

## Norwegian Surgical and Medical Oncologists' Use of the Internet. A New Source for Professional Updating

JAN NORUM<sup>1</sup> and ELI N. BERGLI<sup>2</sup>

<sup>1</sup>Department of Oncology, University Hospital of North Norway; <sup>2</sup>Pharmacia Norway, 0283 Oslo, Norway

**Abstract.** *Background:* The Internet has become an important resource of medical information. The objective of this study was to examine its use by Norwegian oncologists. *Materials and Methods:* One hundred and eighty-six oncologists were invited to take part in a questionnaire-based study and 105 responded. *Results:* Ninety-six percent had access to the Internet. Eighty-four percent employed the net and 82% used e-mail. Males were more frequently e-mail users ( $p=0.044$ ). The mean weekly time spent on the Internet was 103 minutes (range 0 – 10 hours). The benefits of Internet use reported were professional updating and information about meetings/conferences/workshops. Information about vacancies and product advertisements were considered of little importance. Ninety-one percent, mainly medical oncologists ( $p=0.003$ ), had encountered patients/relatives who had provided Internet down-loaded medical data for consideration. Forty-two percent requested more training. *Conclusion:* Most oncologists use the Internet for professional updating. They frequently receive Internet down-loaded data from patients/relatives.

The Internet has opened a new field to medical doctors. They may gain free access to a large number of articles from international medical journals as well as information from medical databases, hospitals' web sites, research institutions and pharmaceutical companies. Today, information and communication technology has made it possible to access medical data from almost anywhere in the world, thus making it a useful tool for medical specialists who want to stay up to date. The majority of clinicians are today surrounded by computer technology in their daily practice and are familiar with telemedicine services such as telepathology, teleradiology and online services from

*Correspondence to:* Professor Jan Norum, Department of Oncology, University Hospital of North Norway, P.O.B. 13, 9038 Tromsø, Norway. Fax: +47 776 26779, Tel: +47 776 26000, e-mail: jan.norum@unn.no

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departments of clinical chemistry. Whereas much is known about the ubiquity of personal computers and the use of the Internet in the general population (1-4), little is known about access to and the use of the Internet among oncologists. To obtain data concerning Norway, we initiated a prospective questionnaire-based study on the use of the Internet. We hypothesized that one or more demographic variables such as age, sex, speciality and access to the Internet would affect the information-searching behaviour of the oncologists.

### Materials and Methods

Norwegian surgical oncologists, medical/radiation oncologists and other specialists dealing with cancer patients, and registered at the database at Pharmacia Norway, were mailed a self-developed questionnaire regarding their use of the Internet. One month later, a reminder was mailed to the non-responders. In Norway, there is one joint oncological speciality, since all medical oncologists are also trained in radiation oncology (here referred to as medical oncologists). The term surgical oncologist is employed for surgeons dealing with medical oncology and/or oncological surgery. The questionnaire comprising 10 questions is shown in Figure 1.

A total of 186 medical doctors (MDs), included in a database at Pharmacia Norway, were identified. The inclusion criteria were MDs working with cancer patients in clinical practice. There were 95 surgical oncologists and 66 medical oncologists. They constituted 95/896 and 66/116 of Norwegian surgeons and medical oncologists according to the database of the Norwegian Medical Association (5). There were 48 females and 138 males, respectively. Whereas only 7/58 surgeons were females, the corresponding figures among medical oncologists and the others were 12/32 and 6/16, respectively.

At closure, 105 out of 186 doctors (56.5%) had responded. There were only minor differences in the response rate between surgical and medical oncologists and gender. The medical oncologists had the lowest response rate (48%) (Table I).

*Statistics.* The Microsoft Excel 2000 for personal computers was employed for the final database and the Statistical Package for Social Science (SPSS) version 11.0 for statistical calculations. Statistical analysis for significant correlations was performed employing the bivariate correlation analysis. All  $p$ -values are two-tailed and considered statistically significant when  $p<0.05$ .

