Emergency Response Protocols

Exercise Intervention and Outcomes Core

Chapter 1: Blood Draw

Chapter 2: iDXA

Chapter 3: Strength Testing (Biodex)

Chapter 4: ECG/Treadmill

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Appendix A: Emergency Exit Maps

Appendix B: SOAP Notes

Appendix C: Laboratory Incident Report Form

Appendix D: Data Safety Sheets for Chemicals
Emergency Response Protocols

For emergencies, from a campus or cell phone dial 911 – specify UMass Amherst when reporting location.

Purpose of Plan:

To prepare for appropriate responses should an emergency situation arise that affects the campus, the Life Sciences Laboratory building, the Exercise Interventions and Outcomes Core area, or an individual as a result of an injury or illness. These protocols are prepared in conjunction with Environmental Health & Safety to ensure they are consistent with campus guidance and standard practice in the event of an emergency, injury or illness. This helps ensure that minor medical incidents do not become major incidents and that major medical incidents are handled with the utmost care and efficacy.

Preparations:

1. Staff must be knowledgeable in current emergency response protocols including, locations of Automatic External Defibrillators (AEDs), fire extinguishers, and emergency exit egress pathways from the Exercise Interventions and Outcomes suite and emergency exit from the building. Once outside of the building, individuals associated with the Exercise Interventions and Outcomes Core must assemble at the traffic circle on Stockbridge Road to ensure that everyone is accounted for.

2. Staff and users must take the EH&S safety trainings on Bloodborne Pathogens which can be accessed online at https://ehs.umass.edu/owl-training. It is recommended that staff and users have a Hepatitis B vaccination which can be obtained at University Health Services free of charge.

3. First aid, CPR, and AED training may be required based upon specific facility utilization.

4. Staff must be certified by the facility director to use the equipment. The facility director will maintain a list of individuals authorized to use the specific equipment and will maintain the OWL database for required EH&S trainings.

5. In-service training on emergency situations
   - Recognition and management of life-threatening emergencies
   - Recognition and management of minor incidents
   - Fires, tornadoes, or other environmental emergencies (follow University policy)
   - Post-emergency documentation

6. Studies involving subjects with specific medical conditions must maintain pertinent information to each subject (i.e. personal physician’s name/phone, medical conditions, medications, etc.) readily available, though secured, during the study in case of an emergency for the access of first responders.
7. Emergency telephone procedures are located near the phones. Phone numbers for emergency services, UMass Police and Environmental Health and Safety are located on these postings.

**Emergency Exit Plan:**

Sign posted on wall of room next to door detailing how to exit the research suite in the case of an emergency. See appendices for specific egress paths.

**Minor Incidents:**

**Definition.** For the purpose of these procedures, a minor incident is considered any injury or illness that is not immediately life threatening. **Examples of minor incidents include abrasions, contusions, and strains.** Any incident that involves breathing, circulation (e.g. cardiovascular problems, severe bleeding, shock), hyperthermia, inappropriate blood glucose, or impaired consciousness is considered life-threatening and will be handled as a major incident. Be aware that many non-life-threatening injuries, such as a broken clavicle, can become life threatening if the subject develops severe shock.

**Procedure.**

1. Survey the scene.
2. Contact a supervising staff member (the study PI, Dr. Busa or otherwise designated staff member when they are absent). Promptly evaluate the injury and determine whether to manage on-site or to utilize community medical resources (call for ambulance or send to emergency room or personal physician).
3. If subject is to receive treatment off-site, the supervising staff member will arrange transportation to the desired location (some options: subject drives self, staff drives subject, ambulance, etc.)
4. Other staff member(s) present are responsible for crowd control, assisting the supervising staff member, or requesting additional assistance.
5. The incident must be documented in writing (Incident Report Form attached) and followed-up as necessary.

**Major Incidents:**

**Definition.** For the purpose of these procedures a major incident is considered any life-threatening illness or injury. This includes any incident that involves or could soon involve breathing, circulation (cardiovascular problems, severe bleeding, shock), hyperthermia, inappropriate blood glucose, or impaired consciousness. These are considered life threatening and will be handled as major incidents.
Procedure.

1. Survey the scene, and prevent further injury.
2. The incident will be assessed, stabilized (i.e., CPR/AED or first aid), and referred to an emergency medical service (ambulance).
3. Staff should function in duty-specific roles.
   a. **First on the scene.** This is the person who witnesses the event or is the first staffer to reach the victim. That person should promptly ensure 911 is called and then render immediate care, consistent with the protocols of CPR or rules of first aid.
   b. **Team leader** - This is the highest-level staffer on duty. After arriving on the scene, that individual should direct the general flow of care. The team leader is also responsible for the post-incident documentation and should make plans for follow-up actions such as contacting the subject's "emergency contact."
   c. **Communications staffer** - This person will call for an ambulance and provide the emergency dispatcher with the exact location of the emergency (240 Thatcher Rd, UMASS Amherst, Life Science Laboratory Room S360), the phone number nearest the incident (Front Desk: 413-577-4583, Room Calorimeter: 413-577-4579, Exercise Testing Room: 415-577-4584), and the nearest entrance to the facility. This person, and a second, if available, will also go outside to meet and direct the ambulance, respectively. Upon return, this individual can be responsible for real-time documentation.
   d. **Crowd control staffer** - This person, along with EH&S personnel, will clear the area of other facility users and of any equipment that may be in the way to ensure that emergency medical personnel can access and treat the victim. This person will locate the participant’s information to retrieve any available information about medical conditions, medications, etc. that may be important to the ambulance personnel. After the incident is well controlled, the crowd control staffer will gather the subject's personal belongings and place them in a secure location.

