

# The Information Explosion

TONY DIXON, MB, ChB, CCFP

**H**ow aware are family physicians of current research findings, and to what extent do they use the original medical literature to make clinical decisions about the care of their own patients?

In this issue (page 871), Dr Pat McNamara and colleagues report on the results of a survey that examined the knowledge and practices of primary care physicians in relation to the use of ASA as a prophylactic against myocardial infarction in asymptomatic males over the age of 40. They found that while 70% of the physicians were aware of two influential studies on the issue, only one-third of them claimed to have actually read the studies, the others having relied on knowledge gained during discussions with colleagues or from the general media. Few physicians were routinely using ASA as a preventive measure in their male patients.

Research into the ways in which physicians access and manage information sources in their practices is limited, but it still helps highlight the dilemmas that are faced in trying to keep up with the information explosion.

In 1980, Stinson and Mueller<sup>1</sup> conducted interviews with 402 randomly selected health professionals in

Alabama to identify their information habits and needs. When the respondents were asked about various information sources, the medical literature was identified as the one most commonly used. The typical health professional in this survey claimed to spend some five hours per month reading medical journals and two hours per month reading books. Urban professionals used journals more than their rural colleagues did.

Professional colleagues were the second most common source of information reported, and again urban professionals reported more use of colleagues than did their rural counterparts. Information obtained from professional meetings was identified as the third most common source, while continuing education courses ranked fourth.

When asked to indicate their local sources of medical literature, the professionals surveyed reported that personal libraries were most often used, while unsolicited literature was second. Unsolicited literature was used less in urban than in rural practices, but was used more by older physicians than by younger physicians and by family practitioners than specialists.

Covell and colleagues<sup>2</sup> studied the self-reported information needs of 47 physicians during a half-day of typical

office practice. The participants were first given a questionnaire to identify frequently used information sources, to assess the value of those sources in answering practice-related questions, and to identify barriers in obtaining information. Then the physicians were interviewed after each patient visit and asked whether during the visit questions about management of the patient's problem had arisen to which an answer would be helpful, assuming access to an appropriate information source.

In their answers to the questionnaire, physicians claimed to use print sources of information more often than they consulted colleagues. Drug compendiums were the most frequently reported source, while computerized sources were used least often. When asked to assess availability, textbooks were reported to be available in the office "almost always," but in half the offices they were said to be more than three years old. Journals were reported to be available "sometimes," while drug information sources were "almost always" available and up to date.

Interviews were conducted after 409 patient visits, during which 269 questions had been raised and all but one of the 47 physicians reported a need for outside information in managing their patients.

In contrast to their questionnaire responses, the interviews revealed that in "real life" the source of information most frequently consulted was a colleague. Less than 3% of the answers to the questions generated were found in medical textbooks, 9% in drug information texts, and 7% in journals. Thus, although physicians believed that they used print rather than human sources to answer questions about patient management, the research indicated that in actual practice the reverse was true.

What about primary care physicians in general, and family physicians in particular? In 1989, Williamson and colleagues<sup>3</sup> reported the results of a

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telephone survey conducted to identify self-perceived problems in managing science information needs among US primary care practitioners and their "opinion leaders" (leaders of professional societies and members of certification and examination boards).

Both groups claimed that published reviews were most useful in meeting their information needs. However, when asked about six recent clinical advances, one-fifth to one-half of the respondents were not using or were not aware of such advances; less than one-third personally searched the literature when information was needed; and, two-thirds claimed that the literature volume was unmanageable. Ninety percent of the practitioners used their own experience to validate research findings and determine scientific validity, rather than analyzing the research methodology used.

Last year, Connelly and colleagues<sup>4</sup> reported the results of a questionnaire given to 126 family physicians to find out how they chose among the information resources available to them. The physicians reported almost daily use of a drug compendium and more frequent than weekly use of colleagues as an information source. There was little use of computerized bibliographic systems. The research literature was used infrequently and was rated among the lowest of resources in the categories of "credibility," "availability," "searchability," "understandability," and "applicability."

In summary, then, the evidence to date seems to be fairly consistent. Physicians find the current medical literature hard to manage in terms of sheer volume, hard to access easily, hard to understand and interpret, hard to make relevant clinically, and hard to apply to routine practice. Faced with management problems in their patients, they turn to immediately accessible, though possibly unevaluated, sources of

information such as colleagues, drug compendia, and the media.

