

## Narrative Techniques in Medicine

### Translating Cognitive Sciences into Potent Informatics Instruments

#### Why medicine needs narrative

With the advent of networked technologies and ubiquitous digital information flows, the nature of how consumers, patients, and clinicians consume and exchange information has been transformed. In parallel, medicine has evolved into an evidence- and guideline-based managed care methodology that has diminished the traditional “art” of medicine – medicine that was based upon clinical experience, intuitive judgment, and therapeutic clinician-patient relationships. Yet, for healthcare services to reach a sustainable level of value, new mechanisms for efficiently “cognitively engaging” participants in chronic disease management, partnered decision making, and behavioral lifestyle changes must be identified.

Information overload and competing pressures in today’s society have reduced the time patients and physicians spend together, thereby diluting the role of recounting of stories and therapeutic discussions. The implications of this effect can be significant. Researchers have observed that cognitive heuristics commonly used in expert decision making involve “first fit pattern matching,” where the mind rapidly moves to a likely categorization based on incomplete information. *How Doctors Think* author Jerome Groopman, MD observed, “Most doctors, within the first 18 seconds of seeing a patient, will interrupt [the patient] telling his story and also gener-

ate an idea in his mind [of] what’s wrong. And too often, we make what’s called an anchoring mistake — we fix on that snap judgment” (National Public Radio).

Groopman says it’s often the very last symptom that triggers the realization in the doctor’s mind about what the patient is suffering from. If doctors had the opportunity to conduct longer visits, he says, they might actually hear that one thing that helps them diagnose accurately (Binks). During a visit, physicians do not have the time to give to patients to allow them to tell their story and feel heard; moreover, physicians do not have enough time to explore patients’ clinical narratives.

#### Narrative for cognitive potency

Advancements in the cognitive sciences over the past decade have revealed much about how we think. As David Herman, author of *Narrative Theory and the Cognitive Sciences*, says, “Research on human intelligence has postulated that studying the structure and use of stories can provide important insight into the roots of self and the nature of thinking,” (Herman). The ways we recognize patterns and integrate fragmented bits of information are implicit processes and drive cognition and decision-making. What we are led to expect affects how we think, make decisions, and behave; this cognitive chain is based on experiential patterns or mental models (schema) that filter most of the brain’s incoming information.

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- Jerome Groopman, MD

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On a larger scale, health informatics is the science of information management in healthcare and its application to clinical practice, decision-making, and research. The goal is successful “triadic consultation,” where the patient, the physician, and the information system work together to facilitate clinical care (Hassey). Understanding how to use and shape information flows between clinician, patient, and healthcare community to best engage these participants can enable the development of cognitively “potent” healthcare informatics applications.

The use of narrative in medicine is one way to draw on these newer fields of science and combat the lack of time while bridging the gap between patients and providers. Narrative’s power rests both in resonating with a person’s (often unconscious) mental schema and in tailoring information for engaging patients and physicians according to these mindsets.

## Narrative techniques

Narrative techniques have applications and benefits throughout the healthcare continuum. They are powerful tools for understanding patients’ thinking and thus optimally engaging them, which can contribute to improved outcomes. They are effective in eliciting patient histories, which improves diagnostic accuracy, patient-provider relationships, and therapeutic effects. Narrative techniques can also provide structure for social networking communities; in the case of patients, these narratives can offer a superior level of patient education, decision-making, and self-care support. Narrative techniques also provide a potentially richer way of assessing patient adherence, satisfaction, and the effectiveness of clinical services and interventions. Finally, narrative adds a layer of depth to online market research.

### Why use medicine in narrative?

#### In the diagnostic encounter, narratives:

- Are the phenomenal form in which patients experience ill health
- Encourage empathy and promote understanding between clinician and patient
- Allow for the construction of meaning
- May supply useful analytical clues and categories

#### In the therapeutic process, narratives:

- Encourage a holistic approach to management
- Are intrinsically therapeutic or palliative
- May suggest or precipitate additional therapeutic options

Adapted from Greenhalgh and Hurwitz. 1999. Why study narrative? *British Medical Journal* 318:48-51.

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- Overcash

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Narrative can be defined along a spectrum of breadth, from the narrow narrative-as-story to the broader narrative-as-personal-expression using any medium. As a story, it is a personal account of a sequence of actions or events that is told to another person or written for a reader. Alternatively, narrative can be viewed as not the story itself but rather the telling of the story; a narrative recounts some set of events, perhaps leaving some occurrences out because they are from some perspective insignificant, while emphasizing other occurrences. Narratives thus shape history (Miami University).

