Incorporating vaccine administration in pharmacy curriculum: Preparing students for emerging roles

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After reading this article, the learner should be able to:
- describe the impact of vaccine administration as an emerging role for pharmacists;
- provide a recommendation as to components of immunisation training which best improve knowledge and confidence in vaccine administration.

Competencies addressed:
1.3 1.5 3.4 6.1 6.2 6.3

Accreditation number: CX1400010U
Upon successful completion of the associated assessment, this activity has been accredited for 0.6 hours of Group 1 CPD (or 1 CPD credit) suitable for inclusion in an individual pharmacist’s CPD plan.

AUSTRALIANS ARE EMBRACING IN-PHARMACY VACCINATIONS WITH CONSUMER SATISFACTION AND UPTAKE FAVOURABLE. LECTURE-BASED AND SIMULATED IMMUNISATION TRAINING, WITH CORRESPONDING ASSESSMENT, SHOULD BE CONSIDERED AS REQUIRED ELEMENTS IN ALL CURRICULA.

COMMONLY ASKED QUESTION: If unused, can the 28-day expiry be safely extended and for how long?

Momentum is building within the Australian pharmacy profession to expand the scope of pharmacists’ practice to include vaccine administration. Earlier this year, the Queensland Pharmacists’ Immunisation Pilot (QPIP) commenced, a collaboration between the Queensland branch of the Pharmaceutical Society of Australia (PSA), the Pharmacy Guild, Queensland University of Technology and James Cook University. The pilot will be conducted during the 2014 influenza season and will evaluate the safety and effectiveness of pharmacists as immunisers in community pharmacy. The pharmacy profession has welcomed this announcement. Pharmacists have always held an important role in the provision of primary and preventive healthcare and are among the most accessible health professionals in Australia. Pharmacists are in a pivotal position to promote health and increase public awareness about immunisation to enhance healthcare outcomes for individuals and the overall population. They can help increase vaccination rates by serving as educators, facilitators and vaccinators.

In recent years, many Australian community pharmacies have incorporated providing influenza vaccine services into their practice model, where an authorised nurse immuniser provided influenza vaccinations at pharmacy premises.

To date the influenza vaccine has been the primary vaccine provided in Australian community pharmacies; however there is potential for expansion of vaccination services. Australians are embracing in-pharmacy vaccinations with consumer satisfaction and uptake favourable.

This expanding practice was further supported by the 2012 publication of the PSA’s Practice Guidelines for the Provision of Immunisation Services within Pharmacy.

The Australian profession is seeking an expansion of professional roles to allow pharmacists to vaccinate, in line with international practice, as occurs in US, Canada, UK, Portugal and New Zealand. It is foreseen that the expanded pharmacist’s role will include the administration of vaccines and provision of complete immunisation services, including aftercare. The role expansion is imperative to alleviate the current burden on the healthcare system and will provide an important, readily accessible, community service that enhances both individual and population-based healthcare. For such a change of practice to occur however, pharmacists need to have the skills and competencies in place to adopt this emerging role when legislative changes occur.

Legislation in individual jurisdictions is starting to reflect this changing practice, with changes to the Medicines, Poisons and Therapeutic Goods Act (that would allow pharmacists to vaccinate) currently before the Legislative Assembly of the Northern Territory. It is therefore imperative that pharmacists be appropriately trained and accredited to expand their role in this area. Practising pharmacists are now participating in continuous professional learning.
development (CPD) programs offering vaccine administration workshops, such as those included in the Pharmacy Guild of Australia CPD by the Sea Conventions in February 2013 and 2014.445 Despite the fact that such education is not yet accredited, this highlights the willingness of members of the profession to upskill in preparedness for new practice competencies.