If it is of any comfort, this difficulty in managing the medical literature does not seem to be a new problem. Bernstein and colleagues quote John Shaw Billings, the US Army physician who created the Index Medicus, and who, faced in 1881 with reviewing the increasing number of biomedical periodicals, declared:

*What will the libraries and catalogues and bibliographies of a thousand, or even of a hundred years hence be like, if we are thus to go on in the ratio of geometric progression, which has governed the press for the last few decades? . . . it leads to . . . an absurd and impossible conclusion, for it shows that if we go on as we have been going, there is coming a time when our libraries will become large cities, and when it will require the services of everyone in the world, not engaged in writing, to catalogue and care for the annual product.<sup>5</sup>*

Faced with ever increasing piles of journals stacked around the office, it is hard not to feel that that day is close by. It has been estimated that even conscientious physicians who read two articles every day will be 55 centuries behind in their reading each year!<sup>6</sup>

We may be living in the "information age," but we have not yet learned to survive it. Perhaps the new science of medical informatics, defined as a new discipline dedicated to the solution of information problems in health care,<sup>7</sup> will become an essential part of the medical curriculum, although it will, of course, then spawn its own research literature, thus compounding the original problem.

Until that day, what can the beleaguered family physician do? First, I suggest, stop feeling guilty. It is not possible to read everything that comes across your desk, so don't set unrealistic demands for yourself.

Second, throw away unread anything that arrives from an unsolicited source that has not gone through the initial screen of peer review. Peer review is not perfect, but it does at least ensure that the most obvious rubbish has been strangled at birth.

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Third, learn the basic skills of critical appraisal. Use them to selectively scan the journals you receive, and then apply them to the articles that you read. Have confidence in your judgment – even the most apparently prestigious journals publish suspect material. Just because something is published in the *New England Journal of Medicine* does not mean that it is gospel.

Meanwhile, what is the challenge for biomedical journals? Largely, I think, it is to provide information that is not just reported, but is also evaluated, and is then presented in a way that enables it to be recalled and used in appropriate situations.

It is probably unrealistic to suggest that every physician will become an expert synthesizer of the medical literature. As Edward Huth, editor of the *Annals of Internal Medicine*, noted:

*There is a heavy cost in time for searching journal literature and retrieving papers. Much of the retrieved literature is likely not to be directly relevant to the problem being considered. Too much time is needed to digest and synthesize what is relevant, valid, and worth further attention. Physicians without special training in critical analysis find judging the validity of articles difficult.*

*The tasks of building new information systems that will better serve physicians and their patients in the years ahead will not be simple. But we must get going if we are to continue to have a coherent profession definable by the expert use of the same domain of expert information. The need is already critical for physicians who prefer to offer primary care and give it competently.<sup>8</sup>*

What seems to be at issue is whether the explosion we are trying to cope with is one of information or misinformation, and how to ensure that neither we nor our patients are victims of the fall out.

How we distinguish between the two and present the results in a relevant and accessible fashion is a continuing challenge for everyone

associated with what is euphemistically called "the literature." ■

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## Editor's Note:

We wish to take this opportunity to thank our guest Editorial Coordinator, **Dr Lorne D. Sullivan**, Head, Division of Urology, University of British Columbia, Vancouver. He assisted with suggesting author names and participated in the review process for the feature articles appearing in this issue.

# Avalanche d'informations

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**L**es médecins de famille sont-ils bien informés sur les réalisations de la recherche contemporaine, et dans quelle mesure la littérature médicale originale vient-elle influencer les décisions cliniques concernant les soins à leurs propres patients?

Dans le numéro de ce mois-ci (page 871), le Dr Pat McNamara et ses collègues rapporte les résultats d'une étude qui s'est penchée sur les connaissances et les pratiques des médecins de première ligne en relation avec l'usage de l'AAS (acide acétylsalicylique) comme agent prophylactique dans l'infarctus du myocarde chez les hommes asymptomatiques de plus de 40 ans. Ils ont constaté que, même si 70% des médecins étaient au courant de deux études importantes sur le sujet, seulement un tiers d'entre eux ont admis avoir effectivement lu ces études, les autres s'étant basés sur les connaissances acquises au cours de discussions avec des collègues ou par le biais des médias. Peu de médecins utilisaient couramment l'AAS comme mesure préventive chez leurs patients mâles.

La recherche sur les moyens utilisés par les médecins pour accéder et gérer les sources d'informations dans leurs pratiques est limitée, mais elle permet néanmoins de faire la lumière

sur les dilemmes qu'ils rencontrent pour tenter de se maintenir à jour face à cette explosion d'informations.

