

Increasing the use of blocks 192% using an Internet based diagnostic test

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Abstract

Research by Johns Hopkins Hospital physicians found that 40%-95% of chronic pain patients were not properly diagnosed. By using an on-line diagnostic test which gives diagnoses with a 96% correlation with diagnoses of Johns Hopkins Hospital doctors, several physician groups reported an increase use of interventional testing up to 192% of the time.

Introduction:

An increasingly number of reports in the medical literature report a high misdiagnosis rate in patients with chronic pain, but very few of these reports offer a solution to this problem, and fewer still offer outcome studies to verify that their solution works.

There are two types of errors seen as causes of misdiagnosis:

- 1) Errors of omission, where diagnoses are overlooked, and
- 2) Errors of commission, where an incorrect diagnosis is given to a patient

Research by Johns Hopkins Hospital physicians found that 40%-95% of chronic pain patients were not properly diagnosed, due to errors of omission, i.e, diagnoses are overlooked, and the cause of pain was not identified. (1,2, 3, 4). As one example, Dr. Long and his colleagues published an article reporting that he evaluated 70 patients who were referred to him with normal MRI, X-ray and CT studies (3). As the result of this, no clear diagnosis had been established. He found that these patients had not been diagnosed properly. Typically, cervical disc disease, facet syndrome, and anteriolysthesis had been overlooked. When properly diagnosed, Dr. Long found that 95% needed interventional testing, such as facet blocks and root blocks, as well as provocative discograms, to confirm diagnoses. After the

diagnostic testing was performed, 63% of the patients were found to be candidates for anterior or posterior cervical fusions, and 93% had good or excellent results post-operatively. Dr. Long was chairman of neurosurgery at Johns Hopkins Hospital, at the time of the publication of this article (3).

On the other hand, 35%-97% of patients are victims of errors of commission. As an example, 35%-70% of people told they have migraines do not have it, but rather one of the other types of headaches (5). A group of physicians from Johns Hopkins Hospital reported that 71%-80% of people who were told they have RSD (CRPS) do not have it, but rather have nerve entrapment syndrome (6,7,8) Hendler and Romero reported that 97% of people told they have fibromyalgia do not have it. In 38 patients, only one met the diagnostic parameters for fibromyalgia (9). In the remaining 37 patients, none met the diagnostic criteria of fibromyalgia. In these 37 patients, evaluated by two physicians, both of whom were past presidents of the American Academy of Pain Management, found 133 medical diagnoses, confirmed by objective medical testing, which had been overlooked by referring physicians (9).

One of the factors leading to overlooked or missed diagnoses is the history taking techniques of physicians. After a physician entered the room, patients were able to speak, uninterrupted, an average of 12 seconds, before

being interrupted by the physician. The time with patients averaged 11 minutes, with the patient speaking for about 4 minutes of the 11 minutes (10). Computer use during the office visit accounted for more interruptions than beepers. Another study confirmed the truncated time physicians spend with patients. The average face-to-face patient care time measured by direct observation in this recent study was 10.7 minutes. When researcher evaluated the time spent on “visit-specific” work outside the examination room and combined it with face-to-face time, the average time per patient visit was 13.3 minutes. (11).

Most importantly, if the patient provides the medical history using a self-administered questionnaire, rather than the doctor obtaining a history, there are fewer errors in the collection of the history. The questionnaire never forgets to ask a question, and provides a consistent form of obtaining a history which eliminates inter-rater variances. This is an important consideration in a group practice. So the doctor does not have to spend time taking the history, by typing on the computer, which leads to the interruptions in taking a history described by Rhoades and his colleagues (10). For that reason, utilizing a self-administered history form is better than a clinician obtained history. This also speeds the evaluation process without sacrificing the quality of the evaluation.

A further complicating factor in obtaining an accurate diagnosis in the use of inappropriate medical tests. As one example, the MRI has a false positive rate of 28% for diagnosing a damaged disc (12), but a false negative rate of 77%-78% compared to a provocative discogram (13). Likewise, the CT overlooks pathology 56% of the time compared to a 3D-CT (14). The use of anatomical tests to diagnose a physiological phenomenon such as pain, is a flawed concept. A physiological test, such as a root block, facet block, peripheral nerve block or provocative discogram provides a more reliable method to verify the source of pain.

