Health and Safety Code of Practice

SCP6 Control of Substances Hazardous to Health

Responsibility for Policy:	Deputy Chief Executive, Organisational Enhancement
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RELEVANT DOCUMENTS

- Health and Safety at Work etc. Act 1974
- Management of Health and Safety at Work Regulations 1999
- Control of Substances Hazardous to Health Regulations 2002 (as amended)
- Control of Substances Hazardous to Health (Approved Code of Practice L5)
- Genetically Modified Organisms (Contained Use) Regulations 2014
- Dangerous Substances and Explosive Atmospheres Regulations 2002
- Classification, Labelling and Packaging of Substances and Mixtures Regulations 2009
- HSG 272 Using Nanomaterials at Work (Health and Safety Executive)
- EH40 Workplace Exposure Limits (Health and Safety Executive)
- HSG 258 Controlling Airborne Contaminants at Work (Health and Safety Executive)
- Health and Safety (Safety Signs and Signals) Regulations 1996
- Secure Your Chemicals (HMSO)
- Poisons Act 1972
- Registration, Authorisation and Restriction of Chemicals Regulations (REACH)

2007
- Human Tissue Act 2004
- Categorisation of Biological Agents according to Hazard and Categories of Containment (Health and Safety Executive)

RELATED POLICIES & DOCUMENTS

- Liverpool John Moores University Health and Safety Policy Statement
- MCP1 Organisation for the Implementation of the Health and Safety Policy
- MCP2 Arrangements for the Implementation of the Health and Safety Policy
- SCP9 Personal Protective Equipment
- SCP15 Management of Microbiological Safety and Genetically Modified Material
- SCP22 Unattended Experiments
- SCP42 Dangerous Substances and Explosive Atmospheres
- ECP5 Hazardous and Offensive Waste
- Health and Safety Guidance: Transporting Materials or Substances by Staff
- Health and Safety Guidance: Respiratory Protection
- Health and Safety Guidance: Undertaking COSHH Risk Assessments
- COSHH risk assessment form
- Fitness to Study Policy

THIS CODE OF PRACTICE FORMS PART OF THE UNIVERSITY'S HEALTH AND SAFETY POLICY AND REPLACES ALL PREVIOUS ISSUES

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PART 1: GENERAL GUIDANCE ON HAZARDOUS SUBSTANCES

1.1 OBJECTIVE

This section sets out the University's general policy and guidance to prevent harm to people from effects of hazardous substances and provides instructions to staff on complying with the Control of Substances Hazardous to Health Regulations (COSHH).

Salient regulations include:

- Regulation 6: Assessment of the risk to health, created by work involving substances hazardous to health
- Regulation 7: Prevention or control of exposure to substances hazardous to health Regulation 8: Use of control measures
- Regulation 9: Maintenance, examination and testing of control measures
- Regulation 10: Monitoring exposure at the workplace
- Regulation 11: Health surveillance
- Regulation 12: Information, instruction and training for persons who may be exposed to substances hazardous to health
- Regulation 13: Arrangements to deal with accidents, incidents and emergencies
- Regulation 14: Provisions relating to certain fumigations

Under these Regulations you must:

- Undertake a risk assessment of any work activities involving substances that are hazardous to health. That includes the whole process involving the hazardous substance, not of just individual substances

- Provide measures to eliminate or reduce risks, as far as is reasonably practicable

- Implement measures to ensure regular maintenance, examination and testing of both equipment and procedures are undertaken

- Implement monitoring, if the risk assessment identifies that it is required, or if exposure is possible even with control measures in place and there is a reasonable likelihood that an identifiable disease or adverse health effect will result from that exposure

- Provide information and training to employees, students and anyone else who may be potentially exposed to substances hazardous to health; keep records and ensure that the contents of containers and pipes containing hazardous substances, together with the nature of those contents and any associated hazards, are clearly identifiable.

- Provide equipment and procedures to deal with accidents and emergencies, including the provision of appropriate first-aid facilities and relevant safety drills (which shall be tested at regular intervals) and suitable warning and other communication systems to enable an appropriate response. Classify areas of specific high risk into zones and mark the zones, where necessary.

- Ensure suitable warning notices are provided for areas where exemptions for research and use of fumigation chambers are in place

1.2 WHAT IS A HAZARDOUS SUBSTANCE?

A hazardous substance is one which has an intrinsic property with the potential to cause harm. They include the following categories, as defined by the Health and Safety Executive (HSE):

a. Asthmagens
b. Asphyxiants
c. Biological agents, which may cause disease in humans (where the organism is being used)
d. Carcinogens
e. Corrosives
f. Dusts in high concentrations
g. Gases, vapours, mists and aerosols
h. Harmful (categorised when inherent properties are not fully understood)
i. Irritants
j. Mutagens
k. Nanoparticles
l. Sensitisers
m. Toxic or very toxic effects (determined by the median lethal dose (LD50) e.g. Teratogenic)
n. Any substance listed in EH40 (those with workplace exposure limits)

These could be contained in something that may be inhaled, or in liquids, gels or powders that come into contact with eyes or skin. There could be harmful micro-organisms present that can cause infection, an allergic reaction or are toxic. Harmful substances can be present in anything from paints and cleaners to wood dust, solder fume, blood or waste.