En 1980, Stinson et Mueller<sup>1</sup> ont interviewé 402 professionnels de la santé de l'Alabama choisis au hasard afin d'identifier leurs habitudes et leurs besoins en matière d'informations. Lorsqu'on leur a demandé quelles étaient leurs différentes sources d'informations, la littérature médicale fut identifiée comme étant l'une des plus fréquemment utilisées. Le professionnel de la santé type de cette étude disait consacrer environ cinq heures par mois à la lecture des revues médicales et deux heures par mois à lire des livres. Les professionnels urbains consultaient davantage les revues que leurs collègues du milieu rural.

L'étude révèle que les collègues professionnels sont la deuxième source d'informations la plus courante et, ici aussi, les professionnels urbains rapportaient utiliser davantage leurs collègues que ne le font ceux du milieu rural. Les informations obtenues lors des rencontres professionnelles constituent la troisième source la plus courante, alors que les sessions de formation médicale continue occupent toujours la quatrième place.

Lorsqu'on leur a demandé de préciser les sources locales de littérature

médicale, les professionnels visés par cette étude ont indiqué que les bibliothèques personnelles étaient le plus souvent utilisées, suivi en second par la littérature non sollicitée. Celle-ci fut moins utilisée en milieu urbain qu'en milieu rural, mais davantage par les médecins plus âgés que par les médecins plus jeunes et davantage aussi par les médecins de famille que par les spécialistes.

Covell et al<sup>2</sup> ont étudié les besoins d'informations rapportés par 47 médecins au cours d'une demi-journée type de pratique. On a demandé aux participants de compléter un questionnaire afin d'identifier les sources d'informations fréquemment utilisées, d'évaluer la valeur de ces sources en répondant à des questions ayant trait à la pratique, et d'identifier les difficultés à obtenir les informations. Les médecins furent ensuite interviewés après la visite de chaque patient et questionnés à savoir si, au cours de la visite, des questions relatives au problème du patient avaient fait surface et auxquelles une réponse était nécessaire, présumant la nécessité d'accéder à une source appropriée d'informations.

Les médecins ont répondu utiliser davantage le matériel d'informations imprimé que la consultation auprès des collègues. Les compendiums pharmaceutiques se sont avérés la source d'informations la plus courante et l'ordinateur la source la moins utilisée. Lorsqu'on leur a demandé d'évaluer la disponibilité, les livres de référence furent cités comme étant "presque toujours" disponibles au bureau mais, dans la moitié des bureaux, l'édition datait d'au moins trois ans. Les revues furent jugées comme étant disponibles "parfois" alors que les sources d'informations sur les médicaments étaient "presque toujours" disponibles et à jour.

Les entrevues furent menées après 409 visites de patients au cours desquelles 269 questions ont eu besoin de précisions et, des 47 médecins consultés, un seul n'a pas eu besoin de consulter une source exté-

rieure d'information afin de solutionner les problèmes de ses patients.

Contrastant avec les réponses au questionnaire, les entrevues ont révélé que, "dans le vécu quotidien", les collègues s'avèrent les sources d'informations les plus fréquemment consultées. Les livres médicaux de référence ont permis de répondre à moins de 3% des questions soulevées, les textes d'informations sur les médicaments 9%, et les revues 7%. Ainsi, même si les médecins ont l'impression qu'ils utilisent davantage les textes que les sources humaines pour répondre aux questions générées par les problèmes de leurs patients, l'étude révèle que, dans les faits, c'est plutôt l'inverse qui est vrai.

Quelles sont les habitudes des médecins de première ligne en général, et des médecins de famille en particulier? En 1989, Williamson et al<sup>3</sup> ont rapporté les résultats d'une enquête téléphonique afin d'identifier les problèmes perçus dans la gestion des besoins en matière d'informations scientifiques auprès des médecins de première ligne américains et de leurs "dirigeants" (dirigeants d'organismes professionnels et membres des bureaux d'examineurs pour la certification et autres examens).

Les deux groupes ont révélé que les revues sont la source la plus utile pour répondre à leurs besoins d'informations. Cependant, à la question de citer six développements cliniques récents, de 20% à 50% des répondants ne se prévalaient pas ou n'étaient pas au courant de tels développements; moins du tiers consultaient la littérature lorsqu'ils avaient besoin d'informations et les deux tiers ont prétendu qu'il leur était impossible de gérer le flot de littérature. Quarante-vingt-dix pourcent des praticiens se sont servis de leur propre expérience pour valider les résultats de la recherche et déterminer leur valeur scientifique plutôt que d'analyser la méthodologie ayant servi à la recherche.

