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A Clinical Study Report and Evaluation of the Ability of Strannik Virtual Scanning to Screen the Health of a Randomly Selected Cohort of 50 Patients

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Abstract

Background: There is increased recognition of the limitations of contemporary biomedicine and of a political and financial imperative to improve how medical conditions can be characterised and treated. The current medical paradigm often involves numerous medical consultations, tests, drugs and therapies. It is an immensely complex, time-consuming and expensive paradigm. There is therefore a need for alternative technologies which are able to simplify the process of healthcare.

Method: This paper reports on a clinical study undertaken during the period March-September 2016 in which a selected cohort of 58 patients was screened with Strannik Virtual Scanning (SVS). This privately-funded study included patients who had their own unique set of medical conditions and/or medical history. The reported ailments included patients with cognitive problems, sleep problems, stress, neurological problems, diabetes, cardiovascular issues, etc. None of the patients had hitherto been in contact with Mimex Montague Healthcare or knew of Strannik technology.
Initial research conducted by various clinicians, involving over 5,000 patients [see Note 2], have previously indicated that SVS is able to diagnose typically 2-23% more accurately than the range of diagnostic tests against which it was compared and which were being routinely used in various Russian medical clinics.
This study, reports the ability of SVS to screen a group of patients in a manner which was broadly comparable to the current medical system, in particular to the GP's consultation in primary care, and illustrates that SVS was able to determine the complete health of each patient and to make an accurate report of their health. Results: of the 58 patients who participated in the study, and who kindly confirmed their known health details in a signed report, 8 did not confirm their known health and their results were excluded from the study. Of the remaining 50 patients SVS determined 271 medical conditions of which 237 were known to the patient i.e. which had previously been confirmed by the doctor(s) in consultations, by focussing upon declared symptoms, and associated diagnostic tests and/or scans. In Conclusion: this encouraging report (i) indicates that, in this particular patient cohort, SVS performed c14.4% more accurately than the range of contemporary diagnostic tests used to diagnose the patient's health, (ii) that the results are consistent with and supports the claims of various clinicians, doctors and researchers in the Russian market and (iii) with a proof of concept study conducted in Spain in October 2015; and illustrates the very significant scale of cost-savings which could arise from the wider deployment of SVS by reducing the flow of patients into the healthcare system i.e. into primary care, by reducing the flow of patients from primary care to secondary care, and by screening the health of the patient throughout their lives.

Keywords: Strannik; mathematical model; Human Brain Project; Strannik Virtual Scanning

Abbreviations: SVS – Strannik Virtual Scanning

Note 1: Note2: http://www.changenow.co.za/component/k2/item/90-dr-rakesh-mohanlall-cardiovascular-perfusionist-bringing-healthy-change-one-heart-beat-at-a-time.html

Note 2: Vysochin Yu et al, 2001. Methodology and Technology of Invigoration of Different Population Orders. In: Consolidated 5 year Research Plan of Physical Training, Sports and Tourism State Committee of the Russian Federation. 2000. English translation available at: http://www.montaguehealthcare.co.uk/files/Vysochin/Vysochin.pdf

Introduction

Strannik Virtual Scanning [1] is based upon an original mathematical model of the autonomic nervous system and physiological systems. It meets the objectives of the European Commission's Human Brain Project [2] for a new generation of cognitive diagnostic technology which can determine the health of the patient (with particular emphasis upon the complex pathological correlates of Alzheimer's disease). It is the first medical technology which is able to provide a comprehensive screen of the health of the patient including an assessment of systemic stability/instability i.e. the coordinated or uncoordinated function of the physiological systems; an assessment of the most dysfunctional organs and of cellular and molecular biology (up to 15 pathologies per organ) in each of the body's 30 main organs; and the genetic and phenotypic components [3] of most common pathologies in all major organs.

The development of SVS is an enormously significant scientific achievement for many reasons including, but not limited to, the knowledge of the relationship between the psychosomatic and somatic states [4] and addresses a number of issues which are largely overlooked by contemporary biomedicine e.g.

(i) what the brain does and how it does it;
(ii) how networks of organs function in a cooordinated or uncoordinated manner;
(iii) the relationship between colour perception and pathological onset/progression;
(iv) the multi-pathological nature of most common medical conditions i.e. that a single biomarker test is often unable to accurately characterise the complex nature of the patient's medical condition(s);
(v) the nature of the relationship between genotype and phenotype, and how this influences pathological onset;
(vi) the multi-level nature of brain function; and
(vii) that drugs often treat the consequences of dysfunction.

Strannik Virtual Scanning

The significance of each SVS test is described in the company's Operating Manual [4] and in previously published papers [5]. It enables the practitioner to understand the health of the patient at different levels of physiological significance e.g.

- at the Systemic level and Organ level and to understand those areas where pathological development will occur in future i.e. of the patient continues with their current lifestyle; and to identify the existence of Pathological Functional Systems [6];
- at the Cellular level where (i) a system of coloured markers is used to identify cellular change in each organ and (ii) illustrate the morphological situation of each organ in terms of processes which support the development of connective tissue, functions acceleration, new cell formation, etc;
- at the pathological level (from the presented bar graph(s)) to identify the specific pathologies in each organ and the genetic and phenotypic components in each pathology.

In addition the technology incorporates a number of cross-checks which enable the practitioner to confirm the nature of the pathology and avoid mis-diagnosis e.g.

- a summary report which indicates the presence of processes:

(i) which stimulate the hormone-related growth of new cells;
(ii) whether new cell growth is being inhibited or sustained;
(iii) whether there is oncological influence(s) upon the genetic system of core cells;
(iv) the organs which are increasingly less able to influence or control metabolic activity;
(v) comparing the patient's calender age with their biological age;
(vi) identifying the presence of organisms which have pathological significance e.g. yeasts, moulds, and bacteria.