1.3 HOW HARM IS LIKELY TO ARISE

Harm is likely to arise via the following:

a. Inhalation: breathing in a substance or organism
b. Ingestion: by eating a substance or organism
c. Contact: touching a substance or organism, passing through the skin
d. Injection: by having a substance or organism forced through the skin
e. Infection: developing a disease or condition as a result of contact
f. Sensitisation: individual adverse reaction to substances

1.4 THE PROCESS OF MANAGING RISKS FROM HAZARDOUS SUBSTANCES

The COSHH Regulations require that all uses of potentially hazardous substances should be assessed, using the following methodology:

a. List the substances
b. Judge the risk (assessment)
c. Implement controls
d. Train and advise exposed people

1.4.1 Conduct an assessment of the risks

The following is required:

a. List the substances or organisms present, or produced in the workplace

b. Collect information on the substances or organisms, their effects/properties; who will use them where and when; the quantity in use; is there a risk that harm will arise to anyone when they are used?
c. A competent person should judge whether any special controls are required
d. A record should be made, where there is an identified risk

A separate consideration and an individual risk assessment should be made when using a substance/procedure, that could be compromise an individual's existing health condition or they could compromise others' health and safety e.g. uncontrolled medical condition resulting in blackout; a condition that renders them unable to use appropriate PPE. Measure this against the risk of exposure/injury (refer to the policy Fitness to Study issued by Student Governance).

1.4.2 Prevent or control exposure

The COSHH Regulations require that exposure is prevented OR, if prevention is not practicable, exposure is controlled to the lowest possible level and in every case below the levels specified in EH40 or other authoritative guidance.

Control can be achieved by each, or a combination, of:

a. Changing the work or the process to eliminate the harmful element
b. Substituting the harmful substance or organism for one less harmful
c. Using a safer form (e.g. by the use of pellets instead of powder)
d. Enclosing the work (e.g. by the use of fume cupboards etc)
e. If reasonable, or for low risk work, using Personal Protective Equipment: gloves, respirators, aprons etc.
f. Providing adequate and suitable information, including labelling and signage

1.4.3 Monitor the exposure

Ensure that systems are working and instructions are being followed. Where substances are listed in EH40, they are generally given a limit of exposure value. The Working Exposure Limit (WEL) is a standard set that should not be exceeded. Substances allocated a WEL in EH40 are those that are known to have hazardous properties and users should consider substitution with a substance of lower hazard. The duty remains under COSHH to ensure that exposure is as low as reasonably practicable.

1.4.4 Conduct health surveillance, where indicated

The COSHHApproved Code of Practice L5 and EH40 provide guidance on where health surveillance is necessary. Where health surveillance is indicated in the guidance, or where the risk assessment suggests that it may be necessary, a copy of the risk assessment should be sent to the Occupational Health Unit and the advice of the Occupational Health specialists sought. If it is necessary, health surveillance will be undertaken by competent persons with appropriate medical and nursing qualifications. A health record will be maintained by People and Organisational Development and the Occupational Health Unit.

1.4.5 Prepare and plan for emergency

Where substances or organisms or their effects require special treatment or procedures, plan ahead and make sure all exposed staff are aware of emergency procedures. Provide any special emergency equipment required, as identified in the assessment.

For substances that are likely to affect the public in the event of spillage or other emergency, or where the emergency services are likely to be required to assist, the assessment should address the procedures necessary to protect those persons.

1.4.6 Train, inform, instruct and supervise persons who may be exposed

All exposed persons must be informed of:

a. The findings of the risk assessments
b. The precautions to be adopted
c. Any emergency procedures

Risk assessments must be kept in the place where the substance or organism is being used.

1.5 WHO IS RESPONSIBLE FOR MAKING COSHH RISK ASSESSMENTS?

In every case and **without exception** the person directing the work with the substance or organism is responsible for adequately assessing the risk, before the substance is used. For example:

- Supervisors of staff for the substances they direct staff to use
- Academics (including research supervisors) for the substances or organisms they direct students or staff to use
- Contractors for the substances used in the course of their work

The task of assessment may be delegated - the responsibility may not.

1.6 PROCUREMENT

Acquiring any form of hazardous substance should be as the result of a robust management system. Hazardous substances should be purchased from suppliers who are both licensed and approved by the University. Authorisations for purchasing should include more than one signatory. The authorization process should be subject to scrutiny by other authorizers. The person raising the order should be competent to do so and have the qualifications relevant to the field of study in which the hazardous substances are required for. There should be an approved list of substances and users and this should form part of an electronic system used for ordering and stock control.

1.7 STORAGE AND USE

COSHH, the Poisons Act 1972 and relevant pharmaceutical legislation require adequate and suitable storage of substances. Containers used should be constructed from a suitable material to suit a particular group of hazardous substances. They should be lockable, with appropriate signage and located in a secure environment. There should be a robust procedure for the receipt of incoming hazardous substances, including a list of users. Collection of substances should be restricted to named persons, who are classed as users of those substances. Storage facilities should be subject to regular checks by local Health and Safety Officers, as part of an inspection programme. For storage and disposal of waste, please see part 3 section 3.2.2.

