Pneumatic Tube System Operation

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Changes from last version of this document

- Update to include York & Scarborough Trust logo
- Removal of obsolete documents
- Minor changes to formatting

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1 Purpose and Principle

The pneumatic tube system (PTS) is in place throughout the York Teaching Hospitals NHS Foundation Trust both on the York site and the Scarborough Hospital site. It connects all patient areas to Laboratory Medicine using sealed sample carriers to transport patient specimens, predominantly blood samples, to the laboratory. The system is also used by the Pharmacy department on both sites.

The system comprises a computer controlled network comprising zones interconnected by means of a central transfer unit with a series of strategically placed in-line diverters. Items are transported to their requested destinations at speed by positive or negative air pressure in specially designed carriers.

Each of the designated stations on the system can send and receive carriers. Address destinations are selected at each station via the keypad by the user or embedded via the software for a fixed station address. All stations except Pathology and Pharmacy will automatically deliver the carriers to Pathology.

The carriers are stored at location, under the transport stations.

The system operates 24 hours a day, seven days a week.
The system is managed by Estates & Facilities. Any faults must be directed to them in order to resolve them in a timely manner. This can be done through 'StaffRoom' for routine enquiries or via **5566** (both sites) if more urgent.

2 References

Transportation & Posting of Specimens: LM-SOP-TRANSPORT

Correct Usage of the Air Tube System: LM-TEM-PTS

HSE guidance for use of the PTS: LM-INF-PNEUTUBE

List of PTS Stations York: YLM-INF-PTS

List of PTS Stations Scarborough: SLM-INF-PTS

The Provision and Use of Work Equipment Regulations 1992
Control of Substances Hazardous to Health Regulations 1994
Manual Handling Operations Regulations 1992

3 Equipment.

Quirepace pneumatic tube system (York)

Aerocom pneumatic tube system (Scarborough)

4 Personnel Authorised to Perform Procedure

Laboratory staff may perform certain aspects of the investigation (such as purging the system) provided they have received appropriate training from an authorised trainer, and this has been recorded in their training file.

Repair and maintenance of the PTS is the responsibility of Estates and Facilities. They must be contacted in the first instance to attempt to fix the equipment or if appropriate contact external specialist engineers. Electronic copies of manuals are held by Facilities. If required contact Estates and Facilities.

The operational state of the pneumatic tube system utilised in Scarborough, has been highlighted on the risk register.

5 Sample Requirements (including COSHH Risk Assessment & First Aid)

PLEASE NOTE: The air tube may take up to 45 minutes to deliver a sample to its location. If a sample is urgent or precious (difficult to obtain a repeat) it is best to hand deliver the sample to the laboratory. See also LM-TEM –PTS.

The PTS may be used to transport the following pathological specimens in their appropriate sampling containers:

- All biochemical analyses
- Whole blood specimens
- Blood Culture Bottles (Plastic)

The PTS MUST NOT be used for transport of any of the following:

- All histology samples
- HIGH RISK SAMPLES - Any known or suspected High Risk Specimens. This includes suspected – HIV; Hepatitis, Meningitis etc, any Bronchial, sputum or pleural fluid samples
- All specimens from **KNOWN** IV-drug abusers
- Swab samples for Covid
- All specimens from patients suspected or known to have SPONGIFORM ENCEPHALOPATHY (e.g. CJD type diseases)
- Tissues or fluids suspected of containing Tuberculosis
- All specimens from patients who have unexplained jaundice
- All specimens from patients with pyrexia who have a recent (within 1 month) history of foreign travel beyond Europe.
- The transport of food, drink, cosmetics or any non-authorised materials under any circumstances.
- Samples for blood gas analysis (as clinically significant changes may occur during transit).
- Hazardous substances such as formaldehyde solutions (formalin, formal saline) etc**.** under any circumstances.

- Any specimens obtained from an invasive procedure or any deemed clinically difficult to obtain e.g.Cerebro-Spinal Fluids (CSF) and Breast Aspirates.
- All blood products

6 Health and Safety Information and Advice

	When performed according to the protocol detailed in this SOP, and in conjunction with adherence to Trust Policies and Good Laboratory Practice, the handling of patient samples represents minimal risk to staff.

Do:

- Ensure that samples are placed in sealed bags.
- Ensure that the lids are securely fastened to the carriers.
- Check that the amber light is out when removing carriers from the receiving station.
- Remove carriers from the receiving station immediately after arrival.
- Ensure the collection baskets are kept clear.
- Carriers must be inspected before returning to the original location.
- Decontaminate carriers as appropriate. If a carrier appears to be contaminated treat as a contaminated sample and decontaminate as soon as time allows.