**Note** – If four research team members are not present, other near-by faculty/staff or available personnel may be called on to assist the staff in the roles outlined above. If all of the above roles cannot be filled, priority should be on filling the “First on the scene” and the “Team Leader” roles.
Incidents Involving Blood:

All incidents in our facility involving blood must follow OSHA’s Blood-Borne Pathogen Rules. Refer to the wall postings in our labs for these guidelines.

Emergency / First-Aid Equipment:

An AED and first aid kit are located in the hallway at the back of the Human Testing Suite (S360/370). **Staff must be aware of where these items are kept.** A checklist for the AED is next to the unit (in working order and battery OK). The AED should be routinely checked for completeness of supplies (and expiration dates recorded) and proper function of AED. **It is the responsibility of the personnel using the facility and testing patients to complete these checks and document the checks.** 12-lead ECG instrumentation is also located in the facility if needed.

Fire extinguishers

In case of fire, locate nearest fire extinguisher (Corridor adjacent to S370D in the rear of the Human Testing Center (S360/370), pull fire alarm, aim, point, squeeze.

**For emergencies, from a campus or cell phone dial 911 – specify UMass Amherst when giving location.**

Documentation:

1. Emergency plan (this document) should be available and familiar to all staff.
2. Subjective/Objective/Assessment/Plan Notes (SOAP) will be used to document the incident in real-time to aid in transfer of information to emergency medical personnel. SOAP notes pages are included at the end of this document.
3. Incident Report Forms will be used to document the details of any incident and will be kept in each laboratory room.
4. Evidence of CPR certification (and first-aid certification if completed) will be kept by the individual PI’s.
5. Emergency equipment maintenance records will be kept in the exercise lab. Maintenance will be completed by appropriate staff (eg; AEDs: EH&S, Eye Wash Stations: facility staff).
All study staff should be familiar with the emergency response protocols.

**Required Trainings:**

- Bloodborne Pathogens (if performing blood work)
- Autoclave (if performing blood work)
- First Aid/AED/CPR
- Certification for instrument use (by Core Staff)
- Hepatitis B vaccination is recommended for those performing blood draws

**List of Equipment**

1. Thermofisher Centrifuge: Sorvall ST 16 swinging bucket centrifuge (S360B)
2. Under counter refrigerator & freezer (S360B)
3. Phlebotomy Cart (S360B)
4. Phlebotomy Chair (S360B)
5. Exam Table w/ paper dispenser
6. Medical Stool
7. GE Lunar iDXA (S360J)

**Room Use Description**

Both examination rooms can serve different purposes e.g., blood draw, general check-in, iDXA, and interview. The SOP for using S360J for performing iDXA scans can be found in Chapter 2. When using the examination rooms for interviews if emergency issues arise investigators should use Emergency Response procedures outlined in this SOP manual.

Examination rooms can be used to perform blood draw and take biopsies of muscle and fat. During the collection of these tissues additional standard procedures outlined here are to be followed to ensure the safe collection, transfer and storage of the samples.

**Authorized Users**

Blood is only to be collected by qualified individuals provided by the study PI. The handling and storage of blood should be done in a manner that limits the risk of spills and falls. Phlebotomy cart should be used when collecting blood and tubes should be kept in the deep wells of the cart. Safety sharps are required equipment to limit the risk of inadvertent needle stick. Vacutainer tubes and needles are also required to limit spills.

**Storage of Sample Tubes**

Sample tubes should be stored in test tube racks (within secondary containment) when being stored in the refrigerator or freezer. When preparations are being made for use of the centrifuge tubes are also to be kept in racks.
Disposal and Sanitation of Equipment

Sharps and syringes are to be disposed of in the supplied sharps containers. Other materials that contain biohazard materials, e.g., gauze and bandages are to be disposed of in supplied biohazard bins.

Centrifuge

When the centrifuge is to be used in S360B to spin blood or other biohazard materials the secondary containment caps on each of the swinging buckets are to be secured prior to spinning samples. Following this procedure limits the risk of a tube breakage or spill contaminating the entire body of the centrifuge.

Routine Cleaning

Disinfection of all surfaces that have come into contact with blood. Spray bottles with an approved disinfectant (supplied by the core) are in the room and should be used with a paper towel to clean the surface. If a participant sits on the exam table, the paper is to be changed after they leave.

Emergency Clean Up

In the case of a blood spill or tube breakage inform the core director. Do not pick up broken glass with your hands, use tongs to move the broken glass to a broken glass or sharps container. Clean the affected area thoroughly with spill kits stored in the cabinet and supplement with approved disinfectant (supplied by the core) as necessary. If a spill is large and assistance is required, please call EH&S at 413-545-2682 to request assistance.