- (i) the morphological situation of the organism in terms of new cell growth, old cells, functions acceleration (hyperfunction), functions deceleration (hypofunction), processes which support the development of connective tissue;
(ii) a comparison of the patient's calendar age with their calculated biological age [8];
(iii) the specific organs which exhibit signs of the processes which are potentially cancer-forming and malignant i.e. which support the development of new cells with loss of control of cell division [7];
(iv) Hayflick [8] limit violations [Note 3] and other processes which influence the function of the organism, which may lead to the onset of processes which have oncological significance, in particular which leads to problems of cell division e.g. signs of fermentation processes which may destroy connective tissue and vessels; and
(v) the specific organs which function as part of a stable pathological functional system (PFS) [4].

Note 3: The Hayflick limit (or Hayflick phenomenon) is the number of times a normal human cell population will divide until cell division stops. Empirical evidence shows that the telomeres associated with each cell's DNA will get slightly shorter with each new cell division until they shorten to a critical length.

Study Protocol/Methods

Patients were recruited randomly. There was no particular effort to recruit any particular racial group, gender, age, weight or medical condition(s). Nevertheless, all patients were of Indian origin and were patients of the SAECP cardiovascular clinic and/or were related to patients of this cardiovascular health clinic. The study was conducted on the premises of the SAECP clinic during Q1 and Q2 2016.

Each patient was given a demonstration of the SVS test which involves studying a video for 15 seconds (and memorising the colours in the video) and then, following the imposition of a colour filter, using the 'mouse' to select colours from a colour palette which could be added or subtracted from the modified video until they completed the task of recovering to the best of their ability the colour balance in the original video. See demonstration video www.montaguehealthcare.co.uk/presentation.php The patient was coached for a period, typically 2-3 videos, to understand how the test works before finally being asked to undertake the SVS test.

Each patient was introduced into the test room where they were weighed (+/-3kgs). They completed the registration form on the SVS test which included their personal identifying details (typically their name or an identifying code); and also their weight, birth date and gender. Upon commencing the test, this process was repeated 4 or 5 times with different video sequences to gather the cognitive data required by the test patient. Finally the data was processed by the mathematics of the program to provide the SVS test report. The test was straightforward for most patients and each test took typically 10-15 minutes, although for those with severe and/or problematic cognitive, neurological or cancerous conditions the process took longer.

The technique is based upon the observation that sense perception has pathological correlates. It focuses upon changes of colour perception, because light comprises an estimated 85% of sensory input, which have pathological correlates. This occurs because proteins are visually active i.e. that they emit biophotons of light during the course of their reaction with their reactive substrates which influences colour perception [1,37,38]; and hence that changes of colour perception can be correlated with levels of pathological onset and progression i.e. of genotype and phenotype in most common medical conditions.

This article focusses upon (i) the ability of SVS to rapidly and inexpensively screen the health of a cohort of 58 selected patients with a wide range of complex medical conditions e.g. diabetes, cardiovascular indications, etc. As outlined, the test method adhered to the basic protocol outlined in the Strannik Operating Manual [4]. The testing was undertaken by Dr Mohanlall at his medical clinic following ethics committee approval by the Durban University of Technology. The study satisfied the requirements of a 'double-blind clinical study', in which the patients were not familiar with the test procedure and could not possibly falsify their test results, and illustrates the likely effectiveness and value of SVS in the primary care setting.

The Strannik practitioner reported the major medical indications which were identified by the test procedure. The patients reported the medical conditions which were known to them i.e. which had been discussed with their doctor(s) and/or which were confirmed in diagnostic/histopathological tests. Their results were subsequently reported to the clinician who is the lead author of this report.

The results were compared simply i.e. whether the SVS results were corroborated by the doctor's consideration of symptoms or by prior diagnostic tests.

Patient Reports/Reported Results

The following patient reports focus upon the key features which were identified in the SVS report. The reported indices are indicative of the rate at which proteins react rather than levels of biochemical markers. Each patient's report was filtered to exclude medical conditions at a presymptomatic level (below 10 units). Reported SVS results comprised >10 SVS units genotype and/or >10 SVS units phenotype.

Note 4: as outlined earlier the test is based upon the measurement of changes of colour perception. The test results are calibrated from typically 0 units to 100 units in which the scale 0-9 Strannik units are indications of presymptomatic onset and above 9 Strannik units of symptomatic progression.

Of the 50 patients tested and who supplied their known medical history

SVS indicated the presence of over 580 pathological indications in the 50 patients i.e. of different levels of physiological significance. 271 medical conditions were confirmed by SVS and correlated with known symptoms. 237 of these conditions were confirmed in a medical consultation, by correlation with declared symptoms, and by diagnostic tests. This illustrated that, in this cohort of patients, SVS was 14.4% more accurate than the combination of the doctor's examination and contemporary diagnostic/histopathological and scanning techniques (see Table 1).

Table 1: The Accuracy of Reported Test Results

Number of Pathologies detected by SVS (pre-symptomatic and symptomatic)	580
Number of Pathologies determined in diagnostic tests/known to the patient	237
Number of Pathologies identified by SVS/consistent with symptoms & diagnostic tests	271
% accuracy by comparison with contemporary methods	114.4% (+14.4%)

Note 5: 8 patients did not complete the questionnaire and hence were excluded. In addition a further 6 were unable to complete the test to the satisfaction of the author(s). Nevertheless their results were included although in normal practice their results would have been excluded and they would have been required to be retested.

