MEDICAL MALPRACTICE

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DOES THE STANDARD OF CARE REQUIRE A "WORST IS FIRST" APPROACH TO DIAGNOSIS?

Often medical malpractice lawsuits allege negligence related to making a diagnosis. In these cases, a central issue in determining if the physician or nurse has met the standard of care in making the diagnosis is whether or not she is required to adopt a "worst is first" approach. Is the physician obligated to rule out the most urgent and life-threatening conditions, even if they are statistically unlikely, before arriving at more common and benign diagnoses? Or, as defence counsel often argue, does diagnosing based primarily on probabilities meet the standard of care?

This very issue came up in two trials I was involved in last year, *Brodeur v. Provincial Health Services Authority*, 2016 BCSC 968 and *Pinch (Guardian ad litem of) v. Morwood*, 2016 BCSC 75. Interestingly, Justice Sharma in *Brodeur* stopped shy of finding that the standard of care required a physician to utilize a "worst is first" approach to diagnosis saying,

> It is not appropriate for me to make a finding — in general — about the wisdom of a diagnostic approach (para.163).

At the same time, Justice Dillon in *Pinch*, had no qualms about adopting caselaw that unequivocally stipulates that physicians are required to comply with a "worst is first" rule:

> The process is to give priority to the diagnosis with the most severe outcome, a "worst is first" approach (*Briante* at para. 271). A process of diagnosis that focuses on the most likely explanation is inconsistent with a proper differential diagnosis (*Campbell* at para. 100) (para. 155).

I will argue that the standard of care does indeed require a physician to comply with the "worst is first" rule when exercising judgment with respect to diagnosis. Any other approach is fraught with risks endangering patient safety and exposes a physician to the possibility of being found negligent at trial or by his or her peers in a professional standards review.

DIFFERENTIAL DIAGNOSIS - THE DIAGNOSTIC PROCESS

According to the CMPA "The Good Practices Guide", the process of coming up with a diagnosis for a patient involves the following steps[1]:

1. Taking an appropriate history of symptoms,
2. Performing a physical examination,
3. Creating a list of possible causes of the symptoms, i.e. the differential diagnosis, giving consideration to worst case scenarios,
4. If necessary, ordering the relevant tests to narrow down the possibilities,
5. Making a final diagnosis, or referring to a specialist, if needed.

Differential diagnosis, therefore, involves considering both the worst possible cause of a patient's symptoms and identifying those causes that are most likely.

DIAGNOSING BASED ON PROBABILITIES – HORSES OR ZEBRAS?

"When you hear hoof beats, look for horses, not zebras". Most physicians learn this saying while still in medical school, and the rule of basic probability throughout their careers reinforces it: most patients they will diagnose throughout their careers will suffer from the most common conditions. Unfortunately, this mindset can result in a missed or delayed diagnosis of a serious medical condition as most serious medical problems share similar symptoms, at least initially, with more common and more benign medical conditions.

Defence counsel routinely argue that an approach to diagnosis based on probabilities is entirely appropriate and that any failure to consider less likely, or extremely unlikely, but more severe explanations of the patients' symptoms amounts to nothing more than "error in judgment", which of course does not attract any liability.

However, errors and omissions resulting from an exercise of clinical judgment are "actionable if the acts or omissions in the course of exercising the judgment fall below the proper standard of care" (*Smith et al v. Grace et al*, 2004 BCSC 395, para. 7).

A review of caselaw demonstrates that the courts' decisions hinge on factually driven analyses: to fully exercise judgment, the physician must obtain all available information and order

all the necessary tests. He or she then must take everything into account when coming up with a list of possible explanations for a patient's symptoms. The list has to include the most serious causes as well as the causes that are most likely. Treatable causes that have serious consequences to the patient if left untreated must be prioritized and either ruled in or ruled out at the earliest opportunity.

REVIEW OF CASE LAW

Brodeur and Cases Relied on therein

In *Brodeur v. Provincial Health Services Authority,* supra, the infant plaintiff Tianna Brodeur was brain-injured during her birth when her mother's uterus ruptured. Uterine rupture is a rare but known complication in women undergoing a vaginal birth after a cesearean section ("VBAC"). It is a serious emergency as the medical team only has ten minutes to organize and carry out a C-section delivery before permanent brain injury or death occurs. Early symptoms of uterine rupture include severe abdominal pain, excessive bleeding, irregular contractions and rapid pulse, which, of course, closely resemble normal labor with no or insufficient analgesia.