Accidental Exposure to Human Source Materials

In the case of an exposure to human source materials sites should be:

- Rinsed under running water for 15-minutes
- Obtain medical evaluation
- Contact EH&S

Approved Equipment needed for Blood draws

- Safety Sharps
- Vacutainer (type) Collection Vials

Approved Disinfection Products

Product: ACCEL TB
EPA Reg#: 74559-1
Registrant: VIROX TECHNOLOGIES INC.
Approval Date: 30-Sept-2005
Active Ingredients: Hydrogen peroxide 0.5%

Product: SANI-CLOTH GERMICIDAL DISPOSABLE WIPES
EPA Reg#: 9480-4
Registrant: PDI
Approval Date: 01-Nov-2007
Active Ingredients: Alkyl*dimethyl benzyl ammoniumchloride(60%C14,30%C16,5%C18,5%C12) 0.25%
Alkyl*dimethyl ethylbenzyl ammonium chloride (68%C12,32%C14) 0.25%

*To be phased out after current supply is depleted* (20 December 2016)

Product: CIDECON CLEANER, DISINFECTANT, DEODORIZER
EPA Reg#: 3862-179-56753
Registrant: Decon Labs, Inc.
Approval Date:
Active Ingredients: para-tertiary-Amylphenol 5.25%
  ortho-Benzyl-para-chlorophenol 3.00%
  ortho-Phenylphenol 3.00%
All users should be familiar with the emergency response protocols.

Required Trainings:

- First Aid/CPR/AED Training
- X-Ray Safety Training
- Certified for operation in accordance with State of Massachusetts Guidelines
- Certification for instrument use (by Core Staff)

Relevant Equipment

GE Lunar iDXA

Instrument Location

The GE iDXA is located in LSL S360J. The instrument is not to be removed from this location and installed in another location without a radiation head leakage scan to ensure that there is no significant radiation being transmitted to adjacent rooms.

Authorized Users

In accordance with Massachusetts regulations operators of the bone densitometry system shall be:

1. Licensed as a radiologic technologist [by the Agency]; or
2. A licensed physician; or
3. International Society For Clinical Densi...technologist; or
4. ARRT certified in Bone Density

Standard Operation

During the operation of any bone densitometry system: (1) The operator, ancillary personnel, and members of the general public shall be positioned at least one meter from the patient and bone densitometry system during the examination. (2) The operator shall advise the patient that the bone densitometry examination is a type of x-ray procedure.

Bone densitometry on human patients shall be conducted only:
1-Under a prescription of a licensed practitioner of the healing arts; or
2-Under an alternate screening program approved by the Agency.

Any person proposing to conduct a bone densitometry screening program shall submit the information outlined in Appendix B of this Part and include the name and address of the individual who will interpret the screening results. (1) Section 120.010 includes CT units that are designed for bone density.
Participants will be asked to remove all metal jewelry prior to scanning and it will be questioned to ensure that they have not received Barium in the previous 48 hours and are not pregnant.

The technician performing the scan should keep the participant on the scanner in line of sight and remind them to remain still during the scan. The console should be kept at least 6 feet from the center of the scanner to ensure the minimum exposure to x-ray.

Emergency Procedures

In the case of an emergency the machine can be stopped by the red button located on the scanner arm of the iDXA head or at the console. Once the scan is stopped the arm can be sent to its home position by pressing ‘Control + H’. Once the scanner arm is returned to its home position the participant can exit the table comfortably. In the case of power outage or participant in extreme distress, the participant can be slid out of the scanner once the scan is stopped. In the event that this happens lab personnel should refer to the Emergency Response chapter of the Core SOP.

Quality Assurance and Maintenance

The Manufacturer’s Quality Assurance and Quality Control programs shall be followed.

Every day that the scanner will be used the quality assurance (QA) block will be scanned. Scans on participants will only be completed if the iDXA passes the calibration. If the calibration fails, the calibration will be run a second time, if it passes the machine will be used, if it fails the second time GE maintenance will be contacted. In accordance with manufacturer recommendations for the iDXA unit, testing with the spine phantom is not needed for quality control, the QA block handles this.

In accordance with state regulations the facility will keep maintenance records for bone densitometry systems. These records shall be maintained for inspection by the Agency for three years. These will be kept by the core director.

Standard Radiological Checks

Radiation badges will be placed on all interior walls of the room housing the iDXA, and will be collected and analyzed via UMass EH&S services monthly. Systematic checks using a Ludlum Model 3 Survey meter with a Ludlum NAI probe, will be conducted by the University’s Radiation Safety Officer and will be logged with maintenance records. Logs will be maintained by the core facility director. If the alternative screening procedure (see option 2 in Standard Operation section) is approved annual checks will be done by a medical physicist to ensure that the machine is operating appropriately with no additional x-ray scatter from the head.
All users should be familiar with the emergency response protocols.

Required Trainings:

- First Aid/CPR/AED
- Certification for instrument use (by Core Staff)

Relevant Equipment:

Biodex System 4 Pro

Instrument Location:

The Biodex should not be moved from its current location in LSL S370E without the a technician from the company coming and making sure the calibration is correct and the unit is leveled properly.

