

'Heart Month' 2004! Another February filled with media articles on how to live a healthier life in order to avoid a 'heart attack'. And – with the exception of the 1,150 in the Niagara Peninsula who were unlucky enough to have a 'heart attack' last year and those of you with established heart disease – another opportunity to ignore every word of it. After all most people do not really know what a 'heart attack' is and certainly would not know that the term is totally inaccurate and only started in popular use in the 1970s.

The disease process that leads to a 'so-called' 'heart attack' was given the much better name of Coronary Thrombosis by a Chicago Physician, James Herrick, as recently as 1912. This describes the fact that a clot, (thrombosis), suddenly forms within the channel of a Coronary Artery, (tube that supplies the heart with oxygen and fuel), leading to Sudden Heart, (Cardiac), Death – or, to electrical black-out of the heart's wiring – or, to death of part of the heart muscle supplied by the artery, 20% of Coronary Thromboses causes Sudden Death of the patient. The other 80% leaves the individual alive, sometimes disabled but often there is no long term damage to the heart itself.

That this process was only given a name 92 years ago is not actually surprising. Sudden cardiac events were relatively rare prior to that time. Much more common was a slow onset of tightness in the chest brought on by exertion; this can last for years without doing a lot of harm. It was named Angina Pectoris by an English Physician called Hebciden in the 16<sup>th</sup> century. Physicians in the 16<sup>th</sup> century liked to baffle their patients with Greek and Latin terms; the only difference from today being that in the 16<sup>th</sup> century the physicians understood them! Angina is taken from a Greek word meaning strangle and pectoris means chest ergo, strangling chest pain. This process has been known for centuries, as had the awareness that it was commoner amongst affluent people. The process of Sudden Cardiac Death had actually been described by Hippocrates - the 5<sup>th</sup> century B.C. Greek physician – whose oath reduces most modern physicians to perjure themselves fairly frequently. But Hippocrates described his condition as being restricted to grossly obese individuals and the only obese people in the 5<sup>th</sup> century. were either Priests or Aristocrats.

The actual process that leads to a 'Coronary' or Angina begins as a streak of porridge-like material, (the Greek name for it was atherosclerosis from athero; gruel and sclerosis hardening), on the inside of the artery wall. It is caused by defects appearing in the protective lining of the artery, (endothelium), which allow cellular material from the bloodstream; inflammatory cells, fatty cells, sticky cells etc. to penetrate the artery wall and form a growth, rather like a sandbar in a river. A famous research study in Bogalusa, Louisiana showed that teenagers who died from accidents had over 60% of their arterial surface streaked with this porridge especially if they were smokers who had higher levels of blood cholesterol or blood pressure. (The most dramatic damage to the endothelium is from cigarette smoke; equivalent to firing a machine gun at a gauze curtain). This streaking starts to form a hard plaque after a few years which gradually occludes the lumen of the vessel over two or three decades. People with angina develop their pain when the artery is sufficiently narrow not to be able to keep up with the demands of physical exertion but their plaque is usually hard and stable and will not necessarily lead to a 'coronary'. By contrast people with high levels of certain chemicals such as LDL, (bad) cholesterol have a liquid core to this plaque rather like a chocolate with a soft centre. If external stress or internal arterial tension cause this plaque to rupture the liquid core bursts out into the blood stream. As the liquid is extremely volatile – think Crazy Glue – there is an instant clot, (thrombosis), which blocks the artery and causes one, or more, of the outcomes mentioned above. That is why the ER Physician gives an immediate injection of 'Clotbuster' to a 'coronary' patient.

So angina, or hard, stable plaque, has been around for 2,500 years especially in those who enjoyed life in the fast lane. (The 'fast' lane in those days was somewhat of an oxymoron as it generally involved overeating and overdrinking albeit after over-galloping). Coronary Thrombosis, the plaque with the soft centre, only became endemic in the last 90 years. Why?

Well, while excess food and drink, has been an option for some affluent people for centuries, there were a couple of things that became available to everyone, for the first time, in the early 1900s. The first is the Internal Combustion Engine via: the motor car or motor bus or motor bike, lawn mower, ski-mobile or anything else that prevents mankind from getting from A to B without using its own leg power. Even riding a horse required a certain amount of energy. After the motor vehicle became available to almost everyone in the latter part of the century daily activity was reduced to zero for some individuals. And daily activity is still far and away the best protection against either of the two villains above; Coronary Thrombosis and Angina Pectoris.