Charles Sturt University (CSU) implemented a pharmacy student vaccine administration teaching in 2010.12 Griffith University School of Pharmacy introduced vaccine administration teaching in an integrated approach across two subjects of the MPharm in 2013. The vaccine administration module built on existing course content in complementary fourth year courses that focused on pharmacy practice and sterile dosage forms. The vaccination module is comparable to the Pharmacy-Based Immunization Delivery program by the American Pharmacists Association (APhA), which is a credential necessary for pharmacists to vaccinate in the U.S.13 This program was then adopted as a curricular component by many colleges and schools in the US.14 The Centers for Disease Control and Prevention in the United States recognizes this program as appropriately preparing pharmacists for vaccine delivery.15

It is crucial that pharmacy education evolves to meet the changing needs of practice and the profession.

### TABLE 1: Student responses to impact of teaching initiatives and assessment

<table>
<thead>
<tr>
<th>Teaching Initiative</th>
<th>Improved my knowledge in vaccine administration*</th>
<th>Improved my confidence in vaccine administration*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>4.76</td>
<td>4.61</td>
</tr>
<tr>
<td>Online ASCIA training</td>
<td>4.69</td>
<td>4.52</td>
</tr>
<tr>
<td>Demonstration with mannequins and placebos</td>
<td>4.79</td>
<td>4.63</td>
</tr>
<tr>
<td>Hands-on experiences with mannequins and placebos</td>
<td>4.83</td>
<td>4.78</td>
</tr>
<tr>
<td>Assessment Tool</td>
<td>Useful in assisting my learning*</td>
<td></td>
</tr>
<tr>
<td>Online ASCIA training</td>
<td>4.52</td>
<td></td>
</tr>
<tr>
<td>Vaccination theory assessment</td>
<td>4.59</td>
<td></td>
</tr>
<tr>
<td>Practical assessment with mannequins and placebos</td>
<td>4.76</td>
<td></td>
</tr>
</tbody>
</table>

*Mean (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5). (n=20)

### TABLE 2: Student perceptions of vaccine administration module

<table>
<thead>
<tr>
<th>Student Perceptions</th>
<th>Mean*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel more confident in my ability to administer vaccines</td>
<td>4.78</td>
</tr>
<tr>
<td>I have greater appreciation of what is involved in offering a vaccination service in pharmacy</td>
<td>4.78</td>
</tr>
<tr>
<td>I believe this is a useful module to offer pharmacy students</td>
<td>4.78</td>
</tr>
<tr>
<td>I believe I can make informed decisions regarding the appropriateness of offering a vaccine service in pharmacy</td>
<td>4.72</td>
</tr>
<tr>
<td>I am more likely to be involved in vaccine services due to the vaccination training</td>
<td>4.72</td>
</tr>
</tbody>
</table>

*Mean (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5). (n=25)
RESULTS
Fifty-seven students were enrolled in the fourth year of the BPharm in October 2013, and 38 (66.6%) completed all aspects of the vaccine administration module including the voluntary assessment. Of these students, 29 (76.3%) completed the questionnaire to evaluate the teaching initiatives (Table 1) and rate their perceptions on the module (Table 2).

All students (n=38, 100%) agreed or strongly agreed that each of the components of the teaching improved their knowledge in vaccine administration. The majority of the students also agreed or strongly agreed that all of the teaching initiatives improved their confidence in administering vaccines, with one neutral response recorded about confidence from lectures and online training. The students ranked the simulated experience with manikins and placebo vaccines highest of all the teaching and assessment components. Demonstration of vaccine administration was rated highest of all in improving confidence in vaccine administration (mean 4.83) plus rated well in improving student knowledge (mean 4.79).

Practical hands-on experience was the activity rated highest overall in improving knowledge (mean 4.85) and also ranked well in improving confidence (mean 4.76) in vaccine administration. Similarly students perceived the simulated assessment with manikins as the assessment tool which best assisted their learning (mean 4.76). Agreement that the theoretical and online assessments also assisted their learning was high (mean 4.59 and 4.52 respectively) with two students neutral on these assessment tools.

