



## Opportunistic immunisation of paediatric inpatients at Rotorua Hospital: audit and discussion

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### Abstract

**Aim** To audit current practice around opportunistic immunisation in a New Zealand hospital and make recommendations for improvement.

**Methods** We reviewed inpatient notes for 369 patients aged 3–23 months admitted over a 6-month period in 2007. Data was obtained regarding children's immunisation status, documentation of this and action taken in response to the under-immunised child. Literature review and discussion with local clinicians were used to identify recommendations for future practice.

**Results** 84% of patients had their immunisation status documented on admission; only 60% of these were up-to-date with immunisations. Official immunisation records were rarely available. In 79% of patients who were behind with immunisation, no follow-up action was recorded, and only 4% of under-immunised children received catch-up immunisation on the unit.

**Conclusions** Current practice around opportunistic immunisation is poor. A number of measures could be expected to improve this; these include establishing routine systems for obtaining immunisation records, a visual reminder system for immunisation and training more staff in immunisation.

New Zealand's low immunisation coverage has caused concern among health professionals and planners.<sup>1</sup> Nationally, only 76% of children are up to date with immunisations, with even lower rates among Māori and Pacific children, and low socioeconomic groups.<sup>2</sup> Lakes DHB, served by Rotorua Hospital, has the lowest immunisation rate in the country; 63% of two year olds in the area are up-to-date.<sup>3</sup>

Missed opportunities are a major factor in under-immunisation, and opportunistic immunisation is key to improving coverage.<sup>4-6</sup> Hospital admission provides a valuable opportunity to review children's immunisation status and provide catch-up immunisation.<sup>7,8</sup> Documentation of immunisation status and opportunistic immunisation of hospital inpatients were adopted as Clinical Indicators by Rotorua Children's Unit in 2007, with the aim of benchmarking performance and driving improvements in practice.

This audit looks at the immunisation status of paediatric admissions to Rotorua Hospital over a 6-month period. Three issues are addressed; immunisation status and factors affecting this, documentation of immunisation, and action taken in response to the under-immunised child. We then discuss potential barriers to catch-up immunisation within our service, and make recommendations for service improvement.

## Methods

In-patient notes were sought for all children aged 3 to 23 months who were admitted to the hospital under paediatric care between 1 May 2007 and 31 October 2007. Demographic information was recorded, as well as immunisation status from the paediatric clerking. For some children, official Ministry of Health immunization records had been obtained and filed in the notes during admission. These were used to confirm the accuracy of information documented in the admission clerking.

It is possible that some parents brought their Well Child (Tamariki Ora) Health Book to hospital during admission. While this may have been an additional source for determining a child's immunisation status we were unable to determine this from the inpatient notes, and felt that contacting parents to obtain this data retrospectively was beyond the scope of this audit.

Where children had not received all of their age-appropriate immunisations, the notes were reviewed for any explanation given for this, and to identify whether any action had been taken, for example advice to see GP for immunisation, discussion about immunisation or catch up immunisation on the ward.

The notes were reviewed by four members of the paediatric team; two SHOs, a senior nurse and an experienced care assistant.

### Audit questions

- National Health Index number (NHI); this is a unique health identification code given to each child at birth in New Zealand.
- Date of birth
- Age (at admission)
- Sex
- Ethnicity
- Month of admission
- Immunisation status from clerking (up to date, behind, or not documented)
- Immunisation status from Ministry of Health data (if included in notes)
- Reasons for non immunisation (if documented).
- Action taken (catch-up done on ward, catch-up offered but declined, referred to GP for catch-up, discussed immunisation)
- NZDep2001 deprivation score of child's address
- Number of previous admissions (excluding Special Care Baby Unit admissions)

### Audit standards

- All children presenting to paediatric care should have immunisation status documented
- Where appropriate, catch-up immunisation should be offered

## Results

388 children aged 3 months to 2 years were admitted under paediatric care between 1<sup>st</sup> May and 31<sup>st</sup> October 2007. Of these, 369 were included in our audit. Reasons for exclusion were the unavailability of notes, children not clerked by paediatrics (boarder children accompanying siblings; children admitted for routine investigations) or children too old for the study (24 months or older on admission).

**Demographic information**—From the audit sample of 369 patients ;

- The majority of patients were Māori (66%)
- A majority (58%) of the admissions were male
- 61% of patients lived in areas with a deprivation score of 9 or 10, thus indicating low socioeconomic status.

**Immunisation status**—Immunisation rates among children admitted by Rotorua Hospital's Paediatric Department were low, though at a level similar to community immunisation rates within the region.<sup>3</sup> Only 60% of children who had immunisation status documented were up to date.

Māori children were less likely to be immunised, but, in contrast with community statistics,<sup>3</sup> immunisation status was not significantly affected by socioeconomic status.

**Documentation**—Documentation of immunisation status was missed in 16% of admission clerkings. Furthermore, Ministry of Health data was only available for 43 patients, although this improved in October when the ward began to routinely obtain faxed reports from the Ministry of Health. Twelve (28%) of the Ministry records contradicted parental reporting of immunisation status.

**Reasons for not immunising**—Of 119 children who were behind with immunisation, reasons were recorded in 43 (36%). The most common reason for missing immunisations was illness at the time a vaccination was due; this was cited in 21 cases. We were unable to determine the type of illness preventing immunisation. Parental choice or concern about vaccination safety (11 children) and time constraints (6) were the other main reasons.

Catch-up immunisation would have been inappropriate in five cases; two children were palliative care patients and three had contraindications to vaccines.

**Action on immunisation**—In 90 patients, 79% of those in whom catch-up vaccination was indicated, no action was documented. Only 4 children were given catch up immunisations on the ward. A discussion on immunisation was recorded in 15 cases, and 5 were referred to their GP.

