Dedication

To my family

Good luck.
Author’s preface

“I guess we misunderstood what life was about. We messed up. I hope this message can be understood.” (A Message from the Past – Act on Climate Change – short film).

"It is difficult to get a man to understand something, when his salary depends upon his not understanding it“ (Upton Sinclair, 1935)

The 21st century will probably be unlike any other century before or since. It will be a century of peaking and then declining natural resources: first oil, then natural gas, water, food, coal and uranium. At the same time, we will have to deal with a record number of human beings on the planet.

Our political, economic and media leaders have prepared us poorly for what is likely to come. The overwhelming message from mainstream sources is in effect that we have infinite resources and can enjoy continuous improvement and infinite growth without consequences, and that technology will find a way to overcome any obstacle. When these things fail to happen (which is almost inevitable) there is likely to be much confusion and anger and a lack of consensus about what to do next.

This book can’t solve all of these problems, but maybe it can help in a small way. It is intended mainly as a guide for my colleagues in the healthcare professions, to help ease our transition into a post-peak healthcare system. It is not intended as a practical guide to how to deliver babies, perform an appendectomy, amputate a leg and so on, because I’m assuming that my colleagues already know how to do these things. However, I hope that even if you are not a healthcare professional, you will still find the book useful.

If you are a doctor or nurse, I am sure you are very good at the job you have been trained for, but there are some scenarios which were not part of your training and which you have probably never even considered as a possibility. For example, if public order breaks
down, your community is attacked by a lawless mob, the attackers are driven off but one or more injured attackers are left behind – what are your ethical responsibilities towards them? Hopefully you will never find yourself in this situation, but if you do, it would be a good idea to have thought about it in advance. If you make the wrong decision either way – to treat them or not treat them – people could die as a result. Or what if the electricity supply, or the supply chain for pharmaceuticals, or the banking system fails? How will this affect your practice? These and other scenarios are examined in this book.

The second group of people I am speaking to in this preface are people who may be reading this book some time in the future - say 100 years from now. It is possible that some copies may survive and that some people may survive to read them. You will have the advantage over me in that you will know what happened in the last 100 years – the start and end dates of major wars, which national borders have dissolved, which countries have ceased to exist, which new countries have formed, how many coastal cities have been abandoned because of rising sea levels, by how much total human numbers have risen and fallen and so on. I can only guess at these things, because they haven’t happened yet.

The facts will be well known to you but what I suspect you will struggle to understand is – why? How could people in the early 21st century have been so stupid as not to see what was obvious: that you can’t create infinite growth out of finite resources, that if you keep pumping carbon into the atmosphere you will make a bad situation worse, and that there is no like-for-like replacement for fossil fuels?

We have the same problem when we look back at people from an earlier time. For example, what were the people of Easter Island thinking of when they cut down their last trees in the 17th century and destroyed their only means of escape? What were the villagers of Salem, Massachusetts thinking of, also in the 17th century, when they executed 20 of their friends and neighbours for practising witchcraft, on the flimsiest of evidence? How could people have condoned the slave trade in the 17th to 19th centuries? Their actions are as incomprehensible to us as our actions probably are to you, because their mind-set is from a different era and a different culture.

You know the facts of what we did to ourselves and the planet, so I’m not going to dwell on that. What I’m going to try to explain now is why we did it.

If you are living 100 years in the future and you have obtained a copy of this book, you probably have access to other materials from our time: newspapers, magazines, Government and think-tank reports, maybe even video material such as newsreels and documentaries. You have probably noticed a common thread running through all these materials, which is a belief that the economy must and will keep on expanding forever, that the population must and will keep growing, and that generally, more is better. Just for fun, I’ve included some examples of this in the book. They are editorials from newspapers published in the Isle of Man, the tiny island of 88,000 people where I now live. The island is so small that if you stand on Snaefell Mountain in the centre of the island, you can see the whole island, and it should be obvious that it can’t support infinite growth. And yet look at these newspaper cuttings:
YOUR ISLAND NEEDS YOU

Help to attract more people here to boost the Manx economy

Unemployment at 18-year low, see page two
They might just as well be opinion pieces from the London Times, or the Washington Post, or the Canadian Globe and Mail, because the message in all cases is the same: growth is good and more growth is better. This is the only message we ever hear in the mainstream
media. Mainstream journalists almost never ask simple questions like “How many people do we need?” or “How is infinite growth possible with finite resources”? The perpetual growth narrative is accepted and reproduced without question. Because the general public only hears one narrative, most people assume that is the only narrative there is.

Not everyone thinks like this. There are millions of people who realise that what we are being told every day by the mainstream media and politicians is not possible, and who are actively preparing for a different future (I’m one of them). However, we are vastly outnumbered by the billions who accept the mainstream narrative, and our voices are not heard in the mainstream media, only on “alternative” media such as weblogs and podcasts.

Why does the growth narrative have such a stranglehold on the mainstream media? That’s hard to say, and I’m not sure that I have the answer to it. I’m sure that from time to time, journalists must stop and think “wait a minute, is infinite growth really possible, maybe I should ask a question about this in my next interview…? But that just doesn’t seem to ever happen. I suspect there are three reasons.

Firstly, it is possible to influence public discourse by throwing a lot of money at it, and the financial services and fossil fuel industries are very wealthy. If you put a lot of money into advertising revenue, research grants, university professorships, political donations and employing people to monitor and edit Wikipedia, you can buy a lot of influence over what is or is not discussed. Secondly there is groupthink, or the herd instinct. If you are a rising young journalist, or university academic, or economist, or politician, it’s both hard and risky to swim against the tide of popular opinion. You risk losing your friends, damaging your career, being ridiculed and ostracised…so the easiest thing is to do and say what everyone else does and says, and to suppress any secret doubts you may have. The more strongly you believe in the growth narrative, and the more skilfully you can articulate it, the more your career is likely to succeed.

And thirdly, maybe the truth is so unpalatable that people can’t bear to think about it. Generally speaking, we enjoy more material comforts than any other generation in history, and the thought that this may soon go away and be replaced by global conflicts over diminishing resources is too painful for many people to contemplate. Please note that I referred to “material comforts” not “happiness”; there is increasing recognition, even in the mainstream media, that our society suffers from widespread mental health problems including anxiety, depression and substance addiction, and that we are not necessarily happier than earlier generations, despite our material prosperity.

Most people will probably cling to the familiar mainstream narratives in the face of all the evidence for as long as they can, encouraged by the mainstream media and politicians who tell them "don't worry, everything will be fine". This is a significant barrier to doing what needs to be done to prepare for the future. However, I anticipate that at some point the evidence will become so overwhelming that a tipping point will be reached, at which a critical number of people will realise what is happening and try to turn the ship around before it hits the iceberg, so to speak. It’s unlikely that many people will change their minds and stop believing in infinite growth when they believed in it before. It’s more likely that as the older generation with these beliefs dies out, a new generation will grow up with a different perspective on reality. However, I think any action taken at a collective scale will probably be too little, too late. For now, people who are aware of these issues need to
prepare at an individual and family level and not expect much help from higher up in the social hierarchy.
Back to the future?

Simple but happy rural folk prepare for an ecologically sustainable harvest (oil on canvas, John Constable, Romantic painter, 1821)

“...modern economic growth reflects an interrelation that sustains the high rate of advance through the feedback from mass applications to further knowledge. And unless some obstacles intervene, it provides a mechanism for self-sustaining technological advance, to which, given the wide expanse of the universe (relative to mankind on this planet), there are no obvious proximate limits.” (Simon Kuznets, Nobel Prize winner in economic sciences, 1971 prize acceptance speech)

"Economic growth is crucial for the future prosperity of Canada" (A Look at Canada, Citizenship and Immigration Canada, 2008)

“This Government believes that the best way to raise additional tax receipts and aid local businesses is to grow our economy” (Hon Laurence Skelly MHK, Minister for Economic Development, Isle of Man Government, Proposals to Accelerate Economic Growth - A Consultation Document, 2016)

In this chapter we are going to look at three possible futures representing life in the 21st century, and the likelihood of each of these futures turning out to be the correct one.

Let's start first with the mainstream view, as articulated by the vast majority of economists, mainstream media sources and politicians, and believed by most of the public. This states, in its simplest form, that economic growth is necessary for the healthy functioning of a
modern industrial economy and for the creation of jobs, and that the right political and economic conditions will create growth which will continue for as long as we want it to. The quotations above exemplify this mainstream view, and the speech from the Nobel prize winner suggests that when the possibilities for economic growth on this planet are exhausted, we will expand the economy to other planets. This view may sound over-optimistic today, but put in its historical context, two years after the first manned moon landings, it probably sounded quite plausible at the time.

Politicians and economists are often reluctant to specify the amount of economic growth needed, or the length of time for which they think the growth should continue, so let's help them out by doing some simple calculations. A figure of 3% growth per annum seems to be the "sweet spot" which economists aim for, so let's use this as the basis for our calculation, and see what happens if we continue this growth rate for one average human lifetime, which in a modern post-industrial country is around 80 years. Plug these figures into a compound interest calculator and you find that the economic output needs to increase to 1,064% of its original size, or a factor of just over 10 times.

Please bear in mind that this represents actual output of real goods and services, not inflation. It would be very easy to create 10-fold inflation just by printing up ten times as much paper money, but it is not so easy to conjure up ten times as much oil, coal, steel, food and water.

Now repeat the calculation for a second human lifetime - another 80 year stretch - and now you see that in order to maintain 3% growth you need to increase the amount of production and consumption 100-fold from your starting point. If a 10-fold increase was probably impossible, a 100-fold increase is definitely impossible. The only logical conclusion we can draw from that is that economic growth as we know it is going to stop, the only question being when. So we can discard this "perpetual economic growth" version of the future as being the version which is least likely to occur, despite the fact most people believe in it.

Now let's look at a second possible future, which is embraced by a sizeable minority of the population. In this future, the reality of peak oil is recognised - after all, it's a non-renewable resource so it has to run out someday - but this recognition is accompanied by a belief that technology will find an answer, for example, by swapping electric cars for gasoline and diesel driven cars, and that our descent down the declining curve of oil production will be as smooth and orderly as our ascent up it. So, for example, if global peak oil extraction occurs in the year 2012, then the world 20 years after peak oil (in 2032) will be similar to the world 20 years before peak oil (in 1992). And 1992 wasn't so bad, was it?

There are several problems with this. For a start, electricity is a completely different energy source from oil, and in many ways an inferior one. It is much less energy dense and much harder to store. So for example, I can easily pick up a gallon of gasoline in one hand, and this will propel a Toyota Prius for 76 miles. I can't pick up an electric battery in one hand which would have the same energy store: it would be very much larger, heavier and more expensive.

Oil can be used to make physical products like plastics, pesticides, fertilizers and food; electricity can't.
Changing to electric cars doesn't solve the problem of perpetual economic growth. Even if all cars were converted to hybrids tomorrow, we would still need to produce 3% more cars each year in order to keep driving economic growth.

The oil and natural gas of 1992 gushed out of the ground under its own pressure, or could be relatively easily pumped to the surface. The oil and natural gas of 2032 will be much more difficult to extract, because the easy deposits will have been used up. It will have to be obtained by fracturing shale rock, or refined from tar sand, or pumped from deep beneath the ocean floor, all of which will make it much more expensive.

Finally, the world of 1992 had more resources and a smaller population. The world of 2032 will have fewer resources and a larger population. There were around 5.5 billion people in 1992, but there will be around 8 billion in 2032, and they will all want a slice of an ever decreasing pie:


All of these factors suggest that a smooth and orderly decline in oil consumption is unlikely to happen.

The third possible future is one which politicians and the public seem generally unwilling to face, but which looks to be the most probable one. This is a world in which most of our important resources (oil, natural gas, coal, uranium, food and water) reach a peak of extraction and then decline, becoming more expensive, and becoming valuable commodities worth fighting over. This is the future we need to prepare for, but which at present we are woefully unprepared for. This book is intended to help you with that preparation.
"Once one lifts one's eyes from the narrow path of daily survival activities and starts scanning the horizon, a frightening array of peaks comes into view". (Richard Heinberg, Museletter # 185, 2007)

Anyone seeing the title of this book "Post Peak Medicine" might be forgiven for wondering "Peak what?". The answer, unfortunately, is "peak everything". There are a great many resources available both online and in printed form which describe this phenomenon in detail. One resource worth looking at is the book "Peak Everything" by Richard Heinberg (New Society Publishers, 2007). This chapter gives a brief introduction to the concept of "peak everything".

Our society depends on continuing inputs of non-renewable resources for its functioning, and increasing inputs of those resources for its economic growth. The resources in question include (but are not limited to) oil, coal, natural gas, uranium, water and food. At first sight, water and food may appear to be renewable, but in the context in which we are currently using them, they are partly non-renewable: this will be explained later.

The extraction of natural resources of most kinds tends to follow a bell shaped curve, with the extraction rate increasing until a peak is reached, then declining. This is because the easy resources are extracted first (those under pressure, near the surface, or on land rather than under the ocean). As those easy resources are used up, a peak extraction rate is reached, and as the more difficult resources are extracted (tar sand, shale rock, deepwater deposits), the rate decreases. In this respect, extraction of natural resources is unlike, for example, empying the gas tank of an automobile, where the flow rate stays constant until the last drop is extracted, and then suddenly stops. Therefore, when considering the extraction of natural resources, the relevant question to ask is not "when will it run out?" to which the answer is usually "never", but "when will we reach peak extraction rate?"