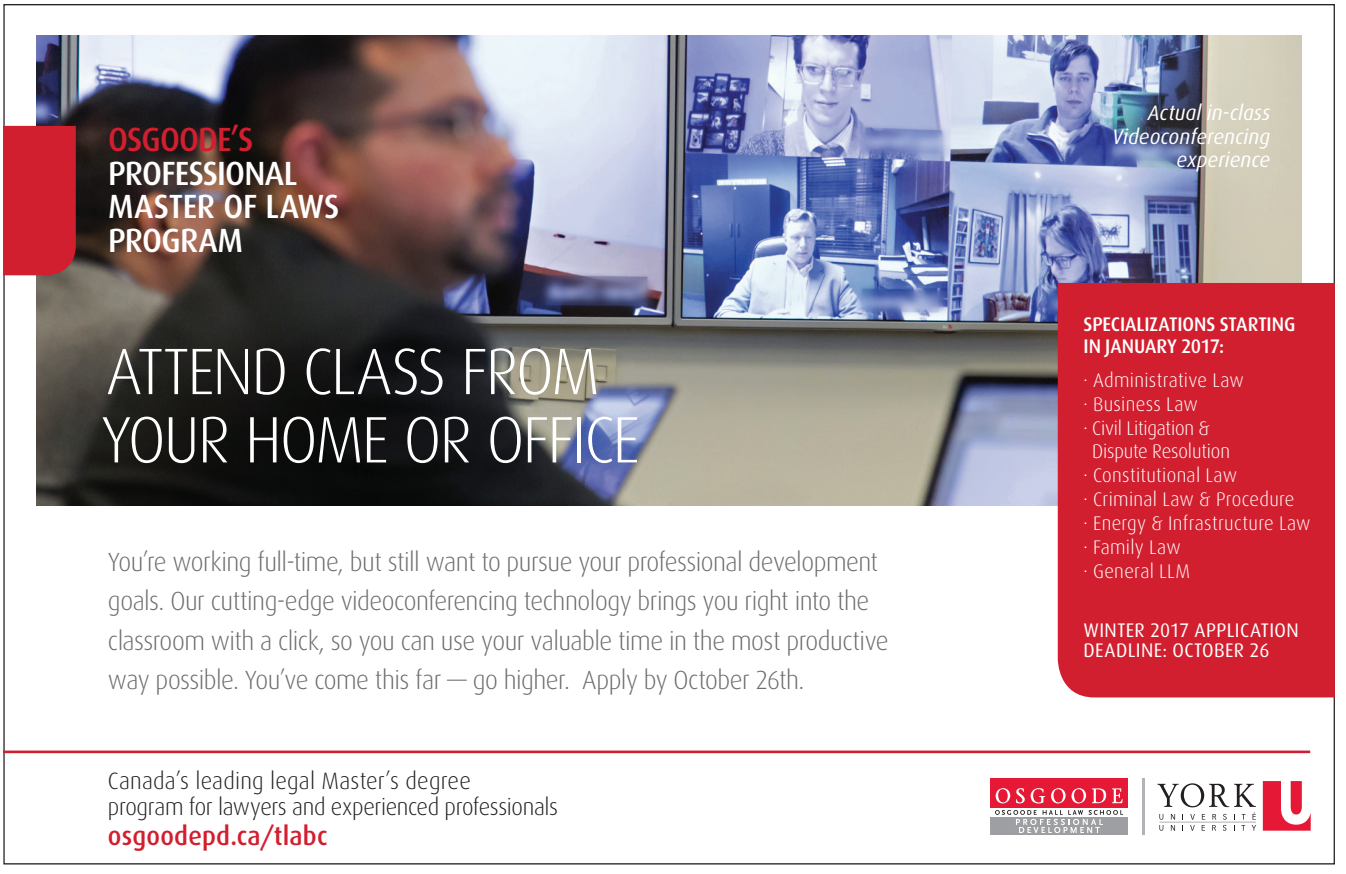
At trial, the plaintiff's case was that the physicians ought to have treated the symptoms based on a "worst is first" approach and ought to have assumed it was a uterine rupture until it was ruled out. The defence argued that uterine rupture is very rare (a risk of only 1 in 200) and that physicians do and should continue to diagnose based on probabilities.

While Justice Sharma refrained from finding that the standard of care required a "worst is first" approach, she did find it was consistent with the case law I will examine below.

