1.0 INTRODUCTION

A transfusion transmissible infection (TTI) is any infection that is transmissible from person-to-person through parenteral administration of blood or blood products. Examples of known TTIs include: hepatitis A, B, C, D and G, HIV, HTLV I and II, West Nile Virus, syphilis, cytomegalovirus, and malaria. A TTI may also result from new or emerging infectious agents, which are not known to be transmitted as a TTI, but for which there is biologic plausibility of person-to-person transmission as a TTI. Such an example is the agent responsible for new variant Creutzfeldt-Jacob Disease.

2.0 CASE DEFINITION OF TTI

A transfusion transmitted infection (TTI) is any infection identified in a *recipient* that is *suspected*[1] to have been transmitted by blood or blood products at any time since 1980[2], or any infection (with potential for blood-borne transmission) identified in a blood *donor* who was infectious at the time they *donated* blood at any time since 1980.

Notes:
1. consistent with acute clinical or laboratory infection, or with past infection with no other cause identified, and associated with blood or blood products
2. Canadian Blood Services/Canadian Red Cross records only available since 1980

3.0 REPORTING OF TTI

3.1 Reportability

TTI was made reportable in British Columbia in 2000, under Schedule A of the Communicable Disease Regulation. **The goal is to ensure, to the extent possible, the safety and security of the Canadian blood supply.** TTI was made reportable to:

- respond positively to findings in Justice Krever's Report on the Canadian Blood System, that the public health system had not been sufficiently involved in preventing HIV and hepatitis C infection transmission in the Canadian blood system
- improve surveillance of infectious agents *known* to be transmitted as a TTI
- establish an effective statutory mechanism to conduct surveillance for *new or emerging* infectious agents that might threaten the safety of the blood supply
- improve the efficiency of lookbacks, tracebacks or other appropriate follow-up by Canadian Blood Services and/or public health to investigate possible TTIs
- increase awareness of TTI among health care providers and of the importance of reporting and appropriately investigating if an infection may be a TTI
- contribute to better understanding of the epidemiology of TTIs

3.2 Reporting Diseases Listed in Health Act Communicable Disease Regulation, Schedules A or B

Schedule A of the CD Regulation requires reporting of listed diseases from "all sources". Operationally, since the listed diseases are laboratory diagnosed, the reporting source for virtually all diseases listed in Schedule A (as with schedule B) is laboratories. Reporting TTIs however, depends on the co-operation of Attending Physicians in evaluating and reporting *suspected* TTIs to their local Medical Health Officer.

3.3 Reporting TTI

The procedure for reporting TTIs, also summarized in Appendix 4, is outlined below:

STEP 1 – Laboratories advise Attending Physician of a positive test result

An advisory note, similar to the sample versions below (addressed to the physician ordering the laboratory test) will be imprinted on laboratory report forms for any positive test for *specific* infectious agents/diseases listed in Table 1. As there are many laboratory information systems with different capabilities, shown below are sample long and short versions of the "Note to Physicians".

Sample Long Version of "Note to Physicians":

Note to Attending Physician

Transfusion-Transmissible Infection (TTI) is reportable to your Medical Health Officer.

Report:

1. any infection identified in a *recipient* that is *suspected* to have been transmitted by blood o blood products at any time since 1980, or
2. any infection (with potential for blood-borne transmission) identified in a blood *donor* who was infectious at the time they *donated* blood at any time since 1980.

If this is a suspected TTI, please fax or mail a copy of this laboratory report to your local public health office, attention: Medical Health Officer. Please indicate as "SUSPECTED TTI". CBS or the MHO may contact the Attending Physician for further information.

Other Relevant Information (e.g. Risk Factors

Sample Short Version of "Note to Physicians":

For West Nile Virus only

Note for Physicians: Has your patient received blood or blood products in the 8 weeks prior to onset of illness (or from the date the specimen was collected if the onset date is unknown)? If yes, please tick the box □ and fax or telephone your local MHO.

For all other Transfusion-Transmissible Infections

Note for Physicians: Has your patient received blood or blood products or donated blood at any time since 1980? If yes, please tick box □ and fax or mail a copy of this laboratory report to your local MHO.

