

Injury cases are often won or lost on the quality of medical evidence. Magnetic Resonance Imaging is considered the gold standard for the diagnostic imaging of many injuries and conditions. That said, courts have begun calling attention to the shortcomings of older MRI technology. These deficiencies include low resolution, poor image quality and clarity, and the presence of artifacts. These problems are exacerbated when patients have difficulty undertaking the scanning process due to physical (such as size) or psychological constraints (sensitivity to noise or claustrophobia) relative to the scanning environment.

Even in the civil arena where the burden of proof is relatively low, a single piece of medical evidence that is not as accurate or as reliable as possible can result in loss of hundreds of thousands of dollars in damages for a patient/client. It is incumbent on doctors and

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lawyers to take advantage of the best available technology in advancing their client’s recovery. This memorandum explores how the use of outdated technology has compromised plaintiff and patient interests. Due to the relatively lower number of injury cases that settle in administrative tribunal settings compared to the

civil court setting, there is a significant amount of quasi-judicial obiter on the utility of higher resolution imaging technology.

### IMAGING QUALITY AND CLARITY

Image quality and clarity arises in the courtroom as a means of challenging the correctness of a diagnosis and the presence of an injury. Plaintiffs can be limited in establishing the extent of an injury due to the power of an old MRI machine. Higher quality MRI images have been a material factor in the reasons behind the decisions of courts and administrative tribunals. For example, the 2010 British Columbia Supreme Court case of *Eggleston v Watson* noted the inability of conventional MRI scanners to image mild traumatic brain injuries. In this case, accepted expert medical evidence used at trial explained:

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<sup>1</sup> 2010 BCSC 890

<sup>2</sup> 2014 ONWSIAT 121, para 62.

<sup>3</sup> 2014 CarswellOnt 11605, para 45

<sup>4</sup> 2014 ONWSIAT 1117, para 30.

“The absence of MRI changes on [the scan] does not preclude the presence of an underlying mild traumatic brain injury as the changes are often beyond the resolution capabilities of the scanner. There are much higher powered scanners available of up to three Tesla that may well go on to show such changes.”<sup>1</sup>

The negative effect of poor quality MRI images is further exemplified in a 2014 Ontario Workplace Safety and Insurance Tribunal decision where a doctor requisitioned a higher quality MRI on account of the first being of poor quality. In summing up, the adjudicator held that the correct diagnosis was compromised by the first MRI scan, and allowed the appeal upon the evidence from the second, higher quality MRI.<sup>2</sup>

*“Dr. G also found that the MRI of February 23, 2012 was a “poorly optimized study for assessment of the labrum” and requisitioned a higher quality MRI scan of the worker shoulder. The newer MRI scan confirmed the injury to the worker shoulder.*

*[...]*

*Although the extent of the injury was not immediately diagnosed and the correct diagnosis was compromised by an unsatisfactory MRI scan the worker’s description of his symptoms from the time of the accident were consistent with the injury that was eventually diagnosed and surgically repaired by Dr. G.*

Higher resolution imaging offers enhanced clarity and certainty of diagnosis. This is essential for any plaintiff as high quality MRI scans can better show evidence of the patient’s injuries and can help prevent the risk of poor quality or unclear medical images being rendered irrelevant or inadmissible at trial.

Clarity and certainty are important not only for the scan, but for patient wellbeing. In a 2014 Ontario Workplace Safety and Insurance Appeals Tribunal decision, two doctors gave a single patient two differing diagnoses based off the same conventional MRI reading, which had a negative emotional effect and frightened the patient as to the possibility of having suffered a stroke.<sup>3</sup> Another ONWSIAT decision from 2014 was vexed due to the uncertainty of whether an MRI showed a defect of the patient’s artery or was simply a poor quality image.<sup>4</sup>

## SMALL BLEEDS AND TEARS

It is essential for a plaintiff to understand the full extent of their injuries. The inability to note small brain strokes and bleeds is a major shortcoming of conventional MRI.<sup>5</sup> For example, in the 2002 British Columbia Supreme Court case of *Brisco v. Brisco*, a neurologist provided expert testimony to explain that conventional MRI, such as the one used to image the plaintiff, will not show minor physiological detail, such as cysts in the brainstem.<sup>6</sup> The imaging power of an MRI machine is essential to the outcome of a court decision, as the ability to visualise the smallest of soft tissue strains or tears increases the likelihood of settlement for plaintiffs. Traditional MRI lacks the imaging power required to distinguish between small fullthickness tears, partial-thickness tears, and tendonitis. This was a material factor in a reported 2013 decision, where ONWSIAT accepted evidence that conventional MRIs may under-diagnose partialthickness tears.<sup>7</sup> In a similar decision, ONWSIAT found that a conventional MRI scan completely failed to image a tear in a rotator cuff.<sup>8</sup> In these cases, the plaintiffs received compensation because the tribunals accepted the high quality MRI images as more persuasive.

