



Volume 8 - Number 3

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Newsletter

Robin Starr-Chichester (Conifer, CO) - President; James V. Schoster (Wisconsin) - President Elect, James T. Case (UC-Davis) - Secretary Treasurer; Ronald D. Smith (Illinois) - Newsletter Editor

IN THIS ISSUE

ASSOCIATION NEWS	2
AVI Nominations.....	2
How to Contact AVI.....	2
CORRESPONDENCE.....	3
Web Site for Online Pet Health Records.....	3
Hand Held Computers In Veterinary Medicine.....	3
VMDB Update	4
AVI at the 1999 AVMA CONVENTION.....	4
PRODUCTS & REVIEWS.....	7
Swine Health/Food Safety Resources.....	7
Lost Pet Recovery Made Easier.....	7
VETcalc Practice Analysis Program.....	8
VETcalc Publications Press Release.....	9
INTERNET RESOURCES.....	9
Cattle On Feed (PCT-BB)	9
Agrobase Bibliographical Database.....	9
National Library of Medicine Unveils Web-based Online Catalog.....	9
NEWS & COMMENTARY.....	10
The Internet and the Future of Telehealth.....	10
MEETINGS & EDUCATIONAL OPPORTUNITIES.....	13
1999 Talbot Symposium.....	13
SUGGESTED READING.....	13
International Journal of Medical Informatics	13
Telemedicine Journal.....	14
Evolution of Profession-Specific Markup Languages.....	14
CLOSING BITS.....	15
How Does the Computer Chicken Cross the Road??.....	15

ASSOCIATION NEWS

AVI Nominations

The Association for Veterinary Informatics is now soliciting nominations from its membership for the offices of President-elect and Secretary-Treasurer. Any full member of the organization is eligible.

The Secretary-treasurer serves for three years and is responsible for the financial affairs of the Association. The secretary-treasurer is also responsible for management of the AVI membership, distribution of the paper version of the Association newsletter, distribution of annual ballots for election of officers and for all communication with the membership.

The President-elect serves for one year, during which time they are the program chair for the Richard Talbot Symposium. After the first year, the President-elect becomes President of the association for one year, during which they guide the direction of the organization in association with an executive board consisting of the Secretary-treasurer, newsletter editor, President-Elect and Immediate Past President. Following their one year term, the President serves a one year term as Immediate Past President, during which they serve as chair of the nominating committee.

To nominate individuals for these offices, please send their name and a brief statement in writing or by Email concerning their qualifications before May 31, 1999 to:

Dr. Charles A. Cohen
Chair, AVI Nominating Committee
214 Main Street
Branford, CT 06405
Email: 74232.41@compuserve.com

How to Contact AVI

Applications for membership, accompanied by a check for \$35 payable to the AVI, should be sent to:

Dr. James T. Case; Secretary Treasurer, AVI;
1590 Augusta Ct., Dixon, CA 95620
Phone: 916/752-4408; FAX: 916/752-5680; e-mail: JimCase@aol.com

Membership application forms are available online at:

<http://netvet.wustl.edu/avi.htm>

Dr. Case is responsible for distribution of the hardcopy version of the AVI Newsletter.

Newsletter items can be sent to:

Dr. Ronald D. Smith, Newsletter Editor, AVI;
UI College of Veterinary Medicine; 2001 South
Lincoln; Urbana, IL 61801.
Phone: 217/333-2449
FAX: 217/333-4628
E-mail: <rd-smith@uiuc.edu>

If you are an AVI member and would like to be on the AVI Newsletter electronic distribution list, send an e-mail message to the Newsletter Editor. Although the electronic version is only an ASCII (text) file, it's faster, searchable, easier to store and retrieve, and environmentally friendly.

Current and past issues of the AVI Newsletter are also available on the Web at:

<http://netvet.wustl.edu/avi.htm>

CORRESPONDENCE

Web Site for Online Pet Health Records

From: Bill Cabana; Global RXData.net
<marketing@rxdata.net>

RE: Association for Veterinary Informatics

Dear Mr. Case:

We have a site that would be useful for your association members to know about. It is the first "free" public service site where pets and people can place their health records for use by themselves and medical personnel worldwide.

