FOCUS

Adult Immunization, a Technology Whose Time Has Come: The Activities of the American College of Physicians

Linda Johnson White and Theodore C. Eickhoff, M.D.

As physicians become increasingly aware of disease and injury prevention practices as primary tools not only for improving the lives of Americans but for containing the costs of medical care, the American College of Physicians (ACP) espouses its beliefs in such practices through a number of policy statements. Policies against smoking, and drug and alcohol abuse, for example, have received widespread attention. Immunization, a major component of disease prevention in both children and adults, however, had been largely neglected among physicians taking care of adults. This oversight has been corrected with the 1985 publication of the ACP *Guide for Adult Immunization* (5) ("The Green Book")—a landmark effort by a professional society to provide within a single source all of the general and specific information on uses of vaccines in adults.[1] Physicians who care for older adolescents and adults now have available to them what pediatricians have had for decades (6), an authoritative guide to the vaccine needs of their patients.

Indeed, the overwhelming success of childhood immunization programs (12), and the underwhelming use of safe and effective vaccines in adults (1,2,14), led the ACP to recognize its responsibility to its members and their patients to assess and make recommendations on this important aspect of health care. In 1981, therefore, it appointed a committee of experts in infectious diseases, immunology, and preventive medicine to study the immunization practices of internists and to promote vaccine use in adults. The ACP's commitment to disease prevention in adults through immunization is shared by other major public- and private-sector groups. The National Foundation for Infectious Diseases has waged campaigns for years to encourage the use of the influenza, pneumococcal, and other vaccines for adults. The National Institute of Allergy and Infectious Diseases and the Centers for Disease Control of the U.S. Public Health Service, whose activities in the past were primarily directed toward the use of pediatric vaccines, also have begun to place more programmatic emphasis on adult immunization. In fact, the Immunization Practices Advisory Committee of the Centers for Disease Control has also released a comprehensive report on adult immunization (3). There are many reasons for this new interest.

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[1] Copies of the ACP *Guide for Adult Immunization* may be obtained at $10.00 each (quantity discounts are available). Write: American College of Physicians, Adult Immunization, P.O. Box 7777–R0325, Philadelphia, Pennsylvania 19175, USA.

First, although the country's combined public and private sector immunization efforts have been enormously successful in controlling diphtheria, tetanus, pertussis, measles, mumps, rubella, and poliomyelitis, the very success of these efforts has resulted in changes in the epidemiology of a number of these diseases (7). The most notable examples are measles and rubella. Outbreaks of both diseases have continued to occur in small pockets of susceptible young adults who escaped both vaccination and natural disease in childhood. Such outbreaks have occurred even in populations whose overall levels of immunity exceeded 85 percent, thus challenging previously held concepts of "herd immunity." In recent years, most such outbreaks have occurred on college campuses. Vivid examples of measles outbreaks on college campuses occurred during the 1984–85 season, and three deaths from respiratory complications of measles occurred among students at one small college in Illinois (4). This represented a tragic reminder of the increased severity of measles in adults, as compared to children. Rubella outbreaks have also occurred, not only on college campuses, but also in the workplace, including the hospital setting. The consequences for susceptible pregnant women in such settings are potentially catastrophic, and in many such instances, pregnant women who contracted rubella elected to terminate their pregnancies. Thus, young adult populations will not be completely protected from measles and rubella until immunization levels reach 100 percent.

Second, underutilization of safe and effective vaccines for adults has been documented in a number of studies. For example, the universal recommendation for booster doses of tetanus and diphtheria toxoid at 10-year intervals is not being followed by most physicians (14). Thus, the majority of cases of tetanus that occur in the United States in recent years have been in individuals 60 years of age or older. Furthermore, it has been shown that hospital personnel often are incorrectly using tetanus toxoid and tetanus immune globulin in emergency situations (1).

In one of the major target populations for influenza vaccine, the population over 65 years of age, annual administration of influenza vaccine has rarely exceeded 20 percent. The major exception was in 1976, in the context of the national program to immunize the entire population against swine influenza; even there, only 38 percent of elderly persons received vaccine. In 1982–83, only 14.7 million persons were immunized, the lowest level of influenza vaccination observed in the past 15 years (2).

