Annals of the Australian Medico-Legal College

VOL. 2 **20 MAY 2022**

Message from the Editor in Chief:

It is a New Year, 2022, and this is the second issue of the Annals of the Australian Medico-Legal College. Regretfully, the optimism that was predominant in October 2021 at the date of the first issue of this Annals, has been negated by the emergence of the South African-Omicron-strain of the Covid-19 virus and the even more recent Cameroon originated strain, identified in France at the end of the year, one in Cyprus and one Omicron sub-variation in Israel and new A variants.

Nonetheless, and despite of this pessimistic image of the pandemic, we, the Editor and the two associate editors, Dr Drew Dixon, the President of the College and William R Albury, Emeritus Professor of Humanities UNSW, wish all the Fellows of the College a good and healthy Year.

The question to be raised this time is how does the Hippocratic Oath applies to today's medical world? How much of the old Oath is still applicable, how do we fulfill our obligations in an infectious environment, risking our own health? This question was raised with the appearance of AIDS and Ebola epidemics.

It is by now well documented that the Hippocratic Oath that surfaced sometime in the second century BCE, namely close to 2 centuries after Hippocrates' death (460-370 BCE). Was this indeed penned by this Greek physician from Kos or by Herotianus, the Latin historian of the second century BCE? (180-255).,

The Oath is today obviously outdated, it was separating physicians from surgeons, it is in many ways irrelevant without incorporating the advances in diagnostic techniques and therapies. It remains however a basic introduction to a modern commitment that medical students accept at graduation. The basic principles are included in the charts of the Australian Medical Association and in the Code of Conduct of the Royal Australian College of Surgeons. Today, all but few medical practitioners strictly adhere to the required principles, despite the relentless anti-doctor litigations that would suggest otherwise. The line between the negligence and negative outcome of medical/surgical treatment remains disputed.

One remains to quote Erasmus of Rotterdam, a priest, with a week physique, but with giant intellect, sought after by scholars, religious leaders, and monarchs of the 16-century:" Do not condemn the Art of Medicine for a few rogue physicians, just as you don't condemn the church for a few adulterating priests".

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THE SO-CALLED HIPPOCRATIC OATH

The publication of the physician charter is a great opportunity to ponder the meaning of the medical profession, its role in society, and the relationship between physician and patient. The principles and commitments of this charter overcome geographical and cultural borders and provide guidelines of behaviour that are stimulating for a constructive dialogue, beginning from the universally valid Hippocratic triangle (physician, patient, sickness). Starting from the debate concerning the Hippocratic Oath , the necessity for a physician to swear an oath has been discussed . On one hand, it can induce paternalistic behaviour and foster self-importance; on the other, many professional societies use oaths, which give them respectability and encourage group solidarity. The Hippocratic Oath must be read as a contract. Although there is no juridical responsibility, physicians who break the contract lose their repute. Nowadays, it is generally accepted that this oath represents not the ethics that are currently common to physicians but their team spirit, which binds them to each other, as in the past .

The publication of this charter is extremely interesting and stresses the importance of continued medical education and professional development. We think that an oath can still be the ethical framework for new doctors, a datum point for physicians, but it is essential that it be integrated into a formative plan. In the Florence Medical School in Italy, we are currently evaluating the feasibility of proposing the swearing of an oath extracted from the Deontological Code, elaborated by the Italian College of General Practitioners before inscription to the Medical College. The publication of the charter is really a great help in this regard and goes beyond the necessity of an oath.

The Oath of the Medical Ethics remains as the most outdated text in medical ethics, and it was controversial already in Antiquity. It was presented to the world by the Latin writer Herotianus who lived in Roma during the reign of Emperor Nero in the first century AD.

Who was Hippocrates and why did Herotianus attribute this text to him?

Hippocrates is considered the Father of Medicine, lived between 460-c.370 BC, was the first one to have put every disease down to an organic origin. He didn't believe in the influence of gods and magic spells, thinking every ailment had a physical origin.
He wrote a book entitled *"On the sacred disease*", where he affirmed that the so-called sacred disease was no more sacred than any other disease, as it was caused by an excess of phlegm. Epilepsy was named sacred disease, as its manifestation are awesome.

Hippocrates traced back the aetiology of epilepsy to imbalance of humours. He believed that good health was determined by the balance of 4 humours (blood, phlegm, black bile, yellow bile) and on the contrary, disease was caused by their imbalance. He laid the foundation for a scientific approach to medicine. He was the highest authority.
When Herotianus felt the necessity to attribute this oath, he chose the greatest expert in the field of medicine that is Hippocrates.
The text is an oath, as it starts with the typical formula: "*I swear*". And it is a medical oath, as the one who calls the gods of medicine as witnesses to his commitment.

Then, Hippocrates makes some promises, ie . to do all his best for the benefit of the patient, according to his strength and his judgement. It means that the doctor had the complete power of decision about the patient's health: only the doctor could choose the treatment and administer it to the patient.

In the central part of the oath, the future doctor promises to honour his teacher, to live with him, to teach medicine only to his offspring and to the ones who will swear the oath, will not induce abortion or to encourage mercy killing.

There are several contradictions: a. Abortion and euthanasia are condemned as these practices do not coincide with Hippocratic medicine or with Greek ethics. However, in the real society, handicapped children were abandoned, abortion was legal, and it was possible to choose the moment and the way of dying.

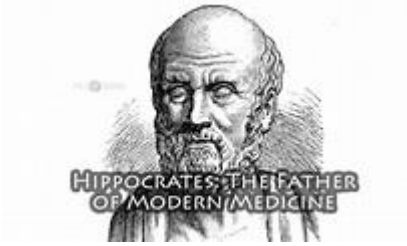
The only explanation is that the text was attributed to Hippocrates, by Herotianus, who lived in the 2 century BCE lived in a Christian environment, wanted to spread the values of Christian religion. The only way to ask everybody to accept these issues was to put these principles in Hippocrates' mouth. However, but Hippocrates had different values. He also had invented a specific device to induce abortion.

b. There is another concept that is even more dubious: In the Oath, the future doctor promises not to operate people who suffer from stone disease, formed in the kidneys, in the bladder or in the urethra. The practitioner however needed to localise the position of the stone and then remove it through surgery. It was rather controversial, as removal of the stone was a minor procedure compared to other major surgical interventions.

The prohibition is for practising surgery, as surgical operations could be lethal, and he wanted to stress that life is sacred: No abortion, no mercy killing, no surgery.
This was the starting point for the separation between medicine and surgery, a concept that lasted until the 19th century. The doctor was the first-rate practitioner. The surgeon was a second-class practitioner, such as midwives and veterinarians
Nowadays in many Schools of Medicine there is the white cloak ceremony, during which new graduated swear to the Hippocratic oath, but this is an anachronism.
Besides that, the oath attributed to Hippocrates should have been sworn before starting the medical training and only who signed the oath could be accepted as medical students.
Swearing it at the end of the course is meaningless.

LIPPI D., GENSINI G.F., CONTI A.A., Charter on medical professionalism: putting the charter into practice, Ann Intern Med. 2003, 138, pp.852-3.

"Codes of Ethics: Some History" by The Hippocratic Oath Today: Meaningless Relic or Invaluable Moral Guide? – a PBS NOVA
http://brewminate.com/wp-content/uploads/2018/04/041118-21-Hippocrates-History-Medicine-Greek-Greece.jpgonline discussions



The concept of Australian Medico Legal College

The Australian Medico Legal College (AMLC) had its genesis in 1968 as the Med Law Association which was formed to promote ongoing education in medico-legal matters. The late President, Prof Fred Ehrlich instigated the move to a more formalised structure as a College, to advance post graduate institutional training with the goal of accreditation as the premier body for advanced training in Independent Medico-Legal Assessments (IME's).

The AMLC **mission** is to

1. Promote ongoing Medico-Legal training
2 Provide a platform for Fellowship participation
3. Provide peer review
4. Have Fellowship Code of Conduct
5. Advance ongoing training where legislation, precedent, and guidelines evolve.
6. To provide regular clinical updates, treatment changes, pain management, newer devices and implants, the impact of injury on ADL's and return to work issues.

The **Mantra** is to provide excellence in medico-legal reporting in areas such as, Expert Witness, Difficult Problem Cases in Impairment assessment, Assess Treatment Disputes and provide probative evidence for the Court: " Amicus Curae"

AMLC Fellowship promotes

1. Interactive and robust continuing education
2. Medico-legal Webinars
3. Educational modules
4. Podcasts by different Craft groups
5. Collegiate atmosphere in learning
6. Cross-pollination of ideas
7. Interactive Forums and Workshops
8. High Ethical standards in Practice.

Fellowship of AMLC provides

1. Certification of expertise in Medico-Legal Practice
2. Re-certification every three years
3. CPD (Continuing Professional Development) programming.
4. Assistance with Fellows in
   - Presentation of Papers
   - Submitting articles for publication
5. By providing an ongoing journal: **The Annals of the Australian Medico Legal College**
6. Information about upcoming medico-legal events eg AOA/RACS/AMLC Annual Clinical Medico-legal Meeting
7. Information on changes in Legislation regarding new guides eg COMCARE (3rd Ed), PIC Guidelines.