Note 6: it was beyond the scope of this study to validate all 580 pathological indications in this study. It is emphasised (i) that SVS is a screening technology and not a diagnostic technology, (ii) that various medical conditions identified by SVS do not have corresponding diagnostic tests, (iii) that SVS is able to identify conditions in cases where there remains an unmet clinical need, (iv) that the identification of 580 pathological indications does not correlate with false negatives.

Specific Observations

- Of the 46 patients 30 indicated that they were 'stressed' but this was only confirmed by 13 patients.
- 10 patients were determined with elevated Hayflick limit, 4 patients with accelerated hayflick limit, and 5 patients with severe hayflick transgressions i.e. 19 patients had indications of the onset of potentially cancerous processes; of which 5 patients were showing precancerous onset. One of these 5 patients was severely underweight (42kgs) and three others were significantly overweight (99-124kgs).
- SVS determined problems with the regulation of sleep in 12 patients. This was confirmed in 5 patients.
- SVS determined accelerated ageing processes in patients with more severe or advanced medical conditions.
- In Patient 18: SVS determined 14 pathologies in the patient which were all confirmed by the patient.
- In Patient 52: SVS determined 12 pathologies which were consistent with known symptoms. 8 of these conditions had been previously diagnosed in medical consultations and/or tests.
- In Patient 7: SVS determined 5 pathologies which were consistent with known symptoms. Only 1 of these pathologies had been diagnosed by the doctor and/or had been confirmed by diagnostic tests.
- Patient 15: ovarian cyst; patients 26,53: urinary infection; patient 38: urinary bladder polyposis; patient 52: migraine; patient 53: hepatic insufficiency; patient 31: liver cirrhosis (in a patient taking STATIN medications).

Statistical Considerations

Accordingly, when considering how to evaluate the accuracy of such tests a number of issues need to be addressed e.g.

(i) How is it possible to assess the statistical outcomes for such a broad-spectrum screening technology which appears to adopt a superior scientific methodology AND which is able to determine so many pathological indications in one test?

SVS is a neural simulation technique which determines the rate of reaction of genotype and phenotype for each common pathology. It looks at what the genes do 'rather than what they are'. It considers the rate of expression of proteins and the rate at which such expressed proteins or enzymes subsequently react with their reactive substrates. It incorporates a generic mathematical formula and/or set of algorithms which determine the onset or progression of the fundamental processes which characterise a particular medical condition i.e. its genotype AND phenotype [9].

The mathematical model developed by Grakov is based upon the knowledge that changes of cognitive properties and/or sense perception have complex pathological correlates. It is based upon the assumption that changes of colour perception, which is believed to comprise an estimated 85% of sense perception, can be used as an accurate determinant.

The development of genetic screening posed a statistical problem for researchers. There had never before been a body of data against which genetic data could be compared and validated therefore the development of the technology required new statistical methods to validate the data. SVS raises similar issues, re the validation of genetic data, which faced researchers when genetic screening techniques were first introduced. It questions the assumption that pathological processes can be accurately characterised by a single pathological process i.e. most medical conditions involve a number of pathological processes. In addition, as each pathological process is defined in terms of both genetic and phenotypic processes this must inevitably complicate efforts to interpret the large repositories of genetic data which researchers are using in their attempts to generate and explore new scientific hypotheses [10-12].

These are some of the dilemmas facing researchers when considering the data from Strannik Virtual Scanning tests.

(ii) How accurate and/or reliable is the test?

It is rare for any medical test [13,14] to be precisely accurate or repeatable e.g. the HbA1c test has shown to be 40% irreproducible after one month [15]. Diagnostic tests range from typically 25-95% accuracy – the PSA test is considered to be 25% accurate, Alzheimer tests 65% accurate, etc. This happens because the pathological profile of patients may differ despite having the same condition. Nevertheless this study report illustrates 14.4% greater accuracy than a range of diagnostic tests which indicates that Strannik Virtual Scanning may operate at an order of magnitude greater than current histopathology tests.

Note 7: Accuracy & Reproducibility: In a study of test results of three medical conditions (migraine, diabetes and cardiosclerosis), in a patient (52yo, male, 75kgs) tested between 18th March 2004 and 7th November 2004, there was a remarkable level of consistency in the 18 tests for diabetes (17 out of the 18 tests were entirely consistent), and a general level of consistency in the 36 other tests. 5 of the 58 tests were inconsistent although none of the inconsistent test results were at a level which would have led to an erroneous conclusion.

(iii) Could the test fail to identify a particular medical condition?

It is entirely conceivable that SVS could fail to identify a particular medical condition (this report highlights concerns with the results of 6 patients) however it is being offered as a screening modality to assist the GP to make a determination of the conditions which ail the patient and not as a diagnostic technology. Nevertheless the evidence generated by this and other published and unpublished studies suggests that, in the hands of a trained and experienced practitioner, SVS is an extremely sensitive test which can determine the progression of pathologies from their presymptomatic onset and to establish, in greater detail than before, the complex pathological correlates of each medical condition [16-21].

Such a technology will incur significant debate for a number of reasons e.g. (i) the results are being compared with established diagnostic tests which are often based upon irregular scientific concepts e.g. the 'indirect marker' HbA1c test to determine whether the patient is diabetic; (ii) which are subject to chemical influences which can influence test outcomes e.g. light, pH, levels of proteins, etc; (iii) which are less sensitive; (iv) which fail to differentiate between genotype and phenotype; (v) with perceived accuracy ranging from typically 25-90%; and (vi) the effect of drugs would be expected to influence test outcomes.