Standard Operation:

Testing apparatus can be found on the back of the experimenter console and on the device rack located adjacent to the Biodex. All apparatus are to be removed following testing and placed back in their appropriate storage location. Please see the MOP for a guide to how different testing protocols are run.

After every user the chair and attachment apparatus is to be wiped down with the provided disinfecting cloths.

Emergency Stop Buttons:

Emergency stop buttons are located on the computer console, dynamometer tower, and a handheld remote that should be given to participants so that they can stop the test if they experience abnormal pain or strain.

In case of Emergency and Faulty Equipment

Please follow Emergency Response procedures. All emergencies, and adverse event are to be reported to the Core Director and to EHS, IRB and PI where appropriate.
All users should be familiar with the emergency response protocols.

**Relevant Equipment:** Quinton Q-Stress ECG System w/ TM55 Treadmill

Manual of Operation highlights the safety shutoffs. Participants should be informed of the emergency shut off prior to getting on the treadmill.

Hands are to be kept clear of all moving parts while the treadmill is on. Cleaning when treadmill is off.

**List of Cleaning Supplies**

1. Disinfecting wipes for the wipe down of equipment that may come in contact with participant sweat.
2. Nitrile gloves

**General Usage Procedures**

Participants will be fitted with the ECG leads and wiring will be secured such that they will not obstruct movement when on the treadmill, and not create a trip hazard either on the treadmill deck or in the surrounding area. Leads will be placed in accordance with the manufacturers specifications.

Electrodes will only be used one time and will be disposed of after each use.

The research staff will be trained of how to use the emergency stop and rapid deceleration features of the devise to ensure participant safety during maximal protocols.

**Standard Maintenance**

**Daily use:**

1. Ensure all components are clean and there are no cracks in any components.
2. Ensure all cords are plugged in properly and do not exhibit any signs of wear.

**Annual Maintenance:**

1. Per manufacturer instructions the system should be maintained annually by a service technician.
All users should be familiar with the emergency response protocols.

**Relevant Equipment:** RacerMate Veloton Bicycle Ergometer

**List of Cleaning Supplies**

1. Disinfecting wipes for the wipe down of equipment that may come in contact with participant sweat.
2. Nitrile gloves

**General Usage Procedures**

Participants will be fitted to the bicycle to a level of their comfort.

In accordance with the manufacturers recommendations the ergometer will be rolled down to ensure that it is calibrated.

The bicycle will be wiped down after every use with disinfectant.

The control unit should be plugged into the data recording computer before it is turned on.

Hands are to be kept clear of moving parts at all times.

**Standard Maintenance**

**Daily use:**

3. Ensure all components are clean and there are no cracks in any components.
4. Ensure that pedals, cranks and chainrings are tight and that there is appropriate tension in the chain.
5. Ensure all cords are plugged in properly and do not exhibit any signs of wear.

**Annual Maintenance:**

1. Inspect the chain and chainrings for wear. Replace if necessary.
2. Ensure the copper fins on the wheel are ‘true’. Replace if necessary.
3. Check bottom bracket for wear. Replace if necessary.
CHAPTER 6
Exercise Intervention & Outcomes Core
Metabolic Testing (ParvoMedics)
LSL S370E

All users should be familiar with the emergency response protocols.

Relevant Equipment: ParvoMedics TrueOne 2400 Metabolic Card

List of Cleaning Supplies
1. Bleach Solution (2% concentration) or Cidex
2. Johnson & Johnson baby wash – cleaning (per manufacturer recommendation)
3. Nitrile Gloves
4. Wall mounted drying rack
5. Wash basins

General Usage Procedures
Participants will be fitted with the head piece in line with the manufacturers recommendation and will be monitored while wearing the mask. Participants will be informed that if they are ever in any pain or substantial discomfort the mask can be removed at any time.

Prior to testing participants will be screened for risk factor. Based on ACSM criteria and specific IRB approval for each protocol, a 12-lead ECG will be used to monitor participant’s cardiac rhythms.

After a test is completed the equipment will be disinfected using a disinfectant solution (e.g. Cidex, Metricide) and cleaned with the mild soap solution (Johnson & Johnson Baby Soap). The equipment will then be dried on the hanging rack.

The heart rate monitor will be disinfected using a disinfecting spray or wipes and will be hung to dry.

Prior to every usage the metabolic cart will be calibrated for both flow accuracy and for O₂ and CO₂. The mask does not restrict airflow and people can breathe ‘normally’ while wearing it. There is no gas from canisters flown into the mask, rather people breath normal air.

Standard Maintenance

Per the Manufacturers recommendations

*After Every Test:* Remove and dry up the “white” water trap filter after every exercise testing. Clean and disinfect the 2-way valve and mouthpiece/face mask. Do not over- tighten the inspiratory port of 2-way valve. Finger tight is recommended.

*Daily:* Warmup 30 minutes. (The CO₂ reading during the first 10 minutes is very unstable.) Flow and gas cal once in the morning and once in the afternoon. Flow Cal must use dry breathing tube. Make sure cal gas is turned off when shutting down the system. Turn off the power strip at end of the day.
3-6 Month Maintenance: Wash and clean up the heated pneumotach every 6 months for exercise system. Replace the PermaPure gas drying line/filter (3 months for dilution mode, 6 months for exercise Testing). Perform Sampling Line Calibration and Gas Leakage Test. Make sure the heated pneumotach is warm.