The College provides formalisation of Medico-Legal Education for medical and surgical Independent Medico-Legal Assessors. (IME's) and FAMLC will reflect your expertise in this area.

Drew Dixon,

President.

MONEY, HEALTH, AND MANAGEMENT

When asked to write about my experiences over the past 50 years since qualifying, the immediate thought was how could I possibly discuss all the changes which have occurred in this period. The rapid progress in Medicine
was inevitable although forecasting the details would have been impossible.

The advent of MRI, recombinant drugs, safe routine organ transplants, proton pump inhibitors and many advances should not have come as a complete surprise to the Year of 1966.

Others better qualified might wish to explain these developments.

Being a simple soul, I will concentrate on the general changes affecting the practice of Medicine. Having worked in 2 countries with different medical systems, I have concluded that almost all individuals will try to
take advantage of the system under which they live and work.

The 3 words **MONEY, HEALTH** and **MANAGEMENT** were given no formal or informal recognition by our teachers at Manchester Medical School. It is reasonable to accept that the same would have applied wherever a student studied medicine in the UK, 50 years ago.

MONEY: Throughout our five years of Medical School, I cannot recall anybody talking about money. We were being taught the language and practice of Medicine but without any concept of how financial considerations effect medical practice.
In fact, it is a very pervasive and corruptive element.

The first perception of its influence occurred during my junior house job in surgery. My registrar was very keen to cut the waiting list for routine surgery. He used a local cottage hospital and managed to bring the waiting time down from 12 months to 3 months for hernias, varicose veins etc. However, the consultants then curtailed this extra surgery. There was a strong rumor that the reason for this was that their private work had decreased.

My awareness of the way money corrupts medical practice came with my move to Australia. In Britain, general practice surgical hours could be as little as two or three a day. The whole idea seemed to be to discourage patients from attending and minimizing expenses. They knew that they were going to receive the same income whether or not they treated the patients on their lists.

One practice in Leeds, for which I did a locum in 1971, was a good example. The waiting room had no chairs and there was no secretary. On the Monday morning, I saw 87 patients, almost all wanting a repeat prescription or a work certificate. One of them looked ill and was coughing, so I requested to listen to his chest. He stopped me with the words, “Dr X is not an examining doctor, he just refers us to the specialist”.

Compare this to the first practice I did in Sydney. The waiting room had settees and a grand piano. The reception staff was dressed in silver lamee outfits. Surgery hours were from 7.00 am until 7.00 pm. The reason for this was that it was a fee for service system. Therefore, the idea was to encourage as many patients to be treated as possible.

The principal who was totally into the business of medicine rather than the practice of it, insisted that we did plenty of investigations as this would bring the patient back for the results. I found that I was rewarded with extra money for writing x-ray and pathology referrals.

It was not just the doctors who exploited the weakness within the system. In Australia home visits were rare, presumably because they were expensive for the patient. In the UK, house visits were extremely common, maybe because they were free.

A good example occurred in Yorkshire where I did a locum in 1973. A father of a small boy, in answer to the question of why he had not brought the child to the surgery earlier that day said, "Why should I spend money on petrol when you can come out and see the boy".

Before moving to Australia, I had never heard the expressions, "Throw a sickie" or "Go on Compo". However, these concepts are quite ingrained in the Australian psyche. When working as the chief medical officer for a company with 12,500 employees, a good percentage of them used their full entitlement of 20 days sick leave a year.

Even when told to bring a doctor's certificate for each occasion, there were always plenty who would supply them. One character had 20 separate days off claiming sickness in one year, each with a certificate for "influenza" which always occurring on Fridays.

Surveillance of chronic offenders became quite a routine. Despite having a certificate, many of them were shown to have spent the day being very active, e.g., surfing 9 ft waves, playing golf, and helping a friend move house. When caught, each was given the option of voluntarily resigning or having the police involved. The average sick leave throughout the workforce rapidly fell from 14.5 days to 5.6 days a year.

There is no doubt that claiming compensation severely affects the progress of the subsequent pain and incapacity following an "injury". I have seen several hundred apparently minor injuries requiring little or no treatment at the time, which resulted in very long-term partial "invalidity" continuing in one case as long as 22 years. Complicit doctors have aided and abetted the claimants.

I did a study of 200 consecutive claimants treated by one such specialist who later lost his registration after being disciplined. Not one claimant had returned to work 12 months post injury. His income just from our company was 3 times that of the CEO. There have been several others who have used the system to make themselves very wealthy over the past 30 years.

It was not surprising that the so-called repetitive strain injury was an Australian invention. When attending the 20-year reunion in 1986. I asked one of our colleagues, an orthopedic surgeon how he was coping with the RSI epidemic. After my describing the usual symptoms, he said that he did not know what I was talking about.

Ten years later, he came up to me and said, "You bloody Aussies are causing us so much trouble" because he was seeing many patients claiming to have the condition. I understand that compensation claims in the UK are now as common as in Australia and probable just as expensive.

No doubt the lawyers are very happy! "Whiplash" is another example of a condition which suddenly became a popular diagnosis.

Maybe we should all heed this quote: -

"**One is instantly reminded of the influence of fashion on medicine, more than on any other science". Pliny the Elder AD23-79**

HEALTH: WH Auden once remarked that," Health is a subject about which Medicine has little or nothing to say".

Health was certainly another word, which was rarely mentioned during our time at Medical School. Of course, there was the National 'Health' Service. It should have been called in those days the National Disease and Injury Service because that was all that was provided. Perhaps, Mr Bevan thought that nobody would use the Service if it were called by its real name. We did have a few lectures on public health but never about the health of the individual.

The presumption seemed to be that if a person had no disease, he or she was normal and healthy. The only people who seemed to be particularly conscious of their personal health and fitness were unusual or just eccentric (vegetarians, vegans, or nudists).

Nobody went to the gym unless you were a boxer, wrestler or professional sports person. Normal people did not have to go for their morning runs so as to produce endorphins to make them feel good. Despite there being no culture of personal fitness, obesity was rarely an issue in 1966.

In 1967, I did my first GP locum. A man aged 35 requested a full medical examination. I asked him why and he replied, "I want to go jogging". I had never heard the term "jogging" and I

asked him to define it. He explained that it meant running around the streets in shorts as he had seen some "joggers" on a recent trip to USA.
However, as he was perfectly healthy, I had no cause to stop him. Unfortunately, three months later when working in Casualty, I recognized a severely ill patient in running shorts as the being the same man. He had been knocked over by a car in a country lane!

Incidentally having completed 2 years and 6 months of house jobs, I went back to Manchester University as an assistant lecturer. This was at the start of 1969. I was totally unaware of the advent of illicit drug taking. On my first day, a young physiologist when chatting to me asked if I had been on any good trips recently. I was perplexed but said that I had been on a package tour to Greece.

Apart from being told that bran was good for our bowels, there was very little knowledge about "healthy" diets. In reality, there was no need because we mainly ate home cooked food. It is a paradox that kitchens were relatively small then but are now much larger with all kinds of cooking equipment but junk food or eating out now forms the basis of so many people's regular diet.

Omega 3, antioxidants and many other so-called recently discovered essential elements of a good diet, were unknown. We of the professional middle class and many others have become indoctrinated by the "healthy eating" brigade. As a result, most of us have feelings of guilt when given greasy foods such a fish and chips or indulging in chocolate for enjoyment. What a shame!

Over the past 50 years, previously unheard-of specialties have developed because of the emphasis on personal health and body image. Bariatric Surgery is now the second most common major abdominal operation in Australia. "Sports Medicine" as a separate specialty has become entrenched with little good evidence-based medicine to justify it.

The weight reducing diet industry has proven to be remarkably unsuccessful. Surely, it would have gone 'broke' if it had been producing a tangible and measurable product. Now, personal trainers are yet another sign of the times, acting as a further indicator that personal health and fitness has assumed major importance, which it never had 50 years ago.

A wise man once said to me that all this training and eating 'healthy' food might possibly put two years on your life but it only does it at the end when you are old and frail and not when you should be enjoying life. Instead, you spend that time busting your guts trying to get fit.
Another way of looking at the 'fitness industry' would be to quote Rumpole from the Age of Retirement; "exercise is simply an invitation for death".

MANAGEMENT: As students we understood that management of patients was the treating doctor's responsibility. Health managers who have had no hands-on experience of Medicine did not exist. Now they are found in abundance. A local teaching hospital had 14 floors, 2 of which were occupied by "management".

These new experts know how to influence treatment to make it more effective and cost-efficient. Doctors seem to be regarded as another category of workers who are necessary for the hospital to function. On several occasions I have heard clinicians express the concept that "we manage in spite of management".

The 'Yes Minister' episode of the hospital with no patients and no doctors was close to the truth in respect of hospital management attitude. Remember that it won the 'Florence Nightingale Award' for the most efficiently run hospital in the country.