1.8 SECURITY

The security of hazardous substances is paramount. Laboratories, workshops, studios and similar workspaces should have a system whereby the rooms are lockable. Methods can include: security key, keypad or electronic swipe. The system should include good practice, keeping rooms locked when not in use, limiting access in research facilities to named persons. Security cameras should be installed where possible outside the room. There is further sector guidance on security of hazardous substances in educational establishments and is available from: http://www.cleapss.org.uk/

1.9 SOURCES OF INFORMATION

1.9.1 Safety Data Sheets (SDS)

All suppliers or manufacturers of any substance to which COSHH apply **must** supply information on the risks and hazards of using the substance or organism. This information is usually supplied in paper format, but can often be accessed on the Internet. **A Safety Data Sheet is not an assessment**. The Safety Data Sheet provides information to enable users to make an assessment of the risks. It may be appropriate, in many cases, to attach the SDS to the assessment to ensure that all the necessary information is available. The REACH Regulations make it necessary for safety data sheets to include enhanced information, exposure scenarios and risk management measures (please see Appendices 1 and 4)

1.9.2 United Nations Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

These harmonised warning and precautionary statements for labels replaced the existing risk and safety phrases in 2015. Hazard statements for labels, for example, include: H240 - Heating may cause an explosion, H320 - Causes eye irritation (please see Appendix 4).

1.9.3 The Regulations and L5 Approved Code of Practice

The Health and Safety Executive publishes guidance on COSHH in the form of an Approved Code of Practice, numbered L5 and advice fact sheets. This LJMU Code of Practice is based on the Approved Code of Practice. Copies are available free to download **online on the HSE website**. Schools or Departments who have significant COSHH risks should obtain their own copy for reference.

1.9.4 EH40 Workplace Exposure Limits

The Health and Safety Executive publishes guidance annually on a range of common substances and organisms. Copies are available **online on the HSE website.** Schools or Departments who have significant COSHH risks should obtain their own copy for reference.

1.9.5 Advisory Committee on Dangerous Pathogens (ACDP) and Scientific Advisory Committee on Genetic Modification (Contained Use)

Detailed guidance on the containment of hazardous organisms is published as Advisory Committee on Dangerous Pathogens (ACDP) Rules; the compendium of guidance is available **online on the HSE website**. Schools or Departments who have significant risks arising from the use of organisms should obtain their own copy for reference. Guidance on

genetic modification is available from the Scientific Advisory Committee on Genetic Modification (Contained Use).

1.10 FUME EXTRACTION AND FUME CUPBOARDS, EXHAUST VENTILATION AND MICROBIOLOGICAL SAFETY CABINETS

All extraction equipment, specifically provided for protecting against hazardous substances, must be:

a. Checked weekly by users - a simple check to ensure that local exhaust ventilation units are operating properly and all controls are functioning. A record is to be kept of the weekly check by the user School or Department.

b. Examined and maintained by a competent person and records maintained of the test and examination on an annual basis.

This provision applies to all fume cupboards, microbiological safety cabinets, dust extractors and all similar equipment provided to protect people. The device will, in all cases, be marked with the date and result of the test or examination. Estate Management, or its authorized agent, will engage a contractor to test and examine installed equipment. Portable equipment is the responsibility of the equipment owner. The duty to ensure that equipment is regularly examined in accordance with statutory requirements remains with the owning department.

1.11 RESPIRATORY PROTECTIVE EQUIPMENT (RPE)

A full risk assessment must be undertaken by the users of RPE and advice sought from the Safety, Health and Environment Department before any powered respirator is purchased, as there are limitations on its use. Advice may also be required from the Occupational Health Unit e.g. in the case of respiratory disease.

Any person issued with a powered respirator must be trained in its use, limitations and procedures for maintenance.

1.12 PROHIBITED SUBSTANCES

A number of substances are prohibited under COSHH (Regulation 4) and can be found listed in Schedule 2 of the COSHH Regulations. Although an exemption is in place for research and development, the use of prohibited substances is not recommended and substitution with a less harmful substance should be considered. The use of any prohibited substance must be justified by risk assessment and agreed with the line Manager, and Hed of Safety, Health and Environment, before work starts.

1.13 CARCINOGENS, known or suspected

A number of substances are known, or suspected to be, causal agents for cancers in humans. A list is published in EH40 of the most common.

COSHH divides carcinogens into 3 categories:

a. Category 1: Substances known to cause cancer in humans, based on experience
b. Category 2: Substances where an assumption can be made, on the basis of animal evidence.

c. Category 3: Substances where there is animal evidence, but of doubtful relevance to humans.

1.13.1 Hazard statements

A hazard statement is a phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous substance or mixture including, where appropriate, the degree of hazard.

Carcinogens must be labelled with hazard statements:

- H350 May cause cancer
- H351 Suspected of causing cancer

Where any use of a carcinogen, known or suspected, is proposed, the risk assessment will refer to Schedule 1 of the COSHH Regulations.

1.14 SENSITISERS

Certain substances are known, or suspected to, set up reactions in individuals. The reaction can start without warning. Suspect substances are marked with the word “Sen” in EH 40.

Note:
It is expected that persons proposing to use any of the above high-risk materials and substances will be competent and aware of the provisions of the COSHH Regulations.

1.15 MARKING AND WARNING SIGNS FOR LABORATORIES AND WORKSHOPS

Every laboratory and workshop to which the COSHH Regulations apply will be marked with a sign at the entrance. The following will apply:

- The sign will show, by standard symbols, the type of materials used in the laboratory/workshop
- The sign will also show the name and a contact number for a person who can advise on precautions to be taken in that laboratory/workshop
- The sign will also indicate whether the laboratory/workshop is designated “HIGH RISK”, where entry is strictly controlled (see 1.17 below)
- Completion of the information signs is the responsibility of the user School or Department. The signs and symbols should be supplied by the user and must comply with current legislation - Health and Safety (Safety Signs and Signals) Regulations 1996.