Methodology:

To address the high rate of misdiagnoses in chronic pain patients, a group of physicians from Johns Hopkins Hospital developed a Diagnostic Paradigm for Chronic Pain which duplicates diagnoses of Johns Hopkins doctors 96% of the time (15). Using the accurate diagnoses generated by this Internet based questionnaire allowed surgeons to predict what they would find intra-operatively 100% of the time (16). Subsequently, physicians from Johns Hopkins Hospital and University of Rome developed a Headache Diagnostic Paradigm which duplicated their diagnoses 94% of the time (5). The on-line questionnaires mentioned above are available from two sources, and within the year a third source will offer the questionnaires (www.MarylandClinicalDiagnostics.com, and www.DiagnoseThePains.com). These questionnaires are available in both English and Spanish. They take only 5 minutes of staff time to administer the questionnaires to a patient, and results are available 3 minutes after a patient completes a questionnaire. The questionnaire output consists of a narrative summary, reporting answers to all the questions, which can be copied and pasted into a patient chart, to serve as an electronic medical record. Based on the complete medical history, the

Diagnostic Paradigm generates diagnoses and differential diagnoses with a 96% correlation with diagnoses of Johns Hopkins Hospital doctors (15). Finally, based on the diagnoses and differential diagnoses, the output recommends the appropriate medical testing to be used to confirm the diagnoses.

Results:

Using the Diagnostic Paradigm, Dr. Das, the former Chairman of the India, Iran, Pakistan & Sri Lanka section of the World Institute of Pain reported “an increase in the number of interventional procedures we do by 192% compared to our previous levels, with increased benefits to patients.” (see Appendix A). Likewise, Dr. Long and his research team from Johns Hopkins Hospital found that once they used the Diagnostic Paradigm to accurately diagnose 70 patients who were referred without a firm diagnosis, since they had normal CT, MRI and X-rays, 95% of the patients required at least one interventional test, such as a facet block, root block or provocative discogram to confirm the clinical diagnosis. Once the diagnosis was confirmed by interventional testing, 63% of the 70 patients required surgery to improve, and 93% had good to excellent relief (3).

Discussion:

Ideally, a physician would look for a method of obtaining a thorough and accurate history, without interruption of the patient, in a language the patient could understand, with high inter-rater reliability, and a high degree of accuracy, which would take very little time for any physician to obtain. This ideal history taking method is cheaper and faster than “one on one” training, and produces an accurate diagnosis with a very high correlation with diagnoses of expert physicians. For these reasons, the “expert system” is superior to older methods of physician training.

Physicians have long realized the value of a careful and complete history. Careful history taking is of importance to decide on the type of arrhythmia (extrasystoles vs tachycardia), complaints, symptom incidence and triggers of the arrhythmia and on the effect of previous therapy. It is essential for the physician who is taking care of patients with cardiac arrhythmias to be well aware of the value of history taking and to be adequately trained to obtain that information. (17). Other researchers feel that history, physical examination, and electrocardiography are the core of the syncope workup (combined diagnostic yield, 50%). (18).

In order to duplicate the result reported in this article, one important approach is to have a consistent and replicable method of evaluating a patient, with higher inter-rater reliability, which has been documented to be

efficacious by outcome studies. Since it has now been well documented that it is very expensive (more than \$140,000) to train a physician in a one on one training situation (19), there are significant error in diagnosing chronic pain patients (1,2,3,4,6), that the source of these error is physician-patient interaction time (10,11), that the erroneous diagnostic system leads to utilizing the wrong tests (3), including the MRI which misses detecting damaged discs 79% of the time (13), and CT which miss boney pathology in post-operative back conditions 76% of the time (14), that the quality of an examination between doctors varies enormously (20,21,22, 23), and that there is faulty logic at the basis of most “expert systems,” with varying degrees of accuracy (24,25,26,27,28,29,30), there needs to be a method which corrects all of these problems, before a good clinical duplication can be effected. Therefore, a method of patient evaluation needs to be examined, using more rigorous criteria, such as evidence-based medicine, and documented outcome studies.