My first experience of non-clinical management came shortly after qualifying. We had a time & motion consultant arrive one morning at 9am, with a clip board. The fact that we had started at 7.30am was not considered to be relevant. He then followed us noting our activities.
At 2pm we went to theatre for an emergency. By the time he managed to change his clothes, we had finished and were on our way out. At 5pm he left to go home but we continued for another 2 hours before being on call for the rest of that night.

I have experienced several other encounters with inflexible even arrogant administrators. When working as a rural surgeon in country New South Wales I instigated a policy to help the staff whereby the Tuesday operating list had to be in by 2pm on the previous Friday. One week I was late because of an emergency and did not submit the list until 3.30pm. The hospital manager promptly cancelled the surgery, and the patients were postponed to another day.

This strange world where the management is the new aristocracy, permeates all parts of Medicine. Is there a general practice without a practice manager?
No wonder that every university and most adult colleges in Australia offer courses in medical administration. These include a variety of 'specialist' training.
The advertisements for these courses all emphasize the excellent salary which can be expected on successful completion. In addition, they often mention that the career can lead to very influential positions in respect of patient treatment and management. The question I want to ask is "how on earth did doctors function without Health Managers"? ***Perhaps someone*** from our Class of 1966 can provide the answer.

Malingering still relevant in today's PC world?

To malinger in the Macquarie dictionary means: to feign sickness or injury, especially to avoid duty, work etc. A malingerer is one who does just that.
In a medico-legal sense it also means one who intends to gain financially from his or her employer.

Thus, it involves the courts of law and hence solicitors, as well as doctors. There are doctors treating the injured worker or victim of an accident and those who prepare reports as independent evaluators for the benefit of the court. We are supposed to be as Solomon was, above the law, and provide an independent opinion as to what happened (the cause), what resulted (i.e., the injury and the consequence) and the outlook for the future.
We rely on the integrity and honesty of the patient or claimant, as well as own honesty and integrity.

The same applies to lawyers, but sadly as in our profession there are those who are prepared to act on behalf of the claimant and those prepared to act for the those who will have to reimburse the patient for whatever injury he or she sustained. In my own practice after introduction to the claimant I used to say I was only there to say what happened, what was wrong and what was the outlook for the future, and that the lawyers were to turn it into money. I was unable to say what their claim was worth.

This would all work very well if honesty and integrity were to prevail. Unfortunately, there are those who are rorting the system, patients, doctors, and lawyers.

Ignorance also plays a part. There are events recorded on papyrus from 4000 years ago about the treatment of women with symptoms attributed to migration of the uterus up into places where it should not be. This is where the word hysteria comes from, as the ancient Greek word for uterus.

Past members of my profession as well as other scientists have been unable to keep an open mind as to the advances being made under their noses.
Sometimes the church was involved, and not just in medicine. Galileo was offered the choice of being burnt at the stake or confined to house arrest in 1645 for proposing that the sun was the center of the solar system and not the earth. It took >350 years before the church apologized when Pope John Paul II did so on 31st October 1992.

Ambroise Paré in 1535, found that not using boiling oil in the treatment of wounds was not harmful in the treatments of wounds, which his colleagues refuted as Jean de Vigo had stated it in a book.

William Harvey had a problem persuading his colleagues in 1625, that the heart was a pump circulating the blood.

Ignaz Semmelweis in 1840 could not persuade his fellow practitioners that washing your hands before delivering a baby would stop women and their babies from dying from child bed fever (puerperal fever).
Even now there is an outcry against vaccination for Covid 19.

The current epidemic of compensation claims began in the Victorian era in Great Britain, with claims against the newly established railway networks for collisions and the jerking of stop-start resulting in spinal concussion, later called whiplash by Harold Crowe in 1928 at a meeting in America.

It was highlighted by John Erichsen in 1866 and became the most common reason for a doctor going to court. In 1883 J G Johnson in New York, wrote about his book that the ingenuity and plausibility spoke more for skill as a partisan than a seeker after truth.

James Syme in 1867, spoke about a trial that had taken place the year before about a commercial traveler who prosecuted the Great Northern Railway company for compensation for an injury alleged to have been sustained by a collision on their line. He said there were 9 doctors involved with those on Erichsen's side predicting death and on Syme's side saying there was no organic disease and good health was expected.

The jury instead of the £12000 gave £4700 of damages and before many months the plaintiff admitted he was quite well. Syme comments: "The truth is, that when juries find medical evidence so conflicting, not able to judge for themselves the merits of the case, they almost always decide in favor of the claimant, so that there is thus the greatest encouragement afforded to unfounded or exaggerated demands for redress"

Sir John Collie published a book on the subject in 1913 which is available free to download on the internet. He defines his subject and in a later chapter discusses the importance of being sued for libel or slander, with the court providing protection.

What he says is still relevant today. In fact, the human condition has not changed much over the course of History. Diogenes (412-323BC) when asked why he went about the streets in daylight carrying a lamp replied: "I am looking for an honest man". He told Alexander the Great to get out of his sunlight.
He also coined the expression "I am a citizen of the world" to which we should all adhere.

The world moved on with the First World War, the 1918/19 Flu epidemic with millions dying, the depression and Second World War and the formation of the United Nations in an effort to stabilize and improve society. Success has been slow.

As more and more people in developed nations had access to homes, cars, appliances and so on injuries changed. Whiplash became common and was studied by Ian McNab in Canada, eventually leading to head rests and seat belts.

Some of you may remember the controversy of compulsory wearing of seat belts as an infringement of a person's liberty and the nanny stat telling us what to do.
Now we have the anti vaxxers!! Remember: "Most doctors smoke Camels!"

We now have the green and blue books as bibles to try and quantify injures. However all too often the cause is not a work-related injury, but how to prove it.
I remember a case I was involved in when a worker injured his heel at work, and I subsequently found a secondary deposit from an undiagnosed lung cancer. His lawyers were not convinced it was not a work-related injury.

I entered Practice in 1972, and initially had a lot of medico-legal work sent on by Jim Evans. There was an interpreter (Azzopardi) who came with recent migrants spurred on by a firm of solicitors. It was thought he was instructing them in making claims for back injuries.

I also joined the Medico-legal Society. Collins Greaves was a wise counsel and gave an entertaining address on Functional overlay in 1986. Later that year Mr. Justice Shepherd made a plea for us to use the word malingering to help the court.

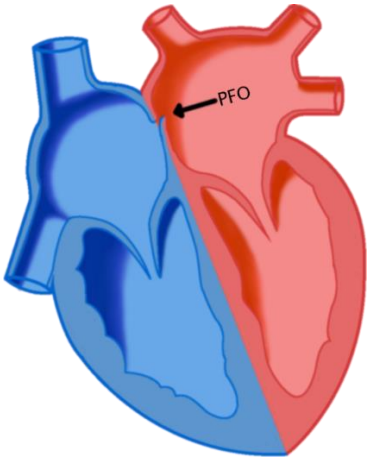
In the RACS Surgical News, Felix Behan, a surgeon from Melbourne, has written articles on the Munchausen syndrome and has also commented on fabricated injuries and illness.

For those of you who haven't yet read it, I can heartily recommend Ian Harris' book on "Surgery The Ultimate Placebo". He also wrote about this in 1977 in the FRACS Journal.
The double-blind trail has become the gold standard. Some operations have disappeared, and perhaps spinal fusion should be one of them, especially when multiple item numbers are used.

We have a problem, and we should grasp the nettle and restore the word malingering in our reports.

More on Paradoxical Embolism.

Residual patency of the inter-atrial opening (-foramen ovale-) normally closes soon after activation of pulmonary circulation and replaces maternal arterial oxygenation, was reported to be prevalent in between 25% to 35% of the population. The incidence of vertebral artery occlusion induced infarct was found to be between 1- 4% of stroke cases, with a remarkably high percentage of mortality usually asymptomatic, unknown, discovered during unrelated investigations. Should the Foramen remain open, a sudden increase of right sided cardiac pressure, would result in a shunt toward the lesser pressure gradient of the left cardiac side, allowing for embolization.



Apart of thrombotic embolism presented in detail in the Annals of the Australian Medico-Legal College no.1 (October 2021), reviewing the literature (Google Scholar, ICBN) one discovers other tissue embolization. These are:

1. Osteogenic embolism: Case studies were published after bone surgery or trauma in operations on bone spikes, cartilage, metal spikes, air, fat).

a. **Lower leg area**: post-tibial osteotomy for osteoarthritis or following uni-or bi-lateral total knee prosthetic replacement.
b. **Upper leg area:** post femoral lengthening procedures, in hip prosthesis or in revision hip surgery.

It is during or soon after surgery that intramedullary fat, pressed by nail insertion in bony canal is dispersing fat into the veins, the thrombus reaching the lungs and the resulting increased gradient is shunting clots into the left and into the systemic arteries. Arterial embolization will reach to the cerebral and cerebellar arteries, to the subclavian arteries (with neurological defect in upper limbs), or to arterial femoral and of coronary embolism.

Spinal surgery seemed to have had the most embolic events: in vertebroplasty for compression fractures resulting in thrombotic, in fat, and cement embolization. Of interest is the reported extensive laminectomies producing air embolism once operated in a sitting position.

Medico-legal implications: a known PFO, not cauterised, remains a liability of the person.