**Peak oil**

Most oil producing countries passed their domestic peak oil production years ago. For example, the USA reached domestic peak oil in 1970 and the United Kingdom in 1999. Until now, the only thing which has delayed global peak oil has been the ability of very large producers such as Saudi Arabia to continue producing in ever increasing quantities. It looks as though even Saudi Arabia may now be at or near peak. Most estimates of the date of global peak oil fall in the range 2005 (meaning we have already passed it) to 2020, with a clustering around 2012.

**Peak money**

Our society depends on oil more than any other commodity for transport, agriculture, manufacturing and energy. Historically, increasing economic output has closely tracked increasing oil production and consumption. It is logical to expect that as oil peaks, economic output will peak, and that as oil production and consumption decline, economic output will decline, leading to a prolonged period of negative economic growth and
eventually a stable state of a zero growth economy. This is in direct contradiction to the forecasts of perpetual economic growth being made by most mainstream politicians and economists.

A prolonged period of negative economic growth is not necessarily a bad thing in itself - it is a long overdue correction from the prolonged but unsustainable period of positive economic growth which has taken place over the last 200 years of industrialization - but it is likely to wreak havoc on all sectors of the economy including banking, insurance, mortgages, pensions and the stock market. All of these institutions are dependent on positive economic growth in order to keep functioning in the way we are accustomed. Peak oil is therefore likely to coincide with peak money.

Peak coal

Global peak coal is likely to occur around 2020 according to the Energy Watch Group (report, 2007). This will particularly impact countries like China and the USA which use large quantities of coal for electricity generation.

Peak uranium

Peak uranium is also likely to occur around 2020 (Energy Watch Group, report, 2006). This will impact nuclear powered electricity generation.

Peak natural gas

No reliable estimates are available for the timing of peak natural gas, but as natural gas and oil deposits are often found together, it seems reasonable to expect a peaking of natural gas to occur probably no later than 2020.

Peak water

Water is in theory the ultimate renewable resource. It falls as rain or snow on to the land, runs as rivers down to the sea, evaporates by the sun's energy into clouds, and falls as rain again. So what's the problem?

The problem is that in many parts of the world, particularly China and the US, water needed for agriculture exceeds that which falls as rain onto the land. Water is therefore being pumped up from deep aquifers - so-called "fossil water" - to irrigate the land, and the level of these aquifers is rapidly falling. When the remaining water in the aquifer becomes so deep that it is not worthwhile to extract it, peak water will be reached in those areas irrigated by the aquifer, along with peak food (see below).

Peak food

"Our results show that to produce the same amount of food using organic rather than conventional means, we'd need to use twice the amount of land...it isn't sustainable to promote (organic farming) as the best or only method of agriculture. To meet future demands of food production, we will need to keep farming our most productive areas in the most intensive way we can." Professor Tim Benton, The Times, United Kingdom, 5 May 2010, on his study comparing organic with conventional agriculture.
This illustrates a common but probably incorrect paradigm of mainstream thinking: an assumption that if we wish to continue intensive agriculture, the oil and gas will be available to allow us to do this. But if the oil and gas are not available, and we have no choice but to adopt organic farming methods, the implications for food production are obvious.

Peak population

People can live, and have lived for thousands of years, without money, oil, coal, natural gas or uranium. People can't live without food or water, and shortages of food and/or water have led to population collapses in the past: for example, those of the Mayan civilization in central America, and Easter Island. The issue of peak population is so important that I have devoted a separate chapter to it.
Historical perspective

"Those who cannot remember the past are condemned to repeat it" (George Santayana, 1863-1952)

After 200 years of industrial economic growth, most people have come to believe that economic growth is a normal and indeed essential state of affairs and that it will continue indefinitely. A historical perspective suggests that on the contrary, economic growth is a temporary phase during the development of a civilization and that it is unsustainable. We can deduce this in three ways: from archaeological records, from contact with other living civilizations and from basic arithmetic. Let's look at each of these in turn.

Archaeological records

Archaeological records tell us that no previous civilization has ever achieved perpetual economic growth. If they had, they would still be here today. Most past civilizations have eventually failed through war, resource depletion or other factors which are examined in detail in Jared Diamond's book "Collapse: How societies choose to fail or succeed" (2005). Examples of civilizations which have failed include, in approximate order of appearance, the Sumerians, Assyrians, Medes, Babylonians, Persians, Greeks, Romans and Carthaginians. Their surviving records suggest that none of them foresaw their own collapse, and all of them thought their society was stable and would continue indefinitely.

Contact with other living civilizations

During the Age of Discovery, from the late 1400s to the late 1700s, European explorers sailed the world making contact with, trading with and/or conquering other civilizations. None of the living civilizations they encountered had achieved, or had an expectation of, perpetual economic growth. All the civilizations encountered had achieved an approximately steady state or zero growth economy, with the exception of Easter Island which was in the final stages of collapse due to resource depletion.

Basic arithmetic

A brief consideration of basic arithmetic will show why perpetual economic growth was just as impossible for early civilizations as it is for us today. Let's take as an example, the Romans. The Western Roman Empire (that part of the Roman Empire centered on Rome) was founded around 753 BC and expanded until around 117 AD with the death of the emperor Trajan. His successor, the emperor Hadrian, was a man ahead of his time and decided that it was neither possible nor desirable for the Roman Empire to continue to expand. He therefore attempted to stabilize the Empire at its then current size, it continued in a steady state until around 180 AD with the ascent to power of the emperor Commodus, then began a long slow decline until 476 AD when the last Western Roman emperor was deposed.
Let's suppose that instead of stabilizing in 117 AD, the Roman economy had expanded at 1% per annum until the present day. This very modest rate of economic growth would be viewed as sluggish by most modern economists. Eighteen hundred ninety three years of economic growth at 1% per annum would result in a Roman Empire which produced and consumed over 166 million times the amount of goods and services in the year 2010 as it did in the year 117. Of course this amount of growth isn't possible: there aren't the resources on the planet to sustain it. So if Roman economic growth had not been voluntarily stopped by Hadrian, it would have been compelled to stop by natural forces when it bumped up against the physical limits of the environment.

And just for fun, let's calculate how much the Roman economy would have grown if it had enjoyed a 3% growth rate until the present day - a rate which most modern economists would consider to be normal. I have no idea what the answer is because the compound interest calculator I am using can't handle numbers that big. If any economist reading this knows the answer, please tell me, and then tell me how he or she thinks that would be possible to achieve.

So archaeological records, contact with other living civilizations and basic arithmetic all point to the same conclusion: perpetual economic growth was impossible in the past, it is impossible now and it must at some point stop.
How long have we got?

This is one of the first questions asked by people who are newly “peak aware” and the short and honest answer is “I don't know”. However, I suspect that you are looking for a more helpful and insightful answer than that in order to help you prepare, so this chapter represents my best estimate of the likely timeline ahead of us.

First we need to define the question, so we need to ask “How long have we got until what?” If you are expecting the Zombie Apocalypse, or Armageddon, or similar, then I'm sorry to disappoint you but I don't think that will happen. I base this view on the lack of historical precedent. It is true that in the past, some civilizations have been suddenly annihilated – Nineveh in 612 BC and Carthage in 146 BC for example – but these are the exception rather than the rule. In the vast majority of cases, civilizations have shown a gradual arc of decline and fall and I think our civilization is likely to follow the same trajectory. We are probably looking at what John Michael Greer describes as a “stair step decline” and what Carolyn Baker describes as a “slow, sucky collapse”.

Western industrial civilization has two principal Achilles heels: its reliance on non-renewable fossil fuels as a primary energy source, and its reliance on infinite growth to power its economy. Both of these are unsustainable and must therefore at some point come to an end. When and how they come to an end will largely determine the answer to the question “How long have we got?”

Let's look at the peak oil story first. At the time of writing this chapter (July 2013) the most reliable information on peak oil, as far as I am aware, is summarized in the graph on the following page, created by Jean Laherrère:
This shows peak oil occurring around 2005. However, there is a relatively flat top to the peak, and oil production in the year 2000 is very similar to oil production in the year 2020. This period at the top of the peak has been described as a “bumpy plateau” in which declines in production from large, older conventional oilfields are offset by production from smaller, newer oilfields and unconventional sources like “fracking” wells and tar sands. I would therefore expect a period of relative stability in oil production, characterized by high but fairly stable oil prices and no significant supply shortages, lasting until around the year 2020.

After 2020, I would expect an period of decompensation and destabilization to occur, with increasingly steep declines in production from conventional oilfields and an inability to offset these with unconventional production. Oil prices will rise and shortages will occur, patchily at first but with increasing severity and frequency. Food prices will rise and there may be food shortages.

The high price of oil will exert a downward pressure on the economy, with fewer goods and services being produced, and those which are produced becoming more expensive. Unemployment levels will rise. Our economy depends on perpetual growth to function properly, but energy shortages will cause a long term contraction of the economy. There will be decreased government revenue, decreased government spending and increased unemployment. Government programs and benefits (including health) will be cut. Both government and private pension funds may be unable to meet their obligations to retirees. As a result of all of the above changes, there may be political and civil unrest.

The above forecast may sound gloomy, but in fact it's a best case scenario, because I am anticipating a slow and steady contraction of the economy. Things may not go down like this, because the wild card in the pack is human psychology, which cannot be easily predicted.

Consider the following hypothetical scenario. A leading public figure, possibly the President or Prime Minister of one of the industrialized nations, makes a speech to the nation similar to Winston Churchill's “blood, sweat and tears” speech of 1939. He explains that peak oil occurred some years ago, and that nothing can now prevent an energy descent because there is no adequate substitute for oil. He further explains that there can be no “economic recovery” in the sense of returning to the old economy, because the old economy depended on infinite growth which is impossible. He urges people to prepare for major changes which lie ahead, including food shortages.

If enough people believed the speech, the effect would likely be immediate and devastating. There would be panic buying and hoarding of food and gasoline, creating artificial shortages. Stock markets would collapse as people scrambled to get their money out of worthless paper “assets” and into tangibles like precious metals. Oil exporting nations would cut their exports in order to conserve their dwindling reserves, prompting retaliation by oil importing nations in the form of trade embargoes or military action. There would be food riots and violent demonstrations as the public demanded that their impotent governments “do something”.

Fortunately it is unlikely that any leading politician would be brave enough to tell the people the truth, so we will probably get our seven years of stability. On the other hand, it
could happen tomorrow. We just don't know, which is why it is a good idea to start your personal preparations now rather than putting it off.
Awareness and denial

"Professor Luis Garicano, director of research at the London School of Economics' management department, had explained the origins and effects of the credit crisis when (the Queen) opened the £71 million New Academic Building. Prof Garicano said: 'She was asking me if these things were so large how come everyone missed it'. He told the Queen: 'At every stage, someone was relying on somebody else and everyone thought they were doing the right thing.'" (Andrew Pierce, The Daily Telegraph, United Kingdom, 5 Nov 2008)

"The Commons Treasury committee said male banking chiefs became caught up in a 'group think,' where they failed to challenge decisions which led the entire banking system to the brink of collapse 18 months ago." Rosa Prince, The Daily Telegraph, United Kingdom, 3 April 2010.

When people first become aware of peak oil, the impossibility of endless economic growth and everything which follows on from that, the first question they are likely to ask is "How should I prepare?" The second question they are likely to ask is "Why can't everyone else see what I can see?" When someone understands that the supply of oil is finite, our economy depends on oil, and that perpetual economic growth is just as impossible as a perpetual motion machine, they often feel compelled to pass on this news to family, friends and co-workers, and are surprised when the response is less than enthusiastic: in fact, the usual response is anger, denial and accusations that the person bearing the news has taken leave of their senses. Even if evidence and arithmetic are presented to support the case, many people don't believe it and often don't even want to look at it.

Beliefs can be held so strongly that they are impervious to logic and evidence. An example of this is Hiroo Onoda, one of the last Japanese soldiers to surrender after World War 2. When the war ended in 1945, Onoda was carrying out guerilla warfare in the Phillipine jungle. His cultural upbringing, and his military orders, convinced him that that Japanese soldiers never surrendered, and he remained in hiding in the jungle for the next 29 years, convinced that he was still at war, and unconvinced by leaflets from the Allies and the local islanders explaining that the war had ended, and letters and photographs from his family. In the end, he was persuaded to surrender by a visit in person from his former commanding officer (now long retired and working as a bookseller) who formally relieved him of his duty.

A belief in perpetual economic growth and denial of evidence to the contrary does not seem to be correlated with intelligence, educational level, age, sex or cultural background. Many highly trained and highly intelligent economists, often working for national governments and central banks, believe in perpetual economic growth, or appear to believe in it. This phenomenon is difficult to explain on rational grounds. In this chapter I am going to offer an explanation based on genetics and evolution. I don't claim that this is the best explanation, or even that it is correct, but it does offer a model for explaining something which many peak oil aware people find difficult or distressing to deal with.

The explanation I am going to offer you is based on our innate herd instinct. In this age of individualism, the terms herd instinct, groupthink or conformist are often used in a mildly derogatory sense, but it is important to realise that the instinct to do as the group does is an important part of the survival toolkit which evolution has bred into us.
You can see the herd instinct in action by watching a shoal of fish, a herd of buffalo or a flock of birds. At the approach of a predator, all the animals start moving in a coordinated manner away from the perceived danger. The animals at the front of the shoal, herd or flock may not even be able to see or smell the danger, but they move anyway. This movement away from danger protects both the herd and the individual animals within it. If an animal decides to move in a different direction, it may be trampled by the herd and/or eaten by the predator, and so doesn't pass on its genes. In this way, evolution reinforces the herd instinct and discourages individual thinking.

