Background
Shoulder pain can be described as a transient side effect of vaccine administration. In some cases, acute onset of shoulder pain and limited range of movement may suggest local injury to structures within the shoulder joint.
Shoulder Injury related to Vaccine Administration (SIRVA) has been described in literature as a rare complication of incorrect vaccine administration causing an immune-mediated inflammatory reaction locally within the shoulder joint.1,2,3
SIRVA described in the literature includes: bursitis, tendonitis, rotator cuff tears and fluid accumulation in the deltoid or rotator cuff. Bursitis of the shoulder joint is one of the more common clinically reported diagnosis, usually confirmed by ultrasound.

Methods
We reviewed the SAEFVIC database for SIRVA, including bursitis reported to SAEFVIC. Data was extracted from the SAEFVIC database (2007–2016).

Diagnostic criteria for bursitis
Clinically diagnosed on ultrasound or by relevant health practitioner i.e. physiotherapist or GP.

Definition of bursitis
Bursae are small fluid filled sacs located between 2 adjoining structures that aid in reducing friction and assist in movement of tendons over bony surfaces. Inflammation of the bursae, called bursitis, can cause localised pain, pain worsened by movement, stiffness and increased friction and assist in movement of tendons over bony surfaces. Inflammation of the bursae, called bursitis, can cause localised pain, pain worsened by movement, stiffness and increased pain or night.

Results — Case Series
There have been 8 clinically confirmed cases of bursitis secondary to incorrect vaccine administration reported to SAEFVIC between 2007 and 2016.

<table>
<thead>
<tr>
<th>Case</th>
<th>Vaccine</th>
<th>Time of Onset</th>
<th>Description</th>
<th>Investigations</th>
<th>Diagnosis</th>
<th>Management/treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>dTpa</td>
<td>5 hours</td>
<td>Tnumb, high temperature, tenderness, pain at injection site, shoulder pain lasting 10 days.</td>
<td>Ultrasound</td>
<td>Impingement</td>
<td>Sports pharmacology, sub-deltoid bursitis, injection of cortisone</td>
<td>Complete resolution</td>
</tr>
<tr>
<td>2</td>
<td>dTpa</td>
<td>1 minute</td>
<td>Immediate pain felt after injection, arm pain continued to increase travelling down shoulder for the following week.</td>
<td>Ultrasound</td>
<td>Acute bursitis</td>
<td>Emergency department, Cortisone injections</td>
<td>Pain lasted &gt; 2 weeks</td>
</tr>
<tr>
<td>3</td>
<td>dTpa</td>
<td>6 hours</td>
<td>Fainted, high near shoulder temperature, pain at injection site, shoulder pain lasting 10 days.</td>
<td>Ultrasound</td>
<td>Mild sub-acromial syndrome,</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>No further follow up</td>
</tr>
<tr>
<td>4</td>
<td>dTpa</td>
<td>3 hours</td>
<td>Unable to lift arm above head, pain extending through shoulder, severe left shoulder pain lasting &gt; 10 days.</td>
<td>Ultrasound</td>
<td>Acute bursitis</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>Pain lasted &gt; 2 weeks</td>
</tr>
<tr>
<td>5</td>
<td>dTpa</td>
<td>1 minute</td>
<td>Reported that nurse had inappropriately injected vaccine into sub-acromial bursa.</td>
<td>Ultrasound</td>
<td>Acute bursitis</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>No further follow up</td>
</tr>
<tr>
<td>6</td>
<td>dTpa</td>
<td>5 hours</td>
<td>Shoulder pain, injection site Heat at injection site</td>
<td>Ultrasound</td>
<td>Impingement</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>No further follow up</td>
</tr>
<tr>
<td>7</td>
<td>dTpa</td>
<td>1 minute</td>
<td>For 2 weeks following, unable to lift arm above head, pain increasing travelling down shoulder for the following week.</td>
<td>Ultrasound</td>
<td>Acute bursitis</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>Pain lasted &gt; 2 weeks</td>
</tr>
<tr>
<td>8</td>
<td>dTpa</td>
<td>1 minute</td>
<td>Pain lasted &gt; 2 weeks</td>
<td>Ultrasound</td>
<td>Acute bursitis</td>
<td>Emergency department, Delivered baby prior to appointment, No further follow up</td>
<td>Pain lasted &gt; 2 weeks</td>
</tr>
</tbody>
</table>

Implications of SIRVA
• Pain
• Decreased range of movement in affected limb
• Medical intervention
• Time off work
• Uncertainty around immunogenicity
• Uncertainty regarding long term joint damage

Take Home Messages
To avoid causing a shoulder injury related to vaccine administration:
• Ensure you can visualise the deltoid from the shoulder to the elbow.
• Be familiar with the anatomical landmarks and surrounding structures.
• Follow recommended immunisation administration techniques.
• Aim for the middle of the deltoid.
• Do not inject too high (near the acromion process) or too low near the insertion of the deltoid.
• For appropriate assessment, management and follow up report any suspected cases of SIRVA to SAEFVIC (Victoria only) online at https://www.saefvic.org.au or by phone 1300 882 924 (Option 1).

References