KGH Research Institute

Standard Operating Procedure **Transportation of Dangerous Goods**			
SOP Number:	SOP-TDG-02	Category:	Lab Process
Supersedes:	SOP-TDG-01	Original Date:	December 1, 2017
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		Pages	1 of 11
Issued by:	Director, Health Sciences Research		

1.0 POLICY

Transportation of all biological specimens outside the Kingston Health Sciences Centre (KHSC) **MUST** comply with the Transportation of Dangerous Goods (TDG) Regulations (TDGR). For air transport, International Civil Aviation Organization (ICAO) technical instructions **MUST** be followed. The requirements for ICAO can be found in the International Air Transport Association (IATA) Dangerous Goods Regulations. This procedure applies to products that are defined as dangerous goods under the TDGR. Included are products as well as waste, chemical, radioactive and biological products and organisms. As a general rule all research associated products fall under some category of the TDG legislation and therefore this procedure applies and **MUST** be followed. Each shipment must be properly packaged, labeled and include appropriate documentation.

2.0 PURPOSE

The purpose of this document is to set guidelines and procedures for the safe handling and transportation of dangerous goods to and from the W.J. Henderson Centre for Patient-Oriented Research (WJHCPOR) and to ensure that all shipments processed in the WJHCPOR and transported outside KHSC comply with TDGR and IATA when shipping within Canada or Internationally.

Note: Reviewing this SOP does not constitute training; you must successfully complete an approved TGA/IATA course and obtain a certification card to be certified to ship, carry or receive dangerous goods.

3.0 RESPONSIBILITIES

Users are responsible for:

- Being properly trained and holding a current certificate of an approved TDG/IATA course if users will be packaging for transport human biological specimens (human blood, tissues, and bodily fluids).

- TDG/IATA training courses are available through Queen's University Environmental Health & Safety Department (Queen's) and KHSC via CITI Canada. To access courses through Queen's, go to https://www.safety.queensu.ca/training/courses-and-quizzes-ong or contact Shelagh Mirski at 613-533-6000 ext. 77077 for more information. To access courses through KHSC (administered by Kingston General Health Research Institute (KGHRI)), contact Lisa McAvoy at 613-549-6666 ext. 3344. KHSC's membership with Network of Networks provides users with access to a number of free online courses through CITI Canada, including TDG/IATA. Queen's and KHSC (via KGHRI) will retain all training records. An untrained individual may handle dangerous goods provided the goods are handled in the presence and under the direct supervision of an individual who holds a training certificate. Certification is valid for 2 years for air and 3 years for ground transport after which the individual must undergo re-certification.

- Carrying their "TDG/IATA Certified" card/certificate with them when they are transporting, shipping or receiving specimens/dangerous goods inside/outside of KHSC.
  - Users should seek guidance from another "TDG/IATA Certified" individual if unsure how to package or complete the documentation for a shipment of specimens/dangerous goods.
  - A shipper **MUST** be able to classify dangerous goods, package them accordingly, and prepare appropriate documentation. Transport Canada has the authority to inspect, seize and in cases of non-compliance, administer fees.
- Familiarizing themselves with this SOP.

User's Direct Supervisors are responsible for:

- Ensuring that users who have been designated to handle dangerous goods comply with the TDG/IATA regulations as outlined in this document and have received the appropriate training.

Kingston General Health Research Institute (KGHRI) is responsible for:

- Providing orientation to users of the WJHCPOR regarding TDG/IATA within WJHCPOR and between internal/external locations.