L'an dernier, Connelly et al<sup>4</sup> ont rapporté les résultats d'un questionnaire distribué à 126 médecins de fa-

mille pour savoir comment ils faisaient leur choix parmi les différentes sources d'informations disponibles. Les médecins ont révélé utiliser presque quotidiennement le compendium pharmaceutique et référer à leurs collègues plus d'une fois par semaine comme source d'informations. Ils utilisent peu les systèmes de bibliographie par ordinateur. La littérature de recherche est utilisée peu fréquemment et fut classée parmi les sources les plus faibles dans les catégories "crédibilité", "disponibilité", "facilité de consultation", "compréhensibilité" et "applicabilité".

Donc en résumé, les données disponibles à ce jour semblent plutôt fiables. Les médecins trouvent difficile de gérer la littérature médicale actuelle en termes de volume, facilité d'accès, compréhension et interprétation, applicabilité clinique et applicabilité à la pratique quotidienne. Lorsqu'ils doivent solutionner les problèmes de leurs patients, ils se tournent vers les sources d'informations les plus accessibles telles les collègues, les compendiums pharmaceutiques et les médias, même lorsque ces sources n'ont possiblement pas fait l'objet d'une évaluation.

Mais, rassurez-vous, cette difficulté à disséquer la littérature médicale n'est pas nouvelle. Bernstein et ses collègues citent John Shaw Billings, médecin de l'Armée américaine qui a créé l'Index Medicus et qui, en 1881, ayant à réviser le nombre croissant de périodiques biomédicaux, déclara :

*A quoi ressembleront les bibliothèques, catalogues et bibliographies dans mille ans, ou même dans quelques centaines d'années d'ici si nous maintenons la même progression géométrique qui a gouverné la presse depuis les dernières décennies?... cela nous mène ... à une conclusion absurde et impossible, démontrant que si nous continuons à ce rythme, il viendra un temps où les bibliothèques deviendront de grandes villes et nécessiteront les services de chaque habitant de la planète, non engagé à écrire, pour cataloguer et manipuler la production annuelle.*<sup>5</sup>

Lorsqu'on constate les piles de plus en plus hautes de revues qui jonchent

nos bureaux, il n'est pas difficile de s'imaginer que ce jour approche. On a estimé que même les médecins consciencieux qui lisent deux articles par jour accumulent 55 siècles de retard dans leur lecture chaque année!<sup>6</sup>

Nous vivons peut-être à "l'ère de l'information", mais nous n'avons pas encore appris à la dominer. Peut-être la nouvelle science de l'informatique médicale, définie comme une nouvelle discipline qui se consacre à la solution des problèmes d'information en soins de santé,<sup>7</sup> deviendra une composante essentielle du curriculum médical, même si, de toute évidence, elle génèrera sa propre littérature de recherche, aggravant ainsi le problème originel.

D'ici là, que peut faire le médecin envahi? D'abord, je suggère qu'il cesse de se sentir coupable. Il n'est pas possible de tout lire ce qui atterrit sur votre bureau, alors ne vous imposez pas des objectifs irréalistes.

Deuxièmement, jetez carrément tout ce qui vous arrive de source non sollicitée et qui n'a pas subi l'étape initiale de révision par les pairs. Ce dernier processus n'est peut-être pas parfait, mais il permet au moins de s'assurer que les absurdités les plus flagrantes soient étouffées dans l'oeuf.

Troisièmement, apprenez les notions de base de l'évaluation critique. Utilisez-les pour faire une revue sélective des journaux que vous recevez et appliquez-les ensuite aux articles que vous lisez. Faites confiance à votre jugement – même les revues les plus prestigieuses publient du matériel douteux. Tout ce qui paraît dans le *New England Journal of Medicine* n'est pas nécessairement vérité pure.

Dans l'intervalle, quel sera le défi des journaux biomédicaux? A mon avis, ce sera principalement de dispenser des informations qui ne sont pas seulement rapportées, mais aussi évaluées et ensuite présentées d'une façon qui facilite leur rappel et leur utilisation dans des situations appropriées.

Il n'est probablement pas réaliste de suggérer que chaque médecin devienne un expert capable de synthéti-

ser la littérature médicale. Comme le fait remarquer Edward Huth, rédacteur, *Annals of Internal Medicine* : *Le coût de scruter la littérature des journaux et de procéder à la recherche et à l'extraction d'articles est élevé en termes de temps. La grande partie de la recherche littéraire est susceptible de ne pas être directement applicable au problème considéré. On consacre trop de temps à digérer et à synthétiser ce qui est pertinent, valable et qui mérite une plus grande attention. Les médecins qui ne possèdent pas la formation spéciale pour procéder à une analyse critique trouvent difficile de juger de la valeur des articles.*

*La tâche de structurer les nouveaux systèmes d'information destinés à mieux servir les médecins et leurs patients dans les années à venir ne sera pas facile. Mais il faut démarrer si nous voulons continuer d'avoir une profession cohérente et définissable par la compétence à utiliser les mêmes sources expertes d'informations. Le besoin est déjà critique pour les médecins qui préfèrent offrir des soins de première ligne et s'en acquitter de façon compétente.<sup>8</sup>*

L'enjeu est de savoir si l'avalanche que nous tentons de contrôler tant bien que mal en est une d'information ou de désinformation, et comment s'assurer que ni nous, ni nos patients ne seront victimes des répercussions.