Annual: Replace the auto-cal PermaPure gas loop at the back of the analyzer module. Replace “white” filters if they are cracked or dirty. Re-order Perma Pure drying lines and water trap filters.

Standard Cleaning

Cleaning processes, which might use elevated heat, chemicals, and gases, reduce the functional life cycle of a product. Your cleaning protocol should be evaluated closely to determine its effect on biological decontamination control, the functional life of the product, and the possible resulting change in care and maintenance of the equipment.

Follow closely all the instructions made available for the operation, care, and maintenance of the Parvo Medics, Inc. TrueOne® 2400. Pay special attention to the warnings and cautions in the User’s Manual and on equipment labels.

If new cleaning techniques or new equipment materials are encountered, run sample test evaluations and review thoroughly the results with all concerned parties.

Good cleaning practices

1. **Disassemble** - allows the physical removal of particulates and allows sterilants to contact all the surfaces while contributing to a thorough rinse.

2. **Prewash** - All particulate matter should be removed before the cleaning operation.

3. **Cleaning/Disinfection Procedure** - Follow our temperature and chemical limitations.

4. **Rinse** - A very critical operation. Disinfectant manufacturer will emphasize special conditions. Sterile water is recommended. If not practical, tap water or distilled water is substituted.

5. **Dry** - A thorough drying is a necessity using a heated chamber to prevent bacterial multiplication. Check for the temperature limit, which is 45 degrees Celsius.

6. **Inspect & Verify** - Make sure the components are
   a. Dry and free from residue
   b. Not deformed or distorted
   c. Flexible materials are not hardening or stiffening
   d. Plastics are not crazed or cracked
   e. Components showing signs of deterioration should be disposed of or returned to Parvo Medics, Inc. for failure evaluation
7. **Lubrication** - Apply a thin film of silicone grease to the threads, o-rings, or calibration syringe seal before re-assembly. One recommended grease is Molykote 33 Grease, medium consistency, manufactured by Dow Corning Corporation, U.S.A.

    Caution! Avoid repeated or prolonged skin contact. Grease may cause mild skin and eye irritation.

8. **Assemble** - Inspect and test for proper function.

9. **Package** - For storage or reuse per your facilities protocol.

10. **Verify** - Your level or biological decontamination on a periodic time program.

11. **Special Treatment** - Refer to section titled Special Cleaning & Care for products requiring special treatment.

Acceptable Cleaning Materials

1. Prewash

    Mild soap (detergent) and water are particularly useful.

    - or - Metrizyme, a proteolytic Enzymatic detergent.

2. Glutaraldehyde Solutions (All of these are toxic materials and bleacl solution, see section 3 below, should be used in favor of these). The following glutaraldehyde solutions have been used successful with our products, except for causing discoloration on nickel plated metal components and may causing discoloration and stress crazing when used with polycarbonate plastic.

   a. Procide(R) 14 N.S. (2.4% glut).

   b. Omnicide(TM) Long Life Activated Dialdehyde Solution (2.4% glut)

   c. Omnicide(TM) Plus (3.4% glut)

   d. Sterilant Claim - 10 hours at 20 degrees C, max reuse of 14 days.

   e. High Level Disinfection Claim - 45 minutes at 20 degrees C, max. Reuse of 28 days.


   g. Metricide, Metricide 28, and ColdSpor. Trademarks of Metrex Research Corporation.

   h. Glutarex. Trademark of 3M Company.

    Cidex or most glutaraldehyde requires, at 25 degrees C, 45 minutes to kill most germs, and 10 hours to sterilize.
Newer kind of glutaraldehyde, such as Procide or Omnicide, can be used at 20 degrees C (room temperature) for 45 minutes to kill germs. And they are not as toxic as Cidex. Therefore, Procide or Omnicide are better recommended. They can be obtained from hospital supply companies.

3. **High concentration chlorine will crack the plastics.** Lower concentration chlorine (2% or 5%), according to Clorox company, will not affect the plastics as much. Cidex will not affect plastics as much. But the newer Procide or Omnicide are not as toxic and can be used in room temperature.

Note: Pay special attention to the proper use of any cleaning materials. Follow the manufacturer's instructions carefully.

Other cleaning instructions for semi-annual and annual services can be found in section 13-4 in the User’s Manual located on the computer desktop of the Parvo Cart.

**Calibration Gas**

Secure to cart
Core staff should the only people to change cal tank.

**Approved Disenfection Products**

*To be phased out after current supply is depleted* (20 December 2016)

<table>
<thead>
<tr>
<th>Product</th>
<th>EPA Reg#</th>
<th>Registrant</th>
<th>Approval Date</th>
<th>Active Ingredients</th>
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<tr>
<td>Cidex OPA</td>
<td>00707800017</td>
<td>Advanced Sterilization Products</td>
<td>28-Jun-2005</td>
<td>ortho-Phthalaldehyde (OPA) 0.55%</td>
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<tr>
<td>Clorox Clean Linen Bleach</td>
<td>5813-1</td>
<td>Clorox</td>
<td>23-Aug-2011</td>
<td>Sodium Hypochlorite 5.25%</td>
</tr>
</tbody>
</table>
All users should be familiar with the emergency response protocols.