4.0 PROCEDURE

4.1 Internal Transportation (within KHSC-Kingston General Hospital (KGH) site)

- All specimens **MUST** be placed into leak-proof, non-breakable containers and labelled in accordance with TDG/IATA guidelines.
- Ensure that specimen containers are securely closed and clean on the outside (if not, wipe with disinfectant (Oxivir®/Accel® INTERVention)).
- Users **MUST** be trained in the safe handling practices and decontamination of spills. See “Spill Control Procedures” SOP.
- Specimens, in their leak proof containers, **MUST** be placed into a sealable secondary container, which will contain the specimen if the primary container breaks in transit (e.g. plastic zip lock bags).
- Laboratory requisitions **MUST** be protected from contamination. If necessary, put in to a separate bag or container. **DO NOT** place requisition in the same bag as the specimen.
- **DO NOT** send specimens with needles attached to any lab, these will not be processed.
- A cart is required when the number or size of the transported container(s) exceeds what can safely be carried with one hand. Users should obtain a cart from their direct supervisor.

4.2 Site-to-Site Transportation (KHSC-KGH site to Queen’s external labs, KHSC-Hotel Dieu Hospital (HDH) site or Providence Care)

- Specimens **MUST** be in biohazard bags and placed in rigid, leak proof plastic containers.
- Place the plastic containers into transport bag with a zipper closure or box.
- Transport bags/boxes must have an infectious substance hazard label on the outside.

4.3 External Transportation of Specimens by Courier

- Carrying dangerous goods should be avoided by using certified carriers, however if a suitable alternative does not exist, always ensure the shipment is well secured and will not spill during transport, that the vehicle is in good working order, and that adequate automobile insurance coverage is in place.

  Note: Most automobile insurance policies exclude the carrying of dangerous goods.

- The shipper is required to place the dangerous goods in the appropriate type of packaging. Carriers have the responsibility of refusing to transport any container that is damaged, leaking, or inappropriate for the dangerous goods within.

- Transportation of all biological specimens outside of KHSC **MUST** comply with TDGR. These regulations address: (1) classification; (2) packaging; (3) labelling; (4) documentation; (5) shipping with dry ice; and (6) emergency response plans. TDGR is the extension of the protection under universal precautions of the user, public and environment. The dangerous goods regulations operate on the premise that while all specimens require a minimum level of containment, infectious substances present a higher degree of risk and therefore, require a much higher level of containment during transport. The user, who in many cases is also the shipper, is best qualified to make the decision regarding the level of hazard that a shipment presents.

  - **4.3.1 Classification**

    The shipper must determine with each shipment, for air or road transport, whether the material being shipped is dangerous goods or not.

    TDGR Classes:

    Class 1 – Explosives
    Class 2 – Gases
    Class 3 – Flammable Liquids
    Class 4 – Flammable Solids
    Class 5 – Oxidizing Substances
    Class 6 – Poisonous Substances, Infectious Substances
    Class 7 – Radioactive Substances
    Class 8 – Corrosives
    Class 9 – Miscellaneous (including dry ice)

    TDGR separates **diagnostic specimens** from **infectious substances.** They require different documentation and labelling but similar packaging (both require the use of the commercially available transport container (e.g. SAF-T-PAK company)).

    Diagnostic Specimens

    - Patient/participant specimens reasonably believed **NOT** to contain Risk Groups II-IV agents. Use packing instruction 650.

    - Risk Group I organisms are unlikely to cause human disease and are therefore not regulated by TDGR.

    Infectious Substances

    - Patient/participant specimens containing viable microorganisms, or reasonably believed to be positive with organisms belonging to RISK GROUP II, use packing instruction 620. Microorganisms or specimens known or thought to

likely contain infectious substances **CANNOT** be mailed via regular Canada Post.

- Infectious substances and diagnostic specimens can be shipped by First Class, Priority Mail or Express Mail only if in compliance with the regulations. Infectious substances must be packaged, labelled, marked and have shipping documents. They must be able to be tracked as Registered Mail.

- For Provincial Health Laboratory (PHL) pickups, “PHL plastic containers” are acceptable.

Only trained users must prepare the specimens for shipment, fill out the paperwork, and sign the proper Dangerous Goods Declaration forms.

Postal Requirements

- Shipping Dangerous Goods by regular mail is **NOT LEGAL** in Canada.

