During the recent Tokyo meeting, outstanding work using the comprehensive National Health Insurance database of Taiwan was presented for discussion. Their data include hospital and primary care data drawn from a comprehensive public health system that the Taiwanese government provides for its 23 million citizens. Most impressive was the description of the design, and preliminary results from a nationwide record-linkage surveillance system which (almost in real-time) has allowed monitoring of the safety of the 2009 pandemic A (H1N1) vaccinations delivered across the country. To achieve this feat, embedded chip technologies were used within the national health insurance card carried by Taiwanese citizens. Using statistical estimates of the numbers of serious reactions to the vaccine gleaned from the literature, they were able to predict and substantially confirm the extent to which serious adverse events such as Guillain-Barré syndrome would be observed as a consequence of their vaccination program.

Also impressive was a workshop describing preliminary work of collaborators in an Asian Pharmacoepidemiology Network. This workshop provided preliminary clues about issues surrounding antipsychotic drug use and the precipitation of diabetic states. The Network includes workers with access to all the major Asian databases, the US Medicaid and Medicare datasets, the Swedish national database as well as the Australian Veteran's health dataset (accessible to South Australian academics). More importantly than the preliminary findings presented at the workshop was the fact that such cooperation and collaboration across language, cultural and institutional barriers had been possible.

Australian hospital pharmacists in our large hospitals have access to rich computerised datasets containing records of local healthcare resource utilisation as well as the health status of clients of their institutions across time. Negotiating the privacy considerations, and learning to use sound pharmacoepidemiological methods to mine such datasets in future could considerably expand the scale and scope of our pharmaceutical care.

Hospital pharmacists engaged in clinical care of patients will find value familiarising themselves with the new tools in pharmacoepidemiological research. Certainly, exposure to this field enhances the ability to spot the confounding that often diminishes the value of observational research.

The sixth Asian meeting on Pharmacoepidemiology will be held in Beijing, China from 28 to 30 October 2011.

Frank W May, MAppSci (Pharm), AUA, ARCM, LRAM, FISPE
Editorial Advisory Board Member
Journal of Pharmacy Practice and Research, and
Service Director
Drug and Therapeutics Information Service
Pharmacy Department
Repatriation General Hospital
Daw Park SA 5041
E-mail: frank149@bigpond.net.au

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It All Begins with One Case

To be a 'seven star pharmacist' according to the WHO's consultative group's report, *Preparing the Future Pharmacist* (Vancouver 1997) pharmacists must fulfil seven roles, which should be considered essential, minimum common expectations of pharmacists by health systems worldwide.[1] These roles are:

- caregiver;
- decision maker;
- communicator;
- leader;
- manager;
- lifelong learner; and
- teacher.

I am sure that clinical pharmacists can identify with each of the listed roles and could provide examples from their current practice as to how they fulfil each role. Yet, lacking from, but integral to all of these roles, is the need to be a researcher.

In many instances, that may simply mean the retrieval and evaluation of the research results of others (i.e. evidence-based practice). In other cases, it may involve the creation and dissemination of new knowledge, with the purpose of advancing patient care. In the era of evidence-based medicine, the pinnacle of such research is the randomised control trial. However, as clinical pharmacists working on the wards, the opportunities to engage in such trials are often limited but the opportunities to engage in research are not.

Clinical pharmacists are charged with the responsibility of identifying and resolving/preventing actual and potential drug-related problems. Every patient who comes under the care of a clinical pharmacist is a potential research opportunity. When faced with a patient with a problem that is believed to be drug-related, the question to be asked is *What did it?* as solving the problem is based on retrospective data. However, in the case of the initiation of a new therapy, the process is prospective and the question is *It did what?*

As clinical pharmacists, it is important to appreciate these differences and to incorporate these questions into your clinical practice. Taking the time to ask the questions *Why is this so?* when confronted with an unusual event and *What will happen next?* when a new therapy is started provides the opportunity for discovery. A single case report is unlikely to change clinical practice, but rather raise a suspicion of a cause or effect. A series of cases studies may in turn form the genesis of a hypothesis for cohort and case-control studies which provide evidence of association, and ultimately randomised control studies which demonstrate causality.

A lot of what we know in clinical practice had its beginnings in chance observations and single case reports. Findings from a case report as limited as it may be, can inform the practice of others or assist them by corroborating their clinical suspicions. Clinical and drug information pharmacists are often asked to give advice on novel drug treatments, and often this information is sourced from case reports. Similarly, when faced with a patient who is suspected to be suffering from an unusual drug-related problem, other case reports are sought to provide possible evidence of association. However, it is important to remember that just because something has not been reported it does not mean that it has not happened before.