1.16 ENTRY INTO LABORATORIES AND WORKSHOPS BY NON-SPECIALIST STAFF AND CONTRACTORS

All laboratories/workshops will be assessed for risk and, where necessary, made secure. The level of security and restrictions on access are to be determined by the risk assessment of the work carried out by users and the substances stored or kept in the area.

Users should be aware, when making assessments, of the need to guard against allowing substances to be removed by persons who may use them for malicious or illegal purposes.

All staff such as Domestic and Security staff will be trained in simple precautions in laboratories/workshops.

Where contractors are to enter any laboratory/workshop to which COSHH applies, the user School or Department will be responsible for ensuring that the risk to the contractor has been assessed and that information is available to the contractor to enable them to work safely. The School or Department must have a **permission to access** procedure in place and contractors must not enter until a member of technical/academic/senior research staff have approved entry for work to commence. This may be superseded in an emergency situation, whereby consultation and approval should be sought through the Safety, Health and Environment Department or the Fire and Rescue HAZMAT Service, should they attend.

User Schools and Departments must inform Estate Management of any special precautions required when making maintenance requests or authorising work or alterations.

1.17 LABORATORIES AND WORKSHOPS REGARDED AS BEING HIGH RISK

The majority of laboratories and workshops are generally safe, providing simple precautions are observed and staff are properly informed of the risks and protective measures.

There remain a small number of laboratories where entry by non-specialists should be under strict supervision, either required by Regulations or disclosed by the risk assessment.

1.18 DESIGNATING HIGH RISK LABORATORIES AND WORKSHOPS

Each School will review the work carried out in laboratories and workshops, where:

a. Biological hazard Group 2 organisms are used or exposed (see section 2.4)
b. Substances allocated a WEL in HSE document EH40 are used or exposed
c. Substances listed in EH40 as a carcinogen are used or exposed
d. Ionising radiation is used or exposed (restricted under other Regulations)
e. Any work likely to cause risks similar to the above is carried out

Those laboratories and workshops will be clearly designated as **HIGH RISK** and:

- Entry will be restricted to authorised persons only and signed accordingly
- The laboratory will be secured to ensure that unauthorised entry is prevented
- Where entry is to be made by non-specialist staff, students or contractors, the risk is assessed by the user and the exposed staff are briefed and made aware of the risks and precautions

PART 2: BIOLOGICAL RISKS

2.1 OBJECTIVE

This section provides information to staff on complying with the Control of Substances Hazardous to Health Regulations (COSHH) and the Genetically Modified Organisms (Contained Use) Regulations 2014.

2.2 WHAT IS A HARMFUL ORGANISM?

Any organism, or viable microbial cell or components of microbial cells for experimental purposes, including:

a. All bacteria
b. All fungi
c. All viruses
d. All parasites

- that are capable of causing disease in humans.

2.3 HOW HARM IS LIKELY TO ARISE

Harm is likely to arise via the following:

a. Inhalation: breathing in a substance or organism
b. Ingestion: by eating a substance or organism
c. Absorption: by touching a substance or organism, or through the skin or eye cornea
d. Injection: by having a substance or organism forced through the skin
e. Infection: developing a disease or condition as a result of contact

2.4 CATEGORISATION and CLASSIFICATION OF THE RISK

The COSHH Regulations divide Biohazards into four categories, based on risk.

2.4.1 Hazard groups (HG)

HG1 - Unlikely to cause human disease.
HG2 - Can cause disease; a hazard to workers; unlikely to spread to the community; effective treatment available.
HG3 - Can cause disease; serious risk to employees; can spread to the community; effective treatment available.
HG4 - Severe risk to employees; likely to spread to the community; NO effective treatment available.

The Regulations require that all organisms in use be assessed and placed in a risk category as above. The Approved Code of Practice L5 specifies the appropriate conditions and levels of containment for each hazard group that must be applied in all cases.

The detailed lists and containment information are contained in the Approved List of Biological Agents - Categorisation of Biological Agents according to Hazard and Categories of Containment from the Advisory Committee on Dangerous Pathogens.

2.5 PROHIBITION ON THE USE OF HG3 AND HG4 ORGANISMS

Under no circumstances will work be undertaken that uses, or may produce, Hazard Group 3 or 4 organisms.

The supervisor of work is, in all respects, responsible for ensuring that this prohibition is enforced and will risk assess all work with micro-organisms to identify the steps necessary to avoid the use or production of these organisms.

2.6 NOTICE OF INTENT TO USE HG 2 ORGANISMS

Before any work with HG 2 organisms takes place, the supervisor (academic responsible for the work) will notify the Microbiological Safety Adviser about what is proposed and include the following details:

a. The location of the work
b. The name of the supervisor and all other workers
c. A fully detailed risk assessment
d. The name of the organism and the hazard category the supervisor has assigned to it
e. The steps proposed to control the risks

The Microbiological Safety Adviser will be responsible for serving notices to the Health and Safety Executive, as required by the Regulations.

As the notices to the HSE must be served 20 days before the work starts, the supervisor must allow sufficient time to enable the notices to be processed.

2.7 THE PROCESS TO MANAGE RISKS FROM HARMFUL ORGANISMS

The Regulations require that all uses of potentially harmful organisms should be assessed, using the following methodology.