- If you are absolutely sure the package is free of any infectious agent it may be mailed to anywhere in Canada only by: (1) using Security Regulated or Priority Post; (2) meeting Canada Post’s minimum packaging requirements; (3) calling 1-800-661-3434 to determine best way to pack the samples; and (4) be prepared to assume full liability.

Courier (FedEx)

- **MUST** be packaged according to IATA packaging instruction 650.

- Requires no special hazard of infectious labels, nor special shipping documents.

- **Note:** even if sending a package to another place in Canada, the package may be diverted through the States, so you must follow the IATA rules. Always check with the courier company to see how the package will be routed.

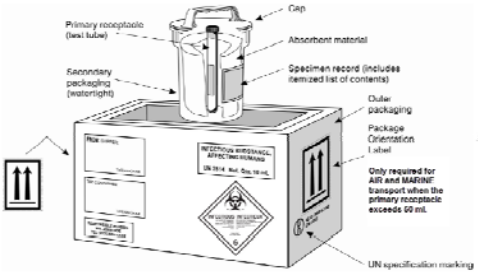
o 4.3.2 Packaging

Infectious substances require **Type P620** containment (packaging instruction 620) and diagnostic specimens require **Type P650** containment (packaging instruction 650) for safe transport of specimens. To make the decision, the shipper must take into account the hazard that would occur in the event of an accident during the transportation of the specimen from point of origin to destination.

The exact nature of the packaging will depend on the goods being shipped. The packaging must protect the material from damage during shipping. For ground shipping, the packaging **MUST** conform to UN requirements (and must have the UN safety mark on the outside). For air transport, the packaging must meet the criteria of ICAO. In most circumstances, combination packaging is used: a leak-proof

container inside a box. The dangerous good(s) are sealed inside a sealed container, which is then placed in an outer package that protects it from damage.

Here is an example:



Type P620 containment

Type P650 containment

Diagnostic Specimens

Diagnostic specimens are those that are reasonably believed **NOT** to contain infectious substance. These specimens are **NOT** subject to TDGR or IATA regulations. Examples: include routine test samples (blood tubes, swabs, urine samples). Shipments to arrive at their destination with no hazard to the public and environment during shipment. The packaging must include:

- Inner packaging comprising of a leak/shock-proof primary receptacle(s): single or multiple bubble wrap. For multiple specimens packing, wrap tubes individually to prevent contact. Use an airtight, leak-proof, re-closable double-locked (zip) polyethylene bag with a document pouch for secondary packaging. Place an absorbent material between the primary receptacle and the secondary packaging (sufficient to absorb the entire content).

- Outer packaging comprising a sturdy box of adequate strength for its capacity, weight and intended use. The completed package **MUST** be capable of withstanding at least a 1.2 metre drop test on a hard unyielding surface without release of its content.

- Label the package appropriately with information regarding the sender and receiver: include name, telephone number, and address.

- A Shipper's Declaration for Dangerous Goods is **NOT** required for diagnostic specimen transport. Fill out airline waybill if required. On waybill add phrase: "Dangerous Goods Shipper's Declaration Not Required" in the "Handling Instructions" column. Add the quantity being shipped in "Nature and Quantity of Goods" column and on the PACKAGE "Diagnostic Specimen Packed in Compliance with IATA Packing Instruction 650".

Infectious Substances

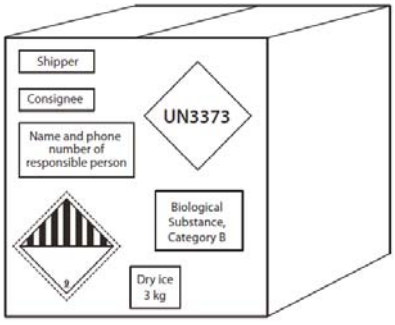
Infectious substances contain viable micro-organisms (including bacterium, biurs, rickettsia, parasite, fungus, or a recombinant, hybrid or mutant) that are known or reasonably believed to cause disease in humans or animals. Shippers of infectious substances **MUST** comply with regulations and **MUST** ensure that shipments are prepared in such a manner that they arrive at their destination in good condition and that they present no hazard to persons or animals during shipment.