It is a very comprehensive database and has fields to accept many kinds of data such as complete health and veterinarian records, microchip numbers, immunizations, treatments, insurance providers, along with other pertinent data. Our service is beneficial for people with pets who travel or transfer to another veterinarian. They will feel secure in the fact that they have put their pet's medical records online for retrieval in the event of a medical emergency that might occur while on trips or using a new veterinarian. I'm sure you can see the benefits of this: * Easy accessibility and completeness of data for the veterinarian when registering or treating emergency cases of new patients. * It will save time for the veterinarian's office staff and increase efficiency. * Gives reminders to owners when scheduled treatment is needed for their pets. * Helpful in recovering lost pets. * Provides pet insurance carrier information. * Useful for pets who need medical care when away from home. * Provides information to kennels boarding animals. There is no cost to you or your members for this service. This is a free service you could offer your members. The only thing I would ask of your association is to promote the use of our site to record their pet's health record data. You can do this by links and whatever methods you have to disperse information to your association members. Your endorsement or acknowledgement of our service will be greatly appreciated if you see the benefits of doing so.

You can see the site at: <http://www.rxdata.net>

At the main menu, click on: "Place your pet's health records online." Please let me know if you feel this is something you would like to pursue.

Thank you for your consideration.

Bill Cabana
Executive Vice-President
Global RXData.net
marketing@rxdata.net
<<http://www.rxdata.net>>

Hand Held Computers In Veterinary Medicine

From: Mark Acierno
<macierno@CVM.MSSTATE.EDU>

I am trying to develop a central source of information pertaining to the use of handheld computers (i.e.: Palm Pilot) in veterinary medicine. While searching the Internet I found many web sites (both commercial and non-commercial) which focus on the use of HHC in human medicine but not one for vet med. I find it hard to believe that an inexpensive product such as a Palm Pilot could have such a large impact in human medicine and at the same time be ignored in our field. If you have found a hand held computer useful in practicing medicine, organizing your practice, or are just interested in the potential use of HHCs in veterinary medicine please visit my site:

<http://www2.msstate.edu/~mja2>

The focus right now is on the palm pilot - partly because that is what I own and partly because it is the largest seller in the HHC category - however, I would be more than willing to expand the site to include other HHCs. If every one contributes just a little, we could accumulate a large collection of useful information and programs quite quickly. Also I encourage everyone to look at what MDs are doing with their HHCs as an example of how hand held technology can influence the practice of medicine.

VMDB Update

From: Allen W. Hahn
<hahna@MISSOURI.EDU>

The current Veterinary Medical Data Base is housed at Purdue Univ. and is managed by the Veterinary Medical Data Program Participants, a consortium of schools and colleges of veterinary medicine. It was originally designed to collect ABSTRACTED data about individual cases submitted to the various teaching hospitals in the US and Canada. It currently has the abstracted data of over 5.4 millions visits since 1964. The system was designed, however, to only contain abstracts of visits and currently contains no data about outcomes (except whether the animal was discharged alive

or dead) and no data about treatment. All data are coded in the STd. Nomenclature of Veterinary Diseases and Operations (SNVDO) for both diagnoses and procedures. The system was originally funded by the National Cancer Institute to track cases of neoplasia (primarily) in the animal population. It worked! Now the system is being revitalized to extend and expand the submissions with more relevant data. The AVMA Infomratics Standards Subcommittee is actively revising the abstract model and we hope to have some new things to bring to the profession within the year. How can we help the rest of the profession with this matter?

AVI at the 1999 AVMA CONVENTION

Sunday July 11th
AVI Computer Laboratory
11:00 AM to 12:30 PM
Multimedia Education Center

**Advanced Internet Search Strategies for the Intermediately
Experienced User**
Moderator - Dr. Stuart Turner

One 90 Minute Session Limited to 20 Participants

(AVI at AVMA continues on the next three pages)

Monday July 12th 1999 TALBOT SYMPOSIUM

"Basic and Advanced Computer Topics for the Practitioner" *Dr. James Schoster -- Moderator*

Dr. Dale Herman will tell you exactly what you need to know about computers and how you can increase your bottom line , improve patient care and expand your clinical knowledge by computerizing your office.