Table 1-

Infectious Diseases for Which "Note to Attending Physician" would be Imprinted on Laboratory Report		
Organism	**Positive Test**	**Clinical**
Hepatitis A Virus	Anti-HAV-IgM	Acute Hepatitis A
Hepatitis B Virus	HBsAg	Acute or Chronic Hepatitis B, or Carrier
Hepatitis C Virus	Anti-HCV or HCV-NAT	Acute or Chronic Hepatitis C
HIV	HIV-Western Blot	Acute, asymptomatic, or AIDS
HTLV I/II	Anti-HTLV	Asymptomatic, HAM, Human T cell Leukemia/Lymphoma
West Nile Virus	WNV –NAT (CBS) +/or EIA IgG & IgM	WNV disease or asymptomatic
Plasmodium spp.	Blood Smear	Malaria
Babesia spp.	Blood Smear	Babesiosis
Trypanosoma cruzi	Blood Smear/Serology	Chagas' Disease

STEP 2 – Attending Physician reviews information to assess if infection is *suspected* TTI

To evaluate if an infection is a *suspected* transfusion transmitted infection, the Attending Physician would typically:

- evaluate laboratory results in the context of known, past medical history
- review patient risk factors for the disease in question
- review history of receipt of blood or blood product in association with clinical presentation, or history of blood donation

STEP 3 – If TTI *suspected*, Attending Physician sends report to Medical Health Officer (MHO)

The Attending Physician would send the lab report on which the "Note to Attending Physician" is imprinted, to the local MHO, in the usual manner for your region

It is important that the following information be included, most of which will already be imprinted on the laboratory requisition:

- **Patient Name**
- **Date of Birth**
- **Sex**
- **Attending Physician name and physician's office phone number**
- **Reportable disease/test result**
- **Whether patient was blood/blood product "donor" and/or "recipient"**
- **Provincial Health Number, if known**
- **Patient Address (and contact phone number, if known)**

The following additional information may also be included, if known:

- Information re: donation/receipt of blood/blood product:
  -when: date(s) of receipt / donation (as best known)
  -what: type of blood / blood product (as best known)
  -where: hospital name, location

STEP 4 - Medical Health Officer (MHO) receives report of *suspected* TTI from Attending Physician and reports to BC Centre for Disease Control (BCCDC) through Public Health Information System (PHIS)

(1) TTIs due to infections that are *currently listed* in the Communicable Disease Regulation
(Schedules A or B) as a reportable disease (e.g. hepatitis A, B, C) are to be reported in PHIS:

- in the usual manner, under the appropriate disease-specific code, **AND**
- under **TTI (new PHIS code 400)**, with the appropriate TTI disease sub-type code, as listed in Table 2:

Table 2:

TTI Sub-type Codes in PHIS	
Infectious Agent/Disease	**PHIS code**
hepatitis A virus	HAV
hepatitis B virus	HBV
hepatitis C virus	HCV
HIV	901
HTLV I	902
HTLV II	903
Plasmodium spp (malaria)	904
Treponema pallidum (syphilis)	905
variant CJD	906
WNV	700
other	907

Additional information provided by the physician in Step 3, should also be entered into PHIS.

(2) TTIs due to infections that are *not* currently listed in the Communicable Disease Regulation
as a reportable disease are to be reported in PHIS as **TTI / "other"** (code 400, subcode 907.

Appendix 5 provides detailed instructions about how data should be entered into PHIS.

STEP 5 – BCCDC advises CBS of suspected TTIs that are reported by MHOs in PHIS

Sharing of TTI-related data as reported in PHIS, with CBS, will be as authorized by regions or as per data sharing agreements. TTIs are not reportable to Health Canada at this time. For aggregate surveillance reporting of confirmed cases to Health Canada, cases reported under the appropriate disease-specific code will be used.