1. Sex  
 Female                       Male  
 Name:.....(optional)
2. Place of work  
 Hospital. Department:.....  
 Hospital and private practice  
 Private practice
3. Access to the Internet?  
 No  
 No, but planning installation in the near future  
 Yes, at office/work place  
 Yes, at home in privacy  
 Yes, both places
- If you answered no to question 3, move to question 9.**
4. Do you use e-mail in any context?  
 Yes                               No  
 e-mail address: .....(optional)
5. Do you use the World Wide Web (www) in any context?  
 Yes                               No
6. Which of the following medical web sites do you visit?  
 Doctoronline.com       Medline.com  
 Pubmed.com               Docguide.com  
 Others: .....
7. How long time do you spend on the Internet per week on average?  
 .... hours                      .... minutes
8. How would you value your experience with the Internet in relation to the following items?
- |                            |                          |                          |                          |                          |                          |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                            | None                     | A little                 | Some                     | Much                     | Very much                |
| Professional updating      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Meetings/workshops/courses | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vacancies                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Product advertisements     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
9. Has a patient or a relative given you information from the Internet for consideration?  
 No                       Yes, rarely                       Yes, quite often
10. In your opinion, do you need training in the use of the Internet?  
 No                       Yes                       Do not know

Figure 1. The questionnaire employed in the study.

Questionnaires returned with an unknown value for a particular variable were excluded from analysis involving that variable.

**Results**

Ninety-six percent of all participating MDs (101/105) had access to the Internet. The majority (67%) had access both

Table I. Characteristics of 186 included and 105 responding doctors.

Variable		Responders	(%)	All included
Sex	Female	25	(52%)	48
	Male	80	(58%)	138
Departments	Surgery	58	(61%)	95
	Oncology/Radiotherapy	32	(48%)	66
	Others	16	(64%)	25

at home and in their workplace. Fifteen and 18 doctors, respectively, had access at home or at work. One hundred and three responders reported having experience with the use of the Internet, while 84 and 82% of the doctors employed the net and e-mail in any context, respectively. Interestingly, males employed e-mail communication more frequently than the females did ( $p=0.044$ ), specifically 84% compared to 60%. No difference between genders was revealed when the use of the World Wide Web (www) was focused on.

Medline was, without any doubt, the site most frequently visited. Seventy % reported using this database. Further details are shown in Table II. Not surprisingly, there was a significant correlation between the use of the Medline and the Pubmed databases ( $p=0.001$ ). The mean time spent on the Internet per week was 103 minutes (range 0 minutes – 10 hours) while the majority (79%) spent two hours or less. The benefits of Internet access reported were mostly related to professional updating and information about meetings, workshops and courses. Not surprisingly, there was a correlation between the use of this media for professional updating and the search for information about medical conferences ( $p=0.014$ ). Females evaluated this access as significantly more important in this respect than men did ( $p=0.019$ ). Whereas only one-third of the males considered the Internet of some or more importance in this setting, three-quarters of the females did. Information about vacancies and product advertisements were regarded as of little or no importance among 84 and 86% of the participants, respectively (Table III).

Ninety-one percent of the doctors had encountered patients or relatives who gave them medical data downloaded from the Internet for consideration. Whereas one-fourth (26/105) had experienced this quite often, 69 doctors reported it to be rare. MDs using e-mail ( $p=0.008$ ) and medical oncologists ( $p=0.003$ ) experienced this more frequently. Whereas all medical oncologists had experienced this situation (38% frequently), only 84% of the surgical oncologists had (14% frequently).

A significant number (44/105) of doctors reported a need for training/instruction concerning the use of the Internet. This was reflected in the fact that the use of the Internet

Table II. *The Web sites/databases visited regularly by the participants.*

Web site/database	%
Medline.com	70%
Pubmed.com	47%
Doctoronline.com	15%
Docguide.com	8%

was correlated with the need for training ( $p=0.002$ ). Whereas those requesting support spent a mean time of 68 minutes on the net per week, the others spent 141 minutes.

### Discussion

The questionnaire disclosed that almost all doctors responding had access to the Internet and more than 80% employed e-mail communication. These figures are quite impressive and even higher than those for Canadian oncologists presented by Chen and Siu (6), who revealed that 70% of oncologists paid routine or occasional attention to medical information in the media and the Internet. This indicates that the explosive growth of the Internet provides a major source of medical and health information and the convenience, anonymity and amount of information available make it an attractive medium for doctors. Four percent of doctors in our survey had no access to the Internet, which may be explained by "computer-phobia", negative experiences or simply that they find too few benefits and too many problems using it, such as unsolicited e-mails and virus attacks.