Basic Computer Topics for Practitioners

1. Nuts and Bolts of a Computerized Practice

- 8:00 am - 8:45 am
"The Anatomy of a Computer – Taking a Byte Out of the Mystery!"
- 8:45 - 9:30 am
"Making Those Bytes Fly on a Single System or a Network"

BREAK

2. Implementing My Computerized Office

- 10:15 am - 11:00 am
"Take a Megabyte out of Your Workload - Computerize!"
- 11:00am - 11:45 am
"Putting Those Bytes to Work for You"

Advanced Computer Topics for Practitioners

- 1:00 pm - 1:20 pm
"Using the World Wide Web to provide Clinical Laboratory Results to Practitioners" - Charles Branch
- 1:25 pm - 2:00 pm
"Clinical Decision Support for Veterinary Practice" - Craig Carter, DVM
- 2:05 pm - 2:30 pm
"The Electronic Medical Record" - Stuart Turner, DVM

BREAK

- 3:15 pm - 3:45 pm
"Education via CD ROM -- Anytime Anywhere Anyone" - Peter K. Shires
- 3:50 pm - 5:00 pm
"Techniques and Strategies for Veterinarians Searching the Internet" - Ken Boschert, DVM

Tuesday July 13th

"Getting the Most Out of a Computerized Clinical Practice"

Dr. Robin Starr -- Moderator AM Session

Dr. Duane Stewart -- Moderator PM Session

AM SESSION <i>Room 212</i>	PM SESSION <i>Room 212</i>
<ul style="list-style-type: none"> • 8:00 - 8:45 am "Digital Video: Uses and Abuses" - Dr. Charles Branch • 8:50 am - 9:30 am "Digital Imaging: basics of Image Acquisition and Management" - Dr. Andrew Dibbern <p>BREAK</p> <ul style="list-style-type: none"> • 10:15 am - 10:45 am "Building and Maintaining a Professional Practice Web Site" - Dr. Peter K. Shires • 10:50 am - 11:20 am "Supporting Basic Science Instruction with the World Wide Web" - Dr. Gary Allen • 11:25 am - 12:00 pm "The Use of Interactive Fiction as a Teaching Tool in Veterinary Education" - Dr. Rob Keagan 	<ul style="list-style-type: none"> • 1:00 pm - 1:20 pm "Current State of Information Technology and Faculty Expertise and Experience in the UK and USA." - Dr. Linda Ross • 1:25 pm - 1:45 pm "A World Wide Web site for Basic Equine Practice Management Information" - Dr. John Dascanio • 1:50 pm - 2:10 pm "Designing a Diagnostic Engine; Lessons Learned Developing Fish-Vet-Diagnostic Program for Fish Disease" - Dr. Daniel Zeldis • 2:15 pm - 2:30 pm "An Anesthesia Bibliographic Database for Veterinarians via the WWW: Animal Capture and Anesthesia Database (ACAD)" - Dr. David Brunson <p>BREAK</p> <ul style="list-style-type: none"> • 3:15 am - 4:00 pm "Evaluating SNOMED Coverage of a Specialty Vocabulary" - Dr. Allen Hahn • 4:05 pm - 4:25 pm "Electronic Identification and Tracking of Food Animals from the Farm to the Table" - Allen W. Hahn, DVM • 4:30 pm - 5:00 pm "Customizing Antimicrobial Regimens Through Use of a Therapeutically Based Antimicrobial Use Database for Food Animals" - Dr. Virginia R. Fajt • 5:00 pm Closing Remarks

Tuesday July 13th

AVI Poster Session

Room 213

- "Assisted Diagnosis of Anemia in dogs and cats using an interactive Internet based decision support group." - Dr. Stuart Turner
- "The Diabetic Cat" - Dr. Stuart Turner
- "The Patient Calculator" - Stuart Turner, DVM
- "Profit 3.0 An Expert System to Cattle Raising" - Dr. Gustavo Quiroga Souki
- "Medicolegal Concerns and the Complete Patient Medical Record" - Valerie Ball
- "Computer Based Training Program for Veterinarians: Bull Reproduction" - A. Tibary and Mushtag Memon

PRODUCTS & REVIEWS

Swine Health/Food Safety Resources

From: Michael Meredith
<meredith@farmline.com>

"Porcine Reproductive & Respiratory Syndrome"

<http://www.pighealth.com/Products/PRRSINFO.HTM>

"Pigs on the Internet" diskette guide to swine & food safety resources

<http://www.pighealth.com/Products/POIDISK.HTM>

Dr. Michael Meredith, M.A., B.Sc.,
B.Vet.Med., Ph.D., MRCVS Pig Disease
Information Centre
4, New Close Farm Business Park
Bar Road, Lolworth, Cambs., CB3 8DS, U.K.
UK Tel: 01954-780695 UK Fax: 01954-
780235 International fax:+44-1954-780235 or
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meredith@farmline.com Email:
pdic@btinternet.com Website:
<http://www.PIGHEALTH.COM> Company
registered in England No. 3263526 Members of
AHIS (Animal Health Information Specialists)
UK & Ireland

Lost Pet Recovery Made Easier

Englewood, FL. -May 19, 1999. --Every day
pets are lost. There are approximately 110
million owned dogs and cats in the U.S. about

7.5 million of them are admitted to animal
shelters each year. Tragically, the majority of
them never make it home. Most are destroyed
because their owners cannot be found! Millions
of pets are euthanized annually.