To combat the poor history taking techniques demonstrated by most physicians, a team of physicians from Johns Hopkins Hospital developed an Internet based questionnaire, which duplicates a physician taking a careful and thorough history. The questionnaire consists of 72 questions, with 2008 possible answers, which takes 45-60 minutes for a patient to complete.

The questionnaire, called the Diagnostic Paradigm, which is available in either English or Spanish, asks all the questions a competent and concerned physician would ask, if the physician spent an hour taking a careful history. With only 15 minutes of training, any medical staff member can be trained to access the Internet and get on the www.MarylandClinicalDiagnostics.com or the www.DiagnoseThePains.com website. Once the website is accessed, it takes only 5 minutes of staff time for the staff member to set up a patient to take the test. When the patient finishes the Diagnostic Paradigm, the answers to the questions are scored, using Bayesian logic programmed in a propriety scoring algorithm. Then, within three minutes of the completion of the Diagnostic Paradigm, diagnoses are generated, based on the answers to the questions. These diagnoses have a 96% correlation with diagnoses of Johns Hopkins Hospital doctors (15). Based on the correct diagnosis, the Treatment Algorithm recommends the correct test to use, which are the tests used at Johns Hopkins Hospital, and often not in common use (3) The efficacy of this technique has been documented by the ability of the Diagnostic Paradigm and Treatment Algorithm to predict intra-operative finding with 100% accuracy (16), as well as outcome studies documenting consistent patient improvement after they have properly diagnosed and correctly tested and treating by following the recommendations of the Diagnostic Paradigm and Treatment Algorithm (31, 32, 33). Using the Diagnostic Paradigm and Treatment Algorithm to serve as a basis for duplicating a consistent evaluation method has a number of advantages. The Diagnostic Paradigm and Treatment algorithm provides a method of obtaining a thorough history, without interruption of

the patient, in a language the patient could understand (English or Spanish) with 100% inter-rater reliability, since all physicians would use the test for diagnostic evaluations, which would not take any physician time to obtain, and takes only 5 minutes of staff time to administer, is far cheaper than the \$140,000 needed for one on one training, produces a diagnosis with a 96% correlation with diagnoses of Johns Hopkins Hospital physicians, and has published outcome studies documenting the efficacy of this expert system (16,31,32,33). This seems to be an ideal “expert system” for use by anaesthesiologist, and other specialists.

References:

- 1) Hendler N, Kozikowski J 1993 “Overlooked Physical Diagnoses in Chronic Pain Patients Involved in Litigation.” *Psychosomatics* 34: 494-501.
- 2) Hendler N, Bergson C, Morrison C 1996 “Overlooked physical diagnoses in chronic pain patients involved in litigation, Part 2. The addition of MRI, nerve blocks, 3-D CT, and qualitative flow meter. “ *Psychosomatics* 37: 509-517.
- 3) Long D, Davis R, Speed W, Hendler N 2006 “Fusion for Occult Post-Traumatic Cervical Facet Injury.” *Neurosurg Quart.* 16:129-135.
- 4) Hendler, N, Overlooked Diagnoses in Chronic Pain: Analysis of Survivors of Electric Shock and Lightning Strike, *Journal of Occupational and Environmental Medicine*, Vol 47, No. 8, and pp: 796-805, Aug. 2005,
- 5) Landi, A, Speed, W, and Hendler, N, Comparison of Clinical Diagnoses versus Computerized Test (Expert System) Diagnoses from the Headache Diagnostic Paradigm (Expert System), *SF J Headache Pain* 1:1, pp. 1-8, 2018.
- 6) Dellon AL, Andonian E, Rosson GD 2009 “CRPS of the upper or lower extremity: surgical treatment outcomes.” *J Brachial Plex Peripher Nerve Inj* 4: 1-7.
- 7) Raja, S, and Hendler, N, Sympathetically Maintained Pain, in *Current Practices in Anaesthesiology*, ed. Rogers, M., pp. 421-425, Mosby-Year Book, Inc., Philadelphia, 1990.
- 8) Hendler, N., and Raja, S.N.: "Reflex Sympathetic Dystrophy and Causalgia." *Handbook of Chronic Pain Management* (2nd Edition). Chap. 39:484-496, ed. Tollison, C.D., Williams and Wilkens, Baltimore, 1994.
- 9) Hendler, N, and Romano, T. Fibromyalgia Over-Diagnosed 97% of the Time: Chronic Pain Due To Thoracic Outlet Syndrome, Acromo-Clavicular Joint Syndrome, Disrupted Disc, Nerve Entrapments, Facet Syndrome and Other Disorders Mistakenly Called