- Previous articles have indicated that SVS is based upon the observation that proteins emit biophotons of light in the course of their reaction with reactive substrates and that this emission of light influences colour perception i.e. it effectively measures rate of reaction which, it is suggested, is a more scientifically valid method than current techniques which are based upon the measurement of levels of biochemical markers.
- There are no known factors/chemical influences which could influence the test outcomes although, as outlined in this report, it is recognised that some patients may be cognitively hindered and unable to complete the test in a satisfactory manner. These could be patients with dementative type conditions or who are extremely stressed.
- The sensitivity is greater than most biomarker type tests because the eye responds to as little as 7*102 biophotons per second i.e. at an order of magnitude more sensitive than most contemporary diagnostic tests which enables it to differentiate between the presymptomatic and symptomatic states.
- It is not possible to accurately define the extent of false positives or false negatives because SVS determines many conditions in levels of sophistication and detail, as outlined above, which exceed the capability of existing diagnostic, biomarker, histopathology, and/or scanning techniques. In addition it determines conditions for which there is currently an unmet clinical need i.e. where there are no other techniques which can determine the extent of systemic, organ, cellular and molecular dysfunction for these particular conditions or syndromes e.g. see 4.3 (v) below.
- Each SVS tests defines each condition in terms of its genotype and phenotype e.g. in diabetes the existence of type 1 and type 2 condition as comorbidities. If a patient is given insulin before their SVS test there are no diabetic signals/indications, neither genotype or phenotype; however after a period of time when the effect of the insulin declines the test will recover the ability to define the patient's condition. Clearly in most cases: e.g. of type 1 diabetes the type 1 signal will be extremely prominent and may be dominant, and in the case of type 2 diabetes the type 2 will be extremely prominent and may be dominant.

(iv) Preliminary indications

If five medical tests were each to have an accuracy of circa 98% the expected accuracy of the test would be less than 90%, typically 85-90%. If 10 ten medical tests were each to have an accuracy of circa 98% the expected accuracy of the test would be less than 80%, typically 70-75%. By comparison the data presented in this report appears to indicate that SVS appears to function at a level of accuracy which is 14.4% more accurate than the range of contemporary diagnostic tests against which it was compared. This supports the data from clinical studies, in particular the paper by Vysochin [Note 2] which concluded that SVS was 23% more accurate than the range of contemporary diagnostic tests against which it was compared.

(v) Can the test identify conditions for which there is currently an unmet clinical need or where the current tests are based upon an etiological deficit i.e. where the current etiology is considered to be unable to explain the condition.

Each SVS test is able to determine circa 5-15 pathologies in each of the 30 main organs. This includes many tests where current tests have inherent limitations or where there is an unmet clinical need or where the current tests are enormously expensive e.g. to deterimine the onset and/or progression of liver cirrhosis; pancreatic cancer; prostate cancer; ovarian cancer; the pathological components of complex medical conditions (whiplash injury, depression, Alzheimer's disease, Raynaud's phenomenon, cardiovascular disease(s), etc). This study includes examples whereby SVS correctly determined the presence of urinary bladder polyposis (polyps), ovarian cyst, and liver cirrhosis.

(vi) What are the limits of the technology?

SVS is able to determine the pathological correlates and/or consequences of a complex medical condition. It is not designed to determine pathological issues e.g. bacterial or viral infections, in the eyes or throat/mouth. It can determine the influence of a bacterial or viral infection upon the visceral organs but it cannot, in general, determine which bacterial or viral infections are prevalent. (Note: exceptions - hepatitis, pneumonia). It is not suitable for pregnant women - the foetus being considered by the test to be an abnormality. It is not designed to be taken by patients who are currently taking medication – the medication can mask the SVS test results - i.e. a short gap of circa 12-24 hours between taking the medication and undertaking the SVS test is essential.

The patient's test results could increase or decrease in severity over a period, depending upon the stress-loading facing the patient.

As outlined earlier, various medical conditions e.g. dementative-type conditions and/or cancers and/or patients under severe stress are occasionally associated with cognitive impairment which can influence test outcomes. An experienced Strannik practitioner would often identify such patients and may request that the patient repeats the test or may offer a short course of Strannik Light Therapy which often appears to sharpen the autonomic/cognitive response and enables the patient to complete the test in a satisfactory manner.

An SVS report provides the general practitioner with a medical report following a single 20 minute test, conducted on a computer. It significantly reduces the need for further tests and consultations. Each test can be conducted by a suitably trained auxilliary which provides the GP with a one-page summary health report which identifies the most significant conditions influencing the health of each patient. There is no need for the GP to meet the patient unless they wish to do so e.g. to question the patient about emergent symptoms, to conduct confirmatory tests, or to send the patient for further confirmatory tests in the secondary care setting.

The technique provides the GP with a mechanism to inexpensively screen and monitor the health of their patients. This information can be used to advise the patient how to improve the quality and longevity of their lives e.g. to alter their diet and/or include an exercise regime if overweight, to alter their bedding if suffering from postural/spinal problems, incorporate stress-reduction measures if stressed, treat the conditions by drugs or by suitable alternative therapies e.g. Strannik Light Therapy, etc.