Registering your pet in the "free" RXData.net
health records database on the Internet will
increase your chances of recovering your lost
pet. Veterinarians and Pet Shelters worldwide
are now using a special system to identify
companion animals which incorporates
microchip technology.

The microchip is a tiny computer chip which
has an identification number programmed into it
and is encapsulated within a biocompatible
material. The whole device is small enough to
fit inside a hypodermic needle and can be
simply injected under the skin of pets, where it
will stay for the life of the animal. This
provides a permanent, positive identification
which cannot be lost, altered or intentionally
removed. Its a safe, simple and inexpensive
way to protect your pet against loss or theft.

Implantation of the chip can be performed by a
local Veterinarian and is no more difficult than a
routine injection. It takes less than a minute
including preparation. Animals of any age can
be injected with the microchip. Once implanted,
the microchip requires no further attention
during the animals' lifespan.

The microchip contains a unique number so no two animals will ever have the same number. A radio signal from a scanner is used to read this number through the skin of your pet. In addition to the number, the microchip generates a reliability check to insure that the pet's identifying number is read accurately. These devices are manufactured by such firms as AVID Canada, which is endorsed by the Canadian Kennel Club, and Shering-Plough which makes the "HomeAgain System" and is endorsed by the American Kennel Club.

When a pet is found, it is scanned for a microchip to get the number. A search for that number in RXData.net's database will then identify it. The database not only has provisions for this number and any tattoo identification numbers but complete pet health records as well. Placing the microchip or tattoo number in the database will enable vets and shelters to not only identify and contact the pet's owner, but will provide them with health information necessary to treat the pet as well.

For people without Internet access, Medical Assurance Registry will enter the data for a nominal charge. To get details, send a self addressed stamped envelope to the address below indicating the number of pets to be registered.

RXData.net(tm), founded in 1998, is the combined efforts of J.R. Wigley and W.A. Cabana both of Englewood, FL. To reach their web site go to: <http://www.rxdata.net>. They can be reached by mail at: Medical Assurance Registry, 1811 Englewood Rd., Suite 194, Englewood, FL 34223, toll-free phone: 877-754-2391; E-mail: president@rxdata.net

VETcalc Practice Analysis Program

From: vetscalc@consultant.com

The VETcalc 15 Minute Practice Analysis Review Finding tomorrow's practice management solutions, today.

To: The Practice Owner,

Tired of trying to make heads & tails out of your end-of-month reports? In one hand, you have your practice management data and in the

other, you have your bookkeeping records. Somewhere in between, there is vital practice information that you need to capture all your practice's Profit Dollars. Up until now, if you were not a trained managerial accountant, there would be no way to bring all that data into one comprehensive review.

Finally, a 15 Minute practice management EOM review that will combine your practice management and bookkeeping data into one seamless "Profit Seeking" easy to read, simple to understand monthly practice management review.

A "Proven" 54 Pt End-of-Month Practice Management Review that will help you find, track, & capture up to an additional 50% in profit from your practice. Major Features include:

- Productivity & Cost-Volume Analysis
- Goal Setting w/ Alert Status Comparative Review
- Allocation of Cost & Profit by Providers
- What-If Analysis based upon any change[s] in Revenue, PtVolume, Fixed Cost, Staff Labor Cost, and or Inventory Cost.
- Reverse Profit Review
- Unlimited Software Support + A FREE 3 Month Operational Review

Data Entry is simple and is based upon EOM data already collected.

List Price for the VETcalc Practice Analysis program is 199.95 + SH.

This Offer includes a 12 Month Money Back Guarantee.

Sample Screens are available via an attached file upon request.