You don't often see human beings moving in large herds, except in artificial situations like airports or sports stadiums, but the herd instinct is still there - it just expresses itself in an intellectual rather than physical form. People share a common set of beliefs about the appropriate way to behave towards family, neighbours and enemies, the nature of birth and death, communal rituals and the origin and destination of their society. We call these things culture and religion. People who deviate from the core set of beliefs may be marginalised or ostracised, and may have just as hard a time as the buffalo who decides to make a left turn when all the rest are charging straight ahead.

This all works well for 99% of the time, when things are going smoothly and the herd is moving in the right direction. But what happens if the herd starts moving in the wrong direction? We can see some examples of this in the animal kingdom. Fishermen can herd fish into nets by making noise to drive them in the desired direction. A famous fictional example can be found in Thomas Hardy's 1874 novel "Far from the Madding Crowd" in which an insane sheepdog drives a herd of sheep over a cliff. In both of these cases, the herd instinct causes the herd to move into danger, not away from it, and the maverick animal which heads in a different direction is the one most likely to survive.

Unfortunately, a herd of human beings can also move in the wrong direction intellectually, and history provides numerous examples of this. We call these mass delusions, mass psychosis or mass hysteria. For reasons which I cannot explain, many (although not all) of the examples involve irrational economic beliefs. Some are relatively harmless, causing a few people to lose a moderate amount of money. Some have resulted in the deaths of tens of millions of people. My main criteria for describing something as a mass delusion or mass hysteria are that a large number of people believed in it, it ought to have been possible to see at the time that the belief was false, and that subsequent events did in fact prove it to be false.

One of the earliest documented examples of financial mass hysteria was the tulip bulb mania in Holland in the 1630s in which the contract prices for bulbs of the recently introduced tulip reached extraordinarily high levels and then suddenly collapsed. At the peak of tulip mania in February 1637, some single tulip bulbs sold for more than 10 times the annual income of a skilled craftsman. The people participating deluded themselves into believing that the tulip bulbs were worth far more than they actually were. It is generally considered the first recorded speculative or economic bubble.

In the Salem witch trials of 1692-93, 150 people were arrested and imprisoned for witchcraft and 19 hanged, on the flimsiest of evidence. The delusional belief in witches died out in Western culture soon after this episode.
In Europe in the 1930s and 1940s over 60 million people were killed. One principal underlying reason for the deaths was a mass delusional belief that Germans were the master race and that all other races were inferior. After the war, many German people had difficulty coming to terms with their former delusions, and tried to resolve this using denial (we didn't know, we feared for our own safety, we were only obeying orders and so forth). This is inconsistent with the evidence of enthusiastic mass public participation in, for example, the persecution of Jews and the atrocities committed by the German army against the Russian civilian population on the Eastern Front.

The "dot-com bubble" was a speculative bubble covering roughly 1995–2000 (with a climax on March 10, 2000) during which stock prices in Internet based companies rose rapidly to a level far in excess of what those companies were worth. This was followed by a collapse of Internet company stock prices in 2001 as investors realised that they had paid too much for the stock and that most of these companies had not and never would make any profit.

Following the collapse of communism in Eastern Europe, there was a spate of economic Ponzi schemes - notably MMM in Russia, Caritas in Romania, Jugoskandic and Dafiment Bank in Serbia, TAT in Macedonia, and VEFA Holdings, Xhafferi, Populli, Gjallica and several others in Albania. Over time, approximately 80% of the Albanian population was drawn into these pyramid schemes, often selling their only real property in order to invest and then depending on the pyramids for all their income. When the inevitable happened, the vast majority of the population was completely dispossessed: http://theautomaticearth.blogspot.com/2008/11/debt-rattle-november-26-2008-from-top.html

The US house price bubble which peaked in 2005 was due largely to a delusional belief, in the face of historical evidence to the contrary, that house prices could only go up and never down, and the house price inflation could be used to fund consumer spending. The subsequent collapse of US house prices was foreseeable and was a significant cause of the 2008 global economic collapse. In a rare moment of insight, the part played in this by the herd instinct was acknowledged in a UK newspaper (top of page).

So the lessons we learn from all this are that human beings are prone to mass delusions, that these occur frequently throughout history, they often involve delusional financial beliefs, they are difficult for most people (even intelligent people) to see at the time they are happening, but they can be seen clearly for what they are after the bubble has burst and the delusion is dispelled.

Some individuals seem to have a natural resistance to mass delusions, in rather the same way that some individuals have a natural resistance to disease. These people have an enhanced ability to see the delusion for what it is in advance of their peers and to take early mitigating action, but they have a hard time persuading their peers to do the same. In a limited sense they are able to see the future, which can be both a blessing and a curse for the person afflicted. They have always been among us, and have been called among other things mavericks, doomsayers, oracles and prophets. Perhaps they are evolution's Plan B, for when the herd instinct isn't working out.
I believe that our society's current belief in perpetual economic growth falls into the category of mass delusions, and that this will become apparent in due course with the longer perspective of history.
Most people, when they think of philosophy (if at all) probably have a vague mental picture of bearded nineteenth century intellectuals debating obscure concepts like “I think therefore I am”, and probably don't see how philosophy could be useful to them in everyday life. While it is true that a lot of philosophy is like this, I hope to show in this chapter how some philosophical concepts can be useful to us in making sense of peak oil, finite growth and society's response.

I would like to introduce you to the concept of a “discourse”. In everyday life this means something like a “conversation”, but in certain schools of philosophy it has a more specialized meaning, namely, the social boundary which defines what can be said about a particular topic, or, as expressed by the contemporary philosopher Judith Butler, “the limits of acceptable speech”. This is very similar to the concept of the “Overton Window” as explained in this essay by Neal Devers.

In order to illustrate this I am going to give you six examples of possible discourses, or statements around which a discourse could develop:

1. Everyone should have the right to vote.
2. The Earth orbits around the Sun.
3. I am a member of the Communist Party.
4. The Aryans are the master race.
5. A slave who runs away from his master deserves to be severely punished.
6. It's OK to smoke cocaine.

Now let's analyze those. Which of those statements do you think fall within, and which fall outside, the “limits of acceptable speech”. Try to imagine what the reaction would be if you spoke those words in a public speech, or wrote them in a newspaper article.

Discourses 1, 2 and 3 would all be acceptable in contemporary Western society. People might be puzzled by 1 and 2, because they seem so obvious as to hardly be worth stating, and although people might not agree with your political views in 3, most people would accept that you have a right to belong to the Communist Party if you want to, and to make public your political affiliation.

In contrast, anyone expressing discourses 4, 5 or 6 would probably be shunned by most members of the audience and might well lose their jobs. These views fall outside the limits of contemporary acceptable speech.

Now let's imagine the same discourses in a different time period, for example, the time of the American Revolution of 1765-83. Discourse 1 would be considered dangerously radical, because at that time only wealthy individuals had the right to vote, and there were no plans to extend the right to women or the poorer classes. Discourse 5 would be considered so obvious that it was hardly worth saying. Slave owning was widespread and
a normal part of commerce, some of the Founding Fathers of America were slave owners, and of course the slavery laws, like any other laws, had to be enforced.

Rewind to the 1600s and Discourse 2 would be considered dangerously radical. Galileo got into a lot of trouble with the Spanish Inquisition for claiming that the Earth orbited around the Sun.

Fast forward to Germany in the 1930s and Discourse 4 would be considered normal. This particular discourse claimed the lives of about 20 million people.

Fast forward to America in the 1950s and you would instantly lose your job if you answered “yes” to the question “are you now, or have you ever been, a member of the Communist Party?”.

And finally, Discourse 6 would not raise any eyebrows among the native peoples of Peru, who have chewed coca leaves for centuries.

The message to take home from this is that discourses are not fixed. They are very fluid, varying from one society to another, and changing over time within the same society. They are stories which society collectively tells itself, and believes to be true, and in order to fit in to that society, people are expected to believe them, or at least pay lip service to them.

Now I want you to consider two more discourses:

1. Infinite economic growth is impossible, and therefore it is inevitable that economic growth must stop;
2. We are running out of cheap oil, and there is no adequate substitute for it.

Apply the public speech / newspaper article test which I mentioned earlier. What do you think would happen if a President, Prime Minister, Central Bank chairman or governor spoke or wrote those words in public? They would lose their jobs, just as surely as if they expressed racist views, defended slavery or admitted to smoking cocaine. These discourses are outside the limits of contemporary acceptable speech. This is why you almost never hear them expressed by authority figures, even though they may be true.
Legal and ethical issues

"The NHS Institute for Innovation and Improvement is a new Venture which will provide an ambitious focus for new ideas, technologies and practices to improve services to patients, users and the public" (A guide to The NHS Institute For Innovation and Improvement, National Health Service website, United Kingdom, 2010).

"The Excellent Care for All Act is proposed legislation that would improve quality, value and promote evidence-based health care". (Ontario Ministry of Health and Long Term Care website, Canada, 2010)

Many years ago, when house calls were a common and accepted part of family practice, I was called out one day to a patient's house to cut her toenails. This unusual request came from the patient's daughter. The patient was around 70 years old and unable to cut her own toenails because of arthritis. The daughter was around 50 years old, in relatively good health and would have been quite able to cut her mother's toenails. Fifty years earlier, the mother had no doubt performed this service for her daughter. However, the daughter felt the cutting her mother's toenails was beneath her dignity and felt entitled to outsource this service to someone else - namely, me.

Later, while practising in Canada, I saw a 22 year old man on welfare benefits who requested a prescription for Viagra. Ever happy to oblige, I gave him his prescription as requested, but warned him that Viagra is quite expensive. He came back a few days later quite angry and complained that I hadn't told him that he would have to pay for it. He had interpreted "quite expensive" as meaning "quite expensive but the Government will pay for it". They didn't.

Both of these incidents are aspects of what some commentators have described as the "culture of entitlement." This may well be a problem in the post-peak medical world when services which people believe they are entitled to may not be available due to a decreasing availability of money, personnel and/or materials. It would be politically unacceptable for any politician to tell the public that services may deteriorate; instead, politicians promise continuous improvement (see quotations above), which raises people's expectations. When their expectations are not met, even if those expectations are unrealistic, people are more likely to be dissatisfied, to complain and to litigate - and there will probably be plenty of post-peak lawyers around to help people pursue their claims.

Situations where the usual standard of care cannot be met raise legal issues. For example, it is the standard of care in Western medicine that if a patient suffers a myocardial infarction or a thromboembolic stroke, the treating physician should consider giving thrombolytic drugs if there are no contra-indications. But what if thrombolytic drugs are not available due to manufacturing or transport problems - is the treating physician liable for malpractice?

The answer in most cases is "no." If resources are not available to provide the ideal standard of care, the physician should do his best with what resources are available, and
should not be held liable as a result. However, this still does not excuse negligent treatment with whatever resources are available.

An interesting fictional example illustrating both of these problems can be found in James Howard Kunstler's post-peak novel "World Made By Hand" (2008). In it, a dentist performs a root canal filling using large doses of morphine because local and general anesthetics are not available. However, he fails to monitor the patient's condition adequately, the patient suffers a respiratory arrest as a result of the morphine, and dies. In this example, the dentist would not be liable for failing to use a safer anesthetic (because none was available) but would be liable for negligently using the morphine.

In Kunstler's example there were no post-peak lawyers around to bring a malpractice suit. Don't expect to be so lucky in real life.

In order to avoid malpractice suits arising from unrealistic expectations meeting limited resources, careful record keeping will be very important. If the ideal standard of care cannot be met for whatever reason, you should document this fact, and the reason why the standard could not be met, what efforts were made to obtain the appropriate resources, and why the second-line resources were chosen. You should also familiarise yourself with the effects and side effects of unfamiliar or second-line treatments before using them.

Clinical research into post-peak second line treatments would be difficult because of the standard of care issue. For example, if conventional antibiotics become unavailable, some form of herbal substitute may have to be used, which will probably not work as well. However, it would be almost impossible to conduct an ethical trial of a herbal antibiotic in real life patients while the conventional pharmaceutical antibiotic was still available, because it would not meet the current standard of care and would probably put patients at risk.

In a contracting economy and parallel contracting healthcare system, one debate which needs to occur, but which politicians and the public find it very difficult to engage in, is: what level of risk is acceptable? Here's an illustration of the kind of dilemma which arises:

A woman comes to her family physician with a breast lump. The physician examines the lump and thinks it is probably a harmless cyst. One way of managing this would be to re-examine it in a month's time to see whether it has got larger or smaller. However, to avoid any risk of a malpractice suit he orders a mammogram just to make sure. The radiologist reports that the mammogram indicates that it is probably just a harmless cyst, but covers himself by suggesting that an ultrasound scan is performed, just to make sure. The report on the ultrasound scan is that it is probably just a harmless cyst, but a biopsy should be performed, just to make sure. A biopsy is performed, and it does indeed turn out to be just a harmless cyst.

So what could have been established clinically at very low cost but slightly increased risk, ends up being established by high-tech medicine at very high cost. A wealthy society with abundant resources can probably afford to do this. A debt-ridden society with diminishing resources probably can't afford to do this. However, where there is a mis-match between public expectations and reality exacerbated by political rhetoric, confusion, dissatisfaction and misallocation of resources are likely to result.
Financing your practice

"Provide whatever appropriate assistance you can to any person with an urgent need for medical care" (Article 18, Canadian Medical Association Code of Ethics 2004).

This provision, or similar provisions, can be found in the code of ethics of most medical professional associations throughout the world. It can, however, create a dilemma. A physician or other healthcare practitioner needs to be paid for the services provided - after all, we need to pay rent and mortgages and feed ourselves and our families just like anyone else. However, what should a physician do when a person needs medical assistance but can't pay?

