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Error in MRI: Bias, Random Error, and the Power of Suggestion

False positives are prevalent in MRI imaging, yet it is still a trusted diagnostic tool (Hoogerbrugge). With high potential for random error, doctors are said to “see what they’re looking for” when evaluating images, rather than viewing them objectively. The purpose of the experiment was to determine just how swayed doctors are by patient histories when asked to evaluate images alone. T1- and T2-weighted images of a healthy brain were obtained. A set of patient information indicative of edema was fabricated. Approximately one-half of image packets to be distributed were paired with patient information. Packets were distributed to approximately 35 doctors, who were asked to make judgments or diagnoses based on the images (they were not instructed to use the histories). Doctors were asked for information regarding their education, job experience, and specialization. Completed surveys were grouped according to history and compared: how much does patient history bias evaluation, and are certain types of bias correlated with factors such as education? Inclusion of an abnormal patient history was strongly associated with increased likelihood of abnormal diagnosis. Among packets where diagnoses were made, edema represented the plurality of the diagnoses. Cerebral edema is one of the most common diagnoses made with the help of MRI, in particular T2-weighted imaging (Bradley). The prevalence of this diagnosis, in conjunction with the fact that it is one commonly made, seems to support that there is lack of critical information processing when evaluating MRI if a doctor believes he knows what to look for.