2.7.1 Conduct an assessment of the risks

The following is required:

a. List the ORGANISMS to be used or produced
b. Collect information on the organisms, their effects, properties, who will use them where and when and if there a risk that harm will arise to anyone when they are used
c. Assign a Hazard Group either by reference to the guidance or on the basis of professional judgement if the organism is not listed
d. Check that containment standards can be met
e. Train and inform staff
f. Set up an emergency procedure
g. Specify disinfection and decontamination procedures

2.7.2 Prevent or control exposure

Follow the procedure set out in 1.4.2 above.

2.7.3 Monitor the exposure

Follow the procedure set out in 1.4.3 above.

2.7.4 Conduct health surveillance, where indicated

Follow the procedure set out in 1.4.4 above.

2.7.5 Prepare and plan for emergency

Follow the procedure set out in 1.4.5 above.

2.7.6 Train, inform, instruct and supervise persons who may be exposed

Follow the procedure set out in 1.4.6 above.

2.8 WHO IS RESPONSIBLE FOR MAKING COSHH RISK ASSESMENTS?

Follow the procedure set out in 1.5 above.

2.9 SOURCES OF INFORMATION

Utilise the sources detailed in 1.9 above.

2.10 FUME EXTRACTION AND FUME CUPBOARDS, EXHAUST VENTILATION AND MICROBIOLOGICAL SAFETY CABINETS

Follow the procedure set out in 1.10 above.

2.11 RESPIRATORY PROTECTIVE EQUIPMENT (RPE)

Follow the procedure set out in 1.11 above.

2.12 MANAGEMENT OF MICROBIOLOGICAL SAFETY AND GENETICALLY MODIFIED MATERIAL SUB-COMMITTEE

A Management of Microbiological Safety and Genetically Modified Material Sub-Committee is in place, under the direction of the Microbiological Safety Adviser who is identified in the University Health and Safety Policy (refer to MCP1 Organisation for the Implementation of the Health and Safety Policy and SCP15 Management of Microbiological Safety and Genetically Modified Material).

The Microbiological Safety Adviser will ensure that ACDP and ACGM rules and standards are met and report compliance, or otherwise, annually in writing to the University Health and Safety Committee. The Microbiological Safety Adviser will be responsible for the management of the Sub-Committee.

PART 3: WASTE DISPOSAL OF MATERIALS TO WHICH THE COSHH REGULATIONS APPLY

3.1 OBJECTIVE

The objective of this part of the Code of Practice is to provide guidance to producers of waste substances or organisms on the standards and systems of disposal. Reference should be made to ECP5 Hazardous and Offensive Waste. The University will dispose of its waste responsibly and in accordance with best practice to avoid harm to people or the environment.

3.2 HARMFUL CHEMICAL WASTE

There are several methods by which hazardous chemical waste must be disposed of safely: by Licensed Carrier/Disposer for Chemical or Clinical Waste, or small amounts can be disposed of to drains but must be consistent with Environment Agency Guidance. Refer to the Safety, Health and Environment Department for this guidance.

3.2.1 Assessing the risk

This Code of Practice requires that all hazardous substances are risk assessed. A part of that assessment, in every case, will be to identify whether waste will be generated and how that waste will be disposed of.

3.2.2 Disposal procedure

Staff must be trained to manage hazardous chemical waste. This should consider purchasing and stock control, as part of the overall management system. All staff who wish to dispose of hazardous materials or substances will contact the local School Health and Safety Officer, Technical Manager/Service Manager or Health and Safety Coordinator at the appropriate University site. Waste producers will supply a list of the following information to the local School Health and Safety Officer, Technical Manager or Health and Safety Coordinator:

a. The chemical name of the substance and synonyms where used
b. The principal risks associated with the substance
c. The quantity of substance
d. Its form and handling instructions

All substances will be labelled, listed and placed in robust containers to await collection. The containers must be stored in a suitable and secure area in the laboratory, workshop, studio, similar workspace or other specified area, which may include an internal or external goods store. All containers must be clearly labelled according to UN hazard classification and display the appropriate hazard warning sign.

Information regarding collection will be provided by the local School Health and Safety Officer, Technical Manager/Service Manager or Health and Safety Coordinator if appropriate. Copies of the hazardous substance list must be kept in a register by the waste producer or Manager for a minimum of three years. All hazardous waste disposals must be via an approved licensed contractor that meets the criteria set by current legislation and the Environment Agency.

3.3 INFECTIVE OR CLINICAL WASTE

Clinical or infective waste will, where practicable, be disposed of only after making it safe by mechanical or chemical means. Where sharps or similar waste is produced, which cannot be sterilized, the producer will arrange for a licensed and competent contractor to remove and dispose of the waste.

Suitable robust, identified (yellow), clinical waste containers must be used and stored to await collection in a suitable demarked area with controlled access. Appropriate transfer notes should accompany the containers.

Procedures for waste disposal should be followed as in policy ECP5 Hazardous and Offensive Waste, sections 9.7, 9.8, 9.9.

3.4 COSTS AND CHARGES

All waste is the responsibility of the producing School or Department.

PART 4: USE OF HUMAN TISSUE IN RESEARCH

4.1 HUMAN TISSUE ACT 2004

Research involving human tissue must comply with the Human Tissue Act 2004 and receive ethical approval from an appropriate Research Ethics Committee. Examples of human tissue include blood, saliva, muscle biopsies and bodily waste.

4.2 ETHICAL APPROVAL

For research conducted on premises covered by a Human Tissue Authority (HTA) research licence, ethical approval is still required and can be sought via the University's Research Ethics Committee. Where the research is not conducted under a research licence issued from the HTA, approval must be sought via the National Research Ethics Service (NRES). Research participants must not be approached or recruited without full and unconditional ethical approval.