Summary

An initial report (available upon request) compiled by Richard Walker, (fmr Regulatory Affairs Director, Medisense/Abbott), Director of ICON Development Solutions (currently Director RegCMC Medical Devices at Novartis), which was submitted to the UK's Department of Health (DH) and which formed the basis of a grant application supported by the DH in 2009/10, indicated that Strannik had the potential to reduce the cost of diagnosing and treating diabetes from £9BN to £2.8BN however this assumes a 100% adoption of lifestyle recommendations by the medical team which is considered unrealistic. A 50% uptake is considered realistic which, if adopted, would yield a cost-saving of circa £3.5BN pa. Moreover altered diet and exercise are now recommended measures for treating diabetes. Nevertheless there remains a need to understand the relationship between the psychosomatic and somatic states and for patients, in particular those who are heavily overweight, to be psychologically stimulated in order to pursue and achieve a more healthy and active lifestyle. If not, any weight-loss achieved during a diet or exercise program may be reversed following the cessation of the diet. The Walker report did not consider the wider applicability of the technology i.e. including Strannik Light Therapy, and of the cost-savings which would accrue from its regular use in the primary care setting.

The immediate benefit from SVS is that it reduces the need for further, often highly expensive, medical tests and consultations e.g. to determine problems with the heart, kidneys, liver, spine, brain, prostate, etc. A series of papers has been compiled which illustrates (i) the ability of SVS to make a comprehensive assessment of the pathologies influencing the health of patients with complex medical conditions e.g. Diabetes [16], Cardiovascular disease [17], Migraine [18], Alzheimer's Disease [19], Raynaud's phenomenon [20], Depression [21], etc.

This report illustrates areas where an SVS test can generate very significant financial cost-savings. Each report was reviewed and identified the additional tests which would typically be required to validate the doctor's conclusions i.e. in the current system of healthcare 8 patients are likely to require examination by endoscope; 15 patients are likely to require regular cardiovascular monitoring; patient 4 is likely to require prostate tests and monitoring for renovascular insufficiency; 4 patients are likely to require diabetes monitoring; 8 patients are likely to require regular cancer checks; patient 17 should require monitoring for encephalopathy e.g. by MRI, perhaps as a precursor to the onset of dementative conditions; c7 patients should be screened for postural issues influencing PNS; etc.

A preliminary comparison of cost-savings which would accrue from the adoption of a screening modality such as SVS can be seen by comparing the £15-25 per SVS test cost with the cost of a doctor's examination estimated at £45 [32,33] and subsequent consultations in secondary care setting estimated at £50-2,000. Accordingly a more comprehensive screening technology, such as SVS which could be deployed in primary care, could reasonably be expected to reduce the number of visits to the GP, albeit at some minor increases to cost; reduce the number and cost of referrals by the GP to secondary care; reduce the number of tests which are currently used in a screening capacity i.e. to determine or not whether the patient has a specific condition; to reduce the cost of secondary care consultations by reducing or eliminating the need for immensely expensive scanning and histopathology tests (see Table 2); etc.

Table 2. Cost of Scanning, Screening and/or Diagnostic Tests in Secondary Care

Type of Test	Estimated Typical Cost
Endoscopic examination [22,23]	>£1000
Cardiovascular screen [24-26]	>£750
Prostate examination and tests [27]	£275
Renovascular examination and tests [28]	£50-100
Diabetes screening [29]	£50-100
Oncological Screen and tests [30]	>£1000
MRI Scans for spinal and postural complaints [31]	>£350
MRI Brain scans [31]	>£350

At £45/test, the screening of 58 patients by the GP incurs a total cost of £2,600. A comparative cost involving SVS is based upon a cost of £15/test and £25/hour cost of a nursing auxilliary i.e. a total cost of £27.5/test and a total cost of £1,600. Subsequent testing in the secondary care setting, at the costs set out in Table 1, could reasonably be expected to incur a total cost of >£30,000 i.e. typically £500-1,500 depending upon the nature and extent of the conditions to be monitored (see Table 3).

Note 8: this illustrates the possibility for the primary care doctor and/or nurse/nursing auxilliary to use SVS to screen a population of 58M at a cost of circa £2-3BN and supports the claims that cost-savings of £10-20BN may be feasible. It is recognised that such a comprehensive medical report could, in some cases, lead to additional testing and costs.

An estimated 14% of all patients who undergo invasive procedures (such as biopsies, catheterizations or bronchoscopies) experience at least one complication which requires treatment and involve a longer stay in hospital [34,35]. Accordingly, the introduction of a screening technology which can prevent or reduce the need for invasive screening techniques has a greater potential for cost-savings than may at first seem apparent (savings of syringes, sample bottles, rubber gloves; and reduced numbers of consultations, cost of mis-diagnosis, cost of wrongful prescribing of drugs, cost of diagnostic side-effects, travel costs and absence from work, etc).

Table 3: A Comparison of Costs

The primary care examination:	£45/test/patient
The secondary care examination:	£500-1,500/patient *
SVS consultation:	£27.5/test/patient

* NHS costs in the most severe 20% of patients

SVS is a screening technology. It is not based upon measuring the levels of biochemical markers or of using electromagnetic radiation to scan patients. It adopts a fundamentally different mechanism based upon the observation that all pathological processes influence sense perception, in particular colour perception i.e. that biophotons of light (often referred to as bioluminescence or autofluorescence) emitted from pathological processes have a direct influence upon colour perception. Accordingly, it is able to determine the level of genetic expression of proteins (genotype) and the influence of stress upon protein function and reaction (phenotype). This is a principle which, in theory, has greater scope than any current method of determining the health of the patient.

Such a technique is relatively free from the limitations or side-effects which influence the accuracy of contemporary diagnostic tests. For example (i) genetic screening considers only the genetic changes which limit the genetic expression of proteins yet the majority of drugs are based upon treating the effects of stress or the environment (phenotype) upon our lives; (ii) genetic tests fail to consider whether the detected genetic changes are the cause or the consequence of a particular medical condition; (iii) biomarker-type tests are often influenced by a range of chemical and physical factors.