In *Paniccia Estate v. Toal*, 2011 ABQB 326, the deceased patient saw his family physician six times during a period of a year and a half, complaining of stomach pain. After ordering a barium swallow x-ray, the physician anchored on the most probable diagnosis of gastritis before ruling out stomach cancer, another possible but less likely cause. By the time the unimproved patient was referred to a gastroenterologist who conducted the proper tests and made the correct diagnosis, it was too late for effective treatment. At paragraph 40, the court said the following (emphasis mine),

> *A key feature of the differential diagnosis process is the elimination of the most serious ailments first, rather than the most probable (referred to as the "worst first principle"). Choosing a diagnostic process based on probability rather than severity is fundamentally flawed and negligent…* Failing to consider the worst first principle and then failing to carry out appropriate tests to confirm or eliminate the worst of the potential diagnoses is not a mere error of judgment but, rather, a breach in the standard of care…

Justice Sharma then relied on another VBAC case, *Guerineau v.*



Dr. Seger et al, 2001 BCSC 291. The attendant nurses attributed the mother's reported symptoms of burning pain to normal labour instead of uterine rupture, and they did not properly investigate abnormalities in the fetal monitoring strip. The defence argued that identified failures were simply errors of clinical judgment. The court dismissed the defence's position and stated at para. 84 (emphasis mine):

> I entirely reject the defendant nurses' submission that their failure to properly interpret the fetal heart monitor strip was simply a matter of differing clinical judgment. While it may be that various nurses would have differing interpretations of the strip and might have attributed the decreased variability and poor pick-up to the earlier narcotics administered and the mother's restlessness and distress—it behooved Nurse Skidmore, the primary treating nurse in this case…, to follow up the matter and pursue continued fetal monitoring in an effort to obtain clear reassuring evidence of the fetus' wellbeing, thus ruling out any danger to the mother and baby. This is all the more so in the case of Nurse Ha, the much more senior experienced nurse. *In effect both nurses short-circuited the process of differential diagnosis, immediately accepting the simplest explanation of the decreased variability (i.e. narcotics) without clearly ruling out the perhaps less likely, but much more dangerous possibility of uterine rupture*.

Justice Sharma further relied on another VBAC case, *Strachan v. Reynolds et al.*, [2004] BCJ No 1418 (QL); [2004] BCTC 915; 132 ACWS (3d) 589 where both the attending nurse and the physician failed to recognize the signs and symptoms of impending uterine rupture. In their view, the unrelenting abdominal pain was consistent with normal labor, and given how small the risk of uterine rupture is, they treated the plaintiff as any other patient. In this case, the court rejected the defence counsel's submission that the physician's failure should be attributed to an error in judgment, saying at para. 492,

> The exercise of clinical judgment requires consideration of all of the relevant facts and possibilities. And above all it must include thinking specifically about the relevant possibilities, particularly the most serious explanation, here, that of a developing uterine rupture; and the conducting of a critical investigation of that possibility and whether it could be excluded.

Further, the court agreed with plaintiff's position that in the context of a laboring VBAC patient, persistent abdominal pain that is unrelenting in between contractions "must be taken as a sign of womb separation … unless and until the physician is able to exclude a developing uterine rupture as the cause of the pain".

Lastly, at para. 540, the court again rejected the approach advocated for by the defence that it was appropriate for the physician to consider the benign and more likely causes in the context of a possible unlikely cause which carried severe consequences and was extremely time sensitive with respect to treatment,

> This appears to be another distinguishing feature of the position taken by the defence experts to the effect that there are a number of benign causes of abdominal pain, and they should be considered when the patient is medically assessed. Again, it ignores the time element. The fact that there are many causes for abdominal pain in pregnancy, should bring no comfort to the defence. That patient was a VBAC patient. The patient was experiencing constant abdominal pain for over 40 minutes. Constant abdominal pain is a known sign of uterine rupture. The circumstances required Dr. Reynolds to deal with the situation immediately by bringing in a specialist, an obstetrician. … It would be pointless, and very dangerous, to start considering benign causes. …The causes are irrelevant unless in the short timeframe available for any kind of medical assessment, it is found that one of the benign causes is in fact the cause, thus excluding developing uterine rupture as the cause.

Pinch and the Case Law relied on therein

In *Pinch*, supra, the mother of the infant plaintiff, Natasha Pinch suffered an eclamptic seizure while home alone, resulting in a devastating brain injury in her daughter, Rebecca. Two days earlier, Ms. Pinch presented at the emergency department of the Powell River General Hospital at 5:15 am complaining of pain in her neck. Prior to seeing the defendant physician, she saw the nurse who did not take and chart Ms. Pinch's blood pressure.

In his work-up, the defendant physician relied on the verbal report of Nurse Barcelonne that all vital signs were normal. He did not notice that the nurse had not recorded the blood pressure, and did not ask Ms. Pinch if pain radiated into the head. He did not measure the blood pressure himself, or order a readily available proteinuria test to rule in or out pre-eclampsia, a condition commonly seen in pregnancy. Essentially, he conducted his differential diagnosis as if a non-pregnant patient presented in the emergency room with neck pain.

