Patient Education in Nuclear Medicine – Is there a role for the World Wide Web?

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Foot line: Patient Education via the Web

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ABSTRACT

Introduction
Patient education has evolved in recent years to be an important component of overall patient management. The WWW may provide the appropriate media for meeting the increasing expectations of patient education in Nuclear Medicine.

Research Question
Does the WWW have a role to play in Nuclear Medicine patient education?

Methodology
A questionnaire was designed to determine patient demographics, patient internet connectivity and the level of satisfaction with current patient education. A total of 491 patients at a private, hospital based Nuclear Medicine department volunteered to complete the questionnaire.

Results
The mean age of the study population was 60.4 years. Only 12 per cent of patients indicated that they had direct access to the internet and this correlated closely with age. 37.7 per cent of patients indicated that they would use the WWW to obtain pre test patient information if it were available online. Only 42 per cent of patients indicated that they had received pre test patient information prior to their appointment of which 82 per cent were satisfied when information was received.

Conclusion
While patients indicated general dissatisfaction with current practices in patient education and were enthusiastic to embrace the WWW as a media for improving it, the role of the WWW in patient education is currently limited by the level of internet connectivity of the typical Nuclear Medicine patient.

INTRODUCTION

Patient Education
In recent years, patient education has evolved as a very important component of patient management. Dr Haile Mariam Kahssay of the Division of Strengthening of Health Services in the World Health Organisation indicates the importance of patient education on patient health: "You cannot have health without the involvement of enlightened people who have been informed and educated about their health situation and about what can be done to improve it". The emergence of patient education and informed consent as a right of the patient has seen the incorporation of patient education requirements into the standards for accreditation of health care institutions.

In the USA, the National Regulatory Commission (NRC) and the Joint Commission on Accreditation of Health Care Organisations (JCAHO) have incorporated standards for patient education as a requirement for accredited facilities and closer to home, the Australian Council of Health Care Standards (ACHS) has followed suite. Moreover, many documents outlining the legal and ethical rights of patients and some professional codes of ethics/conduct (including the constitution of the ANZSNM) acknowledge the role of patient education in overall patient care.

This investigation recognises the importance of patient education in overall patient management and acknowledges both the rights and desire of patients to be better informed. This investigation represents an important step in meeting the responsibilities for patient education by the service provider. In taking this step,
recognition is made that a better informed patient may be more co-operative and compliant, extending advantage to the service provider.

In the age of electronic media and information, patients tend to be better informed of their rights and of the responsibilities of health care professionals. Moreover, patients are aware that they play a key role in the decision making process as an informed party. We are currently experiencing an environment where patients may expect more information and health care professionals are acutely aware that patient education is more than describing the procedure.

The World Wide Web (WWW)
In recent years, across Australia and the world, the internet has initiated a revolution in the manner in which we meet people, educate ourselves, entertain ourselves and do business. The internet service that is responsible for the growth explosion since 1993 is the WWW. The Web browser hides the complex commands and text menus behind a graphical user interface (GUI) which puts the internet within reach of the computer novice. The WWW provides the low cost, high impact medium for information exchange desired in commerce, government and education alike. The WWW makes it possible to reach more people for less money than ever before. For those who do not have a home or office computer with internet access there are outlets providing this as a low cost service (e.g. libraries, computer stores, internet cafes, schools and internet vending machines that are proliferating in public facilities).

The WWW can be utilised to provide several advantages to business, and in particular, to a Nuclear Medicine department:
- It is significantly easier to communicate some information via a visual medium (e.g. directions/maps).
- Allows greater consistency and accuracy of information content.
- Reduction in printing costs and postage.
- Advertising and marketing.
- Increases environmental friendliness.
- Improve the efficiency and convenience of information dissemination to patients.

Efficient and convenient dissemination of information plays an integral role in patients arriving for their examinations correctly prepared and anxiety free, improving the departmental efficiency and improving the patients overall level of satisfaction.

According to the Australian Bureau of Statistics there are over 3.3 million internet users in Australia downloading 4665 million megabytes of information annually. In Australia, men are greater users of the internet than women (31 per cent compared to 27 per cent) and internet use peaks in the 18 to 34 year age bracket (38 per cent) decreasing with age to 65 years and over (six per cent). This age relationship raises significant equity issues for online patient education, particularly in Nuclear Medicine where patients tend to be older. The age disparity in internet use is attributed, in part, to a lack of exposure and opportunities to gain skills for older Australians.