For more information, please contact:

Robert Sprague
Veterinary Practice Management
13726 Penwith Ct Chantilly, VA 20151
VETcalc@Consultant.COM
800 410-0801

Experience Base of 350+ Practices

Requires Windows 3.x or Windows95/98
The VETcalc Program is Y2K Compliant.

VETcalc Publications Press Release

Robert Sprague <VETCALC@AOL.COM>

VETcalc Publications is proud to announce the release of its first publication, "101 Ways to Improve Practice Profits". The book is divided up into two main areas:

- 1] Practice Management Analysis
- 2] Marketing Techniques & Strategies

This is an electronic publication and requires Windows95/98.

For further information, please contact Robert Sprague at VETcalc@AOL.COM or call 800 410-0801.

INTERNET RESOURCES

Cattle On Feed (PCT-BB)

<http://jan.mannlib.cornell.edu/reports/nassr/livestock/pct-bbc/>

A product of the National Agricultural Statistics Service, Agricultural Statistics Board, U.S. Department of Agriculture.

Description:

This file contains the monthly total number of cattle and calves on feed, placements, marketings, and other disappearance; by class and feedlot capacity for selected states; number of feedlots and fed cattle marketings by size groups for selected states.

Contact: help@usda.mannlib.cornell.edu

Agrobase Bibliographical Database

From: Mauricio Garcia, DVM, PhD
<mauricio@TECHNOVET.COM.BR>

Agrobase is a new brazilian bibliographical free searchable database that compiles brazilian references about agriculture, veterinary medicine and animal science. Created by the Brazilian Department of Agriculture, Agrobase can be accessed at:

<http://www.agricultura.gov.br/agrobase.asp>

National Library of Medicine Unveils Web-based Online Catalog

Donald A. B. Lindberg, M.D., director of the National Library of Medicine, has unveiled the

Library's new web catalog, called LOCATORplus, saying it "will allow anyone with Internet access to find out what books, journals, audiovisuals, manuscripts, and other items are contained in the world's largest medical library."

The National Library of Medicine, a part of the National Institutes of Health, has more than 5.3 million books, journals, artworks, and other materials in its collection.

"LOCATORplus is a big step forward for library users," Dr. Lindberg added. For example, users can search by author, subject, title, conference name, keyword and many other specific fields, then e-mail the results to themselves. Hotlinks to online journals are available from many records. Direct access to a variety of other resources is available from LOCATORplus including MEDLINE, MEDLINEplus, Images of the History of Medicine, TOXNET, HSTAT, and other U.S. medical library catalogs.

"The system brings together a number of previously disparate databases, along with information formerly available only to staff, using state-of-art information retrieval technology," said librarian Dianne McCutcheon, who coordinated the NLM team that implemented LOCATORplus. "We want librarians, physicians, scientists, scholars, and students to discover the wealth of research materials available to them. In some cases we are the only library in the U.S. to own a book or journal."

The NLM's LOCATORplus can be found at:

www.nlm.nih.gov/locatorplus/

Bob Mehnert
Public Affairs Director
National Library of Medicine

NEWS & COMMENTARY

The Internet and the Future of Telehealth

Institute for the Future
2744 Sand Hill Road
Menlo Park, CA 94025
650-854-6322 (phone)
50-854-7850 (fax)
<mailto:mcain@iftf.org>
<<http://www.iftf.org/>>

INTERNET KEYSTONES: OPEN NETWORKS AND TELE-COMMUNITIES

It's only appropriate for an issue of Telemedicine and Telehealth Networks looking at the future of telemedicine to really explore what impact the Internet will have on the future of care delivery. But the overwhelming impact of the Internet on seemingly all of modern civilization - as if you really cared that the California milk advisory board has a home page at <<http://www.calif-dairy.com>> - has actually obscured some of its vast potential. The Internet represents many things but two of its features are vital for health care's longer term future.

The first important feature is the emergence of open networks with standardized communication and transaction protocols. Standard protocols for communications and transactions either using the Internet or accessible private networks (like IBM's global network) will lead to a dramatic reduction of transaction costs, enabling smaller players (like physicians' offices and patients) to electronically conduct transactions that were previously paper-based, or didn't exist. Longer term the electronic commerce that these open networks enable will provide the opportunity for new services in both administration and care delivery.

