

Supplementary Table S1. Sensitivity analyses for differences by country, and respondent type.

<b>Scenario</b>	<b>Risk ratio vs. small Ventricular Septal Defect of Responders (95% confidence interval)</b>	<b>Risk ratio vs. small Ventricular Septal Defect Inclusive of All Responders and Non-Responders (95% confidence interval)</b>	<b>Risk ratio vs. small Ventricular Septal Defect (95% confidence interval) adjusted for country of response*</b>	<b>Risk ratio vs. small Ventricular Septal Defect (95% confidence interval) in Pediatric Cardiologists and Nurse Practitioners only</b>
Left ventricular outflow tract obstruction	0.53 (0.45, 0.62)	0.53 (0.45, 0.62)	0.53 (0.45, 0.62)	0.51 (0.43, 0.61)
Congestive heart failure	0.72 (0.65, 0.80)	0.73 (0.65, 0.81)	0.72 (0.65, 0.80)	0.73 (0.65, 0.81)
Channelopathy	0.79 (0.73, 0.87)	0.7 (0.63, 0.79)	0.80 (0.73, 0.87)	0.81 (0.74, 0.89)
Cardiomyopathy	0.89 (0.84, 0.95)	0.87 (0.81, 0.94)	0.89 (0.84, 0.95)	0.89 (0.83, 0.94)
Channelopathy	0.62 (0.54, 0.72)	0.56 (0.48, 0.66)	0.62 (0.54, 0.72)	0.60 (0.52, 0.70)
Channelopathy	0.40 (0.32, 0.50)	0.35 (0.28, 0.44)	0.40 (0.32, 0.50)	0.38 (0.30, 0.49)
Treatable structural heart disease	0.45 (0.37, 0.55)	0.45 (0.38, 0.55)	0.45 (0.37, 0.55)	0.44 (0.36, 0.54)
Channelopathy	0.40 (0.32, 0.50)	0.35 (0.28, 0.44)	0.39 (0.31, 0.50)	0.37 (0.29, 0.48)

\*Country was grouped as US, Canada and other.

## Childhood Immunization Recommendations in Congenital Heart Disease

You are following a patient with a known heart condition. That patient is due for their first routine immunizations including diphtheria-tetanus-acellular pertussis (DTaP) at two months of age. There may be other vaccinations coadministered, but this study will focus on DTaP due to the adverse effects caused by it. The most commonly reported adverse effects of DTaP include tenderness at the injection site, fever, fussiness or irritability, and poor appetite (see table). For each heart condition you will be asked if you would immunize as normal, immunize as normal with special precautions, defer immunization or specify if you would not be consulted for that particular lesion. If you choose to modify the immunization, will you admit to hospital, give prophylactic antipyretics or other (explanation required)?

Table 1. Prevalence of adverse events caused by DTaP vaccine

Adverse Effect	Prevalence
Fussiness	1 in 3 children
Redness, tenderness, swelling at injection site	1 in 4 children
Low grade fever	1 in 4 children
Drowsiness and poor appetite	1 in 10 children
Vomiting	1 in 50 children
High grade fever (above 40.5 °C)	1 in 16,000 children

Languages

- English  
 Français

This study is being conducted by researchers at BC Children's Hospital in Vancouver, Canada. For further information the study coordinator can be contacted via email [heartbeat@cw.bc.ca](mailto:heartbeat@cw.bc.ca). All data will be collected into the secure REDCap database, housed at BC Children's Hospital in Vancouver, Canada. This study is entirely voluntary and you do not have to fill out the questionnaire if you do not wish to. As part of the survey we may ask for your email address to contact you for further information about previous adverse events in your patient/s (for example type of CHD, what the event was, whether child had risk factors). Providing your email address is entirely optional. This survey is anonymous, however if you provide your email address your responses may not be confidential (due to the identifiability of email addresses). Submitting a completed questionnaire will be taken as implied consent to participate in this study. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the University of British Columbia Office of Research Ethics by e-mail at [RSIL@ors.ubc.ca](mailto:RSIL@ors.ubc.ca) or by phone at 604-822-8598 (Toll Free: 1-877-822-8598), quoting reference H19-02702.