4.3 FURTHER INFORMATION

For further information, please contact the Head of Research Programme Development or the Director of the Research Institute for Sport and Exercise Science. Please see the link to the University's Research Ethics Committee's website: https://www2.ljmu.ac.uk/RGSO/93042.htm

PART 5 NANOTECHNOLOGIES

5.1 DEFINITION

Nanotechnologies involve the creation and/or manipulation of materials at the nanometre (nm) scale. One nanometre is 10-9 m or one millionth of a millimetre. By comparison, a human hair is approximately 70,000 nm in diameter, a red blood cell is approximately 5,000 nm wide and simple organic molecules have sizes ranging from 0.5 to 5 nm.

As little is known about the effects to health of exposure to Nanomaterials they must be managed using the COSHH risk assessment process. Unique properties of engineered nanomaterials may pose an occupational health risk. Limited knowledge about the factors that are essential for predicting health risks such as routes of exposure, translocation of nanomaterial once inside the body, and the interaction of the nanomaterial with the body's biological systems are not yet fully understood.

5.2 RISK ASSESSMENT PROCESS

Assessment of health risks arising from exposure to nanomaterials or other substances requires understanding of the intrinsic toxicity of the substance, the levels of exposure (by inhalation, by ingestion or absorption through the skin) that may occur and any relationship between exposure and health effects. More data is needed on the health risks associated with exposure to engineered nanomaterials.

Where nanomaterials have an uncertain or not clearly defined toxicology and unless, or until, sound evidence is available on the hazards from inhalation, ingestion, or absorption a precautionary approach should be taken to the risk management.

Work with nanomaterials must be undertaken using fume hoods that are equipped with the appropriate filters.

The HSE guidance HSG 272 Using Nanomaterials at Work must be followed.

APPENDIX 1

REGISTRATION, AUTHORISATION AND RESTRICTION OF CHEMICALS REGULATIONS (REACH) 2007

REACH places duties on manufacturers, importers and downstream users of chemicals. The requirements of the legislation were phased in until 2013. REACH places the onus on manufacturers and importers of chemicals to register their chemicals for particular uses and to provide enhanced Safety Data Sheets, Exposure scenarios and risk management measures to downstream users of their products, if those products are manufactured or imported into the EU in quantities in excess of 1 tonne per annum. A new type of exposure limit is the DNEL (Derived No Effect Level). For a detailed explanation of a DNEL, please go to the British Occupational Hygiene Society's website.

REACH will complement COSHH and assessments under this legislation should continue to be made.

1. For substances manufactured or imported at levels above a tonne a year, REACH will lead to the collation and assessment of data on environmental and human health risks. This will lead, in turn, to improvements in the health and safety information communicated down chemical supply chains and should then improve local COSHH assessments generally.

2. For substances at lower tonnages, such an information flow will not be triggered by REACH. COSHH will remain in place to help protect those working with chemicals.

   Guidance from the Health and Safety Executive implies it is unlikely that a University will need to register any chemicals - unless a School has any significant direct imports from outside the EU. If this is the case, you should contact the manufacturer and ensure that they intend to register the chemical, within the required timescale, for your particular type of use within the EU. The >one tonne limit for registration is cumulative and applies to total amounts imported by a manufacturer into the EU. Regarding the possibility of a University needing to seek authorisation for the use of a substance listed in Annex XIV of REACH, Article 56 (3) of REACH indicates that the authorisation provision shall not apply to the use of substances in scientific research and development.

   It would, however, be prudent if Schools using chemicals that are classed as "of very high concern" e.g. CMRs (Substances that are Carcinogenic, Mutagenic or Toxic to Reproduction), PBTs (Persistent, Bio-accumulative Toxic Chemicals), vPvBs (very Persistent, very Bio-accumulative Chemicals) and those identified from scientific evidence as causing probable serious effects to humans or the environment, equivalent to those above on a case-by-case basis, such as endocrine disrupters, contact their suppliers to ensure that they are aware of their importance to you, that supply is to continue and that these chemicals will be registered by them, should this be necessary.

APPENDIX 2
HANDLING BLOOD, BODY FLUIDS AND HUMAN TISSUE SPECIMENS

1. OBJECTIVE

The objective of this part of the Code of Practice is to provide guidance to all staff and students on precautions related to work using human blood, body fluids or specimens.

The use of human blood and body fluids must be assessed in accordance with this Code of Practice, placing the blood and body fluids in a hazard group as with any other organism.

Previous issues of this Code of Practice have encouraged a broad interpretation of the term "used for diagnostic purposes".

Persons who use blood or body fluids are advised to consult Schedule 3 paragraph 1 of the Approved Code of Practice L5 (COSHH Regulations) to judge whether the derogation of blood to HG2 is justified for the work to be done.

2. DEFINITIONS

2.1 Supervisor

Supervisor means any member of staff who directs the working of any student or member of staff.

2.2 Blood

Blood in this context means whole blood, cells or other separated constituents of animal and human blood capable, for the purpose of these rules, of causing or transmitting disease from the fluid to a human.

2.3 Body fluids

Body fluids means any human body fluids capable of causing or transmitting disease to humans.

2.4 COSHH Regulations ACDP Rules

The ACDP Rules are the Advisory Committee on Dangerous Pathogens Code, Categorisation of Pathogens According to Hazard and Categories of Containment.