2. The most interesting : **Malignant paradoxical embolism** A review of paradoxical tumour embolization in the literature, was expected to lead to a significant incidence

1	Thompson	1929	Testicular
2	Wolfe	1960	Argentaffinoma
3	Wood	1992	Wil's tumor
4	Mitsui	2001	Ovarian
5	Dumont	2002	Renal
6	Horowitz	2002	Pharynx
7	Wada	2007	Ovarian
8	Schallner	2011	Renal
9	Uga	2012	Breast
10	Thibault	2018	Breast
11	Portigari	2019	Ovarian
12	Kamakura	2019	Bladder
13	Yasui	2020	Renal
14	Yu	2020	Breast
15	Wagner	2021	Lung

The small figure of the published incidence would not permit any conclusion, but to:

1. Raise attention to the likelihood of missed diagnoses within the high percentage of PFO in the population and promote the study of the extent of passage of malignant cells through foramen ovale.

2. Raise the question for the need to close an asymptomatic PFO, a dispute in the literature that reached no definite conclusion. The authors support the closure of existent PFO in a patient diagnosed with malignancy. This intervention could reduce the chance of early spread of tumour.

The Medico- Legal implications: in case of known foramen ovale, with refusal of electro cauterisation closure, the liability is personal. In case of unknown patent foramen, liability is consequential as in the case of thrombotic embolism at work .

Shoulder- related disability.

In my first year in clinical practice, like so many of my colleagues, I filled several locum positions, including a stint in a largely 'medicolegal' practice. One of the first patients I saw was a lady who had suffered a significant mal union of a humeral shaft fracture following a motor vehicle accident. This led to my first ever court appearance as a specialist. The barrister appearing for the lady's husband (!) asked me how the malunion might interfere with her husband's enjoyment of life. I was absolutely nonplussed but was spared further embarrassment by an understanding judge who excused me from answering the question. It was my introduction to the finer points of medicolegal practice. I do not intend to discuss the differences between disability and impairment, or the social connotations of shoulder pain and stiffness, but simply to note several clinical observations, some of them obvious, made over several years.

Viewed simplistically, the main role of the shoulder joint is to help 'position the hand in space.' The function of the shoulder may be affected by loss of range, either active or passive, by pain or by weakness. Anything affecting range or strength, or producing associated pain, may result in some disability.

Let us first consider shoulder range. The shoulder is the most mobile of human joints. It has an extraordinary range of movement in many directions and is constrained purely by soft tissues. Loss of range in certain directions can often be compensated for without significant loss of function. It is often said that shoulder movement is two thirds glenohumeral and one third scapulothoracic. This is of course an oversimplification.

The 'rule of thumb' may reasonably be applied to forward flexion and abduction, but not to extension, internal or external rotation. Significant loss of forward flexion may be catastrophic for an electrician or a plasterer who needs to work overhead, but of little significance to a clerical worker who does not play tennis or cricket. Elderly patients with kyphosis 'start' with their scapulae 'pointing downwards,' and they may employ 30 more degrees of glenohumeral flexion than does a person with a straight back if they are to reach the horizontal.

Reaching overhead will be impossible for them. We often 'make a big deal' of assessing shoulder abduction. While the first 30° of abduction are essential for numerous activities of daily living, including reaching to the side at a desk or the dinner table, for those other than traffic policemen, abduction to the horizontal is rarely required other than when taking a ticket in the parking station. A little external rotation, combined with a little abduction, is essential for tabletop and benchtop activities. However, the extremes of external rotation are rarely employed outside sport and the gymnasium. Internal rotation 'on the other hand' is essential for 'hand to mouth' and toileting.

Bilateral loss of internal shoulder rotation can be catastrophic. Increased scapulothoracic movement may provide a few degrees of compensatory external rotation, but internal rotation is almost entirely glenohumeral. (In the rare situation where bilateral fusion might require, consideration needs to be given to achieving 'hand to mouth' with one arm and

'hand to perineum' with the other, as these functions require differing degrees of internal rotation, and thus different 'fusion positions.')

In assessing 'shoulder stiffness,' is important to remember that some loss of range may be temporary. There are numerous possible explanations for 'frozen shoulder.'
Stiffness due to 'capsulitis' often resolves over 12 to 18 months and should be distinguished from permanent loss of range. The presence of 'end range pain' may be a clue. True capsulitis is painful when the shoulder is stretched at the extremes of range, but virtually pain-free with movement up to the end of range.

A convenient way of determining this is to hold the patient's elbow by the side, and gently externally rotate the shoulder. In cases of capsulitis, this is pain-free until the extreme of passive external rotation is reached, at which point sudden and often severe pain is experienced. (The reason for testing for this in 'external rotation in adduction' is that this movement is largely glenohumeral, while most other shoulder movements are at least partially scapulothoracic).

Shoulder arthrodesis presents difficulties. Unfortunately, CT scanning does not always confirm 'solidity.' As with any joint fusion, 'jogging' the construct passively should not hurt. If it does, one should suspect (painful) fibrous ankylosis rather than arthrodesis. Successful bony union alone may not 'suffice.' The 'position' of fusion is critical. Can the patient reach her mouth and the top of her head, or does she need help with feeding and self-care? Has the joint been fused in too much abduction, resulting in scapulothoracic pain when the arm is put by the side?

If we turn our attention to shoulder strength, it is clear that different people and different occupations have different requirements. Ability to lift and hold a load overhead maybe essential for a manual laborer, for certain tradesmen, or for certain sports. Most of us require a strong deltoid and a functioning rotator cuff for overhead activity. I have seen a world class triathlete with a complete axillary nerve palsy (i.e.no deltoid function) able to swim 3 km 'overarm,' but not at a competitive speed.

Should he be assessed as 'near normal?' Strength requirements differ from person to person and job to job, and simply classifying strength by 'grades 1-5' may not suffice. Sufficient strength to perform a 'one off' activity in the doctor's office may not translate into capacity to perform repeated overhead activity. Such considerations are of relevance to production line workers and sports people. Assessment of 'easy fatigue' is difficult, and often dependent on history rather than single instance observation. (Similarly, one may be able to perform a particular movement once without pain, but repetitive activity might be impossible because of pain.)

Signs of chronicity may be important in determining the cause or chronology of particular shoulder weakness. If muscle wasting is apparent, it might reasonably be assumed that the weakness has been present at least for some months. Profound wasting, such as major loss of deltoid muscle bulk in an axillary nerve palsy, does not 'appear overnight.' More subtle wasting may reflect long-term reduction in activity.

Palpable or visible wasting of the supra and infraspinati reflect long-term ‘disuse,’ which might be due to chronic pain (possibly tendinopathy-related), a rotator cuff tear, a combination of both, or less probably, suprascapular nerve pathology.

A shoulder MRI may be helpful not only in assessing structural integrity, but also in determining ‘timing of injury.’ If the MRI shows fatty infiltration of the muscle bellies of the spinati, it is reasonable to assume that the muscles have been at least partly ‘out of action’ for some months. This may help exclude recent causal injury.

In assessing the clinical effects of any shoulder pathology, one needs to consider whether the dominant or non-dominant arm is affected. This is relevant to activities of daily living as well as to work requirements. In the same vein, one needs to consider any effect on the contralateral shoulder.

Determining the cause of shoulder pain may be difficult. One is often reliant on the veracity of the history given. This brief essay is not the place for a detailed review. Glenohumeral pain is often most noticeable over the back of the joint line or in the region of the deltoid insertion. Subacromial pathology is more likely to produce pain over the top or the front of the joint. Acromioclavicular pathology is almost always associated with the tenderness over the AC joint, or pain on passive movement of that joint.

Pain associated with glenohumeral instability is generally but not always associated with apprehension or discomfort on passive abduction/external rotation. This is often relieved by direct pressure over the front of the glenohumeral joint, the so-called ‘relocation test.’ If appropriate, and if patients agree to it, accurately employed injections of local anesthetic to the subacromial space or the acromioclavicular joint should temporarily eliminate pain from those sites, confirming or excluding these sites as the source of symptoms. It is important to remember that the presence of ‘pathology’ on imaging studies, especially MRI scans, does not ‘prove’ causation of symptoms.

Like minor degenerative changes on cervical radiographs, asymptomatic full or partial thickness rotator cuff pathology is common in older citizens, particularly males. Less commonly, benign harmless swelling around the sternoclavicular joint is common in middle age and older women, and rarely signifies significant injury or disease.

I have not discussed how to examine the shoulder. I generally begin my examination standing behind the sitting patient, a position which makes inspection and palpation easy. In measuring ranges of movement, even with careful use of a goniometer, inter- and intra-observer differences are common at the best of times. In these pandemic days, I have occasionally been called on to examine a patient ‘by zoom.’ I find this inaccurate, difficult, and unsatisfactory, and feel that in most cases it should not be acceptable ‘in a court of law.’

I have found the legal system’s formulaic approach to measuring impairment to be frustrating and unsatisfactory. Sadly, I can offer no better solution. In observing disability rather than impairment, I have seen patients rendered housebound and unemployable by the most minor of rotator cuff tears.