The other crucial feature of the Internet, and its precursors and current constituents such as NSFnet, UseNet and bulletin boards, is the

existence of communities in cyberspace. Whatever your view of the merits of newsgroups and chatrooms, and notwithstanding the New York Times' attempts to portray all online chat sites as purveyors of paedophilia and narcotics, real communities now exist in cyberspace. These communities have been around since physicists in different universities chatted on the ARPANET in the early 1970s. They entail all the support, counseling and inspiration to action that their real-life counterparts provide, and many of them have a health care bent. This patient online community activism has already had an impact on clinical trials and the care of patients with cancer, aids and depression. But, outside of these health care ghettos, the most visible part of the Internet, the Web (with its fancy graphics and interactive capabilities), is starting to change from being just an information source to being a space where people hang out. In that space the information (and subsequent transactions such as purchasing) are part of the background.

Think of the Web of the future as an English pub. The English go there to drink, but they could buy beer at any liquor store and drink it in the comfort of their own homes. So the most successful pubs create an atmosphere and a community that invites "regulars" to return. Amazon.com, the on-line bookstore, is trying to create a similar type of atmosphere with literary review clubs, chatrooms, and writing contests. Their aim is still to sell more books, but to keep people coming back longer term they're trying to create more than just a transaction engine. Health plans and providers will have to work in the same direction if they are going to use cyberspace successfully.

WHAT'S TELEMEDICINE GOT TO DO WITH IT?

So what's this evolution of the Internet got to do with telemedicine as we know it? In some ways not much. That's because the current, somewhat fuzzy definition of telemedicine concentrates more on the basic use of technology than what it's trying to achieve. At the Institute for the Future we define "telemedicine" fairly narrowly to mean remote delivery of medical care using video, teleconferencing and digitized image transmission, usually among clinicians or from clinicians to patients. Telemedicine includes: * Consultation. Direct physician-patient interactions, such as psychiatric consultations, or analysis of dermatological symptoms that can be done using videoconference facilities. * Diagnosis. Remote reading of digitized radiology images such as MRIs or X-Rays, or analysis of pathology images. * Education. CME classes and transmission of grand rounds or surgery live to a remote but interactive audience. These may include distributed education programs that can be accessed via computer or TV at a later time. * Invasive Treatment. Remote treatment including the use of image-guided surgery systems, although that's still in the experimental phase.

WHAT DOES TELEHEALTH ADD TO TELEMEDICINE?

"Telehealth" is a much more interesting concept, indicating the remote delivery of any kind of care. Telehealth expands the what definition of "telemedicine" to include the who, such as: * Patients using cyberspace as a venue for counseling, education and information. * Physicians and other clinicians using information networks for education, research, information sharing and team-work. * Plans and providers using a combination of communication and information systems combined with sensor technologies to remotely monitor and remotely manage patients. Like traditional telemedicine, telehealth will not make a noticeable dent in our current medical care system for some time, but in the next few years a significant amount of this type of activity will develop for two reasons. The first reason is the reduction in the cost of technology. Dedicated networks (such as EDI networks or video-

conference facilities) are expensive to set up and use. Internet access is as cheap as basic phone service (less than \$20 a month in some places), requires little set up, and there's (as yet) no premium for prolonged use. When the reduction in the cost of open networks converges with cheap computing (now under \$1000 for some PCs or less than \$300 for a WebTV box) it will mean the ability of those outside of the upper socio-economic echelons to get on-line (or to have that service provided for them). The other reason for the growth in telehealth is the amazing recent discovery in American health care that the care of sick people is expensive, and the more you can do to keep them healthy, the less money they'll cost. I'm talking of course about demand management and its twin, disease-state management. Currently little of what's going on in those realms is rocket science. It usually consists of phone-based hassling of patients or, as it's been described to me by a couple of medical directors, "acting like their mother." But the combination of getting clinicians to follow care protocols with the ability of plans, providers or specialist companies, like Hi-Life and Cardiac Solutions, to track and influence patients' behavior outside of the doctor's office or hospital is beginning to show real results in the utilization of services by the chronically ill and those at-risk for acute episodes.

The use of all types of communications between plans and/or providers and patients, whether the Internet or other computer-based programs, TV and video, smart phones or actual human beings, will explode if and when the use of those systems is shown to translate into significant savings in utilization - savings that will fall to the bottom line. And that activity will depend on developing "telecommunity" type involvement with patients and clinicians.