o **4.3.3 Labelling**

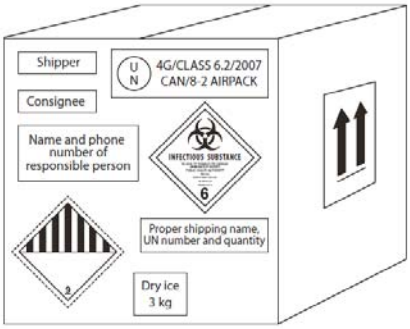
Label Type P620 package to include:

- UN number
- Proper shipping name – infectious substance, affecting humans
- Technical name in brackets (name of pathogen)
- Risk group
- Name, address and telephone number of the shipper and the consignee
- Name and telephone number of a person responsible for the shipment which could be the shipper or another person
- Infection substance hazard label
- Orientation label if not pre-printed on box

The figures below depict the required labels on a shipment of non infectious and infectious specimens on dry ice. The manufacturer of the carton will typically print on the orientation mark and packaging certification. The shipper usually applies the shipping name, UN number, and applies the hazard class label stickers.



Non Infectious



Infectious

- **4.3.4 Documentation**

Fill out “Shipper’s Declaration for Dangerous Goods” form from computer template. Refer to Shipper’s Document Checklist (see below). Print 4 copies. Fill out air waybill and in “Handling Information” box add “Dangerous Goods as per attached Shipper’s Declaration”. Print one copy of this form. File one copy of each form in your study binder.

Shipper’s Document Checklist

DOCUMENT	YES
Name, address and phone number of shipper	
Name, address and phone number of consignee	
Name, address and phone number of person responsible	
Page of page	
Airport of departure (if known)	
Airport of destination (if known)	
Proper shipping Name (Infectious substance, affecting humans)	
Technical name (in brackets)	
Class (6.2, 9)	
UN Number (UN 2814, UN 2900)	
Packing Group (Dry ice only PGIII)	
Quantity (ml, g, kg)	
Type and number of packages	
Packing Instruction (620, 904)	
Authorization (NA)	
“Prior arrangements…” statement	
24 hour emergency contact number “If package damaged…phone Canadian Transport Emergency Centre (CANUTEC) at 613-996-6666” statement	
Name and title of signatory	
Place and date	
Shipper’s signature	
“Prepared according to…” statement	

In the event of a spill or an accident (emergency response) involving infectious substances while being transported call **CANUTEC at 1-888-CAN-UTEC (226-8832), 613-996-6666 or *666 on a cellular phone**. This number is entered into the Handling box on the “Shipper’s Declaration for Dangerous Goods” form.

Local Police: a 24-hour monitored phone number is required on the “Shipper’s Declaration” when shipping to the USA (check operator variations for each country).

- **4.3.5 Shipping with Dry Ice**

Obtaining Dry Ice

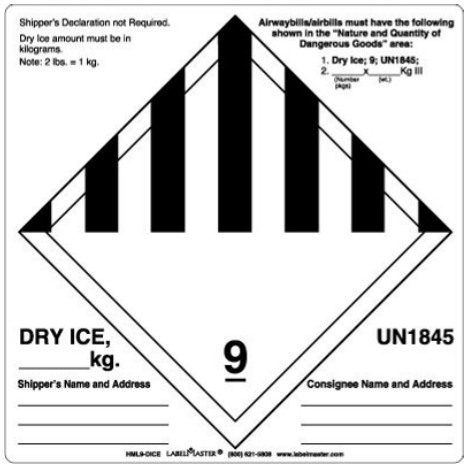
- Wear insulated gloves.
- Wear goggles.

- Refer to Dry Ice MSDS sheets found in the binder above the centrifuges in the Research Centrifuge Room (Connell 4, Room 2-4-041).

Dry ice is a regulated dangerous good and **MUST** always be declared by marking, labelling and documentation. Mark package to include: (1) Dry Ice; (2) UN 1845; and (3) Net Weight.