I also recall with admiration a young double amputee postman (“the accident cost me an arm and a leg”) who returned to work nine months after his injury, standing on a below knee prosthesis and working one-handed at a benchtop.

Another magnificent man overcame some of the frustration of a forequarter amputation by installing a circular swimming pool in his backyard. The unpredictable nature of disease progression is also notable.

I need to state that I have no particular medicolegal expertise and offer the above clinical observations merely as ‘food for thought’.

Lesions of the Posterior Branch of the Axillary Nerve:

(A common condition not previously described).

The literature tells us that axillary nerve lesions are common in association with dislocations of the shoulder or fractures of the proximal humerus. Most of these lesions (due to neuropraxia) recover completely within a year. The literature also tells us that apart from these two situations axillary nerve lesions are uncommon.

The aim of this paper is to indicate that lesions of the posterior branch of the axillary nerve lesions are not uncommon, but are very common indeed, and the diagnosis is simply being missed. These patients usually present following a shoulder injury with persistent shoulder pain for which no obvious cause can be found but is frequently attributed to impingement. The key to making the diagnosis is the finding of diminished sensation over the deltoid muscle in the area supplied by the axillary nerve.

Figure 1 shows the anatomy of the axillary nerve and Figure 2 indicates the typical area of sensory loss in an axillary nerve lesion; I do not see how anyone could make the diagnosis of an axillary nerve lesion without finding the sensory loss. So, let me pose a question at the outset. *"When was the last time you checked for sensory loss over the deltoid in a patient with shoulder symptoms?"*

<u>Anatomy of the axillary nerve:</u>

The axillary nerve is a branch of the posterior cord of the brachial plexus which passes backwards through the quadrilateral space together with the posterior humeral circumflex artery. The space is bounded superiorly by the teres minor muscle, inferiorly by the teres major muscle, medially by the long head of triceps and laterally by the humeral shaft.

Distal to the subscapularis muscle the nerve divides into anterior and posterior branches. The anterior branch contains all the fibres that supply the anterior and lateral deltoid muscle. The posterior branch contains the majority (and sometimes all) of the fibres to the posterior deltoid *as well as all the sensory fibres.*

Note that lesions of the axillary nerve itself, if severe enough, will result in wasting of the whole of the deltoid muscle, whereas lesions of the posterior branch of the nerve, only involve the posterior deltoid.

<u>Testing for axillary nerve lesions:</u>

In most cases the cause of the lesion has been a traction injury to the shoulder, either by trying to prevent something heavy from falling or simply by lifting something unexpectedly heavy.

There are three clinical signs that help to make the diagnosis:

- Diminished sensation over the deltoid (a sign without which one cannot make the diagnosis i.e., it is present in every case) (Fig 2).
- A localised area of tenderness posteriorly over the course of the axillary nerve in relation to the lower part of the glenohumeral joint, present in about two-thirds of cases
- Wasting of the posterior deltoid, as depicted in Fig 1, is present in about one-third of cases. Compare this appearance with the normal rounded posterior shoulder in the same patient (Fig 3).

Figure 3 shows another example with wasting of the posterior deltoid of the right shoulder compared to the normal rounded left shoulder. A posterior view clearly shows the wasting on the right side.

A number of cases of damage of the posterior branch of the axillary nerve where originally shown at an AMS Forum and subsequently put up on my YouTube site in November 2016 [(1)].

In two of these cases nerve conduction and EMG studies confirmed incomplete lesions of the posterior branch of the axillary nerve with involvement of the posterior deltoid, with the anterior and lateral deltoid being unaffected.

The importance of this condition is that its 'non-diagnosis' may 'explain' why ill-advised but frequently undertaken subacromial decompression for isolated so-called 'sub-deltoid bursitis' reported on ultrasound or MRI, frequently fails to relieve associated symptoms.

The following clinical testing is therefore recommended:

- Careful sensory testing over the deltoid
- Careful palpation of the posterior joint line
- Inspection of posterior deltoid bulk

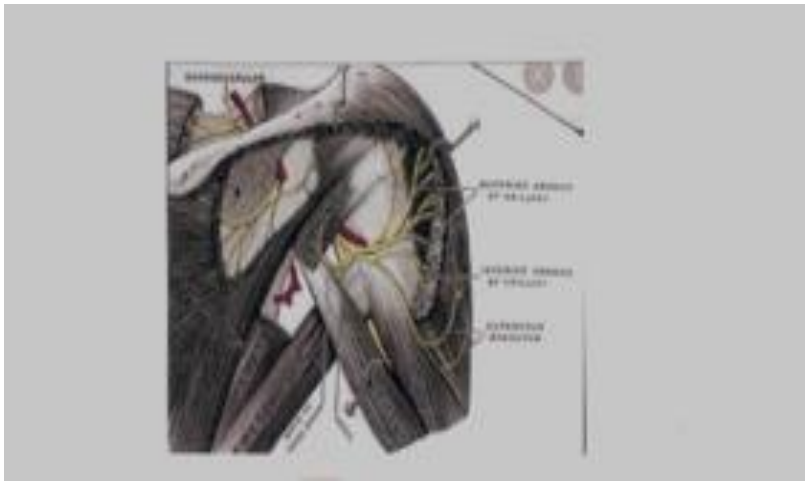
These tests should be carried out in all cases of 'non-specific' post-traumatic shoulder pain, in the hope that the correct diagnosis would save many patients from inappropriate subacromial surgery.

Summary:
Lesions of the posterior branch of the axillary nerve are not uncommon and are in fact very common. The diagnosis is being missed simply because it is not being looked for. The key to making the diagnosis is to be aware of the entity and to carry out appropriate testing for it . *"If you do not think of it, you will not look for it. If you do not look for it, you will never find it* Once again consider this*: "When was the last time you checked for sensory loss over the deltoid muscle?"(*Roger Pillemer YouTube: Axillary nerve lesions: Video no.8).

WPI: Sensory loss: Table 16-15 of AMA5, one would use the maximum sensory deficit (5%UEI) and then refer to and apply Table 16-10 for the appropriate grade. Page 492 AMA5: Motor deficit axillary nerve

Motor loss: Similarly for the motor loss use the maximum impairment (35%UEI); apply Table 16-11 for the appropriate grade. It would then be reasonable to suggest using one-third of this figure, as only one-third of the deltoid is involved.

Figure 1: Anatomy of axillary nerve



Figures 2 : areas of hypo-aesthesia

Fig 3: posterior deltoid wasting, right side

Assessment of complex injuries: An instructive and a detailed case.

ACCIDENT DETAILS AS GIVEN BY THE CLAIMANT: This 53-year-old claimant worked as a hydrographer with Water NSW from December 1999 for just under 20 years until he had to stop work in February 2018. During the course of his varied duties, which included working on riverbanks that were steep and tall to climb, he would often trip over terrain or fall on riverbanks. He had to do manual boat handling of a tinny including pulling boats up and down riverbanks and across over land from his van and had to pull and carry boat motors and various hydrometric equipment over long distances and over rough, steep terrain. He had to lift lead weights of 100 pounds used for flood water barriers and manually install gouge posts of 90mm.
These were galvanized posts that had to be hand driven into the ground at rivers and he had to manually lift and carry dry nitrogen cylinders weighing 40kg on his shoulders upriver banks, ladders and stairs that were used with downlines to the river. He also had to pour concrete slabs and erect shelves which required repetitive and constant bending, lifting, extending, and pushing, pulling, sitting, and standing and driving for prolonged periods and twisting his back for readings. He had to use crow bars and jack hammers to lay pipes in trenches as well as shovels to manually dig.

Another of his tasks was to lift and carry and wind weights up and down on winches from bridges manually to take water samples or doing testing, measuring flow, and driving on unsealed roads over many hours over logs, corrugated roads, and rocks in remote outback areas. Some of his journeys were quite extensive. He originally started with a Leeton run but then did long drives as far as Bourke and out of the Riverina and was away from home for prolonged periods of time, which he estimated was 50% of each year. Some drives one way would be, for example 1200 kilometers, and on some days he would cover 3000 to 4000 kilometers.

During his employment, he developed pain in his lower back and pain in his thoracic spine. He also developed osteochondritis one day when he was lifting a cylinder and required a cortisone injection to the left of his sternum in 2018. He has had scans of his thoracic spine which showed osteophytic change and he has had an MRI of his back which showed an L5/S1 spondylolisthesis.
He did have a Marcaine injection to his back at one stage and it was thought from this he developed thoracic osteomyelitis for which he had to have a PIC line for antibiotics over an extended period, some four months, and then two months of oral antibiotics. He has also had specialist review of his back, but the spinal surgeon said no operative intervention was recommended, as there could be a risk of further infection.

He had review by an infectious disease specialist and has had review by a pain specialist who recommended diagnostic blocks and radiofrequency treatment, which has not taken place due to the Covid-19 pandemic lockdown.

He reports pain and stiffness in his neck with a dowager’s hump, but this has been declined by the insurance company.

What was accepted by the insurer was aggravation of his L5/S1 spondylolisthesis and his thoracic osteomyelitis and multilevel thoracic degeneration.