STEP 6 – CBS receives line list of suspected TTIs from BCCDC, and initiates lookback or traceback as appropriate

STEP 7 - BCCDC analyzes reports for epidemiologic trends

STEP 8 – Evaluate effectiveness of TTI reportability and reporting procedures

Suspected TTI in a *Recipient*, due to an Infectious Agent Currently *Screened* by Canadian Blood Services and/or *Reportable* under Schedule A or B of Communicable Disease Regulation

Infectious Agent/ Disease	Information[1]	Action[2]
Hepatitis A virus	Incubation period: 2-7 weeks Products at Risk: blood components /fractionated products No blood donor testing	Investigate suspected TTI if no other risk factors
Hepatitis B virus	Incubation Period[3]: 6 weeks-6 months Products at Risk: blood components /fractionated products Donor Blood Testing: HBsAg, since 1972	Investigate suspected TTIs since 1980 if no other risk factors
Hepatitis C virus	Incubation Period[3]: 2 weeks-6 months Products at Risk: blood components / fractionated products Donor Blood Testing: 1st generation anti-HCV, since 1990 2nd generation anti-HCV since 1992 3rd generation anti-HCV since 1996 PCR since 1999	Investigate suspected TTIs from 1980-91 Investigate suspected TTIs since 1992 if no other risk factors identified
HIV	Incubation Period[3]: 2 weeks-6 months Products at Risk: blood components / fractionated products Donor Blood Testing: anti-HIV since 1985	Investigate suspected TTIs from 1980-84 Investigate suspected TTIs since 1985 if no other risk factors identified
HTLV I and HTLV II	Incubation Period[3]: unknown Products at Risk: blood components /fractionated products Donor Blood Testing: HTLV I testing since 1990 HTLV I/II testing since 1998	Investigate suspected TTIs since 1980 if no other risk factors
Malaria	Incubation Period[3]: variable: 7-14 days for *P. falciparum*; 8-14 days for *P. ovale* and *P. vivax* (may be protracted, over 1 year); 7-30 for *P. malariae* Products at Risk: blood components Donor Blood Testing: not routinely tested	Investigate recent, acute suspected TTIs if no other risk factor identified
Syphilis	Incubation Period[3]: 10 days-3 months Products at Risk: blood components Donor Blood Testing: testing since at least 1970	Investigate recent, acute suspected TTIs if no other risk factor identified
West Nile Virus	Incubation period 3-14 days Products at Risk: blood components Donor mini-pool nucleic acid testing	Investigate recent, acute suspected TTIs if blood component recipient in previous 56 days

Notes:

1. Hyperimmune globulin products (i.e. human rabies immune globulin, hepatitis B immune globulin, tetanus immune globulin) and immune serum globulin: solvent-detergent viricidal processing since 1997
2. Canadian Blood Services would initiate lookback or traceback, with public health assistance where appropriate
3. Incubation period may vary depending on host factors (e.g. immunosuppression) and characteristics of exposure (e.g. number of infectious organisms contaminating the product)

Suspected TTI in a *Recipient*, due to an Infectious Agent *Not Screened* (by Laboratory Test) by Canadian Blood Services or *Not Currently Reportable* under Schedule A or B of Communicable Disease Regulation

Infectious Agent/Disease	Information	Action[1]
Variant CJD	Incubation Period: unknown Products at Theoretical Risk: blood components; fractionated products; products using bovine-derived gelatin stabilizer	Investigate all vCJD cases for TTI
Other uncommon or newly emerging, potentially bloodborne infectious disease (e.g. babesiosis, Chaga's Disease)	Risk as a potential TTI would be determined by ongoing epidemiologic investigation of reported transfusion-associated adverse events, including conduct of directed epidemiologic studies (retrospective and prospective) of recipients of blood/blood product	Depends on assessed risk May investigate recent, acute suspected TTIs if no other risk factors identified

Notes:

1. Canadian Blood Services would initiate lookback or traceback, with public health assistance where appropriate

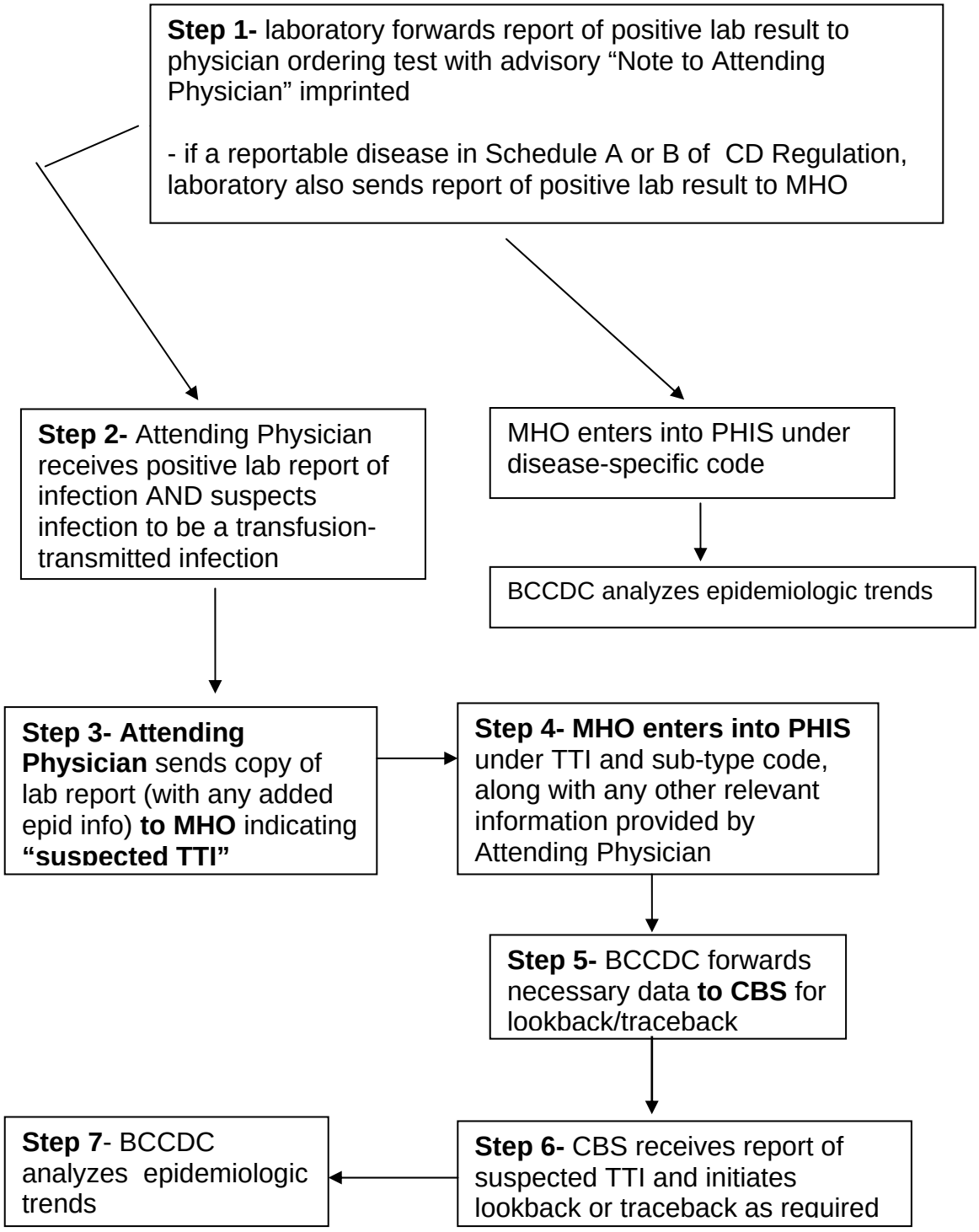
Blood *Donor* Identified With an Infection that could be Transfusion-Transmissible