## RESPONDENT DEMOGRAPHICS

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Country of practice

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua & Deps
- Argentina
- Armenia
- Australia
- Austria
- Azerbaijan
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia Herzegovina
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina
- Burundi
- Cambodia
- Cameroon
- Canada
- Cape Verde
- Central African Rep
- Chad
- Chile
- China
- Colombia
- Comoros
- Congo
- Congo {Democratic Rep}
- Costa Rica
- Croatia
- Cuba
- Cyprus
- Czech Republic
- Denmark
- Djibouti
- Dominica
- Dominican Republic
- East Timor
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea
- Eritrea
- Estonia
- Ethiopia
- Fiji
- Finland
- France
- Gabon
- Gambia
- Georgia
- Germany
- Ghana
- Greece
- Grenada
- Guatemala
- Guinea

- Guinea-Bissau
- Guyana
- Haiti
- Honduras
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland {Republic}
- Israel
- Italy
- Ivory Coast
- Jamaica
- Japan
- Jordan
- Kazakhstan
- Kenya
- Kiribati
- Korea North
- Korea South
- Kosovo
- Kuwait
- Kyrgyzstan
- Laos
- Latvia
- Lebanon
- Lesotho
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Macedonia
- Madagascar
- Malawi
- Malaysia
- Maldives
- Mali
- Malta
- Marshall Islands
- Mauritania
- Mauritius
- Mexico
- Micronesia
- Moldova
- Monaco
- Mongolia
- Montenegro
- Morocco
- Mozambique
- Myanmar {Burma}
- Namibia
- Nauru
- Nepal
- Netherlands
- New Zealand
- Nicaragua
- Niger
- Nigeria
- Norway
- Oman
- Pakistan
- Palau
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Poland

- Portugal
- Qatar
- Romania
- Russian Federation
- Rwanda
- St Kitts & Nevis
- St Lucia
- Saint Vincent & the Grenadines
- Samoa
- San Marino
- Sao Tome & Principe
- Saudi Arabia
- Senegal
- Serbia
- Seychelles
- Sierra Leone
- Singapore
- Slovakia
- Slovenia
- Solomon Islands
- Somalia
- South Africa
- South Sudan
- Spain
- Sri Lanka
- Sudan
- Suriname
- Swaziland
- Sweden
- Switzerland
- Syria
- Taiwan
- Tajikistan
- Tanzania
- Thailand
- Togo
- Tonga
- Trinidad & Tobago
- Tunisia
- Turkey
- Turkmenistan
- Tuvalu
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
- Uzbekistan
- Vanuatu
- Vatican City
- Venezuela
- Vietnam
- Yemen
- Zambia
- Zimbabwe

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Primary practice setting

- Academic teaching hospital
- Non-teaching hospital
- Public health clinic
- Private clinic
- Military facility
- Other

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If other, please specify

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Job title

- Pediatric cardiologist
  - Nurse
  - Nurse practitioner
  - Surgeon
  - Other
- 

If other please specify

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Number of years in practice

- 0-5
  - 6-10
  - 11-15
  - >15
- 

Do you hold any strong beliefs about vaccinations (either for or against)?

- Yes
  - No
- 

If yes, please describe

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Do you routinely recommend additional immunizations (i.e. over and above what is in the routine schedule for healthy children)?

- Yes
  - No
- 

If yes, please list which ones

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Have you had a patient experience a serious adverse event within 48 hours of an immunization? (For example hospital admission, hospital assessment, or death.)

- Yes
  - No
- 

If yes, please specify the type of adverse event

- Hospital admission
  - Hospital assessment
  - Death
  - Other
- 

Please specify details of the event

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If other, please specify

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If you are willing for us to contact you to ask more details about your experience please provide your email address:

(If you provide your email address your response may not be confidential due to the identifiability of email addresses.)

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Do you counsel patients or their parents about whether to proceed with vaccinations?

- Yes
- No

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Do you work as a pediatric cardiologist or with pediatric cardiology patients as your primary focus (greater than 50% of your work)?

- Yes  
 No

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Thank you for participating. Since you do not routinely counsel pediatric cardiology patients about vaccination, no further answers are required. Please scroll to the bottom to submit your response.

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## CASE SCENARIOS

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You have been following infant X since birth. In each scenario the baby was born at term and was diagnosed in the newborn period with the condition listed below. There is no history of immune deficiency or features of DiGeorge syndrome. There are no siblings and no other health issues in the family.

The infant is scheduled for their first immunizations (including DTaP) at 2 months of age at the immunization clinic. Standard practice is for a public health nurse to administer the immunizations, observe the child for 15 minutes then discharge home.

You are seeing the family 1 week before their immunization appointment. For each of the following scenarios, please indicate the recommendations you would give.

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Scenario 1. Severe LV outflow tract obstruction: aortic stenosis with a dysplastic bicuspid aortic valve, a peak echo gradient of 100mmHg, normal systolic function. Infant is asymptomatic, with normal pulses. Grade III/VI murmur. No evidence of heart failure, no tachypnea or tachycardia.

- Immunize normally as per recommendation with no special precautions  
 Immunize but with special precautions  
 Do not immunize at this time  
 I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication  
 Admission to hospital or other observation unit  
 Other precautions

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen  
 Paracetamol  
 Ibuprofen  
 Other

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If other, please specify

\_\_\_\_\_

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When would you admit the patient?