WORK HISTORY: As noted above, he was a hydrographer with NSW Water from December 1999 and worked until 23 February 2018. During his employ, he progressed to become a supervising hydrometric officer and has a Water Operations Diploma, a Project Manager Diploma and qualifications as a hydrographer. He requires analgesia to do these duties and had three cortisone injections and a failed Marcaine injection to try and keep him going but he was unable to do the various tasks above due to increasing pain and stiffness in his back and right buttock sciatica as well as his thoracic spinal infection.

SOCIAL HISTORY/ADL'S: He lives in a one level house with three bedrooms and three bathrooms. His ex-wife comes and does the housework for him and does meal preparation and cooking and assists him with dressing and she does his toes nails. His son helps with the yard work. He lives on 4.5 acres and his son has a ride-on mower for the lawns and he does some of the garden. The claimant is unable to do yard work or household duties and has difficulty dressing and showering and has a rail in the shower and adjacent to his toilet. He has difficulty with toileting and is unable to put on shoes and socks or do his toenails. Heavy cleaning is done by his wife who also does the washing, ironing, laundry, and the heavy grocery shopping.

GENERAL HEALTH, INCLUDING SUBSEQUENT OR PREVIOUS ACCIDENTS: His general health includes the development of raised blood pressure for which he takes Olsmartan.

CURRENT TREATMENT: He takes Endone and Targin for pain relief and Celebrex as an anti-inflammatory and Panadol Osteo. He sees his local doctor regularly and his pain specialist and spinal specialist as referred and still has physiotherapy treatment. He has not had radiofrequency blocks to date.

PRESENT SYMPTOMS: He reports pain and stiffness in his thoracic spine, particularly in the scapular area on the left and reports pain in his lower back with lumbar stiffness, particularly in the right lumbosacral facet area with right buttock sciatica. He reports intermittent paresthesia extending to the whole of both feet, particularly after prolonged sitting. He has reduced sitting and standing tolerance of 5 to 10 minutes and a walking tolerance of 5 to 10 minutes and has great difficulty driving his manual car and generally, his wife acts as the chauffeur. He finds on a journey they have to frequently stop so he can stretch.

He has difficulty with personal care as noted above as well as his ADLs and has not been able to do any recreational fishing or boating. His back pain disturbs his sleep. He has developed neck pain and stiffness which he felt was secondary to his thoracolumbar pains with some right shoulder brachialgia and more recently, has developed intermittent paresthesia in his right hand. His son has bought him a companion dog, but he is unable to take the dog for any sustained walks.

EXAMINATION: examination on 17 September 2021 he was 5'10.5" tall and weighed 127kg.

There was stiffness of his lumbar segment with flexion decreased by one third with slow and jerky recovery with erector spinae muscle spasm with pain on back extension which was decreased by one half and lateral flexion was decreased by one half to the left and one third to the right. He indicated tenderness in the upper and lower lumbar spine as well as the lumbosacral facet joints more marked on the right and right buttock sciatica. He tended to sit on his left buttock and keep off his right buttock during the consultation due to buttock pain.

He indicated pain in the interscapular region of the thoracic spine more marked on the left with pain adjacent to the left scapula. Trunk rotation was decreased by one third to the left and one quarter to the right.

He had stiffness of his cervical spine with flexion decreased by one quarter and extension by one third associated with pain. Lateral rotation was decreased by one quarter bilaterally and lateral flexion by one third. He had difficulty elevating his shoulder due to interscapular pain. He had a full range of motion of his elbows, wrists, and hands. He reported some difficulty with sustained grip in his right hand and movement of his thumb and fingers was satisfactory. He reported intermittent paresthesia in the right hand.

He reported a tender area in the left parasternal region where he had the costochondritis injection previously and his chest expansion is only 2.5cm today and is associated with a cough. He reports he does get short of breath on occasion.

RADIOLOGICAL INVESTIGATIONS: His investigations include a CT of his chest and thoracic spine on 24 April 2018 which showed no chest wall abnormality. There was endplate osteophytic change in the midlevel of his thoracic spine.

MRI of the thoracolumbar spine on 25 May 2018 showed lateral curvature of the upper thoracic spine with degenerative endplate osteophytes, particularly in the middle levels but no abnormality of the thoracic cord. There were degenerative changes in the upper, mid, and lower costovertebral junctions with degenerative endplate osteophytes at the mid thoracic levels which showed partial fusion. There were no crush fractures seen. When he stood today, he tended to tilt to the right which is consistent with the lateral curve of his upper thoracic region.

The lumbar spine MRI showed annular tear of the L4/5 disc without protrusion and at L5/S1 a grade 1 spondylolisthesis with bilateral L5 pars defects and no gross foraminal narrowing.

Bone scan with SPECT/CT on 10 September 2018 showed degenerative disease in the upper lumbar spine and thoracic spine with some increased uptake at the right T12/L1 disc. There was a large osteophyte.

CT on 19 September 2018 showed a CT guided injection to the right L5 pars defect region of cortisone.

MRI of the lumbosacral spine on 22 January 2019 showed bilateral posterolateral annular disc fissures with tears of the discs and at L5/S1 there was grade 1 anterolisthesis without focal disc protrusion and there were no crush fractures.

MRI of the full spine on 12 December 2019 showed normal cord signal in the cervical spine and no acute or chronic inflammatory features and no high grade central canal stenosis and in the thoracic spine there were changes at the discs at T2/3 ad T6/7 levels without collection of abscess. There was ankylosis of the facet joints and partial intervertebral ankylosis from T7 to T11 associated with kyphosis.

In the lumbar spine there was ankylosis of the facet joints and ossification of the interspinous ligaments and intervertebral syndesmophytes and no current acute inflammatory features and no neural compression. There was bilateral ankylosis in the SI joints.

The appearances were consistent with ankylosing spondylitis with SIJ ankylosis, facet joint ankylosis, spinal ligament ossification, syndesmophyte formation, and intervertebral partial ankylosis with kyphosis and persisting inflammatory change from T2/3 and T6/7 in the thoracic spine consistent with inflammatory spondylo-discitis (Andersson lesion).

SUMMARY OF INJURIES AND DIAGNOSES: In summary, due the nature and conditions of his employ, the claimant developed pain in his thoracolumbar spine with radicular complaint with right buttock sciatica with the deemed date of injury being 23 February 2019.

His diagnoses are:

1. Stiffness of the thoracic spine with post traumatic osteophytosis and inflammatory changes, particularly at T2/3 and T6/7 which is consistent with his interscapular pain with dysmetria on trunk rotation.
2. Aggravation of previously asymptomatic lumbosacral spondylolisthesis with facet arthralgia and annular tears at L4/5 with bilateral sacroiliac joint arthrosis.
3. Chest injury with left sided costochondritis which required a cortisone injection which is associated with limited chest expansion and residual left parasternal pain. It is believed he has had spirometry performed which shows reduced lung volumes.
4. Impaction of his injuries on his activities of daily living including foot care;
5. Reliance on analgesia and anti-inflammatories.
6. Post-traumatic stress disorder with anxiety regarding his inability to do his job and his activities of daily living and persisting back pain, leading to mood changes and bouts of anger and ongoing depressive disorder regarding his back condition.

CAUSATION: The above conditions are causally related to the nature and conditions of his employ as a hydrographer with NSW Water.

FITNESS FOR WORK: He had to medically retire in February 2018 although he remains on the books for wages. He is unable to do the prolonged driving over rough roads as he did before, nor can he do the heavy lifting and carrying of hydrometric equipment, loading, and unloading his van and lifting the lead weights and all the manual tasks that are generally associated with his duties.

DOMESTIC ASSISTANCE: His wife does most of the household chores and acts as his chauffeur and his son does the yard work. His wife spends up to 3 hours a day doing the household duties. His son manages the 4.5 acres of yard for at least two hours a fortnight.

FUTURE TREATMENT: He requires ongoing analgesia and anti-inflammatories at a cost of $100 a month. Review by his GP each three months will cost $90 a visit and review by his physiotherapist as required will cost $90 a visit. He would benefit from hydrotherapy and the cost of a pool membership for 12 months would be $800. He would benefit from a lumbosacral binder at a cost of $120, a Merv Basset car seat at a cost of $90 when travelling in a motor vehicle and a lumbar support cushion for use at home at a cost of $60 and a wheat pack for local heat application at a cost of $30. He would benefit from an infra-red massage unit at a cost of $200.

Operative intervention is not recommended as there is a risk of infection. Normally, some stabilisation of the lower lumbar segment at L4/5 where he has annular tears and L5/S1 spondylolisthesis would be indicated, but it is not feasible in the presence of previous spinal infections, which makes such surgery risky.

Review by the pain specialist would cost $250 as referred and by his spinal specialist $250 as referred. The pain specialist was talking about radiofrequency blocks which cost $1000 a time but again, these would have to be done with antibiotic cover. His former facet blocks did not give sustained benefit.

CONSISTENCY OF PRESENTATION. He was consistent in presentation.