Infectious Agent/ Disease	Postive Test	clinical	Action[1]
Hepatitis A	anti-HAV-IgM	acute hepatitis A	Investigate any case with history of blood donation in previous year
Hepatitis B	HBsAg	Acute, chronic hepatitis B, or carrier	Investigate any case with history of blood donation since 1980
Hepatitis C	anti-HCV or HCV NAT	acute or chronic hepatitis C	Investigate any case with history of blood donation since 1980
HIV	HIV-Western Blot	acute, symptomatic or AIDS	Investigate any case with history of blood donation since 1980
HTLV I and II	anti-HTLV	Asymptomatic, HAM, Human T cell Leukemia/Lymphoma	Investigate any case with history of blood donation since 1980
Malaria/ *Plasmodium spp*.	blood smear	Malaria – past or present	Investigate any case with history of blood donation in previous year
Variant CJD		v-CJD	Investigate any case with history of blood donation since 1980
Syphilis	serology	syphilis	Investigate any case with history of blood donation in previous year
Bacterial endocarditis	Positive blood culture- for bacteria	Signs, symptoms, lab tests consistent with bacterial endocarditis	Investigate any case with history of blood donation in previous year
West Nile Virus	WNV NAT	WNV disease or asymptomatic	Investigate any case with history of blood donation in previous 56 days
Other (e.g. *Trypanosoma cruzi* / *Babesia spp*.	Blood Smear/Serology	e.g. Chagas' Disease / Babesiosis	Investigate any case with history of blood donation in previous year

Notes:

1. Canadian Blood Services would initiate lookback/traceback/ and/or inventory retrieval, with public health assistance where appropriate/feasible

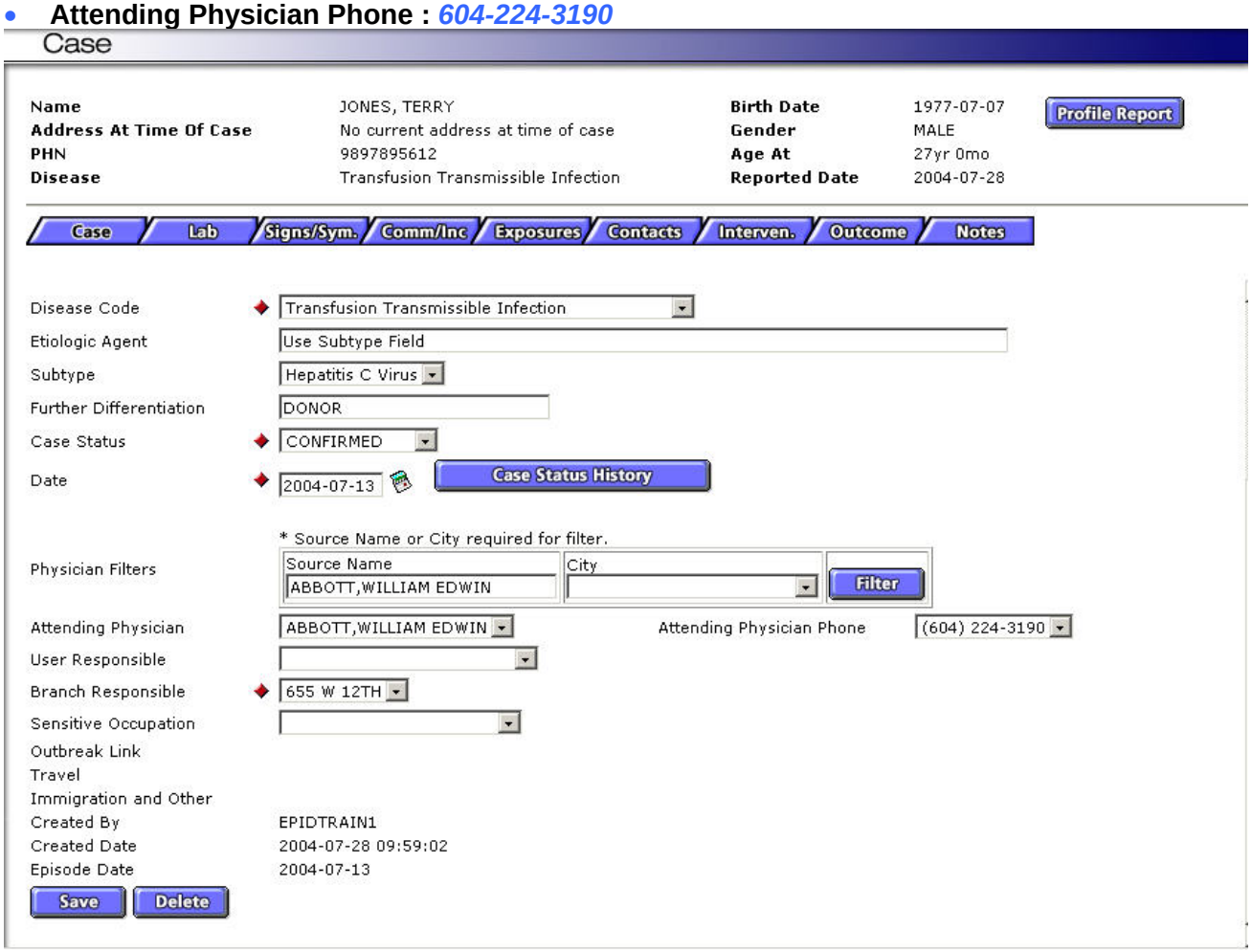
Reporting Transfusion Transmissible Infections