Concerns about underutilization have been focused even more sharply by two recently introduced vaccines targeted primarily for use in adults; these are pneumococcal vaccine and hepatitis B vaccine. After 5 years of promotional effort, by the end of 1983, only 11.1 million doses of pneumococcal vaccine had been distributed in the United States, indicating that less than 25 percent of the elderly and other high-risk population had been immunized. Distribution data suggested gradually decreasing levels of utilization (8). Among health care workers, a major target population for hepatitis B vaccine, low levels of use of this vaccine are well documented (13). Better utilization of hepatitis B vaccine has been hindered by its cost, and by earlier concerns about possible transmission of acquired immune deficiency syndrome, concerns now clearly known to be unwarranted.

Third, preventing disease saves lives and money. In the mid-1970s, the ACP proclaimed its commitment to help its members provide quality *and* cost-effective health care. Its widely acclaimed activity in technology assessment, the Clinical

Efficacy Assessment Project, has served to inform both physicians and third party payers about the merits of new and controversial technologies (15). The "Green Book" is a natural extension of this activity.

The book's section on the cost benefit of immunization cites a number of studies that demonstrate the cost-effectiveness of disease prevention by immunization rather than by disease treatment. About 58,000 people die annually of pneumonia and influenza (9). Many thousands of these deaths are caused by pneumocooccal infection and the mortality from influenza epidemics claims tens of thousands each year. Immunization of high-risk persons with influenza and pneumococcal vaccines would be highly cost-effective, since estimates of the total cost of influenza epidemics in the United States have approached $10 billion in some years (10). The costs of medical treatment for pneumococcal pneumonia are also high, and up to 90 percent of these costs are a result of hospitalization (5).

Finally, the underutilization of vaccines in adults may threaten their continuing availability. American manufacturers, not surprisingly, have no inclination to continue product lines that are not profitable. The American College of Physicians recognized this dilemma in a 1983 policy statement on "orphan" drugs—those drugs with high therapeutic value for which the number of patients requiring treatment is small (11). Although vaccines do not fall into this category, underutilization could make them another class of "orphan." Indeed, a polyvalent pneumococcal vaccine appeared in the United States in the 1940s, only to be withdrawn by the manufacturers within a few years because so little was used (10). The possibility of this happening with some of today's vaccines may not be as remote as we would like.

A number of pharmaceutical companies have already left the vaccine marketplace altogether, largely as a result of issues pertaining to vaccine liability and underutilization. For many vaccines, including measles, mumps, rubella, and live oral poliomyelitis vaccines, there is only one U.S. producer left. Thus, the entire vaccine development and production enterprise in the United States has been eroding steadily for over a decade, and is in some danger of collapsing altogether.

Conclusions—The various factors influencing the activities of the ACP and others in promoting adult immunization touch upon many of the important problems affecting physicians, patients, and the nation's health care policies. Disease prevention in adults through immunization is a technology whose time has not only come but is sorely past due. The ACP will continue its advocacy of this technology and will follow the publication of its "Green Book" with programs aimed at changing patient attitudes and physician behavior toward vaccine use in adults. The ambitious goal is to see a world free of vaccine-preventable diseases.

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TSA EDITORIAL

Vicarious or Simulated Experience Addiction: The Coming Addiction

Clyde Behney

Some time around the year 2000, amidst the celebrations surrounding the changing of the century, we may begin to see the emergence of what may become one of the most destructive spinoffs of medical research. The era of biology will have had almost half a century with us, and its benefits will be substantial and evident. Life and health will have changed in many ways—some dramatic, some subtle. But the accumulation of knowledge and tools in biology, computer sciences, and

artificial intelligence, biotechnology, neurochemistry, and bioengineering will inevitably find applications outside of the health sciences. Not all of these uses will be of benefit to society or its individuals.

One such negative offshoot of the new knowledge may very well be something I am calling Vicarious or Simulated Experience Addiction, or VSEA (acronyms being one of this decade's addictions). Some of you may have seen a movie (whose name I can't recall, although it might have been *Brainstorm*) which depicted a simple form of vicarious experience. The film was about a research project in which subjects engaged in various thrilling activities (sky-diving, erotic adventures, fighting for one's life, etc.). Somehow (the details were not given) the experiences were recorded from the subject's brain, and others were able to "playback" the experience and live it as if first-hand by wearing a helmet connected to the playback apparatus. The rest of the plot is not important, except to note that the protagonist became obsessed with reliving the death of one of the researchers who inadvertently recorded her own accidental death by heart attack.