The concept of spreading the personal economic risks of injuries and illnesses is not new. Examples include the clients and patrons of ancient Rome, the craft guilds in medieval England, and subsequently the mutual aid systems which developed in Great Britain in the 19th century which came to be known as Friendly Societies or Saturday funds. Parishes and workhouses in medieval times provided a safety net of sorts for the poor and sick. As industrialization spread throughout Europe, so did the mutual aid or insurance concept. Many modern hospitals started out as charitable foundations financed by public contributions or individual wealthy benefactors. Masonic lodges in the past would pay a physician from lodge funds to look after the health of the members.

Some physicians in the past have in effect run their own insurance schemes. My father can remember that during his childhood in England, his family paid the local family physician sixpence per week (probably roughly equivalent to a dollar) in return for which they were able to consult with the physician when needed.

Participation in many of these schemes was voluntary which resulted in low participation which when coupled with poor administration and low contribution levels, produced ineffective organizations unable to pay adequate benefits. In the nineteenth century, compulsory national health insurance schemes began to be introduced in many countries, and often took over the management of the pre-existing charitable hospitals. Private insurance is also often used to supplement governmental programs. This has tended to result in an increase in physician incomes, because generally insurance plans can afford to pay more than private individuals would be able to. Currently, physicians in the US enjoy median incomes around four times that of the median household income, and this ratio is similar in most industrialized countries.

As we pass through peak oil and start on the downward slope of energy and resource depletion, there are likely to be severe disruptions in the financial system which may result in health insurance programs being cut back or disappearing entirely, and employed physicians laid off. Physicians may therefore need to consider using any or all of the above methods in order to ensure they are fairly compensated. In the case of a family physician serving a local community, it would be advisable to enter into a dialogue with the community to see what they are willing to provide in the way of premises, equipment or funding. Going forward, physicians will need to be realistic about what to expect in the way of fees and income. Whether in private or employed practice, a physician's income cannot
deviate too far from what insurance plans or private individuals can afford to pay, and as the economy contracts, physician incomes will have to contract with it, probably moving closer to the overall median income.

Other methods of payment worth considering are bartering physician services directly for other products and services or joining a Local Exchange Trading System (LETS). Briefly, the latter is an arrangement whereby a community in effect prints its own money which can then be used to purchase goods and services within the local economy. Several of these systems have been set up worldwide, and they can work well, but the main drawbacks in practice are that the currency can only be spent within a very restricted geographical area, it is difficult to accumulate enough of it to make a large purchase, for example a house, and the systems are often dependent on the enthusiasm of one or two key organisers, and may fail when those organisers burn out.
Closing your practice

A recurring theme in survivalist podcasts and forums is “when The End Of The World As we Know It (TEOTWAWKI) comes, essential services such as fire, police and medical services will stop running because people will stay home to protect their families instead of showing up for duty”. In this chapter we will examine whether there might be any truth in this, and look at the legal and ethical implications for a physician or nurse if he or she does not show up for duty.

Firstly, you have to make a personal decision on moral grounds about how you would act in a societal breakdown, or TEOTWAWKI to use survivalist abbreviation-speak. Would your primary loyalty be to your family, in which case you might stay home to try to ensure their safety, or would your primary loyalty be to your patients, in which case you would show up for duty? There are no right or wrong answers, but realistically, many people would choose to put their families first.

Then, how do you know when TEOTWAWKI has arrived? It may not be obvious, because in real life this may be a messy, gradual process. Selco, who lived through the Balkans war, and Dmitry Orlov, who observed the collapse of the former Soviet Union, have both written about their experiences and observations on the Internet and you may find these observations helpful.

To begin with, there may be rumours that things may be going bad, which will be strenuously denied by politicians and the mainstream media. Then there may be eyewitness accounts of atrocities from people returning or escaping from conflict zones, which may be widely disbelieved. Then there may be delays in paying your monthly wages. Then food and fuel may become more expensive, and there may be patchy scarcities. Then there may be riots which the police and armed forces are called in to suppress. Then those same police and armed forces may attack civilians who are not involved in the rioting. And all the time, the politicians and the mainstream media may be saying “don’t worry, everything is going to be fine, these disturbances are just temporary, we are negotiating a solution.” Then the politicians may fall silent and there may be rumours that they have fled the country. Then an armed gang may show up at your door and demand your property, wife or children.

At what point would you think that TEOTWAWKI had occurred and that it was time to “get out of Dodge”? If you wait until the armed gang shows up at your door, you have probably left it too late. On the other hand, if you flee to your bug-out location at the first unsubstantiated rumours, you are probably acting prematurely. Once again, there are no right or wrong answers and you will need to use the most reliable information sources you can access, and your situational awareness.

There will be potential legal and ethical implications in not showing up for work when you are supposed to, which is another good reason to assess the situation carefully before taking action. If you are an employee, for example a hospital nurse, and you fail to show up for duty, you could be fired. If you are a self employed physician, you could be disciplined by your medical board, college or council. In my jurisdiction (Ontario, Canada), the College of Physicians and Surgeons of Ontario has published guidelines about the correct way to close your practice, which include, for example, notifying patients in
advance of the closure, making medical records available to patients, arranging ongoing care for patients who need it, arranging followup of test results, and arranging for repeat prescriptions to be filled. A physician who closes his practice without arranging to do these things risks disciplinary action and possibly the revocation of his medical licence. So closing your practice at short notice is not something to be undertaken lightly.

In the end, it may come down to a calculation of probabilities. Is the probability of disciplinary action from your Medical Board if you fail to show up for work greater than, or less than, the probability of your family coming to harm if you are not at home to protect them. This is a judgment call you may have to make based on the best evidence available to you, and it may help if you have thought a little about these issues in advance.

So let's suppose you have made your decision to close your medical practice at short notice and “get out of Dodge”. You have time to make one last trip to your office. What should you take with you? My suggested list, in order of priority, would be as follows:

- The tools of your trade, whatever they might be. Things which do not need an electrical power supply should get first priority, but electrically powered equipment may be useful if you can find a power source such as photovoltaic panels.
- Some basic textbooks. You may want to prepare in advance by assembling a library of electronic textbooks which can be stored on a disc and are easily transportable (but would require a power supply to read them).
- Drug samples – but be selective. Most physicians, but especially family physicians, accumulate large quantities of free samples from drug reps and discarded medications left behind by patients. If you can't bring it all I suggest you concentrate on acute medications such as tranquillisers, analgesics and antibiotics, and leave behind chronic medications such as antihypertensives, hypoglycemics and lipid-lowering drugs.
- Dressings and bandages
- Your medical certificates. If you want to set up a new practice in a community far from the conflict zone, it may be useful to bring some proof of who you are and what your qualifications are.
Professional credentials
…and how to maintain them post-collapse.

At first sight you may think that this is a nonsensical topic. Is anyone really going to care about your professional credentials post-collapse? Unfortunately the answer may be “yes”. In order to illustrate the problems you may face, I am going to present you with a hypothetical scenario of a physician providing general medical services in an ongoing-collapse or post-collapse environment. The general principles are also applicable to other professions such as nursing, dentistry and pharmacy.

Imagine you are the sole physician in a large village or small town providing medical services to a few hundred people. You are going through a “slow collapse” scenario where there is no dramatic apocalypse of destruction, but services are slowly deteriorating. The electricity supply is intermittent and the telephones, television, internet and banking ceased to function a while ago. The postal service is slow and unreliable but you can still get some radio stations. These tell you that there is fighting and civil disorder in some parts of the country, but your area has been relatively spared and remains peaceful.

You provide basic medical services to the community, doing the best you can with what you have. These include minor surgery, suturing wounds, setting broken bones, delivering babies, using herbal medicine and comforting the dying. You also provide the community with public health advice on clean water, sewage disposal and limiting the spread of infectious diseases. There is little paper money in circulation and you are mostly paid in kind with food, services and maybe a little gold and silver. There are few supplies coming in from outside the area, and consequently consumable / disposable items like writing paper, paper towels, plastic syringes and plastic speculum tips are in short supply. Because of the lack of writing paper, you make brief if any medical notes, and carry most of the information in your head. You boil and re-use most of your equipment. You haven’t been approached for annual subscriptions by your medical licensing board or malpractice insurers for a couple of years, so you have let those lapse, considering them no longer important. Nobody has the time, money or inclination to hire lawyers any more anyway. The community understands the limitations on what is available and is grateful for your services.

One day you receive an unexpected visit from representatives of the state medical licensing board. The board’s head office is in the state capital some 200 miles away. The representatives are touring the outlying areas ensuring that standards of medical services are being maintained even in these difficult times. They ask to inspect your premises and your charts, and you comply. At the end of their inspection they state that they are dissatisfied with many aspects of your care. You have not paid your malpractice or licensing board subscriptions. You are not using sterile disposable items. You are not keeping adequate records. You are setting fractures without taking x-rays. You are growing opium poppies and preparing opium for medical purposes but you do not have a license to do this.
The representatives of the board inform you that you have 14 days in which to remedy all of these deficiencies, failing which your medical license will be revoked and you will be required to close your practice.

What should you do? Here is a suggested 9-point plan.

1. **DON’T PANIC.** Similar scenarios have probably been played out many thousands of times during this and other collapses. There are multiple ways out of this dilemma. What you are observing here is the struggle between the dying old order and the emerging new order. Slow collapses are messy and confusing because people are unsure who is in charge, what rules apply and what their roles should be. The old order is like a fatally wounded dinosaur: doomed, increasingly irrelevant, but still dangerous until it is completely dead.

2. Maintain the four C’s: stay cool, calm, collected and courteous. There is nothing to be gained by appearing angry, rude or flustered. Be cooperative. These people are here to do business with you, and like it or not, you will have to do business with them. Tell the board representatives that of course you understand their concerns, and any misunderstandings or defects in performance will soon be rectified. Offer them your hospitality. Smile a lot. (People rarely hit a man who is smiling: they might cut their knuckles on his teeth.) Tell them you need a little time to sort things out and to wait while you go and speak to some people.

3. Comply with their requests if it is possible to do so. In ‘normal’ times the medical licensing boards do a reasonably good job of maintaining medical standards and protecting the public, and they deserve the cooperation of practitioners. However, these are not ‘normal’ times, and in the scenario I have outlined, it is not possible to comply with the requests because there is neither the money nor the materials to do so.

4. Try to establish the facts. In times of slow collapse and increasing lawlessness, things (and people) may not always be what they seem. Your visitors may indeed be representatives of the medical licensing board, as they claim, and the board may just be out of touch with reality. Or they may be former employees of the board who have discovered a lucrative sideline in extracting money from physicians. Or they may be con artists with no connection to the board at all. Your response may have to be tailored depending on the reality of the situation. But you can’t rely on the facts being what your visitors say they are: try to verify them from third party sources (see Step 5, below).

5. Recognize that this is a situation you cannot handle on your own. You need the support of the community, both for information about the situation and if necessary for bodies on the ground. It helps if you already have the support of the community before trouble occurs – in other words, if you have been providing a good service to the community and they are duly grateful for it and don’t want to see you go. This is probably the case here. Go and see whoever is in charge (village elder, mayor, reeve, chief of police, sheriff, chair of town council), explain the situation and see if they have any
information which could shed light on it (see Step 4, above). Does anyone know these people? Are they who they say they are? Have they visited other physicians or communities in the area and what was the result?

6. If the visitors are genuinely from the medical licensing board, try to make a realistic assessment of what powers of enforcement they have. In ‘normal’ times, if a physician continues to practice after his license is revoked, this becomes a criminal offence and enforcement is handed over to the police and the criminal justice system. However, if the police and the justice system are locally based and not willing to carry out enforcement, or absent altogether, the board has no power to enforce its orders. Explain the situation to the local sheriff or police chief if you haven’t already done so, and see what his view is.

7. If collapse is quite far advanced in your area, the person in charge may be the local warlord or narco-baron who has extensive (although informal) powers of both enforcement and protection. Let’s call him Mr Big for short. His employees may already have visited you and persuaded you to purchase his insurance policy. Now may be the time to make a claim on that policy. If you feel squeamish about this, you need to lose that squeamishness. These are different times and you need to adapt to the new ways of doing business, or perish. Go and see Mr Big and explain the situation. He will probably be happy to help out because he won’t want to lose a paying customer, he won’t want to lose a physician who is a useful resource to him and his men, and as a matter of pride he won’t want outsiders coming on to his patch and interfering in his business. His men also need something to do. However, having informed him of the situation, you should tell him that you don’t want to claim on the insurance policy just yet, as you still hope that the matter can be settled amicably.

8. Now report back to your visitors. The exact conversation you have with them will depend on the information you have been able to gather and the resources available to you, but it will probably be something like this. Tell them that although you would like very much to comply with their requests, unfortunately the lack of money and materials makes it very difficult to do so, and request their patience and understanding. Tell them that, even more unfortunately, their visit has come to the attention of Mr Big, who is not happy about the situation. You have interceded with Mr Big on their behalf, and as they are your guests, he has agreed to overlook the matter this once provided they conduct themselves peaceably and leave town as soon as their business here is concluded. Tell them that you will do everything you can to ensure their safety, but if they choose to return, you cannot guarantee their safety on a subsequent visit given Mr Big’s displeasure. Offer to escort them out of town to ensure their safe passage. Offer them a gift for their trouble in coming all this way to see you. Offer them more hospitality. Say that you would be very grateful if they would give you a good inspection report and recommend to the board that your license be renewed. Make it look like a win-win situation all round. Keep smiling (see Step 2, above).