Summary

The SVS test results are interesting because they were conducted in an entirely blinded fashion in which the Strannik practitioner was completely unaware of the health of each patient yet provided, what appears to be, an accurate summary of the health of each patient. This compares with the medical diagnosis conducted by the primary care GP whereby he has the benefit of (i) knowing the patient's medical history, (ii) being able to visually assess the patient, (iii) to ask the patient to describe their medical ailment, symptoms and associated information, and (iv) conduct additional tests to verify their medical conclusions.

The study is more typically a controlled observation study rather a Randomised Control Trial (RCT). Nevertheless, and unusually for a medical device, the technology compensates for gender, age and weight and hence that it can be applied to most patient groups.

The report identified a wide range of medical conditions in each patient of which the most prominent and/or significant are summarised in this report. 50 patients provided their known medical history. The SVS test gave information on more than 270 emergent medical indications (typically 5-6 conditions per patient) which appeared to be consistent with their declared medical history and which was known to the medical team monitoring this study. The SVS test reports for the 50 patients were consistent with their known medical conditions with few recorded exceptions. It was recommended that 6 patients results should be viewed with caution, perhaps requiring retesting.

A number of patients with no medical problems or only minor medical problems were introduced for comparative purposes. The test was able to determine whether they were completely healthy and/or the nature of their minor ailments.

The test results included patients who continued to take their medication and/or where the effect of the medication influenced test outcomes e.g. in the patient identified with liver cirrhosis taking statin-type medications.

This report illustrates the potential of the Strannik technology, in particular of the SVS test, to support the work of the doctor e.g. to make an immediate and reasonably accurate assessment of patient health without need for further testing in the secondary care environment, to use this information to improve patient lifestyles, and/or to recommend therapeutic interventions and/or practices which could improve their quality of life. It meets the requirements of independent institutes e.g. the UK's National Institute of Health & Care Excellence (NICE), for 'plausible promise' and hence that further testing e.g. in a double-blind clinical study, should be undertaken in order to fully evaluate the potential of this technology to assist the doctor to reduce the complexity and hence the cost of medical testing [see Note 7].

This report illustrates the possibility to implement SVS testing to limit any further need for expenditure in the UK's NHS at circa £115BN; to justify investment in primary care e.g. as sought by the RCGP and GPC i.e. to increase primary care from 7.25% to 11%, whilst reducing the need to send patients for further secondary care interventions; and to divert the resultant cost-savings to tertiary/social care. This report does not consider the very real possibility to make further cost-savings through the adoption of further technologies arising from the emerging neurological paradigm i.e. by understanding and adapting the multi-level nature of brain function as outlined in the European Commission's Human Brain Project [36].

Conflict of Interest Statement

Graham Ewing is a Director of Mimex Montague Healthcare, a company devoted to the wider commercialisation of Strannik technology.

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SVS test result was considered to be confirmed if the condition was confirmed by symptoms and/or the results of prior diagnostic tests.

SVS Test Results and Symptoms vs Results of Diagnostic Tests

Patent 1
58 yrs 63 kgs NU1
Patient was determined to have poor quality sleep, duodenal ulcer, ischaemic heart disease. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 3-3

Patient 2
38 yrs 85 kgs TT1
Patient was confirmed with cardiac issues, thyroid dysfunction. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 2-2

Patient 3
60 yrs 88 kgs WT
Patient was confirmed with psoriasis, chronic rhinitis, polyneuropathy, ischaemic heart disease. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4

Patient 4
69 yrs 75 kgs HS
Patient was confirmed to have renovascular insufficiency, angina pectoris/cardiosclerosis/ hypertension, prostatitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4
Conditions to monitor: prostate gland

Patient 5
73 yrs 77 kgs NI
Patient was confirmed with stress, destabilised sleeping pattern, prediabetes, polyneuropathy. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4

Patient 7
28 yrs 54 kgs TS1
Patient was diagnosed with bronchial asthma, myositits, psoriasis, neurodermatitis, duodenal ulcer, chronic rhinitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-1

Patient 8
45 yrs 66 kgs TI
Patient was diagnosed with stress, postural problems, neurodermatitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 2-2

Patient 9
51 yrs 72 kgs BNI
Patient was diagnosed with stress, neuritis, etc 3-2

Patient 10
40 yrs 99 kgs WI
Patient was diagnosed with stress, postural issues: ganglioradiculitis and radiculitis, adrenal insufficiency, cardiac infarction, dermatomysitis and eczema. 3-1
Note: This patient was recommended to be retested.

Patient 12
71 yrs 86 kgs JE
Patient was diagnosed with stress, circulatory impairment in the spinal cord, diabetes and/or sclerotic pancreatitis, thrombophlebitis/phlebitis, pyelonephritis, renovascular insufficiency. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-5
Conditions to monitor: pancreas

Patient 13
45 yrs 112 kgs LO1
Patient was diagnosed with sclerosing pancreatitis, tissue growth in the stomach.
Note: The results are untypical of a patient of 112 kgs. The was recommended to be retested. 3-3

Patient 14
32 yrs 64 kgs OO
Patient confirmed with stress, cardiac insufficiency, neurosis of the oesophagus. These were consistent with his symptoms and was confirmed by contemporary diagnostic tests. 3-2

