a boom and bust cycle that does not effectively address the incidence of disease. It would make sense from this perspective that while new treatments are continually being developed and offered, these treatments are not resulting in a decrease of global occurrences of the condition.

Later in this issue, Buteyko Method, or eucapnic breathing is highlighted as an ESM practice (see page X). Dr. Buteyko, a Russian physician, argues that asthma is often produced by hyperventilation or Chronic Hyperventilation Syndrome (CHVS). From a physiological perspective, asthmatics often suffer from low CO<sub>2</sub> in the blood due to stress that is aggravated by the way they breathe. While in the boom cycle of bronchodilator (inhaler) use, asthmatics are able to receive the necessary oxygen. Overbreathing in this state, however, leads to lowering of the blood pH. Lower blood pH leads to poor oxygenation of tissues, requiring more oxygen to reach body tissue in general. The bust cycle in this case happens when the patient tries to get more air. The asthmatic person becomes dependent on more medication to create opportunities for more air. Thus the boom and bust cycle continues.

In a sustainable approach to asthma or CHVS sufferers, patients are given an opportunity to use their energy more wisely. As clinical studies have shown, the more patients invest in balancing breathing skills, the less medication is necessary. As patients invest in fitness, healthy nutrition, meditation, and organopathic remedies that sup-

port the lungs and vascular system such as stress reduction and yoga—all the “sigmoidal” modalities—the less frequently there will be desperate episodes of air hunger. The more we consider the quality of air in our homes and offices, as well as the overall energy consumption of our lives, the more we will create a healthier world in which to breathe.

These ESM solutions won’t guarantee that patients will never have an asthma attack. However, the use of extreme medical solutions will be minimized as will the strain on planetary resources. Costs of treatment will dramatically decrease and personal integrity will rise as patients feel more in control of their lives and less dependent on drugs and doctors for proper health.

Both boom and bust and sustainable cycles are part of nature. Shifting to a more sustainable medical system does not require abolishing medical treatments that act in a boom and bust manner. Instead, sustainable medicine requires investing in sigmoidal solutions that take into account increased efficiency, turnover rate, recycling, maintenance, diversity, stratification and the overall quality of medical interventions.

Fortunately, we have many sigmoidal medical approaches available to us in America today (see page X for a listing of ESM practices). A shift to greater utilization of ESM practices will not only protect vital resources of planet, it will create a more reliable and effective healthcare system that meets the needs of everyone by distributing limited resources only when extreme situations demand it. The bulk of medical treatments—those that come before the crisis and work to maintain health—will consider the wellness of individuals, communities, and ecosystems, as well as the planet as a whole. Wellness from this perspective becomes the central focus of healthcare, with each of us personally investing in the vitality of our wellness while supporting society’s need to balance planetary resources in a sustainable manner.

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