The potential future of the Internet as a venue for telehealth, and in particular active remote patient management, is quite different from its current use. And it doesn't mean that the current health care uses of the Internet - research, information retrieval, marketing, simple transactions and chat and bulletin boards - are going away. What it does mean is that both the community aspect and the information/education aspect of the current Internet are going to be harnessed for the ends

of engaging patients and clinicians in the process of care management. The actors who'll do the harnessing are the organizations financially motivated to deliver (to paraphrase Lenin) better care better. They are health plans, leading providers, and a number of specialist companies who will combine the people motivation and technology management skills that will be required if health care will reap the full potential of the Internet. Their main challenges will be to solve the complex technological, human and business process issues that will appear in three main areas. 1) Team performance using intellectual capital accessed by groupware. Besides winning the 1997 prize for most business consulting buzzwords in one sentence, there is a serious message in this concept. We know that no one individual (even a doctor) knows enough in their head to solve all problems they're faced with. We also know that efficient teams are more powerful than individuals. Two of the biggest problems facing even efficient, well-run teams are accessing each other and locating relevant information. The Internet and other groupware such as Lotus Notes provide the technology to perform both those functions. So far only baby steps have been taken, but imagine how powerful a medical team could be if the sum of the organization's knowledge - its intellectual capital - was delivered when it was needed at the point of care, and all the right resources (specialist opinions, supplies, etc.) could be accessed over computer and communications systems - groupware - at the needed moment. The Internet will provide that collaborative space. But health care organizations must be prepared to make the investments in both capital and people to make this work. And that human adjustment will require an orientation to extended team work that may be difficult for clinicians to adapt to. For instance while in our 1997 Health Care Outlook survey 69% of physicians had patients who'd come in having used the Internet to investigate their diseases, only 22% of physicians recommended that they go seek information there. This is one example of a disconnect that must be mended. 2) Patient education is half the problem and 7/8ths of the battle. The Internet is clearly a great resource for education and information, and already companies like Direct Medical Knowledge are providing customized health information over

the Web on behalf of health plans. The question for its future is twofold. First, can these information systems be provided to everyone? Currently 45% of American households have computers - a number that's more than doubled over the last 5 years - and increasingly they're being used to access the Internet. But they are disproportionately in the homes of those who are college educated, have high than average incomes and are aged under 55. While this is a great market for those offering on-line banking and stock trading, these are not predominately the people who are chronically sick (who of course tend to be elderly and poor). Secondly, will this education and information provision make any difference in people's behavior and their health outcomes? The successful use of the Internet depends on those providing the information successfully understanding what motivates their sick populations, and proving that the impact of that education both works to lower utilization of acute services and ultimately creates better health outcomes. The more that plans and providers are rewarded for long term outcomes rather than for avoiding risk or performing procedures, the more likely this future is. But we are a long way from those incentives being fully in place.

THE REAL POTENTIAL LIES IN THE CONNECTION BETWEEN THE INTERNET, TELEHEALTH AND SENSORS

So is there a clear path to the utopian future I've painted? Or will health care not use the Internet, and the combination of transactions, information, education and communities it offers, as anything other than a sideshow, as telemedicine has been up to this point? The greatest potential lies in using these tools for remote care where they replace current costs (particularly nursing labor) and also improve outcomes. Remote care will depend on a new class of bio-sensors which will be temporarily attached or even permanently implanted in patients in order to record vital signs, alert a human if necessary and even make adjustments. The patient will be automatically monitored as the sensors communicate back to the provider organization over networks, including the Internet. Better outcomes with fewer hospital days and happier patients and payers are the promise. How close will this future be? Sensors will soon be cheap enough that

avoiding adverse effects to chronically ill patients by investing in the technology to monitor them remotely should make sense on a cost-benefit basis. But if actual costs such as home care visits by nurses or people sent home earlier from surgery are removed from the system immediately, the technologies will spread faster and get to more people. So clearly we'll expect this soon in cases where it's cheaper to discharge acute patients from the hospital but still necessary to monitor them at home. The next phase of roll-out depends on whether remote monitoring is cost effective for the high-risk chronically ill.

Finally, much information, such as seniors reporting about taking their medication, can be batched and doesn't need continuous monitoring - much of the labor for this, such as logging-on to the Internet or dialing an 800

number to report activities over interactive voice response, will be pushed onto the patients.

THE CHALLENGE OF TELEHEALTH

Overall, the future of the Internet in medical care is that of a venue for real care management of many varied types, mostly achieved remotely and with a minimum of human intervention. A combination of open networks, transaction standards, and sensor technologies will provide the opportunity to get us there. The real challenge will be for all of us in American health care to develop the financial incentives and human and organizational solutions to get us there in ten years rather than thirty.