Patient 15
48 yrs 68 kgs LO2
Patient was confirmed with stress, ganglioradiculitis, ovarian cyst, cardiac insufficiency, haemorrhagic vasculitis, urticaria. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-5
Patient 17
39 yrs 65 kgs JR
Patient was confirmed with stress, pyelonephritis, leukopenia/thrombophlebitis, Duodenitis, radiculitis, cardiac insufficiency and/or ischaemic heart disease, hypothyrosis, encephalopathy, otitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 9-6
Patient 18
74 yrs 77 kgs MS
Patient was confirmed with stress, vertebral artery syndrome, myelitis, osteochondrosis, otitis, adrenal insufficiency, growth of new cells in the prostate and/or calculosing prostatitis, diabetes (predominantly type 2), ischaemic heart disease and/or myocardial dystrophy, haemorrhagic vasculitis, haemorrhagic diathesis, leukopenia, hypertension, bronchiectactic disease, neurodermatitis, stomach ulcer, duodenal ulcer/Duodenitis, glomerulonephritis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 14-14
Conditions/organs to monitor: significantly elevated Hayflick limit
Patient 19
51 yrs 78 kgs OQ
Patient was confirmed to have stress, polyneuropathy, thrombophlebitis, problems with oesophagus, stomach ulcer, Duodenitis/dyskinesia. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-3
Patient 20
Patient was confirmed with minor indications of stress, spinal cord issues, neuritis, myocardial dystrophy. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 1-1
Patient 20 SN
Patient was diagnosed with stomach ulcer. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient.
1-1
Patient 21
60 yrs 79 kgs TS2
Patient was confirmed with vertebral artery syndrome, new cell growth in the spinal cord, diabetes (predominantly type 1), cardiac insufficiency, anaemia/haemorrhagic vasculitis/hypertension, splenomegaly, neurosis of the oesophagus, stomach ulcer, duodenal ulcer, enteritis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 10-8
Patient 23
39 yrs 61 kgs ON (2nd test/19/04/2016)
Patient was diagnosed with stress, chronic fatigue in the brain and pituitary, hypoparathyrosis, cardiac insufficiency/cardiac infarction/ischaemic heart disease. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 3-3
Patient 24
46 yrs 78 kgs SS1
Patient was diagnosed with stress, a nasal problem, pancreatitis, cardiosclerosis, thrombophlebitis, dermatitis, stomach ulcer, enteritis, colitis, growth of new cells in the oesophagus. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 9-8
Patient 26
52 yrs 75 kgs NO
Patient was confirmed with new cell growth in the spinal cord, adrenal insufficiency, angina pectoris/myocarditis, bronchiectactic disease, dermatomyositis, growth of new cells in the oesophagus, stomach ulcer, Duodenitis, urethral infection. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 9-9
Patient 27
53 yrs 65 kgs SO
Patient was confirmed with Inflammatory process in the spinal cord, ganglioradiculitis, pancreatitis, allergic process in the lungs & bronchi, tissue growth in the oesophagus, allergic process in the duodenum. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 6-6
Patient 28
40 yrs 60 kgs SN
Patient was confirmed with stress, problems with sleeping pattern, type 1 diabetes, impaired spinal circulation, osteochondrosis, hypoparathyrosis, issues with mammary glands, neurodermatitis, urinary bladder polyposis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient.
5-5
Mammary Gland check recommended but not expected to find any significant issues
Patient 30
39 yrs 76 kgs UPN
Patient was diagnosed with stress, problems with sleep, heart abnormalities (ischaemic heart disease), thrombophlebitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 3-3

Conditions to monitor:

Patient 31

52 yrs 102 kgs QO

Patient was confirmed with stress, impaired spinal circulation, neuritis, allergic process in the nose, adrenal insufficiency, liver cirrhosis (on statins), hypertension, duodenal ulcer, urethral infection, myositis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 7-8

Patient 32

39yrs 95 kgs GF

Patient was diagnosed with neuritis, otitis, thyrotoxicosis, idiopathic hypotension, prostatitis, haemorrhagic diathesis, bronchitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-3

Patient 33

64 yrs 79 kgs TC

Patient was confirmed with frontitis, myocardial dystrophy, thrombophlebitis, chronic breathing insufficiency, urticaria, Duodenitis. Significantly elevated Hayflick limit. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 6-5

Conditions/organs to be monitored: testicles and prostate

Patient 34

32 yrs 117 kgs TT2

Patient failed to complete the test satisfactorily on the first occasion. On the second test was confirmed with impaired spinal circulation, radiculitis, pancreatic issues, cardiovascular issues/myocarditis/cardiac infarction/cardiac insufficiency, bronchial asthma/bronchiectactic disease, neurodermatitis. Significantly elevated Hayflick limit. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 6-6

Conditions/organs to monitor: heart, prostate

Note: although patient test results appeared relatively consistent the test did not comply with the required test parameters and indicated inadequate reaction of the brain on environmental/stress influences. It is recommended that the test be repeated.

Patient 35

15 yrs 50 kgs LES

Patient was confirmed with polyneuropathy, otitis, hypothyrosis, dyskinesia of the duodenum. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4

Patient 37

38 yrs 95 kgs TN1

Patient was diagnosed with neural issues (epilepsy/encephalopathy), impaired spinal circulation, polyneuropathy, rhinitis, hypoparathyrosis, glomerulonephritis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-3

Patient 38

47 yrs 91kgs UTS

Patient was diagnosed with stress, spinal problems, renovascular insufficiency, urinary bladder polyposis and arthritis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4

Patient 39

45 yrs 90 kgs WK

Patient was diagnosed with spinal osteochondrosis. This was consistent with his symptoms but had not been diagnosed by other diagnostic tests. Patient was stressed. This was manifest as an emergent stomach ulcer and gastritis. This was consistent with his symptoms but had not been diagnosed by other diagnostic tests.