Internet use in Australia also increases with both individual and household income from 16 per cent for the lower income bracket to 48 per cent for the highest income bracket. Again this undermines an argument in favour of online patient education because poorer Australians tend to have greater demands on health care. While the internet promises significant advantages to rural and remote populations by increasing access to resources, including patient education, internet use in these populations remains lower than their urban counterparts (18 per cent and 32 per cent respectively).

PURPOSE AND OBJECTIVES
The purpose of this investigation was to determine the level of digital connectivity of Nuclear Medicine patients and to determine the level of satisfaction these patients have with existing modes of information dissemination. In doing so, the potential role of the WWW for patient education in Nuclear Medicine could be determined.

METHODOLOGY
The level of patient digital connectivity and the level of satisfaction they had with existing modes of information dissemination was acquired via an investigator administered questionnaire. The information gathered aimed to provide a tool for convolving the role of online Nuclear Medicine patient education and in planning the quantity, level and type of information provided online. Each patient referred to a busy, hospital based, private Nuclear Medicine department during the collection period was given the opportunity to participate. The investigator administered questionnaires remained confidential, were completed prior to the commencement of the procedure and without alteration to current methods of patient education.

The purpose of the questionnaire was to:
- Establish the Nuclear Medicine patient demographics and correlate this with the number of patients with internet access.
- Establish the proportion of patients who felt that they would access Nuclear Medicine information if it were available online.
- Establish the level of satisfaction patients have with the conventional methods of information dissemination.
- Determine the role of online education in providing patients with information about Nuclear Medicine and the procedure they are to have performed.

The majority of questions required a simple yes or no responses with regard to internet access, satisfaction with existing methods of information dissemination and anticipated use of online education. The patients were also requested to rate their level of satisfaction with the amount of information they received prior to their examination. For ease of completion and to avoid individual interpretation of scale variations, it was felt that a descriptive rather than numeric scale would be utilised.

An open ended question was also included to allow patients to express in their own level of detail the type of information they would have liked to have had access to prior to their appointment. This allowed the unique requirements of individuals to be accommodated and, moreover, made the questionnaire less clinical allowing...
the patient to feel that their contribution may make a difference.

There were four major sources of bias considered prior to patients completing the questionnaires:

1. In answering the questions with regard to access a patient has to the internet, social desirability bias may result in patients indicating a greater level of access and use than reality.

2. In answering any of the questions, obsequiousness bias may result in the patient giving answers they perceive as desired.

3. In answering the questions with regard to the patients' level of satisfaction with the current level of information, patients may be apprehensive about answering negatively resulting in a better than reality view of patient satisfaction levels.

4. If the patient has no knowledge or interest in the internet, they may immediately disregard the importance of the questionnaire resulting in inaccurate or deliberately false answers.

To minimise these types of bias in a patient's answers, participants were given clear instructions that both positive and negative feedback is crucial in improving the service we provide. It was important not to place more emphasis toward either positive or negative to avoid the introduction of obsequiousness bias due to leading the patient. Furthermore, participants were informed that, even if they have no interest in the internet, that this information is critical in the planning of alternative methods for information dissemination.

RESULTS
During the study period 491 of 516 patients volunteered to participate (95.2 per cent compliance). Of these 40.7 per cent (200/491) were male and 58.5 per cent (287/491) were female with 0.8 per cent (4/491) not identifying their gender. The mean age of the Nuclear Medicine patients was 60.4 years with a range of 14 to 93 years. There were 77.1 per cent (476/61) of these patients who indicated that they would utilise a Nuclear Medicine Web site to gain patient information prior to attending their appointment if it were available online. There were 29.1 per cent (108/371) of these patients who indicated that they would use a friend or relative's computer to access information on the internet if they felt it was important.

Interestingly, there were 166 patients without access to the internet who would use a friend or relative's computer to obtain important information on the internet of which 55 (33.1 per cent) indicated that they would not access the Nuclear Medicine Web site to obtain patient information prior to attending their examination, suggesting this information is not considered important by the patient.