Label package (see images below) to include a Class 9 Miscellaneous Danger Goods hazard label. It is important that the package is not sealed as it may explode.

Document Waybill to include in Nature and Quantity of Goods column: (1) Dry Ice; (2) Class 9; (3) UN 1845; and (4) quantity being shipped.



For Diagnostic specimens add the phrase “Diagnostic specimen packed in compliance with Packing Instruction 650”.

In Handling Information column add phrase “Dangerous Goods – Shipper’s Declaration not required”.

For Infectious substances being packaged with Dry Ice a Shipper’s Declaration is required and must include on the form: (1) Dry Ice; (2) Class 9; (3) UN 1845; (4) Packing Group-III; (5) quantity being shipped; and (6) Packing Instruction – 904.

Dry Ice (Carbon Dioxide, solid) Packaging Checklist

ITEMS TO BE CHECKED	YES
Air Waybill	
The Air Waybill contains the following information in the "Nature and Quantity of Goods" box:	
1. The words "Carbon dioxide, solid" or "Dry ice"	
2. The Class number "9"	
3. The UN identifier "UN 1845"	
4. The net quantity of dry ice in kilograms or pounds	
Packages and Over packs	
1. The number of packages containing Dry Ice delivered as shown on the Air Waybill	
2. Packages are free from damage and in a proper condition for carriage	
Markings on the Package	
1. The words "Carbon dioxide, solid" or "Dry ice"	
2. The UN identifier "UN 1845"	
3. KHSC/Queen's, Principal Investigator or shipper's actual first and last name and address of the shipper and consignee	
Labels	
1. Class 9 label affixed near the proper shipping name marking	
2. Orientation labels on opposing sides of the package	
Add properly labelled specimen into specimen shipping container and seal container.	
Put sealed container in Styrofoam over pack box.	

5.0 SOP HISTORY

SOP Number	Date Issued	Summary of Revisions
SOP-TDG-01	01-DEC-2017	Original version.
SOP-TDG-02	01-MAY-2019	Bi-annual review of SOP completed. SOP header format updated. SOP version number updated. SOP effective date updated. Removed "Contacts" section from SOP. Updated section number for "SOP History". Under Section 3.0, under "Users Responsibilities", under bullet 1, under sub-bullet 1, added "*via CITI Canada*" and "*KHSC (administered by Kingston General Health Research Institute (KGHRI))*" and updated URL for Queen's courses. Under Section 3.0, under "Users Responsibilities", under bullet 2, added "*/certificate*". Under 4.1, under bullet 2, changed "*Oxivir*®" with "*Oxivir®/Accel® INTERVention*". Under Section 4.2, updated header title from "*4.2: Site to Site Transportation (KHSC-KGH site to Queen's external labs, Hotel Dieu Hospital, Providence Care)"* to "*4.2: Site-to-Site Transportation (KHSC-KGH site to Queen's external labs, KHSC-Hotel Dieu Hospital (HDH) site or Providence Care)"*. Under Section

		4.3, under 4.3.1, under “Infectious Substances”, under bullet 1, revised “*602*” to “*620*”. Under Section 4.3, under 4.3.2, under paragraph 1, revised “*Type 1A*” to “*P620*”, “*602*” to “*620*”, and “*Type 1B*” to “*P650*”. Under Section 4.3, under 4.3.2, under paragraph 2, under images, revised the image titles from “*Type 1A containment*” to “*Type P620 containment*” and “*Type 1B*” to “*Type P650 containment*”. Under Section 4.3, under 4.3.3, under paragraph 1, under sentence 1 revised “*Label Type 1A package to include*” to “*Label Type P620 package to include*””. Under Section 4.0, under sub-header “4.3.4 Documentation”, under “Shipper’s Document Checklist”, revised “*602*” to “*620*”. Under Section 4.0, under sub-header “4.3.4 Documentation”, under “Shipper’s Document Checklist”, typo correction made to add an end bracket to “*Authorization (NA)”*. Updated “SOP History” section.