Three conditions confirmed by SVS but not diagnosed by contemporary diagnostic tests. 2-0

Patient 40

43 yrs 86kgs SE

Patient was diagnosed with stress, radiculitis, Cholelithiasis, diabetes, cardiac myopathy, pyelonephritis, herpes, gastritis, proctitis. These were consistent with his symptoms and was confirmed by contemporary diagnostic tests. A number of identified pathologies were not confirmed. 3-3

Patient 41

35 yrs 83kgs TD

Patient was diagnosed with stress, impaired spinal circulation, polyneuropathy, thyrotoxicosis, mastopathy, cardiac insufficiency, idiopathic hypotension, phlebitis/thrombophlebitis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 7-6

Patient 42

53 yrs 70 kgs SH1

Patient was confirmed with stress, rhinitis, portal hypertension, neurodermatitis, stomach ulcer, duodenal ulcer, arthritis. Major Hayflick violation of unknown origin. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 6-5

Patient 43

49 yrs 42 kgs SH2

Patient was diagnosed with stress, problems of blood pressure, maxiliary sinusitis, cardiac myopathy, angina pectoris, ischaemic heart disease, neurosis of oesophagus, stomach ulcer, duodenal ulcer, enteritis, osteoporosis. Significant Hayflick violation. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 8-8

Patient 44

40 yrs 80 kgs FCS

Patient was diagnosed with stress, diabetes, adrenal insufficiency, duodenal dyskinesia. These were not considered to be consistent with his symptoms. 3-3

Note: The patient was recommended to be retested.

Patient 46
61 yrs 84 kgs BS
Patient was diagnosed with stress, sleeping problems, type 1 diabetes, chronic fatigue, spinal cord abnormalities, spinal osteochondrosis, ganglioradiculitis, inflammation of middle ear, hypoparathyrosis, hypertonia, chronic breathing insufficiency. Significant Hayflick violation. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 9-9
Patient 47
62 yrs 71 kgs NS
Patient was diagnosed with stress, impaired spinal circulation, radiculitis, chronic breathing insufficiency, urolithiasis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 4-4
Patient 48
64 yrs 81 kgs SQN
Patient was confirmed with stress, problems with sleep, chronic fatigue, otitis, diabetes, hypertension, issues with oesophagus and stomach, duodenal ulcer, proctitis in the large intestine. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 8-8
Patient 49
57 yrs 72 kgs TL2
Patient was diagnosed with stress, portal hypertension, myocardial dystrophy/ischaemic heart disease, enteritis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 5-4
Uncertain outcome: pancreas
Patient 50
50 yrs 86kgs TH1
Patient was diagnosed with stress, migraine, sinusitis, sclerotic pancreatitis, angina pectoris, urethral infection. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 7-6
Patient 51
52 yrs 68kgs TH2
Patient was diagnosed with stress, migraine, sclerotic pancreatitis, angina pectoris, hypertension, bronchectactic disease, stomach ulcer, Duodenitis, renal insufficiency, urethral infection. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 11-9
Patient 52
43 yrs 90 kgs TN3
Patient was diagnosed with stress, chronic fatigue, migraine, neuritis, otitis, thyroid issues, pancreatitis, angina pectoris, hypertension, bronchiectactic disease, dermatomyositis, oesophagitis, gastritis, Duodenitis. These were consistent with his symptoms which were confirmed by contemporary diagnostic tests. 12-8
Patient 53
46 yrs 124 kgs SS2
Patient was diagnosed with stress, encephalopathy, encephalitis, neuritis, otogenous labyrinthitis, Cohn's syndrome, growth of new cells in the testicles, hepatic insufficiency, cholecystitis, myocardial dystrophy, cardiac infarction, haemorrhagic diathesis, eczema, psoriasis, enteritis, glomerulonephritis, renal insufficiency, urethral infection, myositis. Major Hayflick violation. 11-8
Note: Although the results appear relatively consistent with what could be expected in a patient of 124 kgs there is concern that the results are too often dominant red phenotypic signals with a complete absence of blue genetic signals. A practitioner is advised to view such results with caution and to request the patient to repeat the test, perhaps after a short course of Strannik Light Therapy. For the purpose of this clinical study the results should be voided.
Patient 54
52 yrs 73 kgs JS
Patient was diagnosed with chronic fatigue, functional changes in the liver, diabetes, phlebitis, neurosis of oesophagus. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 3-3
Patient 56
41 yrs 108 kgs KH
Patient was confirmed with stress, encephalopathy, Arachnoiditis, neuritis, sinusitis, abnormalities of development in the pituitary gland, thyrotoxicosis and other thyroid pathologies, Cohn's Syndrome, Calculous Prostatitis, abnormalities in the testicles, hepatitis and hepatic insufficiency, cardiac myopathy, hypertension, stomach ulcer. 1-1
The results indicate a major Hayflick violation and cognitive challenges arising from encephalopathy.
Note: The patient's declared results for a patient of this weight are inconsistent with expected outcomes which suggests that the results should be treated with caution and to request the patient to repeat the test, perhaps after a short course of Strannik Light Therapy. For the purpose of this clinical study the results should be voided.
Patient 57
56 yrs 62 kgs NS1
Patient was confirmed with stress, vertebral artery syndrome, impaired spinal circulation, ganglioradiculitis, thyrotoxicosis, neurodermatitis, dyskinesia in the duodenum, enteritis in the small intestine, osteochondrosis. Patient did not confirm cochlear neuritis although identified by SVS and consistent with family history. Similarly patient did not confirm diabetes although consistent with family history. 9-8
Patient 58
59 yrs 61 kgs NS2
Patient was confirmed with stress, myelitis, frontitis, Cohn's syndrome, cardiac issues/myocardial dystrophy, hypertension, pyelonephritis, myositis. These were consistent with his symptoms and was confirmed by the patient i.e. of contemporary diagnostic tests undertaken by the patient. 7-6

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