Example of TTI Case with necessary information for data entry into PHIS

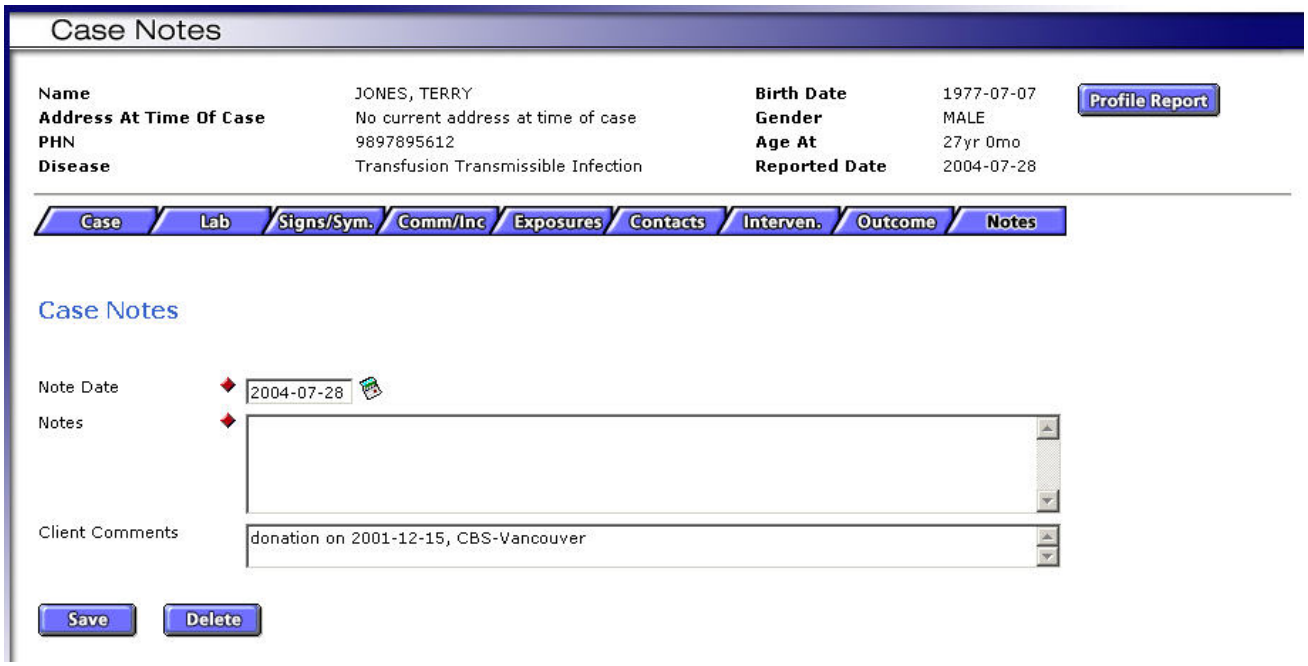
Important to include the following information in the Case Module under the "Case Tab":