9. Hopefully business should be concluded with Step 8. There should be no need for any physical unpleasantness, which should be kept as an absolute last resort. However, if all else fails you may have to return to Mr Big, explain that despite your best efforts, the business could not be concluded peaceably, and call in your insurance policy.
Armed conflict

"Joshua said to the people, 'Shout, for Yahweh has given you the city!' ... and they took the city. They utterly destroyed all that was in the city, both man and woman, both young and old, and ox, and sheep, and donkey, with the edge of the sword." (The Bible, Joshua 6:16-21).

"We shot about 70 people, among them also women, old people and children. And then we burned down the village... We then proceeded to the third village. We didn't come across any partisans there but we still burned down the village and shot around 50 people, even women and children. And then we went on to the fourth village and did exactly the same as we had done in the other villages. (Testimony of Albert Rodenbusch, German soldier tried for war crimes at Minsk in 1946)

The first quotation describes the battle of Jericho which supposedly took place around 1400 BC. Whether or not this particular event actually occurred, the brutal treatment of the civilian population of a captured city is probably not unusual for the period. Similar atrocities were perpetrated by the Romans on the civilian population of Carthage during its destruction in 146 BC, by Oliver Cromwell's forces during the capture of the Irish towns of Wexford and Drogheda in 1649, and by the German army during the invasion of Russia in World War 2. The second quotation is uncannily similar to the first, even though the events described are separated by some 3,300 years.

We have been fortunate enough to live in a time of (generally speaking) world peace. Since 1945 there have been no major armed conflicts between developed nations, although there have been numerous small wars and proxy wars during this period. 65 years of relative peace have led many people to believe that major wars between developed nations are a thing of the past. However, looked at objectively, the history of humanity as far back as records go (about 8,000 years) is a history of armed conflict between nations. War is in our genes, and after only 65 years of peace, it's too early to say whether this represents a permanent change in humanity. When we have had 1,000 years of peace I may feel more confident about it.

Resource scarcity and financial instability have historically been associated with armed conflict, and "peak everything" is likely to result in a great deal of resource scarcity and financial instability. This chapter will examine the rules and laws (if any) which apply to armed conflict, and the ethical role of a physician who may be caught up in it. We are going to look at four possible scenarios:

- a physician who is a serving member of the armed forces involved in an armed conflict between nations
- a civilian physician involved in an armed conflict between nations
- a physician involved in a domestic armed conflict within a framework of law and order; and
- a physician involved in a domestic armed conflict in the context of a "failed state" where law and order have broken down.
A physician who is a serving member of the armed forces involved in an armed conflict between nations

I am going to assume that if you are a serving physician member of the armed forces, you already know what to do and you don't need any advice from me. You should act in accordance with your military training and follow the orders of your commanding officer, except in the most extreme and unusual circumstances.

A civilian physician involved in an armed conflict between nations

The role and ethical obligations of a civilian physician involved in an armed conflict between nations needs a little more explanation, and in particular an understanding of the Geneva and Hague Conventions and other international treaties. The Geneva Conventions comprise four treaties and three additional protocols that set the standards in international law for humanitarian treatment of the victims of war. The first Geneva Convention was signed in 1864 at around the same time the Red Cross was founded, and was intended to mitigate the worst horrors of war. The singular term Geneva Convention refers to the agreements of 1949, negotiated in the aftermath of World War II, updating the terms of the first three treaties and adding a fourth treaty. The treaties of 1949 have been ratified, in whole or with reservations, by 194 countries. Generally speaking, the conventions apply in cases where there is armed conflict between nations and where one or both of the warring parties have ratified the conventions. To a limited extent it also applies to an armed conflict between a government and an internal rebel group where the government has ratified the conventions.

It is a fundamental principle of the law of war that those who do not participate in the hostilities shall not be attacked. In this respect harmless civilians, medical personnel and soldiers 'hors de combat' (no longer fighting due to injury or sickness) are on the same footing. Under the First and Third Geneva Conventions, prisoners of war must be given the medical care their state of health demands, and belligerents must treat members of the enemy force who are wounded or sick as carefully they would their own. Medical equipment must not be intentionally destroyed and medical establishments and vehicles must not be attacked.

A physician involved in a domestic armed conflict within a framework of law and order

This type of scenario would include, for example, a riot in which people are armed and injured, or an attack by a group of armed people for the purpose of appropriating property, but where there is an expectation that the police or army will at some point restore order. In this scenario both domestic laws and humanitarian principles need to be obeyed. Generally speaking, people under attack are entitled to use reasonable force to defend persons and property, which may or may not include deadly force depending on the jurisdiction. However, an attacker who is injured and captured should be treated humanely, including being given medical attention, until help arrives and the captive can be handed over to the police or army.

A physician involved in a domestic armed conflict in the context of a "failed state" where law and order have broken down

Recent and current examples of "failed states" which were or are unable to protect their citizens may include Somalia, Rwanda, the Congo, Yugoslavia, Afghanistan and possibly parts of Mexico. In this case, I would like you to consider a scenario of a remote village, farm or homestead containing a small group of people which is attacked by a small group of bandits. The bandits are killed or driven off but one of the bandits is wounded and captured. There is no framework of law and order and consequently no expectation that the police or army will come and take away the captive. The captors and captive are on their own. This is perhaps the least likely of the scenarios I have presented, but it has
happened in the countries named above, it may happen again, and it is worth thinking ahead of time of the practical and ethical problems involved rather than trying to make these decisions in the heat of an emergent situation. This situation is not covered by the Geneva Conventions (it is not an armed conflict between nations) or the local rule of law (if there is nobody willing or able to enforce it). Practicality may be the most important consideration for the captors, and if it is impractical to continue to care for the captive (lack of personnel to supervise him, lack of food and supplies to share, danger of the captive resuming hostilities against the group) the group may decide that summary execution of the captive is the most practical option. This was a common practice of armed conflict before the Geneva Conventions (see the historical examples above) and is generally termed the principle of "no quarter will be given to the enemy", "quarter" being an old term for "accommodation." "No quarter" was also the general rule for pirates attacking ships in the 17th and 18th century.

Under the laws of war "... it is especially forbidden ... to declare that no quarter will be given". This was established under Article 23 of the IV Convention – The Laws and Customs of War on Land of the Hague Conventions of 1907. A physician who is unlucky enough to find him or herself caught up in these circumstances may wish to try to persuade the group to follow Geneva and Hague Convention principles, but must recognise that at the end of the day, the paramount consideration is the safety of the group and that this must be a decision for the group and not the physician to take.
"Dieback" or "dieoff" of the human population is one of those taboo subjects which you never hear politicians talk about as there are no votes in it. But it is important that we discuss it and form some ideas about what it is, what causes it, how likely it is to occur and what we should do about it.

The fundamental underlying concept is that there is a maximum human population which an ecosystem can carry sustainably. The ecosystem in question can be a local ecosystem, such as Easter Island or the formerly Mayan inhabited region of Central America, both of which experienced profound dieback as a result of environmental degradation. Alternatively, it can be the entire planet.

At the beginning of the industrial revolution (around 1800) the global human population was around 1 billion, and these people were on the whole living sustainably and using only small amounts of non-renewable resources. Today, the human population is around 6.7 billion and we are using very large amounts of non-renewable resources, in particular oil, natural gas and fossil water, to produce our food. A population of 6.7 billion humans may therefore be an unsustainable number, which can only be maintained for a relatively short time until the non-renewable resources are used up. At that point, a correction must take place and the population must be reduced once again to a sustainable level.

Let's say, for the sake of argument, that the maximum sustainable number of humans which the planet can support is 2 billion - twice as many as the number alive at the beginning of the fossil fuel age. In order to make the necessary correction, 4.7 billion people would have to disappear, and this is what is sometimes referred to as "dieback" or "dieoff". How might this happen?

In earlier, simpler times, a failure of the harvest resulted in dieback by starvation. There is archaeological evidence of this happening, for example, on Easter Island, and it still happens in Third World countries. In wealthy industrialised countries with more complex societies, factors other than simple starvation may play a role. To get some idea what to expect when a modern industrial society collapses, we can look at the example of the collapse of the Soviet Union in the early 1990s and what happened to the population of Russia during this period.

The population of Russia hit a historic peak at 148,689,000 in 1991, just before the breakup of the Soviet Union, but then began a decade-long decline, falling at a rate of about 0.5% per year due to declining birth rates and rising death rates. The cause of the rising death rates is widely debated. Very little if any was due to starvation, mainly because the former state-run bakeries continued to function and to distribute bread as they had done pre-collapse. The death rate peaked at around 17 per 1000 in 2003 and the birth rate bottomed out at around 8 per 1000 in 1999, but subsequently both of these indices moved towards a more normal level of 14 per 1000 per annum as the Russian economy improved. Alcoholism was a significant contributing factor, although this had been a pre-existing trend in the population prior to collapse. Rates of heart disease in Russia were higher than the European average both pre and post collapse. The increase in mortality was from multiple causes.
A similar increase in all cause mortality has long been observed in people subjected to psychological stress. A recent study found that after the loss of a spouse, all cause mortality increases by 27% per annum (citation needed).

If psychological stress is a significant contributing factor to all-cause mortality then the high rates of psychological stress apparently being experienced by populations of post-industrial societies are cause for concern. In 2005 10% of Americans were taking antidepressants and 16% of Americans were taking benzodiazepines. The levels today are probably higher. The reasons for these widespread high levels of psychological discomfort are unclear but may be related to societal factors such as fast-paced lifestyles, insecurity of employment and fragmented families and communities.

A shortage of fossil fuels may result in an enforced simplification of life (less commuting to work, more tending vegetable gardens) which in the long term may reduce psychological stress. However, in the short term many people will experience a profound increase in psychological stress because they are unprepared for the changes being forced upon them. An increase in all cause mortality may follow.

Diabetes is another factor which may increase mortality in the coming decades. The current epidemic of type 2 diabetes is largely an unintended consequence of our fossil fuel dependency, as a result of which there have been simultaneous increases in the availability of high fat food and personal transportation, resulting in people eating more, exercising less and becoming obese. As a rough estimate, if the onset of diabetes occurs some 10-20 years after the onset of obesity, and the onset of complications of diabetes (renal failure, blindness, gangrene of extremities) occurs some 10-20 years after the onset of diabetes, and "peak obesity" is likely to coincide with peak oil, then that puts "peak diabetic complications" about 30 years from now. Couple that with a possible decreased availability of medical care due to oil shortages and economic recession, and one can reasonably expect that in 30 years from now diabetics may be even more numerous than they are today, and their life expectancy may be shorter.
Surviving the Dark Age
...a user's guide

“I've had worse” (The Black Knight, Monty Python and the Holy Grail – watch video)

OK, the title of this chapter is a bit tongue in cheek. I'm not expecting anyone reading this to survive the coming Dark Age, if only because Dark Ages are much longer than the human lifespan, typically a few hundred years. What I would like to show is that Dark Ages have an undeservedly bad reputation, and that there is quite a lot to look forward to.

A Dark Age often follows the collapse of an advanced civilisation, and historians have identified at least two periods as Dark Ages in Europe: the 5th-10th centuries AD between the collapse of the Western Roman Empire and the start of the high medieval period, and the 13th-10th centuries BC between the collapse of the Aegean civilisations of the late Bronze age and the rise of the Persian and Greek civilisations.

A Dark Age isn't just about peasants rooting around in the mud for food and knights hacking each other's limbs off, as depicted in Monty Python and the Holy Grail (above). During a Dark Age, life goes on and most people living in a Dark Age probably think that their way of life is normal and can't imagine any other way of living. People are born, get married and raise families, crops are grown and harvested, local laws are upheld in local courts, the passing of the seasons is marked with fairs, festivals and religious observances, traditional music, dance and stories are passed down through the generations, kings and queens are crowned, a limited amount of international trade and travel takes place, and so on.

King Arthur, if he existed, is thought to have been a Dark Age Romano-British warlord who defended England from the Saxons – hence the Monty Python reference.

Dark Ages differ from other periods of history in that things tend to be organised on a smaller and more local scale. For example, local government would tend to occur at the level of a city-state or small kingdom rather than a country or empire, and manufacturing is done at the cottage industry scale rather than in large factories. There is also a lack of expansion, economic growth or
innovation: things tend to stay the same over many generations and there is a relative absence of new discoveries and inventions and a greater emphasis on traditional knowledge. Some might argue that those are not necessarily all bad things, and that maybe humanity needs a little “time out” from technological innovation. There also tends to be an absence of written records compared with the preceding civilisation.

The 20th and early 21st centuries were characterised by rapid expansion, economic growth and technological innovation, which is probably why most people would think of a Dark Age as something to be avoided. However, for most of human history, Dark Age type conditions have been normal, and it is our own age which is atypical.

One of the major downsides of a Dark Age is that knowledge which was gained during the previous civilisation may be lost, sometimes to be rediscovered by the new civilisations which arise afterwards, sometimes to be lost forever. An example of the former is the manufacture of concrete: used by the Romans, lost then rediscovered. An example of the latter is Roman music: we know they were able to make music using various instruments, but we have no idea what it sounded like because none of it has survived. The Dark Age monks copied many Roman texts but didn’t think that preserving music was worth the trouble.

Of particular concern to medical professionals is: how much medical knowledge may be lost during a Dark Age? The Romans understood how to treat cataracts, and the contagion theory of disease; both of these were lost during the following Dark Age but rediscovered in modern times. We have a better understanding of the physical way in which the human body works than at any previous time in history, and it would be unfortunate if, for example, our knowledge about human anatomy, the circulation of the blood and bacteria was lost and replaced by religious ideas about disease being due to divine retribution.