For the healthcare applications discussed in this report, implementing narrative techniques can be deconstructed into phases as follows:

- Eliciting narrative
- Capturing content
- Tagging / indexing
- Knowledgebase construction
- Natural language processing
- Impact-based evaluation

### Eliciting narrative

In narrative training, medical students and professionals are taught to ask open-ended questions that elicit stories and emotions. There are a number of tools for incorporating narrative techniques, most of which focus on a “pre-hypothesis” or ambiguous method of prompting narrative replies. By disguising what information is sought, the subject (which might be a patient or clinician) provides unbiased, unprompted responses.

These open-ended questions come in many forms. One type is “deconstructive,” where the researcher asks questions like “who told you real men don’t pay attention to their health?” in order to get to the root of a belief system. Another type is “perspective,” where the researcher tries

to help the patient understand his or her problem in a new way, via questions such as “does everyone agree that you’re not capable of managing diabetes, or does someone have a different idea?” (Shapiro, Ross).

### Capturing narrative

Narrative comes in many forms, including written language, digital language, digital images, audio dictation, drawings, MP3s and music, video, and URLs. Opportunities for capture can occur in conjunction with a survey or interview that assesses patient satisfaction, a focus group for product development, or through a prescribed intervention – medication or procedure – that assesses attitudes and beliefs. Narrative can also be captured before or after a consult or physician visit that prompts historical accounts of illness and treatment choices.

The Internet has greatly facilitated the capturing of narrative, as content can be found on clinical provider and therapeutic products websites, physician and patient online communities, and throughout healthcare blogs, chat rooms, and message boards. Narrative tools have been used in other industries to transform this sort of “user-generated content” into a knowledge asset and market trending tool.

### Tagging / indexing narrative

There are a number of ways in which text-based narrative content can be synthesized and analyzed to generate more quantitatively oriented findings. Common approaches involve attaching descriptors like tags (keywords) or indexes (retrieving concepts) or extracting thematic patterns as “codes” (commonalities). The content author or a researcher can manually code content by looking for recurring ideas or subjects, or use Internet tools to attach tags to narrative content. One system

**BrainTalk Communities**  
Online Patient Support Groups for Neurology  
est. 1993 "Community and Compassion"

[ Home | Public Library of Science | Dictionary & Thesaurus | Medical Dictionary | PubMed | Drug Info |

BrainTalk Communities > General Subjects > Memory Deficits  
**Short term and working memory loss is driving me crazy**

Register FAQ Members List Calendar Today's Posts Search

03-19-2008, 01:13 AM #7

Vince F  
New Community Member  
Join Date: May 2007  
Posts: 12

Quote:

Originally Posted by **notinvisible**  
*To make a long story short- I am 24. I was diagnosed with short term memory loss and a working memory problem. I scored in the 8th percentile or less for both of these which basically means its terrible.*

*At any rate, now I have graduated college and I have my first real job, teaching Special Ed. I keep getting myself in trouble because I cannot remember anything! I write things on notes but they don't help, my calendar isn't big enough, and I would lose a Palm Pilot (I lost my keys 4 times in one day a few weeks ago).*

*Also I get distracted very easily and as a special educator, I have to take behavior notes on kids. When I go to take a behavior note, when I try to go back to teaching, I can't remember what I was teaching and vice versa.*

*Does anyone have a good idea that I can use to organize myself before I go crazy? Any good websites, tools, assistive technology, etc?*

*Thank you so much!*

What was the cause of your problem?

I had a chemical injury that damaged my brain and everything else. I couldn't remember much, but my long term memory was still pretty good. I had to relearn a lot. I was recommended for cognitive therapy, but physically I couldn't handle the schedule. To do things I had to write down the steps, and even then I had to wait till I could do the task, which usually took an emergency to get me moving. I watched Sesame St a lot, and that helped some things, and for math that I couldn't do in my head, I made exercises, like writing the multiplication tables, and adding and subtracting groups of numbers I was involved with, like estimating what foods I was going to buy would cost, and adding the numbers. I was buying a PC, and I had to add parts to a bare bones unit, so I listed the price of the bare machine, and added different parts, adding each one to the list of prices of the parts with a different one added, like a bigger hard drive. I did it over and over, because I would forget what the totals included, even though I listed each item, it didn't make sense, so I would redo them. If I was reading something I would forget what I read, and would keep going back and rereading. I used to design and build a lot of things, and would draw the design, and when drawing it with changes, I would redraw what I drew before, or make a mistake, and have to Redraw it. I had lost my ability to visualize in 3D, so it was hard to design complicated things, and I used to design and build complicated speaker cabinets with expanding and turning passageways, and when trying to draw them I would want to turn my head to try to visualize and draw them, which doesn't work.