Do Not:

- Try to use the system before you have been trained
- Load more than one carrier at a time.

<u>In the Event of Exposure to Bio-Hazardous Material:</u>

1. If skin has been punctured encourage bleeding by gently squeezing. Wash with soap and running warm water then dry and dress the wound.
2. Splashes to the eyes: irrigate eyes thoroughly with eye wash / saline
3. Splashes to the mouth: gargle with drinking water (avoid swallowing)
4. Contact the Occupational Health Department / Emergency Department for guidance and report all adverse incidents to your line manager / complete an DATIX form.

- Decontamination of Carrier Pods

If it is noted that a pod has become contaminated:

Firstly determine the level of contamination. This must be made by either a Senior member of staff or the Consultant Microbiologist (as soon as possible following the discovery of contamination).

Following the advice form the Senior member of staff (the following notes can be used for guidance):

1. The leaking pod must be placed in a leak-proof plastic container to contain any further leakage and a senior member of staff in Microbiology informed. Out of hours the on call Consultant should be contacted.
2. The pod must be removed to the Category 3 containment room immediately and only be opened within the confines of the microbiology safety cabinet in order to contain aerosols. Spillages must be cleaned up with an appropriate disinfectant.
3. Specimens if intact within their sampling container may be used, but ideally, if they are easily repeated, fresh specimens should be requested.
4. The pod must be autoclaved before reuse.
5. Sample bags must also be considered to be contaminated and must be disposed of immediately into a clinical waste receptacle.
6. The receiving station (the dropout pipe and the collection basket (including the impact cushion in the bottom of the basket) must also be decontaminated by wiping with 70% alcohol before further use – the choice of disinfectant should be made following consultation with the consultant Microbiologist, however hypochlorite must not be used near any metal parts of the station as it is corrosive.
7. If the spillage has leaked into the carrier and the request card is contaminated, then request cards must be copied in the safety cabinet and the original destroyed. A note must be made on the new form that the data has been transcribed.
8. An AIRS form must be completed as soon as possible.

See also LM-SOP-TRANSPORT

For Decontamination of the whole PTS: See Appendix (Section 9)

7 Method

- All samples must be packaged appropriately in the bags supplied and secured in the air tube sample carrier.

- If necessary include paper towels to prevent movement of the sample during transport and help prevent breakages and leaks.
- ALL specimens sent via the PTS ***MUST*** be placed in a carrier pod.
- Under no circumstances should a large number of items be forced into one carrier pod as this may cause a breakage either at loading or unloading and excessive weight can cause a blockage or transport failure.
- If there is a specimen already in the station, **DO NOT REMOVE IT** to make way for your own.

It is the responsibility of the sender to ensure that:

The sample is labelled, packed appropriately and is accompanied by the relevant paperwork. **The specimen must be accompanied by a suitably completed request form.**

This must include:

i) patient name and/or unique identifier

ii) patient date of birth

iii) nature of the specimen

iv) time and date of collection

v) specimen source e.g. ward or clinic

vi) requesting consultant or approved authority

The primary specimen container must be placed in a transparent plastic transport bag and sealed, either by an integral sealing strip, or by other suitable means to enable opening without using sharp-pointed instruments. Bags should not be sealed with pins, staples or metal clips as they may cause injury and may affect the integrity of the bag.

The request form should not be put in the bag with the specimen. All Laboratory Medicine request forms now have an integrated sealable plastic bag for the specimen. However, in the absence of these request forms a plastic bag with a side pocket can be used to accommodate the completed request form.

It is advised to let samples stand for 30 minutes prior to sending to the laboratory using the PTS. This allows the sample clot to fully contract preventing haemolysis which may affect certain biochemistry results. If this is not acceptable the sample should be transported by hand in cases of emergency.

Single specimens:

Where a single sample is to be transported within a carrier pod, a suitable amount of absorbent packaging (foam or absorbent paper towelling) should be included to protect

the specimen from rattling during transit (and to avoid potential haemolysis of the specimen). This should be wrapped around the specimen prior to it being placed into the carrier pod.

Pharmacy Orders/Drugs:

Pharmacy requisitions must only be placed into Pharmacy carrier pods. Pharmaceuticals/ drug orders must **never** be sent to a station without arranging for personal collection before being sent.