**Relevant Equipment:** Oxycon Mobile Metabolic Cart

**List of Cleaning Supplies**

1. Cidex or Bleach Solution – disinfection of mouthpieces
2. Johnson & Johnson baby wash – cleaning (per manufacturer recommendation)
3. Nitrile Gloves
4. Wall mounted drying rack
5. Wash basins

**General Usage Procedures**

Participants will be fitted with the head piece in line with the manufacturers recommendation and will be monitored while wearing the mask. Participants will be informed that if they are ever in any pain or substantial discomfort the mask can be removed at any time.

Prior to testing participants will be screened for risk factor. Based on ACSM criteria and specific IRB approval for each protocol, a 12-lead ECG will be used to monitor participant’s cardiac rhythms.

After a test is completed the equipment will be disinfected using a disinfectant solution (e.g. Cidex, Metricide) and cleaned with the mild soap solution (Johnson & Johnson Baby Soap). The equipment will then be dried on the hanging rack.

The heart rate monitor will be disinfected using a disinfecting spray or wipes and will be hung to dry.

Prior to every usage the metabolic cart will be calibrated for both flow accuracy and for O₂ and CO₂. The mask does not restrict airflow and people can breathe ‘normally’ while wearing it. No mixed gases are flown into the mask, rather people breath normal room air.

**Standard Maintenance**

A service contract is maintained for this piece of equipment. PermaPure lines should be replaced periodically. The Triple-V should be replaced if it does not spin freely.

If any issues arise in the calibration or use of the Oxycon, please consult the Manual of Operations as we have included many tips for overcoming many standard issues that arise.

If any issues arise that need addressed with CareFusion the core director should be contacted and notes specific to the issue at hand should be made.
Standard Cleaning

In accordance with manufacturer recommendations masks and heart rate monitor straps should be thoroughly washed and hung to dry on the drying rack.

The PermaPure lines should be hung and no water should be introduced to them.

The turbine should be soaked in the disinfecting solution in accordance with the guidelines of the solution. The turbine should then be set aside to air dry and should not be used again until completely dry.

The battery should be charged after every use, and removed from the charger when the charging cycle is complete.

Approved Disinfection Products

*To be phased out after current supply is depleted* (20 December 2016)
Product: Cidex OPA
EPA Reg#: 00707800017
Registrant: Advanced Sterilization Products
Approval Date: 28-Jun-2005
Active Ingredients: ortho-Phthalaldehyde (OPA) 0.55%

Product: Clorox Clean Linen Bleach
EPA Reg# 5813-1
Registrant: Clorox
Approval Date: 23-Aug-2011
Active Ingredients: Sodium Hypochlorite 5.25%
CHAPTER 8
Exercise Intervention & Outcomes Core
Exercise Training
LSL S370D

All users should be familiar with the emergency response protocols.

Relevant Equipment: Cybex Treadmill, Cybex Stationary Bicycle, Monark Bicycle Ergometer, Cybex Bravo Multigym.

List of Cleaning Supplies

3. Disinfecting wipes for the wipe down of equipment that may come in contact with participant sweat.
4. Nitrile gloves

General Usage Procedures

Participants will be fitted to the bicycle to a level of their comfort.

In accordance with the manufacturers recommendations the ergometer will be rolled down to ensure that it is calibrated.

The bicycle will be wiped down after every use with disinfectant.

The control unit should be plugged into the data recording computer before it is turned on.

Treadmill trip hazard,

Bravo hands away from moving parts

Standard Maintenance

Daily use (Performed by Core Users):
   6. Ensure all components are clean and there are no cracks in any components.
   7. Ensure all cords are plugged in properly and do not exhibit any signs of wear and do not pose a tripping hazard.

Annual Maintenance (Performed by Core Director):
   4. Inspect the components for wear. Service or replace if necessary.

Pro re nata Maintenance (Performed by Core Users):
   1. Service of cables and belts as they exhibit signs of wear. Report issues to Core Director.
Chapter 9
Human Motion Core
Motion Capture System
LSL S360B

All users should be familiar with the emergency response protocols.

Required Trainings
- First Aid/CPR/AED – Citizen CPR
- Certification for instrument use (by Core Staff)

Equipment
- 8 - Qualisys Oqus 700 Series Cameras
- 1 – Qualisys Oqus 500 Series Camera
- 3 – AMTI force platforms

Authorized Users

The motion capture equipment is only to be operated by certified users, this will be controlled through the Facilities Online Management (FOM) system. Where by the Core Director must activate users once training has been completed.

Standard Procedures

Individuals must login to their NetID account and activate their session, this will unlock the computer and begin billing through FOM.

Individuals are to create and utilize their own ‘Workspaces’ in the QTM software. These can be shared with lab members on the IALS Data Server. A starter ‘Workspace’ file is located on the core website.

The data collection space is to be calibrated before every use to ensure optimal results, calibration should be repeated until the total residual error is less than 0.8mm. The calibration wand and L-frame are to be put away after every use to preserve their lifespan.