VF

I think these exercises helped me remember, or figure how to, maybe putting the abilities into longer term memory or something, that helped me figure how to remember new and different things.

Quote

From BrainTalk Communities, a neurology online patient community, excerpted posts demonstrate how narratives provide not just therapeutic support from fellow patients, but also practical insights for managing disabilities. <http://brain.hastypastry.net/forums/>

developed by “Cognitive Edge” applies semi-structured tagging to narrative content to generate “numerical data with rich context” (Snowden).

## Natural language processing systems

Narrative provides an undeniably rich source of data, but it is difficult to reliably assess by computerized processes. Natural language processing (NLP) systems, a type of artificial intelligence, analyze natural human language content with computers and programmed semantic knowledge to extract coded or structured data. “Because healthcare data are often narrative, natural language processing is another important technique for mining data for quality improvement and patient safety purposes” (Friedman). NLP systems have been shown to be effective in decision support, surveillance of infectious diseases, research studies, automated encoding, quality assurance, patient records indexing, and billing applications.

## Narrative applied to cognitive profiling instruments

Healthcare market research typically strives to understand the mindsets of patients and physicians at either an individual or group level so as to optimally engage them. In order for health interventions and patient-provider communications to be effective, understanding a person’s attitudes and beliefs is essential. As Overcash states, “Narrative research provides an option to explore personal experiences beyond the boundaries of a questionnaire, providing insight into decisions involving treatment, screening, or various health practices, which can help guide how healthcare services are developed and provided.”

In market research, narrative techniques involve the collection and analysis of accounts describing the subject’s experience of actual or hypothetical events. The

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aim of narrative technique is to explore how the individual makes sense of the events, his or her attitude toward them, what meanings the events hold, and how these feelings arise. The power of narrative methods resides in their ability to make explicit – or reveal the implicit – mental filters that shape our thinking.

This type of research has distinct advantages over traditional market research, in large part due to the limitations of surveys. Surveys inevitably contain biases regarding the hypothesis and do not allow for nuance: answer options tend to be one extreme, another extreme, or a vague descriptor such as “it depends.” Narrative prompting, in contrast, is pre-hypothesis. That is, because narratives can be elicited using ambiguous and indirect language, the researcher does not need to formulate a hypothesis, nor is the subject exposed to the inevitable, accompanying biases.

Market research that integrates narrative is useful for gaining insight into a particular group’s behavior patterns and mindset. Internet tools and platforms provide new mechanisms for patient-consumers and clinicians to express in-depth reactions to healthcare experiences via narrative. Tapping into these dynamic online networks provides an unprecedented ability to follow the twists and turns of thoughts and opinions and is thought to be an important source for healthcare innovations going forward (Hoch).

Overcash uses one example of African women whose fatalistic belief system prevented them from being screened for breast cancer. The practitioners used cognitive profiling and narrative to capture and address these women’s specific fears and misconceptions using tailored messages, resulting in successful increases in screening. A second example of cognitive profiling at work is a 2007 study that examined self-care in heart failure patients. Self-care is a complex behavior influenced by a plethora of factors including mental

health, attitudes, self-efficacy, cognition, physical functioning, fatigue, and comorbidities. Dickson, Deatrick, and Riegel conducted a series of semi-structured interviews to obtain qualitative data. They were able to use these findings to create three patient groups with distinct cognitive profiles based on their habits and levels of self-efficacy. Their subsequent development of tailored interventions would not have been possible without using these narrative techniques, they concluded.

### **Narrative applied to care delivery instruments**

In addition to its application to cognitive profiling and market research, narrative can be applied before, during, and after the point of care. Narrative provides meaning, context, and perspective for the patient’s predicament. It defines how, why, and in what way the person is ill: “Understanding the narrative context of illness provides a framework for approaching a patient’s problems holistically, as well as revealing diagnostic and therapeutic options. Furthermore, narratives of illness provide a medium for the education of both patients and health professionals and may also expand and enrich the research agenda. Indeed, it is thought that anecdotes, or ‘illness scripts,’ may be the underlying form in which we accumulate our medical knowledge” (Greenhalgh, Hurwitz).