The court's analysis centered on the adequacy of the physician's assessment. The central questions were: did he take an appropriate history, did he ask the correct questions about radiation of pain to elicit useful diagnostic information, and did he consider all diagnostic possibilities? Justice Dillon found that the physician did not meet the standard of care.

> He all too quickly took the pregnancy out of the equation and *focused on the most likely explanation, the patient's report of neck pain*. He did not make use of all information that was reasonably available because he did not review the nursing assessment and did not notice that Barcelonne had not recorded a blood pressure on the chart. His failure to look at all of the information that was available to him, combined with his failure to take an adequate history, takes his failure to diagnose preeclampsia beyond an error of judgment.

In *Briante v. Vancouver Island Health Authority*, 2014 BCSC 1511, the plaintiff's family took him to the psychiatric emergency department because they were concerned about his delusional behavior. The family tried to provide a history to the psychiatric nurse who told them that she already got a history from the plaintiff. The nurse asked the patient for a urine sample but the vial was returned full of water. She did not follow up on it despite the patient's history of drug use.

The physician who saw the plaintiff relied on the nursing history and did not obtain any additional information from the patient. The plaintiff was sent home and later slit his throat and suffered a severe brain injury.

The court found that the nurse failed to meet the standard of care by failing to gather information from the plaintiff's family and ignoring a faked urine sample. With respect to the care provided by the physician, the court found that the doctor failed to obtain a complete history and relied on the nurse's history when she knew it was incomplete, thereby depriving herself of the opportunity to consider more serious diagnoses in her differential. At paragraph 271, Justice Bracken stated (emphasis mine),

> The doctor also has a duty to diagnose, using the information obtained in the assessment; in doing so, the doctor should produce a differential diagnosis. As explained in *Matthews Estate v. Hamilton Civic Hospitals (Hamilton General Division)*, [2008] O.J. No. 3972 (Sup. Ct. J.), the process of making a differential diagnosis *"requires a specific consideration of the severity of the outcome of the possible diagnoses and giving priority to the diagnosis with the most severe outcome"* (para. 124); see also *Adair Estate v. Hamilton Health Sciences Corp.*, [2005] O.J. No. 2180 (Sup. Ct. J.), endorsing this "worst first" approach to differential diagnosis: *Scott v. Mohan*, [1993] A.J. No. 592 (Q.B.); *Zazelenchuk v. Kumleben*, 2007 ABQB 650 at para. 145; and Paniccia Estate v. Toal, 2011 ABQB 326.

In *Campbell v. Roberts*, 2014 ONSC 5922, the failure to meet the standard of care was a direct consequence of a failure to apply the "worst is first" principle during a differential diagnosis. The plaintiff suffered from a rare genetic condition (known to the treating ER physician) that can cause abnormal blood vessel formations and place a person at a higher risk of brain abscesses. He presented at emergency complaining of headaches, cough, fatigue, and low fever. After some lab tests, chest x-rays and a CT-scan without contrast the physician diagnosed him with "community acquired pneumonia" and sent the patient home with a 10-day course of antibiotics.

The patient returned seven days later with vision loss and finally a CT-scan with contrast was done, identifying lesions in the brain and lungs. The physician listed tumors, infections and arteriovenous malformations (AVMs) as differentials for the lung lesions and either infarction or metastatic cancer as differentials for the brain. The physician then diagnosed the plaintiff with metastatic cancer. During the plaintiff's prolonged stay at the

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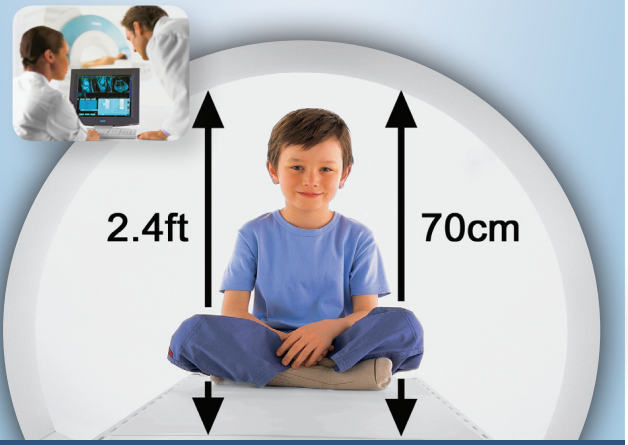

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hospital, the physician did not consider the possibility of a brain abscess (infection), despite the plaintiff improving when placed on antibiotics. Only after a litany of tests including biopsies, all of which failed to confirm malignancy, did the physician think to consult an infectious disease specialist who informed him that the plaintiff's hereditary condition made him particularly prone to brain abscesses. The diagnosis was confirmed and IV antibiotics initiated; however, by this time treatment was too late and the plaintiff was left with significant cognitive defects.