2.5 Work

Work will be taken to mean the drawing, collecting, storing, manipulating or transporting of blood or body fluids.

3. APPLICABLE CODES AND RULES

3.1 Organisation

Laboratory handling of all human blood and body fluids will be regarded as a risk activity and will come within the scope of the University Health and Safety Policy and all the requirements imposed by this Code of Practice.

3.2 Responsibility

The handling of any human blood and body fluids under all laboratory conditions will fall within the Code of Practice's definition of a substantial hazard and therefore, must in every case, be subject to a formal risk assessment.

In every case, without exception, the person who supervises the work as the competent person will be responsible for the completion, and review when required, of risk assessments. The task of carrying out the assessment may be delegated; however, responsibility rests entirely with the supervisor at all times.

There may be a need for immunization against Hepatitis B, so advice should be sought through the Occupational Health Unit. You will need to provide a full COSHH risk assessment.

4. CATEGORISATION

Human body fluids can contain and may transmit to humans a variety of diseases. HIV, Hepatitis B, C and D are addressed specifically in the ACDP Code.

However, supervisors should be aware that any risk assessment carried out must address all likely conditions arising from the work and are required to exercise their professional judgement in identifying potential hazards.

IN ALL CASES, UNSCREENED BLOOD WILL BE REGARDED AS AT LEAST A CATEGORY 2 PATHOGEN AND WILL REQUIRE CATEGORY 2 CONTAINMENT AS PER ACDP RULES. THE SOURCE OF THE BLOOD OR BODY FLUIDS MAY SUGGEST THE CONTAINMENT LEVEL IS HIGHER.

4.1 Blood from higher risk sources

Where blood or body fluids are to be used and the source of that blood is from an individual or group known to be infected with any pathogen identified as category 3 or 4 the supervisor of the work will submit a detailed risk assessment to the Microbiological Safety Adviser before work starts.

The supervisor of the work must be prepared to justify the work being carried out at Category 2 containment levels. Work will be permitted only under the strictest control and will be regularly monitored.

5. SOURCE OF BLOOD OR BODY FLUIDS (other than known or suspected HG3 sources of blood)

For the purposes of these rules blood and any body fluids will be divided into three broad categories depending on source and type of working method.

5.1 Screened blood and similar

For blood or body fluids obtained from organizations such as the Regional Blood Transfusion Service who operate a well-developed screening system, good laboratory practice is still required for the prevention of contamination through cuts or sharps or the creation of aerosols.

5.2 Blood/fluids to be worked on only by the donor

Where students or staff obtain blood from themselves for their own use only, the following conditions must be observed:

a) The blood must be drawn only by a person authorised and competent to do so
b) The work should be carried out in an area isolated from others
c) It is the responsibility of the user to ensure that all services and equipment are fully disinfected and free from the possibility of transmitting infection at the end of each working day and at the end of the work. The provision should include all benches, worktops, sharps etc. (please refer to Appendix 3)
d) It is the personal responsibility of the worker to move all the remaining blood and contaminated equipment from the work area and make them safe by means of chemical or mechanical sterilization (please refer to Appendix 3). These tasks cannot be delegated and remain at all times the personal duty and responsibility of the worker.

5.3 Blood, body fluids from unscreened sources other than the handler of the fluids

In all cases where body fluids are obtained from a source which is unscreened, i.e. it is not possible to predict that the blood carries specific disease bearing organisms, a full COSHH risk assessment (also refer to University Health and Safety Policy and SCP18 Risk Assessment) must be completed and submitted to the Microbiological Safety Advisor, prior to any work commencing.

Unscreened blood will, in all cases, require at least Category 2 containment (ACDP Codes) unless the supervisor can demonstrate that it is reasonable to presume that a lower category containment would be satisfactory in the particular circumstances of the case, having regard to the likely risk.

Factors which should be specifically addressed at assessment are:

- the competence of the workers involved, e.g. how many and their level of expertise
- the conditions under which the work is to take place, type of laboratory etc.
- the type and status of donors, including the likelihood of transmission of infections.

Work with unscreened blood should be regarded as requiring at least Category 2 containment.

Note to all supervisors - It shall remain at all times the responsibility of the supervisor of the work to ensure that work is carried out, in all respects, safely.

6. HUMAN TISSUE SPECIMENS

Specimens such as tissue from human sources are regulated by the Human Tissue Act. There is strict guidance with regard to removal, storage and use of such specimens. Good Practice guidance issued by the Human Tissue Authority must be followed. Any tissue specimens acquired from human donors must have written consent from that donor and the user must detail storage and disposal routes when the specimens are finished with.

It is important to note the contents of Part 4 of this Code of Practice.

7. WORK WITH DIAGNOSTIC STRIPS AND SIMILAR

A number of procedures are used where blood is taken by autolet, using diagnostic strips.

The responsibility of completing assessment both under COSHH and the Management of Health and Safety at Work Regulations rests firmly with the supervisor i.e. the person who actually supervises the work. This is generally not Technical staff. Good laboratory practice must be observed at all times.

8. GUIDANCE

ACDP 'Infection at Work: Controlling the Risks' contains general guidance on good laboratory practice and supervisors are advised to follow its recommendations. Also see University Guidance on the Health and Safety webpage under SCP6 COSHH.

9. WASTE DISPOSAL

The making safe and disposal of the organisms in body fluids and any contaminated items is the responsibility of the work supervisor. Local standard operational procedures for decontamination and disposal must be followed. Please refer to ECP5 Hazardous and Offensive Waste.