In the diagnostic encounter, narratives encourage empathy and promote understanding between clinician and patient. They allow for the construction of meaning and they may supply useful analytical clues and categories. In the therapeutic process, narratives encourage a holistic approach to management and are intrinsically palliative. In the education of patients and health professionals, narratives are often memorable, are grounded in experience, and encourage reflection.

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The use of narrative prior to and during the medical encounter is important because it complements evidence-based medicine. As Greenhalgh puts it, “Appreciating the narrative nature of illness experience and the intuitive and subjective aspects of clinical method does not require us to reject the principles of evidence-based medicine. Nor does such an approach demand an inversion of the hierarchy of evidence so that personal anecdote carries more weight in decision-making than the randomised controlled trial. Far from obviating the need for subjectivity in the clinical encounter, genuine evidence-based practice actually presupposes an interpretive paradigm in which the patient experiences illness in a unique and contextual way. Furthermore, it is only within such an interpretive paradigm that a clinician can meaningfully draw on all aspects of evidence – his or her own case-based experience, the patient’s individual and cultural perspectives, and the results of rigorous clinical research trials and observational studies – to reach an integrated clinical judgment.”

Using pre-encounter narrative as a basis for in-person discussion allows the therapeutic bond with patients to develop and deepen without extensive office time. Focus is shifted toward the patient rather than toward the clinician and the system of managed care. Research has touched on the therapeutic nature of narrative in terms of mental health and sense-making as well. Orgad says, “It can be argued, that fundamentally, patients’ storytelling online [or during the medical encounter] is an attempt to regain some ‘normality’ in their lives; lives that have been disrupted by illness. It enables patients to hold on to a sense of themselves as agents who have control, however little, over their lives.” Narrative allows the patient to regain order and establish continuity of experience, which directs it toward closure. This process has been described as ‘emplotment,’ or

the configuration of different events into a whole (Polkinghorne, Somers, based on Ricoeur, as cited in Orgad).

New technologies are facilitating the reintegration of narrative into the practice of medicine. Technology allows patients to provide narrative outside and prior to a doctor visit, and it affords a sense of anonymity and privacy that can encourage higher levels of disclosure. This disclosure may occur through electronic forms completed before a visit or through online support groups, chat rooms, or other forms of communication. Providers who use an electronic medical record, or EMR, can incorporate narrative into it. Physician practice portals that support patient engagement and secure communications also provide patients a vehicle for sharing narrative.

### **Narrative applied to community instruments**

A third application of narrative technique is online patient and physician communities. The Internet has facilitated the formation of large communities of people exchanging personal yet often anonymous stories. The narratives exchanged through online patient communities not only foster support and encouragement, but also can generate an advanced level of collective expertise concerning the specific, shared disease. For example, epilepsy specialist Dan Hoch observed online epilepsy patient communities and found, “In 70 percent of postings, group members provided each other with what amounted to a crash course in their shared disease...these extended patient narratives – no two alike – thus gave rise to an accumulated body of what my colleagues and I began to think of as an expert patient knowledge base” (Hoch and Ferguson). Hoch and Ferguson further concluded that patient narrative communities could play a critical role in complementing the physician’s time-lim-

ited, encounter-based explanations, and provide valuable self-care advice that a provider cannot.

Online patient communities also have tremendous therapeutic value. The use of narrative on the Internet allows patients to develop relationships with people who are going through or have gone through similar experiences, which can be quite therapeutic in terms of education, support, decision-making, and self-care. The voicing and sharing of stories fosters 'emplotment,' a sense of control, and a sense of closure. Some of the mystery and fear that fuels many illness trajectories is mitigated.

There are a growing number of online patient communities centered upon narrative exchanges. For example, a United Kingdom organization launched "The Database of Individual Patient Experience" (DIPEX, [www.dipex.org](http://www.dipex.org)) in 2001 as a vehicle to collate, index, and publish the experiences – in narrative form – of patients with a wide variety of illnesses. The database is accessible to patients, their families and caretakers, researchers, policymakers, and clinicians. Another patient community site, [www.tudiabetes.com](http://www.tudiabetes.com), describes itself as "for people with diabetes to connect with each other." It currently has close to 2,300 active patient members who share experiences about living with diabetes, post videos and photos, and enter discussion forums and special interest groups.