Data is to be saved to each users ‘home’ folder on the IALS-Data Server Accounts will be furnished for each user and user groups can be created/amended as needed. This ensures that data will be available for use at the data processing computers in the Computational Space (S360H).

14 mm retroreflective markers are provided by the Core. Markers that are damaged or lose their reflective capability are to be placed in the container marked ‘old markers’, these are not to be used any further. If additional markers are required for a project they can be purchased through B&L Engineering.

Users are to logout of the collection computer after use, this will terminate your FOM session and terminate billing.
Chapter 10

Human Motion Core
Delsys Trigno EMG/IMU sensors
LSL S360B

All users should be familiar with the emergency response protocols.

Emergency Procedures:

Please refer to the emergency response (Chapter 1) for a list of the emergency response and documentation procedures for this core.

Required Training

First Aid/CPR/AED – Citizen CPR (if working with human participants)
Certification for instrument use (by Core Staff)

Equipment

Delsys Trigno EMG/IMU System

Authorized Users

Delsys Trigno users will be certified by the Core staff. As this is instrument will most often be used in tandem with either the motion capture system (Chapter 9) or the Biodex (Chapter 3) it will be booked through FOM as an accessory for each of these facilities. Only approved users will be given the ability to book this accessory.

Standard Procedures

As the Delsys Trigno system is synchronized with other systems in the Human Testing Center there are no standard procedures other than to book the instrument through FOM.
All users should be familiar with the emergency response protocols.

Emergency Procedures:

Please refer to the emergency response (Chapter 1) for a list of the emergency response and documentation procedures for this core.

Required Training

First Aid/CPR/AED – Citizen CPR (if working with human participants)
Mechanical & Electrical Research Safety
Certification for instrument use (by Core Staff)

Equipment

Kuka LBR iiwa 14-R820 robot arm

Authorized Users

The Kuka Robot is only to be operated by certified users, this will be controlled through the Facilities Online Management (FOM) system. Where by the Core Director must activate users

Standard Procedures

Individuals must login to their NetID account and activate their session, this will unlock the computer and begin billing through FOM. At the end of their session users are to logout of the collection computer after use, this will terminate your FOM session and terminate billing.

The robot resides in the northeast corner of S360B, it can be moved into the center of the room so that it is in view of the motion capture system. When moving the robot, ensure that there are two people present. The steel base plate should always be in place underneath the robot prior to bolting it to the ground. The robot must ALWAYS BE BOLTED TO THE GROUND PRIOR TO TURNING IT ON.

Emergency stops are located both on the desktop and on the handheld control. If a person interacting with the is ever in distress the emergency should be plunged immediately.
All users should be familiar with the emergency response protocols.

**Required EH&S Trainings:**

- First Aid/CPR/AED
- Bloodborne Pathogens (if doing blood work)
- Certification for instrument use (by Core Staff)

**Relevant Equipment:**

- Room Calorimeter Chambers
- Equipment Relevant to metabolic acquisition
  - Gas Analyzers
  - Gas Blender
  - Gas Cylinders (O₂; CO₂; N₂; 20% O₂, 1% CO₂, balance N₂; 21% O₂, balance N₂)

**Standard Operation:**

The operation of the room calorimeters with human participants are to follow the extensive procedures outlined in the MOP to ensure accurate assessment of relevant dependent measures (e.g., VO₂, vCO₂, Energy Expenditure, and Respiratory Quotient). In brief, this requires gas calibrations and null measurements to be run prior to testing. As well as a null measurement run after the participant has been removed from the chamber.

The chamber will have gas from the medical air system (ensures dry air that will have uniform O₂ and CO₂ which is no different than normal ambient air).

**Alarming Procedures:**

Alarms will be set in the room calorimeter software (CalRQ) as a safe guard to alert examiners to conditions in the chambers that should be addressed by either checking the flow panel, adjust settings in the software or remove the participant from the chambers. Values are selected to prevent undue risk to participants. Alarm values for O₂ and CO₂ are established from guidelines set forth by NIOSH for CO₂ or McManus 1999 for O₂ to ensure that issues with the calorimeter are made at levels that do not approach any level of harm for the participants. The first (local) alarm point above NIOSH the long term CO₂ (8hr) exposure level (0.5%) and the altitude corrected O₂ for approximately 2000 ft above sea level (19.5%). The second alarm (text to core director) is set at 0.9% which is well below the NIOSH short term exposure limit for CO₂ (3%), the O₂ level is set at 18%, which is equivalent to 4000 ft above sea level. If the chamber values cannot be corrected when local alarms are triggered either by the study staff or by contacting the core director then the study is to be terminated and the participant removed from the chamber immediately. The second warning level that triggers a text to the core facility director allows for a system check and if no changes can be made immediately then the room can be called and study staff will be instructed to remove the participant from the chamber and close the chamber door. Temperature guidelines are established to ensure that the participant does not remain in the chamber if the
HVAC system has a failure. This failure would cause the room temperature to rise to an uncomfortable, though not dangerous, level.