Fibromyalgia, *Journal of Anesthesia & Pain Medicine*, Volume 1: Issue 1, pp: 1-7 2016.

10) Rhoades DR, McFarland KF, Finch WH, Johnson AO. 2001 "Speaking and interruptions during primary care office visits." *Fam Med*. Jul-Aug;33(7):528-32.

11) Gottschalk, A, and Flocke, S, 2005 "Time Spent in Face-to-Face Patient Care and Work Outside the Examination Room" *Ann FAM Med* November 1, vol. 3 no. 6 488-493.

12) M C Jensen 1 , M N Brant-Zawadzki, N Obuchowski, M T Modic, D Malkasian, J S Ross, Magnetic resonance imaging of the lumbar spine in people without back pain, *N Engl J Med* 1994 Jul 14;331(2):69-73.

13) Sandhu HS, Sanchez-Caso LP, Parvataneni HK, Cammisa FP Jr, Girardi FP, Ghelman B. 2000 "Association between findings of provocative discography and vertebral endplate signal changes as seen on MRI. " *J Spinal Disord*. Oct;13(5):438-43.

14) Zinreich SJ1, Long DM, Davis R, Quinn CB, McAfee PC, Wang H. Three-dimensional CT imaging in postsurgical "failed back" syndrome. *J Comput Assist Tomogr*. 1990 Jul-Aug;14(4):574-80.

15) Hendler, N., Berzoksky, C. and Davis, R.J. 2007 "Comparison of Clinical Diagnoses Versus Computerized Test Diagnoses Using the Mensana Clinic Diagnostic Paradigm (Expert System) for Diagnosing Chronic Pain in the Neck, Back and Limbs," *Pan Arab Journal of Neurosurgery*, October:8-17

16) Landi, A, Davis, R, Hendler, N and Tailor, A, 2016 "Diagnoses from an On-Line Expert System for Chronic Pain Confirmed by Intra-Operative Findings," *Journal of Anesthesia & Pain Medicine*, Vol. 1, No. 1 pp. 1-7.

17) Wellens HJ, Brugada P. Antiarrhythmic therapy. 1987 "The value of the history of the patient. *Eur Heart J*. Mar;8 Suppl A:71-5.

18) Linzer M, Yang EH, Estes NA 3rd, Wang P, Vorperian VR, Kapoor WN. 1997 "Diagnosing syncope. Part 1: Value of history, physical examination, and electrocardiography. Clinical Efficacy Assessment Project of the American College of Physicians." *Ann Intern Med*. Jun 15;126(12):989-96.

19) Nousiainen MT, McQueen SA, Ferguson P, Alman B, Kraemer W, Safir O, Reznick R, Sonnadara R. 2016 "Simulation for Teaching Orthopaedic Residents in a Competency-based Curriculum: Do the Benefits Justify the Increased Costs?" *Clin Orthop Relat Res*. Apr;474(4):935-44.

20) Thaller M, Hughes T. 2014 "Inter-rater agreement of observable and elicitable neurological signs." *Clin Med (Lond)*. Jun;14(3):264-7.

21) Van der Salm SM, de Haan RJ, Cath DC, Van Rootsaler AF,

Tijssen MA. 2013 "The eye of the beholder: inter-rater agreement among experts on psychogenic jerky movement disorders. *J Neurol Neurosurg Psychiatry* Jul;84(7):742-7.