The screenshot shows the DIPEX.org website interface. At the top, the logo "DIPEX.org" is displayed next to the tagline "PERSONAL EXPERIENCES OF HEALTH & ILLNESS". Navigation links include "Home", "Experiences", "Forum", "News", "Help!", and "Contact Us". A red banner at the top right highlights the "Heart Attack" category.

The main content area features an "Interview HA22 Transcript" section. It includes a video thumbnail of a woman in an orange top, with "play audio" and "play video" buttons. Below the video, a blue headline reads: "Support from the staff and talking to other heart patients at cardiac rehabilitation helped her to recover." The transcript text follows, discussing the benefits of cardiac rehabilitation and the support from staff.

To the right of the transcript is a "Patient" section titled "Other Interview Clips". It lists several hyperlinked snippets of text, such as "The nurses told her strict bed rest, the doctors wanted her to have a treadmill test; she wondered who to believe.", "High blood cholesterol was the only risk factor that might have contributed to her heart attack.", "It took a bit of time to accept what had happened to her, but then she made a conscious effort to put it behind her.", "Support from the staff and talking to other heart patients at cardiac rehabilitation helped her to recover.", "A cough, some hair loss and vivid dreams are the side effects of her medicine.", "Describes what having angioplasty was like.", and "She made little change to her diet."

DIPEX is a large scale UK repository of patient narratives describing illness courses provided as a resource to patients, families, clinicians and researchers. <http://www.dipex.org/DesktopDefault.aspx>

## Narrative applied to evaluation instruments

A fourth application of narrative technique is to evaluate the safety, effectiveness, and value of a healthcare intervention or of clinical services. Traditionally, healthcare evaluation methods involve quantitative metrics, and frequently are based on hard and fast thresholds. But in complex human social systems like healthcare, outcomes are not always determined by inputs. Impact is multi-dimensional and should be examined as such, via multiple lenses and methods.

Knowledge management experts have developed innovative narrative research techniques for evaluating intervention impact, in a manner that melds qualitative with quantitative data. For example, the government of Liverpool engaged Snowden's Cognitive Edge firm to develop a system for measuring the educational impact of a children's museum program ([www.pstm.net/pdf/363738PSTM%20-%20Sept%203.5.pdf](http://www.pstm.net/pdf/363738PSTM%20-%20Sept%203.5.pdf)). The resulting eval-

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uation instrument instructed the children to go to an online post-museum visit site to “tell six stories about their experiences related to indirect prompts... then index in those stories over ratings and filters from about 15 questions.” As Snowden describes, the system they developed generates three tools:

- Statistically Guided Measures backed up by narratives: “By the end of the year, you will have several hundred thousand stories, indexed by the children... the figures carry the context with them.”
- Instant Impact Monitoring: “a dynamic feedback mechanism for impact measure which allows you pick up trends early and immediately find the context and take action.”
- Knowledge Database: “Because once you’ve actually got stories indexed by people, the metadata, the way they index it, becomes clear.”

Greenhalgh and colleagues have identified four approaches to the use of narrative in healthcare quality improvement research. They are narrative interview, naturalistic story gathering, organizational case study, and collective sense-making (Greenhalgh, Russell, Swinglehurst). Narrative interview can provide vivid detail about the functioning of the healthcare system. The evaluation of end-of-life care via the collection of narrative is one example of how this type of quality improvement research can be beneficial. Naturalistic story gathering requires more resources but is potentially more powerful: it involves field research and immersion in the environment or system being studied. Gathering stories and conducting informal interviews

with nurses at a hospital that has adopted the EMR is an example. In this type of research, context is taken into account, and the ethnographic nature of it may capture more detailed data.

The third approach to using narrative in quality improvement research is through the organizational case study. This process entails detailed analysis of one organization (or team or unit) through narrative with the goal of understanding why particular events unfold as they do. Finally, quality improvement research can use narrative through collective sense-making, where a team works to develop a shared perspective on the problem and implement change. All of these quality improvement methods “allow the individual participant to determine the information constructive and relevant to the discussion” and provide detail that “one would not come to understand at all where (the patient) is with respect to his thinking from a questionnaire or a highly structured interview” (Overcash).

