Transfusion Reaction Module 5

Transfusion Reaction Reporting and Surveillance Case Studies

Provincial Health Services Authority
Province-wide solutions. Better health.

BC Provincial Blood Coordinating Office
A program of the Provincial Health Services Authority

BC Transfusion Medicine Advisory Group

Speaker

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Disclosure:
Dr. Wadsworth states that he has no conflict of interest relating to industry.

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Contents of Module 5

- Goals and Objectives
- TMAG Recommendations
- Transfusion Reaction chain of events
- Surveillance Reports
- 2010 Transfusion Reaction Toolkit
- Transfusion Reaction Report Form
- Case studies

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Goal and Objectives of Module 5

Goals are to:

- orient the pathologist to transfusion reaction reporting
- ensure that pathologists have the knowledge to report transfusion reactions using the provincial transfusion reaction reporting template
- explain the need for provincial and national data surveillance

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Objectives of Module 5

On completion of this module, you should be able to:

- identify essential elements of the BC TR reporting system
- identify the components of the Transfusion Reaction Toolkit
- use the provincial model Transfusion Reaction Report (TRR) form
- report the results of a transfusion reaction investigation to meet provincial model surveillance requirements

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Key Points - Module 1

- Stop all transfusions as soon as a reaction is suspected.
- All TR must be reported, report what the reaction is (*not what it is not*)
- For all suspected TR, a bedside check should verify that the correct patient is receiving the correct component/product, correctly labelled and infused at the correct flow rate.
- Signs and symptoms of different transfusion reaction types overlap difficult to distinguish clinically the type of reaction occurring
- A laboratory investigation is required to determine if the signs/symptoms are related to the transfusion.
- A serious TR requires prompt action.
- Delayed reactions require laboratory investigation. These investigations and reports are often initiated by the laboratory.

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Surveillance

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Year	TR Surveillance Timeline in BC
1998	Krever Commission recommendation
1999-2004	National Working Group develops and pilots TTISS
	BC – pilots with 4 facilities
2004	Additional BC sites as a result of education
2009 - 2011	BC TTISS Renewal project - development phase
2011 - 2013	Implementation of BC TTISS Renewal project in all BC facilities

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BC TTISS – Renewal

- 2009-2010, BC TMAG endorsed a review and standardization of processes related to TR.
- Multidisciplinary teams (nurse, TM-MD and technologist) developed and released provincial model documents that merge standardized provincial best practice with Health Canada TTISS reporting elements for:
  - bedside recognition and reporting of TR
  - laboratory investigation process
  - pathologist interpretation and conclusion

Collectively these documents have been named the Transfusion Reaction Toolkit.

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BC TTISS Transfusion Reaction Toolkit:

- Represents provincial best practices
  - developed and reviewed by Health Authority representatives to TMAG, NRG and TRG
  - approved by TMAG
- Includes BC provincial model documents
  - for implementation by Health Authority TMS leaders
- Released to HAs in August 2010
- Posted at the PBCO website

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BC TTISS Transfusion Reaction Toolkit:

Nurse/ Transfusionist	Quick Reference Guide – Response to Transfusion Reaction Transfusion Reaction Report form
Technologist	Transfusion Reaction Investigation Process and Procedures Training & competence documents
Pathologist	Transfusion Reaction Report form Transfusion Medicine Medical Policy Manual Section 11 – Appendix D, Table 11.4 Recommendations for Pathologist Comments – Transfusion Reaction Report

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Reporting to TMS- WHY?

Reporting:

- ensures appropriate patient care
  - triggers TR investigations
  - provides recommendations for future transfusions
  - ensures the continuity of patient transfusion history
- comprises an essential component of transfusion safety
  - provides surveillance data for Transfusion Committees and relevant quality committees
  - identifies potential problems and focuses development of quality improvement initiatives
  - fulfills provincial and national accreditation standards/requirements

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Reporting

To Patient Chart/Electronic Record:

- communicates the results of the TR investigation
- provides recommendations for future transfusions
- raises awareness about the adverse effects of transfusion

To PBCO:

- facilitates BC TTISS provincial and TTISS national surveillance
- provides provincial data to base improvements to patient safety and transfusion best practice.

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Mandate for TR reporting?