APPENDIX 3
CHEMICAL DISINFECTANTS

1. LABORATORY DISINFECTION AND THE USE OF CHEMICAL DISINFECTANTS

The broad principles accepted in the hospital use of chemical disinfectants in clinical areas apply equally well in laboratories, **except** that the concentration of micro-organisms may be much greater in the laboratory where cultures and infected pathological material may be present in volume.

2. WHEN CHEMICAL DISINFECTANTS SHOULD NOT BE USED

Chemical disinfectants should not be used:

- When sterilisation is required
- When physical methods can be used instead
- When thorough cleaning is adequate
- When disposable equipment can economically be used

3. WHEN CHEMICAL DISINFECTANTS MAY BE USED

The use of disinfectants is limited to a few well-defined situations, which may be described in the terms used to classify their use in hospitals:

- Treatment of skin - very limited requirements (not hand wash)
- Disinfection of instruments and apparatus when physical methods cannot be used
- Making infected items safe for subsequent handling
- Decontamination of hard surfaces: house-keeping, spillages and increased risk areas

Laboratory disinfectants should be active:

- Against vegetative bacteria
- Against mycobacterium
- Against bacterial spores
- Against viruses

In the presence of organic material and hard water, but be

- Non-corrosive
- Non-toxic to inhale, or to the skin

No single disinfectant fulfils all the requirements.

4. DISINFECTANT GROUPS

Disinfectants may be grouped into the following:

- Alcohols e.g. ethanol
- Phenolics e.g. hycolin
- Halogens e.g. sodium hypochlorite
- Aldehydes e.g. formaldehyde

5. STEPS TO BE TAKEN IN SELECTING DISINFECTANTS

The following steps must be taken, when selecting disinfectants:

- List the purposes
- Eliminate:
  - Where sterilisation is required
  - Where more reliable means are available
  - When cleaning is adequate
  - When disposables are used
- Select disinfectants; arrange for distribution; instruct the users; check results by test

APPENDIX 4
HAZARDOUS SUBSTANCE LABELLING

International symbols have replaced the European symbols. Risk phrases have been replaced by hazard statements and precautionary explanations to reflect changes implemented by the Classification, Labelling and Packaging of Substances and Mixtures Regulations (CLP Regulations) 2009.

The new UN Globally Harmonised System aims to standardise all classification labelling and packaging of substances across the world, aiming to simplify information, reduce confusion and contribute to risk reduction measures.

This system has been implemented by the CLP Regulations. Prior to this substances and preparations were classified, labelled and packaged according to the Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP), which were revoked in 2015.

You will need to be aware of the changes in phrasing, pictograms and safety data sheets. The word 'Preparation' has been replaced with the word 'Mixture'. There are now only 9 pictograms, all on a white background, with a red diamond frame with the black hazard symbol inside (see table below). All pictograms relating to transport are still governed by the Transport of Dangerous Goods Regulations.

Other considerations include:

a. Storage cabinet signage must also conform with updated safety signage

b. Standard Operating Procedures will need to reflect any new hazard and precautionary statement, if the risk and safety phrases were at a lower standard.

c. Containers should maintain the supplier's label. If you decant into smaller containers these should now be labelled with the new style pictograms and warning statements, unless they are too small to usefully hold the information required. This information can be, for example, on a poster kept near to chemical storage.

d. Material Safety Data Sheets – the word 'material' has been removed and these are now known simply as Safety Data Sheets. They will include 16 set headings:

1. Identification
2. Hazard(s) identification
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

Table of signage

Description	Old pictogram	New pictogram	Hazard class and hazard category
Exploding bomb			Unstable explosives Explosives of divisions 1.1, 1.2, 1.3, 1.4 Self-reactive substances and mixtures, types A,B Organic peroxides, types A,B
Flame			Flammable gases, category 1 Flammable aerosols, categories 1, 2 Flammable liquids, categories 1, 2, 3 Flammable solids, categories 1, 2 Self-reactive substances and mixtures, types B, C, D, E, F Pyrophoric liquids, category 1 Pyrophoric solids, category 1 Self-heating substances and mixtures, categories 1, 2 Substances and mixtures, which in contact with water, emit flammable gases, categories 1, 2 ,3 Organic peroxides, types B, C, D, E, F
Flame over circle			Oxidizing gases, category 1 Oxidizing liquids, categories 1, 2, 3
Gas cylinder			Gases under pressure: - Compressed gases - Liquefied gases - Refrigerated liquefied gases - Dissolved gases
Corrosion			Corrosive to metals, category 1 Skin corrosion, categories 1A, 1B, 1C Serious eye damage, category 1
Skull and crossbones			Acute toxicity (oral, dermal, inhalation), categories 1, 2, 3
Exclamation mark			Acute toxicity (oral, dermal, inhalation), category 4 Skin irritation, category 2 Eye irritation, category 2 Skin sensitisation, category 1 Specific target organ toxicity – single exposure, category 3

Health hazard			Respiratory sensitization, category 1 Germ cell mutagenicity, categories 1A, 1B, 2 Carcinogenicity, categories 1A, 1B, 2 Reproductive toxicity, categories 1A,1B, 2 Specific target organ toxicity – single exposure, categories 1, 2 Specific target organ toxicity – repeated exposure, categories 1, 2 Aspiration hazard, category 1
Environment			Hazardous to the aquatic environment - Acute hazard, category1 - Chronic hazard, categories 1, 2