The Court laid out the general principles with respect to standard of care when diagnosing a patient at para. 100 (a) – (j), of which I have reproduced only the most pertinent subsection:

> (f) Using the process of differential diagnosis, a physician is required to identify the potential causes of a condition, and then through a systemic comparison and contrast of clinical findings eliminate the most serious potential causes first.[9] *Adair Estate v. Hamilton Health Sciences Corp*., 2005 CanLII 18846 (ON SC), [2005]O.J. No. 2180 (Sup. Ct.)(QL) at para. 116. *A process of diagnosis that focuses on the most likely explanation is inconsistent with a proper differential diagnosis*.[10] *Ibid* at para. 153. Focusing on one diagnosis, to the exclusion of all others, without constant reassessment and reconsideration may be negligent.[11] However, a physician must not be held to a standard of practice in which he or she is always anticipating a worst case (but most unlikely) scenario;

The court found the physician negligent because he focused on the most likely cause of the plaintiff's condition. The court said the following at paras. 226-227 (emphasis mine),

> I find that Dr. Roberts *ignored one of the key features of differential diagnosis in that he did not eliminate the most serious possibility first*, but rather he was bent on eliminating the most probable. As per the text *Legal Liability of Doctors and Hospitals in Canada*, "[I]f doctors were to diagnose based on probability, rare and severe ailments would regularly be ignored…."

In *Williams v. Bowler* [2005] OJ No 3323 (QL); [2005] OTC 680, another case considered by Justice Dillon in *Pinch*, the plaintiff presented at her physician's office complaining of headaches after hitting her head on a cement pillar in a bar a week before, and after several more visits was admitted to the hospital for assessment. The physician carried out a lumbar puncture which demonstrated possible increased breakdown of red blood cells in the cerebrospinal fluid. The most common cause of this is head trauma, but in 30% of cases the cause is associated with spontaneous bleeds, such as a ruptured aneurysm.

The physician concluded that the cause of the plaintiff's complaints of headache was resolving viral meningitis and that the presence of red blood cells in the CSF was caused by a head injury sustained in the week prior and discharged her home. A week later, the plaintiff suffered a major hemorrhage due to a ruptured aneurysm.

The court was critical of the defendant physician for anchoring his diagnosis of head trauma through a conversation with the patient and failing to consider and rule out, through a specialist consultation, other possible causes of the plaintiff's symptoms. The court said the following on the topic of differential diagnosis at paras. 237-238,

> In exercising sufficient care and skill in making a diagnosis, the physician should avail himself of available resources, including up-to-date texts, articles and works in that particular field. This is especially important where a doctor makes a differential diagnosis. As noted by Quijano J. in *Hughes v.Cooper Estate*, there is an absolute need for the physician to ensure that sufficient tests and detailed investigations have been conducted before ruling out one disease over another.

Zazelenchuk v. Kumleben, 2007 ABQB 650, is another case that plainly states the need for a "worst is first" approach. The plaintiff presented at the hospital clutching his chest, hyperventilating and sweating. He did not complain of any chest pain and, on that basis, was diagnosed with acute anxiety. The next day he suffered a massive heart attack while on observation at the hospital.

Virtually all experts (defence and plaintiff) testified that the diagnostic approach required the application of the "worst is first" principle. The court stated the following at para. 144,

> The Plaintiff's expert opinions also took into account the "worst first" principle. This principle was accepted by all of the physicians who testified, and has been accepted as a feature of the standard of care in the process of arriving at a diagnosis: *Adair (Litigation administrator of) v. Hamilton Health Sciences Corp.,*2005 CanLII 18846 (ON SC), [2005] O.J. No. 2180 (S.C.J.). There was no satisfactory explanation from Dr. Webb or Dr. Kumleben as to why the worst diagnosis, ACS, was not excluded on the basis of standard and easily available tests, before a diagnosis of anxiety was accepted.

CONCLUSION

Defence counsel's routine argument that diagnosing based on probabilities constitutes a reasonable exercise of judgement is supported by little else than misguided cognitive biases. Most physicians would agree and the relevant case law firmly states that the standard of care requires physicians to employ a "worst is first" approach when conducting a differential diagnosis. Repeatedly and consistently, the courts have found that failure to consider and rule out the most serious possible causes of a set of symptoms before diagnosing a more probable and benign cause is a basis for the finding of negligence. V

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