Agency/Body	Section	Details
CAN/CSA Z902-10	18	Document, report, evaluate and follow-up ALL adverse reactions related to transfusion
DAP - BC	11	Document, promptly report, evaluate and follow-up ALL adverse events related to blood transfusion
Accreditation Canada	22.0 BB and TS Standards	"The transfusion service identifies, reports, evaluates, and follows-up on all adverse events." – in reference to transfusions
CSTM Standards	7.2	Document, report, evaluate and follow-up ALL adverse reactions related to transfusion

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TMAG Recommendations:

- All TR should be reported to the Transfusion Medicine Service
- All TR reports should be sent to PBCO.
  - *Except "Not a Tranfusion Reaction" cases*
- Non-complex TR reports should be reviewed, concluded and reported internally within 10 working days of the notification of the reaction

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Recapping from Module 1:

Triggers for Contact

Roles in TR Investigation

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Clinical Staff immediately phone the TMS/lab when:

- there is a patient/component/product identity error
- the patient has any of the following:
  - new onset red/brown urine
  - sudden onset of hypoxemia
    - SpO2 <90% on RA **or**
    - PaO2 < 60mm Hg on RA **or**
    - PaO2/FIO2 ratio ≤ 300)

  sudden onset of hypotension
    - ≥30 mm Hg drop in systolic BP **and**
    - systolic BP below 80 mm Hg
  - suspected bacterial contamination of component/product

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Laboratory Staff immediately phone the on-duty pathologist when:

- they **receive a report** of a TR where there is:

  - recipient or component/product identity error
  - suspected bacterial contamination of the component/product
  - sudden onset of hypoxemia
  - sudden onset of hypotension
  - new onset of red/brown urine (if hemoglobinuria is proven)

- the **transfusion reaction investigation** shows:

  - abnormal results in the Primary Investigation
  - additional component/product is requested and the investigation is not complete

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Roles in Transfusion Reaction Investigation

clinical staff	• initiates TR Investigation promptly • manages the clinical care • orders X-rays & cultures on recipient as prescribed
technologist	• investigates the Transfusion Reaction • performs examinations • contacts TM pathologist • coordinates results for pathologist to review • sends out completed reports promptly to chart, physician(s) and external agencies
pathologist	• provides consultations for TMS/Lab and clinical staff • provides recommendations for future transfusions • reviews S/S and lab results to reach a "conclusion" of report within 10 working days •contacts blood supplier, if applicable

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REPORTING

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Reporting

To	Document
TMS/lab	TRR form or phone call from clinical care area
Patient chart	TRR investigation conclusion
PBCO, CBS, Manufacturer	• TRR form with pathologist's conclusion > **PBCO exports non-nominal data to HC**
CBS for possible TRALI cases	TRR form and pathologist's conclusion **PLUS** CBS TRALI form

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TMS/Lab External Reporting (1 of 2)

What	Where	When
all reactions	PBCO	reaction investigation conclusion
serious reactions	CBS/ Manufacturer	promptly* when reaction investigation concluded

*For suspected bacterial contamination facilities must report to CBS/manufacturer within 24 hrs

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TMS/Lab External Reporting (2 of 2)

Condition	What	Where	When
Death	component	CBS	within 24 hours of suspected linkage & at investigation conclusion
	plasma protein product	Manufacturer	as soon as linkage is suspected & at investigation conclusion
Serious reactions due to product quality issues	component	CBS/ Manufacturer	as soon as linkage is suspected & at investigation conclusion (within 24 hours for suspected bacterial contamination)
	plasma protein product	Manufacturer	as soon as linkage is suspected & at investigation conclusion

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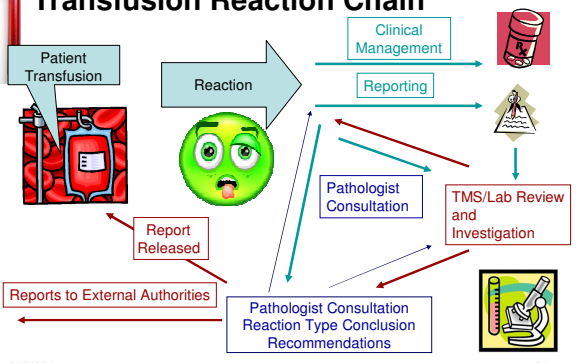
Transfusion Reaction Chain



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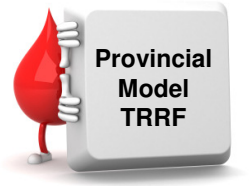
Tranfusion Reaction Report Form



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Transfusion Reaction Report form (TRR)

BC Model document contains 2 pages:

Page 1 is used by nurse/transfusionist to report the details of the:

- recipient and transfusion
- signs and symptoms of the transfusion reaction
- clinical management of reaction

Page 2 is used by technologist/pathologist to:

- summarize TR investigation results
- record pathologist final conclusion providing :
  - type
  - relationship of reaction to transfusion
  - severity
  - outcome
- record recommendations for future transfusions

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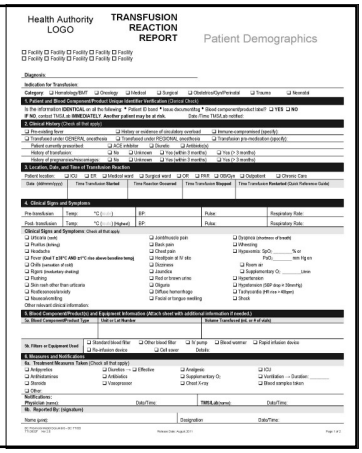
Transfusion Reaction Report

(TRR) form page 1


Health Authority LOGO

TRANSFUSION REACTION REPORT

Patient Demographics

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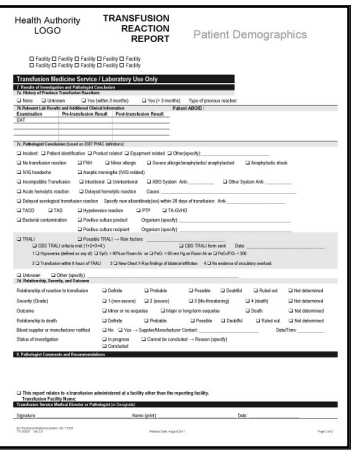
Transfusion Reaction Report

(TRR) form page 2


Health Authority LOGO

TRANSFUSION REACTION REPORT

Patient Demographics

Transfusion Medicine Service / Laboratory Use Only

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Transfusion Reaction Report (TRR) form

The following slides show sections of Page 2 of the provincial model document TRR to highlight key areas that the pathologist must review when compiling a TR report.

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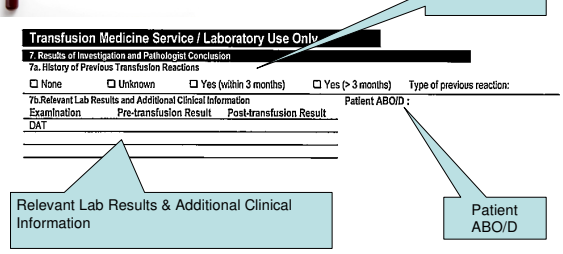
TRR Page 2 – Section 7a & 7b



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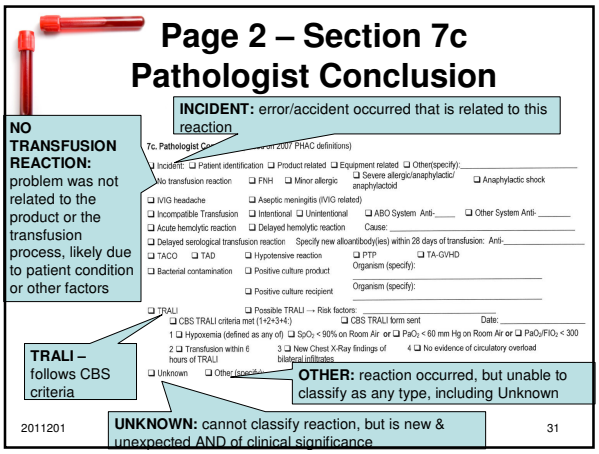
Page 2 – Section 7c Pathologist Conclusion



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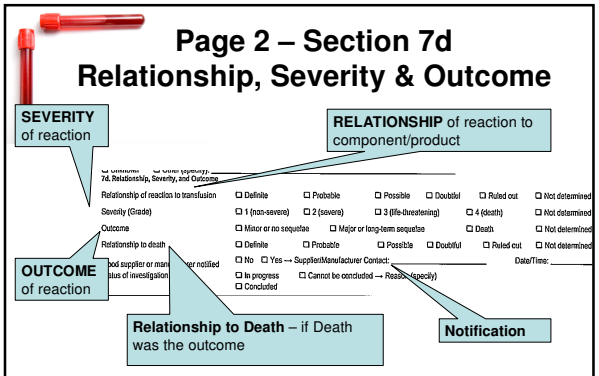
Page 2 – Section 7d Relationship, Severity & Outcome