22) Beghi E, Regio V, Papantonio A, Bentivoglio AR, Fasano A, Fogli D, Giordano L, Piolti R, Rinaldi G, Simone P, Specchio LM, Tonali P, Torelli P, Zarrelli M, Messina P. 2014 "Reliability of clinical diagnosis of dystonia." *Neuroepidemiology*.43(3-4):213-9.

23) Shahidi B, Johnson CL, Curran-Everett D, Maluf KS. 2012 "Reliability and group differences in quantitative cervicothoracic measures among individuals with and without chronic neck pain." *BMC Musculoskeletal Disord* Oct 31; 13:215.

24) Lavine MS. 2017 "Optimum human input." *Science*. Jun 23;356(6344):1243-1244.

25) Lavine MS. 2017 "Filtering through to what's important. " *Science*. Jun 16;356(6343):1134-1136

26) Schewe S, Herzer P, Krüger K 1990 "Prospective application of an expert system for the medical history of joint pain." *Klin Wochenschr* 68: 466-471.

27) Schewe S, Schreiber MA 1993 "Stepwise development of a clinical expert system in rheumatology." *Clin Investig* 71: 139-144.

28) Molino G, Marzuoli M, Molino F, Battista S, Bar F, et al. 2000 "Validation of ICTERUS, a knowledge-based expert system for Jaundice diagnosis." *Methods Inf Med* 39: 311-318.

29) Cammà C, Garofalo G, Almasio P, Tinè F, Craxì A, et al. 1991 "A performance evaluation of the expert system 'Jaundice' in comparison with that of three hepatologists. " *J Hepatol* 13: 279-285.

30) Kentala E, Auramo Y, Juhola M, Pyykkö I 1998 "Comparison between diagnoses of human experts and a neurotologic expert system. " *Ann Otol Rhinol Laryngol* 107: 135-140.

31) Hendler, N.: 1988 "Validating and Treating the Complaint of Chronic Back Pain: The Mensana Clinic Approach," in *Clinical Neurosurgery*. Edited by P Black, E Alexander, D. Barrow Vol. 35, Chap. 20:385-397, Baltimore: Williams and Wilkins.

32) Talo, S., Hendler, N, Brodie, J. 1989 "Effects of Active and Completed Litigation on Treatment Results: Workers Compensation Patients Compared With Other Litigation Patients" *J. of Occupational Medicine*, Vol. 31, pp. 265-270.

33) <https://www.slideshare.net/DiagnoseMyPain/patient-cost-savings-53-pages>

APPENDIX A

-----Original Message-----

From: Dr. Gautam Das MD, FIPP <gdas2310@gmail.com>

To: Dr. Nelson

<DrNelson@MarylandClinicalDiagnosotics.com>

Sent: Sun, Sep 10, 2017 8:12 am

Subject: Request for an Article at Jorapain

Dear Dr. Nelson,

Your lectures at the ICRAPAIN conference in Kolkata were excellent. From the 550 physicians from around the world who attended, you received the highest rankings for your lectures. I am so pleased that you incorporated this lecture material in your new book. This will be very valuable to any physician. May we publish your lecture in **Journal on Recent Advances in Pain**, where I am editor in chief?

We have found that The Diagnostic Paradigm from www.MarylandClinicalDiagnostics.com has provided excellent medical information. This test has allowed us to increase the number of interventional procedures we do by 192% compared to our previous levels, with increased benefits to patients. Thank you for introducing this program to us.

I look forward to receiving your permission to publish your lecture.

Regards,

Dr. Gautam Das MD, FIPP

Editor-in-Chief: Journal on Recent Advances in Pain

Director: Daradia-The Pain Clinic

Course Director: Aesculap Academy Pain Management courses

Author of books: 'Clinical Methods in Pain Medicine-2nd Ed'; 'How to start & run a pain clinic'; 'Basics of Pain Management' & 'Common pain management procedures'.

Ex-Chairman: World Institute of Pain- India, Iran, Pakistan & Sri Lanka section