The second social evil to emerge in the 20<sup>th</sup> century was the cigarette. Prior to that tobacco had been widely available for pipe smokers, cigar, (only available in XXL at that time), smokers, snuff sniffers and even 'baccy chewers. North American natives had used it in rituals and councils for years with no more adverse effects than being regularly swindled by Non-Native Americans; Europeans had used it ever since Sir Walter Raleigh had brought it back there from Virginia in 1605 and quite rightly had his head cut off by James 1 (England)/James VI (Scotland). History relates that his execution was for treason but generations of nicotine addicted ghosts would sentence him for crimes against the lungs. (Varieties of tobacco used prior to the 20<sup>th</sup> century were not strongly associated with Heart Artery Disease). The Turks in the Crimea War (circa 1850s) have been blamed for teaching British Army Officers how to roll finely cut tobacco into small paper packets. The resulting cigar-ette was a disaster for anyone in the next 150 years who had a genetic predisposition to nicotine addiction. For many individuals the first puff of their first cigar-ette (usually at age 8 or 9) condemned them to a lifetime of addictive illness. It is after all possible to make a nicotine-free cigarette – but no-one would smoke it. The only reason for smoking a cigarette is to get the 'buzz' from the nicotine. Nicotine elevates brain chemicals such as dopamine which are responsible for making us feel good. (People with depression for instance have low levels of dopamine). Once the elevated dopamine from the last cigarette starts to fall we get withdrawal symptoms unless more nicotine from another cigarette is not available to push it back up again. If the Government licensed the sale of a Nicotine 'pill' alone and banned cigarettes the amount of heart artery disease would be cut in half. Because it is all the other chemicals in the cigarettes that do the damage to heart arteries and lead to Coronary Thrombosis and Angina.

So trying to solve the cigarette problem through punishing smokers who have already been addicted by the disease – by making them restrict smoking to their own homes – is really similar to the treatment of Black Death/The Great Plaque in 17<sup>th</sup> Century London. All the plaque victims were locked into a house and the door barred to prevent them getting out again. There was no attempt to treat the disease; although 17<sup>th</sup> century victimizers at least had an excuse they didn't know what caused Plaque, (*Pasturella pestis* bacteria did not give it self up to authorities for another 200 years).

By contrast we are fully aware of what causes the illness of Cigarette Addiction and yet we ensure that new, young addicts are infected every day by selling the product at every street corner. Try telling a 9 year that cigarettes are a bad poison when he/she sees it on sale beside the comic books and the candy bars every time his/her Mother buys a newspaper.

But it is that 9 year old who is the hope for a reduction in Heart Artery Disease. Because a 9 year artery is still clear of arteriosclerosis; that glue which will start hardening the arteries of every teenager who has a genetic predisposition to higher levels of blood lipids (cholesterols), blood pressure, arterial inflammatory disease or blood clotting especially if they start smoking cigarettes. In the next 10 years gene maps will be available and we may wish to find out what diseases are hidden in our future. Regrettably Heart Artery Disease is so complicated and genetic risk appears on so many chromosome loci that you probably can tell as much about your risk today by having a few blood tests done. If we decided to identify the adolescents who had high levels of risk for Artery Disease and successfully counseled them to keep active, not smoke and avoid atherogenic food sources we would save a lot of money in the 2044 Health Care Budget.

Before that happens Fast Action MRI, (which is available for about \$1,000 Can. in parts of America), can tell a 30 or 40 year old whether they have significant but silent artery disease. If the MRI shows that they do: an angioplasty will reopen the vessel and a variety of “pills” will keep in patent, in most cases, for many years. If this solution catches on about half-a-million Ontarians will be eligible for investigation and treatment and for a few billion dollars a year, (on top of the \$8 billion Can. a year cardiovascular disease is costing Ontarians already), Coronary Thrombosis will finally be a rare event again as it was when James Herrick won the “Name this Disease” prize in 1912. Of course, Ontario will be bankrupt and no-one will be able to afford cigarettes, gasoline, or fast food so the solution should be permanent.

How much easier to follow the advice of Heart Niagara, who have been working on Primary Prevention in Schools since 1980, and put a few million dollars into working with today’s Elementary and High School children – and their parents – to keep ‘hardening of the arteries’ from developing in the first place. That way you avoid the slow progression of arterial narrowing up to Coronary Thrombosis or Angina in 30 or 40 years. But it also means providing physical activity for all students IN the schools, cleaning out the atherogenic food from cafeterias and providing Smoking Cessation Programmes in each school for those who have already been ‘hooked’.

After all, if you really need to smoke, be inactive and eat fatty, sugary things start doing it in your 70’s that way you’ll have your Sudden Cardiac Death when you are 110.

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