The film was science fiction. I suspect, however, that in 20 or so years it may seem old-fashioned. Or irrelevant. We will either know enough about brain functioning and chemistry, and accessing and recording the brain's functions, to recreate experience vicariously, and in ways untouched upon by the movie; or, we will have gained sufficient knowledge to make the recording of actual experience unnecessary. Instead we may be able to direct an individual's own brain to simulate experiences that could never be created in reality.

I am by no means an expert in the fields necessary to make a convincing presentation that this can come to pass. But the potential seems real. What knowledge would we need? Information on how the brain stores data, on how it processes it at the physical, chemical, molecular, and genetic levels. Information on how to activate certain memories or emotions. Information on how to connect computers to the human brain and nervous system. Development of ultra-sophisticated computers with extremely large mass memory capabilities and rapid access times. Ability to synthesize various proteins and introduce them to the proper sites. Sophisticated and inexpensive recording and playback devices in the form of laser disk systems or something similar. Information on how muscles, organ systems, and so forth receive their messages and take their actions. And many others. The point is that this list reads like a list of current research topics and priority goals for future research.

Assuming for the moment that VSEA or something on its order is possible, what then are its implications? Why worry about it? Because it could become a societal addiction, and if it did it would inevitably be an addiction of the first magnitude. The mechanisms for achieving simulated experience (actually, self-fantasy through inducement) may very well be in the form of pharmaceuticals. Even computer-recorded vicarious experience will perhaps be available on laser disk. The equipment might not be any more expensive than a video cassette system is today. And there will be a great many people eager to develop and market these products, even if they are illegal in part.

Why addiction? Imagine if you could eat a pill or put on a helmet and "tape" that allowed you to go into a dream state in which you had ultimate power, or ultimate happiness or peace, or the ultimate sensual or sexual experience. In simulated, as opposed to vicarious experience, the addict has the added bonus

of having the fantasy keyed to his or her own memories or symbols. Thus, not only might you be induced to fantasize about having great political or physical power, but you could take revenge, in the fantasy, on actual people you feel have slighted or harmed you. Imagine if you were an insecure or stressed college student, or trash collector, or "housewife," or business person, and you could have access to a totally convincing fantasy world. I suspect that thousands would not only explore this world but increasingly spend more time in it and eventually stay in it.

But is it a physical addiction? By the year 2000, we may very well understand that many or most addictions are indeed chemical/physical.

It represents an even greater danger because its forms will be relatively innocuous in the beginning, and there will be great pressure to keep it legal and available even as it takes on more dangerous aspects. Even after the public health menace of the addiction is apparent, it will be difficult to make it illegal. Further, making it a crime might be difficult in terms of the constitutions of many countries. And criminal penalties are not likely to have the full result intended anyway, for this will be a much stronger addiction than most.

Obviously, all of this may never happen, or even if the capabilities are developed it may not turn into a societal and public health challenge. But on the other hand, it might. I raise it now, well before the possibility even exists, to stimulate thinking about the potential social implications of the technological developments inevitably arising from today's research.

STIFF LITTLE REVIEWS

User-Generated Reviews of Microcomputer Hardware and Software

Steven S. Bjorge[1]

XYWRITE II+: VERY STRONG AND VERSATILE WORD PROCESSOR

XyWrite II+ is a comprehensive word processing program that handles heavy text operations, such as preparation and printing of major reports and publications with extensive formatting needs, including running headers, running footers, foot-

Stiff Little Reviews takes its name from Stiff Little Fingers, the former music group from Northern Ireland, who some (namely your editor) consider the patron saints of computer documentation because of this snippet of their lyrics: "Just because there's a reason doesn't mean it's understood."

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notes, tables of contents, indexes, and microjustification. But it is so flexible that it becomes an indispensable aid to the daily work of any writer, analyst, or other user in need of a good all-around word processor. Virtually all word processing features are available, as and when needed, without imposing on the user any more options than necessary for individual needs. The program runs on the IBM-PC and compatibles, requires 192K and one disk drive (though more memory and two disk drives optimize performance), and can be copied onto a hard disk.

Speed of response with XyWrite II+ is the first thing the user notices. The complete, compact program loads into computer memory, without need for further access to the program disk during operation. Jumping from the top to the bottom of even a large file takes only a moment. Copy, move, and deletion of text is fast and easy. Reading and writing of text files on the disk is quick and secure.