## **Conclusion**

In conclusion, the use of narrative techniques in medicine has become not only recommended but essential to the advancement of the healthcare system and those who touch it. Addressing the thoughts, attitudes, emotions, and perceptions of patients and physicians alike so as to better engage and support them has become feasible and advantageous through informatics technologies and the Web. This more cognitively advanced approach to medicine has the potential to truly transform the system and lead to superior clinical and psychological outcomes.

## References

- Binks G. 2007. Dr. Jerome Groopman, *How Doctors Think*. CBC News. Accessed on March 25, 2008 at <http://www.cbc.ca/news/background/health/books-how-doctors-think.html>.
- Definition of narrative. Miami University. Accessed March 25, 2008 at <http://www.units.muohio.edu/technologyandhumanities/nardef.htm>.
- Dickson VV, Deatrck JA, Riegel B. 2007. A typology of heart failure self-care management in non-elders. Published January 3, 2008 on the *European Journal of Cardiovascular Nursing* website.
- Elwyn G, Gwyn R. 1999. Stories we hear and stories we tell: Analysing talk in clinical practice. *British Medical Journal* 318:186-188.
- Friedman C. 2005. Semantic text parsing for patient records. In *Medical Informatics: Knowledge Management and Data Mining in Biomedicine*. Chen S, Fuller SS, Friedman C, Hersh W., eds. New York: Springer Publishing.
- Greenhalgh T. 1999. Narrative based medicine in an evidence based world. *British Medical Journal* 318:323-325.
- Greenhalgh T, Hurwitz B. 1999. Why study narrative? *British Medical Journal* 318:48-51.
- Greenhalgh T, Russell J, Swinglehurst D. 2005. Narrative methods in quality improvement research. *Quality and Safety in Health Care* 14:443-449.
- Greenhalgh T, Wengraf T. 2008. Collecting stories: Is it research? Is it good research? Preliminary guidance based on a Delphi study. *Medical Education* 42:242-247.
- Groopman: The doctor's in, but is he listening? National Public Radio. Accessed March 25, 2008 at <http://www.npr.org/templates/story/story.php?storyId=8946558>.
- Hassey A. 2006. "If things were simple..." presentation to SCIMP conference. Accessed April 1, 2008 at [www.scimp.scot.nhs.uk/documents/conference2006/dr.%20hassey%20day%201.ppt](http://www.scimp.scot.nhs.uk/documents/conference2006/dr.%20hassey%20day%201.ppt).
- Herman D. 2003. Introduction. In *Narrative Theory and the Cognitive Sciences*, Center for the Study of Language and Information-Lecture notes.
- Hoch D, Ferguson T. 2005. What I've learned from e-patients. *Public Library of Science* 2(8):206.
- Hurwitz B, Greenhalgh T, Skultans V. 2004. Introduction. In *Narrative Research in Health and Illness*. Hurwitz B, Greenhalgh T, Skultans V. eds. London: Wiley-Blackwell.
- Lombardi V. 2003. Metadata glossary. Accessed March 26, 2008 at [www.noisebetweenstations.com/personal/essays/metadata\\_glossary/metadata\\_glossary.html](http://www.noisebetweenstations.com/personal/essays/metadata_glossary/metadata_glossary.html)
- Orgad S. 2006. Patients' experience of internet environments: Storytelling, empowerment and its limitations. In *Media, Connectivity, Literacies and Ethics*, The London School of Economics and Political Science discussion series.
- Overcash JA. 2003. Narrative research: A review of methodology and relevance to clinical practice. *Oncology Hematology* 48:179-184.
- A review of narrative methodology. Australian Government Department of Defense. Accessed March 20, 2008 at <http://dSPACE.dsto.defence.gov.au/dSPACE/bitstream/1947/3817/1/DSTO-GD-0385%20PR.pdf>.
- Shapiro J, Ross V. 2002. Applications of narrative theory and therapy to the practice of family medicine. *Family Medicine* 34(2):96-100.
- Snowden D. 2007. Cognitive Edge. Accessed on January 24, 2008 at <http://www.cognitive-edge.com>.
- What is narrative medicine? Program in Narrative Medicine. Accessed March 20, 2008 at <http://narrativemedicine.org/about/about.html>.
- Tag. Wikipedia. Accessed March 25, 2008 at [en.wikipedia.org/wiki/Tag](http://en.wikipedia.org/wiki/Tag) (metadata)