A version of this article appeared in Telemedicine and Telehealth Networks, December 1997

MEETINGS & EDUCATIONAL OPPORTUNITIES

See the informatics section of NetVet for a more complete and current list of informatics-related activities at:

<http://netvet.wustl.edu/info.htm>

1999 Talbot Symposium

July 12-13, 1999; New Orleans

The 1999 Talbot Symposium schedule is available at...

<http://schoster.vetmed.wisc.edu/TalbotSchedule>

SUGGESTED READING

International Journal of Medical Informatics

<http://www.elsevier.com/locate/ijmedinf>

Formerly International Journal of Bio-Medical Computing

AIMS AND SCOPE

The Journal provides an international medium for dissemination of original results and interpretative reviews concerning the field of medical informatics.

The scope of the journal covers:

Information systems, including national or international registration systems, hospital information systems, departmental and/or physician's office systems, document handling systems, electronic medical record systems, standardization systems integration etc.; Organizational, economic, social, ethical and cost-benefit aspects of IT applications in health care;

Computer-aided medical decision support systems using heuristic, algorithmic and/or statistical methods as exemplified in decision theory, protocol development, artificial intelligence, etc.;

Evaluations of educational computer based programs pertaining to medical informatics or medicine in general.

The emphasis is on the description of clinically evaluated systems. Short technical communications concerning (solved) problems in implementing or using existing information systems are welcome. Review articles concerning subjects falling in the scope of the journal are also invited.

Contact:

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Evolution of Profession-Specific Markup Languages

From: Chuck Cohen
<CACohen@COMPUSERVE.COM>

The May issue of Scientific American has an article about the evolution of profession-specific markup languages. This seems to have occurred with the obvious development of XML and also with the enhanced capability of Unicode. I am not a terminology expert by any means, but I wonder what the effect of this is upon those who do work in medical nomenclature and esp. in publishing arenas.

CLOSING BITS

How Does the Computer Chicken Cross the Road??

ANSWERS:

Assembler Chicken: First it builds the road.

C Chicken: It crosses the road without looking both ways.

C++ Chicken: The chicken wouldn't have to cross the road, you'd simply refer to him on the other side.

```
COBOL Chicken: 0001-CHICKEN-  
CROSSING.  
IF NO-MORE-VEHICLES  
THEN PERFORM 0010-CROSS-THE-  
ROAD  
VARYING STEPS FROM 1 BY 1 UNTIL  
ON-THE-OTHER-SIDE  
ELSE  
GO TO 0001-CHICKEN-CROSSINGc
```

Cray Chicken: Crosses faster than any other chicken, but if you don't dip it in liquid nitrogen first, it arrives on the other side fully cooked.

Delphi Chicken: The chicken is dragged across the road and dropped on the other side.

G3 300 mHz Chicken: It crosses twice as fast as any Pentium chicken

Gopher Chicken: Tried to run, but got flattened by the Web chicken.

Intel Pentium Chicken: The chicken crossed 4.9999978 times.

Iomega Chicken: The chicken should have backed up before crossing.

Java Chicken: If your road needs to be crossed by a chicken, the server will

download one to the other side. (Of course, those are chicklets.)

Lotus Chicken: Don't you *dare* try to cross the road the same way we do!

Mac Chicken: No reasonable chicken owner would want a chicken to cross the road, so there's no way to tell it to.

Microsoft Chicken (TM): It's already on both sides of the road. And it just bought the road.

Newton Chicken: Can't cluck, can't fly, and can't lay eggs, but you can carry it across the road in your pocket!

NT Chicken: Will cross the road in June. No, August. September for sure.

OOP Chicken: It doesn't need to cross the road, it just sends a message.

OS/2 Chicken: It crossed the road in style years ago, but it was so quiet that nobody noticed.

OS/ 8.1 HFS+ Chicken: It had much more free space to cross.

Quantum Logic Chicken: The chicken is distributed probabilistically on all sides of the road until you observe it on the side of your choice.

VB Chicken: USHighways!<TheRoad.cross>
(aChicken)

Web Chicken: Jumps out onto the road, turns right, and just keeps on running.

Windows 95 Chicken: You see different colored feathers while it crosses, but cook it and . . . it still tastes like chicken.

Windows 98 Chicken: The DOJ may actually prevent it from crossing the road.