Please note that I have specified above that we have a good understanding of the physical functioning of the human body. I don’t think our understanding of mental functioning is nearly as good, judging by the high prevalence of anxiety, depression and substance abuse in modern society. We seem to have created an environment which is not conducive to mental health and we don’t seem to have any clear idea about what to do about that. Less advanced societies, including indigenous people, seem to have a better grasp of people’s psychological, social and spiritual needs than we do.
Personal preparation

The main focus of this book is on preparing one's medical practice for "peak everything", but inevitably the question arises "how should I prepare personally?" There are a great many resources to help you decide how to do this, some of which are listed at the end of this section (see "Further reading"), but in this chapter I will make a few suggestions. Everyone's circumstances are different, including your geographical location, financial means, presence or absence of family and dependents, and how much time and effort you want to put into preparing. So it's not possible to make any "one size fits all" recommendations: you must develop your own preparation plan according to your personal circumstances.

The first peak to arrive will probably be peak oil, and this will probably coincide with the cessation of industrial economic growth which has been considered normal for the last two hundred years. Permanent cessation of economic growth is likely to cause severe disruption in all sectors of the economy including employment, pensions, banking, mortgages, insurance and the stock market. Financial preparation is therefore an important concern.

If you have debts, you should try to pay them off. Debt forgiveness is unlikely to be a feature of the post-peak era; on the contrary, creditors may increase their efforts to collect from debtors because they too will be feeling the economic squeeze.

If you have savings or investments, ensure that these are as widely diversified as possible. This doesn't mean diversifying into different sorts of retirement savings plans and mutual funds - it means diversifying away from these traditional investments and into physical assets like precious metals and land. Consider diversifying into things which are not usually thought of as investments such as a share in a Community Supported Agriculture (CSA) scheme.

Consider purchasing things which increase your production of food and energy such as solar heating panels, photovoltaic panels and a greenhouse: these are also investments because they produce a return.

If you are contemplating a house move, consider moving to an area of low population density where food is produced within walking distance (also known as "the countryside"). This will considerably increase your resilience in the event of a gasoline or diesel shortage. Remember that it's probably better to be poorly prepared in a good place than well prepared in a bad place. See also the next chapter on “Where to live?”.

Grow some of your own food. It's fun and healthy. You don't need to attempt to grow all of your own food, which is probably impossible even for a farmer. Growing 10% or even 5% of your own food increases your resilience in the event of problems with the food supply and gives you a good skill base to build on. Think of this as creating an "urban homestead."

If you feel overwhelmed by the whole post-peak concept and don't know where to start, consider starting where I started and organise your toolbox. Seriously. There will be a lot of opportunity for DIY in the post-peak world, and reorganising your toolbox is a simple...
thing which you can do at very little cost and which may improve your life right now even if nothing goes wrong. Make sure all your tools work, throw out any junk, replace those missing screwdrivers, sockets and drill bits, and make sure you have manual versions of your power tools (hand drill, hand pump etc) to back up the electric versions.

And while you are doing that you can be thinking about your next steps...
Where to live?

“There are three things that matter in property: location, location, location.” (Lord Harold Samuel, British real estate tycoon)

In this chapter I am going to make a few suggestions about where you might want to live in the event of a societal collapse which is possible, imminent or actually occurring. However, I'd like to start with a few caveats.

This book's target audience is medical and allied health professionals: doctors, nurses, pharmacists, dentists and the like. My advice about where to live is therefore mainly targeted at them, although I hope that other people may find the general principles helpful.

If you are new to the concept of societal collapse and all this seems strange and rather scary, what you need to do right now is: nothing. Hold it right there and don't panic. Too many people have learned about peak energy, economic unsustainability and so on, panicked, sold their home and bought a farm or homestead in some remote area when they knew nothing about farming or homesteading, with predictable disastrous results. Don't be one of them.

You probably have enough time to prepare and/or move. I believe that given the unsustainable nature of our society, some form of collapse is inevitable, but it is more likely to be a gradual stair-step descent, as described by John Michael Greer and others, rather than a rapid crash. Conventional wisdom says that you should wait at least two years after discovering the peak energy / infinite growth dilemma before making any major decisions like buying or selling property.

However, please also bear in mind that occasionally, collapses can happen with terrifying suddenness. There are numerous historical examples of this, for example, the sack of Rome by the Visigoths, Hitler's invasion of Poland, and the genocide in Rwanda, to name but three. In those instances, people really did not have time to prepare or move. So don't act too hastily, but don't delay too long either.

My final caveat is that where possible you should consider "sheltering in place": in other words, make the best of what you already have rather than moving somewhere else. There is no such thing as the perfect collapse-proof place (although some places are undoubtedly better than others) and staying in place allows you to build on what you already have and conserve your limited resources. You may also need to stay put because of your job.

Having said all that, let's now look at some places which might not be good to live and where you might want to consider moving from sooner rather than later. First let's consider places which are either too densely or too sparsely populated. I would avoid large cities and densely populated urban areas, because the people living there are absolutely dependent for survival on continuous inputs of food and fuel which are delivered
round the clock on a "just in time" basis. If anything interrupts this flow, local stocks will run out in a few days, it will be difficult or impossible to find alternatives, and life could potentially become very difficult very quickly.

I would also avoid places which are too remote or sparsely populated. You may have some sort of retreat or bug-out location in a rural area, for example a cottage or cabin if you live in Canada, but getting people and food in and out of these places usually involves driving long distances, and if the supply of gasoline and diesel fuel dries up, these places may not be habitable for very long either. These areas will probably revert to the wilderness they once were before the arrival of fossil fuels, because that is their natural state.

Finally, I would avoid settlements which are located in geographically unlikely places where there are no local supplies of food (for example, northern Canada) or water (for example, Las Vegas). The existence of such places is only made possible by fossil fuels, and as described above, this may turn out to be a very short term arrangement.

So much for places where you might not want to live. Now let's look at what the ideal place might look like.

It's difficult for individuals to survive in isolation, because human societies seem to work best when there is a division of labour which allows for a degree of specialization. Homesteaders are self sufficient up to a point, but even if they grow all their own food and make all their own clothes, they probably still need someone to supply other goods such as shoes, nails and pottery which they don't have the time and/or skills to make for themselves. In addition, if you are a medical professional reading this, you have a specialized skill to offer which is best supplied in the context of a community of other people also supplying similarly specialized skills. A useful model here might be a small medieval European town where the premises of merchants, craftsmen and professionals would be concentrated in the town square and surrounding streets, further out would be the residential areas, and further out still would be the agricultural areas which supplied the town with food. There would also usually be a river which supplied the town with fresh water.

So what I would suggest you look for is not necessarily an actual medieval European town, but something built along similar lines and which has similar features, in particular, a central square or main street where many commercial premises are concentrated within walking distance of each other. This would be a good location for a medical or dental office or pharmacy. Avoid commercial premises which are widely dispersed along strip malls or inside covered malls which have no natural light: these are unlikely to survive the end of the fossil fuel era.

In terms of size, for a commercially viable practice you probably need a community of at least 2,000 people (including the outlying rural area). If the community is more than about 10,000 people you may start to run into problems of transportation of food from the
periphery to the centre, and pressure on local environmental resources such as water, wood and waste disposal.

Make sure that the community has a mixed economy including local production of food, clothes and shoes, blacksmithing, milling of grain into flour, carpentry, plumbing, electrical work and so on. Avoid highly specialised communities where the main industry is business conferencing, or paper milling, or tourism, or a copper mine or military base. If the main industry goes away, these communities will have to either have to re-tool and diversify, or go under, and they should be left alone until they have had a chance to sort themselves out and determine where they are headed.

If you are supplying medical services in a community with a mixed economy like the one described above, there may not be much money in circulation and you may have to trade your services for benefits in kind or general community support. This is dealt with in more detail in the chapter "Financing your practice".

Finally, all other things being equal, try to choose a community which is not located near to, or on a main highway out of, a large urban area. As I said earlier, I think a gradual or stair-step decline is more likely than a sudden collapse, but if a sudden collapse does occur, you don't want to be overwhelmed with refugees streaming out of the city and picking your community clean as they go.
Herbal medicine

For thousands of years, indigenous peoples have been aware of the medicinal properties of plants. Today we have access to tens of thousands of commercially produced pharmaceutical medicines. Some of them (like morphine) are plant based, but most are produced indirectly from oil by the petrochemical industry. Production and distribution of modern pharmaceuticals is a complex process requiring access to oil based chemical feedstocks, laboratories for research, production and quality control, motorized refrigerated transport for distribution, and a system for licensing doctors and pharmacists who act as the gateway to the end user, the patient. In a forced simplification of society (best case scenario) or a societal collapse (worst case scenario), commercially produced pharmaceuticals may go away and physicians may have to produce their own medicines, as they did up until the start of the Industrial Revolution. Here are some thoughts on how to go about it.

There are many books on herbal medicine available. The problems I have found with most of them are mainly as follows:

- There is too much reliance on traditional knowledge as in “Herb X has been used by indigenous peoples to treat condition Y” and not enough emphasis on examining whether the treatment actually works. I do not mean to dismiss traditional knowledge, but it should be used as a starting point rather than an end point. It can be difficult to separate physical effect from placebo effect.
- I am skeptical about claims, frequently made in herbal medicine, that one individual herb can be used as a cure-all for numerous conditions ranging from the common cold to gonorrhea. These claims are inconsistent with the behavior of conventional pharmaceuticals and seem inherently implausible.
- Herbal medicine textbooks often contain references to hundreds of herbs and it's hard to know where to start.
- Many herbs may not be available in your area. For example, the peyote cactus has powerful psychoactive properties, and grows naturally in the southern United States and Mexico, but that's not much use to you if you live in Scotland.

So here are my practical suggestions to help you get started in herbal medicine.

Find out what medicinal plants grow naturally in your area. You can do this by consulting history books (what herbs did the local medieval monks and apothecaries use?), wildflower books or talking to community elders or traditional gypsies. Identify where these plants can be found. They may be difficult to identify when not in flower, and may have to be collected at a certain time of year, so you need to know where and when to look. Make a shortlist of 10 or 20 of them and when you have collected them, make sure they are properly preserved by drying or similar so they last until the next season. When collecting plants, make sure to take only a small proportion of the plant and leave the roots to enable it to come up again next year. Experiment to see if they work – on yourself if necessary.

In addition to your local indigenous plants, try to make sure you have access to the herbal medicines listed below, for which there is at least some scientific evidence of effectiveness. If they don't grow naturally in your area, try to get hold of some seeds and
cultivate them. Medieval physicians and monks would often grow a “physic garden” for this purpose.

Opium

Opium and its derivatives such as morphine have been used for pain relief for millennia. The poppy plant was cultivated in ancient Persia, Egypt and Mesopotamia. The main active ingredient in opium is morphine, which was first isolated in 1804. Morphine is on the World Health Organization's List of Essential Medicines. It became a controlled substance in the US in 1914.

Opium is the dried latex obtained from the opium poppy (Papaver somniferum). There are several varieties of poppy but only this variety produces significant amounts of opium. Seeds can be bought from garden centres (as ornamental poppies) or shaken out of dried poppies from a craft store. Once the poppy plants have grown and flowered, the opium is harvested by making cuts in the immature seed heads. A brown resin oozes out and can be scraped off after a few hours. The resin can be dissolved in alcohol but is relatively insoluble in water. For medicinal purposes, the opium can be given in suppository form or dissolved in alcohol and drunk – a preparation known as tincture of opium or laudanum.

Suggested further reading: “Opium for the Masses” by Jim Hogshire.

Marijuana

Hemp fibre has been used to make ropes and clothing for thousands of years. The first recorded evidence of medical marijuana use appeared over 4,700 years ago in the pharmacopoeia of Shen Nung, one of the fathers of Chinese medicine. In the 1800s marijuana preparations were widely used in many proprietary medicines. In the early part of the 20th century, legislation was passed in many countries making the use of marijuana illegal, even for medicinal purposes. This roughly coincided with similar prohibitions on the use of alcohol in some jurisdictions, particularly the United States. The alcohol prohibition laws were lifted after a relatively short time; the marijuana prohibition laws generally remain in place.

Marijuana is currently licensed for use for medical purposes in several jurisdictions. Uses include severe arthritis, HIV/AIDS, terminal cancer, spinal cord disease and multiple sclerosis. The medical licensing requirements for marijuana vary from one country to another.

The growing and harvesting of marijuana plants is a large and complex topic which I cannot cover adequately in this book. Briefly, the plant is thought to have originated in India, it thrives best in hot, dry climates but it can be grown in most places in the world. Contemporary books on marijuana growing tend to emphasize indoor growing under artificial light, but in a post-collapse scenario this would probably not be relevant as outdoor growing would be the only option, and the likelihood of prosecution low. The flowering tops of the female plant contain the highest concentrations of resin and tetrahydrocannabinol (THC), the main active ingredient.

Suggested further reading: The Cannabis Grow Bible by Greg Green is a 429 page volume which contains all you need to know. It is available at multiple places on the Internet.
Ethanol

Also known as ethyl alcohol. The first recorded distillation of alcohol was by Arabian alchemists around 700 AD, but distillation was probably being performed in Arabia and Egypt much earlier than this. Distillation was made subject to registration of stills and payment of taxes in the 1790s in the USA, and in most other jurisdictions at around the same time. Failure to comply with these requirements after this date constituted a criminal offence.