In total, 37.7 per cent (95 per cent confidence interval: 33.4 per cent - 42 per cent) of patients (185/491) indicated that they would use a Nuclear Medicine Web site to obtain information prior to attending the department if it were available online (34.0 per cent of males and 40.4 per cent of females). Only 42 per cent (206/491) of patients in the study population, indicated that they had received information about the procedure they were to have performed prior to attending their appointment (95 per cent confidence interval: 37.6 per cent - 46.4 per cent). Of those who did receive information, 82 per cent (169/206) indicated that the information was satisfactory (95 per cent confidence interval: 76.8 per cent - 87.2 per cent). The mean response for satisfaction with existing modes of information dissemination was 82 per cent (57/61). The results indicate that only 12 per cent (59/491) of patients had direct access to the internet (95 per cent confidence interval: 9 per cent - 15 per cent). Patients with internet access included 24 males (12 per cent) and 33 (12.2 per cent) females with no significant difference between genders noted (p=0.476). The mean age of the patient population with internet access was 45.5 years with a range of 16 to 81 years. There were 89.8 per cent (53/59) of patients with internet access who indicated that they would utilise a Nuclear Medicine web site to gain information prior to attending their appointment if it were available online (87.5 per cent of males; 91.4 per cent of females).

Clearly, 88.0 per cent (432/491) of patients indicated that they did not have direct access to the internet, of which, 61 patients (12.4 per cent of study population) indicated that they were planning to connect to the internet in the near future (21 male and 39 female). The mean age of patients planning to gain access to the internet in the near future was 46.3 years with a range of 14 to 78 years. There were 77.1 per cent (476/61) of these patients who indicated that they would utilise a Nuclear Medicine Web site to gain information prior to attending their appointment if it were available online.

The remaining 75.6 per cent (371/491) of patients did not have direct access to the internet and indicated that they were not planning to connect to the internet in the near future (155 male, 213 female and three with no gender indicated). The mean age for this group was 65.1 years with a range of 15 to 93 years. Of patients without internet access, 22.9 per cent (85/371) indicated that they would utilise a Nuclear Medicine web site to obtain patient information prior to attending their appointment if it were available online. There were 29.1 per cent (108/371) of these patients who indicated that they would use a friend or relative's computer to access information on the internet if they felt it was important.

Figure 1: Age distribution of study population.
Patient Education in Nuclear Medicine - Is there a role for the World Wide Web?

Table 1  
Patient satisfaction with existing modes of information dissemination (percentages of each group are in parentheses).

<table>
<thead>
<tr>
<th>Will use web site</th>
<th>Very satisfied</th>
<th>Satisfied</th>
<th>Average</th>
<th>Dissatisfied</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18 (10.9%)</td>
<td>69 (41.8%)</td>
<td>53 (32.1%)</td>
<td>20 (12.1%)</td>
<td>5 (3.0%)</td>
</tr>
<tr>
<td>Will not use web site</td>
<td>54 (17.1%)</td>
<td>187 (59.2%)</td>
<td>48 (15.2%)</td>
<td>25 (7.9%)</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>72 (15.0%)</td>
<td>256 (53.2%)</td>
<td>101 (21.0%)</td>
<td>45 (9.4%)</td>
<td>7 (1.5%)</td>
</tr>
</tbody>
</table>

dissemination was “satisfied” (Table 1). Patients who indicated they would use a Nuclear Medicine Web Site demonstrated a below average mean response while patients who indicated they would not use a Nuclear Medicine Web Site demonstrated an above average level of satisfaction.

When information was provided to the patient, it was satisfactory for 82 per cent (169/206) of patients. Moreover, in the 18 per cent (37/206) of patients receiving unsatisfactory information, the level of satisfaction was actually lower than those who had received no information at all, both of which are significantly lower than the satisfaction level for those patients who received information that they felt was satisfactory. Interestingly, 59 per cent (167/283) of the patients who indicated that they did not receive information prior to their appointment were either satisfied or very satisfied with the information they did not receive (95 per cent confidence interval: 53.3 per cent - 64.7 per cent).

There were 434 outpatients and 57 inpatients in the study population. There was a significant difference noted between the 86.0 per cent (49/57) of inpatients who received no information prior to attending the department for their appointment and the 55.3 per cent (240/434) of outpatients who did not receive information prior to their appointment (p<0.001).

DISCUSSION

Only 12 per cent of Nuclear Medicine patients indicated that they had direct access to the internet, with another 12.2 per cent indicating that they intended to connect to the internet in the near future. A total of 37.7 per cent of Nuclear Medicine patients indicated that they would use a Nuclear Medicine Web Site to obtain information prior to their appointments if it were available online.

The mean age of the study population was 60.4 years with a range of 14 to 93 years. Table 2 indicates internet access figures with respect to age from this patient study and figures published by the Australian Bureau of Statistics. The lower than expected percentage of patients in the 18 to 24 years age group with internet access may be a reflection of the lower average income and higher unemployment in the region investigated.