XyWrite II+ is largely "command-driven," not menu-driven, so execution is fast. Furthermore, there is no need in XyWrite II+, as there is in many word processors, to tediously change from text entry mode to formatting or editing mode. The top three lines of the screen are defined and labeled as the command entry area (including a ruler line and a helpful reminder line), while the remaining 22 lines are the text entry area. The cursor jumps instantly between the two areas by a single keystroke. Many editing commands are executed by the 10 Function Keys (also with Alt, Shift, and Ctrl combinations), while a great many other less often used instructions are executed at the command line. Dynamic, continual reformatting on-screen displays the effect of commands, such as centering, underlining, paragraph indentation, margins, etc. Two windows, so-called "split screens," allow the user to work with two files at the same time, either side by side, or top and bottom, or two full screens. This feature has many uses, for example, consulting a file of notes on one screen, while drafting text on the other screen. Text is quickly and easily copied from one screen to the other.

File size is limited only by the available storage space on disk and the memory in the computer. XyWrite II+ uses all available memory, and its speed makes it feasible to work on very large files (such as 50-page chapters). XyWrite II+ uses the entire keyboard, and in addition the program allows the user to easily reprogram the keyboard. Any function that seems inconvenient to the individual user can be repositioned to a different key (or keys). The Dvorak keyboard, or any non-English keyboard lay-out, can be reprogrammed. Furthermore, any group of individual functions can be strung together to produce an extended macro function, speeding routine, and repetitive tasks.

Another related feature is XyWrite's own programming language that can be used to quickly and easily define macros of "saved keystrokes," that is, to string together a series of repetitive text or command keystrokes, that are then stored as one executable function, to be called up by a user-assigned name. Logical statements can be included to control or check processes. Indexes (up to nine different ones) and tables of contents can be marked and then printed automatically with correct page numbers. Page numbering in the document is accomplished using either a running header or running footer. Footnotes are handled with automatic incrementing on-screen of the numbers in text, and user-defined formatting of the printing style. The footnotes themselves can be printed either at the end of each page, or collected and dumped at some other point in the document.

A wide range of printer drivers is supplied (and the company will develop a printer file for any printer if you loan them a manual with the printer command codes). Clever users can customize their own printer driver files quite easily to get unique combinations, such as bold, underlined, compressed pitch italics. Another feature of XyWrite II+ is the capability to load printer substitution files that automatically translate ASCII codes to the printer. This enables the user to achieve compatibility of the extended character set on-screen and at the printer.

XyWrite II+ also allows you to load into active memory up to nine "help screens" which are then available instantly. The nice part about this feature is that you can have help screens containing hints on XyWrite commands (and four such screens accompany the program) or, as you learn the program and no longer need that sort of help, you can make any sort of reminder screens you want.[2] Another example of XyWrite II+'s tremendous flexibility is that DOS commands can be run from within XyWrite II+ without quitting the program. This permits the use of spelling checkers, disk formatting, copying, and other application and utility programs, including DOS batch files. For example, from XyWrite II+, you can enter DOS, load and work with Lotus 123, then return directly to the point at which you left (if you had an active text file open, you will return to it). This program was written by the same people who helped develop the Atex computerized editing system, which is one of the most widely used text processors in the newspaper, journal, and magazine publishing field. A number of publications use XyWrite II+ to prepare copy which is then directly transmitted to an Atex print shop.

A flexible mail merge capability permits preparation and printing of mass mailings. XyWrite II+ creates standard ASCII files that can be read by many other application programs, or XyWrite II+ can be used as a program editor. The insertion of frequently used words, phrases, and "boiler-plate" can be automated. Four-function math, column operations, left/right/decimal/centered tabs, flexible cursor movement are just some of the many other features that are included in this very powerful program that retails for *less than* any other full-featured package ($295 list price, and less than that from some mail-order discounters).

The major complaints with XyWrite II+ are a manual that needs better editing and writing, and unsophisticated tutorials. Of some consolation, the parent company XyQuest provides very friendly and supportive assistance by telephone.

This program is strongly recommended as a best buy, even for people who may not use all of its features.

[2] *Note from the Editor:* As an example, I use XyWrite and have the following screens set up and available to me instantly: three screens of phone nuumbers, a list of staff, a list of all active cost codes in my office, three screens of ASCII characters and keyboard scan codes, and a screen with a calendar, current time and date—all available with a flick of the ALT-F9 wrist!

MEMBERSHIP APPLICATION FORM: INTERNATIONAL SOCIETY FOR TECHNOLOGY ASSESSMENT IN HEALTH CARE

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