In 2001, 45% of Norwegian patients wanted to communicate with their doctors *via* e-mail (7) and it appears that the great majority of doctors are now employing this media. Today, two-thirds of the Norwegian hospitals' Web sites provide e-mail interactivity [unpublished data, Norwegian Centre for Telemedicine]. There are reasons to believe that, in the future, patients will want to communicate with doctors directly instead of through a hospital's central e-mail system. This is based on the fact that Norwegian cancer patients consider their oncologist to be the most important source of information about the disease (8) and on individual patient-doctor relationships created during outpatient visits. Although this direct communication is technically possible in Norway, there are several security concerns that have to be solved, because connecting patient and hospital data may make it possible to manipulate data from the Internet. Whereas some physicians realise that they are unwilling or unable to meet their patients' growing need for online health information and advice, others have concluded that this communication offers many benefits. A Healtheon survey found that 33%

Table III. *The benefits reported related to Internet access among 105 doctors. All figures are percent of responders to each item.*

	None	A little	Some	Much	Very much	Total
Professional updating	4	22	27	30	17	100
Meetings/workshops/courses	23	37	24	15	1	100
Vacancies	70	14	7	7	2	100
Product advertisements	65	21	12	1	1	100

of physicians communicate with patients by e-mail (9), a process reported to be time efficient.

The fact that male doctors employed e-mail more frequently than the females could be simply because men are more interested in new technology than women. It is also supported by a Norwegian survey observing that males were more frequently Internet users (2). It has been shown that young age and high level of education are correlated with a more frequent use of the Internet (10-12). Whereas we had no indication of differences in education between gender and age, we know that the mean age of female doctors in Norway is somewhat lower than that of their male colleagues (5).

The medical doctors in our survey spent a mean time of 103 minutes on the Internet per week, reflecting their need for sufficient time to stay updated in their field of medicine. In "the old days", doctors had to walk to the institution's library to access medical journals and textbooks, while now they may access a significant number on the Internet, with obvious time-saving.

Internet-based information about vacancies and product advertisements were considered of little or no importance, in accordance with Chen and Siu (6). They reported the most common reason for accessing the Internet was to keep informed with respect to patients' enquiries.

The trend for patients/relatives to give Internet-obtained information to their doctors is new and must be correctly addressed. In one study (6), both patients and oncologists agreed that information seeking does not affect the patient-physician relationship. Since the diagnosis of cancer is associated with substantial anxiety about prognosis, the availability and effectiveness of treatment and its side-effects, and a lack of long-term disease control in many cases, it is not surprising that cancer patients and their relatives want to receive as much information as possible about their illness (13). The Internet is frequently employed in this setting. However, currently there is no quality control concerning medical and health information

and the net so that anyone may establish a Web site and post medical information. The patients are aware of the fact that the quality of medical and health information on the Internet may be suboptimal and frequently want reassurance concerning the accessed information. This desire is reflected in our survey, with 91% of the doctors reporting that they have received data available on the net from patients and relatives for comments. It has been estimated that about 30% of cancer patients use the Internet to obtain cancer information (6, 14, 15). Though they are aware that it may be suboptimal, they wish to discuss it, thus adding extra time to the consultation. Even if a relatively small number of patients bring Internet information to discuss, for busy oncologists this would add significantly to the overall time spent in clinical encounters, although balanced by improving patients' understanding of their disease.

Our study is the first to look at the access to and use of the Internet among doctors working with cancer patients within Norway. However, there are some limitations to our study which had a 56.5% response rate to the questionnaire. This figure compares favourably with the return rates recorded for other physician-directed questionnaires (6, 16). However, it may be biased as doctors who seek information from the Internet and are more interested in this field may be more likely to respond to such a questionnaire. Our questionnaire was designed so that it could be completed within a short period of time. As a result, there are many other aspects of the use of the Internet that we were not able to explore in detail. As such, our results must be considered in the context of a first attempt at addressing this subject. Future studies should build on our study and use more detailed questionnaires or more structured in-depth interviews. They should also focus on the subject of secure e-mail communication.

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