Ethanol’s social use as an intoxicant is well known. Medicinally, it is used for disinfection of skin and wounds. Historically, it has been given orally to patients before painful procedures such as amputations. For example, during the Napoleonic wars, officers were given rum or brandy before an amputation (enlisted men were given a piece of wood to bite on). However, I really wouldn’t recommend it for this purpose. It is unlikely to be effective for pain relief other than in doses so high that it would endanger the patient’s life. Vomiting and aspiration of vomit are significant side effects. A safer and more effective choice for pain relief would be opium.

Ethanol is also used to make liquid preparations of drugs which are poorly soluble in water, an example being tincture of opium, discussed above.

Construction and operation of an ethanol still is a complex process and there is not the space to go into detail here. The basic principles are as follows: vegetable material such as potatoes, corn or fruit is fermented using yeast (the “mash”) and ethanol is produced. In order to separate and purify the ethanol, the mash is heated to just above the boiling point of the ethanol. The ethanol vapor rises into a tube, is cooled and turned back into a liquid by means of a condenser and collected in a second container.

There is a widespread belief that drinking homemade liquor from illicit stills may lead to death or blindness from methanol poisoning. Examples of this can be found in the media ("Homemade liquor kills 48", Associated Press, 8 July 2009), PubMed (“Serious methanol poisoning from home brewed alcohol”, Crit Care Resusc, March 2012) and popular fiction (“Invasion”, Foyle's War British TV detective drama, Series 4 Episode 1). I therefore investigated to find out whether this is the case. Surprisingly, the idea that home distilled ethanol can cause widespread accidental methanol poisoning appears to be a myth.

Home distilled liquor (variously called “hooch”, “moonshine” or “poteen” depending on the country) is produced using a fermentation process. In this process, traces of methanol are produced along with ethanol, but the quantity of methanol is generally too small to be harmful. It occurs naturally in trace quantities in beer and wine.

Methanol, also known as wood alcohol, is produced in industrial quantities by completely different processes including catalytic processes acting on coal or natural gas, or the destructive distillation of wood. It is not produced by fermentation. It is true that methanol is a potent neurotoxin and can cause death, blindness and other neurological effects. There are numerous case reports of methanol poisoning on PubMed and it is a serious public health problem in some parts of the world, particularly India and Indonesia. However, as far as I can establish, all cases of methanol poisoning have resulted from the deliberate adulteration of fermented liquor with industrial methanol. Ethanol produced for automobile fuel is often deliberately adulterated with methanol to discourage people from drinking it.

The only theoretical way in which you could get methanol poisoning from an ethanol still would be to drink the first few drops of distillate directly from the still. This contains the naturally occurring methanol mentioned above, but in a high concentration, because
methanol is more volatile than ethanol and is distilled off first. The first few drops from the distillation process should therefore always be discarded.


**Devil's Claw**
Botanical name: Harpagophytum Procumbens
Habitat: indigenous to the deserts of the Kalahari in South Africa and in Namibia.
Preparation: gathered from the wild, harvested in the main from deep holes. The roots must be cut into small pieces and dried immediately after harvesting otherwise they decompose or deteriorate within a short period of time.
Active ingredients: Harpagocide and other as yet unidentified chemicals
Action: relief of pain and inflammation

**White Willow Bark**
Botanical name: Salix Alba
Habitat: native to Europe and western and central Asia; found in marshes, wet hollows, ditches, ponds, streams, rivers and lakes, riverine and riparian woodland
Active ingredients: flavonoids, glycosides, tannins, salicin, salicyl alcohol, and aromatic acids and aldehydes
History: In 1763, an English clergyman, Edward Stone, gave dried willow bark to people as a relief from rheumatic fever but it was known to cause stomach problems especially bleeding. In 1823, Italian scientists extracted the active ingredient and gave it the name salicin. A race started to produce this painkiller in a marketable form but the problems of stomach irritation meant that it was 1899 before Aspirin, a patent medicine, was launched. Aspirin is a modified form of salicin which gives reduced gut irritation and bleeding.
Action: relief of pain and inflammation

**Cayenne**
Botanical name: Capsicum Frutescens
Habitat: native to southern North America and northern South America. Seeds were brought to Europe and Capsicum annum began to be planted extensively in Portuguese colonies in Africa, India and Asia.
Active ingredient: Capsaicin
Action: Reduces pain when applied to skin, probably by a counter-irritant action

**Berberine**
Source: Various plants including Berberis e.g. Berberis vulgaris (barberry), Berberis aristata (tree turmeric), Mahonia aquifolium (Oregon grape), Hydrastis canadensis (goldenseal), Xanthorrhiza simplicissima (yellowroot), Phellodendron amurense[2] (Amur cork tree), Coptis chinensis (Chinese goldthread), Tinospora cordifolia, Argemone mexicana (prickly poppy), and Eschscholzia californica (Californian poppy).
Habitat: the European barberry, Berberis vulgaris, is common in Europe, North Africa, the Middle East, and central Asia.
Preparation: Berberine is usually found in the roots, rhizomes, stems, and bark.
Action: Anti-diabetic and anti-inflammatory
Mode of action: Berberine is an alkaloid which activates the enzyme Adenosine Monophosphate-Activated Protein Kinase (AMPK) while inhibiting Protein-Tyrosine Phosphatase 1B (PTP1B).
**Kava**
Botanical name: *Piper methysticum*
Source: Western Pacific islands
Active ingredients: Kavalactones, extracted from the roots
Action: Mild sedative, used to treat anxiety and sleep disorders
Safety concerns: has been implicated in liver damage including some deaths. Banned in Europe and Canada for this reason, but still used in USA.

**St John's Wort**
Botanical name: *Hypericum perforatum*
Habitat: native to parts of Europe and Asia but has spread to temperate regions worldwide as a cosmopolitan invasive weed. The common name "St John's wort" comes from its traditional flowering and harvesting on St John's Day, 24 June.
Active ingredients: Hypericin, hyperforin and possibly multiple other chemicals the nature of which is not understood
Action: Antidepressant
Mode of action: Probably similar to SSRIs (selective serotonin reuptake inhibitors) and SNRIs (serotonin–norepinephrine reuptake inhibitors). Believed to increase the extracellular level of the neurotransmitters serotonin and norepinephrine by limiting their reabsorption into the presynaptic cell, increasing the levels of monoamines in the synaptic cleft available to bind to the postsynaptic receptor. Monoamines are connected to the pathophysiology of depression. Symptoms are thought to appear because concentrations of neurotransmitters for example norepinephrine and serotonin are insufficient.
Safety concerns: Interacts with multiple other medications including antidepressants, sleeping pills, anaesthetics and antidepressants, either prolonging and intensifying their actions (sleeping pills and anaesthetics) or reducing their effectiveness (contraceptives).

**Valerian**
Botanical name: *Valeriana officinalis*
Action: sedative, used for anxiety and insomnia
Active ingredients: mostly found in the roots
- **Isovaleramide** may be created in the extraction process.[9]
- **Gamma-aminobutyric acid** (GABA)[10]
- **Isovaleric acid**[11]
- **Iridoids,** including valepotriates: isovaltrate and valtrate[7]
- **Sesquiterpenes** (contained in the volatile oil): valerenic_acid,[12] hydroxyvalerenic acid and acetoxyvalerenic acid[13]
- **Flavanones:** hesperidin,[14] 6-methylapigenin,[14] and linarin[15]
Description and habitat: perennial flowering plant, with heads of sweetly scented pink or white flowers that bloom in the summer and can reach a height of 5 feet. Valerian flower extracts were used as a perfume in the 16th century. Native to Europe and parts of Asia, valerian has been introduced into North America.

**Black cohosh**
Botanical name: *Actaea racemosa* or *Cimicifuga racemosa*
Habitat: perennial plant native to North America
Preparation: from roots and rhizomes (underground stems)
Active ingredients: the compounds in black cohosh that may be responsible for any relief of menopausal symptoms are not known. Substances that may account for its activity include triterpene glycosides such as actein, 23-epi-26-deoxyactein, and cimicifugoside; resins, such as cimicifugin; and aromatic acid derivatives such as caffeic, isoferulic, and fukinolic acids.
Use: menopausal vasomotor symptoms

**Ginseng**
Botanical name: American Ginseng (Panax quinquefolius, L.) and Asian Ginseng (Panax ginseng)
Active ingredients: ginsenosides
Uses: possibly effective for treating angina pectoris and erectile dysfunction
Action: possible vasodilator action.
Notes: Red and white ginseng are prepared from the same plant using different methods. Traditional medicine claims that they have different actions, but it seems difficult to justify this claim scientifically.

**Tea tree oil**
Botanical name: Melaleuca alternifolia
Habitat: Southeast Queensland and the Northeast coast of New South Wales, Australia
Preparation: essential oil with a fresh camphoraceous odor and a colour that ranges from pale yellow to nearly colourless and clear. It is taken from the leaves of the plant.
Action: probable antimicrobial action
Uses: Toxic when taken by mouth, but is widely used in low concentrations in cosmetics and skin washes. Possibly effective for acne, fungal skin infections and head lice.
Immunology

Immunization has been one of the great success stories of modern medicine, saving millions of people from disease and death by enhancing their immunity to diseases such as smallpox, polio and meningitis. Most modern vaccines consist of highly purified attenuated strains of bacteria or viruses, killed bacteria or viruses, or antigenic proteins derived from the causative organisms. Unfortunately, production of these vaccines requires an infrastructure of medical laboratories, manufacturing plants and refrigerated storage and transport which can only be provided by an advanced technological society, and if that advanced technological society goes away, the vaccines will also go away.

The original low-tech vaccinations were performed by inoculating patients with cowpox by using fluid from the skin lesions of people who already had the disease, usually caught from cattle. It was observed that dairymaids, farmers and cavalry officers were less likely to catch smallpox, presumably because they had already caught cowpox or horse pox from their animals. These diseases are caused by variola viruses which are related to the smallpox virus but cause a less severe form of the disease. Upon recovery, the patient is immune to both the animal variola viruses and the smallpox virus. The latter occurs only in humans.

In principle, this low-tech method of vaccination could be used again in a low tech society, but would probably be unnecessary as smallpox has now been eradicated worldwide. I do not know of any other diseases for which a similar vaccination technique would work.

There is no evidence that homoeopathic vaccines, also known as nosodes, are effective. The British Homoeopathic Association and the Australian Register of Homoeopaths have both recommended that people should receive conventional rather than homoeopathic immunizations.

The best defences against infectious diseases in a low-tech society are good hygiene, good nutrition, clean water, safe disposal of human waste and dead bodies, and avoiding contact with infected persons.
Nursing

Penny Powers

Peak oil, climate change, ocean acidification, overpopulation, and economic contraction are contributing to declining standards of living in the developed world. Among human societies, this decline develops in stages. Following Joseph Tainter’s *Collapse of Complex Societies: New Studies in Archeology* (1990), and Jared Diamond’s *Collapse: How Societies Choose to Fail or Succeed* (2011), Dimitri Orlov (2011) argues that these stages proceed in the following order:

**Stage 1:** *Financial collapse.* Faith in "business as usual" is lost. The future is no longer assumed to resemble the past in any way that allows risk to be assessed and financial assets to be guaranteed. Financial institutions become insolvent; savings are wiped out, and access to capital is lost.

**Stage 2:** *Commercial collapse.* Faith that "the market shall provide" is lost. Money is devalued and/or becomes scarce, commodities are hoarded, import and retail chains break down, and widespread shortages of survival necessities become the norm.

**Stage 3:** *Political collapse.* Faith that "the government will take care of you" is lost. As official attempts to mitigate widespread loss of access to commercial sources of survival necessities fail to make a difference, the political establishment loses legitimacy and relevance.

**Stage 4:** *Social collapse.* Faith that "your people will take care of you" is lost, as local social institutions, be they charities or other groups that rush in to fill the power vacuum run out of resources or fail through internal conflict.

**Stage 5:** *Cultural collapse.* Faith in the goodness of humanity is lost. People lose their capacity for kindness, generosity, consideration, affection, honesty, hospitality, compassion, charity. Families disband and compete as individuals for scarce resources. The new motto becomes "May you die today so that I die tomorrow" (Solzhenitsyn, The Gulag Archipelago).

These stages are not mutually exclusive, and can overlap in practice. Currently, the U.S. and Europe are in the midst of financial collapse. Some elements of commercial collapse are beginning to appear. For instance, shortages of food will begin following widespread drought and commodity speculation. Fossil fuel drives economic activity, and as access to energy declines, commercial collapse will become total. At this point, many professionals will have left the country for more stable places to live where the stages of collapse have yet to progress. Wars over energy and food resources will follow. Food shortages are highly correlated with social unrest (Lagi, Bertrand & Bar-Yam, 2011). Interdisciplinary modelling has even predicted planetary environmental collapse before 2100 (Barnosky, et al., 2012).

As each stage gradually emerges, the effects on health care are profound. The modern health care system is not sustainable (Epstein & Ferber, 2011). Austerity budgets in a no-growth scenario will affect employment, food, fresh water, shelter and health care, but the time line is unclear and it is difficult to predict ongoing developments.

Developed countries are ill prepared to adjust to reduced fossil fuel availability and health care has not prepared to downsize. Dr. John House has written a short essay about post-collapse health care, which has been published in several places on the internet. Excerpts from this essay are as follows:
"Health care as we know it will not exist in a few years. Once collapse is in full swing health care will disappear almost overnight. Of all the industries in our complex world, medicine has become one of the most energy-intensive, technology-dependent, and thus fragile endeavors that exists.....