## IMAGE ARTIFACTS

Image artifacts, which can be caused by a variety of factors such as patient breathing or moving during the scan, are prevalent in MRI scans that use conventional 1.5T imaging, and ultimately lead to a decreased image quality. This has consequences for the use of the MRI as evidence in court. For example, a 2015 case noted that axial lumbar MRI images were “obscured by patient motion artifact.”<sup>9</sup> In a 2014 case, another lumbar MRI contained “a fair bit of artifact.”<sup>10</sup> In both of these cases the appellants, seeking to rely on the MRI results as evidence of their sustained injuries, were unsuccessful in their claims. Cases have been reported of duplicate MRI scans to be undertaken, as previous scans contained distorted images due to artifact.<sup>11</sup> In a recent ONWSIAT decision, MRI scans identified cervical and lumbar imaging which contained patient motion artifact.<sup>12</sup> As a result, a second MRI scan was conducted and proved material in allowing the appeal.<sup>13</sup> Image artifact also impacts diagnostic certainty by reducing the sensitivity and specificity of the image.<sup>14</sup> This was highlighted in a 2014 decision, in which a pre-existing herniated disc could not be ruled out since the MRI contained significant motion artifact.<sup>15</sup>

<sup>5</sup> 2014 CarswellOnt 11605, para. 63

<sup>6</sup> 2002 BCSC 293, para. 94.

<sup>7</sup> 2013 ONWSIAT 1647, para. 33

<sup>8</sup> 2013 CarswellOnt 9525, para. 95-98

<sup>9</sup> 2015 ONWSIAT 1284, para. 85

<sup>10</sup> 2014 CARSWELLONT 6284, para. 16

<sup>11</sup> 2014 CarswellOnt 17872, para. 26; 2009 CarswellNat 5724 para. 49.

<sup>12</sup> 2016 CarswellOnt 3073, 24

<sup>13</sup> 2016 CarswellOnt 3073, para. 49

## CLAUSTROPHOBIA, BODY HABITUS & NOISE

Conventional MRI scanners fail to adequately provide a comfortable experience for larger patients or those who are claustrophobic partially because of the size of the bore - the ring that houses the magnets which surround the patient lying on the bed. Higher quality 3.0T MRI scanners generally have significantly larger bores. The wider bore of 3.0T helps to reduce the frequency of image artifacts, as body habitus is attributed to artifact in conventional MRI machines.<sup>16</sup> There have been several cases before the courts which note that a conventional MRI scan was cut short due to a claustrophobic sensation experienced by the patient in the machine.<sup>17</sup> Conventional MRI machines are rather loud which can affect the scan process. Scan noise has a negative effect on the patient, and can lead to discomfort, anxiety, incomplete imaging or tinnitus. One study noted that conventional MRI scan noise can top 100 decibels.<sup>18</sup> In 2014, a case heard before the British Columbia Supreme Court concerned hearing loss due to a lack of ear protection in a conventional MRI scanner.<sup>19</sup>

## CONCLUSION

The need for high quality imaging which can be completed in a timely manner is of critical importance for diagnosing the extent of a patient’s injury. The quality of the MRI scan is also a material factor for plaintiffs wishing to seek compensation from an injury. Traditional MRI machines, which operate at 1.5T, have many shortcomings which impact the image quality and the likelihood of settlement for clients. The latest 3.0T MRI technology

available provides images with greater detail than traditional MRI machines. Furthermore, the image is likely to be less distorted because the 3.0T technology provides a better patient experience which is likely to minimize distortion of the image from movement or patient discomfort.

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<sup>14</sup> 2013 CarswellOnt 18332, para. 12

<sup>15</sup> 2014 ONWSIAT 2488, para. 38

<sup>16</sup> 2014 CarswellOnt 6285, para. 27

<sup>17</sup> *Martin v. Liberty Mutual Insurance Co.* 1998 CarswellOnt 1767; Decision No. 610/14, 2015 ONWSIAT 189; Decision No. 269/16, 2016 ONWSIAT 931; Decision No. 2466/12.2014 ONWSIAT 1330.

<sup>18</sup> Price, D. L., De Wilde, J. P., Papadaki, A. M., Curran, J. S. and Kitney, R. I. (2001), Investigation of acoustic noise on 15 MRI scanners from 0.2 T to 3 T. *J. Magn. Reson. Imaging*, 13: 288-293. doi:10.1002/1522-2586(200102)13:2<288::AID-JMRI1041>3.0.CO;2-P

<sup>19</sup> *Pausch v Vancouver Coastal Health Authority* 2014 BCSC 2552