The patient questionnaire illustrated a clear inadequacy in the existing methods of information dissemination with only 42 per cent of patients receiving information prior to attending their appointment. 18 per cent of patients who did receive information felt that the information was unsatisfactory. Patients indicated a higher level of satisfaction when they received satisfactory information than when they received no information or, worse still, when they received unsatisfactory information. Patients who would use a Nuclear Medicine Web Site showed a below average mean satisfaction response while patients who would not use a Nuclear Medicine Web Site demonstrated an above average level of satisfaction. This may be the result of the combined effects of patients who received inadequate information being more interested in finding alternative methods of receiving this information, patients with internet skills having higher expectations with regard to information and patients that are not interested in gaining more information.

Table 2  
Internet access in the patient population with respect to age groups.

<table>
<thead>
<tr>
<th>Age</th>
<th>Total number</th>
<th>% with access</th>
<th>% planning access</th>
<th>% who will use a friends</th>
<th>% who will use web site</th>
<th>ABS% WWW users</th>
<th>% adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18</td>
<td>9</td>
<td>33.2</td>
<td>22.2</td>
<td>33.3</td>
<td>66.7</td>
<td>9</td>
<td>46.7</td>
</tr>
<tr>
<td>18 - 24</td>
<td>14</td>
<td>14.3</td>
<td>57.1</td>
<td>21.4</td>
<td>57.1</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>25 - 39</td>
<td>42</td>
<td>33.3</td>
<td>38.1</td>
<td>9.5</td>
<td>73.8</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>40 - 54</td>
<td>94</td>
<td>30.9</td>
<td>12.8</td>
<td>30.9</td>
<td>60.6</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>55 +</td>
<td>330</td>
<td>3.3</td>
<td>6.9</td>
<td>20.9</td>
<td>19.7</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>491</td>
<td>12</td>
<td>12.4</td>
<td>33.8</td>
<td>37.7</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
Interestingly, 59 per cent of patients who indicated that they did not receive information prior to their appointment were either satisfied or very satisfied with the information they did not receive. This, given the age profile of the patient population, may be a consequence of the traditional patient/doctor relationship where patients tend to be less active and less vocal with regard to their health care; putting their trust in the health care professionals and preferring to remain less informed with regard to the finer details of procedures.

Given the mean age of Nuclear Medicine patients (60.4 years), the low proportion of patients with internet access and the high degree of satisfaction with conventional methods of information dissemination, the role of a Nuclear Medicine Web Site for most patients may be simply to provide additional, more detailed information as a supplement to information they received by more traditional means. For 37.7 per cent of patients with the access, interest and ability to do so, a Web Site may provide an alternative method of information dissemination. This role should evolve with time, and generational changes, with an increasing representation of the older age groups typical of Nuclear Medicine patients in the cohort of patients with internet access. In general, the patients have indicated that they would like to receive more information about the procedures they are having performed, prior to their appointment and in the printed form.

Unfortunately, the results of this investigator administered questionnaire may be subject to some bias and confounding. While great care was taken to avoid such bias and confounding, the perception of a lack of anonymity may have resulted in:

- Social desirability bias whereby patients may have indicated a greater level of access to/ use of the internet than reality because they may feel left out/left behind by the truth. Since, in this patient population, results indicated low access to and use of the internet, this bias has not influenced the determination of the role of a Web Site for patients.
- A reluctance of patients to answer negatively with regard to their level of satisfaction with the existing methods of information dissemination. This may account for the 167 (of 283) patients who did not receive any information prior to their appointment who indicated that they were either satisfied or very satisfied with the information they did not receive.
- Obsequiousness bias may have resulted in patients providing answers that they think are desired by the investigators. In administering the questionnaire, it was noted on a number of occasions that patients actually asked ‘What do you want me to say?’ The effects of this bias are difficult to estimate, however, one suspects that the bias may artificially increase the proportion of patients with internet access while decreasing the level of satisfaction results. Obsequiousness bias may also be responsible for the disproportionate number of internet users compared to the number that indicated they would use the Nuclear Medicine Web Site.

CONCLUSION

While a Nuclear Medicine web site provides a useful tool for information dissemination, at this time a departmental web site should not come at the expense of more traditional media for information dissemination. There is both a need and professional obligation for significantly improving patient education which has, in part, been in response to the internet spawned expectations of the information age. This very vehicle of change, however, does not provide the vessel for quenching the patients’ thirst for information – at this time!

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REFERENCES