Faire la distinction entre les deux et présenter les résultats pour qu'ils soient applicables et accessibles constitue un défi que doit continuer de relever quiconque est associé avec ce qu'on appelle euphémiquement "la littérature". ■

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### Note de la rédactrice:

Nous désirons remercier notre coordonnateur invité, le **Dr Lorne D. Sullivan**, chef, Division d'urologie, Université de Colombie-Britannique, Vancouver. Il a suggéré des noms d'auteurs et participé au processus de révision pour les articles de fond apparaissant dans le numéro de ce mois-ci.

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Administration of Ditropan in large doses to patients with ulcerative colitis may suppress intestinal motility to the point of producing a paralytic ileus and precipitate or aggravate toxic megacolon, a serious complication of the disease. The symptoms of hyperthyroidism, coronary heart disease, congestive heart failure, cardiac arrhythmias, tachycardia, hypertension and prostatic hypertrophy may be aggravated following administration of Ditropan. Ditropan should be administered with caution to patients with hiatal hernia associated with reflux esophagitis, since anticholinergic drugs may aggravate this condition. **Use in Pregnancy** - The safety of Ditropan in pregnancy has not been established. Therefore, Ditropan should not be used in women of childbearing potential, unless, in the opinion of the physician, the expected benefit to the patient outweighs the possible risk to the fetus. **Use in Children** - Because the safety of Ditropan in children under the age of five has not been established, use of the drug in this age group is not recommended. **Use in Nursing Mothers** - It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Ditropan is administered to a nursing woman. **ADVERSE REACTIONS** - The following adverse reactions have been reported with Ditropan (oxybutynin chloride) administration: dry mouth and throat, difficulty swallowing, decreased sweating, urinary hesitance and retention, blurred vision, dilation of the pupil, cycloplegia, increased ocular tension, palpitation, tachycardia, chest pain, syncope, flushing, nose bleed, drowsiness, weakness, dizziness, headache, insomnia, mood changes, nausea, vomiting, anorexia, metallic taste, constipation, bloated feeling, edema, impotence, suppression of lactation, interference with normal heat regulation, severe allergic reactions or drug idiosyncrasies including urticaria and other dermal manifestations. **DOSAGE AND ADMINISTRATION** - Ditropan Tablets and Syrup are for oral administration. **ADULTS**: The usual dose is one 5 mg tablet or one teaspoon (5mL) syrup two or three times a day. The maximum recommended dose is one 5 mg tablet or one teaspoon (5mL) four times a day. In elderly and debilitated patients, it is advisable to initiate treatment at the lowest recommended dosage and to increase the dosage carefully according to tolerance and response. **CHILDREN OVER 5 YEARS OF AGE**: The usual dose is one 5 mg tablet or one teaspoon (5mL) two times a day. The maximum recommended dose is one 5 mg tablet or one teaspoon (5mL) three times a day. **DOSAGE FORMS: Availability** - Each scored biconvex, blue tablet engraved with Ditropan on one side and 1375 on the scored side contains 5 mg of oxybutynin chloride. Supplied in bottles of 100 and 500 tablets. Each 5 mL of green coloured syrup contains 5 mg of oxybutynin chloride. Supplied in bottles of 473 mL. **Composition** - Inactive Ingredients (Tablets): Each tablet contains calcium stearate, FD & C Blue #1 lake, lactose and microcrystalline cellulose. Inactive Ingredients (Syrup): Contains citric acid, FD & C Green #3, flavour, glycerine, methylparaben, sodium citrate, sorbitol, sucrose and water.

Product Monograph is available on request.

#### References:

1. Diokno AC, Lapidus J. Oxybutynin: A new drug with analgesic and anticholinergic properties. *J Urol* 108:307-309, 1972.
2. Thompson IM, Lauvetz R. Oxybutynin in bladder spasm, neurogenic bladder and enuresis. *Urology* 8, 5:452-454, 1976.
3. Diokno AC. Study shows nearly one-third of elderly living in community are incontinent; over 58 percent do not inform physician. *Urology Times* (14)1:(suppl) January 1986.
4. Ditropan® Product Monograph.

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