PROGNOSIS: His prognosis for returning to work as a supervising hydrographer remains guarded. The outline of his duties above are beyond him, with his current back condition and now, people doing such work, work as two-man teams and not one-man units as there is too much lifting and carrying, loading and unloading and working on remote sites and driving on uneven roads, dragging heavy equipment through shrubbery and down riverbanks to be able to manage such duties in the foreseeable future. He is essentially medically retired from work. His ability to return to manual work is poor.

STABILISATION: His condition has stabilized in that there has been no significant change in the last three months and no significant improvement by more than 3% is expected in the next twelve months.

SPECIFIC QUESTIONS: In answer to specific questions on the date of examination via Zoom was.

His general and clinical history, examination findings and conclusions are in the above report, as well as the history and nature of his employ and the diagnoses and causation. Although he did have an L5/S1 spondylolisthesis, this was asymptomatic at the time. The nature and conditions of his employment is a substantial contributing factor to the aggravation, acceleration, and deterioration of that condition.

HIs symptoms in the upper limbs may be related to his employ but there has been no established causal relationship for his neck condition and his shoulder brachialgia appears to be related to his interscapular pain.
There is no evidence in his spinal imaging to suggest any urinary dysfunction as causally related to his back injury but a cystometrogram may provide some assistance regarding his bladder function and review by a urologist to examine his prostate would be advisable.

His condition has resulted in impairment, and this is permanent.

His condition has stabilized, and no further improvement is expected.

1. Aggravation of pre-existing L5/S1 spondylolisthesis
2. Thoracic chondritis at costo-chondral junction requiring cortisone injection
3. Ankylosing spondylitis with inflammatory spondylo-discitis (T3 and T6/7) thoracic spine consistent with Anderson Lesion
4. Thoracic osteomyelitis after Marcaine injection to the back requiring anti-biotics for two months with PIC line.

Assessment of Whole Person Impairment:
This claimant's whole person impairment for his thoracic spine where he has post traumatic stiffness with dysmetria on trunk rotation is from Table 15-4, page 389, AMA V, DRE Category II 5% whole person impairment.

That for the lumbar spine where he has post traumatic stiffness with dysmetria, facet arthralgia and radicular complaint with buttock sciatica is from Table 15-3, Page 384, AMA V, DRE Category II, plus impaction on his activities of daily living including self-care, is 8% whole person impairment less one-tenth for pre-existing lumbar spondylosis, giving 7% whole person impairment.

This gives a total from the Combined Values Chart of 12% whole person impairment.

Because of his symptomatic costochondritis and because of his diminished chest expansion and because of the pain where he required the cortisone injection and his rib injury due to the heavy weight at work, it is believed he should have spirometry performed to gauge his vital capacity and forced expiratory volumes (FEV1) to provide a rating for his chest.
He also has post-traumatic stress disorder which could be rated by a consultant psychiatrist or neuropsychologist.
He has reached maximum medical improvement.

Banana skins and Swiss cheese.

No modality of medical management is perfect. Humans are fallible. When medical errors and mis-judgements align, the situation resembles a tunnel formed through the alignment of holes in overlapping slices of swiss cheese, allowing patients to fall through into the underlying boiling vat of avoidable morbidity, mortality and legal pursuit.

100% success is expected from doctors in a work environment littered with discarded virtual banana skins. A mistake with the 101st patient can be likened to the unanticipated painful landing on the backside after slipping on such an unexpected banana skin.

A single medical mistake is generally correctible, but it takes the concerted efforts of multiple serial mistakes to seriously damage or kill a person.

Case 1

The subject of this cautionary tale was a man in his 50s, who (presumably) having mis-spent much of his youth on the beach, rather than studying medicine or the law, developed what is colloquially termed *actinopathic skin*. Severe sun damage resulted in the continued formation of skin cancers and pre-cancerous keratoses, necessitating regular visits to his dermatologist for treatment.

Familiarity, sometimes breeding complacency, his dermatologist designated a lesion on the forehead as an area of sebaceous hyperplasia (a benign condition), needing no specific treatment. It was noted at a visit a few months later to have changed appearance. Since a benign diagnosis–erroneous in retrospect- was lodged in the brains of both patient and doctor, nothing further was done to that lesion, besides noting its continued presence. The abnormality was not sampled for pathology during the next 16 months, while various other adjacent skin cancers were expunged by a variety of means.

A sample of the stubbornly persisting lesion was finally taken16 months after its initial discovery, submitted to pathology and reported as a squamous cell carcinoma (SCC), one of the common skin cancer types resulting from sun damage.

The dermatologist, with no specialist surgical training, attempted to excise the cancer 2 months later, and that excision was reported as incomplete. The pathologist noted that *there was no perineural invasion by the tumour*.

The patient was then referred to a specialist plastic surgeon who fully excised the remaining cancer, 2 years after it was initially observed by the patient and noted by the dermatologist.

The examining pathologist reported that the cancer had by that time grown through the skin into underlying tissues, but was totally removed and added the (reassuring) comment that *there was no perineural invasion or invasion into blood vessels by the tumour.*

Squamous cell carcinomas, when confined to the skin almost never spread further and with complete removal a near 100% cure rate is achievable. Once through skin into underlying tissues, metastasis to regional lymph nodes does occur and growth around nerves (PNI) within subcutaneous tissues is indicative of an increased likelihood of such spread.

Upon my review (requested after the start of legal proceedings) extensive PNI was detected in both the initial incomplete and subsequent complete excisions. PNI may be difficult to spot in the standard haematoxylin and eosin stained histological sections. Easily available special staining techniques differentially colouring nerve and surrounding tumour, as shown in figures 1 and 2, will highlight such occurrences to allow their easy detection. Such staining should (arguably) be routinely undertaken with deeply infiltrating SCC, but was not done in this instance.

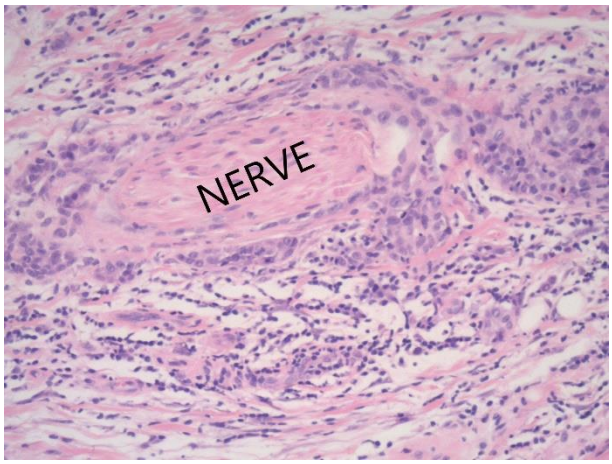


Figure 1
Nerve surrounded by cancer cells

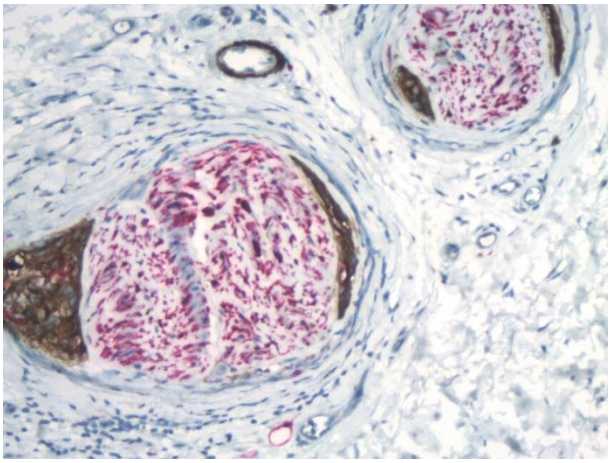


Figure 2
Immune staining from a different case showing nerve: red - cancer cells: brown

Four and a half years after the excision of the forehead cancer, (more than six years after initial presentation), the actinopathic man developed a lump in his neck in close proximity to the removed cancer. The lump, together with numerous other lymph nodes and surrounding tissues was removed and diagnosed as containing the same type of cancer as the forehead. However, the pathologist opined that since there was no evidence of perineural or blood vessel invasion by the initial tumour, the current metastatic cancer most likely originated from somewhere in the nose or throat. The patient's nose and throat were extensively examined by learned practitioners, but no primary cancer was detected.

Tumours grow through cell division: one cell becomes two, two cells divide into four and so on. The time period of tumour cell division is variable but can take up to 90-100 days for each division cycle to occur. Working backwards, it becomes apparent that the metastatic tumour excised from the neck, containing millions of tumour cells, must have originated from a handful of cells present in that lymph node at the time of the forehead excision. There are no diagnostic modes of detecting a very small number of cancer cells, but they could have been prophylactically removed through surgery or radiotherapy at the time of excision of the primary tumour, thereby preventing further progression and spread of the disease.

To the author's knowledge, the patient survived, albeit with the continuing morbidity consequent on disfiguring neck surgery.