The majority of student comments about the vaccine administration module were positive, particularly about the simulation with manikins (mentioned in 76% of free-text comments): “Demonstration—let me see how it would be done in the pharmacy. Demonstrations—allowed me to practice my technique.” “Manikins—really gives you the idea of injecting and treating/ injecting for real.”

“Vaccination training introduction—raise awareness (and provide) more options for future career…”

“Think it is a great implementation to Master of Pharmacy”

DISCUSSION
Pharmacy students embraced the additional of the vaccination administration module into the curricula, which was valuable in improving student knowledge and confidence. The majority of students completed the entire module, including voluntary written and practical assessments. These students all positively agreed that the vaccine administration module was useful to pharmacy students, providing an appreciation of what is involved in vaccine services, improving confidence in their ability to administer vaccines and ability to make informed decisions about the appropriateness of a vaccine service.

Overall, these students are more likely to want to become involved in vaccine services in their future professional practice. This reflects the student perception in the US, where students support incorporation of vaccination training into the curriculum and previous surveys of pharmacy students completing the APHA vaccination certificate program have indicated confidence in their vaccination ability and a positive impact on the perceived knowledge and skills.

More innovative teaching methods are being used to enhance the presentation of immunisation content in medical education. A curriculum must incorporate a dynamic program of both didactic and experiential learning responsive to developments in practice, including the pharmacist’s role and responsibility in preventative medicine. Experiential education allows students to develop abilities and is essential in educating...
pharmacy students to care for patients. Precious studies have shown that pharmacy students may be inexperienced with using needles and syringes and apprehensive about administering injections. An active-learning approach (Figure 1) to teaching injection technique allows students to gain knowledge and confidence in simulated real-world experiences, the practice of which helps to alleviate students’ fears. The student survey reinforced this concept as students consistently ranked the demonstration and hands-on experience with mannequins and placebo vaccines highest in improving knowledge and confidence in vaccine administration and assisting learning. Therefore, when incorporating immunisation training, both lecture-based and hands-on immunisation training should be considered as required elements as it has been demonstrated that such training can be enhanced by the use of simulations.

Curriculum must also be dynamic and responsive to developments to ensure future clinicians who will practice immunisation in new contexts. To expand the role of pharmacists as immunisers, appropriate knowledge and training must be included in the curriculum. Those opposing pharmacists as immunisers have stated that they will not support pharmacist-administered vaccinations unless the education becomes integrated at the university level.

In the US, considerable variation in preparation of newly graduated pharmacists to provide immunisation services was identified and academic pharmacy is responding by providing certifications to pharmacy students. Currently the APhA’s Immunization Delivery Certificate is the credential necessary for licensure to administer injectable medications and this has been incorporated into pharmacy schools. While such accreditation is yet to be formalised in Australia, there remains a responsibility to improve immunisation education and develop practice skills of undergraduate pharmacy students.

Students can be well prepared and confident in administering adult immunisations by incorporating education into the curriculum. The inclusion of lecture-based and simulated immunisation training, with corresponding assessment, should be considered as required elements in all curricula.

CONCLUSION
Pharmacy students welcomed the additional experience and competencies gained in the MPPham, and the teaching of vaccine administration proved a valuable addition to the pharmacy curriculum. The vaccine administration module developed was modelled on the APHA approach, using components of self-study, theory and simulation, which proved to be useful to the student cohort in this study. A simulated approach, using injectable mannequins and placebo vaccines, had the greatest influence in improving student knowledge, confidence, and in assisting their learning. Aligning with current trends in Australian pharmacy practice, it is recommended that pharmacy graduates be skilled in the field of vaccine administration.

Competing interests: None declared.

17. Marque CM, Motter CM, Kukalis J. The impact of an immunisation training/certification program on the perceived knowledge, skills and attitudes of pharmacy students toward pharmacy-based immunisations. Pharmacy Practice 2010;8(2).