**O₂**: below 19.3% (local alarm), below 18% (core director text message)

**CO₂**: above 0.5% (local alarm), above 0.9% (core director text message)

**Temperature**: greater than X standard deviations of the 10 minute average (local), greater than X standard deviations away from the 10 minute average (core director text message)

**Standard Operation:**

Prior to participants entering either of the chambers for a study the system will undergo a calibration where check the system against known concentrations (Zero Gas: 21% O₂, 0% CO₂, balance N₂ and Span Gas: 20% O₂, 1% CO₂, balance N₂) as well as ensuring that the system is delivering air that has stable, near 0% CO₂ air.

If a participant is in a chamber a core certified researcher must be present. Participants will be able to communicate with the researcher via the push button communication system. Additionally, if a participant feels uncomfortable for any reason they are free to leave the chamber, pushing the button door latch.

When staying long durations in the metabolic chambers participants will be passed their meals through an airlock and a separate airlock will be used for anything that needs passed out of the chamber. Meals will be provided by the research staff in accordance with the protocol.

Curtains are located on the inside of the large chamber and outside of the small chamber. These are to provide participants with privacy while in the chambers.

As part of the lab certification researchers will be made aware of where the materials needed to tend to any blood spill that may occur in the facility.

Between participants the chambers will be cleaned by UMass custodial staff or by the research staff and linens will be changed.

Gas tanks used to calibrate the chambers are secured to an unistrut on the wall with chain in LSL S360D. These gases include: (2) 21% O₂, balance N₂, (1) 100% CO₂, (1) 100% O₂, (1) 100% N₂, (1) 20% O₂, 1% CO₂, balance N₂. Depending on need extra tanks may also be stored in this room, these tanks will also get secured to the wall with chain. Appropriate signage will be placed on the door of S360 to inform people of the gasses located inside. In the case of fire vacate the area immediately, as the large O₂ source is an explosion hazard.

When connecting tanks to regulators a leak checking solution is applied to the threads to ensure that no leaks are present. Additionally, all tanks are checked for fill level every week.

**Standard Maintenance:**

In accordance with MEI specifications the mass flow controllers (MFC) will be sent to MEI every 6-months to undergo calibration.
Mixed gas (zero and span gasses) will be verified for content by using the gas blender that is part of the system to ensure that the measures used are correct. The method for this is located in the MOP developed in conjunction with MEI (the chamber manufacturer).

The HVAC systems for each chamber are located on top of each chamber and the glycol chiller and medical air system are located in LSL S235 and will be maintained by the UMass physical plant in accordance with their manufacturer specifications. In accordance with factory specification the drying unit on the medical air system is to be switched every month to ensure that the tanks can dry out and the system will continue to operate properly.
APPENDIX A

Emergency Exit Maps

LSL S360B: Blood Draw Room
Exercise Testing: S370E

- Your location
- Exit route
- Exit route alternate
Exercise Training: S370D

Your location

Exit route

Exit route alternate
APPENDIX B

SOAP Reporting

SOAP Reporting Instructions:

When an adverse event occurs the documentation of the event is of the utmost importance, using the S.O.A.P. documentation format allows for concise documentation of important information that relate to both the participant and the setting.

S: Subjective

In this portion of the SOAP form responders are to document their subjective views of the situation. For example, ‘The participant was eager to participate today.’ or ‘The participant seemed tired.’

O: Objective

This section is where you document measurable information that is observed during treatment. This includes things like Participant temperature, O₂ saturation, and blood pressure. Other things that can be reported in this section include reporting behaviors. For example, ‘The participant had difficulty remaining conscious.’

A: Assessment

This is the portion of reporting where you report, in descriptive terms, the participant’s performance during the session that would have led to the incident. For example: ‘the participant knocked lost consciousness and hit the phlebotomy cart resulting in the blood vials falling on the floor and breaking.’

P: Plan

In this section of the SOAP notes you are to outline the treatment plan. For example, ‘As the participant had no issues, they were allowed to leave. EH&S was contacted to help with the blood clean up.’ or ‘The participant was aided to the exam table where they laid down, 911, campus police and EH&S were contacted for their assistance. Participants feet were elevated.’
# SOAP Notes – Human Testing Suite Incident Reporting Sheet

**S:** Subjective  **O:** Objective  **A:** Assessment  **P:** Plan

<table>
<thead>
<tr>
<th>Date:</th>
<th>Person Recording:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Staff Present:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S</th>
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**APPENDIX C**

**Laboratory Incident Report Form**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Department:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Building / Room:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date/Time of incident:</th>
<th>Phone #:</th>
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</thead>
<tbody>
<tr>
<td>E-Mail:</td>
<td></td>
</tr>
</tbody>
</table>

**Witness(es):**

**Description of incident:** Include the use of Personal Protective Equipment, chemical hood or other environmental control, safety equipment (attach additional pages if necessary).

**Did the incident result in an injury:** Yes ☐ No ☐

**Description of injury:**

**Notice of Injury report submitted:** Yes ☐ No ☐ Date:

**Environmental Health and Safety (EH&S) notified:** Yes ☐ No ☐ Date:

**Name of EH&S staff person notified:**

**Title:**

**Date:**

**Emergency response information (include EH&S, fire, police, ambulance response present at the scene):**

**Name of supervisor:**

**Signature:**

**Date:**