- **Family Name :** ***JONES***
- **First Name :** ***TERRY***
- **Sex :** ***M***
- **PHN (if known) :** ***9897895612***
- **Birth Date :** ***1977-07-07***
- **Reported Date :** ***2004-07-28***
- **Disease Code :*****Transfusion Transmissible Infection***
- **Subtype :** ***Hepatitis C Virus***
- **Further Diff - Use "Further Diff" for whether donor and/or recipient :** ***DONOR***
  Also use this field to indicate name of disease if it is one that is not currently a reportable disease in Communicable Disease Regulation
- **Comments - Use Comments field under the "Notes Tab" for any additional known information. :** ***donation on 2001-12-15, CBS-Vancouver***
- **Attending Physician :** ***ABBOTT, WILLIAM EDWIN***
- **Attending Physician Phone :** ***604-224-3190***

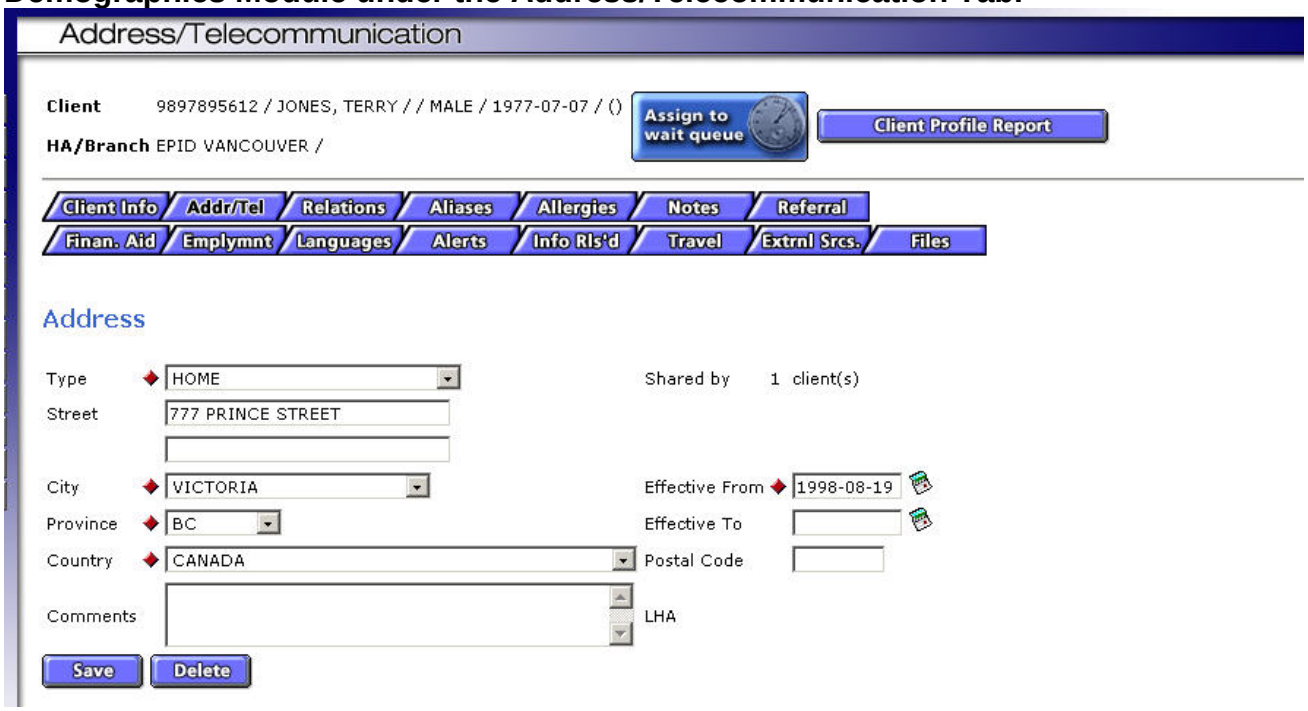


Additional Information for Client Comments under the “Notes Tab” within the Case Module could include:

- Information re: donation and/or receipt of blood or blood product:
  -when: date(s) of receipt and/or donation (as best known)
  -what: type of blood or blood product (as best known)
  -where: hospital name, location



It is also important to include client address information if known in the Client Demographics Module under the Address/Telecommunication Tab.



Include client's contact phone number if known in the Client Demographics Module under the Address/Telecommunication Tab.