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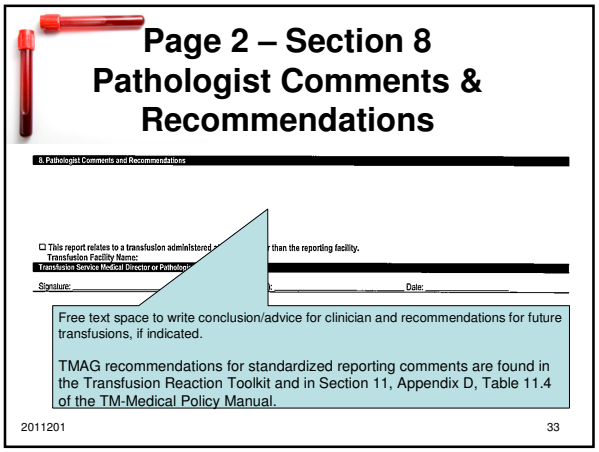
Page 2 – Section 8 Pathologist Comments & Recommendations



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When to use the "Unknown" category for a TR:

- When the recipient has experienced a clinically significant reaction that cannot be classified and represents something new and unexpected
  - Eg red eye syndrome
- Such circumstances are extremely rare
- "Unknowns" are reported to national TTISS

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When to use the "Other" category for a TR:

- When the recipient has experienced any other type of transfusion reaction not already described in the surveillance categories
  - Examples:
    - Severe electrolyte imbalance as would occur using a stored irradiated red cell unit
    - Atypical pain syndrome (pain not usually associated with receiving a blood transfusion)

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Transfusion Reaction

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Case Study 1

Clinical History:

- 53 year old oncology inpatient, multiply transfused, received 1 dose of platelets,
- S/S include:
  - Pre -Tx Temp - 36.9℃
  - Post -Tx Temp - 38.5℃ (1.6 ℃ rise in temperature)
  - chills

Lab investigation details:

- clerical check, visual check of unit and post-transfusion samples - OK
- DAT is negative
- Culture is not indicated

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Case Study 1 – Section 7 results

(1 of 2)

	Heading	Result
7c	Pathologist Conclusion	FNH
7d	Relationship to transfusion	probable
7d	Severity	Grade 1 (non-severe)
7d	Outcome	Minor (no sequelae)
7d	Status of Investigation	Concluded

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Case Study 1 – Section 8 results

(2 of 2)

	Heading	Result
8	Pathologist comment	Pathologist Recommended Comments
	Based on a review of the patient's history, clinical and serological findings the patient's symptoms are most consistent with a febrile nonhemolytic transfusion reaction (FNHTR). *For recurrent febrile nonhemolytic transfusion reactions, premedication with an antipyretic may be considered, but is not supported by literature evidence. Consultation with a Transfusion Medicine Pathologist may be helpful if the patient experiences recurrent febrile reactions.*	

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Case Study 2

Clinical History:

12 year old multiply transfused patient with β thalassemia major develops chills and nausea 2 hours after infusion of a unit of rbc.

Vital Signs	Temperature	BP
Pre-Tx	36.7	100/65
Post-Tx	36.9	105/73

Lab investigation details:

- clerical check, visual check of unit and post-transfusion samples - OK
- DAT is negative

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Case Study 2 – Section 7 results

(1 of 2)

	Heading	Result
7c	Pathologist Conclusion	FNH
7d	Relationship	probable
7d	[illegible]	ade 1 (non-severe)
7d	[illegible]	nor (no sequelae)
7d	[illegible] Investigation	Concluded

You will recall from Module 3 that a FNHTR despite the name does not always result in a temperature rise

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Case Study 2 – Section 8 results

(2 of 2)

	Heading	Result
8	Pathologist comment	Pathologist Recommended Comments

Based on a review of the patient's history, clinical and serological findings the patient's symptoms are most consistent with a febrile nonhemolytic transfusion reaction (FNHTR).

For recurrent FNHTR, premedication with an antipyretic may be considered, but is not supported by literature evidence.

Consultation with a Transfusion Medicine Pathologist may be helpful if the patient experiences recurrent febrile reactions.

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Case study 3

- A 60 yr old oncology patient with septicemia and a fluctuating temperature receives a dose of platelets.
- During the infusion the temperature rises from 37 to 38.1C. No other symptoms/signs are reported.
- Laboratory testing and checks are negative
- There is no evidence that this is a TR and temperature change probably reflects patient's underlying condition

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Case Study 3 – Section 7 results

(1 of 2)

	Heading	Result
7c	Pathologist Conclusion	No transfusion reaction
7d	Relationship to transfusion	Doubtful
7d	Severity	N/A
7d	Outcome	N/A
7d	Status of Investigation	Concluded

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Case Study 3 – Section 8 results

(2 of 2)

	Heading	Result
8	Pathologist comment	Pathologist Recommended Comments
	This is not a Transfusion Reaction. Patient's fever is explained by the underlying condition and coincidental to transfusion.	