No-one who was offered the opportunity for catch-up immunisations declined.

40 of the under-immunised children had at least one previous admission to the children's ward, suggesting previous missed opportunities to vaccinate.

## Discussion

This audit confirms a low rate of immunisation in children admitted to Rotorua Hospital, and demonstrates a high level of missed opportunity in relation to catch-up immunisation to the ward. While we believe this is the first audit of opportunistic immunisation in New Zealand, it is likely that similar problems exist in other district health boards. We hope that this audit and discussion will help other district health boards to reflect on and improve their practice.

16% of children presenting to the children's unit did not have their immunisation status documented on admission, despite this being a key question in paediatric history taking. Furthermore, verification of immunisation status was rarely possible, since Ministry of Health data was only available for 43 patients. Parental recall of immunisation status is often inaccurate,<sup>4</sup> and official health records are essential if catch-up immunisation is to take place.<sup>7-9</sup>

It is encouraging that the availability of this data improved towards the end of the audit period, when the paediatric ward clerk began routinely obtaining and filing Ministry of Health Records.

Perhaps most concerning was the lack of action when children were found to be behind with immunisation. Despite catch-up immunisation being recommended by many bodies, and being adopted as a clinical indicator for the children's unit, only 4% of under-immunised children received immunisations in hospital.

Availability of staff trained in immunisation was a major barrier to catch-up immunisation. While the Children's Unit is trying to address this, it is still common for there to be no immunisation trained nurse available on the day of discharge.

Lack of a pre-ordered vaccine supply was another potential obstacle to ward-based immunisation. While vaccines were always available from hospital pharmacy, they needed a doctor's prescription before they could be obtained on the ward, and could not be ordered in advance.

However, since only 19% of patients have any action or discussion documented, it seems likely that the patient's immunisation status is often over-looked. Immunisation status is not routinely referred to during discharge planning, and in our experience vital information often remains unread in a patient's charts.

Some of the barriers to catch-up immunisation may relate to a lack of knowledge and education among health professionals. In his study of opportunistic immunisation of hospitalised children in Leeds (UK), Conway noted a lack of interest in immunisation among health professionals.<sup>8</sup> There may be a need for increased education among junior doctors and nurses about the importance of immunisation.

It is also possible that junior doctors do not feel confident in discussing immunisation with parents. Indeed, a survey of New Zealand GP's demonstrated significant knowledge gaps in relation to immunisation,<sup>1</sup> while research in Rotorua found that a significant proportion of health professionals lack confidence around immunisation safety.<sup>10</sup> It is likely that hospital healthcare providers have similar educational needs, which must be addressed if practice is to improve.

Interestingly, the most common reason for incomplete immunisation was illness at the time the immunisations were due; only 11 parents cited 'choice' or 'concern' as an explanation. Furthermore, none of the families who were offered catch-up immunisation refused. This correlates well with New Zealand data suggesting that only 5-6% of families choose not to immunise their children.<sup>11</sup>

As doctors, we may overestimate parental concern about immunisation; a survey of New Zealand GPs found that parental concern was believed to be the most significant barrier to improving immunisation rates.<sup>12</sup> An appreciation of parental willingness to immunise should encourage health professionals to respond more confidently to missed immunisations, with less fear of causing conflict with parents.

A number of steps have now been taken on the paediatric unit to try to improve practice, beginning with the prioritisation of immunisation as a paediatric clinical indicator and the decision to audit this practice. Most importantly, the ward has now established routine systems for establishing children's immunisation status from the Ministry of Health. It has also increased the availability of vaccine information for

parents and professional, begun training more nurses in immunisation, created systems for vaccine ordering and cold chain storage, and made arrangements for continuous monitoring of practice.

## Recommendations

Systems for immunisation of hospitalised children have been developed by Conway<sup>8</sup> in Leeds, UK, and by Bell and colleagues<sup>7</sup> in Philadelphia, USA. Both authors highlight key aspects of a ward-based immunisation programme;

- A routine system for obtaining accurate immunisation data
- A routine system for providing catch-up immunisation, including visual reminders of a child's immunisation status and a plan to immunize on day of discharge
- Educating, motivating and supporting staff
- Monitoring and evaluating progress.

Discussion with Rotorua paediatricians has identified two ongoing barriers to catch-up immunisation. These relate to systems for immunisation and staff training.

The unit lacks a routine system for providing catch-up immunisation; to establish this will require a commitment from all staff to provide immunisation on day of discharge, education and encouragement from senior ward medical and nursing staff, and a system to help alert staff to the under-immunised child. As a visual reminder, we would recommend a coloured stamp or laminate to highlight the child's status in the front of the in-patient record and drug chart.

Secondly, unavailability of staff trained in immunisation is a major barrier to catch-up immunisation. We recommend that the children's unit broadens programmes to train nurses in immunisation, and considers including junior doctors in such programmes. As an interim measure, the ward now displays a list of immunisation trained nurses at the nurses station.

Leadership and coordination is an essential aspect of improving immunisation practice.<sup>7,8,13</sup> We recommend the nomination of a person with responsibility for immunisation, whose role would include education, support and monitoring of progress. The district health board may want to consider the introduction of an Immunisation Coordinator to help develop and maintain a strong programme.

Ongoing evaluation and feedback to staff about the successes and limitations of an in-patient immunisation programme is vital.<sup>12</sup> The Children's Unit has already made arrangements to repeat this audit and bench-mark our performance against other District Health Boards in New Zealand; it is hoped that analysis of this data will demonstrate a change in practice and promote continuous improvement.

**Competing interests:** None known.

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