Safety Services Guidance

Guidance on best practice in the management of open-plan, shared laboratories

Key word(s):	Open plan laboratories, management of shared laboratories and facilities
Target audience:	Staff and students working in open plan laboratories, sharing benches and fume cupboard/bio safety cabinets.

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Introduction

1. During December 2006, an exercise was carried out to evaluate whether open-plan, shared laboratories presented any additional health and safety issues compared to the traditional single occupier laboratories. The findings of this evaluation are shown in the Appendix.

2. Within the limitation of the exercise, no enhanced or novel safety issues were identified, however, the potential for an accident/incident and its consequences appeared to be greater. This is perhaps not surprising as there is a perception of less "ownership" by the occupiers since there is less definition of space.

Delivering standards

3. The standards expected for occupiers in laboratories are defined in the written local health and safety arrangements (e.g. local policy, Codes of Practice, local rules, Standard Operating Procedures, authorized notices etc). The same standards are required for shared labs; however, delivering the standards is more challenging in multi-occupancy areas. There is a requirement for the employer to ensure that there is adequate co-operation, co-ordination and communication between those sharing a workplace to ensure that everyone is sufficiently informed about all the risks present.

4. To ensure that lab personnel are made adequately aware of the changing nature of risk and to maintain acceptable standards of health and safety, it is advisable that there should be "champion" e.g. senior/ lead academic or equivalent who has sufficient management authority to ensure that adequate co-operation, co-ordination and communication takes place between neighbouring research groups. The nominated person should have good links with the local health and safety committee.

5. Additionally, shared workplaces may require supplementary systems of control to ensure a co-ordinated approach to managing risks to avoid the failings identified in the Appendix.

6. The table below is intended to illustrate the areas where additional systems of control may be required for shared labs.

7. Table A - Topics specific to open-plan labs to be covered in the written health and safety arrangements.

Topics	**Additional requirements**
Organizational structure with respect to health and safety	Identification of the nominated person (eg a lab champion)
Roles and responsibilities	Define the nominated person's role (and the role of all other lab users)
Purchasing arrangements for reagents/material & Stores operation	Inventory system to monitor acquisition of hazardous material
Space allocation	Regularly review with respect to different activities and to take action to deal with any overcrowding issues. Include an occupancy plan
Selection and use of personal protective equipment (e.g. lab coats, eye protection, gloves, masks)	Raising awareness of the limitations of the equipment (e.g. chemical compatibility, choosing correct filter protection)
Hazardous equipment	Nominated person to be informed of equipment purchase/acquisition System to prevent use by untrained user or unauthorized users
Risk assessments	Must consider risks to those not directly involved in the work and provide them with adequate information
Waste management	Effective mechanism for regular disposal and planning for changing lab staff levels
Immunization policy	Consider in the risk assessment those not directly involved in the work
Specialized work areas e.g. safety cabinet, centrifuges, scintillation counter	System of control (e.g. booking) required and displayed local rules emphasizing cleaning procedures.
Testing and maintenance of equipment	Communication of the work schedule to other occupiers (including permits to work for roof / plant room access, etc)
Working at height	Avoid storage at height and control the use of ladders
Controlling visitors and contractors	Communication to other occupiers
Inspection of facility	Identify anticipated failings (e.g. segregation of chemicals) and evaluate for adherence to standards

Planning considerations

8. A key advantage of open-plan labs is the flexibility in the use of space; however, careful consideration of the degree of segregation of work activities is required. Routine bench work may occur in the open-plan lab itself whilst specialized work such as tissue culture and fume hood activities require dedicated equipment/areas. The demand on these areas will need to be determined in consultation with the end users. Additionally, the criteria for space allocation to a research group will need to consider both their requirements for specialized space as well as individual space.

9. The health and safety arrangements must be communicated to the end users prior to occupancy of the facility. Ideally this should be carried out through a building induction programme and additional arrangements made for the specialized areas.

Appendix: Survey of Shared, Open-plan Laboratories, Dec 2006

Aim:

The purpose of the exercise was to evaluate whether open-plan, shared laboratory areas present any additional health and safety issues compared to the traditional single occupier laboratory and, if necessary, make recommendations to reduce risks.

Observations:

Five shared labs housing either single or multiple research disciplines were visited in December 2006. Although notice was given, the users were asked NOT to make any special preparation for the visit.

Our focus was to evaluate both safety and health issues; although with the time limitations we concentrated on safety issues. It may be necessary to consider heath issues at a later date.

Visits were carried out by Maynard Case, Catherine Davidge and Patrick Seechurn as follows:

Date	Building	Area(s) visited	Visit team escorted by
1/12/2006	MIB	2nd floor labs	Janet England & Tanya Aspinall
7/12/2006	Smith	G floor, A wing	Arthur Nicholas
13/12/2006	CTF	2nd floor (FLS)	Louise Hewitt
15/12/2006	CTF	3rd floor (FMHS)	Yvonne Alexander
15/12/2006	Chemistry (Brunswick St)	OMIC (1st floor 'old building') & Ground floor lab in new extension	Elaine Armstrong & Mike Morris

Results:

We observed varying standards during the visits and have listed issues seen in a number of areas which adversely affect safety in the laboratories:

- Incompatible storage of chemicals
- Poor storage arrangements
- Variable compliance on using PPE
- Lack of awareness of other risks generated by neighbours
- Trip hazards

- Overfilled bins
- Inadequate labelling of chemicals
- Excessive storage of combustible material
- Opportunities for loss of containment/cross contamination
- Excessive storage of polystyrene boxes which generate excessive smoke and heat in a fire
- Better planned preventative maintenance on key equipment is required (e.g. gas regulators)
- Insufficient planning of space allocation prior to multi-user occupancy
- Laboratory design has increased some risks inadvertently (e.g. excessive high storage, overreaching to access electrical sockets)

Discussion:

Although we did not identify any enhanced risks from this limited exercise, it was obvious that the consequences of an incident would be greatly amplified in an open-plan laboratory (e.g. fire spread, degree of cross-contamination)

We observed acceptable practice where there was an identified individual taking a lead on promulgating health and safety standards. It was noticeable that the experience of the individual and their knowledge of the work taking place played a significant contribution in maintaining standards. However, there are limitations in this approach particularly where the nature of the work being undertaking is very varied and where formalised corrective action is needed to maintain standards.

In laboratories where there were dedicated technical staff standards, in general, were higher.

Some laboratories had made a careful plan of occupancy and it was observed that the safety of the laboratory reflected the tactics employed in the exercise as these areas demonstrated a greater adherence to safety standards.

Recommendations:

To build on the above model of acceptable practise further, it is suggested that where there are several research groups each with their own Principal Investigator (PI), there should be an academic staff member nominated to ensure co-ordination and communication between each group to maintain appropriate standards of lab practice. Their role would be to ensure that there are suitable arrangements in place to prevent the types of issues identified above, although the list should not be regarded as exhaustive.

It would be advisable for the nominated academic to have good links with the local general health and safety committee and their role should be incorporated into the written local health and safety arrangements.

Increased attention to detail is required at the planning stages when designing open-plan laboratories and when allocating space to reduce known areas of potential risk. A careful 'plan of occupancy' should be made prior to moving into open-plan laboratories. Sharing of existing good practice will assist.

It may be appropriate to apply the principles of these recommendations to other new buildings being developed on campus to increase safety standards campus-wide.

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Owner of this document:	Head of Safety Services, Dr Patrick Seechurn
Lead contact:	Dr Patrick Seechurn