This case is not reported to PBCO

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Case Study 4

Page 1 relevant details:

Frozen plasma is ordered for a post-operative patient with severe bleeding. During transfusion the patient develops itching and hives over the arms and trunk.

Transfusion is stopped and antihistamine is given

Lab investigation details:

The bedside nurse realises, during the identity check, that the infused product is platelets rather than plasma

No lab investigation is done but the technologist confirms that platelets had been issued rather than plasma.

Case Study 4 – Section 7 results

(1 of 2)

	Heading	Result
7c	Incident	**YES and product related**
7c	Pathologist Conclusion	Allergic
7d	Relationship to transfusion	Probable
7d	Severity	Grade 1 (non-severe)
7d	Outcome	Minor (no sequelae)
7d	Status of Investigation	Concluded

Case Study 4 – Section 8 results

(2 of 2)

	Heading	Result
8	Pathologist comment	Pathologist Recommended Comments

Based on a review of the patient's history and clinical findings, the patient's symptoms are most consistent with an allergic transfusion reaction.

For recurrent allergic transfusion reactions, premedication with an antihistamine may be considered, but is not supported by literature evidence. Urgent consultation with a Transfusion Medicine Pathologist is suggested if the patient experiences a severe allergic or anaphylactic reaction.

BUT the nursing unit and laboratory followed up with incident reports. It is important to realize that the patient may not have suffered a TR if the correct product had been issued.

Case study 5

- A 12 year old girl with sickle cell anemia (SCA) with no detectable rbc alloantibodies receives a red cell transfusion (Rh, K phenotype matched) prior to a laparoscopic cholecystectomy. Pre Tx Hb 73g/L
- 12 days post transfusion she is readmitted with lower back pain, headache and Hb of 52g/L
- Further rbc transfusion is ordered but
  - Anti S is detected
  - DAT negative
  - LDH 2275 u/L (380-770) (the pre op was LDH 1556)

Case Study 5 – Section 7 results

(1 of 2)

	Heading	Result
7c	Pathologist Conclusion	Delayed Hemolytic TR
7d	Relationship to transfusion	Probable
7d	Severity	Severe
7d	Outcome	Major/long term sequelae
7d	Status of Investigation	Concluded

Case Study 5 – Section 8 results

(2 of 2)

	Heading	Result
8	Pathologist comment	Pathologist Recommended Comments

*Despite the negative DAT this patient has had a DHTR. This type of reaction is not uncommon in patients with SCA who have a high rate of sensitization since they receive blood largely collected from an ethnically different donor base. All future rbc transfusions for this patient **must** be S antigen negative.*

In patients with SCA, DHTR must be differentiated from episodes of SCA related hyperhemolysis which can be triggered by DHTR.

Future BC Surveillance State

ALL FACILITIES

1. Recognize and report TR to TMS/Lab
2. Investigate
3. Reach a conclusion
4. Report to patient's chart
5. Send Transfusion Reaction reports to PBCO
6. Send serious Transfusion Reaction reports to CBS or manufacturer, as required

PBCO

1. Review cases for TTISS data elements.
2. Enter cases into PBCO database
3. Send non-nominal transfusion reaction BC data to national TTISS program
4. Report provincial and HA Transfusion Reaction data annually

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Course Contributors – Advisory Panel

Thanks to:	Health Authority	Advisory Group
Dr. Kate Chipperfield	VCH	TMAG
Dr. Jason Doyle	IH	TMAG
Dr. Doug Morrison	FH	TMAG
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Maureen Wyatt	IH	TRG
Donna Miller	VIHA	NRG
Shelley Feenstra	VCH	NRG

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- BC Transfusion Transmitted Injuries Surveillance System Working Group (BC TTISS WG)
- Technical Resource Group (TRG)
- Nursing Resource Group (NRG)

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Questions?

Upcoming Live Webinars

Date / Time	Topic	Speaker
December 15, 2011 12:00 to 1:00pm	Transfusion Reaction Annual Data Reports and Case Studies	Dr. Kate Chipperfield MD FRCPC Regional Medical Leader, Blood Transfusion Medicine, VCH

Next Steps

- **Visit LearningHub** - LearningHub Link

- **Note:**
  - Need LearningHub Username and Password
  - Confirm email

- **Complete:**
  - Participant Evaluation
  - Quiz (**Closes midnight December 2, 2011**)