The case of a 43-year-old woman with breast cancer who had a reduced requirement for warfarin (1 mg daily) after commencing tamoxifen prompted Tenni et al.[2] in 1987 to undertake a retrospective review of the warfarin requirements of a further 18 women with breast cancer and thromboembolism. This case series revealed that for patients on tamoxifen, of the five patients on the combination, two had suffered haemorrhagic complications, and the other three were on low doses of warfarin (2 to 3 mg daily). Whereas the other 13 women had been stabilised on standard warfarin doses (4 to 10 mg daily). Tenni et al.'s case report was only the second in the literature. The interaction was theoretically plausible based on the knowledge of the day, and 20 years later the concomitant use of warfarin and tamoxifen carries a warning. This is despite the fact that Givens et al.[3] reported that the literature on the interaction consisted of two letters, two case reports, and two retrospective reviews. They stated: 'Collectively, these articles described a total of 31 patients taking warfarin and tamoxifen concomitantly, with 8 patients experiencing bleeding complications'.[3] This example does not only illustrate the power of case studies, but also the worth of the clinical pharmacist as a researcher (Peter Tenni and Debbie Lalich were clinical pharmacists at Sir Charles Gairdner at the time their paper was published).

Jenicek[4] has stated that it is those 'special cases that advance the knowledge, research and practice of medicine' which form the basis of what we know and teach today. Clinical pharmacists are well placed to discover and assist in the management of special cases. Each case alone will contribute to Category III evidence and when combined into a case series Category II-3.[5] As mentioned before, these may form the basis for a hypothesis to be tested by cohort or case control studies or even randomised control trials. For this reason, I would encourage clinical pharmacists to continue to present and publish case reports, and use these to enhance the basis of a practice-research nexus.

Professor Jeff Hughes, BPharm, GradDipPharm, MPharm, PhD
Editorial Advisory Board Member
Journal of Pharmacy Practice and Research, and
Head of School
School of Pharmacy
Curtin University
Bentley WA 6102
E-mail: J.D.Hughes@curtin.edu.au

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Why has the Nurse Practitioner been granted Prescribing Privileges?

First November 2010 saw the enactment of legislation pertaining to nurse practitioners and midwives and their access to the Medical Benefits Schedule and the Pharmaceutical Benefits Scheme. The Federal Health Minister, the Honorary Nicola Roxon announced: 'For the first time, Nurse Practitioners are able to access relevant new items under the Medicare Benefits Schedule and to prescribe certain medicines under the Pharmaceutical Benefits Scheme'.

Background

The role of the nurse practitioner is not new in the international world of health professionals. In the UK, Canada and USA, the nurse practitioner role for advanced practice clinicians has been in place for over 50 years. The roles and scope of practices provide health services for under-served populations and enhance timely and efficient care in over-utilised services, with nurse practitioners as integral members of healthcare teams

The introduction of nurse practitioners into the Australian professional health workforce was first mooted in 1990 but it was not until 2001 that the first nurse practitioner was appointed (in a remote area without a practising doctor). The intervening 11 years were challenging with a somewhat misinformed media campaign being waged by medical groups against the role.

Following the first few appointments of nurse practitioners in New South Wales, a momentum built up across the country as more nurses with advanced skills and a passion for what they did were able to gain the qualifications necessary to be authorised in the role. At the same time, doctors who worked alongside nurse practitioners began to speak out in support, negating the adverse effects of the negative press. Thus, while the movement began slowly in 1990, in 2010 there are over 400 nurses in various roles and they are represented by the Australian College of Nurse Practitioners.

The relatively recent (10 years) recognition in Australia of the nurse practitioner as an authentic healthcare provider has been chiefly driven by the needs of the health system. Most pertinent drivers have been the fragmentation in continuum of care for patients, diminishing funding sources and the threat of workforce shortages. Federal and state healthcare reform and productivity papers over the past 20 years that have reviewed the status of the Australian health system and workforce, confirm these facts and concerns. Meanwhile, international evidence confirms that nurse practitioners deliver safe and effective care to patients, families and communities with many working in rural and remote communities as the only health professional.

Why the nurse practitioner?

The Australian Nursing and Midwifery Council defines a nurse practitioner as: a registered nurse educated and authorised to function autonomously and collaboratively in an advanced and extended clinical role. This role includes assessment and management of clients using nursing knowledge and skills and may include but is not limited to the direct referral of patients to other health professionals, prescribing medications and ordering diagnostic investigations.