Case 2

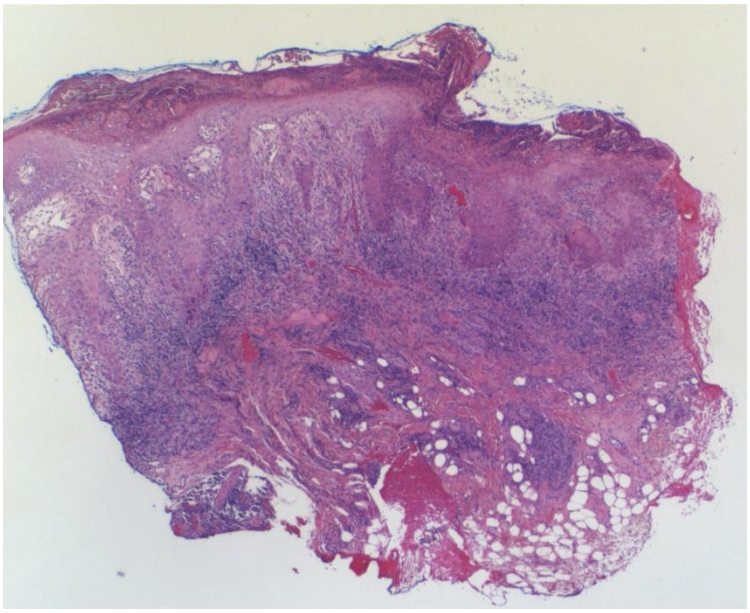


Figure 3
Low power view of histological section of lower lip biopsy. Line around invasive SCC

Another 50 years old actinopathic man with numerous previous sun induced skin cancers affecting his face presented to his doctor with a lip lesion diagnosed as cancer and subsequently fully excised. Two years later, he presented with another lesion on the lip, which was sampled and reported by the pathologist as showing a non-specific ulcer *with no features of malignancy*.

On my examination of that sample (after the start of legal proceedings), I diagnosed the clear-cut features of a well differentiated tissue invasive SCC as shown in figures 3 and 4.

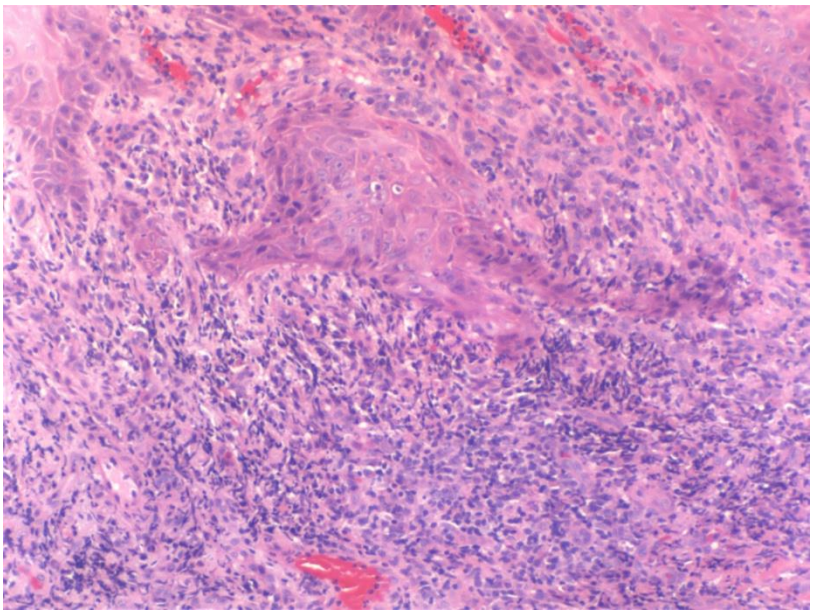


Figure 4.
Higher magnification of invasive cancer seen in figure 3 SCC circled

SCCs of the lip and lower limbs often grow with an extremely well differentiated pattern and a high index of suspicion by the reporting pathologist is required in interpreting the appearances.

The lip ulcer (labelled as *benign* by pathology) was treated topically for a further 18 months with no discernible improvement and at that time it was decided to excise the ulcer and surrounding tissues through the operation of vermilionectomy.

The pathology of the excised ulcer showed the unequivocal features of cancer, which progressed during the 18 months to extend through skin and infiltrate, lip muscle. The carcinoma was excised with a 0.7mm margin of uninvolved tissue. Although, there exist no generally agreed upon guidelines as to what constitutes an adequate excision margin[1,2,3], based on my personal experience, the 0.7mm excision margin was uncomfortably close to the cancer which had to be regarded as being at an advanced (muscle invasive) stage of its natural evolution.

The WHO Classification of Head and Neck Tumours[4] states

> Conventional OSCC [oral squamous cell cancer] is aggressive, with a propensity for local invasion and early lymph node metastasis……. Conventional histological grading corresponds poorly with clinical outcomes. Histological risk factors associated with a worse prognosis include a non cohesive pattern of invasion, perineural and lymphovascular invasion bone invasion and thickness >4mm. Margins from the resection specimen predict local control better than margins from the tumour bed.

8 months after the vermilionectomy, the patient presented with a swelling under the lower jaw. This was diagnosed as an infected tooth abscess and a range of treatments for that condition were undertaken until 17 months after vermilionectomy, when the lump was excised and found that rather than being an abscess, it contained metastatic cancer from the lip. A further 7 months later, an enlarged groin lymph node was discovered, palpated, looked at, pondered at, subjected to fine needle aspiration (which yielded no diagnosis) and eventually excised, only to discover that it also contained squamous cell carcinoma, metastatic from the lip or neck lymph node deposits. Body scans undertaken at that time revealed numerous other foci of metastatic cancer at a wide range of anatomical locations, indicating that the patient's condition was terminal.

#1 Delayed diagnosis resulting in delayed treatment of potentially curable disease

For case 1, the delay could be termed as failing to *spot the canary among the sparrows*, missing the one lesion among numerous others which were adequately dealt with and failing to critically evaluate that diagnosis for an unreasonably long time.

In Case 2, there was an incorrect pathology report creating a false clinical impression, lulling the physician into complacency. The clinician erred through absent critical thinking and self questioning for the unreasonably long 18 months delay in initiating appropriate treatment.

#2 The biological resilience of humans

Billions of years of evolution have made human beings tough and resilient organisms and many minor ills can be managed by almost anyone after a few hours' training. The object of long years of specialist medical training is to spot and apply highly skilled methods to the small number of difficult cases irregularly scattered among the easy *routine* cases. .

It is important to *know what one does not know.*

Both of these cancers were surgical cases managed by doctors without specialist surgical training.

In both instances, the initial excisions were too limited and did not achieve adequate clearance of the cancers. The predictive significance of the more aggressive behaviour of cancers on the lip was not considered.

#3 Post-surgical management which proved inadequate in retrospect

Regional lymph node sampling and radiotherapy were not undertaken in either instance

THE ALIGNED *SWISS-CHEESE HOLES*:

A combination of:

- **missed and therefore delayed cancer diagnosis**
- **lack of critical self-questioning during continuing case management over extended periods of time**
- **treatment by doctors lacking specialist training in the relevant area of practice**
- **mis-diagnosis by specialist pathologists**

Conflicts of interest and acknowledgements:

These cases were derived from the author's medico-legal consultancy files and were commissioned and remunerated by the requesting legal practitioners.

The author wishes to thank and acknowledge Dr Arthur Fischer for helpful suggestions in the drafting of this manuscript.

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TOULOUSE -LAUTREC AND MEDICINE: A TRIUMPH OVER INFIRMITY

Many well-known authorities wrote or painted their homage to their treating physician. So was Erasmus of Rotterdam, who wrote an ”Oration in praise of medicine”, so did the Francesco Goya who painted his physician (see the first volume of this Annals).
One of the most successful painters of the post-Impressionist's style Henri , was suffering from Multiple morbidities, described by this author as the **“Toulouse-Lautrec Syndrome”.**

His most obvious association with medicine is through his bone disease Pycnodysostosis, from the Greek *puknos* (dense), *dys* (defective), and *ostosis* (condition of bone), – a hereditary autosomal recessive dysplasia due to a cathepsin K enzyme deficiency in osteoclasts , reducing the normal bone resorption , leading to bone quality deterioration and to fragility.

In Henri's case, the symptoms were: a short stature (151-cm), short legs; a large head with unfused fontanelle, short mandible, dental deformities, a large tongue, thick lips, profuse salivation, sinus obstruction, post-nasal drip. Fractures of the long bones during childhood, later of the clavicle, hearing problems. Complicated with syphilis (contracted on first night in Paris); Wernicke -Korsakov alcoholism and psychosis and tuberculosis to complete the
diagnosis of *pycnodysostosis*.

Count Henri Marie Raymond de Toulouse-Lautrec-Monfa was a descendent of two aristocratic families dating back to the Crusades, had lived for centuries in the southern regions of France, frequently intermarrying. Henry's grandmothers were sisters, and his parents were therefore first cousins.

Henri painted gratitude to three of his physicians:

1. Dr. Henri Bourges ,Carnegie Museum of Art, Pittsburgh;

2. Dr. Gabriel Tapie de Celeyran Musée Toulouse-Lautrec Albi and

3. “Un Examen à la Faculté de Médecine de Paris” in 1901, with the candidate Dr. Gabriel Tapie de Celeyran his friend, sitting in front of two examiners. (Please note the arthritic hands).