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Relative needs index study, South Australia and New South Wales

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Abbreviations

DAS	Dental Anxiety Scale
NSW	New South Wales
OHIP	Oral Health Impact Profile
RNI	Relative Needs Index
ROC	Receiver Operating Characteristic
SA	South Australia

Symbols

*	statistically significant
n.s.	not statistically significant
. .	not applicable

Summary

The Relative Needs Index (RNI) Study applied indicators of patient-perceived treatment needs (i.e. symptom-based measures of disease, and social and psychological consequences of oral diseases and disorders) and compared them to a clinical judgment of urgency of care. The RNI study sought to determine the relative need of patients attending for emergency and general dental care by assessing both patient-perceived need and a clinical determination of need stratified into a hierarchy of urgency of care.

At present there are no criteria or protocols in place that can be used to check or assess the reasonableness of a patient's presentation for emergency dental care or even the relative need or priority of patients on the waiting list for general dental care.

Currently, waiting lists for general dental care are based on a chronological queuing of patients, meaning that general dental care is offered on a 'first come, first served' basis to potential patients in the order they entered the waiting list. However, is this the most egalitarian approach to rationing dental care?

It may seem equitable to take the approach of 'those who make the first claim to wanting to receive dental care by joining a waiting list should also be the first to receive the care'. However, there are clear disadvantages involved in the use of this system. It does not take into consideration a patient's need for care or the urgency with which the care is required.

One way of circumventing the problems associated with allocating dental care to patients on the basis of waiting time is to ration the care on the basis of their overall experience of oral diseases and disorders. Patients would be given priority on the waiting list depending on their reported symptoms and/or the psychosocial impact of their oral problem. Systems that give priority to patients with the greatest need first are deemed to be equitable, and should facilitate better access to adult dental care in both South Australia (SA) and New South Wales (NSW).

The data in the report derives from individual client experience of the problem presented to clinic, and is cross-matched with data provided by the assessing dentists. If client perception and dentist perception are assumed to express the pragmatic experience of access to care, the results suggest that some triaging of emergency and general patients using questions similar to the ones asked in the questionnaire may not be seen as unreasonable by both clients and service providers.

A total of 839 (91.2% of the anticipated sample) and 740 (82.2% of the anticipated sample) eligible patients requesting emergency dental care and general dental care were recruited across South Australia (SA) and New South Wales (NSW) respectively.

Subjective oral health status indicators (i.e. experience of pain or other oral symptoms) and the psychosocial impact of oral disorders were examined as potential predictors of urgency of care.

Psychosocial impact was assessed by asking patients if, during the last week for emergency patients or the last four weeks for general patients, they had experienced specific events because of problems with their teeth, mouth or dentures. The study

included social impact questions on toothache and other oral and facial pain, being concerned/worried about one's dental health or appearance, avoidance of going out, ability to carry out daily activities and dental anxiety.

For the emergency sample, just over 71% of patients reported having a toothache in the last week, almost 70% indicated that they were worried about the appearance of their teeth or mouth, approximately 31% stayed home more than usual and 26.5% reported avoiding their usual leisure activities because of problems with their teeth, mouth or dentures. Variables having a statistically significant association with urgency of care included age, education, experience of toothache, pain in teeth with hot or cold food/fluids, pain in jaw while opening mouth wide, sore gums, bleeding gums, pain at night, difficulty sleeping, staying home more than usual, avoiding usual leisure activities and worry/concern about the health of one's teeth or mouth.

For those patients seeking general dental care, almost 45% reported having a toothache in the last four weeks, 41% of the sample indicated that they were prevented from eating foods they would like to eat, just over 49% felt uncomfortable eating any foods, almost 70% indicated that they were worried about the appearance of their teeth or mouth, approximately 44% reported being embarrassed by the appearance/health of their teeth or mouth and just over 27% felt that life in general was less satisfying. Variables having a statistically significant association with urgency of care included age, usual/previous occupation, experience of toothache and various other oral and facial pain symptoms, being prevented from eating certain foods, decreased enjoyment of food and being worried/concerned or embarrassed about the appearance and health of one's teeth or mouth.

Logistic regression was used to further examine the significant bivariate associations for each sample, and models were developed to aid in the prediction of urgency of care. Since the experience of symptoms reported by patients in each sample is somewhat different, the perceived treatment needs of emergency and general patients will also be different. These differences are accounted for by using separate models to predict urgency of care for each sample.

Emergency dental care

Three statistical models were developed to predict the treatment urgency of patients attending for emergency dental care.

The first regression modelled 'urgency' as needing to be seen within 48 hours compared to more than 48 hours. Difficulty sleeping, pain in the jaw when opening mouth wide, having a broken filling, having a loose tooth and concern about the health of one's teeth or mouth had a significant positive association with needing to be seen within 48 hours. In addition, bleeding gums were negatively associated with needing to be seen within 48 hours.

The second model determined which factors were associated with needing to be seen in the period 2–7 days compared with more than 7 days. Factors significantly associated with needing to be seen in the period 2–7 days included experience of toothache, pain in teeth with hot food or fluids, bleeding gums, having a broken filling, difficulty sleeping all the time, and concern about the appearance of teeth or mouth.

The third model determined the associations with needing to be seen within one week compared with 8 or more days. Those factors with a significant positive association with needing to be seen within a week were presence of toothache, having a broken filling, having a loose tooth, difficulty sleeping all the time and very often being concerned about appearance of teeth and mouth.

General dental care

Two statistical models were developed to predict the treatment urgency of patients requesting general dental care.

The first regression modelled 'urgency' as needing to be seen within 6 months compared to 7 or more months. Factors significantly associated with needing to be seen within 6 months included oral and facial pain symptoms scale, oral health impact profile (OHIP) scale, usual reason for dental visit, time since last visit and smoking.

The second model determined which factors were associated with needing to be seen within 3 months compared with 4 or more months. Factors significantly associated with needing to be seen within 3 months included the oral and facial pain symptoms scale, oral health impact profile (OHIP) scale, usual reason for dental visit, place of last dental visit, usual/previous occupation, a lost filling, a loose tooth and being a smoker.

Predictive ability of the models

Sensitivity, specificity, positive predictive values and negative predictive values were calculated for each model to determine how well the models were able to predict urgency of care. Sensitivity and specificity are dependent on the cut-off values selected for the test, i.e. the value above which the test is interpreted as urgent. The relationship between the cut-off value and sensitivity/specificity were examined for each model using receiver operating characteristic (ROC) curves. As the cut-off was modified (i.e. as the point that separated non-urgent patients from urgent patients was changed), the sensitivity and specificity of the test also changed; sensitivity was enhanced at the expense of specificity and vice versa. A sensitive test will have few false negative test results while a specific test will have few false positive test results. The decision to maximise either sensitivity or specificity depends on the relative cost of a false positive or false negative test result.

This study has indicated that there are tests that may prove useful in giving priority to patients seeking emergency and general dental thus making the RNI a potentially useful tool for allocating priority to patients. The application of RNI requires management decisions on the desirable clinical/political outcomes. The selected approach then needs to be demonstrated and the effects monitored.