I analyzed the 25 most common reasons people come to my clinic. Of those, only a few had any kind of treatment that didn’t require some sort of petroleum-derived therapy. It’s important to remember, contrary to what those involved with “alternative medicine” may say, prior to the 20th century, other than opium, there were virtually no medical treatments which were effective with any regularity.

Of those top 25 reasons for seeking medical care, the number one reason — pain — is the one which we will still have the ability to treat post-collapse. Opium, and thus morphine, heroin, and so on, is derived from the poppy. Wikipedia has a wonderful article on this topic and should be required reading for anyone preparing for collapse.....

If there is any good news in all of this, perhaps it would be that many of those top 25 reasons people come to see me will disappear or at least lessen in severity post-collapse. For example, diseases related to obesity such as diabetes, hypertension, high cholesterol, heart disease, and low back pain should improve significantly. When people are scrounging to grow their own food, obesity-related illnesses will be non-existent.

Gone too will be people needing medicine for their depression, anxiety, and insomnia. I have no doubt that those maladies will still plague us, but I suspect that we will have much more important things to worry about. In fact, in a world where we are trying to protect our family and property from thieves in the night, a little insomnia might serve a useful purpose.

On the flip side is the hard reality that immediately post-collapse there will be outbreaks of all sorts of plagues and diseases which we in the developed world thought were conquered, such as cholera, malaria, measles, starvation, smallpox, polio, tuberculosis … the list goes on and on.

When it comes to preparing for collapse of the health care system, if you are dialysis dependent, or you have hepatitis C or HIV, or survive only with chemotherapy or radiation, the outlook is indeed bleak. For everyone else, there are some things you can do to prepare. I’ve started a short list. I’m sure there are many other things which readers can come up with, but this should get us going:

1) If you take regular medication which isn’t a controlled substance (like opioids or benzodiazepines) and doesn’t require refrigeration, talk to your doctor about getting a few extra prescriptions “just for emergencies”. He or she may be willing to accommodate your request.

2) Grow your own poppies. Nobody wants to suffer from severe, long term pain.

3) Have at least one book which deals with medical emergencies in a wilderness setting.

4) Take a basic course in first aid.

5) Avoid the cities at all costs — those outbreaks of once cured diseases will center on large collections of people.

6) Always wear good foot protection and other protective clothing and eye wear when needed. Remember, antibiotics will be a thing of the past (this is already starting, but that’s a different topic) and even a little cut can lead to death if it gets infected.
7) Make sure your water supply is not contaminated by feces from humans or any other animals. Many diseases are spread this way.

8) Wash your hands any time after you come into contact with blood, bodily fluids, or excrement.

9) Avoid those who are sick. This seems harsh by today’s standards, but this was common practice in times past.

10) Do your best to eat a wide variety of foods, focusing more on fruits and vegetables with a minimum of red meats.

I wish I had a more encouraging assessment, but as with so many other areas of our complex world, health care is about to go back to the stone age. Best wishes for us all.”

In addition, a blog by Dr. Dan Bednarz called “Health After Oil” is a good place to find updated information as collapse progresses.

Nurses who cannot find employment in the downsized environment of the health care system will have to provide care alone or in partnership with other health care providers in order to barter for the necessities of life. This care will be very localized, as will most other human activities at that point. The dream of neighbourhood clinics will become the de facto norm, but without the support of a larger system to back up the clinic staff. Individual nurses will be called upon to provide basic health care to friends, family and neighbours.

It is incumbent on all nurses to be prepared for changing conditions. Nurses are highly regarded in all societies and provide trustworthy care in difficult times. Nurses should take this role seriously. First, take care of yourself. Get to know your neighbours and support them in their times of need and they will be there for you when you need them. Know where the closest health care providers live and get to know them, for they will be your partners.

There is still time to prepare. Take a refresher course in first aid or emergency care. Upgrade your maternity skills. Rotate to the Emergency Department or do some work in rural and remote nursing, where supplies are scarce. Befriend your local EMTs for trauma skills. Volunteer at local events in order to become widely known as a skilled nurse.

Next, you will need to stock up on supplies and equipment that will be in short supply or non-existent:

Drugs: antibiotics, antibiotic ointments, anti-fungals, medication of any kind that you can get your hands on. Pain killers of all kinds.

Birth control pills and abortifacients. Read up on herbs with these properties as well.

Equipment: Splints, suturing supplies, surgical tools, Celox blood stopper, lots and lots of bandages. Get yourself a huge first aid kit and a trauma kit if you can find one.

IV needles, tubing and IV fluids for re-hydration and blood transfusions.

Needles and syringes of all sizes. You can get these at a veterinary supply house and may even be able to get old-fashioned glass and stainless steel ones that can be sterilized and re-used. You’ll also see refrigerated penicillin there, as well.


Bulk over the counter medications, especially for stomach ailments will be highly valuable, and can be bought wholesale. Organic medicinal teas last for years in a cool dark place.
Kerosene, lanterns, candles, gasoline, diesel, blankets, clothes, stockpiles of food and water.

Cash and coins. Other currencies.

Disposable gloves, masks and lots of soap and detergent. Pressure cooker to sterilize equipment.

Safe supply of drinking water because supply will be intermittent as facilities deteriorate. Maybe a water purification system or big pots to boil water.


Lots of un-iodized salt. Lots of chlorine bleach, vinegar, isopropyl alcohol, iodine and hydrogen peroxide.

You'll also need a place to work and people to help. Train your family and friends to be your assistants. Pretend you’re educating people for disaster response, tsunami, hurricane, earthquake, snowstorm, wildfire, etc. Hold workshops in your neighbourhood. Get to know who has what skills that will be useful. Who knows how to fix vehicles? Who has welding equipment? Woodworking tools? Any pharmacists nearby? Who has a big garden? A snowmobile? Anyone a military veteran? Write down your neighbours’ skills and keep this list for future reference.

There may be people near you who already realize that times are likely to become more difficult in the years ahead. These people can be very helpful. Others will resist your attempts to educate them in ways to prepare for a very different future. Much has been written about how to reach people who are actively hostile to what you have to say. The best approach is no approach. Continue your own preparations for difficult times and answer questions – that’s all you can do until friends and relatives begin to view events as connected, and begin to seek answers on their own.

Keep in touch with other health professionals for as long as you can. Communities will need to keep trust alive to avoid Stage Five. Try to be the lynchpin of that trust.


Record keeping

Unless we have a very sudden and profound societal collapse, there will be post peak lawyers looking over the shoulders of post-peak doctors and nurses for a long time to come. In the coming years there may well be a large mis-match between public and regulatory body expectations on the one hand, and what can be provided with the resources available on the other hand, providing a potential breeding ground for dissatisfaction, complaints and litigation. Therefore, accurate record keeping is likely to be as important in the future as it is today. This chapter discusses how medical records might best be kept in a post peak environment.

One particular point which you should be careful to document when treating patients is the reason why you have departed from the usual standard of care (if you do). For example, if commercial pharmaceuticals are unavailable and you need to use a herbal alternative, or conventional anesthetics are unavailable and you have to use ether or chloroform, or you attempt a home delivery because transport to hospital is unavailable, you should always document the fact that the first line treatment was unavailable and that you did the best you could with the resources which were available.

Your main choices will be paper or electronic records, which each have their pros and cons.

Paper records

Pros: no complicated technology to go wrong: just requires paper and pen/pencil. Permanent record.
Cons: needs a continuing supply of paper, pens and pencils which may or may not be available. Storage and retrieval problems if you build up a large volume of records.

Electronic records

Pros: a laptop can store an effectively unlimited quantity of medical records and needs no physical material inputs. Can be recharged using solar power.
Cons: Records can be accidentally erased, so be sure to keep a daily backup copy of your records. Records have a limited lifespan: laptops can go wrong, the lithium battery will expire after about five years and the hard drive will expire after 10-20 years.

For a standalone EMR (Electronic Medical Record) which works on a laptop and is free, I would recommend OpenEMR. I have tried a number of medical record systems but this was the only one which I could get to work on my laptop. All the others I tried either had to be paid for, or required a degree in computer science to install.

OpenEMR comes as a single .exe file which when opened, unpacks itself and installs the various components automatically. Even so, there are some caveats as follows:

At the time of writing (October 2012) the latest version of OpenEMR is 4.1.1 and can be downloaded from here:

http://www.oemr.org/download_openemr/

However, they haven’t got round to preparing the one-click .exe installation file as described above: the only installation files available are .zip files which unpack into a
myriad of components which need to be installed and configured separately. After a few
tries I gave up.

So for the time being, if you can get it you should install the older version, 3.2, which is
available from here:

http://www.open-emr.org/wiki/index.php/OpenEMR_3.2_XAMPP_Package_Installation

This comes as a single .exe installation file, but if you are installing on Windows Vista or
Windows 7, instead of double-clicking on the installation file as you normally would, you
must right-click on it and select “Run as administrator”

It comes pre-loaded with username: admin and password: pass, which you can change
after installation. Don't forget your username and password, because there doesn't seem
to be any way to retrieve them.

If you are unable to obtain or install OpenEMR, a simpler but less elegant solution would
be to keep patient records as individual word-processor text files, one for each patient.
Shelf Life Extension Program (SLEP)

This somewhat secretive US Government program was set up to conduct research into whether pharmaceuticals which have passed their expiration date are safe and/or effective to use. This information is important to preppers as many of us have a stockpile of useful items (for example antibiotics) which we would like to store for as long as it is safe to do so. Generally speaking, I don’t believe in conspiracy theories, but this is a rare example of where there really is a conspiracy by “Them” to keep information from the general public.

To save you the trouble of reading to the end of this chapter, the short answer is yes, most solid pharmaceuticals (capsules and tablets) are safe and effective to use long after their official expiration date provided they have been stored in cool, dark and dry conditions. The same cannot necessarily be said of liquids or of pharmaceuticals which have been stored in sub-optimal conditions. For further information about the SLEP program, carry on reading.

The secrecy surrounding this program is illustrated by the following notice about SLEP which is posted on the US Army Medical Department website:

“The following is a general notice from SLEP manager:

As a reminder, all testing and extension data provided to the Shelf Life Extension Program (SLEP) by the Food and Drug Administration is considered For Official Use Only and cannot be shared with anyone outside the user's organization. SLEP Administrators have fielded several calls recently from individuals wanting to share this information with local, civilian counterparts. That is not permissible, as it is not only a violation of the terms agreed to by the FDA but also a violation of the Memorandum of Agreement each participant organization signs prior to entering the SLEP program. SLEP website accounts of violators will immediately be terminated and inventories may be eliminated from the program, pending notification of the parent organization. Additionally, non-SLEP organizations that use SLEP information are in violation of Federal law that governs misbranded pharmaceuticals. Questions on this topic may be addressed to SLEP Administrators through the website.

SLEP Admin”

So in re-posting this information I am probably violating US Federal law and may be terminated, eliminated and so forth, any moment now.

When I discovered this I was curious about it. Why would a government apply such draconian penalties to what appears to be harmless information? After all, national defence and security are not threatened, Government revenue is not affected, and if the research shows that certain pharmaceuticals are safe past their official expiration date, why should this information not be in the public domain? So I did a little reading around it and came up with the following explanation which is part evidence and part hypothesis.

In 1985 the US Government became concerned about the cost of replacing expired pharmaceuticals which had been stockpiled for civilian emergency and/or military purposes. The replacement costs in 1986 totalled $2.5 million (a large sum of money 26 years ago). Discussions took place as to how these costs might be reduced, and one suggestion was to test the products to see if they were still safe and effective to use, and if
they were, to keep them instead of replacing them. Accordingly, in 1985-1986 the SLEP program was born.

However, savings and loss of profits are opposite sides of the same coin. The US Government was no doubt happy to save $2.5 million, but the pharmaceutical industry was no doubt unhappy to be losing the same amount in sales. The US government needed the cooperation of the pharmaceutical industry to conduct the testing on the expired pharmaceuticals, and the pharmaceutical industry needed the cooperation of the US Government to ensure that the resulting information was restricted to as few organizations as possible, preferably only Government and military. The last thing the pharmaceutical industry wanted was for the information to be released to, for example, civilian hospitals and pharmacies, and for them not to replace their pharmaceutical stockpiles, because of the hemorrhage of profits which would result.

Almost certainly, there then followed several weeks or months of backroom horse-trading and saber-rattling between the US Government and the pharmaceutical industry until the following deal was hammered out. The pharmaceutical industry would cooperate with the SLEP program provided the data was restricted to pharmaceutical companies and government departments. The US Government would enforce the restrictions by making it an offence under Federal law to disclose SLEP data to any unauthorized organization. That is the situation as it exists today.

Currently, the SLEP data exists as a database which is continually updated as new information becomes available. Access to the data is restricted as above, but occasionally small amounts of the data leak out in the form of research papers published in scientific journals. Overall, the available evidence suggests, as stated at the start of this chapter, that most solid pharmaceuticals (capsules and tablets) are safe and effective to use long after their official expiration date provided they have been stored in cool, dark and dry conditions. The same cannot necessarily be said of liquids or of pharmaceuticals which have been stored in sub-optimal conditions. The maximum length of time for which pharmaceuticals can be kept is uncertain, but I understand that some pharmaceuticals which have been kept from the start of the SLEP program in 1986 may still be effective.

In terms of enforcement of the SLEP access restrictions, I have not heard of Federal law being used to enforce this, and I think that it is unlikely that it would be used except in the case of very gross violations. The US Government doesn’t really care who has access to the SLEP data, and the pharmaceutical industry probably doesn’t really care either as long as it doesn’t affect their profits. So if you are reading these words, I probably haven’t been terminated yet.