- Prior to the immunization  
 After the immunization

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Duration of admission in days

\_\_\_\_\_

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Do you recommend a catch up schedule?

- Yes  
 No

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If yes, catch up after lesion is treated?

- Yes  
 No

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Scenario 2. Large ventricular septal defect with heart failure on diuretics, and digoxin with some feeding difficulty. Respiratory rate of 50 breaths per minute with mild subcostal retraction.

- Immunize normally as per recommendation with no special precautions
- Immunize but with special precautions
- Do not immunize at this time
- I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
- Admission to hospital or other observation unit
- Other precautions

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen
- Paracetamol
- Ibuprofen
- Other

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If other, please specify

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When would you admit the patient?

- Prior to the immunization
- After the immunization

---

Duration of admission in days

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Do you recommend a catch up schedule?

- Yes
- No

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If yes, catch up after lesion is treated?

- Yes
- No

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Scenario 3. Asymptomatic, heterozygous for a known pathogenic variant in KCNQ1 (long QT type 1) with a QTc of 500msec. On therapeutic dose of beta blocker. No family history of long QT syndrome.

- Immunize normally as per recommendation with no special precautions
- Immunize but with special precautions
- Do not immunize at this time
- I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
- Admission to hospital or other observation unit
- Other precautions

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen
- Paracetamol
- Ibuprofen
- Other

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If other, please specify

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When would you admit the patient?

- Prior to the immunization
- After the immunization

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Duration of admission in days

\_\_\_\_\_

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Do you recommend a catch up schedule?

- Yes
- No

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At what age or condition will you begin catch up?

\_\_\_\_\_

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Scenario 4. Asymptomatic, dilated cardiomyopathy, mildly reduced function, ejection fraction 50%.

- Immunize normally as per recommendation with no special precautions
- Immunize but with special precautions
- Do not immunize at this time
- I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
- Admission to hospital or other observation unit
- Other precautions

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen
- Paracetamol
- Ibuprofen
- Other

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If other, please specify

\_\_\_\_\_

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When would you admit the patient?

- Prior to the immunization
- After the immunization

---

Duration of admission in days

\_\_\_\_\_

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Do you recommend a catch up schedule?

- Yes
- No

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At what age or condition will you begin catch up?

\_\_\_\_\_

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Scenario 5. Small hemodynamically insignificant 2mm mid-muscular ventricular septal defect.

- Immunize normally as per recommendation with no special precautions
- Immunize but with special precautions
- Do not immunize at this time
- I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
- Admission to hospital or other observation unit
- Other precautions

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen
  - Paracetamol
  - Ibuprofen
  - Other
- 

If other, please specify

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When would you admit the patient?

- Prior to the immunization
  - After the immunization
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Duration of admission in days

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Do you recommend a catch up schedule?

- Yes
  - No
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At what age or condition will you begin catch up?

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Scenario 6A. Brugada syndrome, SCN5A pathogenic variant, family history of Brugada syndrome in father (asymptomatic Type 1 ECG pattern). Asymptomatic infant. Normal ECG.

- Immunize normally as per recommendation with no special precautions
  - Immunize but with special precautions
  - Do not immunize at this time
  - I would not be consulted about immunizations for this particular lesion
- 

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
  - Admission to hospital or other observation unit
  - Other precautions
- 

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If other precautions, please specify

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Please specify which antipyretic medication

- Acetaminophen
  - Paracetamol
  - Ibuprofen
  - Other
- 

If other, please specify

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When would you admit the patient?

- Prior to the immunization
  - After the immunization
- 

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Duration of admission in days

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Do you recommend a catch up schedule?

- Yes
  - No
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At what age or condition will you begin catch up?

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Scenario 6B. Brugada syndrome, SCN5A pathogenic variant, family history of Brugada syndrome in father (asymptomatic Type 1 ECG pattern). Asymptomatic infant. ECG shows type 1 Brugada pattern.

- Immunize normally as per recommendation with no special precautions
- Immunize but with special precautions
- Do not immunize at this time
- I would not be consulted about immunizations for this particular lesion

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Special precautions (choose all that apply):

- Prophylactic antipyretic medication
- Admission to hospital or other observation unit
- Other precautions

---

If other precautions, please specify

\_\_\_\_\_

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Please specify which antipyretic medication

- Acetaminophen
- Paracetamol
- Ibuprofen
- Other

---

If other, please specify

\_\_\_\_\_

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When would you admit the patient?

- Prior to the immunization
- After the immunization

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Duration of admission in days

\_\_\_\_\_

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Do you recommend a catch up schedule?

- Yes
- No

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At what age or condition will you begin catch up?

\_\_\_\_\_

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Please provide any additional comments or feedback

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