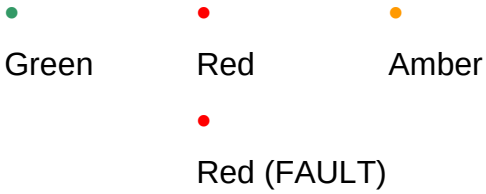
Sending in a carrier:

- Load carrier(s) with samples
- If display shows "**READY FOR DISPATCH" If you are using the more modern pods that contain a microchip which can automatically send the pod to the correct address or should the microchip not be working or the pod be of the older type then it is necessary to t**ype the destination code number on the keypad (each location has a coded destination). See location list below
- Insert the carrier ensuring that it is properly seated in the holder.
- Depending on the station type (you may need to close the latched door on the older stations), the readout should display **"SELECTION O.K."**

If the station is ready to use a red and green light will come on and the carrier will shortly be dispatched.

Warning lights

These lights are arranged as follows



The Green light indicates the station is ready to send the carrier

The top Red light indicates network busy

The Amber light indicates carrier arriving

The **bottom** Red light indicates a Fault condition.

Receiving a Carrier

The imminent arrival of a carrier is indicated by illumination of the amber light on the station. This is followed by the click of the "entry shutter" and the carrier dropping into the receipt basket.
Carriers must be removed from stations as soon as possible to prevent blockage and thus inactivation of the whole zone.

Spillages and Leaks in Transit.

- Sample bags containing leaking containers will be discarded and the sender notified in order that a repeat sample can be taken.
- Every effort will be made to rescue non-repeatable samples but the ability to do this will be limited by health and safety considerations.
- If the spillage/leak has contaminated the inside of the air-tube container, then the container will be taken out of use and cleaned thoroughly and decontaminated by laboratory personnel.
- If there is any suspicion that the leak/spillage may have contaminated the air-tube itself, the system will be closed down until cleaned and disinfected. In these circumstances the person noticing the leak should immediately contact: Facilities Help Desk, through the desktop icon on StaffRoom.
- On the York site the Porters will then assume responsibility for the transport of specimens until the system has been properly cleaned and disinfected. On the Scarborough site a combination of ward staff and the portering team will assume responsibility for the transport of specimens until the system has been properly cleaned and disinfected.
- All samples, but particularly those from patients suspected of having certain blood borne and other infectious diseases, constitute a hazard to portering and laboratory staff handling the sample.
- All samples are therefore managed according to standard principles applied universally.
- Staff are reminded to wear examination gloves (latex free) when in contact with blood, body fluids or tissue.

If you have a patient in a particularly high risk group, e.g. viral haemorrhagic fever, and are in doubt about the feasibility of a test, please contact the Microbiology Department before taking or sending any samples.

Delivery of Samples to Laboratory Medicine (or Pathology)

Outside Core Hours (17.30 to 08.00)

Blood Sciences and Microbiology operate a 24 hour service. The laboratories provide a full service between the core hours of 08.00 and 17.30 and a reduced repertoire during weekends and weekday night shifts.

The responsibility for timely delivery of the sample/request to the Laboratory rests with the porters and the requester.

8 Performance Issues & Known Limitations

The pneumatic air tube system is designed to deliver specimens in a way that prevents leakage but care is required to ensure they are not damaged.

The transport tube does go outside of the building at Scarborough so in cold and wet weather there may be some water seepage into the dispatch tube. This will not get into contact with any material within the sample carriers and has not presented a problem so far even within adverse weather conditions.

9 Appendix

<u>Decontamination of the whole PTS:</u>

For Information Only- seek advice from the Estates and Facilities Team.

Request that they attend to perform this procedure

This is extremely difficult and relies on immediate prompt action by the staff in reception who discover the contamination. It should ONLY be considered when a potentially infective specimen has leaked from the pod during transit (thereby leaving a trail of infective material down the inside of the tube system), indications for this are wet velcro on the outside of the pod and damp/wet trail on the inside of the tube on pod arrival. The system must be shut down IMMEDIATELY (see below) and the Consultant Microbiologist called to make a decision on how to proceed

This will require the shutdown of the entire system and will involve an engineer to attend on site. ***Contact Estates and Facilities to coordinate this****. The minimum timescale for the system to be brought back online should be considered to be three working days. Obviously shut downs of this scale should never happen given the restrictions on using the PTS for High Risk specimens, however in the real world, we need to plan for such an occurrence.*

Procedure to switch off system*:*

- *Determine which system the offending sample came from using the "BPanalyse" programme on the controller PC.*
- *From the OVERALL VIEW pres Esc*
- *Select F1: Power Supply On/Off.*
- *Using Function Keys F1 to F3 select which system to switch off.*
- *Switch toggle switch to Off.*
- *Use Esc key to return to the Overall view*

Call the Quirepace service line on (0239 2601119) or Aerocom on Service Help Line: 07736 42557

- *Only after complete decontamination should the system be brought back on-line.*